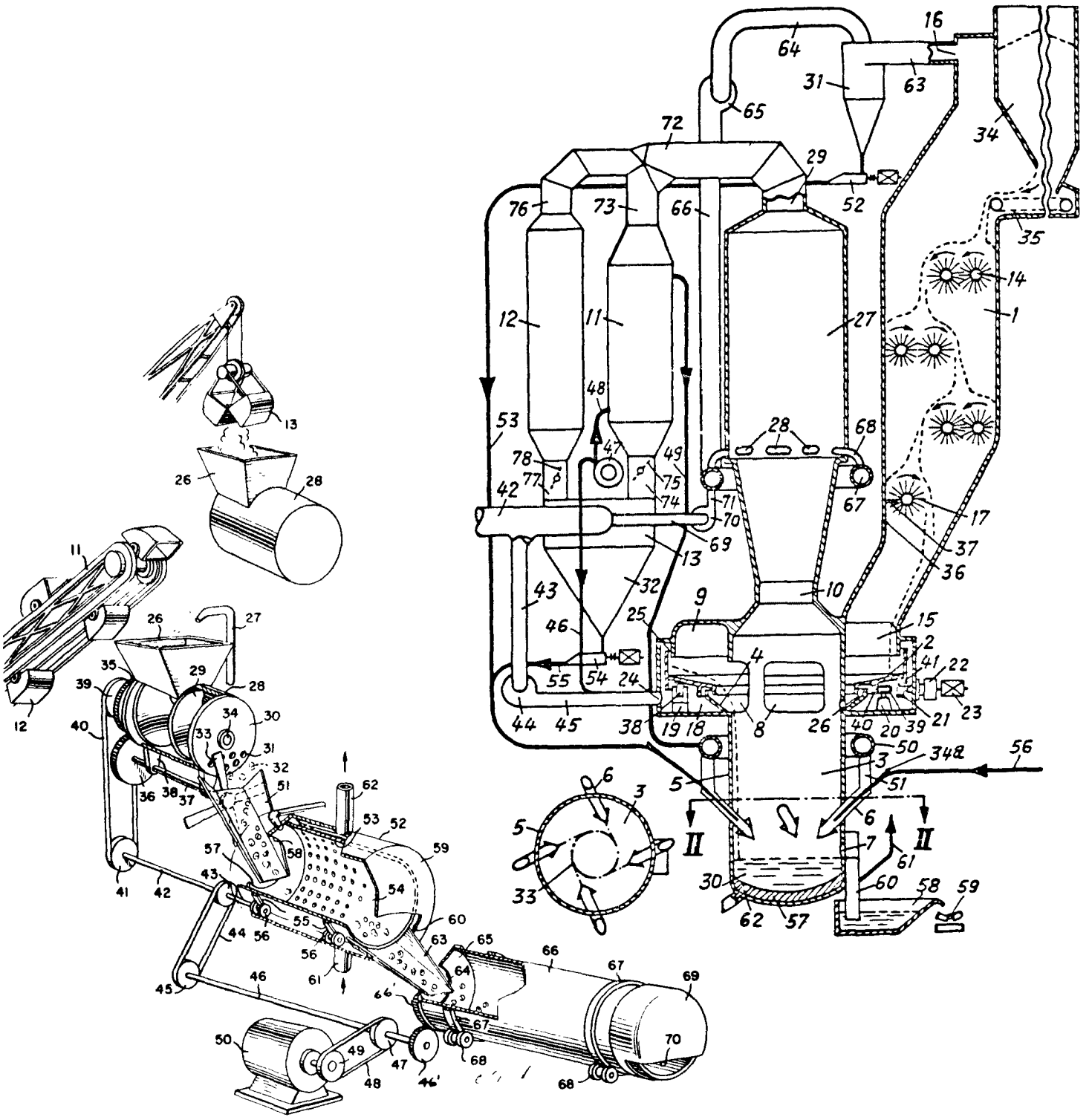
PATENT ABSTRACTS

INTERNATIONAL

SOLID WASTE MANAGEMENT 1945-1969



PATENT ABSTRACTS
INTERNATIONAL
SOLID WASTE MANAGEMENT, 1945-1969

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FOREWORD

The Office of Solid Waste Management Programs (OSWMP) of the U.S. Environmental Protection Agency presents the second of a two-part publication dealing with worldwide patents for designs and devices for solid waste management. The first volume (SW-77) is restricted to U.S. or domestic patents; the second represents international contributions.

Through a contract with the Franklin Institute of the State of Pennsylvania, 1,061 patents were abstracted; citations were formulated which give "curriculum vitae": name of the inventor, his sponsor (if any), dates filed and issued, and the most representative drawing(s) accompanying most of the patents. Some of the illustrations received from the country of origin were not of the best quality, but every effort was made to reproduce them as effectively as possible. The volume is arranged in 20 subject categories, and detailed indices follow the abstracts so that the reader may locate his area of interest without difficulty. After being abstracted for this volume, the patents then become part of a solid waste information retrieval system, which is continually adding to its data base of published literature.

This document and its companion are intended to complement the 1968 publication entitled Abstracts; Selected Patents on Refuse Handling Facilities for Buildings, also prepared by the OSWMP. The widened coverage is an indication of the increased interest in finding solutions to refuse-handling problems. The concordance index demonstrates that several countries have patented identical equipment and processes.

It is our hope that these documents will stimulate further development in this area.

--SAMUEL HALE, JR.
Deputy Assistant Administrator
for Solid Waste Management

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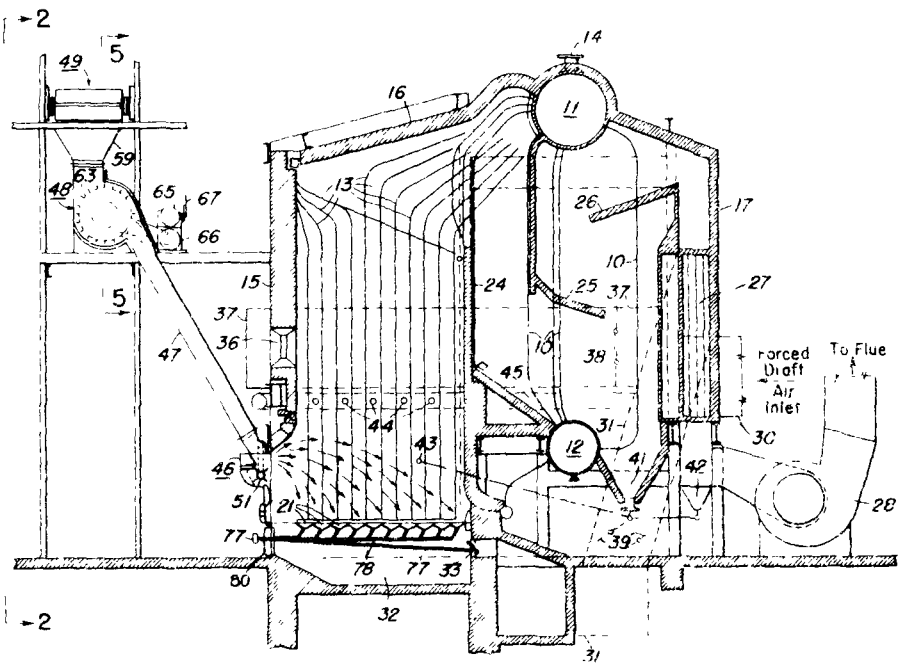
AGRICULTURAL WASTES

INT-0001

Weigel, A. C., and H. G. Meissner (Combustion Engineering-Superheater, Inc.). Art of burning bagasse. Canada 466,151; filed Mar. 31, 1948; issued June 27, 1948.

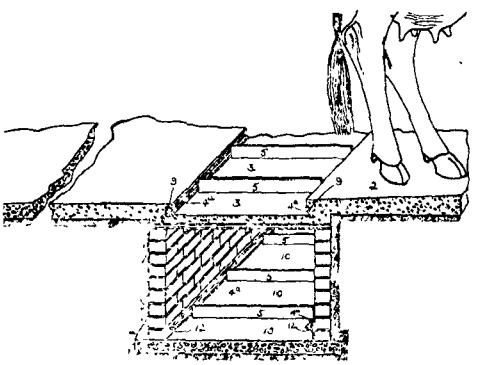
This system for burning bagasse and similar vegetable fuels involves a combustion chamber, a grate at the bottom of the spreader, and a device beneath the grate for admitting air upward through the grate. In one of the furnace walls above the grate is a spreader stoker with an inlet outside the wall and a rotating distributor communicating with the interior of the chamber. The bagasse fuel is brought by a conveyor to a hopper from which it enters a feeder placed above the stoker inlet. Inside the feeder, a stationary cutter slices off measured portions of the fuel and mechanically-driven flight members release the material into a duct leading to the spreader stoker at an accurate, adjustable rate. The rotating distributor in the stoker injects the bagasse into the combustion chamber where it is uniformly distributed over the grate. As they travel toward the grate through the hot combustion gases, the spreader-injected bagasse particles are dried and partially burned. A bed of burning bagasse is maintained on the grate to support combustion.



INT-0002

Evans, J. E. Improvements in or relating to the disposal of manure in shippons, piggeries, and the like. Great Britain 605,900; filed Jan. 25, 1947; issued Aug. 3, 1948.

In this apparatus, an endless push-plate conveyor works over a channel floor provided for the reception of the manure. The return path of the conveyor is situated vertically above or below the channel floor. Both sides of the floor channel are undercut or recessed to constitute housings for a pair of conveyor chains, or conveyor chain guides, so that the



pusher plates, each of which is attached by its ends to the chains, span the full width of the channel floor and so sweep the whole of the floor. The conveyor is mounted on or carried by conveniently positioned toothed sprockets, and is mechanically driven in any convenient manner, such as by an electric motor, gas or oil engine, or other power source. A stationary brush or brushes may be located in the return path of the conveyor, so that any manure tending to adhere to the push plates or chains shall be removed.

INT-0003

Siddiqui, S., K. K. Sarin, J. P. Varma, and P. Dayal. Manufacture of heat-insulating light-weight padding material for roofing boards or the like from agricultural waste. India 41,878; filed Aug. 25, 1949; issued May 2, 1951.

Short-sized fibrous material, such as coconut fiber, sisal, jute, or flax fiber, is mixed with bagasse pulp and water to form a suspension. The water is allowed to drain off and the mass is pressed into boards. The proportion of pulp to fiber is preferably 75 to 25 by weight. Bagasse pulp is obtained by cooking bagasse with a sodium hydroxide solution and grinding the cooked bagasse in beaters.

INT-0004

Bhargava, M. P. Improvements in or relating to processes of digestion of fibrous raw materials for the production of pulp of cellulose. India 48,905; filed Feb. 3, 1953; issued Oct. 3, 1953.

The digestor is charged with bamboo chips, the moisture content of which has been previously determined. The charge is steamed to about 5 to 10 lb gauge pressure by admitting saturated steam (25 to 35 lb gauge pressure) at the bottom. Meanwhile, cooling liquor that contains about 24 percent total active alkali (sodium hydroxide and sodium sulfide) and has a sulfite content of 25 percent and an initial concentration of 6 to 7 percent is heated separately in a pressure vessel to about 162 to 170 C. The heated cooking liquor is forced under steam pressure into the top of the digestor containing the presteamed chips. Pressure in the digestor is built up to about 100 lb per sq in. by injecting compressed air or high-pressure steam at the top of the digestor. The temperature of the charge in the digestor is then quickly raised to about 162 C by indirect steam heating. As the temperature rises, the pressure in the digestor increases and must be relieved to reach a constant 100 lb per sq in. The digestor charge is then kept at 162 C and 100 lb gauge pressure for 3 to 4 hr. The pressure in the digestor is then relieved to about 45 lb per sq in., and the charge blown into a tank for the subsequent operations of recovering black liquor, washing, breaking, screening, and bleaching. Grasses, bagasse, and agricultural residues may also be used in this process.

INT-0005

Notarbartolo, L., and V. Tagliabue (SNIA VISCOSA Societa Nazionale Industria Applicazioni). Cellulose from sugar-cane residues. Italy 505,033; filed Apr. 4, 1953; issued Dec. 15, 1954.

The residue (100 parts, as dry weight) is treated with 6 to 12 parts of soda ash in 1 percent solution under pressure and at 150 to 170 C, for between 40 minutes and 2 hr. The material is then washed with water and cooked with 5 to 8 parts sodium hydroxide at 6 to 8 atm. The obtained cellulose, whose lignin content is under 2 to 3 percent, is bleached by conventional methods. (Text in Italian)

INT-0006

Idnani, M. A., and V. G. Walunjkar. Improvements in or relating to manures from wool and hair wastes. India 49,075; filed Mar. 2, 1953; issued Feb. 9, 1955.

Wool or hair wastes are washed with water and heated with a 10 percent sodium hydroxide solution to obtain a paste. After cooling, a 10 percent solution of sulfuric acid or hydrochloric acid is gradually added to the paste until a spongy precipitate separates from a white liquor. The liquor is decanted, and the precipitate dried in the sun or with hot air. The product which contains 10 to 14 percent nitrogen, can be used as a nitrogenous fertilizer.

INT-0007

Gardille, F. M. G. Soil-conditioning and fertilizing agents. France 1,095,744; filed Dec. 22, 1954; issued June 6, 1955.

Soil-conditioning and fertilizing agents are prepared by treating pulverized vegetable matter containing lignin, e.g. wood, straw, vegetable leaves or stems, hay, or vegetable residues. In the fresh, dried, or partially composted state, these wastes are combined with caustic alkali or calcium hydroxide at temperatures between 0 and 100 C in the presence of water. Treatment with a concentrated alkali metal or alkaline earth monochloroacetate follows. The soil conditioners thus obtained are used as free

acids or calcium, ammonium, or potassium salts. For example, 100 kg of straw were treated with 12 kg sodium hydroxide and 100 kg of water for 24 hr at ordinary temperatures, then with 29 kg chloroacetic acid, 12 kg sodium hydroxide, and 25 kg of water for 3 hr at 40 to 50 C. The mixture was then filtered, centrifuged, acidified with sulfuric acid, centrifuged, and rinsed. (Text in French)

INT-0008

Okuno, S., and T. Okuno. A manufacturing method for artificial silk and other high-purity pulps from bagasse. Japan 31-2,351; filed June 1, 1953; issued Mar. 31, 1956.

Beaten bagasse is heated with 0.05 to 0.2 percent actinium hydroxide to dissolve the pentosan and silica, cooked with sodium hydroxide or with a mixture of sodium hydroxide and sodium sulfide, and bleached to obtain a product yield of 35.2 percent. The product contains: alpha-cellulose, 97.2 percent; beta-cellulose, 1.64 percent; ash, 0.08 percent; and pentosan, 1.08 percent. (Text in Japanese)

INT-0009

Shiratori, K., S. Tatara, and C. Kobata. A manufacturing method for heat-resistant plate. Japan 31-2,489; filed Sept. 24, 1953; issued Apr. 4, 1956.

A mixture of bagasse and sawdust in a 3 to 7 ratio is immersed in a solution containing 3 percent zinc chloride, 2 percent copper sulfate, 2.5 percent calcium chloride, 2.5 percent of magnesium sulfate, and a small amount of methyl carbonate. This is rinsed to obtain residue I. A mixture of 7 parts I, 1 part cement containing 7 percent calcined gypsum and 3 percent magnesium oxide, and 2 parts asbestos is made into a dough with the addition of 3 percent sodium silicate and 2 percent sodium phosphate solution. This is then molded into fire-resistant board. (Text in Japanese)

INT-0010

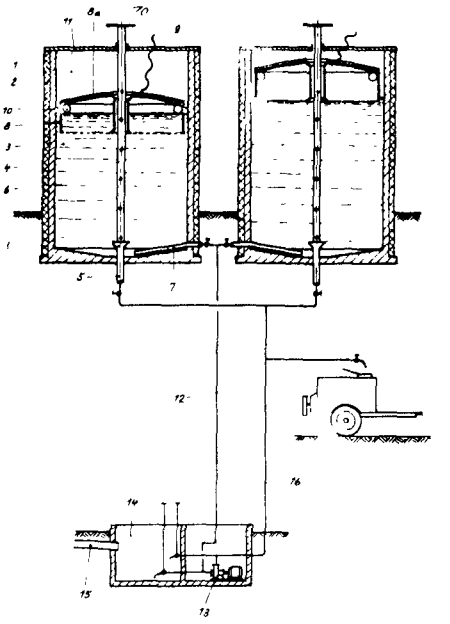
Powell, E. L. (Brown and Root Incorporated). Process for the production of pulp from bagasse. Great Britain 758,766; filed May 10, 1954; issued Oct. 10, 1956.

Low-cost production of purified cellulose pulp from bagasse is described. Bagasse is treated with steam for 30 minutes to 1 hr at 100 to 125 psi to remove incrustants by steam distillation. Then it is pumped into an alkaline solution of 2 to 3 percent caustic soda, treated with live steam, and cooked under pressure with rotation for 30 to 60 minutes. The material is then bleached with calcium or sodium hypochlorite and washed with water. Use of a rotating vessel saves time and heat and produces a superior degree of uniformity of the product.

INT-0011

Schmidt, F., and W. Eggersgluss. Method and apparatus for the processing of organic waste material. Canada 540,755; filed Dec. 30, 1954; issued May 14, 1957.

This apparatus subjects stable manure that is in a semiliquid or pulpy condition, to a rotting process resulting in continuous gas recovery. Inside a tank, the waste material encompasses a vertical, liquid supply pipe.



The pipe contains ports which allow the passage of liquid for dispersing scum on the waste material, and allow the permeation of liquid through the waste material at predetermined levels. A cover that can move axially along the pipe retains and is supported by the gas produced by the rotting waste material.

INT-0012

Calderoni, A., and V. Vita. Process for the production of organic nitrogenous fertilizers from animal products and fertilizers produced by such process. Great Britain 785,652; filed Apr. 28, 1955; issued Oct. 30, 1957.

Animal hair or wool is wetted with water and mixed with caustic soda or potash. The mixture is heated to form a thick liquid mass which coagulates and hardens on further heating. The process can be carried out continuously by feeding the reactants into a tubular vessel through which they are traversed by means of a suitable screw arrangement, followed by heating, cooling, and finally grinding for use as a fertilizer. Wool offals, the by-products of carding machines, or the loppings or shearings from textile production may also be used in this process.

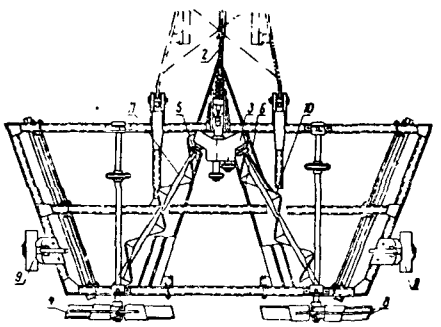
INT-0013

Knapp, S. B., and J. D. Wethern. Rapid soda process for pulping bagasse and like plant materials. Australia 216,044; filed Feb. 11, 1957; issued June 26, 1958.

Fibrous, nonwoody, lignocellulosic plant material is shredded or milled into small pieces and placed in a pressure vessel with the pulping chemicals. The liquor contains sodium carbonate, and, optionally, sulfur, sodium sulfide, or sodium polysulfide. If these are used, sulfidity should reach 15 percent. The ratio of water to plant material in the mixture should be 2 to 15 parts to 1. The pulping mixture in the digestor should be heated from 1 second to 15 minutes, until a temperature of 150 to 190 C and a pressure of 14 to 240 psi are reached. The mixture is then kept at this pressure for 5 to 30 minutes. The major portion of the lignin is separated from the carbohydrate fraction of the lignocellulose to form a cellulose pulp. The pulp can be further processed by conventional methods. (See also Australia 210,733)

INT-0014

Rykov, V. I., and A. N. Karmazin. Manure spreader. U.S.S.R. 145,813; filed July 15, 1961; issued Mar. 21, 1962.

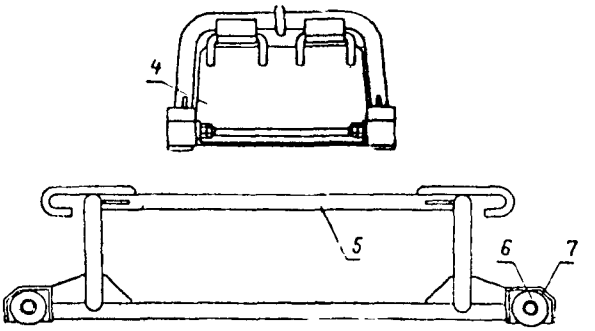


This manure spreader is designed to be hitched to a caterpillar tractor. In operation, the spreader is transported up to the manure heaps previously deposited on the field. By means of a divider and moldboards, a manure heap is divided into two equal parts. Then the manure is transported by worm conveyors to the rotors which scatter it over the field. (Text in Russian)

INT-0015

Gamalitskiy, V. A. Manure conveyor with scrapers and system of manure conveyers in which it is applied. U.S.S.R. 147,396; filed Sept. 12, 1960; issued May 21, 1962.

The manure conveyor consists of two branches which are placed immediately above parallel, longitudinal gutters and which are connected to each other by flexible rods. Each branch can be set into a reciprocating motion by a joint driving and tensioning station. When moving in one direction, the conveyor rides freely above the manure in the gutter; when



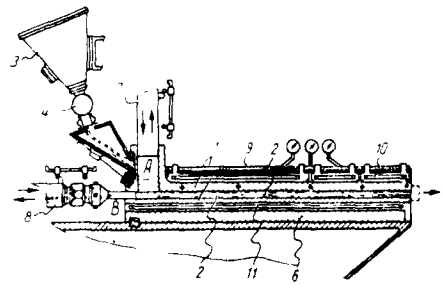
moving in the other direction, it drags along the gutter to scrape the manure toward a transverse conveyor of the same design. The transverse conveyor, which is placed in a gutter that lies somewhat below the level of the longitudinal gutters, transports manure originating in several stables into a single manure-collecting tank.
(Text in Russian)

INT-0016

Gershkovich, B. M., A. N. Otlivanchik, P. P. Titov, and V. I. Tarasov (Vsesojuzny Nauchno-Issledovatelsky Institute Novykh Stroitelnykh Materialov). Method for manufacturing shaped works from crushed wood and agricultural waste and similar raw material and an apparatus for accomplishing the same. Canada 709,759; filed June 7, 1963; issued May 18, 1965.

A method of manufacturing material from crushed wood and agricultural wastes involves

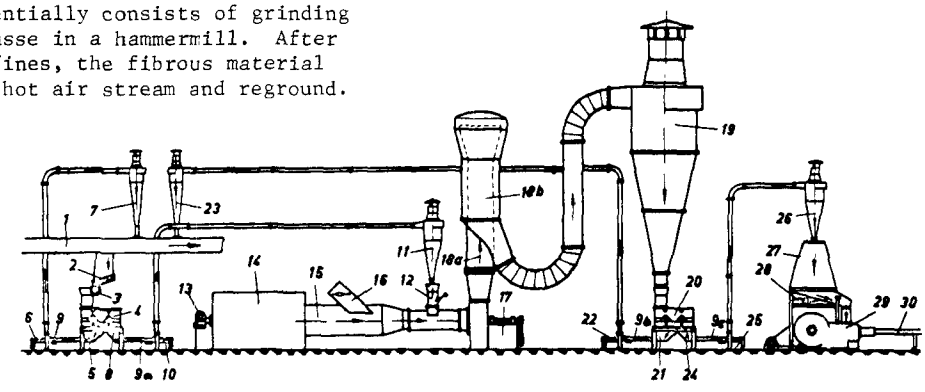
the use of polymeric binding agents. Waste chips are delivered into a molding chamber by a pressing force serving to orient the fibers in the chips in a direction parallel to the longitudinal axis of the flow of the process. Other components of the apparatus include a charging bunker located at the entrance of the chamber, a batch-meter beneath the charging bunker, and a vibrating trough placed between the batch-meter and the chamber's entrance. A pressing device is located at the entrance to the molding chamber, and a prepressing mechanism with a vertically arranged piston is placed in the charging part of the chamber.



INT-0017

Ruckstuhl, K. Utilization of sugarcane bagasse. Germany 1,214,620; filed Jan. 26, 1962; issued Apr. 14, 1966.

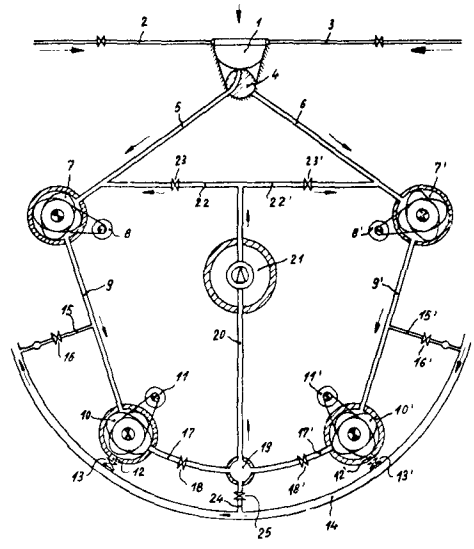
A method for making bagasse into a useful material also eliminates spoilage of the bagasse during storage and greatly reduces the storage space requirements. The operation essentially consists of grinding the green bagasse in a hammermill. After removing the fines, the fibrous material is dried in a hot air stream and reground. The bagasse fibers are then either converted directly into a finished product, or fed to a press and extruded in a form suitable for storage. The pressed bagasse is then stored until it is further converted into a finished product, such as chip sheets or briquettes. (Text in German)



INT-0018

Ponn, H. Method of and apparatus for treating the rumen manure removed from slaughtered cattle. Great Britain 1,045,226; filed Sept. 15, 1965; issued Oct. 12, 1966.

This method of treating paunch manure involves the liquification of the material with the addition of water. The slurry is then mixed with a nitrogen-containing material and passed into a clarifying plant. The apparatus for carrying out this process comprises an intake hopper placed at the site where slaughtering occurs. This hopper is fitted with a water-flushing system. The hopper communicates by means of an intake channel with at least one size-reducing unit which is, in turn, connected via an outlet channel to a sewer fed with nitrogen-containing material. This sewer leads to a clarifying plant.

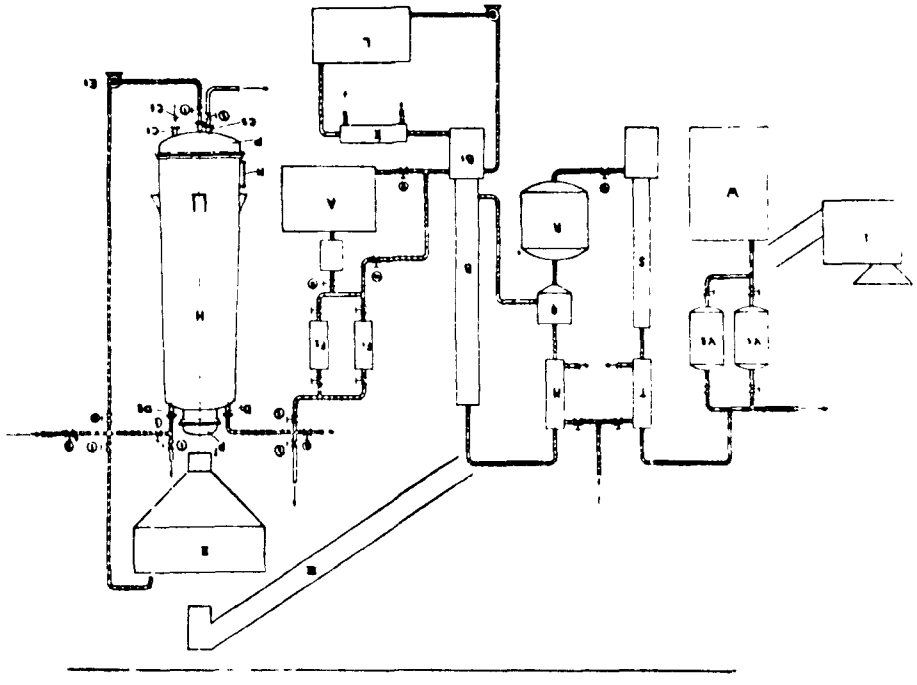


Agricultural Wastes

INT-0019

Pillorget, P. (Pierre Pillorget Societe des Produits Chimiques de Sainte-Columbe). Process and apparatus for the physical and chemical transformation of agricultural and biological wastes. France 1,484,673; filed Mar. 1, 1966; issued June 16, 1967.

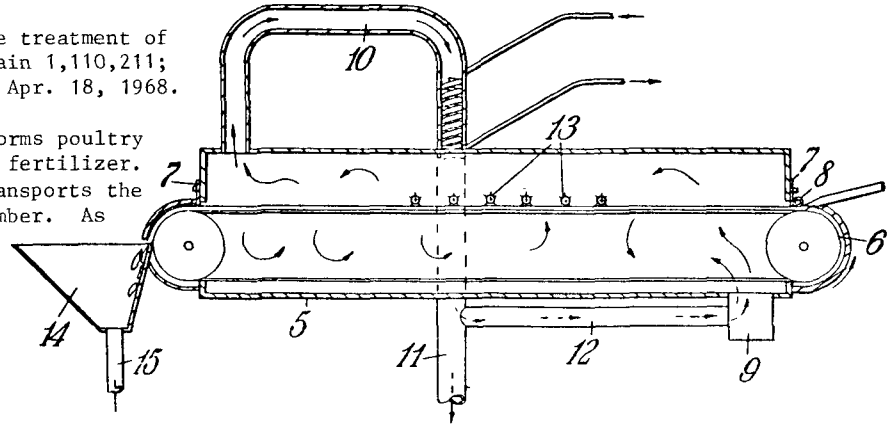
Agricultural wastes are hydrolyzed with acidulated water to transform the pentosans to furfural and a part of the celluloses into sugars. The extension of furfural is limited to prevent the carbonization of cellulose and lignin, and the destruction of sugars. The crushed materials are sent by elevator to a funnel where they are humidified until saturation, after which they enter the hydrolyzer under 2 or 3 atm of vapor. The dropping of the base of the apparatus permits the recycling of the excess acidulated water to the funnel. When a balance of pressures is obtained in the top of the apparatus, a system of sluices sends furfural-containing vapors through filters. The furan gas and cellulose-containing vapors are condensed by a refrigerant and the resulting liquid is sent to a distillation unit. When the furfural content is about 1 percent, hydrolysis is stopped, the hydrolyzate is drawn off, the apparatus is charged, and a new cycle is begun. The neutralized hydrolyzate is stored. Its sugars slowly transform the matter into a moist compost which contains organic matter, nitrogen, soluble or insoluble phosphoric acid, humic acids, and potash. This compost can be dried and sown with Azobacter. (Text in French)



INT-0020

Fuller, G. F. Plant for the treatment of poultry manure. Great Britain 1,110,211; filed July 12, 1965; issued Apr. 18, 1968.

This treatment plant transforms poultry manure into an agricultural fertilizer. An endless belt conveyor transports the manure through a drying chamber. As

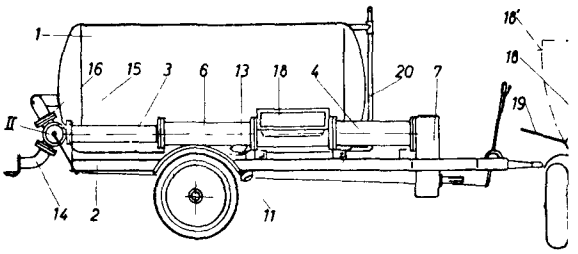


the manure is stirred within the chamber, a heater dries it. A roller attached to the conveyor at the entrance to the drying chamber can be used to regulate the depth of the layer of manure on the belt. The plant is equipped to recirculate the drying gases and to shred the dried manure.

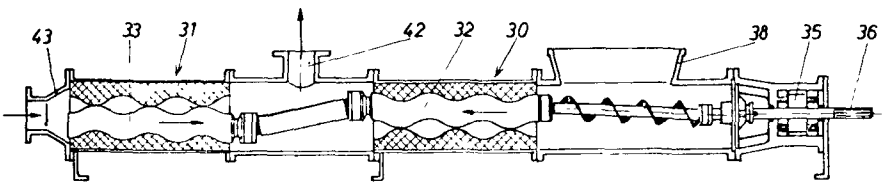
INT-0021

Streicher, M. (M. Streicher, and O. Seidl). Device for processing and transportation of liquids, suspensions and/or solids, particularly sullage, liquid manure and/or solid manure. Switzerland 462,518; filed Dec. 21, 1965; issued Sept. 15, 1968.

This device incorporates at least one eccentric worm-gear pump, a shredder, a conveyor with a feeding hopper for solids, and a mixing chamber. The mixing chamber is provided with a connecting pipe for a suction line. The pump, shredder, and conveyor form a subassembly driven by a reversible drive and attached to a mobile tank. Valves at the inlet and outlet of the pump direct the medium into the tank or to a discharge pipe. An alternate form



of the subassembly incorporates two eccentric worm-gear pumps whose outlets terminate in a common mixing chamber. The inlet of one of these pumps is connected to the conveyor onto which solid manure is charged; the inlet of the other can be connected to a supply of a liquid medium. (Text in German)



INT-0022

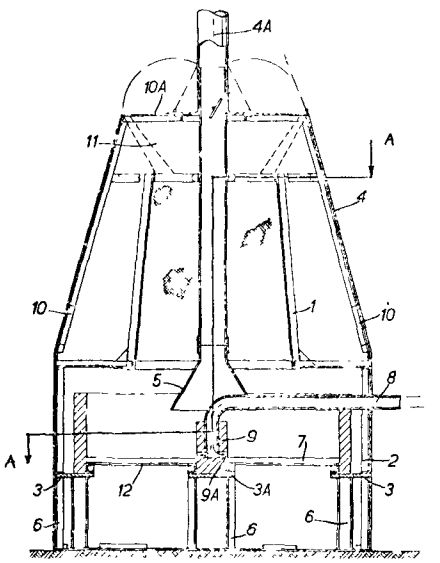
Chudakov, M. I., I. S. Voropaev, S. V. Ivanov, A. V. Antipova, and A. P. Samsonova (All-Union Scientific-Research Institute of the Hydrolysis of Plant Materials). Substrate for producing fodder yeasts. U.S.S.R. 229,407; filed Aug. 12, 1967; issued Oct. 23, 1968.

A food substrate for fodder yeasts is prepared from plant wastes such as straw, husks, peat, and wood pulp via destruction under high temperature and pressure. To prepare a substrate which contains substances which are readily available to yeasts and also to expand raw material resources, such as hydrolyzed lignin, before destruction, the plant wastes are mixed with calcium oxide and a liquid such as a postyeast spent wash. The resulting mixture is oxidized by atmospheric oxygen, put into a salt solution, and then acidified. (Text in Russian)

INT-0023

Bigwood, T. E., and B. T. Bigwood (Calorific Manure Disposal Company Limited). Improvements in and relating to incinerators. Great Britain 1,141,494; filed July 19, 1965; issued Jan. 29, 1969.

An incinerator particularly suitable for burning raw or unprocessed animal and other manure, which may or may not have been previously dried, consists of an inner structure in the form of a cage, an outer container or housing, a grate below the cage structure for supporting material to be

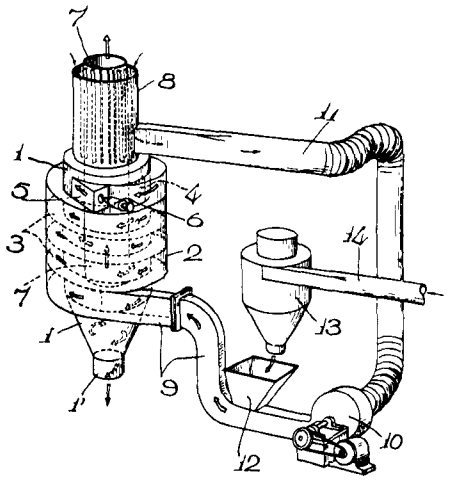


burned, and a chimney extending through the cage structure. The cage structure is made of expanded metal and is supported by brackets carried by legs which rest upon an outer annular plate. A process is also included for manufacturing fertilizer by mixing a combustible material such as coal dust with manure and then burning the mixture.

INT-0024

Isogaya, K. Rice husk burning device. Japan 44-2,154; filed Sept. 2, 1965; issued Jan. 29, 1969.

A device to burn rice husks consists of a cyclone-type incinerator surrounded by a wind tunnel with a spiral passage through which husks are blown. The upper part of the passage is connected to the incinerator at the point where the flame from the burner is located. The bottom of the wind tunnel is connected by a wind-transmitting duct to the blower. A husk-feeding device is situated at the middle of the duct. The

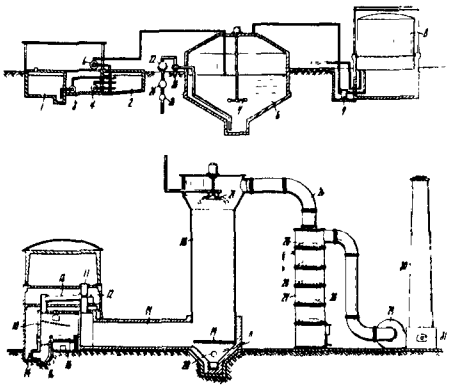


exhaust pipe from the incinerator connects to the blower and wind pipe. The hot air dries the rice husks, which are otherwise difficult to burn. The husks can then be burned to either ash or coal in the incinerator. (Text in Japanese)

INT-0025

Moriyama, I., and Y. Wanibuchi (Seiko Donetsu Kosetu K.K.). Incinerator. Japan 44-4,719; filed Apr. 4, 1964; issued Feb. 26, 1969.

This incinerator that burns both manure and garbage has a small fuel cost. Winglike projections stir the manure in a digestion tank to accelerate its liquefaction. Methane gas from the manure is collected, desulfurized, and then stored. The digested manure is pumped into a colloidal mill for crushing and then sprayed into the incinerator by a centrifugal sprayer. The garbage, having been conveyed through a drier, is burned with a heavy oil burner. Part

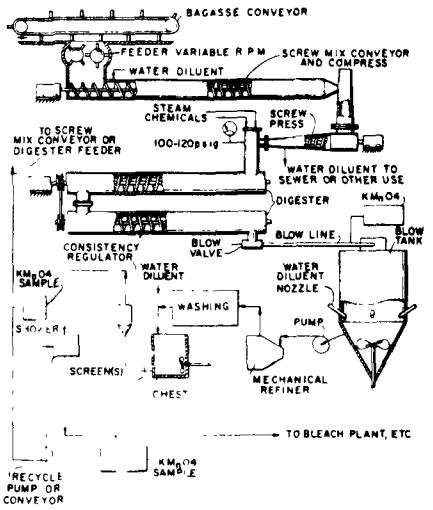


of the gas generated by combustion is used in the drier; the rest enters the incinerator through the flame duct. The manure powder that is not burned in the gas burns when it drops to the fire grid. The burner which heats the fire grid uses methane gas from the manure digestion process. (Text in Japanese)

INT-0026

Grondona, C. A. Bagasse pulping. Canada 807,411; filed Oct. 19, 1966; issued Mar. 4, 1969.

A bleachable grade of pulp derived from bagasse, or any other cellulosic material, can be produced on a continuous basis. Cellulosic material is cooked in a digestor to achieve a pulp having a predetermined average permanganate number. When the pulp is blown from the digestor



and passed through a separating screen, only the pulp with permanganate averages below the predetermined average reaches the bleaching plant. The remainder of the pulp is recycled into the digestor.

INT-0027

Wright, G. A. Processing animal manures. Great Britain 1,148,538; filed Dec. 15, 1966; issued Apr. 16, 1969.

Semiliquid animal manure is centrifuged at high speed to produce a solid residue and a substantially clear effluent. The solid residue has value as a fertilizer and can be bagged for transport and sale. The solid residue may be exposed to the atmosphere to undergo a natural processing before bagging. The liquid from the centrifuge may be sprayed on the land and is an excellent manure for grassland. The interior of the centrifuge must be resistant to the corrosive nature of the manure liquor. The body of the centrifuge may be lead-lined; the basket may be coated in ebonite. Residue builds up on the interior surface of the centrifuge and must be removed from time to time.

INT-0028

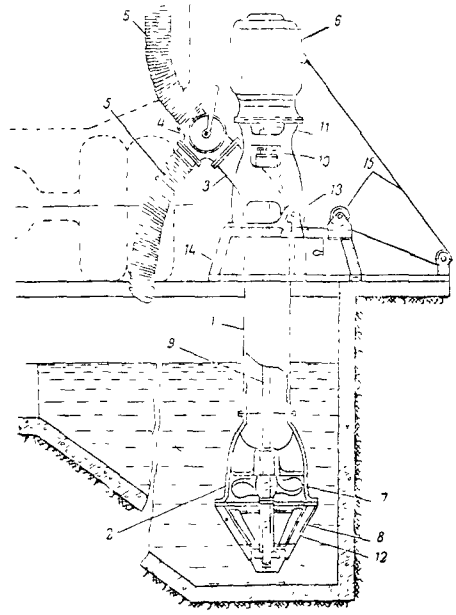
Rionda, J. A. (Esso Research and Engineering Company). Composition based on bagasse and heat-hardenable resin. France 1,565,996; filed May 21, 1968; issued May 2, 1969.

Bagasse compositions containing 10 to 30 percent phenol-formaldehyde resins (I) are used to prepare panels with improved tensile strength, cohesion, surface solidity, and reduced water swelling. The fibers are separated from green bagasse, impregnated with 25 percent aqueous I solution, and converted to mats by a felting machine. The mats are assembled in such a way that large fibers constitute the core and fine fibers containing some medulla constitute the surface. The material is pressed at 149 to 177 C to produce panels with reduced water absorption and swelling. The panel surface can be polished to assure improved brilliancy. (Text in French)

INT-0029

Shikalov, I. D., I. Z. Vorobyenko, N. F. Chernov, A. A. Tyuvyakin, D. I. Batmanov, and V. M. Zernov (Syzran Combine Plant). Device for unloading of manure from a manure storage pit. U.S.S.R. 247,785; filed Jan. 19, 1967; issued July 4, 1969.

A device for unloading manure consists of a pump whose housing is a vertical cylinder terminating in a bell-mouth at its lower end, and an intake pipe provided with a three-way valve connected to hoses at its upper end. An electric motor is mounted above the feed pipe. An impeller is located in the bell-mouth, and below this is provided an inverted conical mixing drum formed of knife blades. The drum



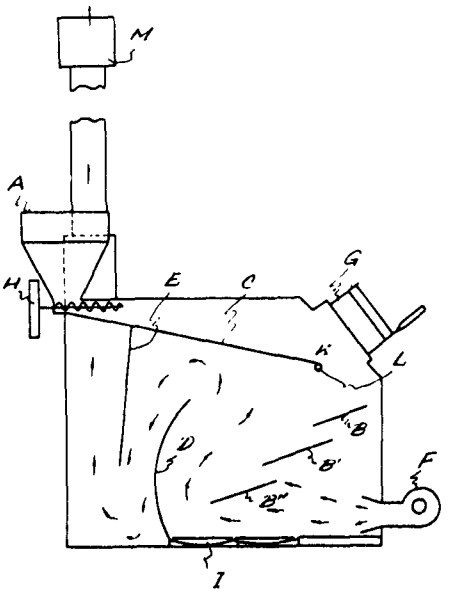
is surrounded by a ribbed conical housing provided with countercutting knife blades. During the operation of the device, the coarse constituents of the manure and litter are shredded by the conical mixing drum and are propelled, together with the liquid constituent, by the action of the impeller, to the intake pipe. This mixture then proceeds through a hose either to the transport vehicle, or, when the manure is to be stirred, back into the manure storage pit. (Text in Russian)

INT-0030

Takaura, K. (Kansai Denki Company). Incinerator. Japan 44-16,431; filed May 6, 1966; issued July 21, 1969.

An incinerator for the combustion of the feces of cattle, horses, pigs, and other livestock converts the approximately 90 percent water content to steam, and burns the remaining inflammable material to a small amount of ash. The incinerator contains an inclined metal sheet extending from the screw conveyor at the top, which feeds the manure to a point over the burner. An oil dropping device overhangs the end of the sheet. Stepped fire grids are placed in the opposite direction to the sheet below the sheet. The burner, which is faced by

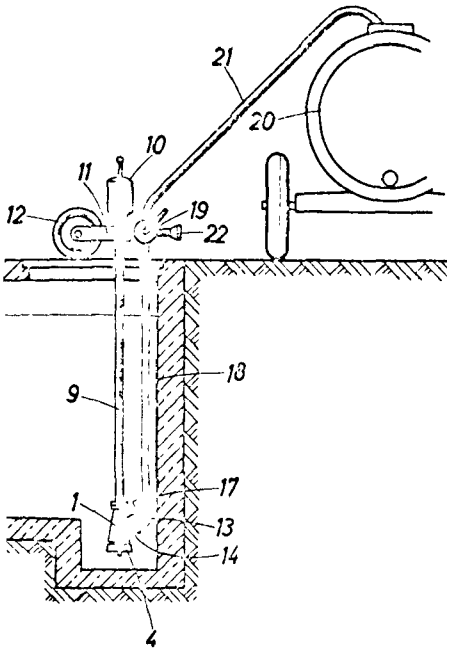
a baffle, is installed beneath the grids. Feces are dried as they progress down the hot metal sheet. The oil from an outside gasoline tank and the fire grids ensure quick combustion. The gas generated in the incinerator heats the baffle, the sheet, and the fire grids, and is released through a smoke duct. An opening through which garbage can be thrown, other than the hopper opening, can be used as an observation window. (Text in Japanese)



INT-0031

Streicher, M. (R. Artmann). Preparation for agitating, homogenizing, and removing thick flowing media such as manure. Germany 1,301,599; filed Feb. 27, 1963; issued Aug. 21, 1969.

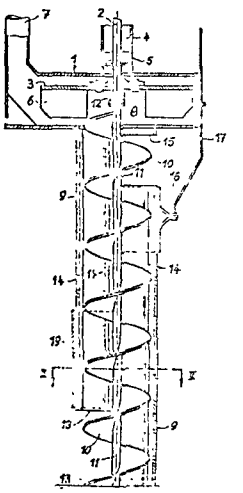
A manure stirrer consists of a pump impeller mounted inside the manure pit and coupled to a motor by a long shaft. The impeller has cutting edges to enable the manure to be homogenized and a connecting pipe which transfers the manure out of the pit. (Text in German)



INT-0032

Baehrs, A. (D. Baehrs). Motor-driven manure pump with vertical shaft. Germany 1,301,957; filed Feb. 8, 1965; issued Aug. 28, 1969.

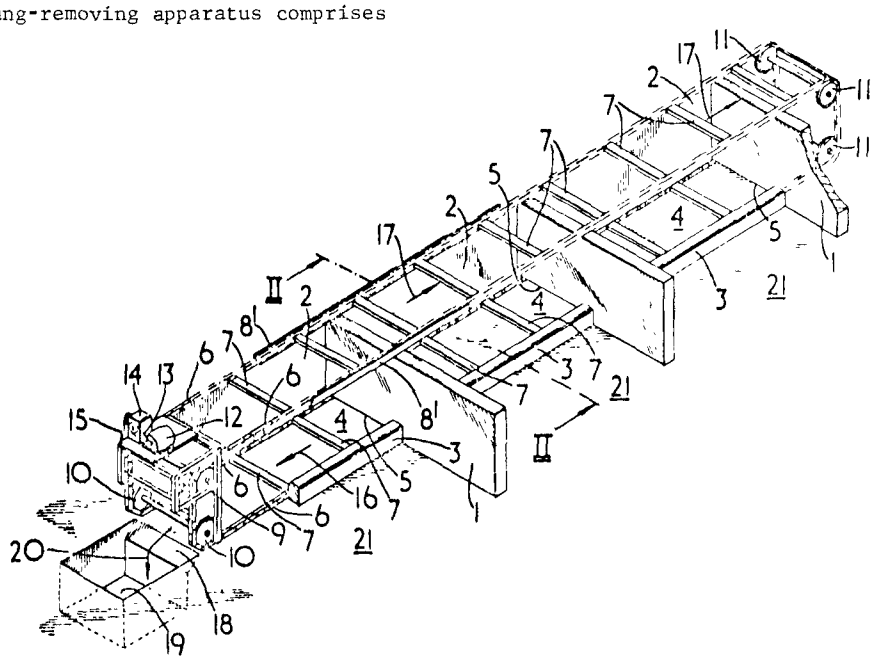
This manure pump has a vertical lift shaft, with a runner rotating in the riser pipe, which receives the material fed through a pipe concentrically in front of the suction passage. The suction passage is in the center of the pump shaft and is driven by a rotating screw. The screw extends throughout the pipe, which has cutter bars and a side inlet near to its closed base. The side opening extends over approximately half the periphery of the pipe, so that the conveyor screw is free in the region of the opening and forms a preliminary comminutor together with the opening. (Text in German)



INT-0033

Blanch, A. B. (Alvan Blanch Development Company Limited). An animal pen including apparatus for removing dung therefrom. Great Britain 1,167,174; filed Oct. 19, 1967; issued Oct. 15, 1969.

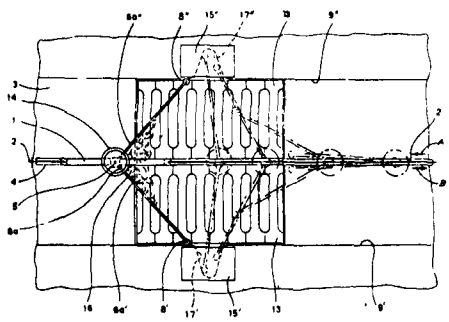
A pen having an apparatus for removing dung does not require a slatted floor. It consists of an open, dung-receiving passage in the floor which passes beneath a pair of opposite walls. The dung-removing apparatus comprises an endless conveyor of the chain-and-slat kind having slats spaced at least 3 ft apart. The conveyor is arranged to travel along the bottom of the passage sweeping dung through the passage into a pit positioned outside the pen. An apparatus is provided for driving the conveyor at a speed less than 10 ft per minute. Where a number of pens are arranged side-by-side in a row, the passage extends through all the pens and the conveyor is common to all the pens. The apparatus is particularly suited for a piggery.



INT-0034

Andreae, H. G. (Alfa-Laval Aktiebolag). Dung remover for cattle sheds. Great Britain 1,167,253; filed Oct. 11, 1967; issued Oct. 19, 1969.

This dung-removing apparatus is designed so that it can be used in places where considerations of space are such that the cleared dung has to be removed from the center of the cowshed or from some other place disposed between the two ends of the area being cleaned. Two scrapers are pivotally connected about an upright axis and means are provided for pivoting the scrapers rearwardly with respect to the direction of movement at an intermediate point in the travel of the bucket in each direction of movement so that, after passing the intermediate point during movement in each direction, the scrapers lie close together. This reduces the area swept by the edges of the scrapers.



AUTOMOBILE

INT-0035

Cotton, F. H., and P. A. Gibbons (F. H. Cotton). Process of reclaiming rubber. Australia 119,682; filed Aug. 11, 1943; issued Mar. 5, 1945.

Sorted and sheared rubber scrap, such as used tire covers, is heated in a water tank at 80 to 90 C. It is then fed to a steam-jacketed autoclave where it is heated to 150 to 190 C by steam. This process reduces the strength of the rubber to reduce the strain on the grinding machine, and ensures a high temperature for the next stage. The steam is used to heat the water in the previous stage. The rubber is then fed to a two-rotor mixer which has been heated to 130 to 160 C or higher. The hot waste rubber is subjected, under heat, to mechanical stress, and a small quantity of oxygen or air is admitted to soften the vulcanized rubber. The friction causes a rise in temperature up to between 190 and 250 C. The attainment of peak temperature means the end of the effective grinding. With some rubbers, it is desirable to introduce a catalytic softening agent such as phenylhydrazine. At the stage at which peak temperature is reached, a dry powder such as soot, China clay, or commercial silica, is introduced to form a tough mix with the rubber, and to work against any unplasticized vulcanized rubber particles. The material is discharged, preferably after the addition of 1 to 3 percent water, and may be immediately sheeted and refined. (See also Australia 119,639)

INT-0036

Evans, W. W. (Boston Woven Hose and Rubber Company). Plasticizing of vulcanized rubber. Australia 119,321; filed June 2, 1943; issued May 31, 1945.

Well-vulcanized rubber scrap from automobile tires is finely ground and then mixed with acidic substances together with a small amount of a mercaptan or thiophenol. The mixing takes place on a mill or an internal mixer under oxidizing conditions. The recovered rubber has many of the physical characteristics of unvulcanized rubber. It can be mixed with additional curing agents and revulcanized to give high tensile strengths. Acid materials advantageous to the process are the higher fatty acids, both saturated and unsaturated. With rosin acids, it is desirable to add an antioxidant before revulcanization in order to improve the product's aging properties.

INT-0037

Lewis, J., and S. C. Lewis. Improvements in and relating to the reclaiming of rubber. Great Britain 569,659; filed Apr. 22, 1943; issued June 4, 1945.

The rubber in waste material, that may also contain fibrous matter such as that in tires, is softened by steam under pressure at a temperature of not less than 230 C and not greater than 270 C. The cooling of the rubber is effected by flooding the treatment vessel with water after releasing the steam pressure, and before opening the vessel. The rubber is then milled. The process is economical and gives a 92 percent yield. The rubber is high in tensile strength and plasticity.

INT-0038

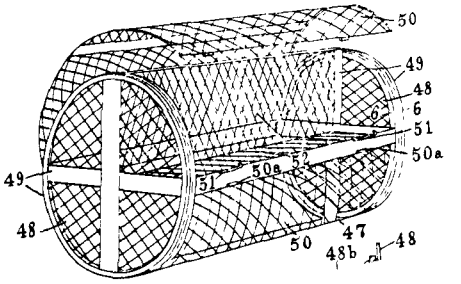
Amphlett, P. H. A., A. J. Hughes, and D. F. Twiss (Dunlop Rubber Company Limited). Improvements in or relating to the reclaiming of vulcanized rubber containing cellulosic material. Great Britain 573,054; filed Sept. 14, 1942; issued Nov. 5, 1945.

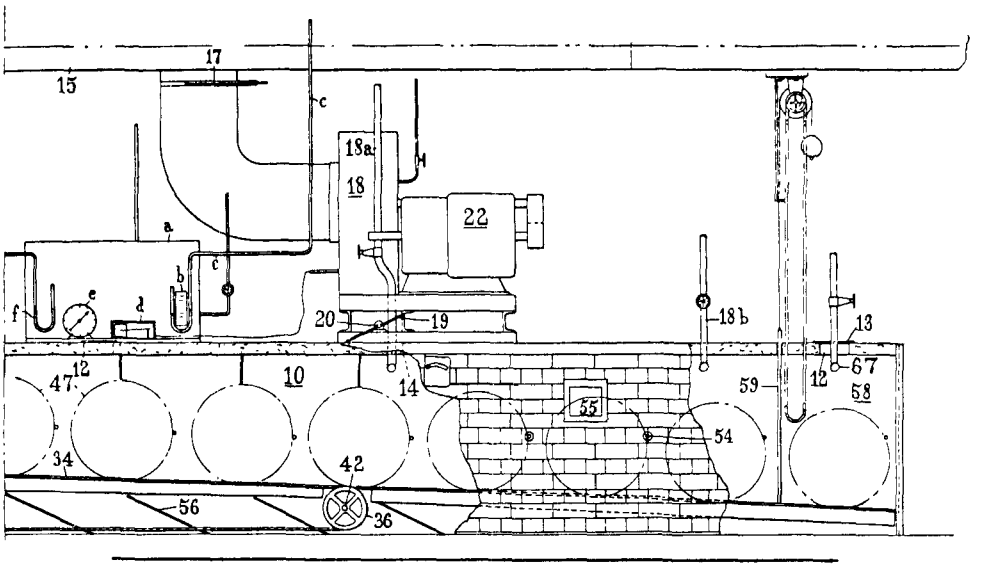
This method involves heat treatment by which the cellulosic material is modified so that it is readily converted on rolls into a fine powder which acts as a filler in the reclaimed rubber. The method comprises comminuting the vulcanized rubber, such as rubber from old tires, and mixing the comminuted rubber with an oxidizing agent in solid or liquid form, plasticizing the rubber of the mixture by heating, and sheeting the mixture so obtained between rolls. The oxidizing agent used is preferably one which yields oxygen on heating. Such agents include peroxides, of which hydrogen peroxide is most preferred since its products of decomposition are volatile and a washing operation is therefore avoided. The peroxide preferably contains a small proportion, that is up to 2 percent, of an acid such as hydrochloric acid or phosphoric acid; these acids may not only act as stabilizers for the peroxide and so delay decomposition during the initial heating-up period, but also assist in the tendering of the cellulose material during the heating. The use of hydrochloric acid is advantageous because it is completely volatilized during the heating, and washing is therefore unnecessary. The oxidizing agents are preferably used in liquid form as aqueous solutions or aqueous dispersions, although they may be used in solid form.

INT-0039

Johnston, A. (North British Rubber Company Limited). Waste rubber regeneration. Canada 438,358; filed Nov. 7, 1942; issued Dec. 3, 1946.

The process comprises treating waste rubber, such as that derived from tires, by contact with heated inert flue or exhaust gases of low oxygen content until the rubber is in such a condition that it may be easily plasticized. The temperature should be sufficiently high to bring about the disintegration of the fibrous material in the rubber, or between 450 and 500 F. The rubber is cooled in an inert atmosphere before being exposed to air. Fiber-containing and fiber-free portions of the rubber should be separated by stripping, so that the fiber-containing portions may be subjected to a reheating treatment. Incompletely decomposed fibrous material can also be removed by treatment in a washing mill. An apparatus for this process comprises a perforated container in the path of a supply of heated inert flue or exhaust gases. The container is rotated to bring all portions of the rubber in contact with the gases.

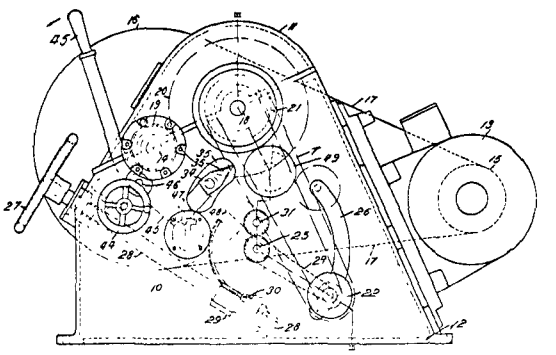




INT-0040

Jones, C. H. (Northwestern Rubber Company). Improvements in or relating to machines for the recovery of rubber from tires. Great Britain 588,431; filed Dec. 14, 1942; issued May 22, 1947.

A machine is provided for recovering the rubber portion of a tire bead from the wire or wires of the bead. The bead is put under tension and cut circumferentially so as to cause the wire or wires to be exposed. The machine comprises a driving mechanism over which the bead is stretched, and a cutting device against which the bead is traversed by the driving mechanism so that an incision is made in the rubber around the bead, and the rubber separates or can be stripped from the wire or wires. According to a further feature, a mechanism is provided for stretching the bead over two or more pulleys, at least one of which is a driving pulley.



INT-0041
Dasher, P. J. (Dasher Rubber and Chemical Company). A process for reclaiming scrap vulcanized rubber. Great Britain 871,925; filed Nov. 19, 1957; issued July 5, 1961.

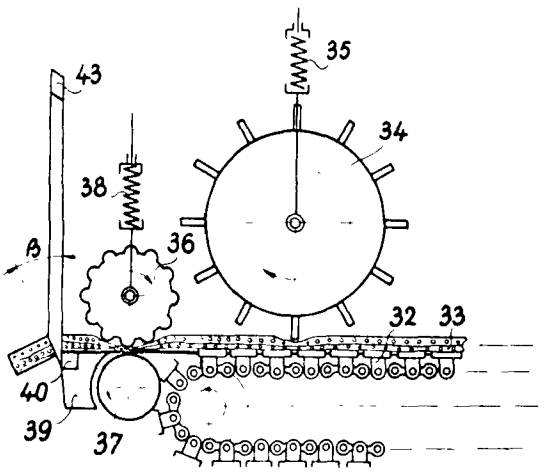
A process provides a means of producing high-quality reclaimed rubber wherein the necessity for refining the devulcanized material is entirely eliminated, or greatly minimized. Scrap vulcanized rubber, such as defibered tire scrap, is treated in a 3- to 10-hp Banbury machine at less than 320 F for 1 to 4 minutes to yield a finely divided powder which is then selectively screened. The selected powder is then subjected to a Banbury machine at an average temperature of 300 to 400 F until the rubber is devulcanized. F.E.F black grinding agent facilitates the initial grinding. Temperature is maintained by means of water-cooled jackets in the walls of the working chamber. The process applies to natural as well as vulcanized synthetic rubbers, such as butadiene and other copolymers.

INT-0042
(United States Rubber Company). Method of reclaiming rubber. Great britain 965,177; filed June 26, 1962; issued July 29, 1964.

A digestion process reclaims vulcanized elastomeric scrap by heating comminuted tire scrap, in a mixture with a substantial volume of water, within a closed container to produce an aqueous reclaim. Afterwards, the reclaim is dried to a millable condition in an enclosed chamber with a heating medium, separated from the reclaim by an impermeable heat-transfer surface whereby exposure of the reclaim to air or oxygen-containing gases is substantially excluded.

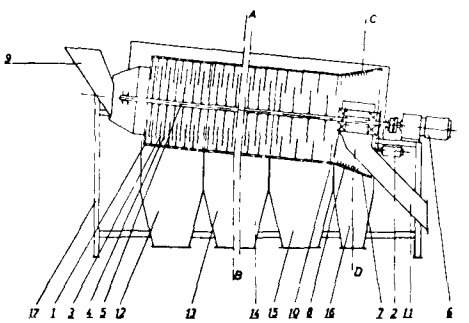
INT-0043
Varady, S., and J. Darvas (Chemolimpex Magyar Vegyiaru Kulkereskedelmi Vallalat). Process and machinery for the production of grist from rubber goods and the recovery of textile contents from rubber grist. Canada 693,686; filed Jan. 14, 1963; issued Sept. 1, 1964.

A process for the production of rubber grist from rubber goods which contain textiles, especially motor vehicle tires, and for the recovery of textile contents, involves ripping the rubber into strips prior to milling. The strips are cut crosswise to similar lengths, and these uniform long slices of rubber containing the textile yarn are fed into revolving mills. Following the milling, the rubber grist of mixed grain size is conveyed for sizing and for the separation and removal of impurities. The impurities are removed into a revolving plansifter system with separating air piping.



During this process, the cord fibers separated from the rubber, on leaving the prismatic trommel, are fed to a lickerin. A carding willow is provided for the purpose of recovery, and the recovered staple fiber is passed into a carding machine for working.

INT-0044
Merges, H. A. (Condux-Werk, Herbert A. Merges K.G.). Waste rubber sorting device. Germany 1,181,902; filed Dec. 10, 1960; issued Nov. 19, 1964.



A waste rubber sorting device is designed for separating rubber and cord fibers from fiber-reinforced rubber waste, particularly old or faulty car tires. The device is formed of a rotatable shaft fitted with rods inside a rotatable screen cylinder composed of different axial screen portions, and has an inlet and an outlet. The internal surface of the cylinder is fitted with spaced comblike strips. Irregularly spaced, inwardly protruding axial rods are fitted

on the inside of the cylinder as far as the conical outlet end. The rods on the shaft are arranged in the form of a helix. Other rods penetrate into the spaces between the first set of rods and are of the same length, at least in the front part of the screen, and become gradually shorter in the adjacent parts. (Text in German)

INT-0045

Rudolph, S., W. Welz, and G. Wollmann. Recovery of fibrous material from tire-cord waste. East Germany 49,345; filed Aug. 4, 1965; issued Aug. 5, 1966.

A process is provided for the recovery of fibrous material for its use in the production of artificial leather and boxboard. Approximately 100 to 150 kg of shredded tire cord is pulped and then conducted under slight pressure to a refining mill, and then the material is centrifuged with water. Water and the separated rubber portion is discharged in a discontinuous process. The rubber is separated from the fibrous material because of the difference in density. (Text in German)

INT-0046

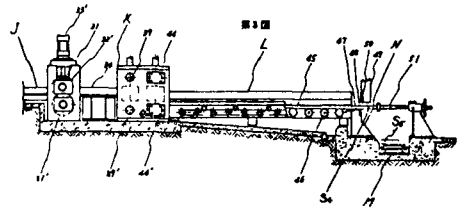
Stieler, A., and O. Zuegel (Metallgesellschaft A.G.). Recovering rubber and fiber by flotation. Germany 1,244,387; filed Mar. 24, 1965; issued July 13, 1967.

The rubber and fiber contents of rubber articles, such as automobile tires, are recovered and separated from other components by grinding and sifting the material. The sifted particles are then pulped with water and alkali and subjected to flotation. Thus, 18 kg per hr of automobile tires can be reduced by grinding, sifting, and disk-milling to particles larger than 1.5 mm. The fine material is stirred for 12 minutes in a conditioning tank with water and calcium hydroxide to a pulp containing 60 g solids per liter and having a pH of 11. The pulp is then passed through a 6-cell flotation machine in which fibers are separated overhead by aeration. The underflow from the last cell is then adjusted to a pH of 8 with a small amount of sulfuric acid, and passed through a 2-cell flotation machine in which practically pure rubber is taken off overhead. The impurities are drawn off in the waste pulp. The yields of fiber and rubber in the products are, respectively: fiber product, 93.5 and 3.9; rubber product, 6.5 and 92.0; and impurities, 0 and 4.1. The combination of mechanical reduction and flotation is more economical than the conventional mechanical and electrostatic separation process. (Text in German)

INT-0047

Ryo, S. Method for disposing of scrap cars by heating and cutting by a continuous series of rollers. Japan 42-20,667; filed Dec. 5, 1964; issued Oct. 14, 1967.

A disposal method for scrap, such as used cars, includes heat-cutting. The scrap's purity is raised so that it can be reused effectively. The scrap is first rolled flat, and then its width is diminished. Then the scrap is gradually heated to about 1,100 C, so that impurities melt and are burned off by stages. The heating is in three stages, so that in the first temperature zone (about 500 C), lead, tin, and zinc melt; in the second temperature zone (about 500 to 800 C), aluminum and its amalgam melt; and in the third temperature zone (about 800 to 1,100 C), brass and bronze become molten. For



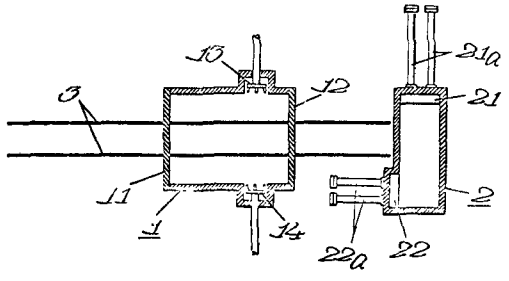
each temperature zone, there is a pit and outlet on the furnace bed to remove the melted metals separately. While the compressed scrap is cut in the next stage, the oncoming scrap is stopped. The roll bearings ensure that the pressure on the surface of the rolls is always even. Because of heatroll treatment, the scrap is smooth, narrow, and highly dense. There is no need for large oil-pressure presses; very simple equipment will suffice. The operation is also continuous and automatic. (Text in Japanese)

INT-0048

Tezuka, K. (Tezuka Kosan K.K.). Scrap car compressor. Japan 42-22,273; filed Mar. 24, 1965; issued Oct. 31, 1967.

An integrated operation of melting and compressing cars can be carried out quickly by this invention. Depending on the nonferrous metals present, the heat is raised by certain amounts so that nonferrous materials drop off, leaving only the iron car body to be compressed. The object to be melted is held between the two sides of the furnace and is

rotated so that the dropoff is due to the vibration accompanying rotation and the metal's own weight. The holding boards at the top can advance, recede, and rotate; the vertically and horizontally pushing boards, operated by the plungers connected with the oil-pressure device, can compress the car body. Even if the nonferrous metals are not separated out, the old car can be softened and compressed by

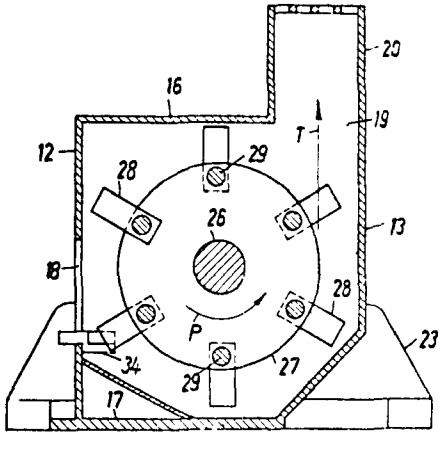


hanging inside the furnace on chains without being rotated. Then it is transferred to the compressor for compression. (Text in Japanese)

INT-0049

Newell, A. S. Hammer mill or crusher, particularly for comminuting scrap metal. Great Britain 1,096,835; filed Feb. 24, 1966; issued Dec. 29, 1967.

This mill is intended for producing scrap metal from sheet metal such as motor car bodies and other large objects. A hammer unit comprising a series of discs is disposed along a central driving shaft, each with six beating hammers, mounted pivotally about the periphery. A comb-shaped anvil member is located at the inlet aperture of the mill and is such that the beating hammers passing between the parallel teeth of the comb tend

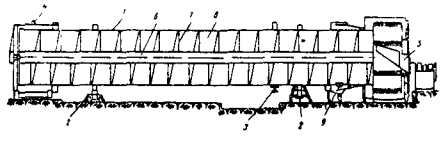


further to comminute the introduced sheet metal. At the upper part of the mill is a chamber which directs the comminuted metal to a grid, which allows only the metal pieces of a certain small size to be ejected, the larger pieces being dropped back into the mill for further comminution.

INT-0050

Tugov, I. I., and N. A. Umanskiy. Apparatus for reprocessing of worn-out tires and treatment of tire-casing strips with hydrocarbons. U.S.S.R. 226,138; filed May 20, 1963; issued Sept. 5, 1968.

A horizontal, cylindrical tank, resting on roller supports, is provided with a charging port and an outlet chamber. Inside the casing is an integral coaxial worm made of a tube with a continuous helical fin welded to its outer surface, thus forming a helical duct with 17 turns of slightly trapezoidal cross section. Liquid hydrocarbons are continuously fed into the tank at the fifteenth turn, and leave it at the first turn of the duct, so as to maintain all 15 turns in a half-filled condition.



A batch of tire-casing strips is charged into the first turn while the tank is at rest, and remains in it for between 24 and 40 minutes, immersed in the hydrocarbons. Then the first batch of strips is made to tumble into the second turn of the duct, while a second batch is charged into the first turn. In this manner, every turn of the duct will be occupied, and every batch successively traverses the 15 turns during a total of 6 to 10 hr. In the sixteenth turn, the hydrocarbons are drained from the well-soaked, swelled casing strips into the drain. In the seventeenth turn, these strips are rinsed with hot water, and then tumbled into the outlet chamber in which they are rinsed with cold water before being discharged. (Text in Russian)

INT-0051

(Logemann Brothers Company). Improvements in or relating to the crushing and cutting of scrap material. Great Britain 1,147,401; filed July 4, 1966; issued Apr. 2, 1969.

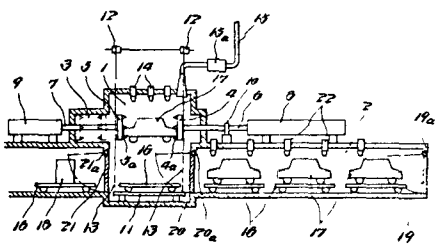
An apparatus is provided for crushing and cutting scrap material, particularly junked automobiles. The machine consists of a frame having a bed for receiving material

to be crushed, a shear member mounted on the frame, a jaw member pivotally mounted on the frame which has a crushing portion at the outer end, and a shear member mounted between the crushing portion and the point at which it is pivotally mounted on the frame. The shear members on the jaw and frame cooperate when the jaw is pivoted, to produce a shearing action. There is a power-operated device for pivotally moving the jaw.

INT-0052

Tezuka, K. Apparatus for reclaiming ferrous and non-ferrous metal from an object. Great Britain 1,152,172; filed Apr. 7, 1966; issued May 14, 1969.

The apparatus reclaims ferrous and non-ferrous metals contained in an object manufactured from metal, such as a used automobile. It consists of a melting furnace and a preheating furnace arranged for communication with each other, and is provided respectively with heating means and a device for adjusting the operation of the heating means in the melting furnace so that the temperature of the object can be raised to melt the non-ferrous metals. The



various non-ferrous metals of different melting points, such as tin, zinc, brass and copper, melt and fall under the vibration of rotation and their own weight until only the ferrous metal remains. Opposed rams are operable in association with the driving device to hold the object and rotate it in the melting furnace. A device is provided for conveying the object from the preheating furnace to the melting furnace and for conveying the reclaimed metal from the melting furnace.

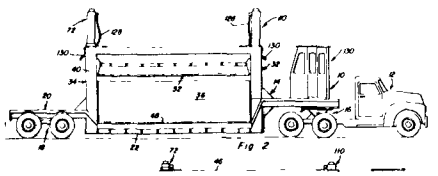
INT-0053

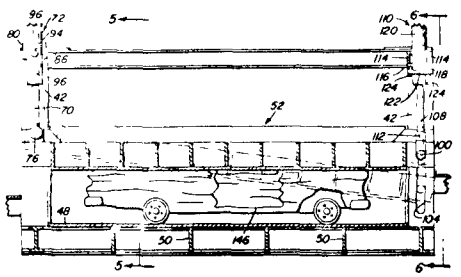
Smiltneek, R. J. (Logemann Brothers Company). Apparatus for processing scrap material. Canada 814,178; filed May 30, 1966; issued June 3, 1969.

This crushing and shearing machine reduces junked automobiles for a reasonable cost when compared to equipment presently in use. A junked auto is positioned on the machine, and then crushed by a jaw which is actuated downwardly. On the jaw's next stroke the crushed segment of the auto is cut off by a shearing mechanism while the jaw continues to devour the auto. This procedure is continued until the entire auto is crushed and sheared into relatively small pieces.

INT-0054

Flanagan, R. L. (Aspec, Inc.). Mobile vehicle press. Canada 818,185; filed July 12, 1968; issued July 22, 1969.





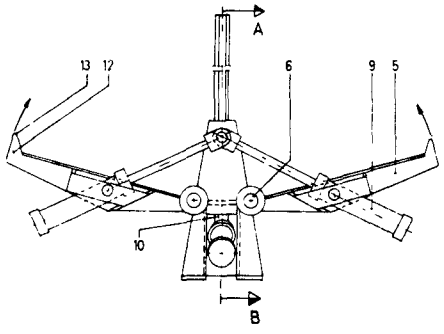
This machine, which crushes junked vehicles, is mounted on a tractor-trailer body. The pressure head is mounted above the base of the press, and it is supported by hydraulic cylinders. When in operation, the cylinders extend above the trailer body in order to exert a maximum crushing force upon junked vehicles. After the pressure head is moved down to its lowermost position, the upwardly projecting cylinders may be retracted to reduce the overall height of the trailer, thus facilitating its transit.

INT-0055

Galter, H., and V. Stille (Rheinstahl Henschel A.G.). Device for compression of automobile bodies. Switzerland 476,571; filed Jan. 24, 1969; issued Aug. 15, 1969.

The device crushes discarded automobiles into flat-faced packets which can be easily stacked and shipped. The degree of compaction is not so high as to adversely affect the subsequent cutting or shredding of the metal. In operation, the automobile body is placed in the device so that its bottom plate rests on the side flaps and its longitudinal axis is at right angles to that of the base of the device. The end wedge is then rotated into the horizontal position, squashing the

roof of the automobile and precreasing its bottom plate. With the end wedge locked hydraulically in that position, both side flaps are rotated symmetrically towards each other, folding the body about the lower edge of the end wedge. The forces required to

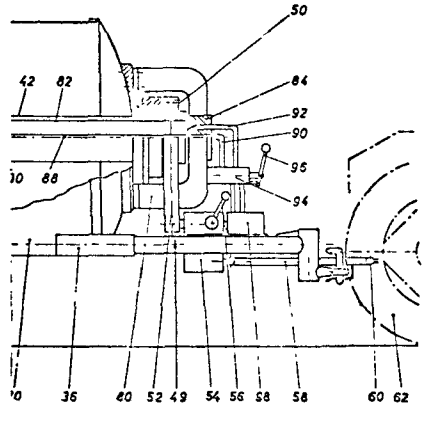


perform the operations are quite small in comparison with those of the conventional scrap-metal presses. (Text in German)

BULKY WASTES

INT-0056
Herter, M. Roadway device for grinding and transporting of wastes and other bulk goods. Germany 1,288,002; filed Mar. 31, 1967; issued Jan. 23, 1969.

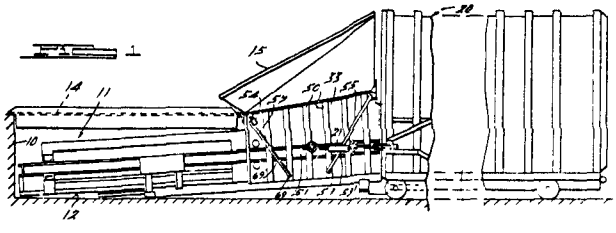
A mobile waste disposing and disintegrating vehicle has a horizontal cylindrical vessel whose rear end is pivotable into an open position for the reception of waste. To



grind the bulky waste, the interior of the vessel has a reversibly driven, coaxially journalled worm screw displaced axially by a drive. (Text in German)

INT-0057
Pioch, R. J. Handling and compacting apparatus for loose bulk material. Great Britain 1,159,922; filed July 19, 1966; issued July 30, 1969.

A handling and compacting apparatus for loose bulk materials is of particular, though not exclusive, application for compacting refuse and loading it into containers to facilitate the hauling and disposal of refuse with a minimum of equipment and labor. The apparatus handles a wide variety of materials differing in density, size, and moisture content, such as those encountered in general refuse which may be collected from household sources, as well as those in industrial wastes. The apparatus includes a ram housing comprising spaced parallel sidewalls, a header bar, interconnecting upper front corner portions of the sidewalls, and a ram movable through the housing from a retracted position spaced from the header bar, to a projected position under the header bar, so that the material in the housing may be forced into a receiver. There is a means for sensing bending of the header bar, including a shaft



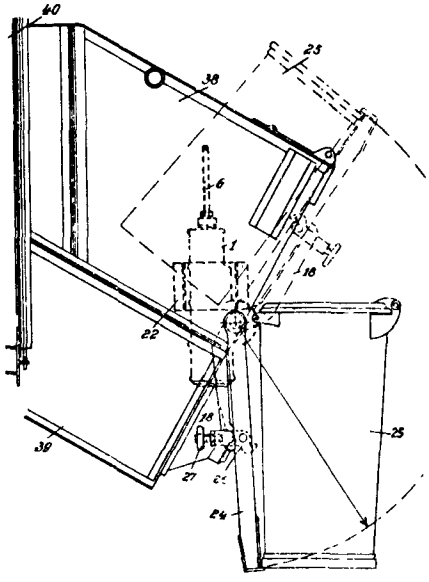
extending parallel to and rotatable with respect to the header bar. The sensing means is adapted to modify the actuation of the ram when the bar is bent, and cam and follower elements, carried by intermediate portions of the header bar and shaft, rock the shaft in response to bowing of the header bar.

COLLECTION

INT-0058
Ballert, O. (Armin Tenner Kommanditgesellschaft). Equipment on refuse collecting vehicles for emptying cans. Switzerland 236,955; filed Jan. 8, 1943; issued Mar. 31, 1945.

The vehicle has a container with a feeding inlet on the rear side. The cans are emptied by the lifting effected by a swinging

lever, tiltably arranged at the feeding inlet. The lever is actuated by a driving mechanism consisting of a pressure-operated cylinder and a piston. A piston rod of the driving

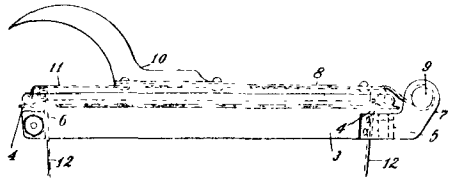


mechanism connects to a carrier at the feeding inlet. At the cylinder, which is movably mounted on the piston, is a dented rod which fits into the gear that drives the swinging lever. (Text in German)

INT-0059

Sherwood, E. M. Improvements in and connected with dustbins to be used in connection with dustless refuse carts. Great Britain 576,170; filed Feb. 7, 1944; issued Mar. 21, 1946.

A detachable attachment for dustbins comprises a band or a collar to be fitted around the top of a dustbin. The band or collar has a circular flange which extends laterally, and which is adapted to act as a dust-tight sealing rim around the opening, uncovered by the shutter in a refuse collector when the bin is being emptied.

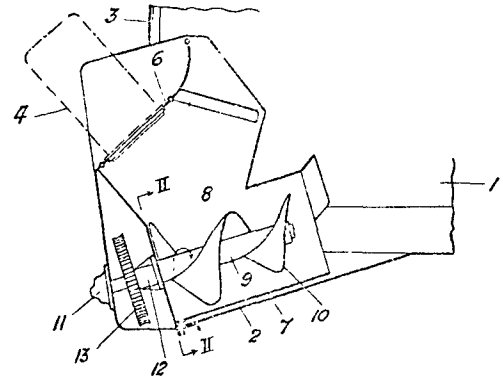


The lid is secured to a hinged bar, and the bar is provided with an upwardly curved part, intended to cooperate with devices on the cart when the loading bar is in engagement with hooks, or the like, on the cart.

INT-0060

Linde, H. Collecting container for refuse or the like. Great Britain 582,200; filed Mar. 27, 1940; issued Nov. 8, 1946.

A collecting container for refuse, or the like, is mounted on a vehicle which is provided with a conveyor screw, which can be rotated in a tubelike casing for feeding refuse through the end opening of the casing, under pressure, into the container. Along part of the circumference of the casing, the clearance between the screw and the casing is closer to the front edge of the charge opening provided in the casing than it is to either or both ends of the screw surface. The end of the conveyor screw can be mounted in a cantilever fashion, but it can also include the screw extending with its shaft through the whole container and journalled at its front end. The foremost



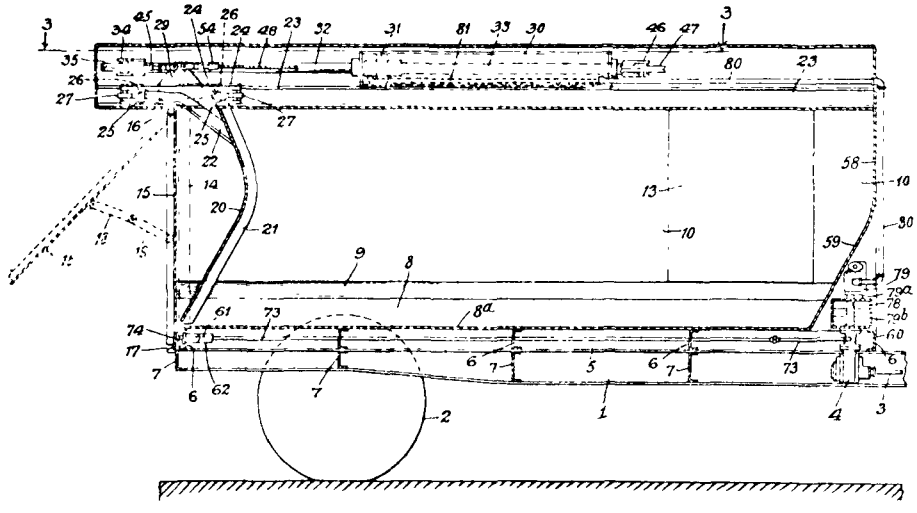
end of the tubelike casing may be conically, or otherwise contracted, in order to enable a better concentration of the press action and to prevent reentrance of the refuse.

INT-0061

Anthony, W. C. (Anthony Company). Refuse body. Canada 440,101; filed Mar. 7, 1945; issued Mar. 11, 1947.

The refuse-receiving container on a refuse body is closed except along a restricted area at its top and at its rear, where a movable and latchable gate is provided. A blade, whose area and shape duplicates the cross section of the interior of the body, packs the refuse in the vehicle and discharges it when the gate is opened. The blade is supported on a dolly which runs on tracks positioned above and along the opening in the top of the body. A hydraulic piston and cylinder assembly is positioned above and adjacent to the opening in the top of the body. Flexible connections from the piston to the dolly enable the dolly to move when

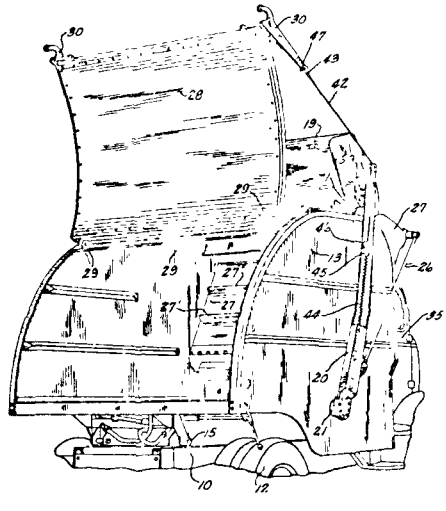
the piston does. Pressure fluid is supplied to the cylinder, and it is directed to one or the other end of the cylinder to move the piston positively in either direction. A safety device bypasses the fluid from the cylinder, when the controlling means is activated by the door when the latter is closed, and actuated by a spring biased to move it outwardly when the door is open. The releases are set to yield at different pressures.



INT-0062

Heil, J. F., and A. H. Samuelsen (The Heil Company). Refuse bodies. Canada 443,074; filed Feb. 7, 1946; issued July 22, 1947.

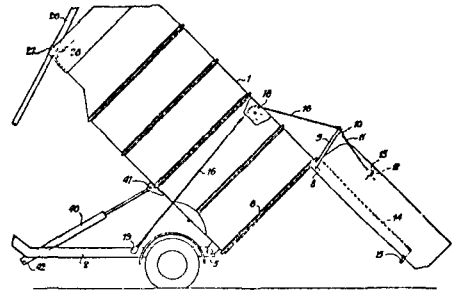
A refuse collection truck has an upper loading opening. A refuse bucket is movably mounted on arms having their inner ends externally, pivotally mounted on side portions of the body. The bucket is normally disposed adjacent to the lower rear portion of the body. Power means swing the arms to move the bucket from its normal lowered position in registration with the loading opening. A combination closure and material-packing panel is mounted by hinges to the body to move through the loading opening, in and out of the body. When the panel is in a fully opened position, it is projected upwardly and outwardly relative to marginal portions of the loading opening. It is formed with projecting wings, whereby it may serve as a guide hopper relative to material dumped from the bucket through the loading opening. Rods, adjacent to the outer side portions of the body, connect the panel to the arms to transmit motion from the latter to the former.



INT-0063

Hugh, P. G., and L. D. Watts (P. G. Hugh, L. D. Watts, and Scammell Lorries Limited). Tipping mechanism for emptying refuse collecting vehicles. Great Britain 595,516; filed July 5, 1945; issued Dec. 8, 1947.

In a refuse-collecting vehicle, there are

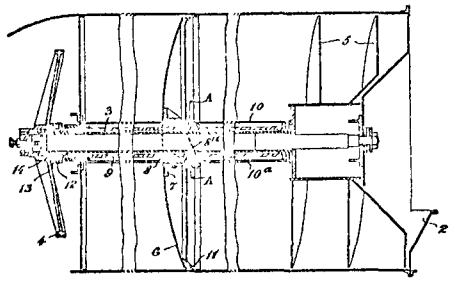


hydraulic cylinders and rams for tipping the body. These are located in a space between the forward end of the tipping body and a cab mounted on the vehicle frame. The loading receptacle is interconnected with the body, and the vehicle frame is interconnected by flexible cables. In this manner, the loading receptacle will be automatically displaced to uncover the discharge opening when the body is tipped to discharge the refuse collected therein.

INT-0064

Walter, J. C. (J. C. Walter, and The Eagle Engineering Company Limited). Improvements in refuse collecting vehicles. Great Britain 597,493; filed Aug. 22, 1945; issued Jan. 27, 1948.

This invention consists of a refuse-collecting vehicle which incorporates a container provided with a pug screw and a traversably mounted disc which, under pressure, is automatically coupled to the screw shaft and decoupled according to the pressure of the material fed into the container. A cylindrical

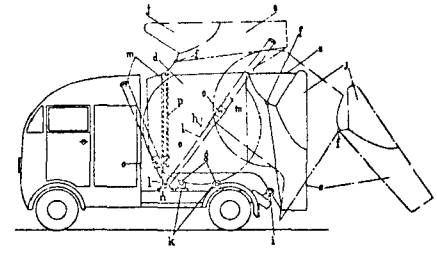


container, mounted on the vehicle frame, is provided at its rear end with a hopper, into which the refuse material is introduced. Refuse is transferred to the interior by a power-driven, bladed pug screw and encounters the traversable disc, thus building up a pressure against one face of the disc which engages a spring-loaded clutch. When the feeding of material stops or is markedly reduced, pressure on the disc is diminished and the clutch is disengaged.

INT-0065

Sherwood, J., and S. Allchurch. Improvements in and relating to refuse collectors and the like. Great Britain 606,775; filed Jan. 18, 1946; issued Aug. 19, 1948.

Refuse which is to be collected and transported by a collection vehicle is first loaded into a filling box attached to a collecting body at the rear of the vehicle, and then transferred from the filling box to the collecting body by tipping the body with the box attached. This operation is repeated each time the box is full until the load, which is packed into the body, is finally discharged. In the collector, there are two telescopically assembled tubes capable of extension and contraction under the action of hydraulic pressure. The lower end of the inner tube is secured to a hinged base mounted on the chassis of the vehicle, and the lower end of the outer tube can slide against the collecting body. It is also adapted to be prevented from sliding when it is required that the collecting body be moved. The sliding

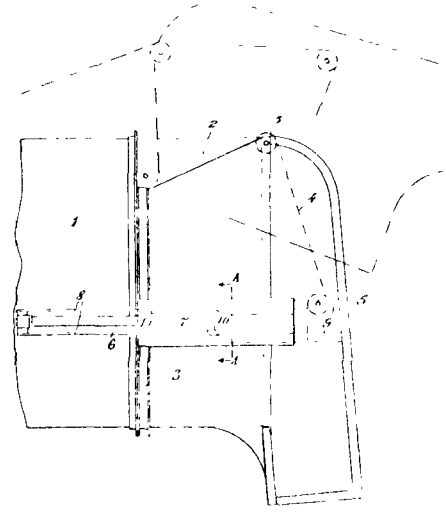


mechanism of the collector consists of a sleeve provided with trunnionlike projections, fixed around and near the lower end of the outer tube, and engaging within two channel irons arranged opposite and parallel to one another in a recess in the collecting body, and guided thereby.

INT-0066

Palmer, R. G. (The Eagle Engineering Company Limited). Improvements in or connected with refuse collecting vehicles. Great Britain 612,969; filed June 11, 1947; issued Nov. 19, 1948.

A refuse vehicle is provided at its open rear end with a hinged hood which forms a container for a traversable compression plate

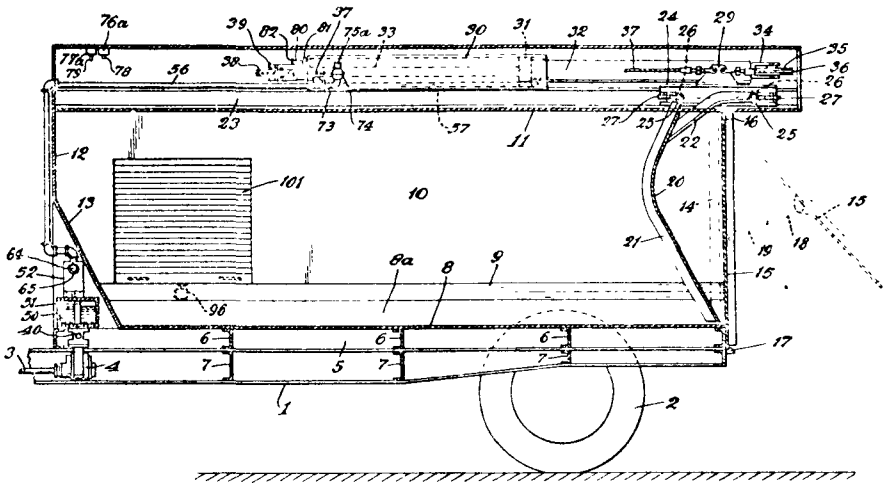


when in its outermost position. A container is also provided for refuse which is collected and compressed during loading. The hood is power-operated through a flexible coupling with a wire cable passing over pulleys. A compressor plate and a ram-operating mechanism are interconnected by means of lugged brackets and a linkage located within the hood; the compressor mechanism is operated when the hood has been raised. Compressed refuse is ejected by gravity or by action of the compressor plate.

INT-0067

Duis, G. A. Improvements in or relating to hydraulic load-packing and load-discharging apparatus for refuse vehicle bodies and similar load-containers. Great Britain 621,118; filed Aug. 23, 1945; issued Apr. 5, 1949.

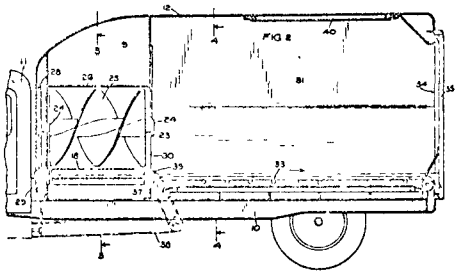
An hydraulic apparatus is proposed for compacting refuse into a load container and, by the same means, to discharge a previously packed load by opening a normally closed discharge aperture in the rear of the container. Packing and discharging is achieved by a vertical transverse member which moves longitudinally on rollers along rails disposed at the top, parallel to the roof of the load container. A cylinder, fixed above or within the upper part of the container, is provided with a piston and projecting piston rods which are connected by cables to the packing assembly. The power system, which activates the packing and discharging assembly, comprises an hydraulic piston motor which powers a double-acting piston and cylinder assembly connected to an hydraulic circuit. Hydraulic pressure fluid is supplied to one or the other side of the piston which is governed by a controlling system, operable from within the driver's cab. Thus, the refuse is packed in one direction and discharged, through the rear door, in the opposite direction. (See also Great Britain 589,775)



INT-0068

Dear, A. T. C. (Lewin Road Sweepers Limited). Improvements in or relating to refuse collecting vehicles. Great Britain 633,851; filed Jan. 8, 1947; issued Dec. 30, 1949.

The refuse-collecting vehicle is provided with a chassis with the usual driver's compartment at its front end. In front of this compartment is a power unit, and behind it is a sheet metal refuse container having a vertical charging door. Refuse is introduced through this door onto a transverse, horizontal, endless belt conveyor, whereby it is discharged to a horizontally rotating, longitudinal screw impeller. It is then transferred onto a longitudinal conveyor belt which forces the refuse toward the

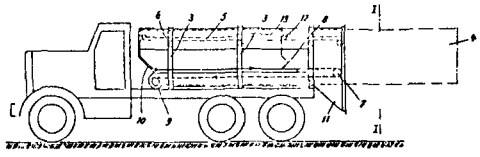


rear. The container is emptied through a door at the rear of the vehicle. The roof is provided with hinged doors to allow entry, when required, of bulky articles. Space, when not occupied by the loading mechanism, provides seats for the loading operators. (See also Great Britain 611,758)

INT-0069

Plichta, P. and J. Karst. Emptying device for vehicles transporting solid material. Germany 863,619; filed July 8, 1949; issued Nov. 26, 1950.

A container for solid material has two rows of wheels installed on both lateral walls.

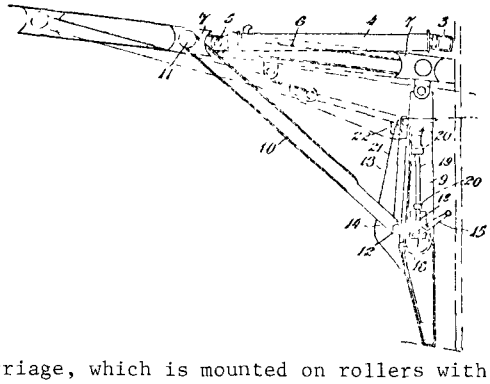


The wheels run in rails mounted on a structure attached to the truck chassis. The container is pulled out for emptying by a rope and pulley. The bottom end of the container, facing the driver's cabin, is slanted. (Text in German)

INT-0070

Meats, W. H., and D. McGettigan (The Eagle Engineering Company Limited). Improvements in refuse collecting vehicles. Great Britain 651,636; filed Nov. 6, 1948; issued Apr. 4, 1951.

This improvement applies particularly to collecting vehicles having a traversable pressure plate which compresses refuse within the body of the vehicle. A pivotally mounted, hydraulic ram is connected to a traversable

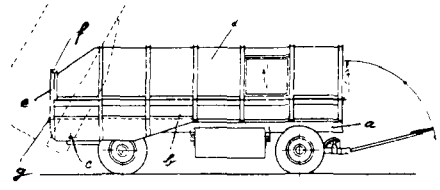


carriage, which is mounted on rollers with guide rails. An opposing, normally vertical plate is mounted at the rear of the vehicle. Extension of the ram compresses the contained refuse against the pressure plate which can be withdrawn to a position parallel to the floor of the body in order to empty the vehicle. This operation is controlled by a lever device, linked in alternative ways to the pressure plate.

INT-0071

Seitz, F. X. Dust cart. Switzerland 274,751; filed July 8, 1949; issued Apr. 30, 1951.

The chassis of the dust cart bears a tiltable platform which turns on an axis at its lower end. A lifting mechanism on the chassis is used for this operation. When a container

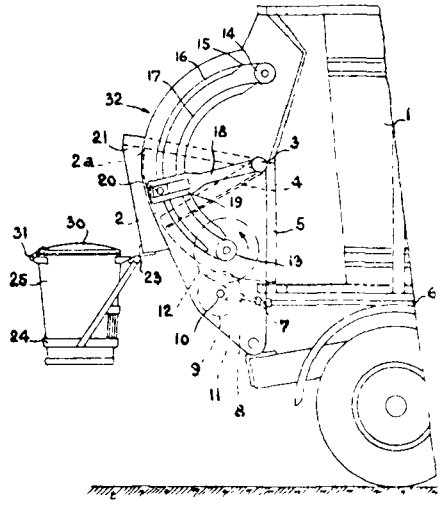


rests on the tipping platform whose rear wall is hinged to the platform, the rear wall is closed by a rod, and a pleated curtain seals the loading inlet in order to prevent spreading the dust. (Text in German)

INT-0072

Doorne, H. J. van. Garbage collection truck. Switzerland 278,216; filed Aug. 19, 1948; issued Oct. 15, 1951.

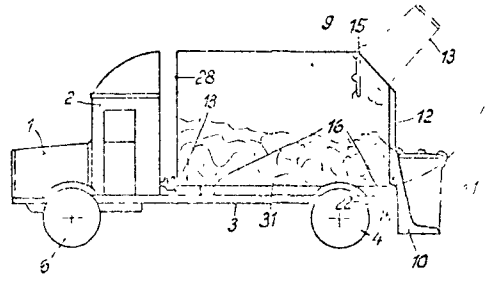
This device for lifting and emptying garbage cans into garbage collection trucks and then compacting the refuse, avoids all hydraulic actuators by making use of a system of levers which are moved by an endless chain. This chain extends between two pulleys and runs in semicircular channels. A shaft from the



truck's engine drives one of the pulleys. A stud is fastened to the chain which engages with the main lever, converting the rotary movement of the chain into the lever's reciprocating action. A platform, which receives the can to be emptied, is attached to the main lever. As the can is tilted, a plate inside the truck's body moves downward with the can, and thus compacts the freshly loaded garbage. Because of the system of small levers and handles, the loading action can be started or halted within a loading cycle. A release mechanism disengages the lifting device from the driving shaft after the completion of a loading cycle. Two loading and compacting devices can be arranged side by side at the rear of a collection truck. (See also Great Britain 651,156) (Text in French)

INT-0073

Combuechen, P. (Kloeckner-Humboldt-Deutz Aktiengesellschaft). Truck for transportation of solid material, primarily refuse. Germany 886,120; filed July 8, 1949; issued Oct. 21, 1951.

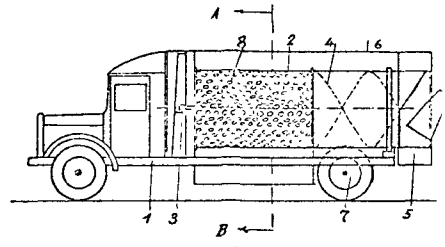


This refuse transportation truck is equipped with a vibrating device for distribution and compaction of refuse within the truck. The elastically mounted container is vibrated by means of a thrust rod. The latter is driven by the motor of the truck or a separate electric motor. The container is vibrated in a horizontal direction. The bottom of the container is connected with the sidewalls via rubber bands. Only the bottom of the container may be vibrated, or both bottom and walls. The speed of vibration can be regulated. It is advisable to vibrate the container rapidly while pushing backward, and slowly while pulling forward. (Text in German)

INT-0074

Keppner, K. W. Vehicle for the transport of solid material, primarily refuse. Germany 826,574; filed Mar. 16, 1949; issued Nov. 29, 1951.

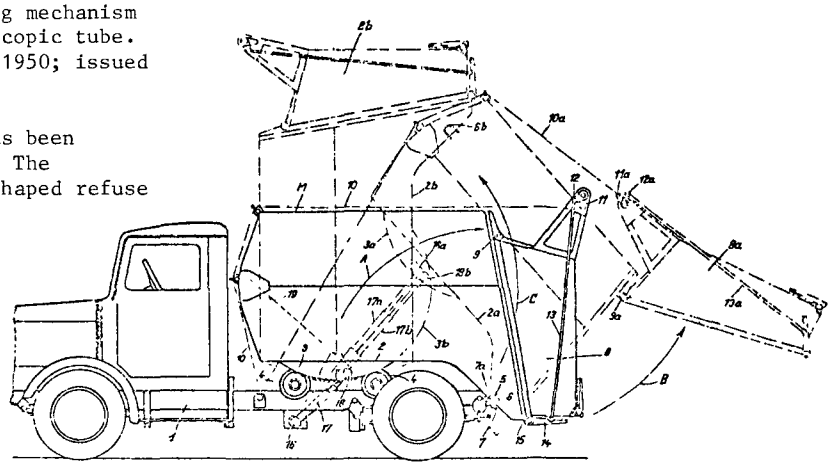
The disposal truck has a rotary drum, which is perforated on all sides like a sieve, for the reception of refuse. Underneath the drum there is a container for collecting the sifted fine material. The container forms two pockets. It has openings for emptying the material. Collection container and rotary drum are accommodated in a common casing. (Text in German)



INT-0075

Schmidt, K. H. Hydraulic dumping mechanism for refuse containers with telescopic tube. Germany 829,726; filed Dec. 22, 1950; issued Jan. 28, 1952.

A hydraulic dumping mechanism has been devised with a telescopic tube. The mechanism is suitable for drum-shaped refuse

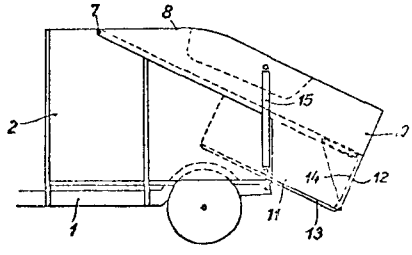


containers which rest on bogie wheels. The telescopic tube is attached to the edge of the drum at an oblique angle to the horizontal floor of the refuse container. The tube is long enough to permit tilting of the container into a dumping position and returning it into a vertical transporting position. In the frontal lower edge of the container there is a recess for accommodation of the telescopic tube in an outstretched position. (Text in German)

INT-0076

Eckertz, H. Refuse collection vehicle with a charging device. Germany 836,618; filed Sept. 22, 1950; issued Mar. 13, 1952.

The refuse collection vehicle has a loading container which is on one end movably attached to the large refuse collection container. With the other end, it rests on one edge of the large container. By lifting the loading container, its bottom unfolds. At the closed position of the loading container, a scraper pushes the refuse into the large refuse container. The bottom of the

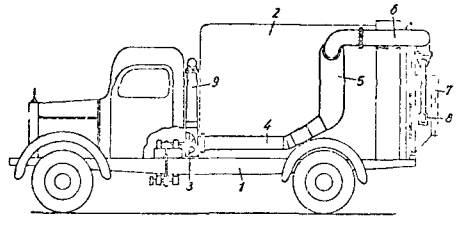


loading container projects into the large refuse container. The loading container can be lifted up, together with the top of the large refuse container. (Text in German)

INT-0077

Meinen, P. (Daimler-Benz Aktiengesellschaft). Refuse collection container primarily for disposal trucks. Germany 839,022; filed July 8, 1949; issued Apr. 3, 1952.

The refuse collection container for disposal trucks is equipped with a dust collector, whose blower produces a slight underpressure in the container, and which presses the

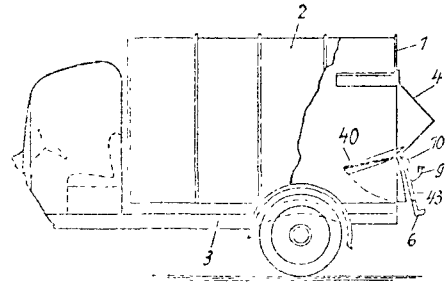


dust-laden air through a filter. In the compressed air pipe a liquid filter is installed. It consists of a tube-shaped water container into which the narrower pipe coming from the blower protrudes freely. The pipe dips below the water level. Some distance from the water level, a sieve is installed which prevents the overflow of the filtering liquid through the effect of the pressure by the blower. A heater is installed in the liquid filter which prevents a thickening of the liquid at cold ambient temperatures. The exhaust gases can be used as fuel for the heater. An antifreeze agent may be added to the liquid to eliminate the necessity of a heater. (Text in German)

INT-0078

Meinen, P. (Daimler-Benz Aktiengesellschaft). Motor-driven refuse collection vehicle. Germany 842,472; filed Sept. 4, 1940; issued May 8, 1952.

The motor-driven refuse collector comprises: a charging device for the refuse collection container; a shovel installed immediately behind the charging point; and a rectangular shaped container. The shovel is lowered during the process of emptying the garbage can into the container. The refuse falls right in front of the shovel. Through the wedge-shaped cross section of the shovel, the refuse is pushed towards the sides, and no refuse can accumulate in the vicinity of the rear wall of the container. The



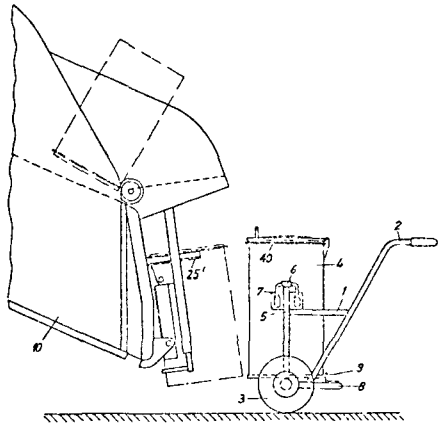
shovel is accessible from the outside via a lid. On the inside, this lid is also wedge shaped. The shovel is moved, together with the tilting mechanism, by a reciprocating piston. The shovel extends over the entire width of the container. (Text in German)

INT-0079

(J. Ochsner and Company A.G.). Method and equipment for collecting refuse and rubbish by means of large capacity cans. Switzerland 284,308; filed Oct. 5, 1949; issued July 31, 1952.

Large-capacity cans can be easily transported

by means of a two-wheel transport barrow. The wheelbarrow consists of at least one handle and two supports where the cans rest. The wheels of the barrow are pivotal. By pressing down the handle of the barrow, the large-capacity can may be easily lifted. The

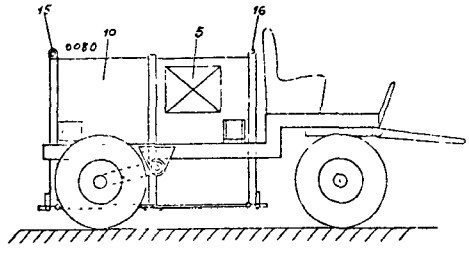


handle of the wheelbarrow can be moved to another position and secured in order to move two or more cans. (Text in German)

INT-0080

Kroengen, C. Collection vehicle for refuse or solid material with exchangeable container. Germany 854,917; filed Nov. 11, 1950; issued Sept. 4, 1952.

A refuse collection vehicle has a receptacle with rear and lateral openings for the loading of refuse, and bottom openings for unloading. It also has adjustable legs for setting it on the ground. To load the container on the vehicle, the forked undercarriage is placed underneath the container, and the rear bar is locked. Then the legs are removed. The container comes to rest on the supporting beams of the undercarriage. The openings in

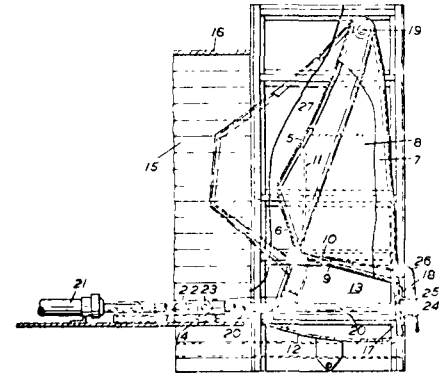


the container are fit for standard-sized garbage cans, as well as for all other types. The full container is lifted on a collective transportation medium. After emptying on the dump site, the container is driven back, unloaded, and the forked undercarriage is placed under it and freshly loaded. (Text in German)

INT-0081

Gibson, G. T., and W. H. W. Ramsay, Jr. (John Gibson and Son Limited). Improvements in or relating to refuse-collecting vehicles. Great Britain 680,174; filed Sept. 12, 1950; issued Oct. 1, 1952.

The invention relates to an improved discharge door affixed either to the rear end or side of a waste collection vehicle body, which empties itself by tipping. The door structure, pendulously attached by its upper end, comprises oppositely inclined upper and lower wall sections extending between and connecting a pair of vertical outer sideplates. These plates, together with a bottom wall, form a cavity for the introduction of refuse from the outside. This cavity is positioned above a charging chamber with a floor curved toward an opening into the interior of the vehicle body. The inner wall is provided with an inclined section, powered by an hydraulic ram, which sweeps the refuse into the vehicle. When the vehicle is tipped for emptying, the



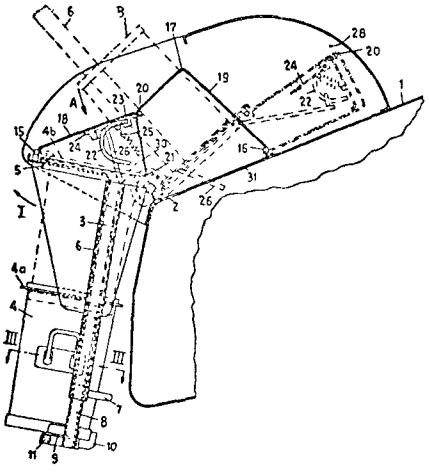
door structure swings free on its upper pivots and allows the refuse to flow out. (See also Great Britain 742,833)

INT-0082

Ochsner, J. (J. Ochsner and Company A.G.). Device for the dust-free emptying of refuse pails into refuse collecting vehicles. Great Britain 681,323; filed Aug. 3, 1950; issued Oct. 22, 1952.

The device has a closure member supported adjacent to the opening of the vehicle body, which is adapted to be coupled with a handle on the pail cover. A spring-controlled hook is pivotally mounted, which during the forward movement of the hood during the emptying of the pail, engages a loop provided on the pail cover for the purpose of opening the cover. A control member is provided which cooperates with the hook and causes it to move against the action of the spring to

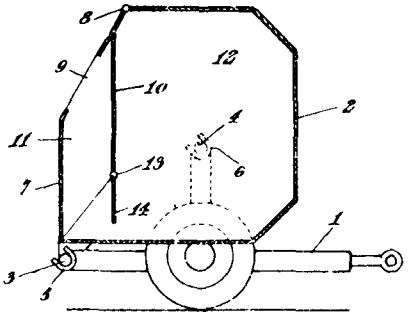
its inoperative position. The carrier provided for supporting the refuse pail, which is capable of being raised and pivoted, features an eccentrically pivoted lever which engages rollers on the carrier.

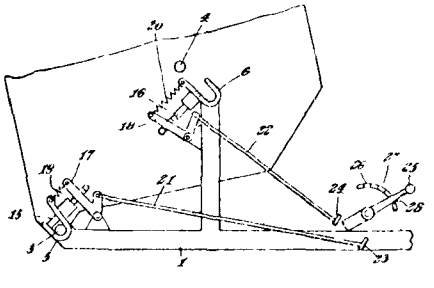


INT-0083

Feidert, J. Collection equipment for all types of wastes, primarily rubbish. Switzerland 286,394; filed Oct. 31, 1950; issued Oct. 31, 1952.

Rubbish collection, as well as collection of other types of refuse, is facilitated by a container which rests on a chassis on pivot bearings. The container, which can



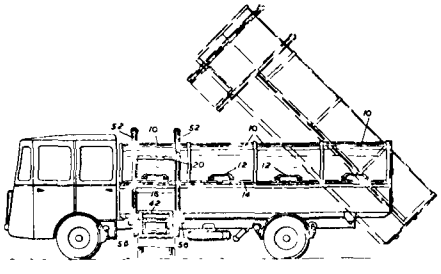


be tipped forward and backward, is loaded from the rear. The loading shaft is separated from the main part of the container by a board that is rigidly attached to the container door. A flap mounted to this board opens only into the main container section, not into the loading shaft. When the loading shaft is filled with waste, the container is tilted, the flap opens, and the waste falls into the interior of the container. The pivot bearings have special locking mechanisms attached to springs. They are operated manually by a lever. By unlocking one bearing, the other is automatically locked. (Text in German)

INT-0084

Edwards, C. K. (Shelvoke and Drewry Limited). Improvements in and relating to refuse collecting vehicles. Great Britain 682,876; filed Nov. 21, 1949; issued Nov. 19, 1952.

A tipping hoist unit, which is attachable to a collecting vehicle primarily designed for hand loading, can mechanically lift and discharge large containers into the vehicle. The



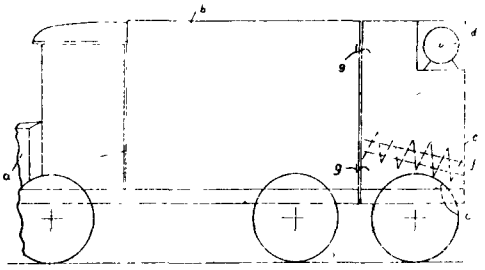
hoist assembly, located at the front end side, comprises a pair of vertical tracks and a pair of L-shaped tracks which are bent at 90 degrees over the edge of the vehicle. Refuse is transported in wheeled containers which can be attached to the hoist and carriage. This cable-suspended carriage is fitted to the tracks and is raised and lowered by a winch drum, to which the cables are attached. Tipping is actuated by projecting forks at the side of the container. A snail disc jack supports the body during loading. The hoist is readily detachable and replaceable by means of bolted clamps which fit over the sides of the body wall.

INT-0085

Weibelzahl, H. R. E. Refuse collection vehicle. Germany 894,525; filed July 8, 1949; issued Jan. 29, 1953.

Coupled to this refuse collection vehicle is a trailer equipped with a transporting mechan-

ism, charging device, and dust collector. The refuse collection container, a box-shaped structure of suitable material, may be mounted on a chassis of any type of truck. The trailer with the charging device is equipped with a motor for driving the transporting mechanism and a dust collector. As garbage cans are emptied into this part of the vehicle, and the refuse is transported by several screw conveyors into the refuse container. Using this

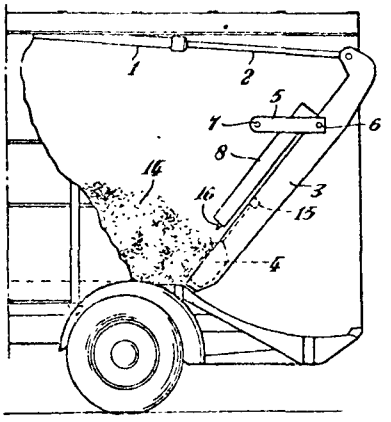


arrangement, more refuse can be transported by the truck. Several garbage cans may be emptied into the truck simultaneously. In case of a failure of the charging device, another trailer with a similar arrangement is coupled to the truck. (Text in German)

INT-0086

Evans, L. W. (Glover, Webb and Liversidge Limited). Refuse collecting vehicle. Great Britain 707,317; filed Oct. 26, 1950; issued Apr. 14, 1954.

Refuse is collected in a bin mounted on the chassis of a motor vehicle which is equipped with an hydraulic lift. This lift tilts the bin to unload the refuse through a rear compressing door which is pivoted at its top to swing outwardly. Refuse is compressed by the inward swing of the door, which is driven by two hydraulic rams. These rams are mounted parallel to the container bin roof and attached through pivots to the top part of the door. An inner door is mounted coaxially with the

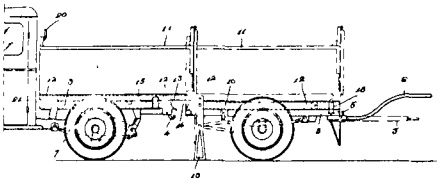


compressing door, and it holds compressed refuse in place when the compressing door returns to the rear to assume its open loading position. (See also Great Britain 942,792 and 1,119,317)

INT-0087

Inuzuka, I. Small garbage truck. Japan 29-3,854; filed June 27, 1952; issued June 30, 1954.

Although basically a small-sized trailer truck, this vehicle also serves as a tractor and a detachable trailer. Each part of the truck has a container equipped with rollers to allow easy movement back and forth along the guide rail tracks provided on the rear body of the truck and on the trailer. Both containers are the same, and therefore are easily interchangeable. A detachable coupling rod hooks up the trailer with the tractor (truck) when both should move as a combined unit, or is replaced with a steering rod when the trailer is used as a pushcart. When



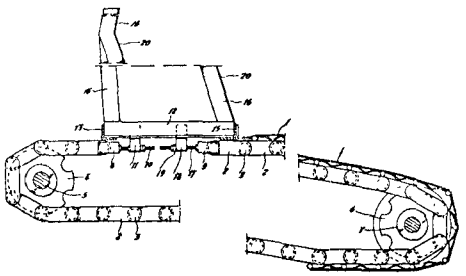
garbage has to be collected from back alleys or small streets, the trailer is detached from the tractor, converted to a push cart, and pushed along the alleys to pick up the refuse. When fully loaded, the first container is interchanged with the empty one on the tractor. As a result, a small garbage truck can take care of a workload twice its normal capacity. (Text in Japanese)

INT-0088

(Glover, Webb and Liversidge Limited). Improvements in or relating to refuse collecting vehicles and the like. Australia 157,868; filed May 14, 1952; issued July 27, 1954.

A refuse-collecting vehicle has a loading compartment with a moving floor actuated by at least three conveyor chains and a movable barrier within the compartment in order to compress the refuse. Each conveyor chain is discontinuous; its two ends are connected to and independently adjustable on the barrier. One end of each chain is provided with a screw-threaded rod which is free to rotate thereon without axial movement, and which is threaded with an internally screw-threaded part of the barrier. The other end of the chain is provided with a

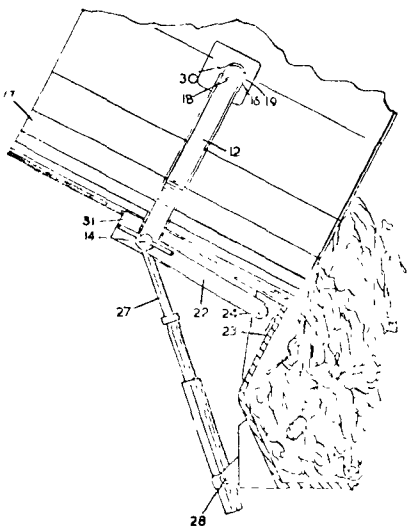
screw-threaded, rigid rod, connected to the barrier. The conveyor chains are operated by power from the vehicle's engine via a gearbox having forward, reverse, and neutral positions. At the end of each length of travel, the barrier knocks against a stop which throws the gearbox into neutral, thus stopping the movement of the floor.



INT-0089

Dawes, H. W. (Dennis Brothers Limited). A bin lifting and tipping mechanism for a refuse-collecting vehicle. Great Britain 719,825; filed Jan. 30, 1953; issued Dec. 8, 1954.

The type of tipping mechanism described is of the kind in which the pair of transversely spaced arms is carried by a supporting link or links, suspended from the top of the tail board or other rear part of the vehicle and swingable, for lifting or tipping, by a power means provided on the vehicle. With

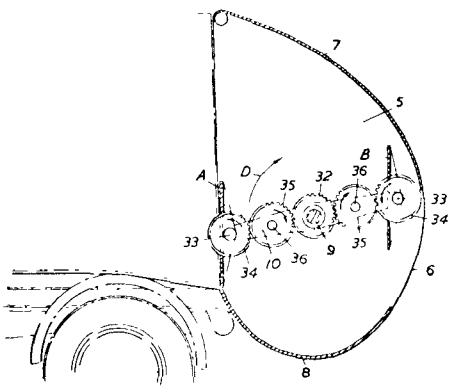


the mechanism in its lowered position, these arms may be locked either in an inoperative, hanging position, or in a generally horizontal, rearwardly extending operative position. The free ends of the arms feature notches in their upper edges to receive trunnions on a bin to be lifted, and devices to retain the trunnions. The transverse shaft of the mechanism is connected, axially inwardly of the links, with hydraulic jacks which form the power means for swinging the supporting link or links.

INT-0090

Gibson, G. T. and W. H. W. Ramsay, Jr. (John Gibson and Son Limited). Improvements in or relating to refuse collecting vehicles. Great Britain 727,861; filed June 13, 1953; issued April 6, 1955.

The improvements in prior patent specifications in a refuse-collecting vehicle or tailgate structure comprise paddle supporting elements secured to and extending outwards from a paddle shaft, paddles rotatably supported by the elements, and a mechanism for maintaining the paddles in a constant upright position when the paddle shaft is rotated. Each paddle



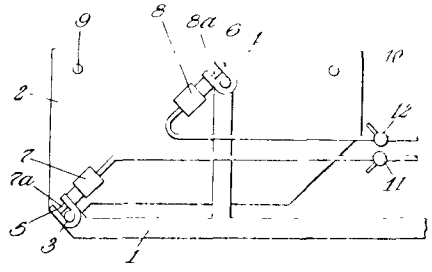
is mounted to turn with a wheel geared to a fixed central wheel on the paddle shaft axis. The power mechanism for turning the paddle device comprises a rope and pulley mechanism operated by a single ram cylinder, the paddle shaft being driven through a one-way drive clutch.

INT-0091

Feidert, J. Improvements in and relating to road-vehicle refuse-collecting containers. Great Britain 730,392; filed July 14, 1952; issued May 25, 1955.

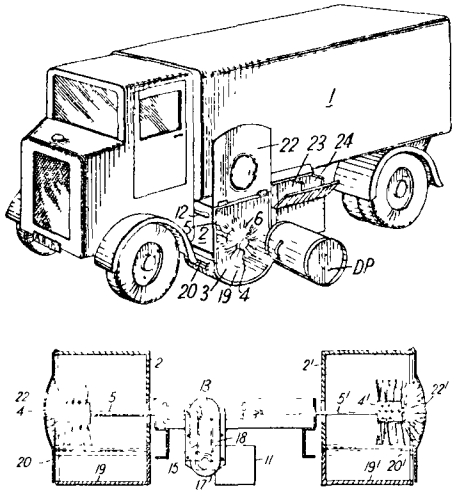
This invention concerns a controlling device, built on a road vehicle, for the loading and unloading of the container as well as the changeover of the container with another similar container of a transporting body. The bearings, about which the container can be tilted between its loading and unloading positions, are provided with pressure

cylinders having displaceable lock-pistons controlled by valves to bolt or unbolt the bearings. The changeover position is effected by the simultaneous unbolting of all bearings by the lock-pistons.



INT-0092
Finch, R. M. and H. S. Hannam (The Lord Mayor, Aldermen, and Citizens of the City of Nottingham). An improved refuse collecting vehicle. Great Britain 730,882; filed July 3, 1952; issued June 1, 1955.

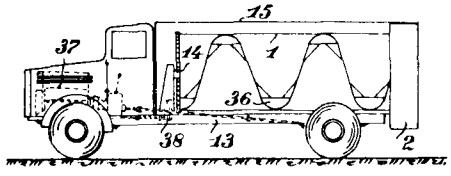
This invention provides a vehicle, for collecting refuse from dustbins, having at least one open-mouthed housing for receiving the open end of a bin, and a brush mounted within the housing for rotation within the bin, and means for rotating the brush while it is inserted within the bin. The brush



is rotated by the vehicle engine. The vehicle features a base part of the housing which is readily removable for emptying all material received from the dustbins after being cleaned by the brush. The bristle tufts of the brush are arranged in a helix by which means the tufts propel refuse in the bin rearwardly through the open mouth of the bin.

INT-0093
Staudenmeier, G., H. Tilch, F. Kaiser, and A. Blessing (A. Talenti, and Keller and Knappich Maschinenfabrik G.m.b.H.). Refuse vehicle loading and unloading. Canada 528,629; filed Apr. 12, 1950; issued July 31, 1956.

A device for the loading and unloading of vehicles carrying loose material comprises a rotary, drum-shaped tank, horizontally mounted on the vehicle, in combination with a blade wheel, adapted to rotate with the tank, and several inclined conveying guide plates for distributing the material through the tank. The blade wheel, mounted coaxially with an end of the tank in which there is an opening, comprises a hollow cylinder of a larger inside diameter than the tank opening, and a number of radially directed conveyor blades disposed around the inner circumference of the cylinder. Material which enters the tank through the opening is introduced into the wheel by the conveyor blades. A circular cover mounted

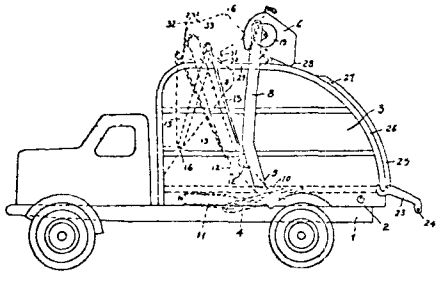


on the stationary part of the vehicle is able to swing about the axis of rotation of the tank. The cover may be locked to the stationary part of the vehicle, or to the rotary drum and blade wheel unit. An adjustable stop mounted on the cover is adapted for engagement with a stationary abutment, or with a stop on the rotary drum and blade wheel unit. Mounted on the cover and able to swing with it, is a chute which, when in the charging position, provides that any loose material falling out of the blade wheel slides into the tank. When the chute is in the discharging position, the loose material slides outwards through the chute. A collecting receptacle, having an opening capable of being closed and a capacity at least sufficient for the clearance losses of one tank charge, is located underneath the clearance between the cover and the blade wheel.

INT-0094
Yashiro, M. (Kongo Seisakusho Company, Ltd.). Garbage truck. Japan 31-7,760; filed Nov. 17, 1954; issued Sept. 17, 1956.

A dump truck specially designed for the collection of garbage, trash, and similar solid wastes features an interlock loading

and unloading mechanism. The main arm of the loading bucket fits onto a shaft on the lower side of the dump container. The shaft leads to a loading hoist under the bottom of the dump container by means of another short arm. An automatically interlocking arm extends from the main arm to the top of the front pressing board, which swings open when pushed up by the interlock arm, and presses the loaded garbage when pulled down. On the top end of the main arm are provided pulleys, along with the bucket, which hold a line of wire with a hook. Both the rear side and the rear door of the container are curved to allow the bucket to slide smoothly along their surfaces. When

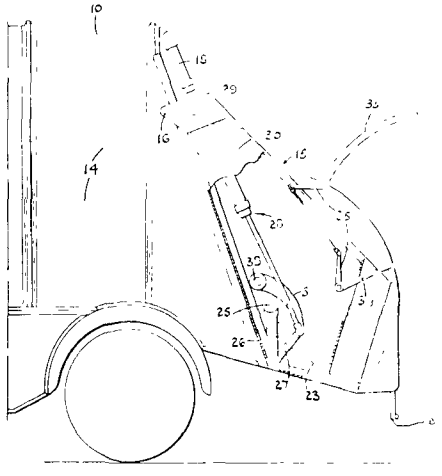


the full bucket is lifted, the interlocking arm pushes the pressing board from the opening. The garbage is dumped, the arm recedes, and the pressing board compacts the garbage. For dumping, a line with a hook provided at the top end of the main arm of the loading bucket is hooked up to the rear door. As the main arm is hoisted up by means of the loading hoist, the rear door opens, and the whole container is lifted. (Text in Japanese)

INT-0095

Dear, A. T. C., and A. W. Lambert (Lewin Road Sweepers Limited). Improvements in or relating to refuse collecting vehicles. Great Britain 761,183; filed July 16, 1954; issued Nov. 14, 1956.

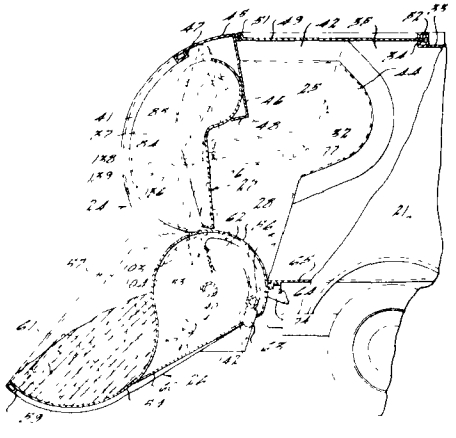
The refuse-collecting vehicle comprises a body for the refuse, a refuse receiving opening, a feeder for charging refuse into the body, and means for tipping the body about a pivotal axis disposed at the rear lower end to effect gravitational discharge. A closure device is hinged about a horizontal axis disposed at the rear upper part of the body so as to be swingable to the rear and upward, into an open position, to enable the gravitational discharge, and to be swingable downward and forward into a closed position. A feed plate is hinged to the closure device and it is swingable from a lowered position, such that refuse can be loaded thereon, to an elevated position in which the refuse is deposited into the body and compacted therein by the feed plate. The power mechanism for operating the closure member comprises one or more hydraulic rams connected to the upper rear end or sides of the body, and the upper part of the closure member.



INT-0096

Barrett, E. R. (Gar Wood Industries, Inc.). Refuse truck. Canada 537,283; filed Dec. 5, 1951; issued Feb. 19, 1957.

A device for loading and compressing loose material into an enclosed compartment comprises a hopper, mounted adjacent to an opening of the compartment, and a compressing panel, adjacent to the hopper. The hopper is pivoted and movable between a lower position, in which a concave material-receiving portion is exposed, and an upper position, in which the receiving portion faces the compartment opening. The compressing panel is pivoted and movable between a retracted position and a compressing position. One edge of the

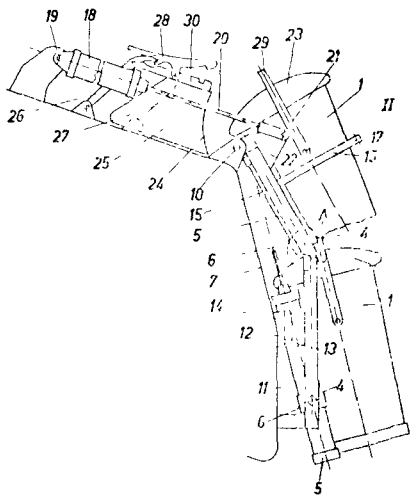


panel adjoins one end of the concave portion of the hopper when the latter is between its extreme positions. A lip of the panel sweeps across the hopper receiving portion, as it moves from its retracted to its compressing position. (See also Great Britain 761,124)

INT-0097

Soechting, H. (Hoerbiger and Company). Pneumatically actuated lifting and tipping device on refuse collection trucks for emptying garbage cans. Switzerland 320,223; filed Apr. 1, 1954; issued Mar. 31, 1957.

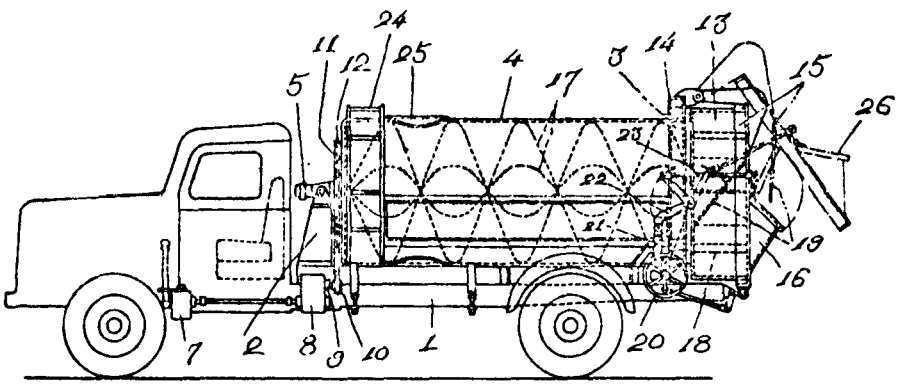
The pneumatically actuated lifting and tipping device for emptying garbage cans into refuse collection trucks has two different sets of compressed air cylinders. One set is for lifting the can, the other for tipping it. The two lifting cylinders, which form a sled for the can, act only in one direction, the return movement being taken care of by gravity. The tipping cylinder acts in both directions. The return movement and shaking movement is possible by the rapid switchover of force. The sled has rollers which run in the U-profiles of a guide rail. When compressed air flows into the lifting cylinders, the sled is lifted with the can. When the sled enters the upper section of the guide rail, the tipping cylinders are actuated, tipping the rail, the sled, and the can. The sled descends when the upper guide rail section connects to the lower guiding section which is fixed to the truck. (Text in German)



INT-0098

Inuzuka, I. Garbage truck. Japan 32-3,514; filed Apr. 5, 1955; issued June 10, 1957.

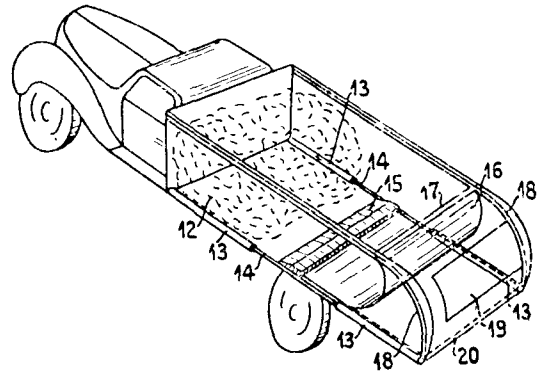
This garbage truck features a rotary drum-type dump container. The container opens at its rear and has a shaft at the front. Since it is held in position by the shaft bearing and rotors on which it is mounted, it can freely rotate when driven by the engine via a chain-drive mechanism. The rear door, which has the garbage charging port, usually remains closed except when dumping garbage out, but it is closed rather loosely, so that rotation of the drum may not be hampered. The inside of the drum is provided with spiral ribs so that garbage is moved into the inner portion as the drum revolves. For dumping, the rear door is hoisted up by turning the handle manually, and the drum is then rotated in the direction counter to that in which the drum is rotated for garbage loading. (Text in Japanese)



INT-0099

Ochsner, A. (J. Ochsner and Company A.G.). Garbage collection truck. Switzerland 323,259; filed Apr. 12, 1955; issued July 31, 1957.

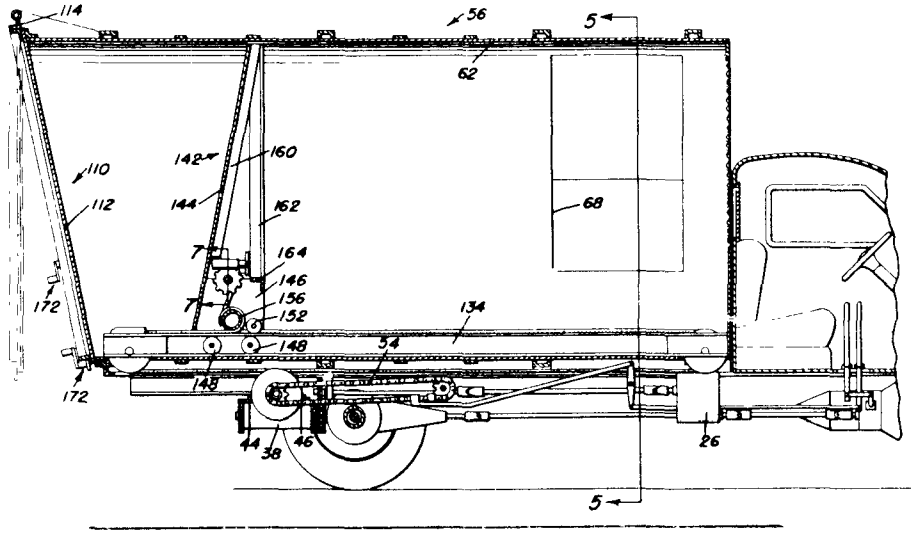
The bottom of the loading space of the collection truck is covered by a flexible sheet made of rubber or steel links. The end of the sheet which is nearer to the front end of the truck is attached to the bottom of the loading space, while the other end is attached to steel ropes. By means of winches, the ropes pull their end of the sheet upward and toward the front end of the truck. Thus, the garbage, which had been loaded onto the sheet at the rear end of the truck, is moved forward. If the garbage contains sharp-edged material, such as metal or glass, it is desirable to minimize the relative movement between it and the sheet. Therefore, in an alternative version of the invention, the front end of the sheet is not attached to the truck, but moves forward in synchronization with the other end of the sheet. Emptying the truck is effected by pulling the rear end of the sheet down and backward, and tilting the whole loading space. (Text in French)



INT-0100

Williams, W. A. (Seal-Press Incorporated). Refuse unit. Canada 548,131; filed Oct. 4, 1954; issued Oct. 29, 1957.

A refuse truck comprises a horizontal, cylindrical body with an open rear end to which a hinged gate is attached. The rear end is inclined such that its uppermost portion projects beyond its lowermost portion. Inside the body, a combined compression and ejector plate, sloped oppositely from the rear end, moves along a longitudinal track with protruding, generally horizontal flanges. Guides on the compression/ejector plate and on the flanges constrain the motion of the plate. This system permits the maximum amount of refuse to be stored within a given volume of the cylindrical body.

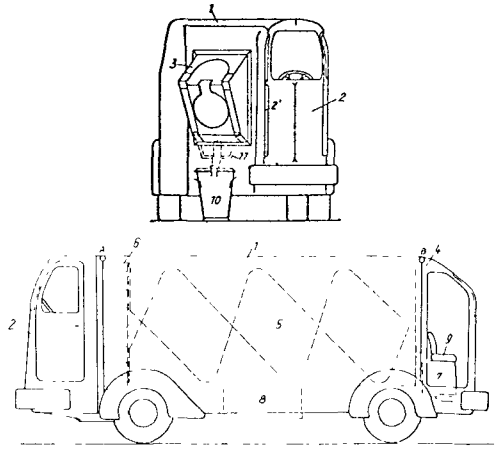


INT-0101

Zoeller, H. Garbage truck. Germany 1,022,156; filed Sept. 30, 1954; issued Jan. 2, 1958.

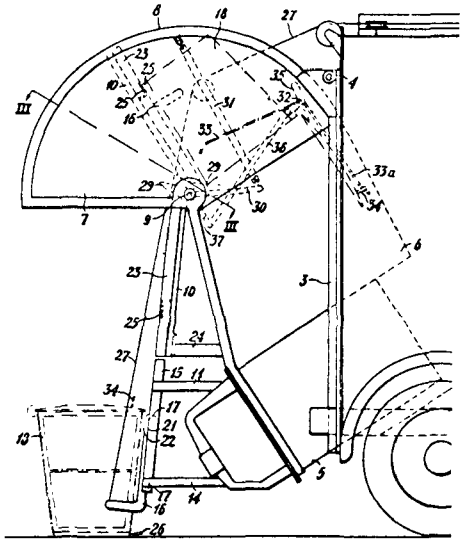
This garbage truck is designed for the mechanical loading and unloading of garbage by means of a pouring device by which the garbage can be moved to the rear of the truck

interior. To enable the driver of the vehicle to control the loading or unloading of the garbage without getting out of the cab, the driver's cab has glass sidewalls. The garbage container is brought to the truck and emptied by another operator into the pouring device. From that point, the driver can control the emptying of the garbage can by a tipping device and return the empty can. (Text in German)



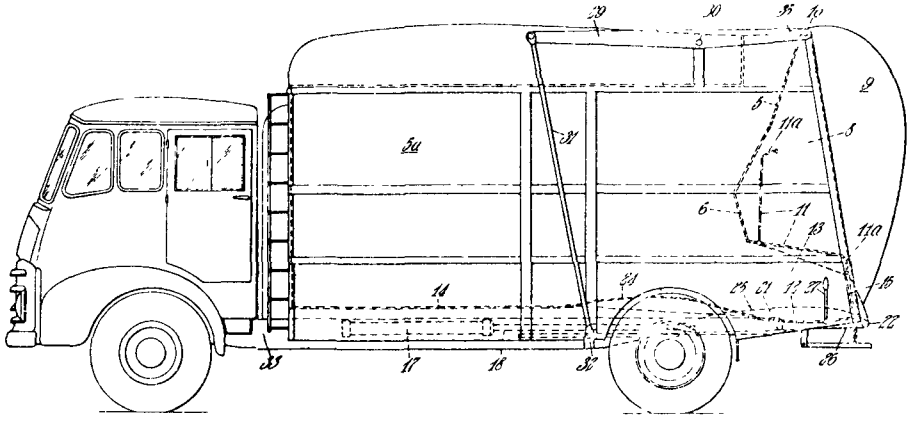
INT-0102
Linde, H. Garbage truck. Germany 1,022,519; filed May 16, 1955; issued Jan. 9, 1958.

This garbage truck features a collection chamber which can be filled via a maneuverable device attached to the rear wall. This wall is also provided with an attachment to the transport mechanism featuring an emptying hopper. In this area, a cover is so placed that it can be swung by its upper edge, and it can be shut firmly, being provided with strips of rubber for sealing. Special arms for lifting the garbage can are operated by means of a rail, and this operation is also connected to the closing of the cover. (See also Switzerland 300,497 and Canada 632,402 and 440,843) (Text in German)



INT-0103
Gibson, G. T. (John Gibson and Son Limited). Improvements in or relating to refuse-collecting vehicles. Great Britain 789,564; filed Sept. 12, 1955; issued Jan. 22, 1958.

The cylinder and ram assembly in the refuse-collecting vehicle is positioned below the floor of the body of the vehicle, and the ram is connected to the door by means of a link of rectangular cross section with its major axis vertical, while the floor of the body of the vehicle is provided with a longitudinal slot and a cowling covering the forward end of the slot. The slot is open

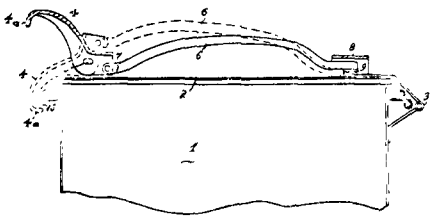


at its rear end, the link passing through and sealing the slot. The cylinder and ram assembly is protected from contact with the refuse, and the passage of refuse or dust through the floor of the vehicle is prevented. (See also Canada 681,430)

INT-0104

Goetz, E. (Eisenwerk Streuber and Lohmann G.m.b.H.). Garbage can cover. Germany 1,023,398; filed Dec. 8, 1953; issued Jan. 23, 1958.

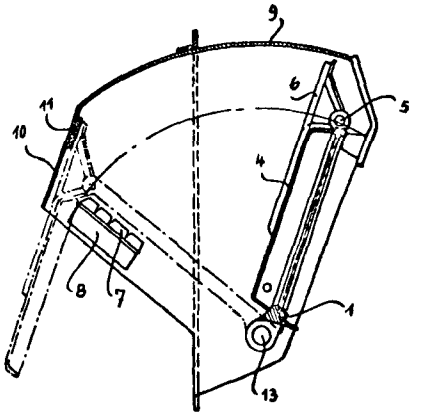
A device, for covering garbage cans, is designed to facilitate the emptying of garbage when the container is tilted. This is done in such a manner that the operation is dust free. The cover is attached to the can by means of a hinge at the upper circumference of the vessel and can be opened in a tipped position. The mechanism for tipping is devised so that, in the tipped position, it is limited to the angle most suitable for emptying. (Text in German)



INT-0105

Schaffner, G. (Schmidt and Melmer). Refuse bucket pouring device. Germany 1,023,719; filed Aug. 13, 1956; issued Jan. 30, 1958.

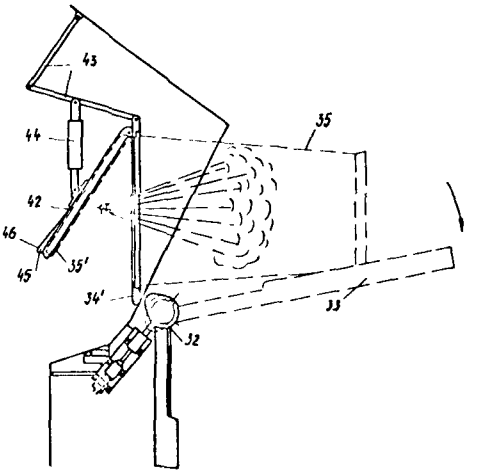
This pouring device features a front plate fastened to the sidewalls of the emptying device by an axle. The opening for the introduction of the refuse can be closed by a cover, which is movable by means of a swivel joint, which is guided by the front plate. The cover is cambered and is extended in length over the swivel joints. The housing is protected against the inward swing of the front plate by rubber cushions on the interior. (Text in German)



INT-0106

Zoeller, H. Procedure for dust-free disinfection of refuse receptacles during their emptying into the collection container and a device for carrying out the operation. Germany 1,024,875; filed June 6, 1953; issued Feb. 20, 1958.

This is a procedure which is useful in disinfecting garbage cans at the time of their being emptied into the collection van. The



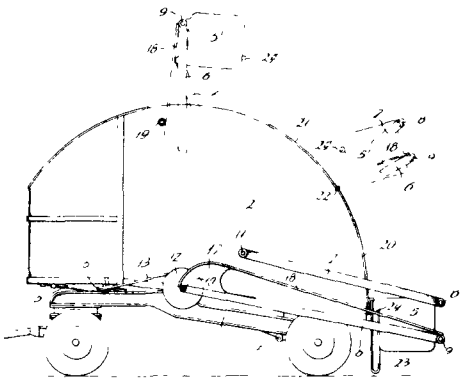
disinfection is carried out by means of spraying with a mist into the open can and on the inside of the cover. This operation is performed automatically in the tipping of the can backward and forward; the garbage is also sprayed with the disinfectant simultaneously. The device for carrying out this operation has a compressed air cylinder, with valves leading to a control device, which works in connection with the moving parts of the tipper and with a compressed air-driven hydraulic pump with valves leading to the main container. (Text in German)

INT-0107

Armitage, J. B. (Freighters Limited). Improvements relating to mobile garbage unit. Australia 213,621; filed Mar. 22, 1956; issued Mar. 10, 1958.

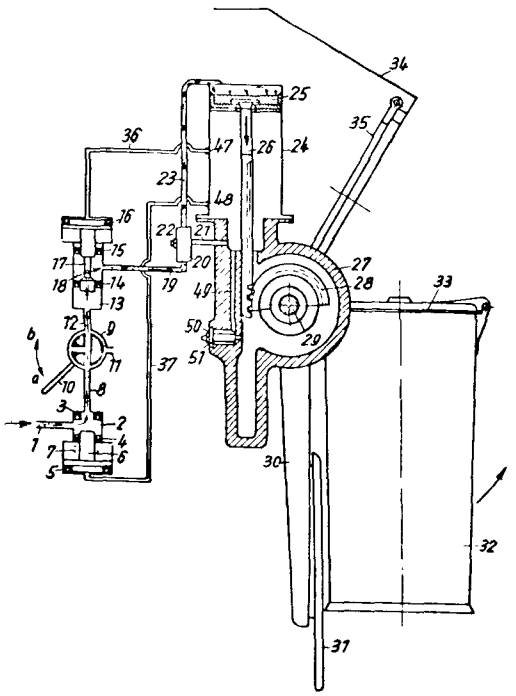
A mobile garbage collector has a main collection bin and a dumping bin into which the garbage is initially deposited. A bucket is movably mounted, on one end, upon one or more

pairs of substantially longitudinal supports of uneven lengths, pivoted to the bucket and main bin. The articulated supports effect an angular movement whereby the bucket is raised from a lower filling position to an elevated discharge position, during which it describes a relative angular movement so as to be inverted in the discharge position. In response to the movement of the bucket from a filling to a discharge position, a door provided at the rear of the bin permits the discharge of the garbage from the bin. Hydraulic means tip the main bin, relative to the chassis, about a rearwardly disposed transverse pivot to facilitate the dumping.



INT-0108

Zoeller, H. Hoisting and tipping device for refuse bins. Germany 1,026,685; filed Sept. 19, 1956; issued Mar. 20, 1958.

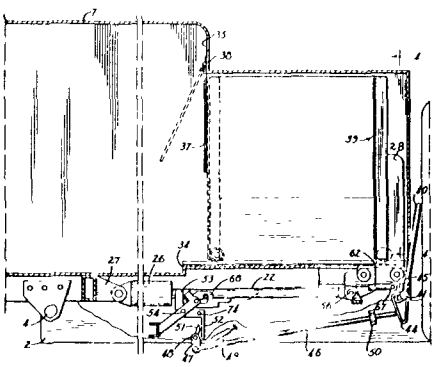


This device is intended for emptying refuse bins into the collection vehicle, and, at the same time, providing automatic manipulation control in order to reduce noise and damage to bins emptied manually. The tipping of the bin is provided via a compressed air cylinder attached directly to a swivel arm and supported by a bracket on the main frame through its piston rod. The bins are elevated by means of a hoisting cylinder, with its piston rod connected at its free end to a rope pulley attached to the hoisting arm. The hoisted bin is then slowly tipped to bring its upper rim in contact with the face plate, at which point the pistons of the cylinders are positioned so as to allow free flow of the activating pneumatic driving air pressure. The return operation is controlled by a similarly automatic procedure. (See also Great Britain 774,413, 970,614, and 1,127,425; Germany 1,022,157, 1,023,396, 1,024,008, 1,024,009, 1,028,935, 1,028,936, 1,029,283, 1,045,898, 1,048,221, 1,056,533, 1,094,184, 1,097,354, 1,103,842, 1,117,035, 1,117,478, 1,131,141, 1,174,692, and 1,252,126; and Switzerland 339,568. (Text in German)

INT-0109

Huffines, J. D. Compressor mechanism for refuse truck. Canada 557,515; filed May 25, 1956; issued May 20, 1958.

A hydraulic mechanism can compress the refuse and elevate the truck to a dumping position. The dump truck is of the conventional type with a front-loading compartment, and a larger rear dump body. A compressor blade is mounted within the dump body and is operated via a plunger located within an hydraulic cylinder which is mounted longitudinally beneath the body. The hydraulic cylinder is connected by conduits to a valve mechanism, which is connected by a discharge line to the hydraulic reservoir. A compressed spring is released by a trip mechanism at the end of the compression stroke, thus reversing the flow of the hydraulic fluid. The refuse is

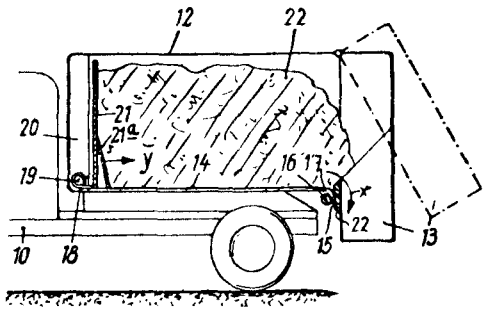


compressed and pushed into the dump compartment. Hydraulic plungers under the dump body lift it for dumping. A valve plunger is operated by rod connections, which enable the movement to be controlled from the cab of the vehicle. The compressor can be stopped at any time before it reaches its full stroke by moving a lever placed on each side of the loader compartment. This feature is valuable for safety.

INT-0110

Haller, W. (Fahrzeugbau Haller G.m.b.H.). Garbage truck. Germany 1,033,587; filed July 20, 1956; issued July 3, 1958.

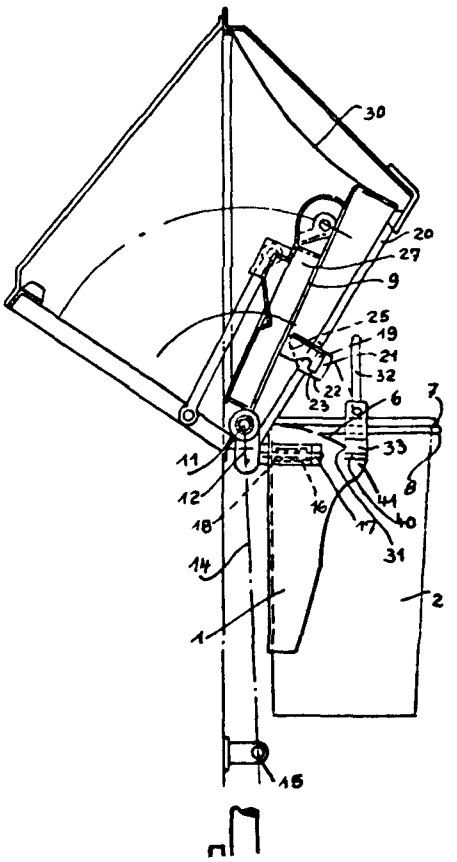
The assembly described comprises a bin container mounted behind the driver cab on the chassis frame of a suitable motor vehicle. The rear end of this bin is closed by a loading assembly, which projects the refuse into the bin. The entire floor of the latter consists of a broad, chain-driven band made of rubber or other elastic material, which can be rolled up on rollers placed fore and aft within the bin. A movable, roller-driven, vertical wall, which is fitted inside the bin, facilitates unloading. (Text in German)



INT-0111

Schaffner, G. (Schmidt and Melmer). A chute for dust-free emptying of garbage cans. Germany 1,034,099; filed Apr. 20, 1957; issued July 10, 1958.

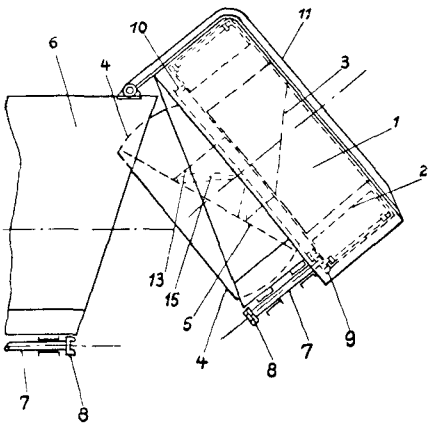
The chute features a front plate mounted on an axle in the housing and separated from the latter by its enclosure in a case. The front plate can be rotated and is equipped with a cover which closes automatically. This cover, in the position of swinging outward, grasps the cover of the garbage can for the emptying process. A device for hanging the garbage can is constructed in the shape of a maneuverable scoop to fit the contours of the garbage can. This scoop is attached to the front plate and can be fastened to it. It is also provided with a hasp which is kept in place by a pressure spring. (Text in German)



INT-0112

Dolenga, H. Device for loading garbage trucks. Germany 1,037,957; filed Dec. 28, 1954; issued Aug. 28, 1958.

A device is used for loading a garbage truck by means of a paddle wheel, the latter being mounted on wheels. The operation of the

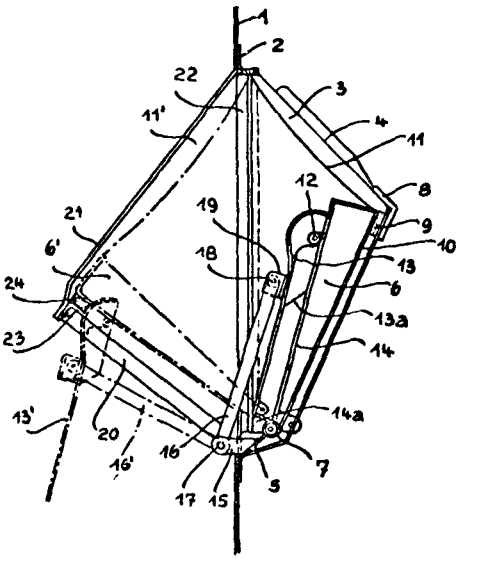


paddle wheel is controlled by a driving shaft provided with a rack and pinion. The paddle wheel lifts the garbage into a cylindrically shaped insert which is designed to open, on the inner parts of the paddle wheel, toward the right and left sides. This insert is open at the top and bottom, and is also equipped with a chute which is fastened to the main collection chamber. The device allows for continuous filling. (Text in German)

INT-0113

Grisse, H. (Schmidt and Melmer). A filling device for garbage trucks. Germany 1,041,859; filed Mar. 29, 1957; issued Oct. 23, 1958.

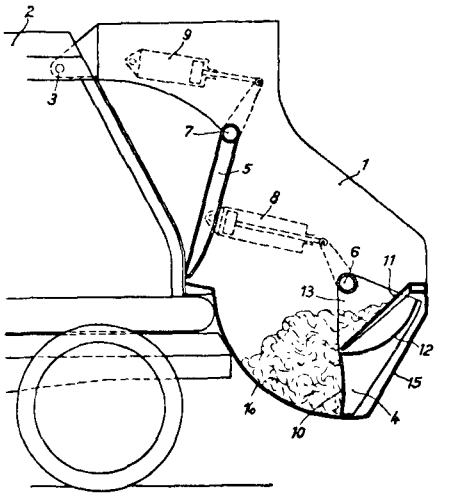
The housing of the garbage truck is provided with a center wall which separates the back of the housing from the front. The receiving end is provided with sidewalls and a cover, as well as with a removable tray at the bottom. The front plate is movable by means of axles which are operated for emptying the garbage cans, and which can be brought back to the starting position. The front plate is provided with an airtight seal in one of its positions, the seal being composed of flexible material which acts as a spring under tension. (Text in German)



INT-0114

Maass, E. (Klockner-Humboldt-Deutz Aktiengesellschaft). Garbage truck with filling and compressing shovel. Germany 1,043,201; filed July 11, 1957; issued Nov. 6, 1958.

The garbage truck assembly, designed to collect refuse from garbage pails, features two scoop shovels: one for the collection and the other for the compression of the refuse. The shovels are arranged to move simultaneously about their respective horizontal axes so that collected waste material is taken up and compressed within the main collection chamber. Both shovels are operated by individual hydraulic pump cylinders, and the entire assembly is supported by the framework chassis of the motor truck. (Text in German)

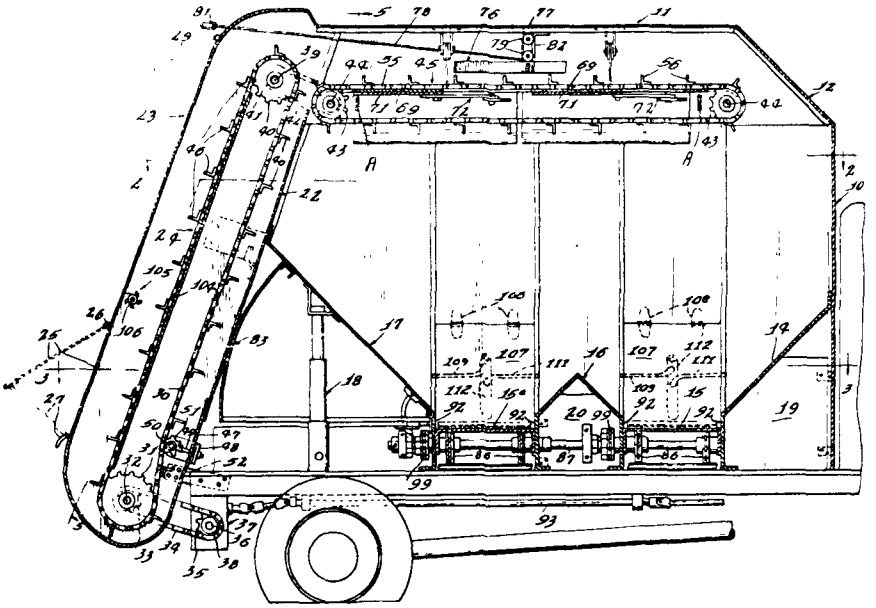


INT-0115

Kutscha, A. Self-loading and unloading refuse vehicle body. Canada 565,789; filed June 28, 1957; issued Nov. 11, 1958.

At the rear of the truck is a conveyor system enclosed in a removable housing, which consists of spaced chains supporting spaced transverse flights of an L-shaped cross section which will carry the refuse, regardless of its characteristics. In the interior of the loading housing are toothed wheels that will break up bulky objects as they are being conveyed to the distributing conveyor on the top of the truck body. The refuse is transported onto the upper part of the truck, where it is discharged onto a longitudinal conveyor similar to the other one. The conveyors are simultaneously controlled by the operator with power

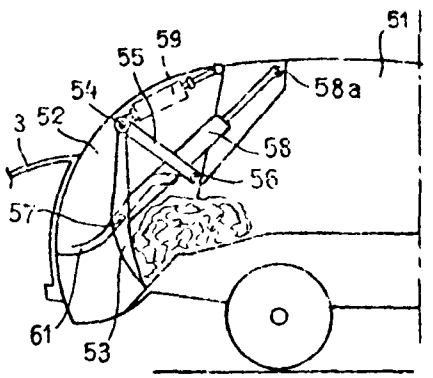
transmitted through a speed reducer to the loading conveyor, and from there, to the distributing conveyor. Movable panels beneath the distributing conveyor permit the operator to control the vertical discharge of the refuse into different sections of the truck. V-shaped deflectors above the distributing conveyor direct bulky material to the rear of the body, where it is collected and compacted by a tiltable floor section which, when raised, will compress the material in that chamber.

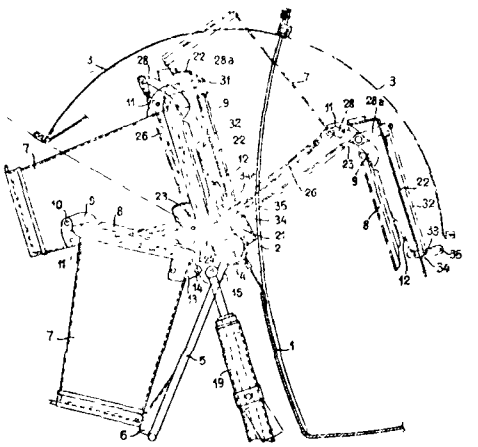


INT-0116

Chiapella, G. (Officine Viberti S.p.A.). Vehicle for the transportation of rubbish. Switzerland 334,546; filed Mar. 6, 1956; issued Dec. 15, 1958.

The vehicle consists of a container which can be tipped by a hydraulic lifting device. At the rear part of the container is a feeding chamber, linked at its top to a feeding chute and a compacting device. The compacting device's blade is linked to two tiltable arms; the other end is fastened



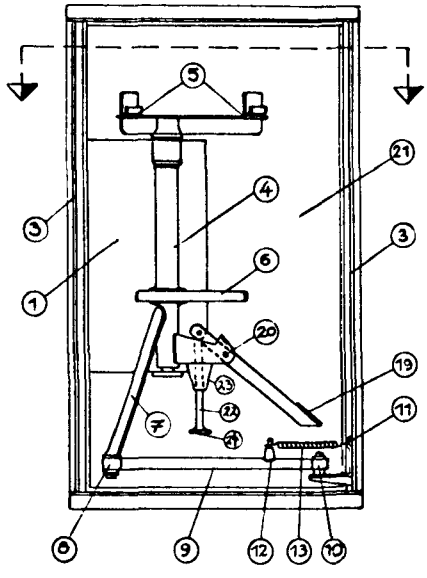


on the wall of the feeding chamber. A hydraulic lifting device causes the blade to move forward and pick up the refuse. It is then compacted and transported into the container. The can is emptied into the feeding chute by means of a support which can be tipped by a lifting device. (Text in Italian)

INT-0117

Blancke, R. Device for hanging up detachable waste receptacles on a garbage collection truck. Germany 1,047,113; filed Jan. 31, 1956; issued Dec. 18, 1958.

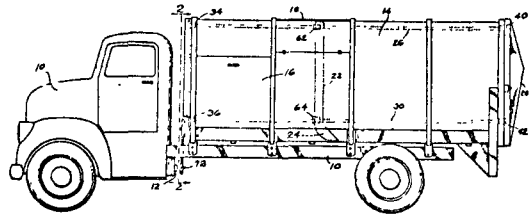
The device is designed to be suspended on a truck which collects refuse. It is fastened to the inner side of the door of a waste receptacle cabinet in such manner, that it can be lifted out. The cabinet is also equipped with supporting pieces which can be adjusted to hold receptacles of various sizes. The device is mounted on a vertically rotatable roller, and it is connected to the cabinet by means of a joint. One end of the joint is a lever in contact with the roller, and the other end is another lever in contact with the wall. The receptacle door is fastened to the frame of the cabinet by means of hinges. The cabinet is provided with a metal or wooden plate used to shut off the cabinet or the recess in the wall of the house where it is to be located. The plate is provided with a spring so that it stays shut until the refuse receptacle is swung outward. (Text in German)



INT-0118

Gilleo, L. S. Refuse hauling apparatus. Canada 568,750; filed Apr. 6, 1955; issued Jan. 13, 1959.

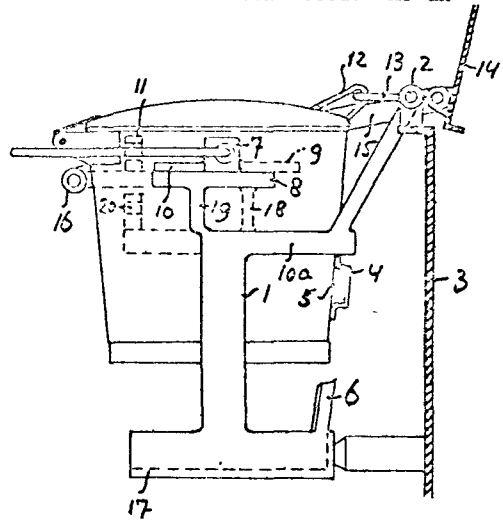
The refuse-hauling vehicle is provided with loading doors on the side and top of the vehicle, and it has discharge doors at the rear. A packing plate, mounted within the body for longitudinal movement, compresses the contents to a high degree, thus providing a truck of large capacity per unit volume. The packing plate is actuated by means of screws, which are mounted, for rotation, in forward and rearward bearings. The direction of screw rotation determines whether the plate goes forward or backward. The packing plate may be driven from the power of a conventional truck assembly, and is controlled via a lever which is operated through the usual clutch pedal. When a predetermined pressure has been reached during the packing operation, or the plate has reached the extreme rear of the body, or the plate has reached the forward end of the body after having been retracted, means are provided for arresting the movement of the plate. The motion of the packing plate can be controlled hydraulically or electrically. The packing plate may be used for ejecting the load through the rear door.



INT-0119

De Graaff, P. Device for emptying a garbage can, particularly into a garbage truck. Germany 1,048,821; filed Nov. 9, 1955; issued Jan. 15, 1959.

A tipping rocker connected to the rear wall of the garbage truck is suspended in a position from which it can be swiveled. The garbage can is provided with a ring and a rim which are interconnected. As an

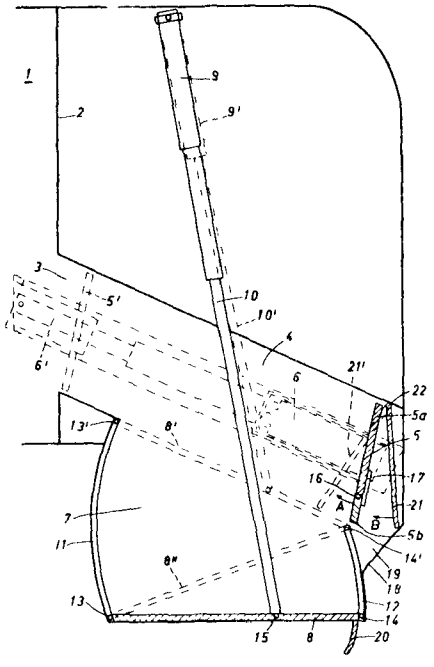


alternative, this ring can be installed in the tipping rocker itself and the rim may remain as part of the can. This arrangement takes care of fastening the can in a secure position. The upper part of the tipping rocker has supporting surfaces for holding a garbage can with supporting projections. The central portion features a lip to hold the can during the operation of tipping. The bottom of the tipping rocker is equipped with a ring which encloses the garbage can in a secure position during part of the operation. (See also Great Britain 699,504, 725,324, and 749,951, Germany 1,051,724, and Switzerland 303,197) (Text in German)

INT-0120

Schmidt, K. H. Sack for introduction of refuse into garbage disposal truck with back and forth swinging transport plate. Germany 1,052,311; filed Dec. 6, 1955; issued Mar. 5, 1959.

The sack for introduction of garbage into a garbage disposal truck features a plate which swings forward and backward to move the garbage into the collection chamber. This

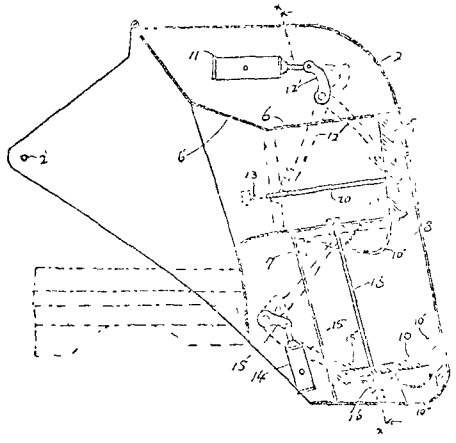


motion is effected by means of hydraulic pressure. A supplementary garbage sack, located in the lower part of the filling sack, has a variable capacity due to expansible walls. The filling sack also features a floor which moves upward and downward. This floor is operated via an hydraulic hoisting cylinder. (Text in German)

INT-0121

Katsura, Y. Garbage truck. Japan 34-1,408; filed Apr. 21, 1957; issued Mar. 14, 1959.

In this garbage truck, the rear dumping container cover is equipped with a pair of built-in presses. The two upper corners of the rear of the container are cut off. Both sides of the overlap-type cover have triangular front edges; the entire cover is bolted onto the container at the angular point of the front edge, so that the entire cover may swing up and down on this bolt axis. A lanyard or wire rope, one end of which is fastened to the top front edge of the cover, is guided by rollers over the top side of the container, along the front side, and under the bottom, to finally reach the middle of the truck chassis where the other end is fastened. The length of the rope is such that the rear cover is automatically pulled upward to open when the container is hoisted up for dumping. Hydraulic cylinder devices are built into the rear cover. The upper cylinder activates the push-in press, while the lower cylinder activates the push-up press. When garbage and other solid wastes dumped into the cover pile up, the push-up press is activated to push the wastes upward. Then the push-in press is activated to press them inward. Although the hydraulic pipe system is common to both hydraulic cylinders, control valves permit the operation of each separately. (Text in Japanese)

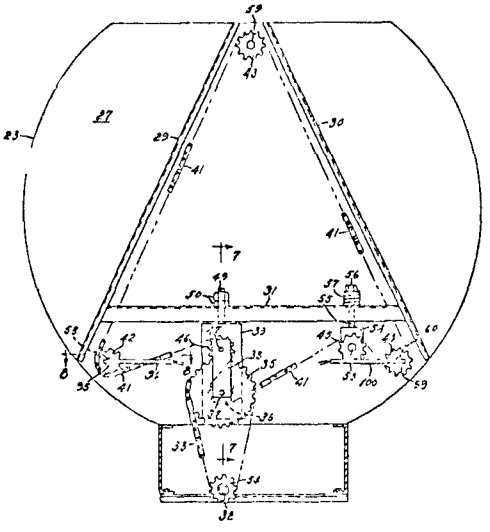


INT-0122

Carter, H. C. Waste packer truck. Canada 572,220; filed June 14, 1955; issued Mar. 17, 1959.

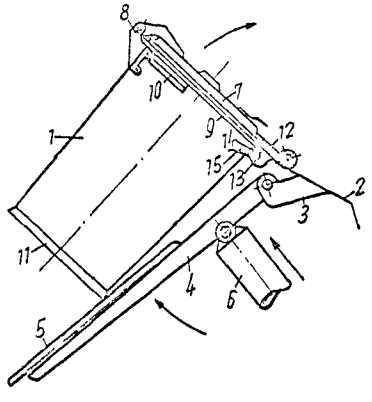
The truck has a completely closable tank-type body with a loading inlet in the side shell at the front end, and a hinged rear door for

unloading. A transverse partition, capable of being moved the length of the truck, is positioned at the front end. When the refuse is ready to be compacted, the ram is activated via three spaced, parallel, longitudinal drive screws connected to the drive shaft by chain and sprocket. Safety means are incorporated to prevent the ram from going past a preset limit. The screws stop turning when one of them has reached its limit. An abutment device, secured to the partition ram, permits the ram to push out the refuse when the latch is open. If it is not open, the abutment device is rendered inoperative.



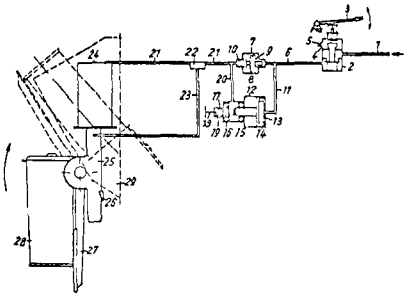
INT-0123
Zoeller, H. Garbage can with streamlined and reinforced lip. Germany 1,056,047; filed May 28, 1956; issued Apr. 23, 1959.

A garbage can features a streamlined and reinforced lip. The reinforcement is concentrated in the areas of greatest pressure: partly around the circumference, and in the area of the hinge for the cover. The reinforcement is applied in a segmented form. The reinforcement device is applied to both sides of the cover hinge, the upper part being applied under the rim of the container, and the lower part being welded or otherwise secured to the body of the container. (Text in German)



INT-0124
Zoeller, H. A controlling device for a garbage can tilter designed to throttle the pressure leading to the pressure cylinder. Germany 1,057,962; filed Jan. 25, 1956; issued May 21, 1959.

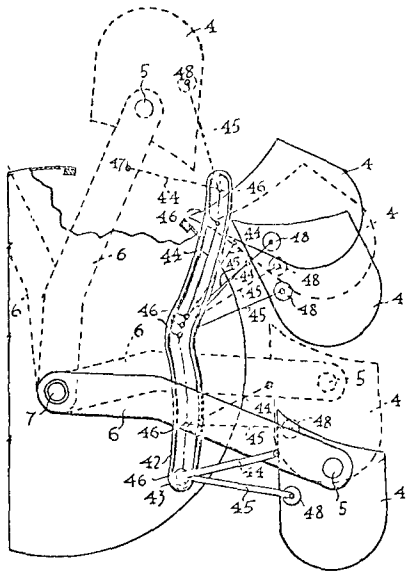
A controlling device is applicable to a garbage can tilter. This device employs a fine adjustment valve, manually regulated and designed to introduce pressure modifications via a damper valve with interchangeable vents. This adjustment valve can control the motion of the tilting arm. The regulating valve is provided on the one side of the pressure cylinder with an air valve, and on the other side with a nonreturn valve and a rapid aerating valve. Both of these devices are connected to the air pressure cylinder which operates the tipping housing. (Text in German)



INT-0125
Burton, E. Garbage loaders. Canada 576,392; filed Sept. 14, 1956; issued May 26, 1959.

A garbage-loading device, particularly suited for loading garbage into a truck, consists of a pair of booms attached pivotally at their inner ends to the vehicle, and projecting laterally with respect to the vehicle. The outer ends of the booms are on opposite sides of the vehicle. A garbage-collecting bucket is attached rotatably to the outer ends of each boom, and a mechanism, between the vehicle and the boom, moves the boom upward to elevate the bucket from a lower, collecting position to a raised position. There is also a mechanism for rotating the bucket in the

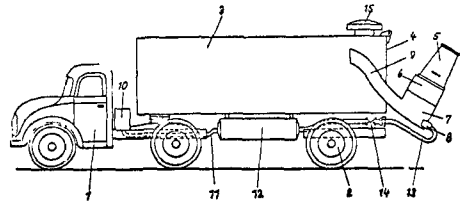
raised position to discharge garbage from it into the vehicle.



INT-0126

Holtey, H. (Bischoff-Werke K.G., formerly, Pfingstmann-Werke). Garbage truck. Germany 1,059,345; filed Sept. 12, 1956; issued June 11, 1959.

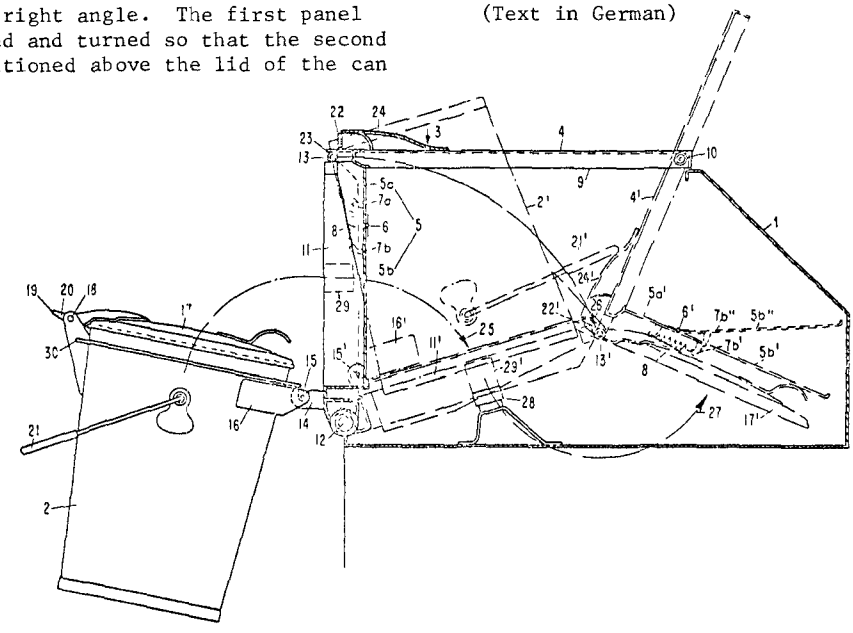
Garbage may be emptied into this garbage vehicle from various types of containers. The truck comprises a chassis and a garbage container which has a tipping device at its rear end. This device features a filling section which can be tipped into the main collection chamber, and an air blower, with a compressed air vent, having an exhaust outlet into the main container. The air blower is controlled from the front end of the vehicle, via an air compressor. The tipping device is operated by means of pneumatic pressure. (Text in German)



INT-0127

Ochsner, A. (J. Ochsner and Company A.G.). Movable hood for the dust-free emptying of refuse containers into a garbage truck. Switzerland 339,120; filed Oct. 7, 1955; issued June 15, 1959.

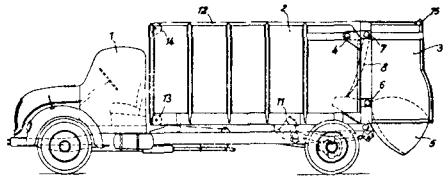
The hood consists of two sheet steel panels which form a right angle. The first panel can be shifted and turned so that the second panel is positioned above the lid of the can during the tipping operation. The second panel consists of two parts: the first is rigidly connected with the first hood panel, and the second is spring-loaded to give way to the lid when the garbage can is too full and its lid is half open. Any deformation of the panel is avoided by this method, whether the can is tipped hydraulically or manually. (Text in German)



Collection

INT-0128
Herterich, O. (Kloeckner-Humboldt-Deutz Aktiengesellschaft). Garbage collection truck. Switzerland 339,567; filed Jan. 10, 1956; issued June 30, 1959.

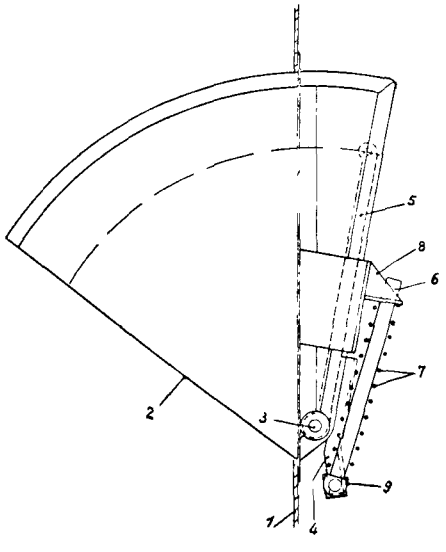
The garbage collection truck is equipped with two shovels: one, the upper shovel, for transporting refuse from the charging compartment into the garbage container, and for compacting; and the other, lower shovel, which is shaped like a trough, for lifting the refuse so it can be moved into the container. The charging compartment in the rear of the container is moved about an upper horizontal axis; the trough-shaped shovel is moved about a lower horizontal axis. The shovels are operated by double-acting cylinders which are activated by pressurized oil. In its resting position, the transporting and compacting shovel closes the container toward the charging compartment. For moving and compacting, the upper shovel swings to the rear wall of the charging compartment. The trough-shaped shovel, which holds the refuse, is lifted and the upper shovel passes over it, scraping and pushing the refuse into the



container. When the container is full, the shovel compacts the refuse by pushing more refuse into the container. For emptying, the container is lifted about a rear axis. (See also Germany 1,023,395) (Text in German)

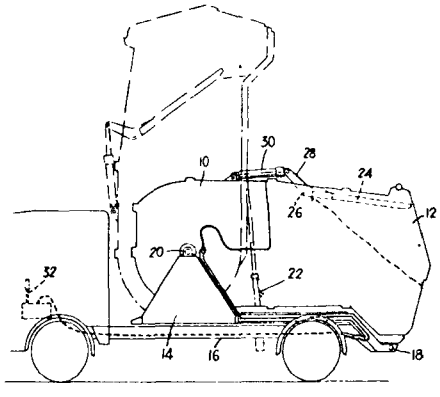
INT-0129
Goetz, E. (Eisenwerk Streuber and Lohmann G.m.b.H.). Filling device for the dust-free emptying of garbage cans. Germany 1,065,322; filed Mar. 5, 1957; issued Sept. 10, 1959.

This filling device is part of the main collection chamber. A faceplate swings between the solid walls of the filling apparatus, and is retracted by means of tension springs. When the faceplate swings inward, the spring is stretched and produces, at the end of the tipping action, a retraction of the faceplate. A lever is provided to modify the retraction power. (Text in German)



INT-0130
Huggins, J. (Shelvoke and Drewry Limited). Improvements in or relating to refuse-collecting vehicles. Great Britain 835,702; filed June 17, 1957; issued May 25, 1960.

The improved design purports to provide means whereby collected refuse is compressed under pressure to reduce volume. A refuse-carrying body is mounted at the rear frame of a vehicle and is cradled on a subframe resting upon the

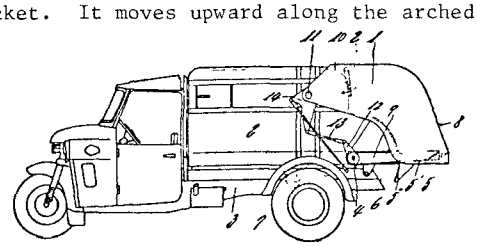


chassis. This subframe can be pivoted into a vertical position for unloading. The body alone can be pivoted to an upright position as the load is compressed by a grid or plate, powered by a pair of hydraulic rams with variable controls.

INT-0131

Miyahara, M. (Daihatsu Kogyo K.K.). Device to load trash on garbage truck. Japan 35-7,764; filed Mar. 27, 1958; issued June 23, 1960.

A conventional loader usually has two pressing devices, one a push-up type and the other a push-in type, each operated separately with a hydraulic cylinder. However, this loader performs both functions with one cylinder, and, therefore, has relatively simple operation and construction. The loader bucket and its guide mechanism are the unique features of the device. At the rear end of the dump container of the truck, an arched separator plate covers the lower half of the rear opening of the container. This separator plate is linked with the hoist mechanism and can move downward to disappear below the floor of the container when the garbage is dumped. Behind the separator plate is the loader bucket, equipped with a triangular guide plate at the front side. A flexible plate suspended from the top above the separator plate serves as a lid for a feed-in port formed between the ceiling and the separator plate. This flexible lid prevents garbage from falling out as the bucket is withdrawn. As garbage is thrown in and accumulates in the loader bucket resting on the bottom of the rear gate unit, the hydraulic cylinder is activated to lift the bucket. It moves upward along the arched

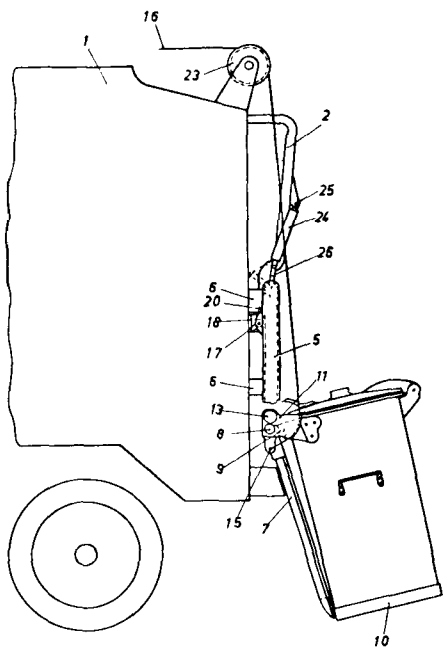


separator plate, guided by the front triangular guide plate. When the separator plate terminates, the bucket ejects the garbage forcefully, since the rear angular point of the triangular guide plate is thrust up by the terminal end of the arched separator plate. (Text in Japanese)

INT-0132

Goetz, E. (Eisenwerk Streuber and Lohmann G.m.b.H.). Device for raising and tipping garbage containers. Germany 1,091,480; filed July 26, 1956; issued Oct. 20, 1960.

A device for lifting and tilting garbage receptacles is operated by means of a lifting cylinder or by a block and tackle arrangement. This operation is applicable to a garbage collection vehicle with a swinging faceplate for dust-free emptying of garbage cans. The swivel arm for the garbage cans, fastened to the back wall of the vehicle, is equipped with perpendicular rails, and is moved on rollers up to the faceplate of the vehicle. The garbage can is lifted or tilted by the swivel arm by means of a power cylinder and lever. (See also Germany 1,056,046, 1,105,793, and 1,157,139) (Text in German)

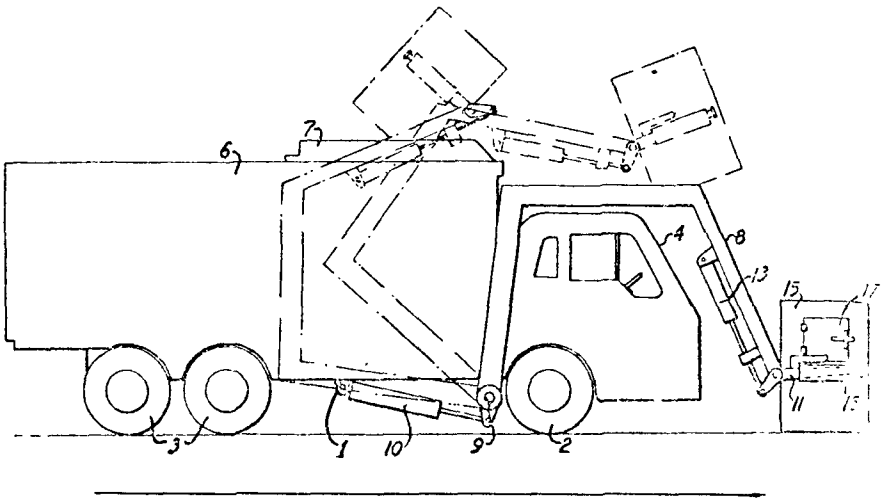


INT-0133

(Dempster Brothers Incorporated). Loading devices for tipping refuse containers into vehicles and other bodies. Great Britain 854,472; filed Mar. 4, 1959; issued Nov. 16, 1960.

The loader structure features a pair of U-shaped lifting arms, one on each side of the vehicle driving cab, and extending downward and over it at the front end. Pickup

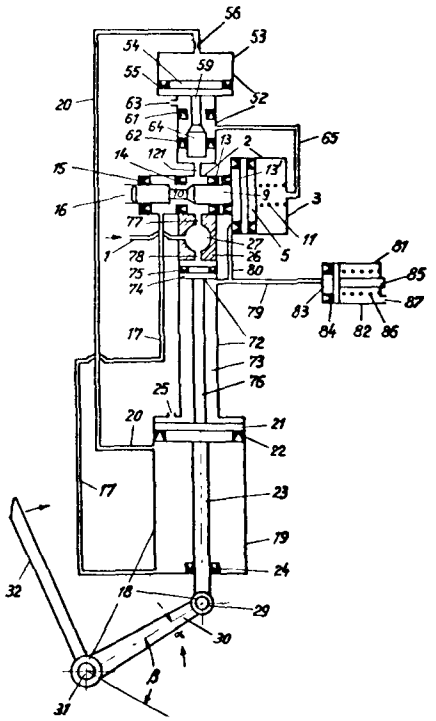
devices at the ends of these arms extend forward to engage the collecting bin, which is elevated over the cab and tilted to discharge the contents into the vehicle.



INT-0134

Zoeller, H. (E. Zoeller, and H. Schulz-Zoeller). Garbage can chute with a retractor for swinging front plate. Germany 1,094,659; filed July 27, 1957; issued Dec. 8, 1960.

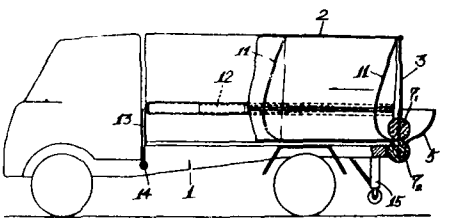
The retractor for the front plate consists of a cylinder with an air vent, a piston with caulking, and a piston rod with padding, bolts, and a pulley. This device is operated by means of pneumatic pressure. The cylinder of the chute and that of the retractor form a unit, and the piston of the chute is connected with the piston of the retractor. In the cylinder portion of the chute, various control valves are connected by ducts. Another feature of the device is a check-lever for the swivel device of the garbage containers. (See also Germany 1,053,402 and 1,093,724) (Text in German)



INT-0135

Katsumura, G. Garbage truck. Japan 36-559; filed Mar. 26, 1959; issued Feb. 7, 1961.

A sanitary and efficient garbage truck features an automatic feeder/loader that assures greater haul volume, and a device for rapid dumping. A sealed dump container is mounted on the rear body of a small truck. The dump container is open-ended, but has a rear cover that can be fixed in either an open or closed position. In the lower part of the cover is the feed port, which is equipped with a pair of large, flexible rollers that serve as the feeder/loader. A bucket just outside of the loader, mounted on the shafts of the two rollers, can swing downward with the upper roller to go below the bottom of

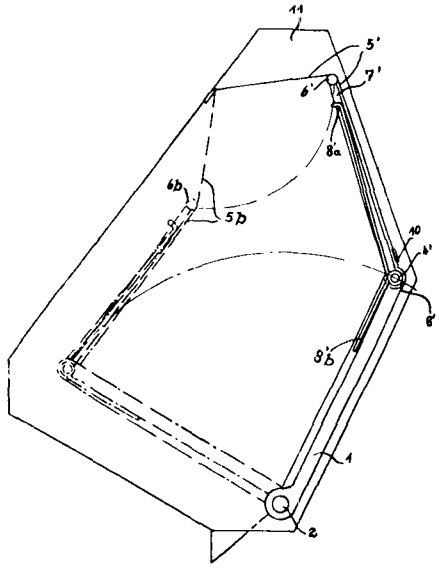


the container when the garbage is dumped. A parabolically arched pusher plate, whose side edges slide along the inner sidewalls of the container, is located at the rear of the empty container. The pusher plate is linked with a hydraulic cylinder. After garbage is dumped by the bucket into the rollers to be crushed, it accumulates in the space between the rear cover and the pusher plate. The pusher plate is gradually pushed forward until it reaches the front wall of the container. For dumping the garbage, the rear cover is opened, the bucket and rollers are turned downward, and the pusher plate pushes the garbage out. (Text in Japanese)

INT-0136

Quast, A. (Schmidt and Melmer). Dust-free filling device for refuse carriers. Germany 1,101,272; filed Oct. 15, 1959; issued Mar. 2, 1961.

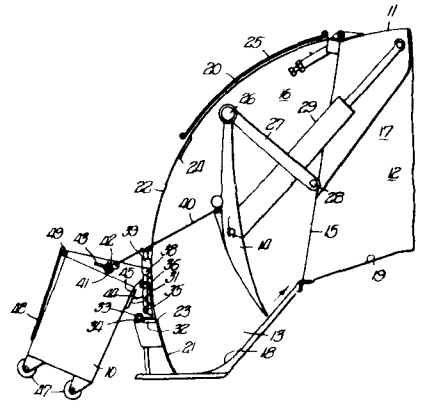
A dust-free filling device includes a feeding mechanism equipped with a movable front plate with a textile lining. The front plate has its axis of rotation between the sidewalls of the shaft of the filling device, and, near to this axis, it is provided with hooks for attaching the refuse container during the emptying process. When the front plate rotates, the hinge of the cover moves in an arc about the axis of rotation, and the cover opens. During the first part of this process, the lining is separated from the cover. The lining is controlled by the opening and shutting movement of the front plate, which stretches the dust filter. (Text in German)



INT-0137

Gollnick, C. R. (Leach Company). Refuse collecting and transporting equipment. Canada 630,409; filed Nov. 30, 1956; issued Nov. 7, 1961.

A self-loading refuse vehicle has a storage chamber and a loading hopper. Refuse is dumped through an opening above the hopper, by a mobile collecting container. This container is detachably connected to the vehicle by pivoted, rigid arms attached to the vehicle. These arms are fastened with pins located on the container. Flexible cables, with hoods adapted for connection to the container, are used to raise the container and tilt it through the opening.

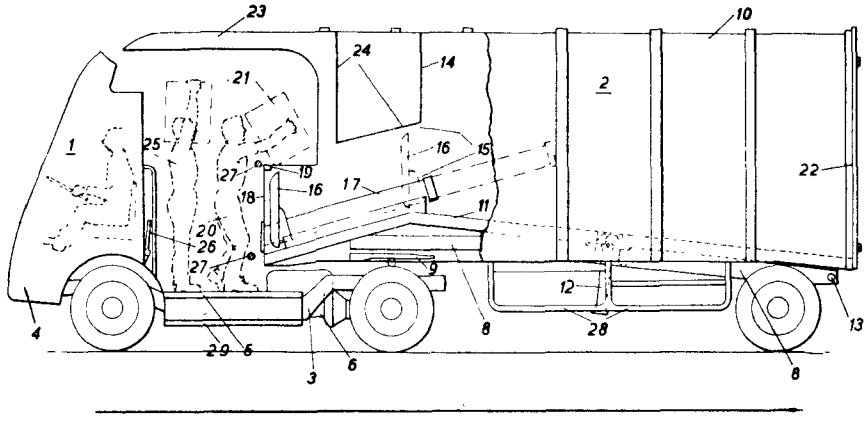


INT-0138

Haughton, E. (E. Haughton and the Lord Mayor, Aldermen and Citizens of the City of Liverpool). Garbage collecting vehicles. Canada 630,897; filed Aug. 13, 1957; issued Nov. 14, 1961.

This garbage-collecting vehicle consists of a tractor and semitrailer. There are three sets of wheels: front wheels near the front of the tractor, immediate wheels near the rear of the tractor, and rear wheels supporting the semitrailer. The driving position is approximately above the front wheels. A transverse walk-through platform on the tractor, in front of the intermediate wheels and accessible from both sides, is separated from the driving position by a transverse partition. On the trailer is a closed body extending beyond the intermediate wheels, and capable of being tipped backward. It has a loading opening at its forward end, above

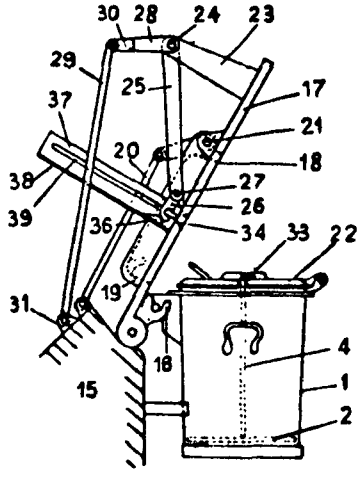
the level of the platform. The load can be compacted by tipping the body backward. Doors at the rear of the body allow the load to be discharged.



INT-0139

Loriot, C. P. O. A. Refuse collecting truck. Germany 1,120,359; filed Apr. 5, 1958; issued Dec. 21, 1961.

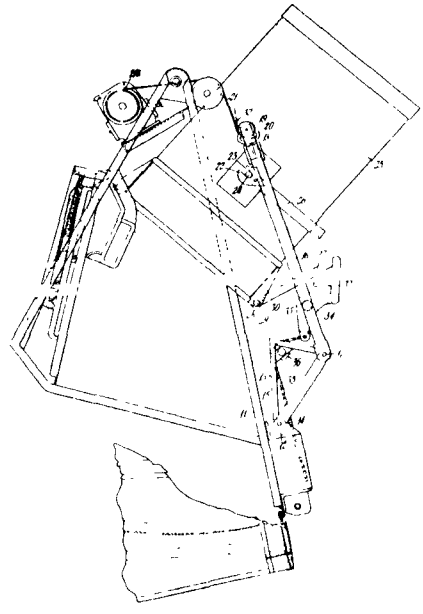
A device for emptying refuse bins has a pivotal front plate, against which a pin is pressed when the plate is opened. There are means, mounted behind the plate, for gripping traction rods in the bins. These rods are attached to bottom inserts, and serve to move the inserts toward the opening. (Text in German)



INT-0140

Gibson, G. T. (John Gibson and Son Limited). Improvements in and relating to refuse-collecting vehicles. Great Britain 886,671; filed June 1, 1959; issued Jan. 10, 1962.

A refuse-collecting vehicle is provided with a device for emptying bins. It is composed of a bracket, pivotally mounted on the rear of the vehicle. A lifting structure is pivotally mounted on the bracket to support a bin, so it can be swivelled about a horizontal axis. Power-operated winding drums are also included. Cables are connected to the bin-lifting structure. The structure cooperates with vertical guides when raised by the cable. A chain is anchored at one end of the vehicle, connected by a clip to the rim of the bin to be emptied. The bin can be fitted in the lifting structure when it is in a horizontal position. The clip is attached to the rim of the bin, while the bin is raised, by means of the winding drums and their cables. The bin-lifting structure

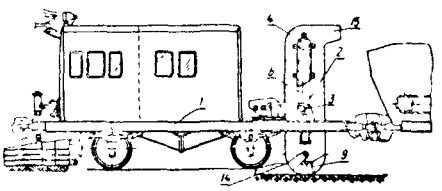


turns about its pivotal support; the structure and its bracket then turn about the pivotal support of the bracket. As the raising movement continues, the chain becomes taut to swivel the bin so it discharges its contents into the vehicle, as the bin-lifting structure cooperates with the guides.

INT-0141

Loskutnikov, V. A., V. I. Latskiy, G. A. Hurzin, A. L. Lyubarskiy, M. B. Fedorov, and B. S. Bessonov. (Invention and Discoveries Committee, Council of Ministers U.S.S.R.). Loading machine for cleaning and removal of snow and refuse from railroads. U.S.S.R. 144,196; filed June 5, 1961; issued Feb. 6, 1962.

This machine is designed as a suspension aggregate with a vertical conveyor that allows removal, transportation and loading of snow (or wastes) into storage cars by means of a single operating unit. A frame with the bearing fasteners of the adducing, leading, and guided rollers is installed on a track carriage. The tractive chain of the vertical conveyor is mounted on the two spiders of its leading and guided rollers, respectively. The

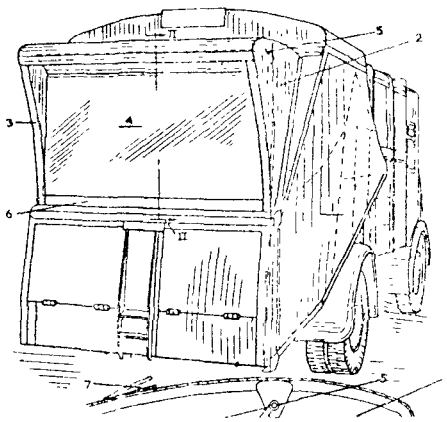


conveyor is provided with cable paddles fastened to the tractive chain; they are arranged in rows along the moving direction, are U-shaped and have a length of one-third the width of the conveyor. A rotary fencelike spur is located at the bottom of the conveyor, and the moving direction of the snow bulk is controlled by a rotary screen. (Text in Russian)

INT-0142

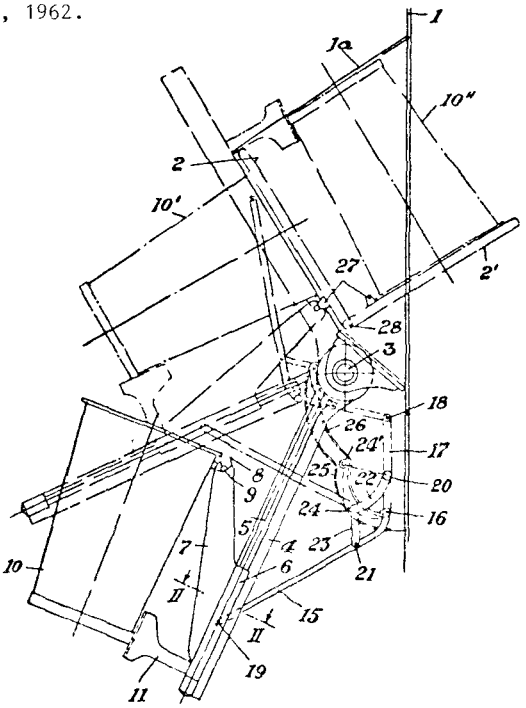
Foster, D. (Dennis Brothers Limited). Improvements in or relating to refuse collection vehicles. Great Britain 890,845; filed June 24, 1959; issued Mar. 7, 1962.

A refuse collection vehicle has a frame which defines a loading opening which gives access to the refuse compartment. A flap hangs freely in the frame, supported so it can pivot about a horizontal axis. In the hanging position, the flap closes almost the entire opening; it is capable of being pivoted inward to an open position, to allow refuse to be emptied into the refuse compartment. A normally closed outlet valve is arranged to open to allow air, displaced by the inward pivoting movement of the flap, to be exhausted. The valve closes on the return of the flap. Air then flows into the vehicle through the space between the closed flap and the frame. A canopy is positioned around the mouth of the refuse compartment. The frame and the flap are rectangular. The flap, in its closed position, occupies all of the opening bounded by the frame, except for a narrow gap beneath the lower edge of the flap. The apparatus reduces dust during operation.



INT-0143

Talenti, A. Refuse collecting truck. Germany 1,126,310; filed July 23, 1958; issued Mar. 22, 1962.

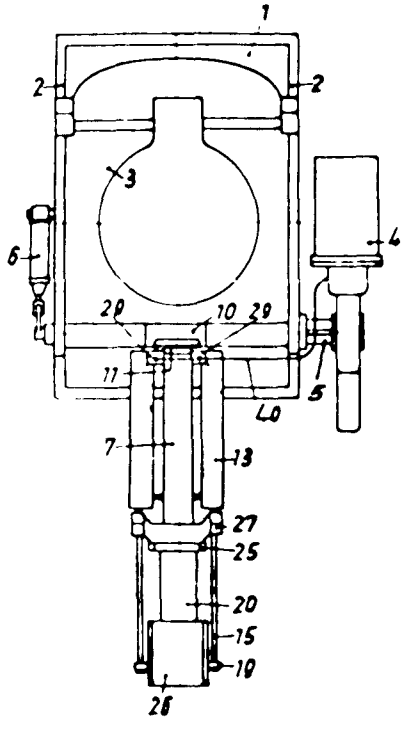


A device for lifting and tilting bins includes a lifting arm with a bin support fork, and a bin-holding plate with a mouthpiece, actuated through a crank and lever mechanism. (Text in German)

INT-0144

Zoeller, H. (E. Zoeller, and H. Schulz-Zoeller). Refuse collecting truck. Germany 1,127,278; filed Oct. 30, 1959; issued Apr. 5, 1962.

This collecting truck includes a lifting piston cylinder, secured on a swinging arm structure, and a hoist arrangement, fastened on a refuse container discharger with a tipper. The crosspieces are fitted in a

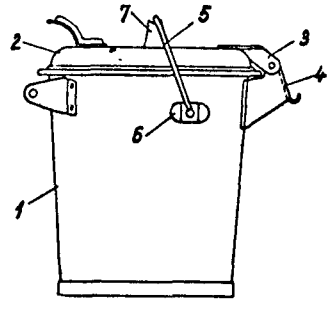


shortened form on the swinging arm, connected with the cylinders via stepped journals on boxes on their free ends, which are firmly fixed laterally to the upper ends of the cylinders. Locking pins penetrate both boxes and journals. (See also Germany 1,099,933, 1,109,600, 1,113,177, 1,121,538, and 1,128,802) (Text in German)

INT-0145

Goetz, E. (Eisenwerk Streuber and Lohmann G.m.b.H.). Refuse bin. Germany 1,128,803; filed Oct. 24, 1956; issued Apr. 26, 1962.

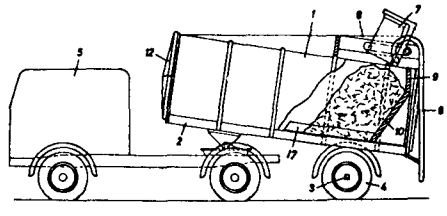
A lid closure for refuse bins, intended for dust-free emptying, comprises a hinged lid and a bearing bar mounted on the sides of the bin body, and pivoting via the lid hinge. For locking the lid and the bar on the bin body, the bearing bar is mounted outside the body's perpendicular centerline, but displaced relative to the lid hinge side; in bearing position, the bar locks over a rigid handle on the lid. (Text in German)



INT-0146

Ballert, O. Refuse collecting truck. Germany 1,134,331; filed May 20, 1957; issued Aug. 2, 1962.

This vehicle has a loading device at the rear end of the collecting container. There is also a forwardly operating, hydraulically actuated compression device. The collecting container is rotatable, relative to the remainder of the vehicle, about a vertical axis, and it is provided at its front with a discharge opening. The compression device also serves for pressing the refuse out of the container. (Text in German)

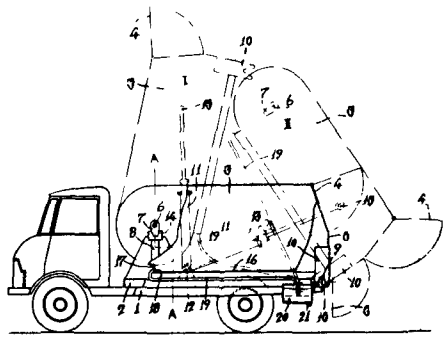


INT-0147

Hayashi, G. (Nippon Kikai Kogyo K.K.). Dehydrating mechanism on garbage truck. Japan 37-10,002; filed Oct. 4, 1960; issued Aug. 2, 1962.

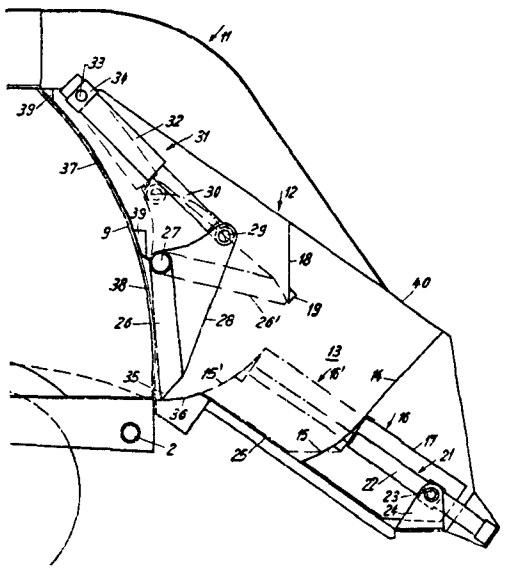
The entire container can be pivoted backward on the rear shaft for dumping, and forward on the front shaft for compacting and dewatering loaded garbage by its own weight. The front side of the dump container is semicircular. The rear side has a hinged cover for the discharge opening, located in the lower half, and another for the charging port, in the upper half. Forked supporter plates, one for each side, which are fitted to the lower rear

end of the container, engage the rear shaft on which the container pivots backward. The central front shaft is held in place by a shaft bearing and shaft supporters. The tips of the piston rods of the two hydraulic cylinders, which are installed on each side of the truck chassis, are fixed to the sidewalls of the container. The bottom of the container is curved as the bottom of a ship. When the stop pin of the rear shaft is removed, the rear side of the container is lifted and pivoted on the front shaft by the hydraulic cylinders, so the garbage is moved forward and the pressure of gravity squeezes out the water. The water flows through an outlet connected to the water tank and attached to the chassis near the rear end. To dump the garbage, the stop pin of the front shaft is removed, and the container is inclined in the opposite direction. (Text in Japanese)



INT-0148

Ochsner, A. (J. Ochsner and Company A.G.). Tamping device attached to a rubbish vehicle. Switzerland 363,936; filed Jan. 7, 1959; issued Aug. 15, 1962.

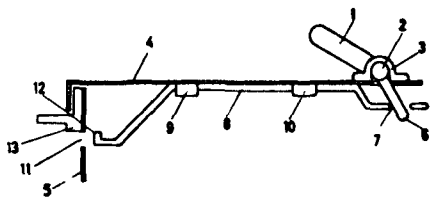


This vehicle consists of a container on whose rear side is a rubbish compactor and an attached feeding unit. In the lower part of the feeding unit is a sliding apparatus, which, by means of an hydraulic control element, transports the refuse toward the compacting plate. The compacting plate can be tipped, by a hydraulic lifting device, to collect the refuse from the slide. (See also Switzerland 272,187, 272,516, 290,812, and 347,765; and Germany 1,028,039) (Text in German)

INT-0149

Feidert, J. Refuse bins. Germany 1,134,928; filed June 14, 1956; issued Aug. 16, 1962.

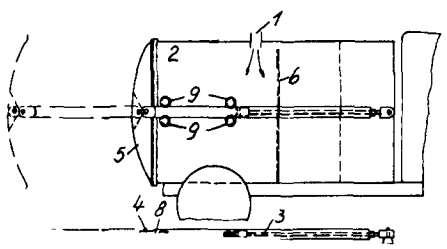
Dust-free emptying of bins is ensured by a lid-locking device, enclosing a carrier bar which is swivel-fitted on a hinged lid. When the bin is lifted, this bar automatically locks the lid by means of bolts. The bar cooperates by means of a rigidly connected lever. The lever has a bolt which slides vertically in relation to the bar axis. It homes in a slot in the bin sidewall. (Text in German)



INT-0150

Gabler, W., and M. Nitz (Keller and Knappich G.m.b.H.). Refuse collecting truck. Germany 1,137,377; filed May 14, 1960; issued Sept. 22, 1962.

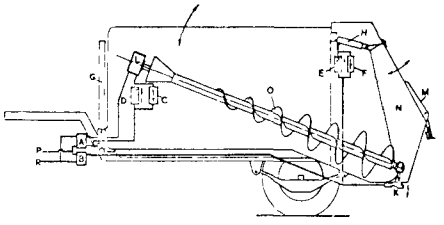
An emptying device for a refuse-collecting truck has a refuse collector with a displaceable piston rod, connected to a container end serving as an emptying lid, to expel the rubbish via an external drive when the lid is opened. This lid is engaged by drive components which are guided by container-fitted rollers, so the lid and the rods connecting it to the piston execute a translational movement. (Text in German)



INT-0151

Dijkhof, H. J. H., Jr. Improvements in or relating to refuse wagons with loading screws. Great Britain 907,953; filed Apr. 4, 1961; issued Oct. 10, 1962.

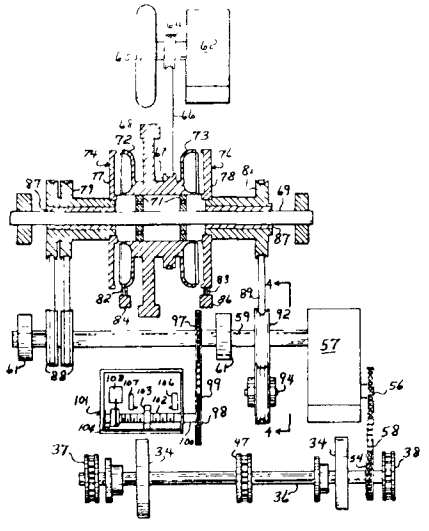
To simplify the loading and unloading of refuse wagons which have refuse reservoirs that tip, a system of hydraulic conduits can be used. These have actuating valves which, in one position, drive a conveyor worm in the loading direction, causing the refuse to be displaced toward the front end of the reservoir. In a second position of the actuating valves, the conveyor worm is driven in the unloading direction, causing the collected refuse to be discharged from the reservoir. The discharge is effected after the hydraulic pressure has risen sufficiently to cause the latch on the rear wall of the reservoir to open, and the reservoir to tip.



INT-0152

Smith, L. B. Packer mechanism for a refuse truck. Canada 653,651; filed Feb. 15, 1960; issued Dec. 11, 1962.

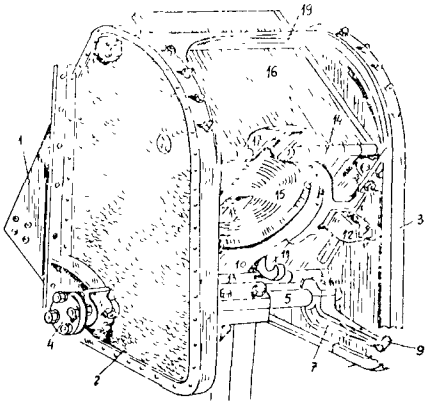
This packer comprises a mechanism for activating a pressing device. An energy accumulator is connected to a prime mover, and a clutch is interposed between the energy accumulator and the pressing device. A device connects the clutch in driving relation to the energy accumulator, and in driving relation to the pressing device. This device is adapted, when energized, to move the pressing device in one direction. A second clutch is interposed between the energy accumulator and the pressing device. This second clutch is connected in driving relation to the energy accumulator and to the pressing device in a direction opposite to that imparted by the first clutch. A control mechanism is connected to the clutches for energizing and deenergizing them in order to activate and then stop the pressing device when it is moved a predetermined distance in either direction. This mechanism is adjusted to stop the pressing device when a predetermined pressure is exerted against it.



INT-0153

Paggi, G. (S.p.A. F. Macchi). Feeding inlet for emptying the contents of cans with linked covers into a vehicle for collecting and transporting refuse. Switzerland 366,489; filed Mar. 28, 1959; issued Dec. 31, 1962.

The feeding inlet which extends over the container is closed at its front side by two moveable walls. A covered feeding chute is provided in the lower wall. A tiltable support lifts the can, and the walls are moved by means of two L-shaped lifting arms. When the can is tipped, the walls move back, and emptying is effected in a closed compartment, thus preventing the development of dust. (Text in Italian)

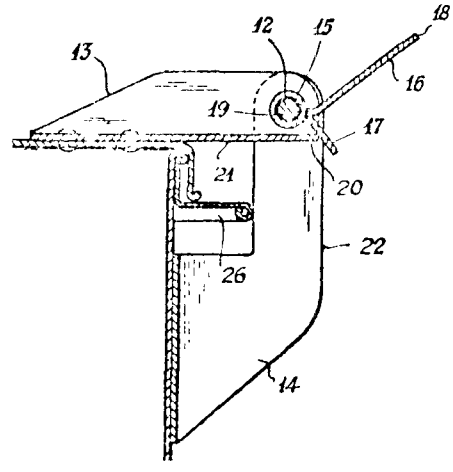


INT-0154

Allchurch, S. (Shefflex Limited). Improvements in collecting bins and apparatus for collecting and loading refuse. Great Britain 914,722; filed Jan. 22, 1958; issued Jan. 2, 1963.

A refuse-collecting bin has a hinged lid with an abutment. This abutment is adapted to

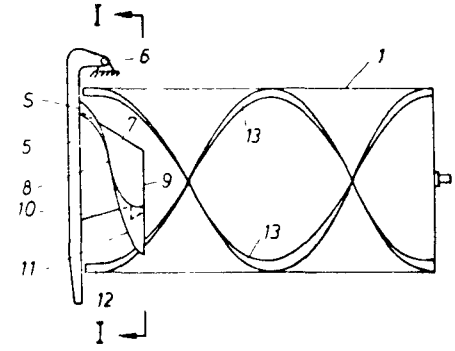
cooperate with an abutment provided on a refuse collection and loading apparatus. This is accomplished by an intermediary abutment provided on the hinge, which ensures that the lid is held open while the bin is in its discharge position. The device is suitable for use with a vehicle having a refuse-receiving chamber, where the loading aperture is in an outer wall or shutter of an overhead loading compartment. The wall or shutter would be hinged and spring-urged toward a closed position. A closure flap or gate for the aperture would stay open during the tipping movement of the bin to permit the contents to pass through the loading compartment, and into the refuse-receiving chamber. Tipping the bin would cause the hinged wall or shutter to open toward the loading compartment. The wall would prevent dust from escaping to the atmosphere. The device is especially useful in emptying a bin where some of the contents are bulky cardboard or other material liable to become trapped in the lid and mouth of a bin. (See also Great Britain 588,626, 592,403, 593,883, 596,169, 937,064, and 944,032)



INT-0155

Schaffler, G., and K. Fichtl (Keller and Knappich G.m.b.H.). Refuse collecting vehicle. Germany 1,144,185; filed Sept. 7, 1960; issued Feb. 21, 1963.

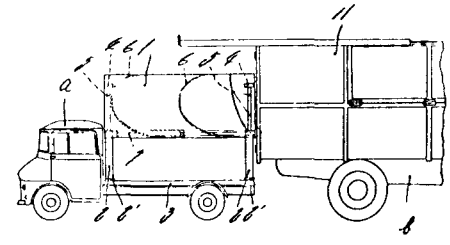
A refuse-collecting vehicle has, as a material container, a rotating drum with a stationary rear end wall, provided with an inwardly extending, truncated, cone-shaped charging opening. The drum has, on the inner surface, helical ribs of uniform height; the tapered section of the end wall carries, on the outside, a guide blade whose height varies to obtain a uniform gap between the guide blade and the ribs. (See also Great Britain 906,200; Germany 1,269,568 and 1,172,603; and Australia 291,805) (Text in German)



INT-0156

Yamamoto, I. (Morita Ponpu Tokushu Kogyo K.K.). Garbage collection by a large ordinary garbage truck plus a small garbage truck that allows for lifting the garbage container up and down. Japan 38-2,201; filed Nov. 17, 1960; issued Mar. 16, 1963.

Small garbage collection trucks, used in pairs with a larger counterpart, should each have a dump container equipped with a mechanical hoist-up/discharge device to transfer garbage to the larger truck in order to conserve manpower. The garbage is pushed out of a smaller truck's container by means of a plate operated by an hydraulic cylinder. Under the bottom of the dump container are four more hydraulic cylinders, one at each corner. These hoist the container to the level of the large truck, at which point, the push-plate moves the garbage from the smaller to the larger truck. (Text in Japanese)

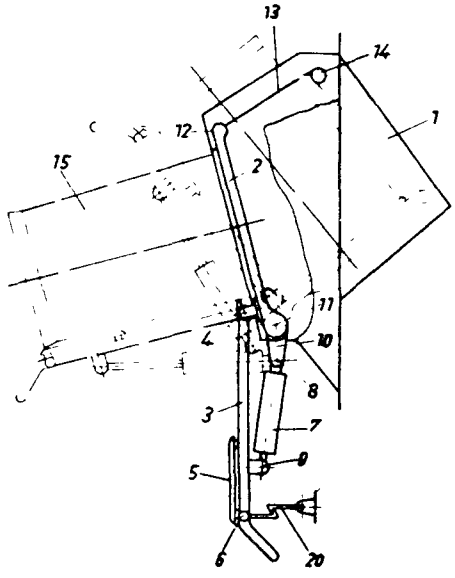


INT-0157

Naab, J. (E. Zoeller, and H. Schulz-Zoeller). Refuse collecting truck. Germany 1,146,440; filed Nov. 12, 1960; issued Mar. 28, 1963.

A tipping device for refuse-collecting trucks provides for the dust-free emptying of dustbins. The device is provided with a swivel arm for the dustbin, hinged to the front plate, and a return spring. The return spring is arranged

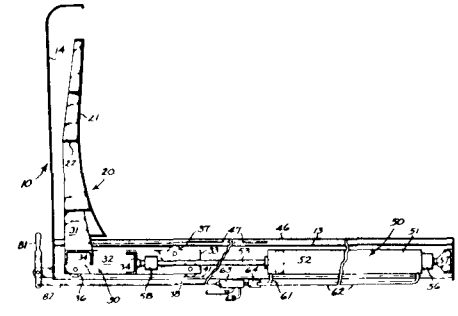
between the front plate and the swivel arm to support the movement of the arm. To retain the swivel arm in its initial position at the rear wall of the vehicle, a locking device is provided. (See also Switzerland 398,454 and 401,819, Great Britain 975,668, and Germany 1,150,020, 1,176,054, 1,201,757, 1,204,579, 1,220,785, and 1,288,003) (Text in German)



INT-0158

Kamin, E. F. Refuse collection vehicle. Canada 663,310; filed July 28, 1959; issued May 21, 1963.

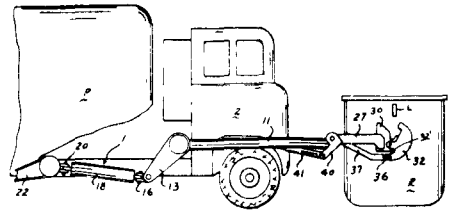
A refuse collection vehicle comprises a hollow body having sidewalls and a floor. A compacting device, mounted in the body, moves from a retracted position in the front to a compacting position in the rear. The packer includes a blade, above the floor of the body, connected to a carriage structure beneath the floor. The carriage has a pair of arms extending longitudinally. A guide structure defines the path of the carriage. A double-action piston-cylinder, beneath the floor, has the piston rod reciprocally mounted in the cylinder, with one end of the rod projecting from the cylinder. That end of the rod is pivotally connected to the carriage. The other end of the cylinder is pivotally connected to the body at a point in front of the packer throughout the compaction stroke. A conduit system admits pressure fluid to the ends of the cylinder. Adjustable valves produce retraction and extension of the piston rod into and out of the cylinder. (See also Canada 575,981)



INT-0159

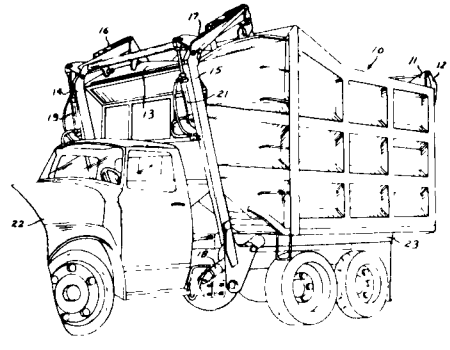
Aldredge, H. D., and R. L. Aldredge (Container Service Company). Loader for refuse truck. Canada 666,046; filed May 2, 1960; issued July 2, 1963.

A lift and dump apparatus, used in combination with a truck having a receptacle at its rear end, includes a single lift arm with an engaging device for moving a cylindrical container. The lift arm and container can be pivoted from a position in front of the truck to a position adjacent and parallel to one side. A sleeve on the lift arm can be rotated to invert the container. A truck using this apparatus can drive to a waste container, lift it, dump its contents into a packer attached to the truck, and return it to its proper location, without the driver leaving the truck.



INT-0160

Aldredge, H. D. (Container Service Company). Packer body for refuse truck. Canada 666,007; filed Dec. 17, 1959; issued July 2, 1963.

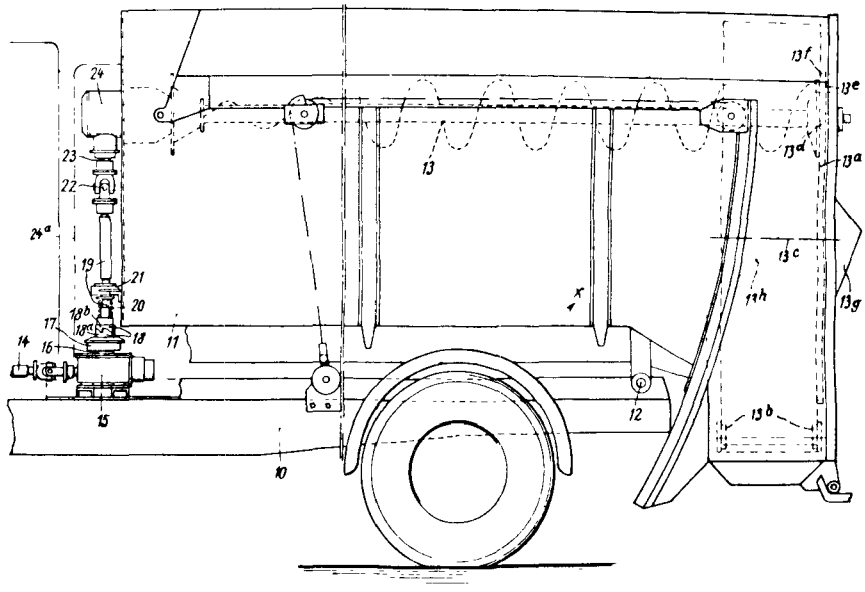


A refuse collection truck includes a bedframe with a body pivotally connected to it at the rear. The body has an entrance opening at the front and an exit opening at the rear. Based on the bedframe, and connected to the front of the body, is a single extensible and retractable device. A packing blade moves inside the body. The blade is controlled by an actuator outside the body, and it can be latched against motion relative to the body. When the blade is latched, the actuator operates the extensible and retractable device to tilt the body.

INT-0161

Westermann, R. (Fahrzeugbau Haller G.m.b.H.). Refuse collecting truck. Germany 1,152,357; filed Apr. 12, 1957; issued Aug. 1, 1963.

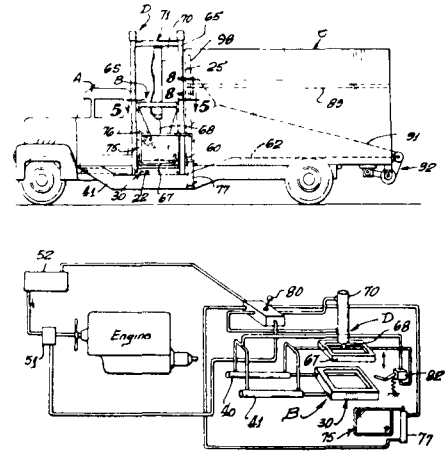
In a refuse-collecting truck, the drive for the internally installed distribution and conveyor devices includes an overload clutch, and a dog clutch, disengaged during tilting of the refuse container. The spring-loaded clutch is located on the vehicle frame, and it is accessible for servicing after the container is tilted. (Text in German)



INT-0162

Shubin, J. M. (P. S. Shubin). Refuse vehicle and loading apparatus therefor. Canada 668,320; filed July 19, 1960; issued Aug. 6, 1963.

This invention relates to refuse-collecting and disposal vehicles, particularly to an improved means for loading such vehicles. The apparatus consists of a cab section, a loading section, and a tank section for trash storage. The trash is loaded onto a delivery apparatus, located between the tank and the cab. This device delivers the refuse to the loading bin. The loading bin contains a piston, driven by hydraulic cylinders, which forces the refuse through a small opening in the forward bulkhead into the tank. The refuse behaves as a fluid, circulating through the

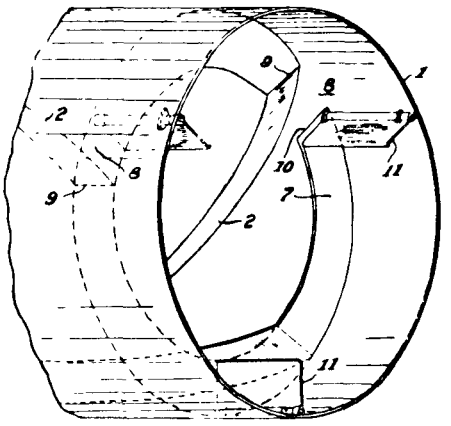


tank and occupying spaces of least resistance near the bulkheads. In addition, a safety side gate is utilized in combination with a closure assembly to assure retention of trash in the loading bin during the piston action. An oversize door is also provided on the forward bulkhead to accommodate bulky objects that cannot pass through the conventional opening. The mechanisms embodied in this patent allow the entire vehicle to be filled with refuse.

INT-0163

Talenti, A. Refuse collecting vehicle collecting container. Germany 1,154,394; filed Dec. 4, 1959; issued Sept. 12, 1963.

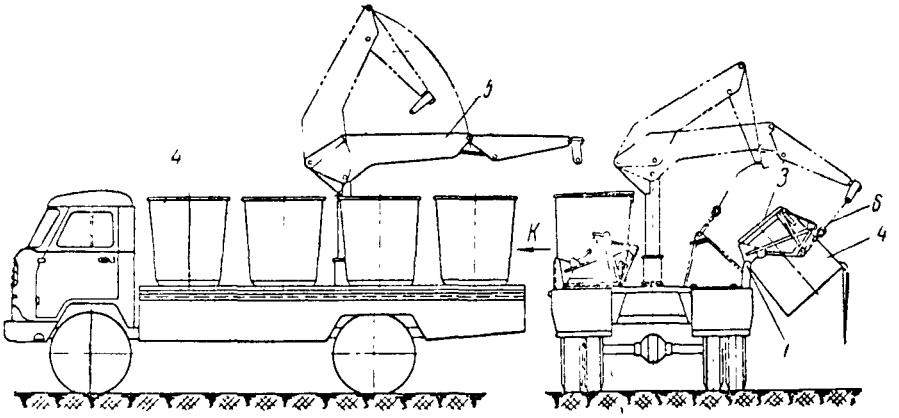
In order to increase the useful space within the cylindrical rotary drum devices that are mounted on motor vehicles for the loading and unloading of garbage, the radial vane wheel can be redesigned. Rather than keeping it rigid with the drum and projecting from its rear edge, thus taking up some of the transverse space in the vehicle, the radial vane wheel and the drum can be defined by the same cylindrical surface. This is done by mounting annular segments on a cylindrical surface forming an extension of the terminal portion of the drum. The segments are located in a radial plane, equiangularly separated by void spaces. One end of each segment is directly connected to the outer end of a helical member that extends into the drum; the other end is adjacent to a radial vane that extends out of the drum into the extention of the drum. Each of the radial vanes is carried by a sleeve that is journalled at one end in a hub fastened to the drum. The sleeve is connected to the hub by an elastic torsional member, consisting of a steel leaf pack. One end of the pack is received within the hub, while the other is received into a seat provided in a bush rigid with the vane. (Text in German)



INT-0164

(Experimental-Design Bureau of the Public Welfare Administration of the City of Moscow). Refuse-container collecting truck. U.S.S.R. 157,265; filed Nov. 2, 1962; issued Sept. 25, 1963.

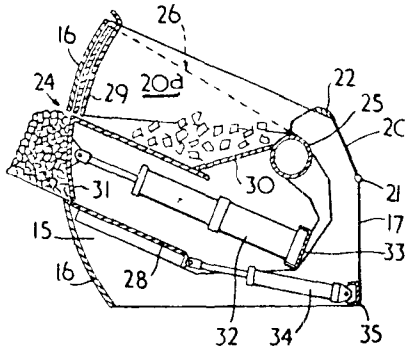
This collection truck for refuse containers includes: an auxiliary frame mounted on an automobile chassis; tipping platforms connected to the frame; removable containers secured to these platforms; and a hydraulic crane. In discharging refuse, the crane tips the platforms on their hinges with the aid of a cable, and thereby trips the containers. During the loading and unloading of the containers, the overturning moment applied at the collection truck increases considerably. In order to increase its resistance to overturn, a stabilization mechanism is mounted on the auxiliary frame. (Text in Russian)



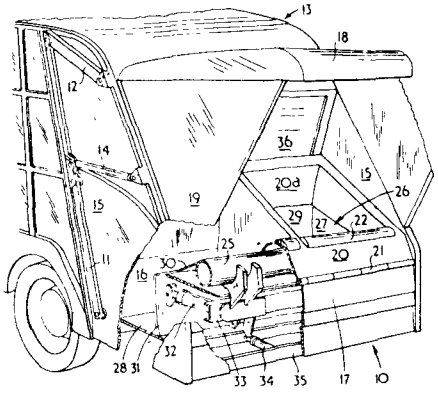
INT-0165

Palmer, D. G., and K. L. Merther (The Eagle Engineering Company Limited). Improvements relating to refuse collection vehicles. Great Britain 953,142; filed Dec. 2, 1961; issued Mar. 25, 1964.

The apparatus has a compartment where refuse is compressed, and a storage compartment. The first compartment has a rocking hopper. In the first position of the hopper, refuse is compressed between a ram-operated device and the fixed wall between the two compartments.



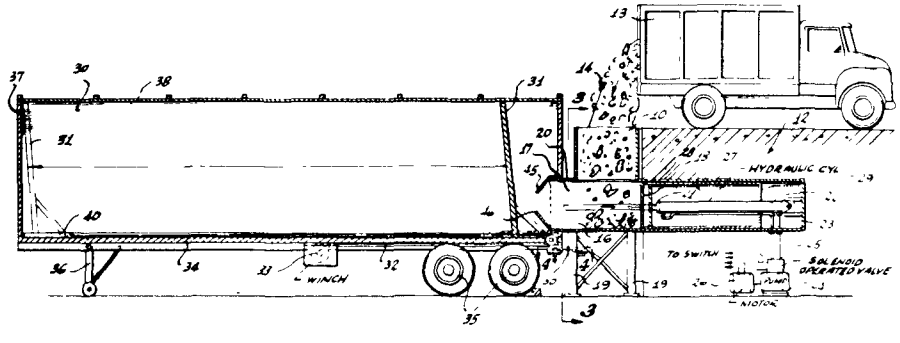
A second ram rocks the hopper to bring the refuse into register with a transfer port in the wall. The refuse is displaced into the storage compartment by further movement of the compressing ram. The compression ram occupies only the lower part of the hopper to permit continuous filling of the hopper during its compressing and discharging operations. The hopper is mounted to rock about a horizontal axis. (See also Canada 773,920)



INT-0166

Bowles, S. V. Refuse collection apparatus. Canada 696,169; filed July 30, 1962; issued Oct. 20, 1964.

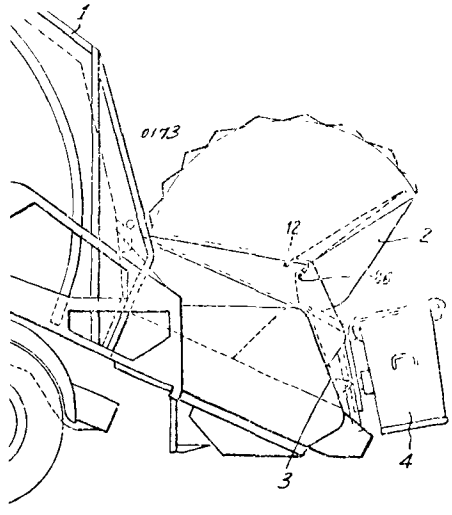
The apparatus particularly relates to a system in which refuse is initially transported from homes and commercial areas by small pickup trucks, then transferred to a large truck, or semitrailer, for hauling to a disposal or dumping site. The device has a hopper, a dock, and a vehicle body. The hopper is a large bin which receives the refuse from the small pickup trucks. It is mounted on the dock or receiving platform, and it has a hydraulically actuated packer which acts as a feeder, transferring trash from the hopper to the vehicle body. The vehicle body is modified by a packer blade, which assists in emptying the truck at the dump site. The blade is hydraulically operated. Other specifications include: a chain to secure the body of the vehicle from falling behind the blade; and a winch and cable to control the position of the packer blade during loading.



INT-0167

Rey, F. Hermetic closure for a garbage collection truck with automatic tipping device for garbage cans. Switzerland 383,876; filed Oct. 23, 1962; issued Oct. 31, 1964.

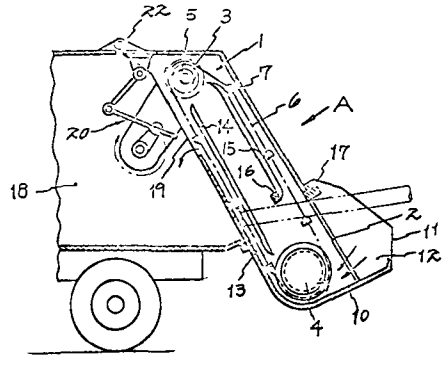
In order to prevent dust development when tipping a garbage can into a truck, an adjustable hood is attached to the rear end of the truck. The hood consists of a pleated rubber sheet, in the shape of a quarter sphere. The pleats are reinforced by steel arches which pivot about a common axis. The latter coincides with the tilting axis of the can-tipping device. One end of the hood is attached rigidly to the superstructure of the truck; the other carries a front plate. As the can is lifted, its top end presses against the front plate of the dust hood which collapses the folding pleats. (See also Switzerland 304,326 and 275,342) (Text in French)



INT-0168

Endo, Y. (Kato Manufacturing Company). Garbage truck that smashes garbage. Japan 40-243; filed Apr. 4, 1963; issued Jan. 9, 1965.

An improvement on a conventional garbage truck which is unable to crush furniture, lumber, etc., has a horizontal beam arranged over the garbage dumping opening, and reversible chain wheels. Regular garbage is moved forward by the tilted floorboard, pushed up by the front smashing rod, and is sent into the bin for storage. Thus, continuous loading is possible. When the garbage contains bulky wastes, the chain wheels are reversed, the rear smashing rod goes up, and the front smashing rod comes down. The object to be smashed is placed between the beam and the rear crushing rod, which, when it goes up, creates the cutting force and warping momentum that crushes the garbage. If the rods are not rounded, but have edges, the motive force required can be reduced. The garbage-dumping opening is in the rear, at the bottom of the garbage transmission box. On all sides of the box are chain wheels and guide wheels, between which are chains. Several crushing rods are between the chains, and when the chain wheel is driven, the smashing rod goes up in front of the garbage transmission box. The smashing rod pushes the garbage up from the bottom of the transmission box; a horizontal beam on top of the dumping opening holds the bulky garbage, and in concert with the smashing rods, crushes it. (Text in Japanese)

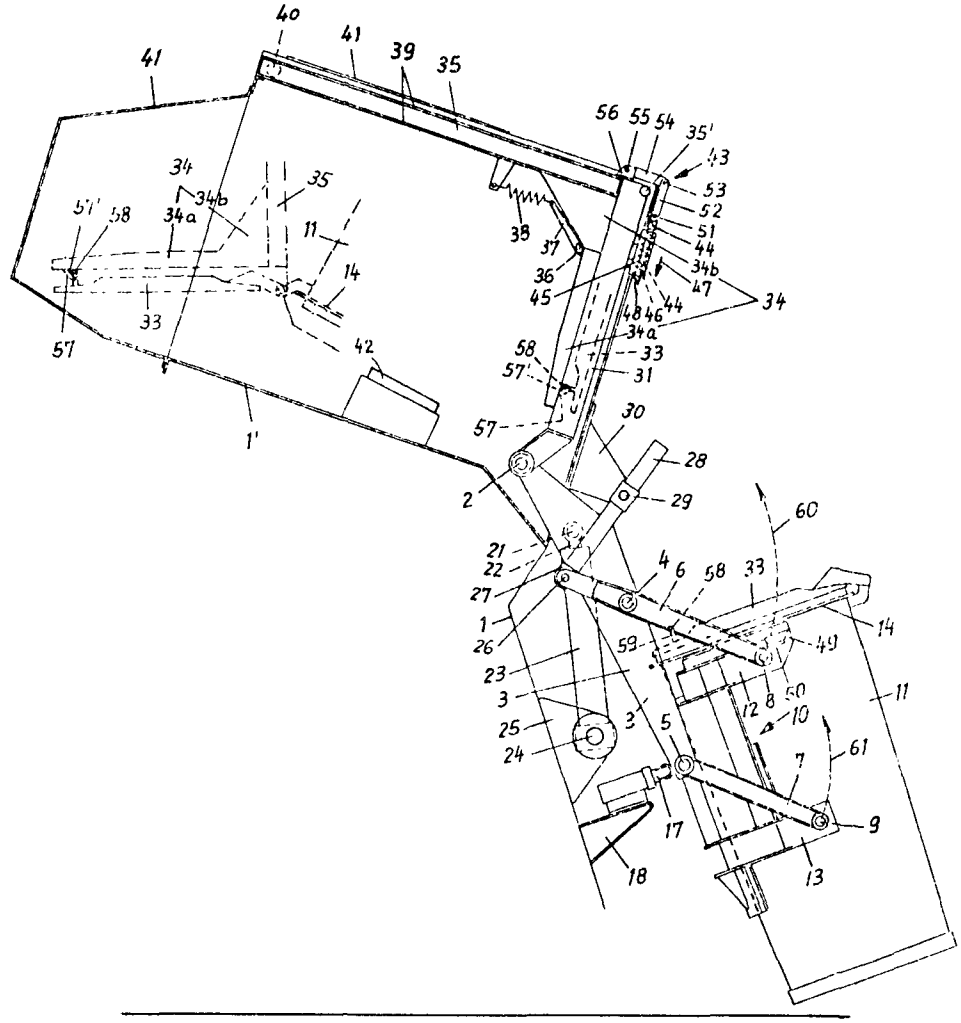


INT-0169

Ochsner, A. (J. Ochsner and Company A.G.). Equipment on refuse collecting vehicles for dust-free emptying of garbage cans. Switzerland 388,851; filed July 24, 1961; issued Feb. 28, 1965.

The emptying device consists of a can-holding device which can be lifted, by means of two swinging levers, from the rest position into the emptying position. The holding device is connected to each of the swinging levers by a lift arm and a guiding arm, forming a quadrilateral link. Both lift arms can be operated by a mechanism situated at the swinging lever. To empty the cans, the lift arms are moved, causing a movement of the holding device with regard to the swinging levers. In a second phase of movement, the relative positions of the holding device and the swinging lever remains unchanged. Dust plates are attached at the holding device. They are linked to the can lid, opening it when the can is emptied into the feeding

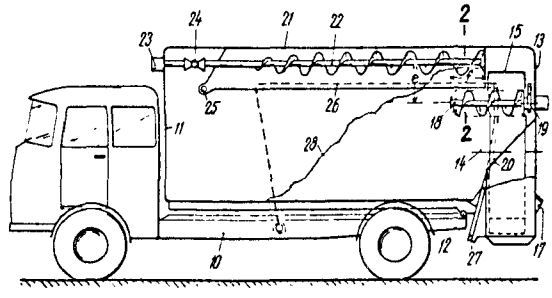
inlet of the hood. (See also Switzerland 286,395, 299,965, 323,850, 323,851, 338,763, 387,538, and 407,872) (Text in German)



INT-0170

Schwabe, O. H., and M. Jung (Fahrzeugbau Haller G.m.b.H.). Refuse truck. Germany 1,188,507; filed Jan. 27, 1962; issued Mar. 4, 1965.

A refuse truck has a discharge device consisting of a conveyor and a compression screw. The screw takes the refuse from the conveyor, and terminates in the refuse container. The refuse truck also has a distributor screw which is arranged on the roof of the container, extending over almost its entire length. (See also Germany 1,200,205) (Text in German)

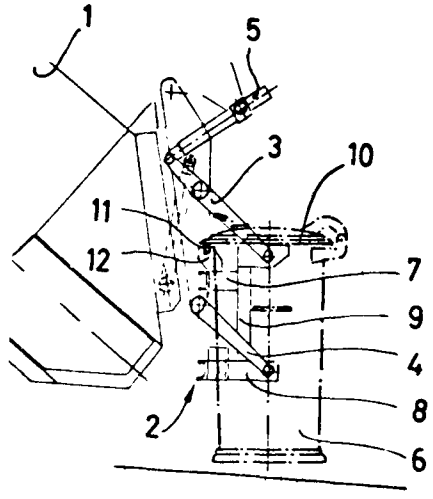


INT-0171

Roedel, Max, and P. Jordan (Maschinenfabrik Augsburg-Nuernberg A.G.). Device for emptying garbage cans into garbage truck. Germany 1,192,583; filed May 24, 1963; issued May 6, 1965.

A device for emptying garbage cans of various dimensions into garbage trucks is provided. The device, affixed to the truck, is equipped

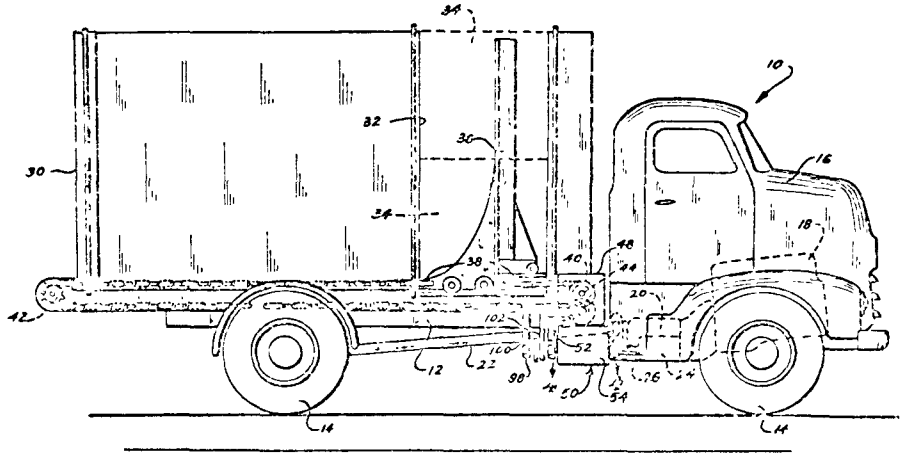
with adjustable clamps and a scoop arrangement for the insertion of the refuse cans. It is also fitted with the usual lifting device. The scoop is used only in cases where the clamps cannot be applied, that is, to cans of unusual shape. (Text in German)



INT-0172

Dean, F. H. (Pak-Mor Manufacturing Company). Power transmission assembly for refuse handling vehicles. Canada 711,106; filed Dec. 29, 1962; issued June 8, 1965.

This refuse vehicle has a body defining a receptacle with an opening for receiving refuse and a discharge door at one end. When the door is closed, the packer plate mounted in the receptacle moves the refuse from near the opening and compresses it against the door; when the door is opened, the packer pushes the compressed refuse out of the receptacle. Power is transmitted from the vehicle motor to the packer by a pair of parallel shafts, one connected to the motor assembly and the other to the packer plate assembly. Two electromagnetic clutches, controlled by an electric circuit, are mounted on one of the shafts. Engaging the first clutch causes a high speed-low force movement of the packer, which continues until the resistance to such movement exceeds a predetermined amount. Then the first clutch is automatically deenergized, and the second is engaged which effects a low speed-high force movement. When the compaction stroke is finished, a third clutch engages automatically to cause a high-speed movement of the packer away from the door. This power-transmitting assembly is remotely controlled. It effects a minimum packing cycle time and a maximum packing force from a minimum power source.

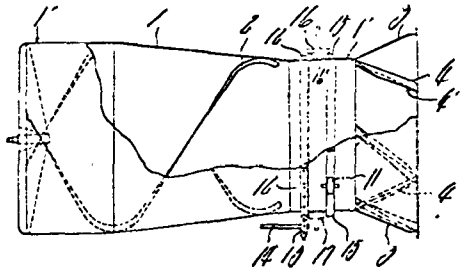


INT-0173

Ishihara, J. (Fuji Car Manufacturing Company, Ltd.). Garbage truck. Japan 40-12,564; filed Dec. 27, 1963; issued June 19, 1965.

The loading method of this garbage truck is entirely different form that of ordinary garbage trucks. Inside the garbage drum, which can revolve, is a screw to push garbage out. At the opening of the drum is an expanded cylinder, inside of which, and equidistant from each other, are revolving boards tilted so that the dumped garbage is pushed deep inside. There is a fixed cylinder with a conical head, which can slip into the expanded one. A spiral board to guide the garbage surrounds the cylinder. The garbage is dumped through the opening of the fixed cylinder to the inside of the revolving, expanded cylinder. The garbage is scraped

along the outer surface of the fixed cylinder, and the guide board pushes the garbage into the drum. The pushing-out force of the screw inside the drum, and the pushing-in force at the dumping opening, serve to compress the garbage in the front part of the fixed cylinder. When the garbage is discharged, there is no need to change the revolving direction of the fixed cylinder; instead, the

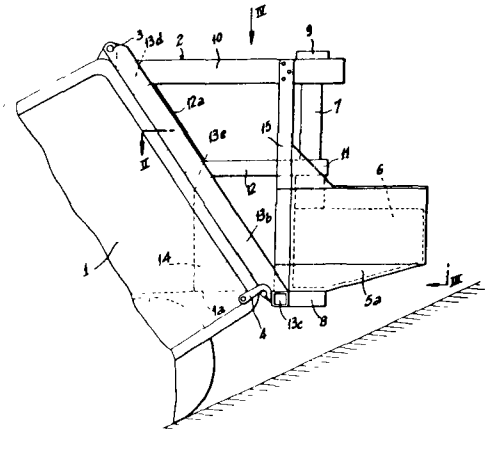


fixed cylinder is taken out of the expanded cylinder. Then, the garbage inside the drum can be discharged by the screw. (Text in Japanese)

INT-0174

(Societe Industrielle de Transports Automobiles S.I.T.A.). Refuse lorry loader. Germany 1,196,122; filed Dec. 4, 1963; issued July 1, 1965.

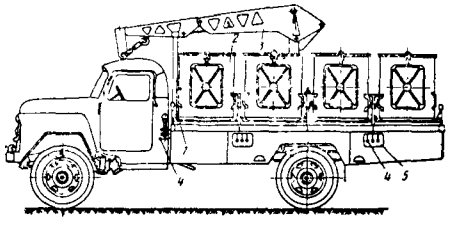
A refuse truck loader consists of a semi-cylindrical trough and an element that passes over it. This element is arranged as a rudder on a shaft. It is rotated by crank arms and two piston drives, subject alternately to the action of a pressure machine, in such a manner that the rudder moves back and forth in the trough. The direction of force of one of the piston drives approaches the vertical of the appropriate crank arm, if the rudder continues in the direction of one of its reversing points. (Text in German)



INT-0175

Ivanova, D. L., G. A. Litinskiy, G. L. Karaban, and M. A. Polkovskiy (Experimental Design Bureau of the Public Welfare Administration of the City of Moscow). Refuse container collection truck. U.S.S.R. 175,424; filed July 1, 1964; issued Sept. 21, 1965.

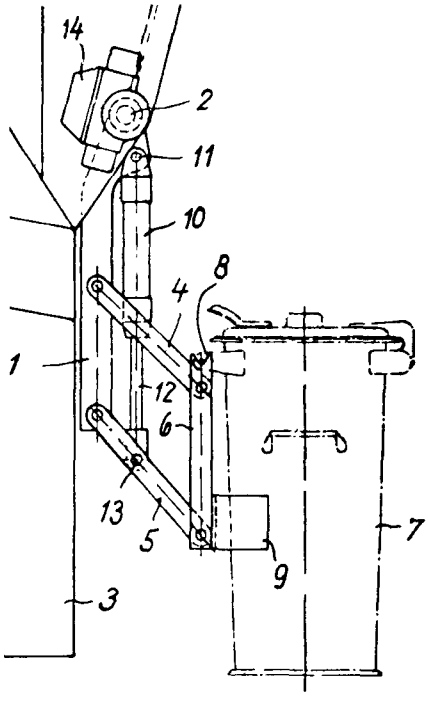
The collection truck includes: an auxiliary frame mounted on an automobile chassis; tipping platforms hinged to this frame; removable containers secured to these platforms; a hydraulic crane; a rear-spring stabilizer mechanism; and hydraulic crane control levers located in recesses of the truck body. (Text in Russian)



INT-0176

Maab, E., and H. Doering (Kloeckner-Humboldt-Deutz Aktiengesellschaft). Refuse truck. Germany 1,201,756; filed Sept. 21, 1963; issued Sept. 23, 1965.

This refuse truck has a hoist, by which refuse bins are lifted and tipped into the vehicle by

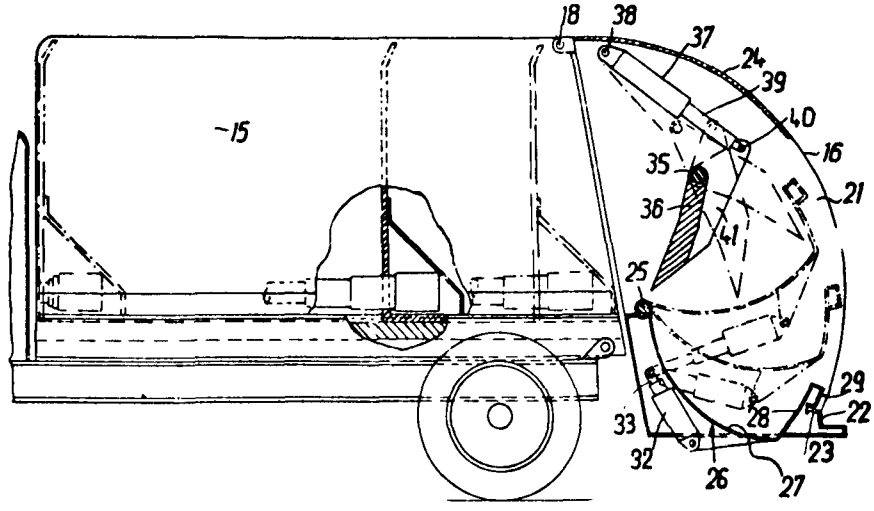


means of a quadrilateral linkage and a swivel arm, respectively. Both are individually powered by a pressure motor, and sequentially actuated by sequence switching. The swivel arm forms one rod of the linkage facing the bin support frame. (Text in German)

INT-0177

Urban, G. E. (The Heil Company). Refuse vehicle loader. Germany 1,203,179; filed May 7, 1962; issued Oct. 14, 1965.

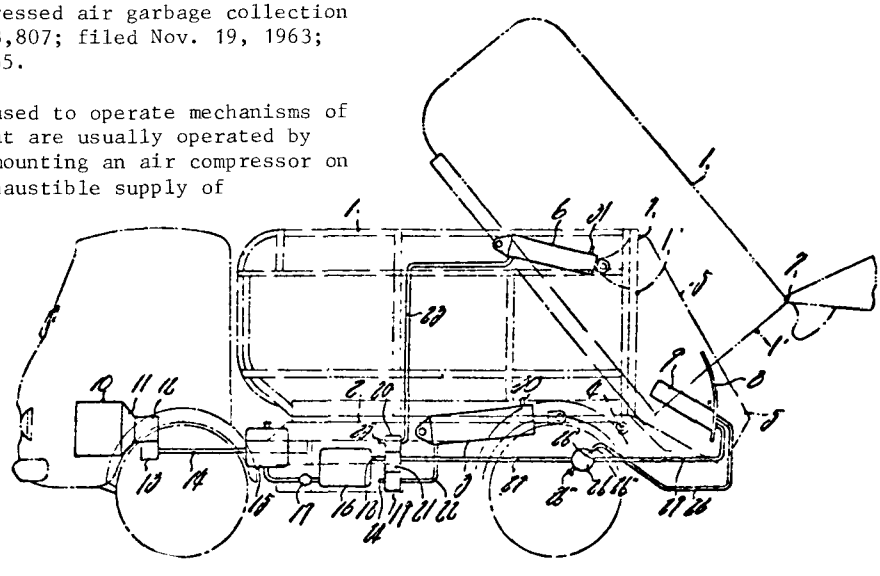
A refuse vehicle loader has a horizontally pivoted shovel and a compactor plate travelling to and from the fillhole. The shovel and plate are actuated by double-action hydraulic cylinders in the appropriate tempo. The load circuit of these cylinders contains two control valves which put the shovel-lifting chamber of one cylinder in series with the compactor-readying chamber of the other cylinder. The shovel then starts upwards, once the plate is halfway from closure in front of the fillhole, to its ready position for clearing the refuse shovel. (Text in German)



INT-0178

Yamamoto, I. Compressed air garbage collection truck. Japan 40-23,807; filed Nov. 19, 1963; issued Oct. 19, 1965.

Compressed air is used to operate mechanisms of a garbage truck that are usually operated by oil pressure. By mounting an air compressor on the truck, an inexhaustible supply of

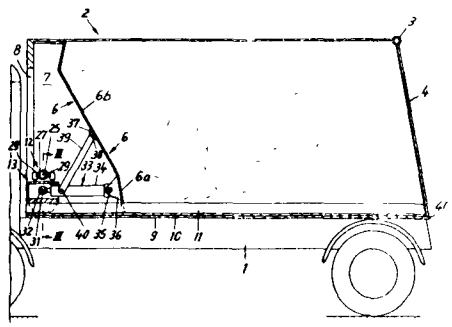


compressed air is available. The compressor is operated utilizing the motive power of the engine. Once the compressed air is used, it is emitted directly into the atmosphere, so that there is no need for recycling piping, as is the case for the oil pressure arrangement. The piping is shorter, which means economical operation as well as reduced danger of leakage. Of the three cocks for the main pipe from the air tank, two are connected with the dumping mechanism, and one to the left chamber of the piston of the device which turns the garbage box. Since the air compressor charges while the truck is in motion, the operation is efficient and economical. (See also Japan 33-5,910 and 39-4,103)
(Text in Japanese)

INT-0179

Ochsner, A. (J. Ochsner and Company A.G.). Refuse discharging device in refuse collection truck. Switzerland 403,629; filed Oct. 1, 1963; issued Nov. 30, 1965.

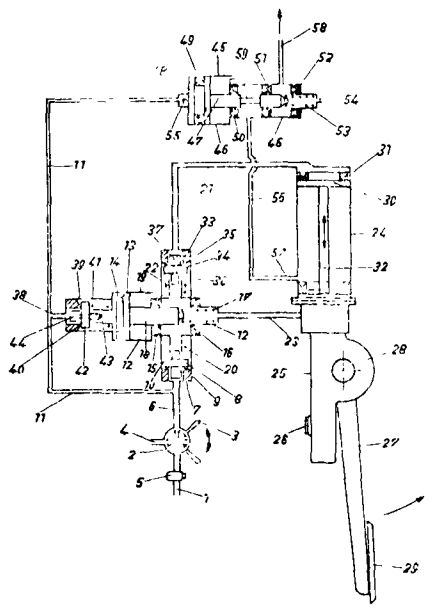
A refuse collection truck carries, on its chassis, a rectangular container whose rear wall is rotated around a horizontal upper axis. The interior of the container has a discharging plate which moves along the length of the truck. It is arranged perpendicularly to two guide wings, which are in the immediate vicinity of the lateral walls. A clamp rail and a clamping device counteract the operations of the telescopic jack, so that the discharging plate is moved only a fraction of the entire path with each stroke. The clamp rail is fixed to the floor of the container. The telescopic jack is arranged between the discharge plate and the clamping device. The discharge plate has a forward-inclined central section, linked to the telescopic jack via a support. The clamp rail can also be installed so it can be shifted by the telescopic press along the floor of the container. The clamping device has a press which is connected with a movable jaw on one side of the rail, and a stationary jaw on the other side. (Text in German)



INT-0180

Naab, J. (E. Zoeller, and H. Schulz-Zoeller). Control device for can-tipping equipment and a cleaning and disinfecting plant for garbage cans. Switzerland 406,972; filed Sept. 10, 1962; issued Jan. 31, 1966.

The device, which consists of a main control element, is operated by hand. In the feedpipe near the tipping cylinder, a relief valve is arranged, in the drainpipe, an air-exhaust valve with a control piston is provided. The latter is connected to the feedpipe by means of a control pipe. A pressure pipe, attached at the tipping cylinder and controlled by the cylinder piston, leads toward the pneumatic switch of the cleaning and disinfecting device. In this pipe, a pressure-controlled pilot valve, connected with the control pipe of the air-exhaust valve, is arranged. By means of the control device, the cans are completely rinsed, automatically and with preselected velocity. (Text in German)

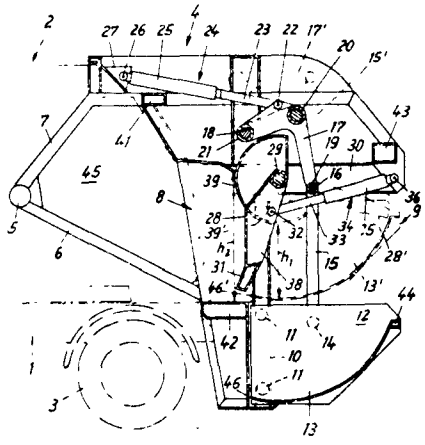


INT-0181

Ochsner, A. (J. Ochsner and Company A.G.). Feeding and tamping device on a collecting vehicle for bulky refuse. Switzerland 406,971; filed Oct. 1, 1963; issued Jan. 31, 1966.

The feeding and tamping device for bulky refuse consists of a liftable trough, the bottom of which forms a circular cylindrical section. It can be lifted by means of two lifting devices. A plate, tiltable by two tipping mechanisms, closes (in its rest position) the container of the vehicle. When the filled trough is lifted, the plate tips and covers it, precompacting the

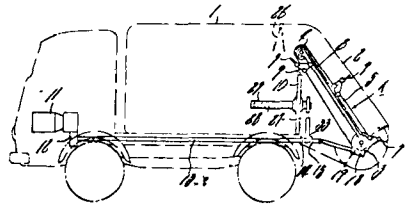
rubbish. In this position, the axis of the plate parallels that of the trough, and by tipping the plate back to its rest position, the refuse is emptied into the container. (Text in German)



INT-0182

Takenouchi, S. (Kurita Rolling Stock Sales Company, Ltd.). Garbage truck. Japan 41-8,123; filed Dec. 13, 1963; issued Apr. 28, 1966.

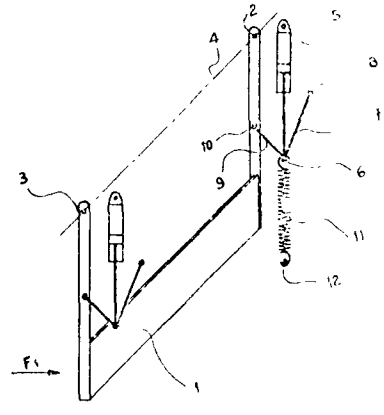
The described garbage truck has a dump box that is tilted at the rear. Inside the box is a belt around two drums. On the surface of the belt, equidistant from each other, are garbage-scraping boards. These mark the garbage passage. When the boards push garbage forward, they stand erect; when the belt descends, the boards fall flat on it and are cleaned with a rotating brush. When the boards reach the other side of the belt, they again become erect. In front of the garbage-scraping device, and in the rear of the box, is the board which pushes in the garbage. It operates back and forth with fitted screws. These operations are carried out mechanically by the motive power of the engine. The action is relatively stable, compared to oil-pressure systems. The garbage is charged continuously. When enough garbage is collected in front of the pushing board, the worker switches on the umbrella cogwheel. The pushing board moves the garbage to the rear of the box. When the umbrella cogwheel reaches two other cogwheels, the pushing action stops. (Text in Japanese)



INT-0183

Minaire, A. (Societe Sovel Vehicules Electriques Industriels). Mechanism for moving a pusher for redistributing waste inside a garbage collection truck. Switzerland 415,449; filed Sept. 17, 1963; issued June 15, 1966.

The device for redistributing the waste inside a collection truck, particularly for moving it from the rear to the front, consists essentially of a horizontal board mounted on two vertical arms that pivot about a common axis. The device is actuated by a hydraulic cylinder. Two levers are attached to its piston. One of the levers is also attached to a joint mounted on the truck's superstructure, while the other is attached to joints on the arms of the board. Since the hydraulic system is fed by a constant displacement pump, its piston moves with constant velocity and force. The described mechanical linkage produces a movement of the board which is fast and light in the beginning when the waste is loose, but slow and more powerful at the end of the cycle as the waste is being compacted. The linkage allows the use of smaller hydraulic actuators than would be necessary if the piston were attached directly to the arms of the waste-pushing board. (Text in French)

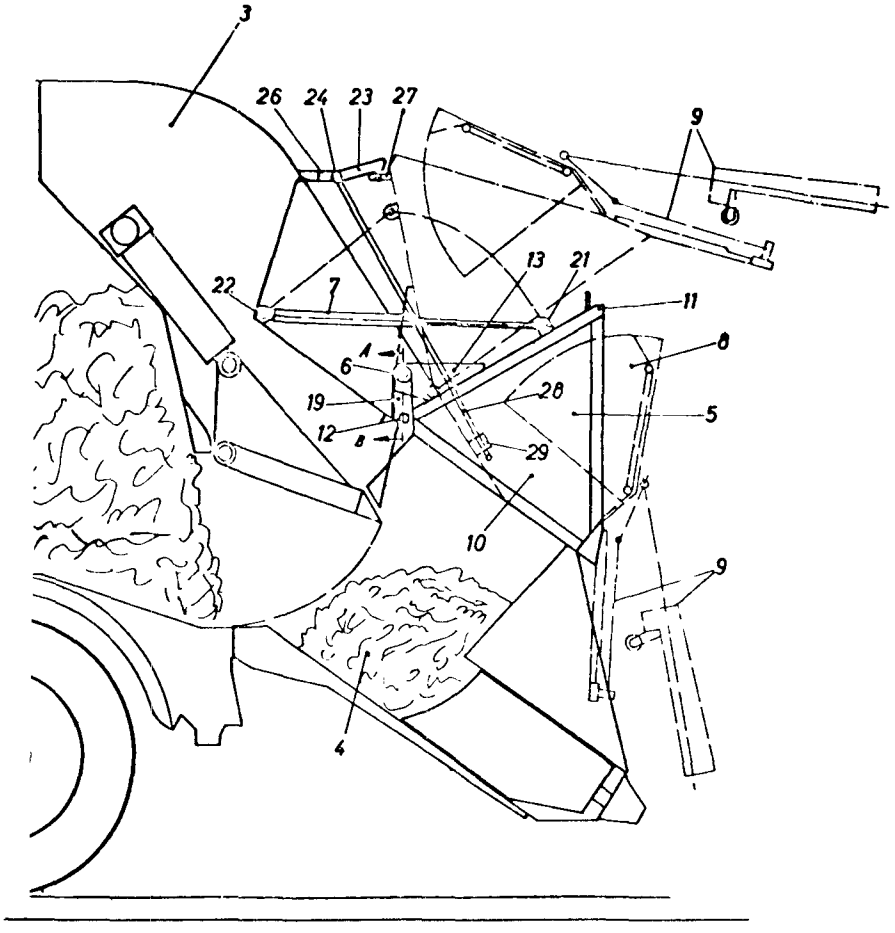


INT-0184

Goetz, E. (Eisenwerk Steuber and Lohmann G.m.b.H.). Refuse compactor vehicle. Germany 1,219,855; filed Feb. 24, 1965; issued June 23, 1966.

This vehicle handles system and bulk refuse bins by means of tip boxes. These boxes pivot on axes well above the top trough rim and the box lid. They are tipped by simplex rams carried on solid journal bearings on the roof above the box outer wall, and on the rear wall of the refuse compactor itself. Similar bearings on

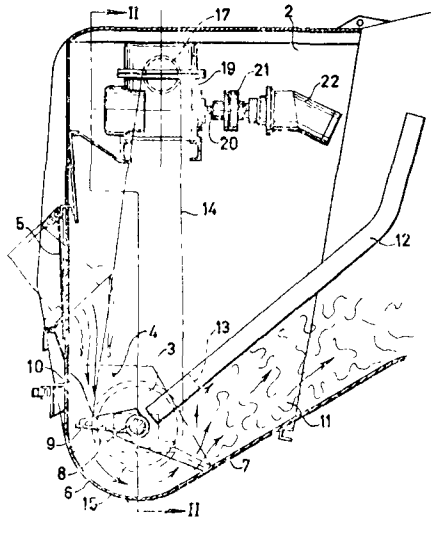
a shaft, situated on the compactor front, carry catch-hooks. These hooks thrust against their own weight and that of a service lever until lugs on the boxes are engaged. The boxes start to fall, but are caught securely by the hooks. (Text in German)



INT-0185

De Graaff, P. (N.V. Netam). Equipment for compacting and shredding of coarse rubbish and for transportation of the rubbish into a container. Switzerland 419,958; filed Oct. 25, 1963; issued Aug. 31, 1966.

The equipment for compacting and shredding rubbish has a container with a charging compartment attached to its rear end. Near the bottom of this charging compartment is a crusher, arranged in such a way that a curved charging canal is formed. The bottom of the charging compartment rises upward. The crusher consists of a shaft, to which rods or blades are attached perpendicularly, that transverses the charging duct. Between the radially arranged blades, there are four impact bars which converge upon the shaft in perpendicular planes. The charging duct is followed by the upward rising through-duct which borders on top on a grate with scrapers. These remove the rubbish adhering to the blades

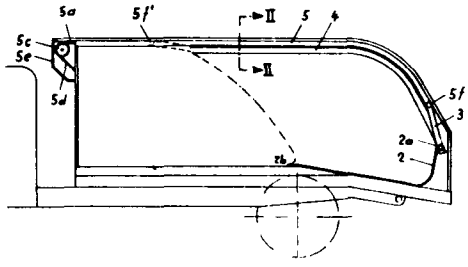


of the crusher. The charging compartment is equipped with one or more inlets. The shaft is driven by a hydraulic motor. (Text in German)

INT-0186

Naef, M. (Carrosserie Hess A.G.). Mechanism for moving and guiding the compacting mat in a garbage collection truck. Switzerland 421,814; filed Dec. 3, 1964; issued Sept. 30, 1966.

The compacting mat is fastened in the garbage container with one end on the floor, and the other on a horizontal axis. Roller chains, driven by an auxiliary motor, are coupled to the mat to move it through the container. Upon actuation of the chain wheels over which the roller chains pass the mat (which consists of rubber or sheet steel foil) is pulled into

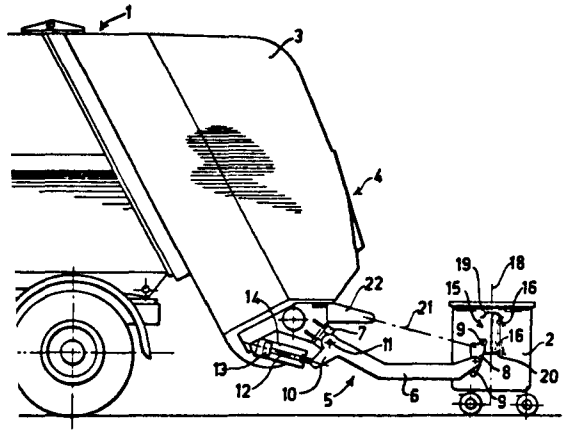


strapped position and moved across the container. The refuse is carried along and pressed against the front wall. When this operation is complete, the mat returns to its original position. (Text in German)

INT-0187

(Geesink N.V.). A combination of a refuse collector with a refuse container. Great Britain 1,049,649; filed Oct. 30, 1963; issued Nov. 30, 1966.

A lifting device, consisting of two arms pivoted at one end, is affixed to the filling compartment of a conventional refuse-collecting vehicle.

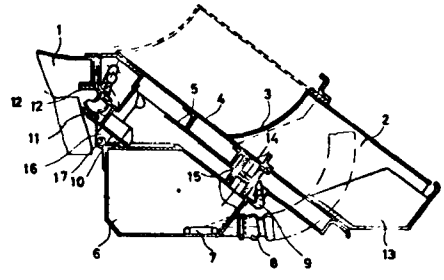


The other end of each arm is provided with a lever with a bearing element on each end. A hydraulic press cylinder, used to raise the arms, is connected to a projection provided on the arms. In operation, the arms are juxtaposed to a refuse container equipped with forks which engage the bearing elements on the hoisting arms, forming an integrated unit for raising, emptying, and lowering the refuse container.

INT-0188

Roedel, M. (Maschinenfabrik Augsburg-Nuernberg A.G.). Compacting refuse wagon liquid collection. Germany 1,234,621; filed May 11, 1965; issued Feb. 16, 1967.

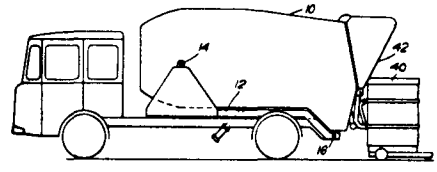
The process is carried out in a rough dewatering stage near the starting position of the conveyor slide, in a collector vessel beneath the conveyor base plate. The plate is attached and inclined upward to the wagon box floor, and it has runoff perforations or channels across the width of the conveyor. In a final dewatering stage, immediately preceding the compaction position, is an additional liquid runoff system consisting of a trickle plate, a guide plate, and a catcher channel terminating in the collector vessel. (Text in German)



INT-0189

Tillson, T. W. (Shelvoke and Drewry, Ltd.). Improvements in or relating to refuse collecting vehicles. Great Britain 1,060,612; filed Feb. 25, 1963; issued Mar. 8, 1967.

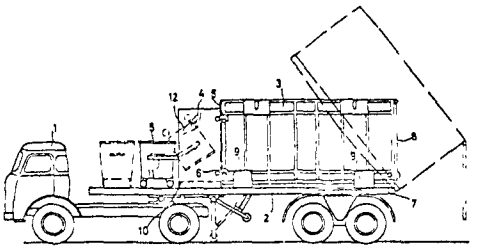
This packer has a hopper which deposits refuse in the body of the vehicle. The hoisting mechanism consists of one or more hydraulic or pneumatic rams, located in compartments in the floor of the vehicle. These rams do not project from the vehicle body. The storage compartments keep the ram mechanisms free of dirt and refuse.



INT-0190

Roedel, M. (Maschinenfabrik Augsburg-Nuernberg Aktiengesellschaft). Refuse vehicle. Germany 1,238,841; filed June 18, 1966; issued Apr. 13, 1967.

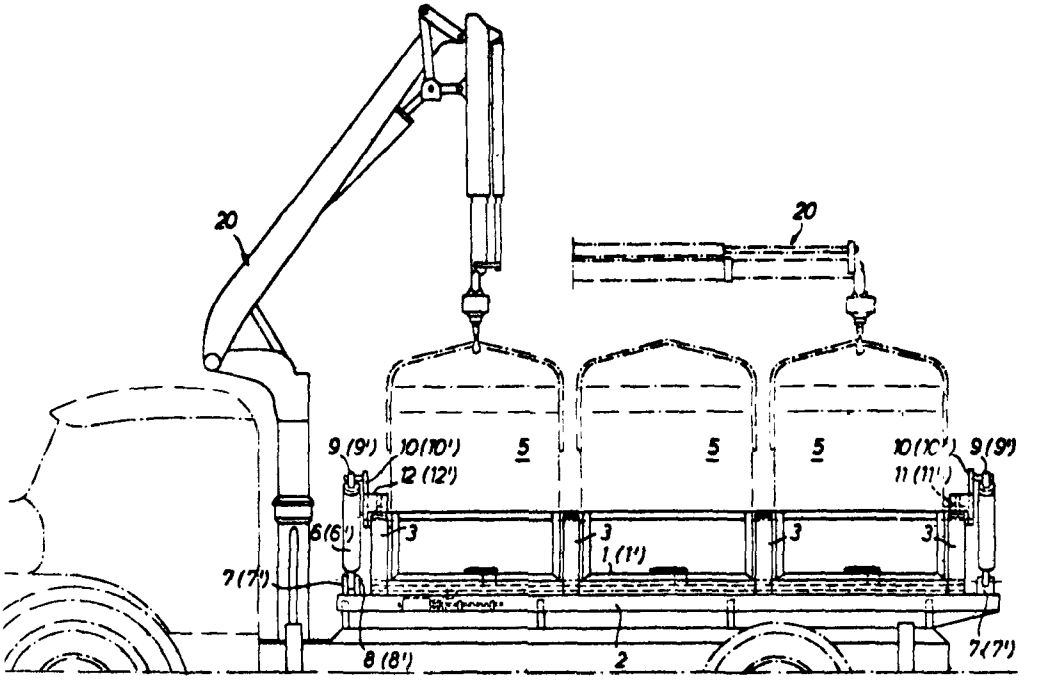
This vehicle is a semitrailer whose platform takes the removable changeover refuse container body, and a permanent feed/press/hopper unit for precollector bins. The container body is emptied by tipping it backward so that a hole in the rear wall is opened, or else the wall is swung out of the way of the emptying area. (Text in German)



INT-0191

Liebmann, H. (FEKA Fabrik fur Spezialfahrzeuge Kraft and Company K.G.). Refuse container vehicle. Germany 1,239,619; filed Sept. 17, 1962; issued Apr. 27, 1967.

This vehicle carries detachable containers on two bridges, which tip (together or singly) to their respective outer sides through more than 90 degrees. These bridges are located around an axis above the outside of the bridge and parallel to it. The cylinder of each hydraulic hoist tipping the bins swings around an axis near the longitudinal centerline of the total load area, and roughly level with the bridges. The free end of the hoist ram is hinged to its bridge at a point which, in repose, forms a right triangle whose hypotenuse is provided by the connection between the tip axes of the bridges and the cylinder. (Text in German)

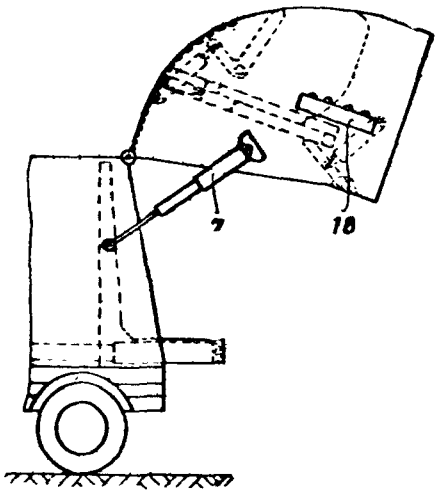


INT-0192

(Fahrzeugbau Haller G.m.b.H.). Vehicle for baled refuse. Germany 1,242,142; filed Apr. 10, 1964; issued June 8, 1967.

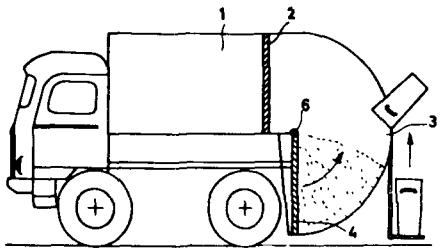
A vehicle is equipped with a container for receiving and shredding baled refuse by means of scrap shears. Loading is accomplished by means of a compactor plate, which covers the shears. The loading platform is vaulted, and it is cushioned in the vertical position. It is coupled with the press shield, and the two move simultaneously. The operating power of the loading plate, press shield, cutting shears,

and waste propellor is derived from a common source. (Text in German)



INT-0193

Oecki, O. (Maschinenfabrik Augsburg-Nuernberg). Refuse collecting van. Germany 1,243,582; filed Nov. 27 1964; issued June 29, 1967.

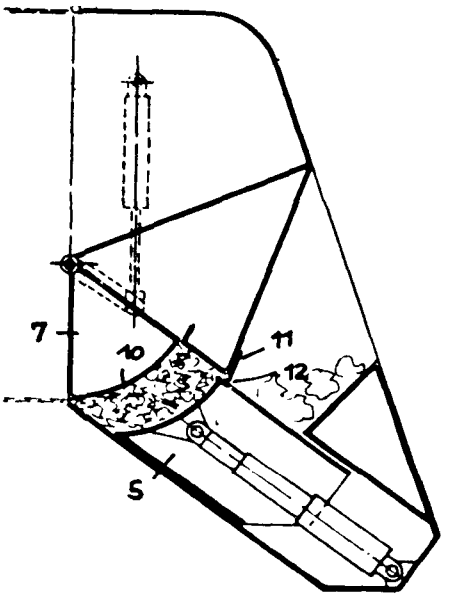


A refuse collecting van has a refuse container with a semicircular end. At its center of curvature is a shaft, from which hangs a compressor plate across the container. This pivots upward to convey the refuse toward and against a movable counterplate. (Text in German)

INT-0194

Smarra, G. (Aktiengesellschaft Eisenhuette Prinz Rudolph). Refuse compactor/loader. Germany 1,247,201; filed Jan. 18, 1965; issued Aug. 10, 1967.

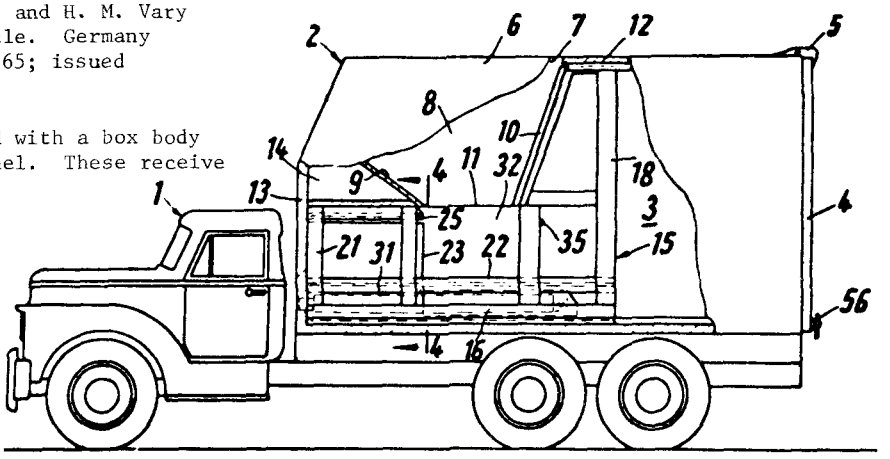
A loader for vehicles pushes the material through a tube whose movable seal acts as an abutment during compaction, and then opens. An associated pressure switch responds when a preselected degree of compaction is reached or exceeded. It stops the pusher and opens the seal to accept additional refuse. (Text in German)



INT-0195

Brisson, J. R., F. J. Sudac, and H. M. Vary (Lodal, Inc.). Refuse vehicle. Germany 1,247,937; filed June 14, 1965; issued Aug. 17, 1967.

A refuse vehicle is designed with a box body and a filling space and funnel. These receive

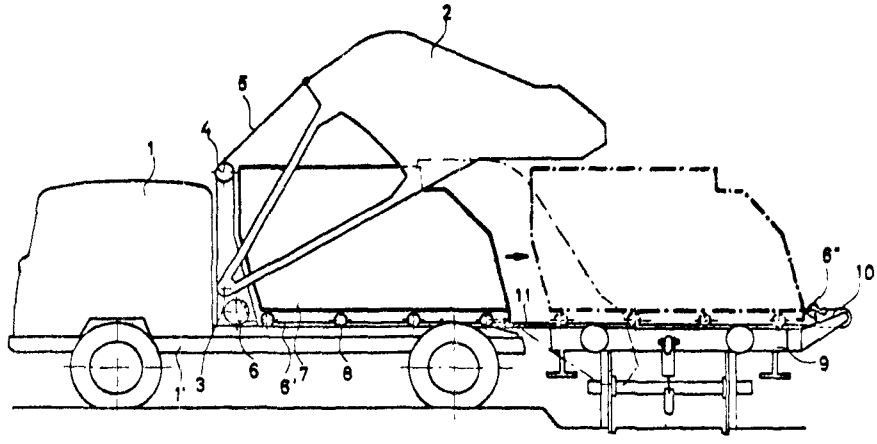


the refuse, for conveying and compacting, on a reciprocating pusher to the collector space. A frame, moving longitudinally through the body in this collector, has a plate above the pusher and where its stroke ends. The pusher is moved by its own actuator in conjunction with the frame and plate specified to empty the collector space. (Text in German)

INT-0196

Klanner, R., and M. Roedel (Maschinenfabrik Augsburg-Nuernberg Aktiengesellschaft Zweignierderlassung Muenchen). Refuse vehicle loader. Germany 1,252,127; filed Mar. 30, 1965; issued Oct. 12, 1967.

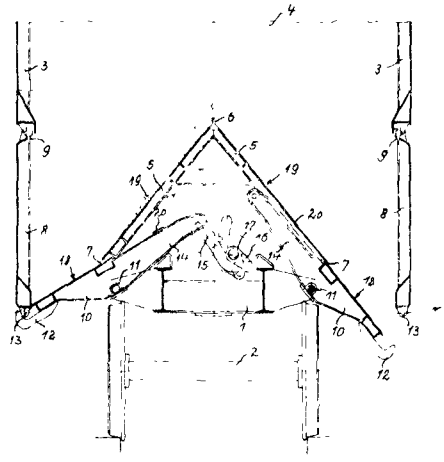
This refuse vehicle loader is pivoted directly on the chassis. A square sheet container starts close behind the cab and ends with the chassis, so that the loader closes it when swung downward. Rollers under the container run on the chassis. The compactor and pusher forming the loader are carried just behind the cab, and they swing up via arms to the side of the container. A rope winch, immediately behind the cab, raises the loader and keeps it raised, and it pulls the container out and off onto another vehicle. (Text in German)



INT-0197

Stahn, R., G. Engelter, and K. Grebe (Gebruder Crede and Co., G.m.b.H.). Vehicle for the facilitation of dumping. Switzerland 437,408; filed Oct. 4, 1966; issued Nov. 30, 1967.

A refuse vehicle has a dumping apparatus with a multisectioned, saddle-shaped floor that can be mechanically tilted for emptying. The horizontal distance of the apparatus between each of the two sidewalls and the corner of the immovable portion of the saddle is smaller than the horizontal distance between these corners and the center of the saddle. Each tilting section has an arm, extending to the center, to control the opening and closing of the floor slats for emptying or loading. (Text in German)

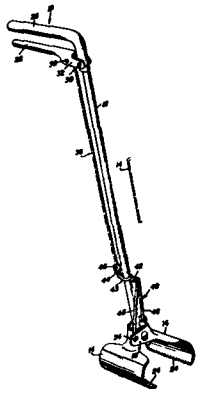


INT-0198

Johnston, O. Pickup device for trash. Canada 775,450; filed May 2, 1967; issued Jan. 9, 1968.

A tool for picking up and handling trash comprises a vertical shaft with a pair of clamping jaws pivotally mounted at one end. Serrated engaging teeth on the jaws overlap when the jaws are clamped shut, to retain the trash. An elongate, resilient device, connected to a handle on the shaft and to levers on the jaws, moves the levers so the jaws close. Plates on one end of the jaws abut one another when the jaws are shut. The trash, picked up

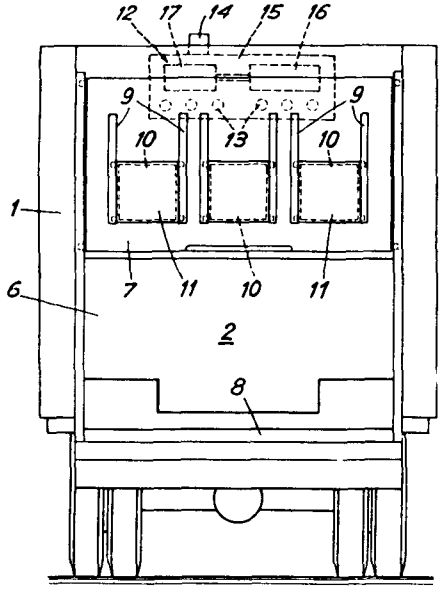
in the jaws, is held against the plates when the shaft is raised to a horizontal position.



INT-0199

Fluri, K. (E. Moser A.G.). Refuse collection vehicle. Switzerland 450,279; filed Jan. 12, 1966; issued Jan. 15, 1968.

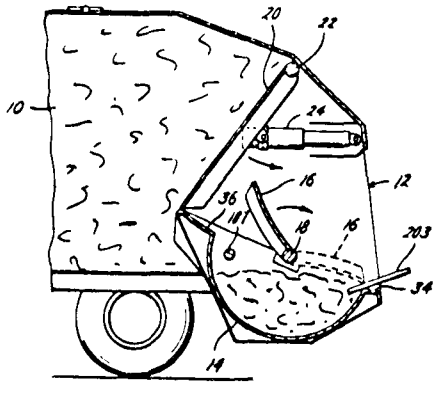
The vehicle has a totally enclosed refuse loading hopper, whose rear wall has at least one loading opening to prevent dust from escaping. Pneumatic equipment maintains a slight vacuum in the hopper, even when the loading aperture is open. The pneumatic equipment consists of a motor-suction fan unit enclosed in a box with several air intake openings provided with screens or filters. It is mounted in the hopper, and discharges the screened air from the hopper upward into the atmosphere. The loading opening extends over most of the width of the vehicle, and it has a pliant flap to assist in maintaining the vacuum by reducing the influx of outside air into the hopper, while yielding to the containers from which refuse is discharged.
(Text in German)



INT-0200

Ferrari, W. A., O. M. Anderson, and F. H. Dean (Pak-Mor Manufacturing Company). Loading and ejecting mechanism for refuse vehicles. Canada 775,991; filed July 22, 1965; issued Jan. 16, 1968.

This refuse vehicle has a hollow body with a rear opening which is closed by a tailgate. A trough is carried by the tailgate into a position for accepting a charge of refuse, which is moved into the body when the gate is closed. The refuse is transferred from the trough by a horizontally rotating sweep panel on the tailgate. A ram panel then pushes the refuse into the body.

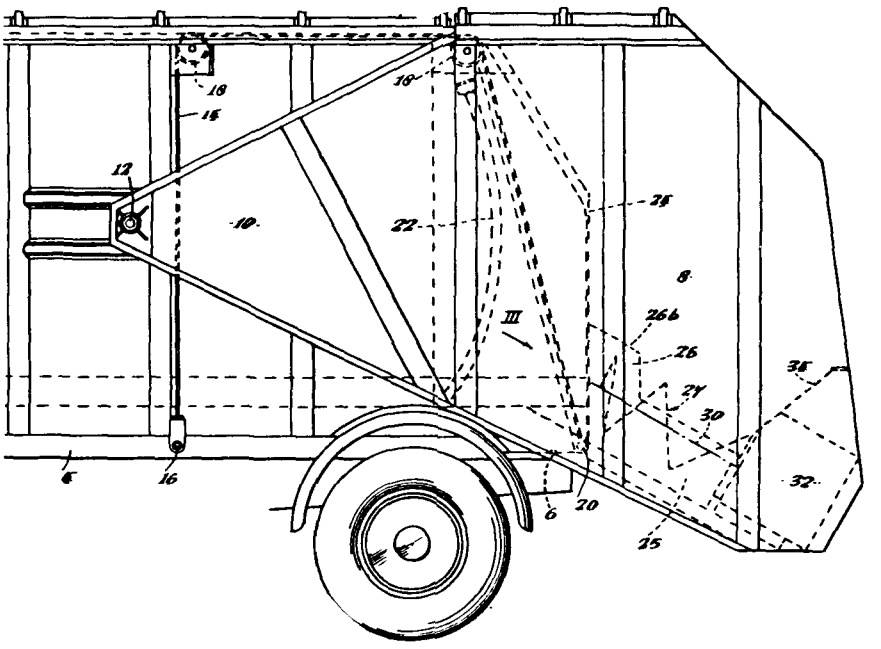


INT-0201

Greenland, J. F., and L. W. Evans (Glover, Webb and Liversidge, Ltd.) Improvements in or relating to refuse collection vehicles. Great Britain 1,114,420; filed July 26, 1965; issued May 22, 1968.

A packer mechanism forces the refuse from the loading hopper into the main chamber of this refuse collection vehicle. A pair of helical screws, arranged side by side, effect the transfer of the refuse. The axes of the two screws are parallel to each other, and their arrangement is such that they rotate in the same direction but 180 degrees out of phase. In order to prevent refuse from jamming in

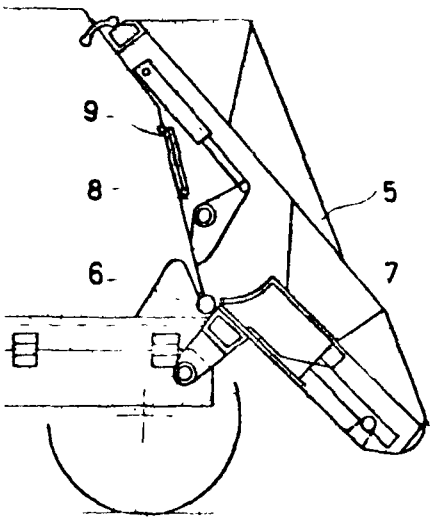
the tunnel, the diameter of each screw is tapered, and the axes are upwardly inclined at approximately 25 to 35 degrees to the horizontal.



INT-0202

Roedel, M. (Maschinenfabrik Augsburg-Nuernberg A.G.). Refuse collection method. Germany 1,269,569; filed May 11, 1966; issued May 30, 1968.

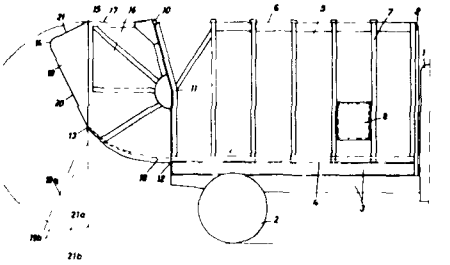
A device for the collection and transportation of refuse is constructed so that a full container can be transferred to a transport vehicle, and then to a center for disposal or processing. The vehicle is equipped with a tipping frame to facilitate the removal of waste. The smaller collection vehicle is not constructed for travelling over rough roads, but only for saving time in cleaning the streets. The parent transport vehicle, however, is adequate for transportation of waste over rough surfaces. (See also Germany 1,198,732, 1,219,388, and 1,225,546) (Text in German)



INT-0203

Terho, M. Container dumping mechanism for garbage packer. Canada 787,214; filed Apr. 9, 1965; issued June 11, 1968.

This collection apparatus for waste comprises a vehicle having a body or tank for receiving collected waste material. A hinged collection dipper, at the rear of the vehicle body, is lowered to receive waste or cans containing

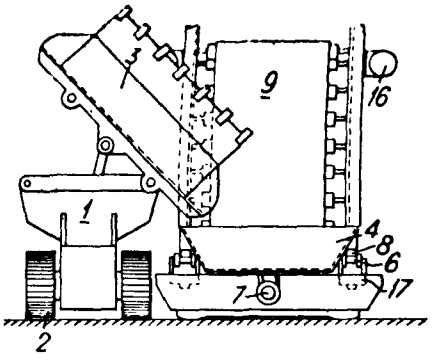


waste. The waste is dumped into the body when the dipper is swung upward on its hinge. At least one arm on the dipper is pivotal. This arm presses a suction cup against a waste can while the can is resting on the dipper, and while it is moved to a dumping position. The engine of the vehicle includes a device for producing suction in the suction cup. A number of suction cup-carrying arms are located at various positions on the dipper. A valve prevents suction while the cup is not in contact with an object. This valve closes automatically by the separation of the cup from the object. (See also U.S. 3,319,810)

INT-0204

(Siemag Maschinen-Und Stahlbau Netphen G.m.b.H.). A stage loader for loading trucks with bulk material, for example debris. Great Britain 1,117,182; filed July 26, 1965; issued June 19, 1968.

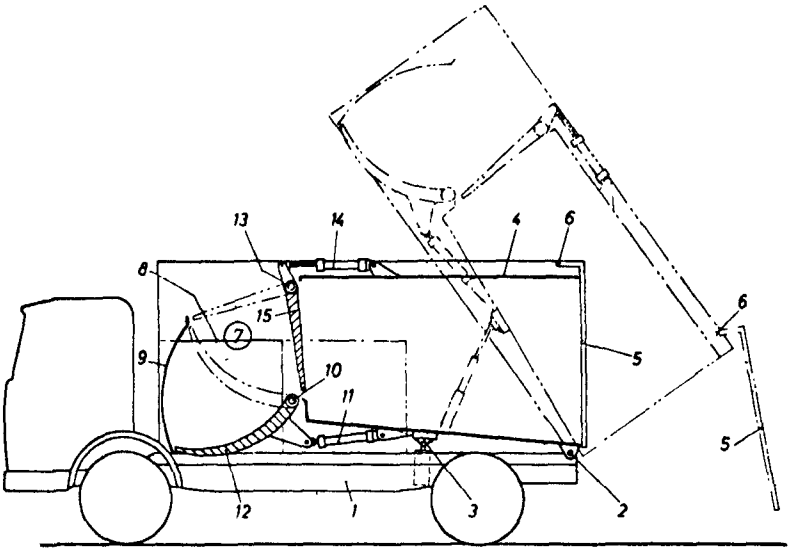
A stage loader for loading trucks with bulky waste comprises a feed receptacle into which the material can be emptied by a shovel loader. A conveyor belt and a vibrator drive the receptacle. The receptacle is carried on guides toward and away from the conveyor belt by the action of the vibrator, causing material to pass continuously from the receptacle to the conveyor belt. The stage loader has a removable protective screen covering the feed receptacle and its drive mechanism. The loader also has a frame to which a winch drum is connected for driving the scraper conveyor.



INT-0205

Schaeffler, G. (Keller und Knappich G.m.b.H.). Refuse vehicle. Germany 1,272,216; filed May 8, 1967; issued July 4, 1968.

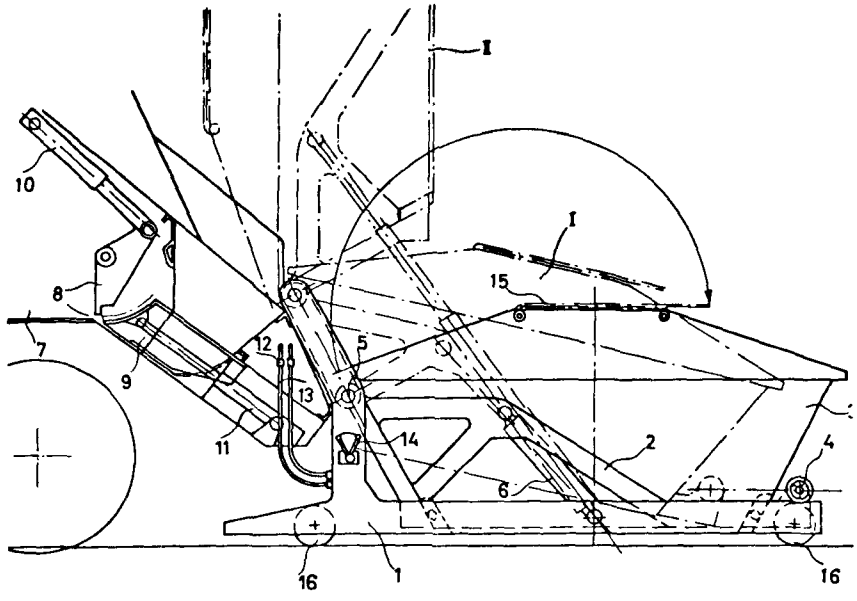
This vehicle has a refuse holder which can tip backwards. There is a loading chamber at the front containing a charging shovel, articulated for upward pivotal movement to a horizontal shaft, spaced a short distance from the base of the chamber. The refuse on the charging shovel is pushed rearward by a compacting blade, mounted pivotally on a shaft adjacent to the roof of the chamber. (Text in German)



INT-0206

(Maschinenfabrik Augsburg-Nuernberg A.G.) Free-standing device for emptying large refuse containers. Great Britain 1,129,336; filed Nov. 15, 1965; issued Oct. 2, 1968.

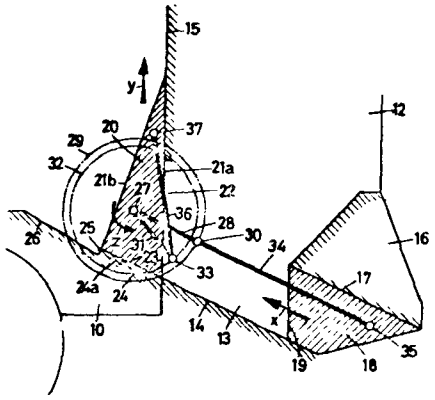
The invention consists of a freestanding device for emptying large refuse containers into a truck. The device is not mounted on the refuse truck. It comprises a main section with a tiltable frame mounted on it and adapted to carry a refuse container. There is a telescopic hydraulic device attached to the hydraulic system of the refuse truck. This is actuated to tilt the frame and empty the refuse container into the truck, when the truck is adjacent to the device. Preferably, the tiltable frame is provided with supporting and guiding rollers which engage and move on the main frame.



INT-0207

Schwabe, O. H. (Fahrzeugbau Haller G.m.b.H.). Refuse vehicle charging system. Germany 1,279,535; filed June 4, 1965; issued Oct. 3, 1968.

A charge space is limited at the rear by a reciprocating refuse pusher, and on the vehicle side by a seal-off pusher which moves vertically across the other pusher. Both devices move so that when the refuse pusher advances to feed into the vehicle, the seal-off pusher is released, but it is locked when the refuse pusher is retracted. The seal-off is a compactor whose pressure surface approaches a countersurface limiting the feed section, in a downward direction, by moving across the refuse pusher path when the seal-off pusher lifts, so refuse is crushed and precompacted before being passed on into the vehicle itself. (Text in German)

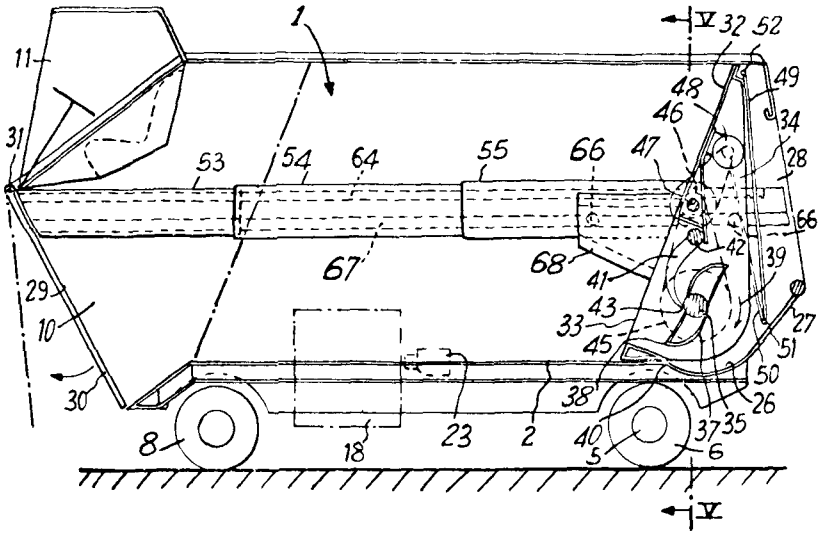


INT-0208

(Compania Immobiliaria y Financiera de La Escala S.A.). Refuse collection vehicle. Switzerland 466,794; filed Sept. 20, 1967; issued Dec. 15, 1968.

This refuse collection vehicle has a boxcar-type body, with longitudinal undercuts on both sides near the bottom. The usable space extends the entire length of the vehicle,

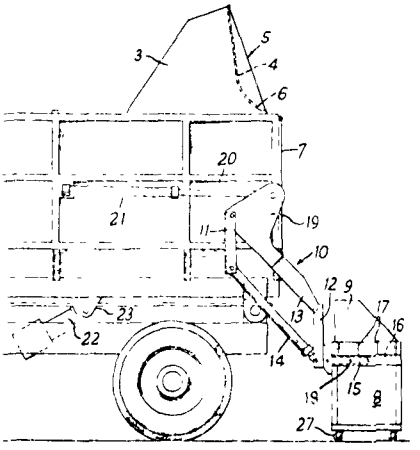
which has, at the rear end, an opening through which refuse is thrown into an input hopper. At the front end is an opening through which refuse is discharged. All motor drives and accessory equipment are accommodated in the two undercuts. The interior contains an open boxlike subassembly formed of two intermediate and two lateral, vertical, supporting plates joined by horizontal crosstie strips, and by the compacting plate. Refuse, pushed by an impeller from the hopper toward and through the loading hatch in the compacting plate, is precompacted to some degree. A horizontally pivoted scraper blade, whose edge remains in contact with the flanks of the impeller ribs as they recede from the loading hatch, prevents retrograde motion of the refuse. At intervals, refuse in the interior is pushed forward and further compacted by a forward displacement of the subassembly. (Text in French)



INT-0209

Burke, F. (Hipope Limited). Collection and disposal vehicle. Great Britain 1,141,680; filed Dec. 7, 1966; issued Jan. 29, 1969.

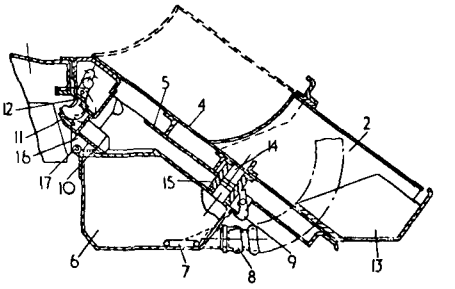
The collection and disposal vehicle consists of a container mounted on a wheeled chassis, and equipment for loading waste into it. The equipment is comprised of a charging carrier and power-operated linkages, coupled, or adapted to be coupled to the carrier. These lift the carrier in a parallel motion from a low loading position to the level of a charging opening and then tip the carrier to discharge the contents into the container. The charging opening is in the otherwise closed top of the waste container. An upstanding hood is disposed over this opening. The hood has a rearward-facing mouth closed by a hinged flap.



INT-0210

(Maschinenfabrik Augsburg-Nuernberg A.G.). A liquid refuse collecting device for refuse collecting vehicles. Great Britain 1,144,329; filed May 11, 1966; issued March 5, 1969.

This device extracts liquid from refuse or garbage containing a substantial proportion of

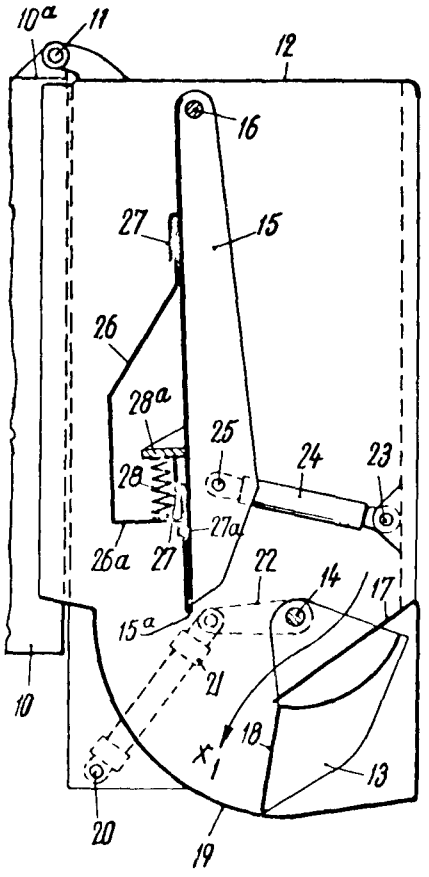


moisture, and prevents liquid dripping to the road surface when the vehicle is in motion. The device is attached to the end of the refuse compartment of a collecting vehicle. It consists of a loading bin or ram and a base plate for guiding the loading bin or ram to the refuse compartment. A liquid collecting vessel is situated beneath the base plate. The base plate has means for allowing the liquid to drain into the liquid-collecting vessel.

INT-0211

Schwabe, O. H. (Fahrzeugbau Haller G.m.b.H.). Feeding system for a refuse container, especially a refuse vehicle. Germany 1,293,675; filed Sept. 26, 1967; issued Apr. 24, 1969.

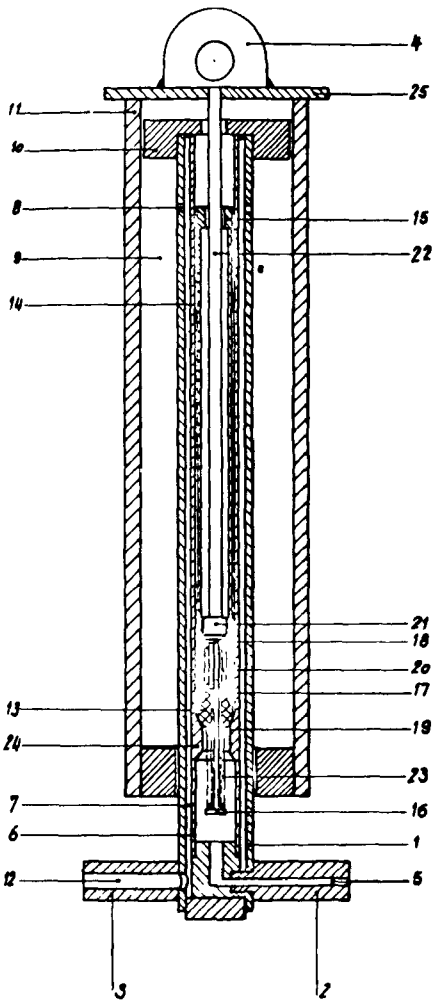
This system bulk feeds refuse into a vehicle body. One shovel deposits refuse which is then scooped up by a second conveying shovel. The two shovels are interdependent. (Text in German)



INT-0212

Goetz, E. (Eisenwerk Streuber and Lohmann G.m.b.H.). Pneumatic cylinder for agitating the arm of a hopper for the dustless emptying of refuse containers. Germany 1,294,217; filed May 24, 1962; issued Apr. 30, 1969.

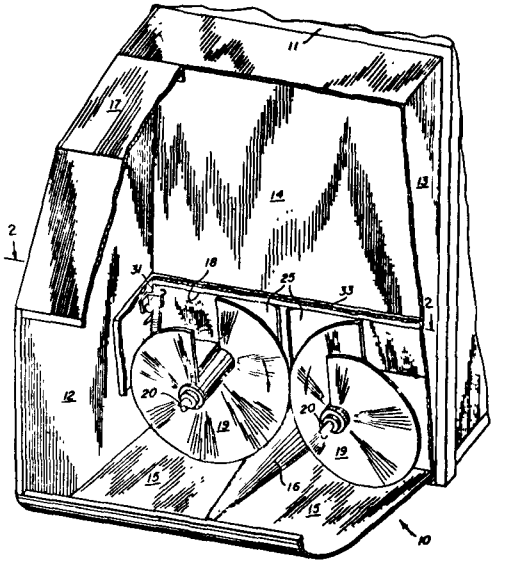
This pneumatic cylinder powers a refuse container emptying system. The stroking speed of the cylinder is controlled automatically by a throttle valve, working with a rod, on the cylinder cover. An isolator valve, carried with the valve disc via a compression spring, permits the cylinder to be used as a tilting and lifting device. (Text in German)



INT-0213

Sagmeister, E. Refuse packer. Canada 813,188; filed June 27, 1966; issued May 20, 1969.

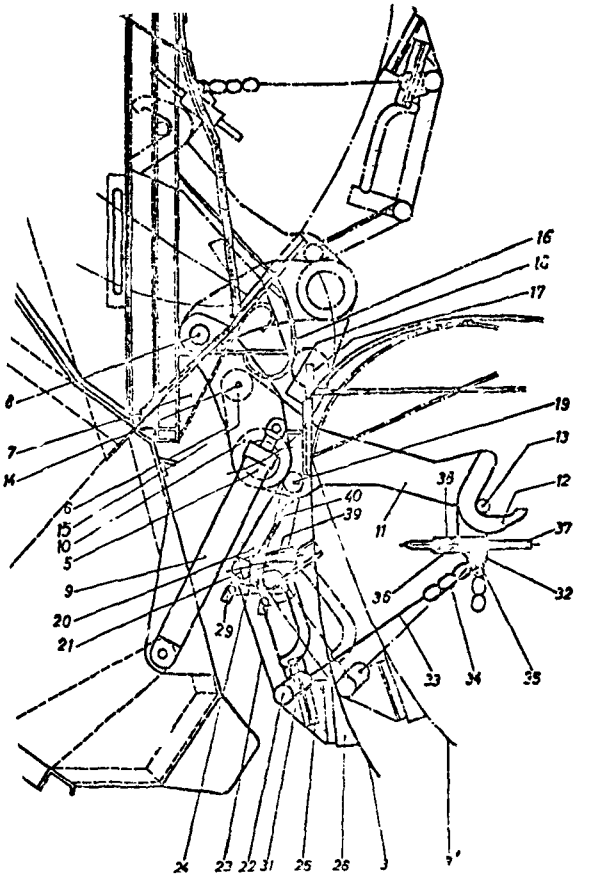
This refuse-handling apparatus comprises a receiving body with a screw conveyor device adjacent to the opening at one end. When the screw conveyor rotates, it causes refuse to be drawn from the receiving chamber, through part of the opening, into a refuse vehicle body. A scraper device is placed across the entire remaining part of the opening, and it is resiliently pushed against one end of the screw conveyor. The scraper extends at least halfway across the screw conveyor, in a lateral direction, in order to dislodge refuse from the screw conveyor. A stop on the wall adjacent tc the scraper limits its movement; this reduces the spilling of refuse from the vehicle body through the opening.



INT-0214

Goetz, E. (E. Zoeller, and H. Schulz-Zoeller). Tipping device for emptying large capacity refuse containers. Germany 1,298,445; filed Mar. 7, 1966; issued June 26, 1969.

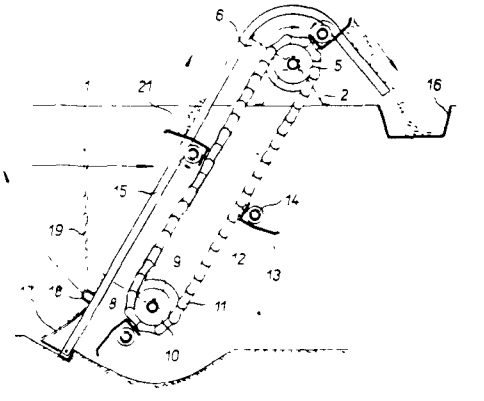
This refuse bin tipping mechanism has a support formed by articulated levers, interconnected by a pivot pin along the arms. The lower levers form a frame with a connecting rod and their pivot pin, which has auxiliary hooks associated with container buffers supported by the connected rod. Support arms, actuated by the cable drivers, are adjustable by a coupling mechanism so standard and nonstandard waste containers can be emptied in random sequence. (See also Germany 1,269,037) (Text in German)



INT-0215

Harvanek, A., and V. Chalupnik (CHEPOS zavody chemickeho a potravinarskeho strojirenstvi, Brno ob orovy podnik). Grid with a cleaning device. Switzerland 474,629; filed May 12, 1967; issued June 30, 1969.

A device is provided for clearing a grid of solid refuse. It consists of combs mounted

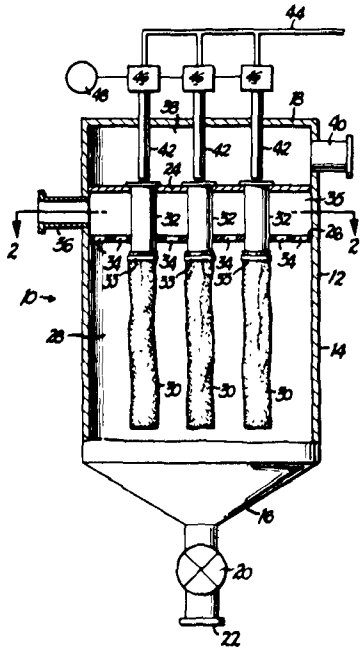


on a link belt. The teeth of the combs protrude through the grid. They are rounded in the opposite direction of their movement to ensure simpler discharging of the refuse material, since nothing can be caught in the obtuse angle between the grid and the comb teeth once they have moved over the top of the grid. (Text in German)

INT-0216

Hirs, G., and Stein, A. H. (Hydromotion Engineering Company). Dust collector. Canada 817,176; filed Nov. 25, 1966; issued July 8, 1969.

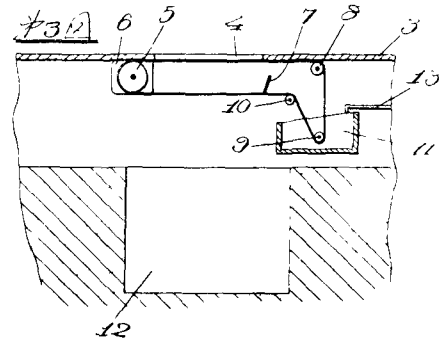
This device filters dust-laden gas. A wall separates the chamber into an outlet area and a filtering portion. Tubes extend downward from the outlet chamber into the filtering chamber. Within the filtering chamber, porous, gas-permeable bags are attached to the tubes. Dust-laden air flows into the filtering chamber in a horizontal stream, and is dispersed downwardly along the sides of the bags. An upward flow of air is induced through the interior of the bags. Dust collects on the exterior of the bags. Periodically, pulses of air under pressure abruptly inflate the bags, dislodging dust from their exteriors. Clean air is exhausted through the outlet chamber.



INT-0217

Nunota, T. Device to treat human manure. Japan 44-16,989; filed Sept. 15, 1964; issued July 26, 1969.

A device to collect waste matter from latrines and kitchens consists of an endless belt which has one opening, and whose surface touches the surface of the floorboard or backside of the lid. The lower part of the belt passes through the cleaning tank. The mechanism to rotate the endless belt is connected to the roller. The inside of the belt is equipped with the scraping board. The traditional types of Japanese latrines (which are not flushed) and kitchen garbage containers are unsanitary, because there is no sealed lid to keep out flies. The endless belt system shuts out air from the waste tank. The belt is made of stainless steel or synthetic resin. There is an opening on the board through which feces drop. The driving roller moves so the opening in the endless belt comes under the opening in the floor. When not in use, the part of the endless belt without an opening is under the opening in the floor. The dropped waste is scraped by the board and drops to the tank below as the roller rotates. When the roller is moved, part of it goes through a tank fed with cleaning water by the pipe, so the belt is always clean. The roller can be operated either electrically or manually. There are no problems with obnoxious odors or flies. (Text in Japanese)

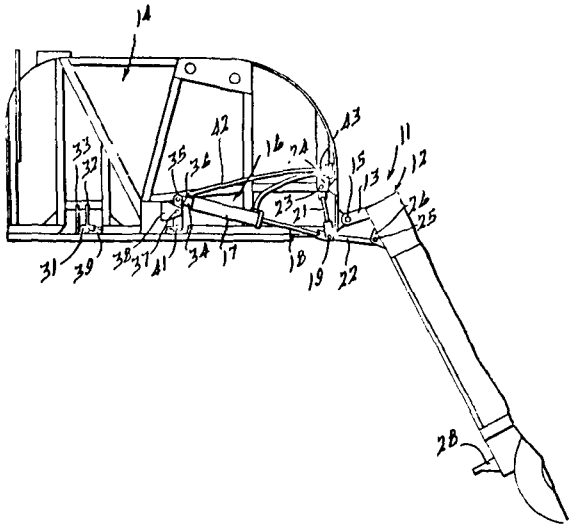


INT-0218

O'Brien, A. J. (Gar Wood Industries). Refuse vehicle. Canada 821,355; filed June 29, 1966; issued Aug. 26, 1969.

This latch-operating device for controlling the closure member of a refuse vehicle operates automatically. This device includes interengaging latch means, positioned outside of the storage area. The latch can be opened or closed closed automatically, and can withstand the pressure created when the vehicle is compacting

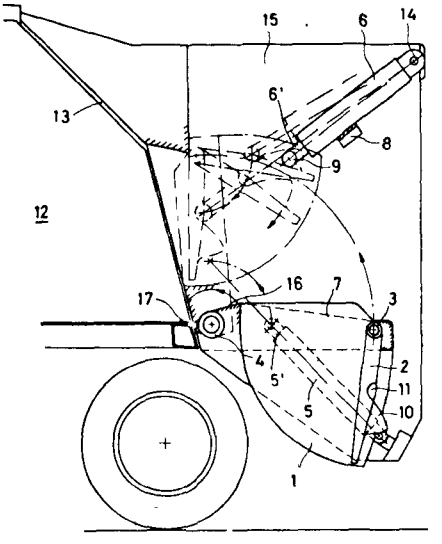
refuse. The automatic latch device facilitates unloading the refuse vehicle.



INT-0219

Zuber, R., and H. Pertsch (J. Ochsner and Company A.G.). Attachment for a refuse compaction vehicle for picking up and loading refuse and bulky rubbish. Switzerland 479,465; filed Apr. 8, 1968; issued Oct. 15, 1969.

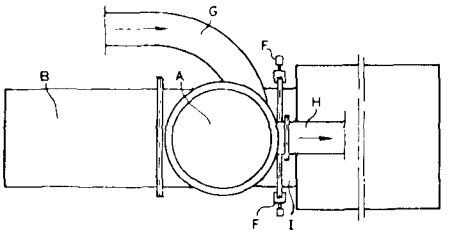
The attachment incorporates a trough-shaped loading scoop with a presser plate. Linkages and hydraulic drives are required for the operation of the scoop, and the several phases of its operation. An alternative version of the scoop and its phases of operation are also disclosed. (See also Switzerland 445,375) (Text in German)



INT-0220

Medhammar, K. I. M. (A.B. Centralsug). Method and device for removal of refuse. Switzerland 480,244; filed Jan. 24, 1969; issued Oct. 31, 1969.

Refuse, arriving at an intake station, is conveyed through a duct by suction into a collecting container in which the refuse is separated from the air. During the influx of the newly arriving refuse into the collecting container, and during the maintenance of the underpressure in this container required for this influx, refuse already present in the container is removed and compacted. The collection container is equipped with an outlet duct connected to a device for discharging the refuse. The discharging device is designed to prevent entry of outside air into the container during the discharge operation. (Text in German)

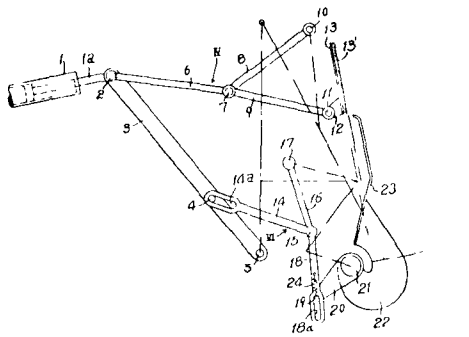


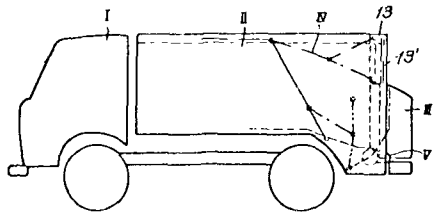
INT-0221

Nagai, T., and S. Kawasaki (Urga Heavy Industry Company). Garbage truck. Japan 44-29,085; filed Apr. 3, 1965; issued Nov. 27, 1969.

This improved mechanism is designed to operate a pivotal bucket to receive garbage. It includes a shutter which moves vertically to close off the garbage. The device is provided for a garbage truck which has the dumping opening in the rear of the body. To increase the inlet capacity of the truck, it is necessary to increase the size of the receptacle of the pivotal bucket and the dumping opening at the same time. However, it is easier to increase the capacity of the bucket than the opening because, if the opening is too large, garbage already loaded can spill out, scattering over the street. The invention corrects this defect, having a big dumping opening at a suitable height from the ground, to facilitate both the dumping of bulk garbage and crushing and transfer to the garbage box. After the garbage is received by the bucket, and before it is stored inside the garbage box, it is crushed between the rotating bucket and shutter, which operates vertically. Dumping and crushing are carried out by a single oil pressure (or compressed air) mechanism, through the cylinder piston. The device includes: a

garbage collection box on the chassis; a comparatively long arm, pivoted on the box, which moves forward and backward; an oil-pressure or compressed-air piston to operate the arm; first and second link devices, which move against each other; a shutter, which operates vertically; and a rotating bucket operated by the link devices. (Text in Japanese)

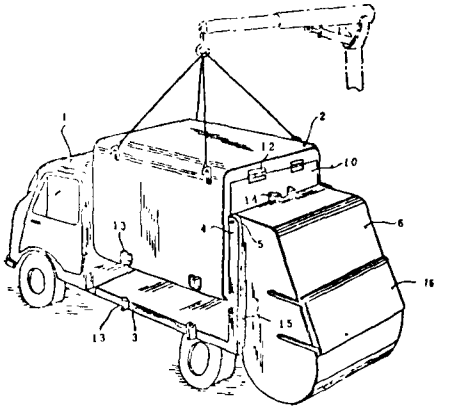




INT-0222

Uehira, H., and T. Uda (Shin Meiwa Kogyo K.K.). Garbage truck with a removable container. Japan 44-30,923; filed Aug. 12, 1965; issued Dec. 11, 1969.

Small collection vehicles are especially useful in narrow passageways where collection is usually difficult. Since large-scale incineration plants are usually located far from urban areas, it is more efficient to use larger trucks to transport wastes to the plants. A removable container can be placed on a small truck for the collection of refuse and the truck can dump it, using the hoist attached to the container dumping table, if the incineration plant is nearby. However, if the distance to the plant is too great, the container can be lifted by crane onto one of the larger trucks placed conveniently throughout the city. An oil pressure cylinder operates a plate, which is installed at the rear of the container dumping table, to either dump refuse or push it into the container. The plate also serves as a door. This door and its oil pressure cylinder can be detached. (Text in Japanese)

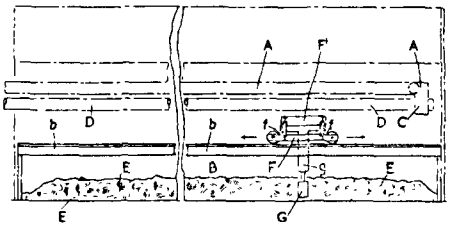


COMPOST/COMPOSTING

INT-0223

James. A. E. W. (Heenan and Froude Limited). Improved method of turning over and mixing refuse and sewage. Great Britain 604,706; filed Nov. 30, 1945; issued July 8, 1948.

This method relates to mixing town refuse and sewage or sewage sludge for the production of fertilizer. The refuse, in pulverized form, is fed into a long, narrow hopper or receptacle. The sewage or sludge is then introduced by means of pipes, or the like, onto the top of the refuse; the contents of the hopper are then turned over by a plough, harrow, or similar device. This plough or harrow can be moved either transversely or lengthways along the hopper or receptacle and is supported by a carriage which can be moved at right angles to the direction of movement of the plough or harrow. The pulverized refuse and the sewage or sludge are thus given a thorough mixing. Two hoppers or receptacles may be arranged side by side, each with its own mechanism for turning the refuse and sewage.



INT-0224

Baillod, P., and G. Boss. Organic compounds coming from organic wastes and the resulting compost. Switzerland 251,131; filed Oct. 15, 1947; issued July 16, 1948.

Fermentation of night soil, garbage, or

industrial organic waste by a bacterial culture of azotobacter, amylobacter, or Bacillus radicola is induced by the addition of a mixture of inorganic salts which act as catalysts. A solution containing approximately 1 g vanadium pentoxide, 2 g molybdenum sesquioxide, 2 g manganese tetroxide, and 0.5 g cadmium borotungstate per liter is suitable. Another possible mixture is 1 g vanadite, 2 g molybdenum disulfide, 2 g manganese dioxide, and 0.5 g cadmium borotungstate per liter. One liter of the catalytic mixture is added to a ton of organic material containing preferably 30 percent moisture, and the material is then allowed to ferment. For best results, the temperature should not rise above 40 C. After 4 to 5 days, lime should be added to bring the pH to about 7.5. The resultant product is a fertilizer. (Text in French)

INT-0225

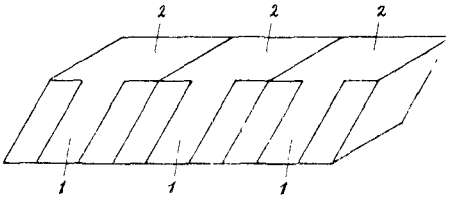
Spaeth, O. Method for converting communal refuse into fertilizer and soil improvement agents. Germany 821,947; filed Mar. 8, 1949; issued Nov. 22, 1951.

Communal refuse or sludge is spread in layers without sifting or removal of bottles, cans, rags, etc. Numerous holes are drilled into the refuse layer to create channels for passage of air. Upon attainment of a temperature between 40 and 60 C, these channels are partly or entirely sealed. By this method, the fermenting process can be controlled. If the refuse contains no bulky parts such as cans, bottles, etc. they should be added. The air passage channels are sealed with fine-grained refuse. Sludge is added only after the first stage of the fermenting process is completed. It can be spread over the solid refuse so that the air channels are sealed. Any coarse refuse components, still present after the composting process, must be separated and mechanically shredded, then returned to the composted material. (Text in German)

INT-0226

Eichhorn, R. Container for composting. Germany 823,034; filed Sept. 5, 1950; issued Nov. 29, 1951.

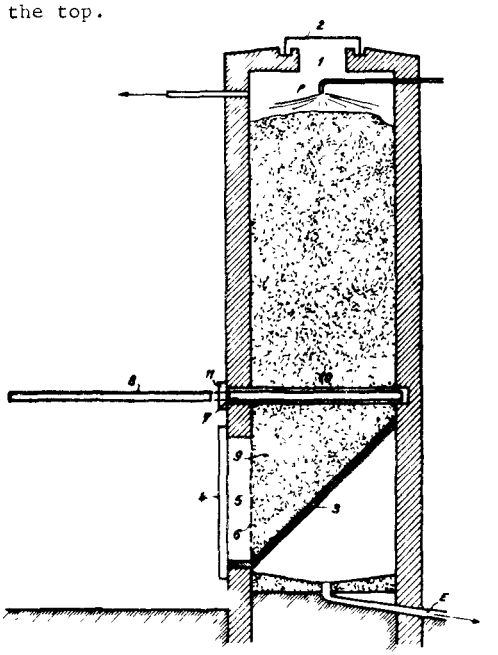
A prism-shaped container has been devised for composting any sort of gardening wastes such as leaves or residual matter from vegetables and fruit. On its front and top, a central opening extends toward the rear side. This opening is closed in front and on top by plates. The container may consist of one or more sections, and it may be of concrete, iron or any other suitable material. The top opening may extend over the entire top side. (Text in German)



INT-0227

Pitrois, G. Process for the continuous operation of fermentation cells for garbage, town-refuse and various other substances, and cell for executing said process. Canada 480,398; filed Jan. 15, 1946; issued Jan. 22, 1952.

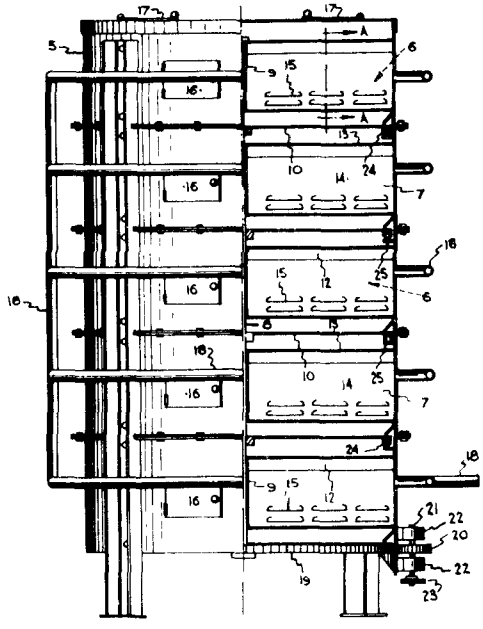
A cell for the fermentation of garbage and other refuse has a filling opening at its top and a discharge opening at its base. Between the top and bottom is a lateral opening through which a separating device, such as a grate, can be introduced to cover a horizontal section of the cell. The lateral opening can be hermetically closed. The cell is discharged by inserting the separating device and extracting the fermented matter from the lower portion of the cell. The separating device is then withdrawn, so matter in the upper portion falls to the lower portion. The empty upper portion can then be filled through the opening at the top.



INT-0228

Lovett, G. S. Means for the treatment of organic waste materials for the purpose of forming fertilizing material therefrom. Australia 145,047; filed June 2, 1949; issued Feb. 8, 1952.

Organic wastes are fermented and decomposed in this digestor, which is divided into stepped processing compartments by a number of horizontally disposed floors. Each floor has an opening of quadrantal shape through which the material falls to the next floor. The openings are in staggered relationship. The floors are divided by radially disposed elements, hollow and substantially quadrilateral, each with an air pipe leading into it; louvred openings are provided so that air may pass out of the elements to the material being treated. A central, vertical shaft rotates the floors at predetermined intervals. The underneath sides of the peripheral portions of the floors ride on roller tracks on horizontal ledges on the inside of the container. Each processing compartment has an inspection door, and there is a hinged loading door on top. The end product from organic wastes treated in this digestor is a fertilizer, devoid of offensive odors.



INT-0229

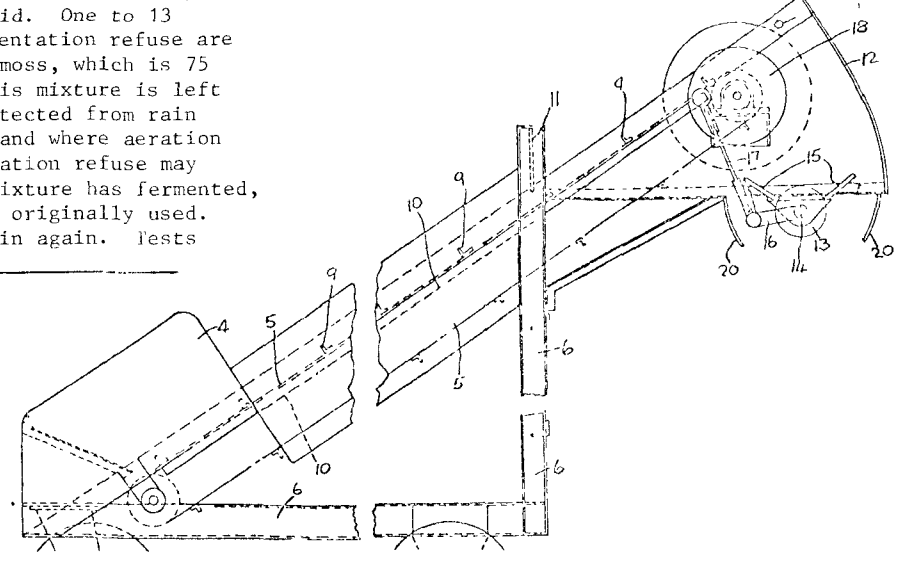
Christensen, W. G. A. A compost for horticultural or agricultural use, and the production thereof. Great Britain 701,234; filed, Aug. 21, 1951; issued Dec. 23, 1953.

A fermented mixture of fermentation refuse from the manufacture of antibiotics and peat moss produces a compost suitable for horticultural and agricultural use. A filter cake containing 20 to 30 percent dry substance (in the case of penicillin) is obtained by filtering fermentation fluid. One to 13 parts of the filtered fermentation refuse are combined with 1 part peat moss, which is 75 percent dry substance. This mixture is left to ferment where it is protected from rain and temperature extremes, and where aeration is possible. More fermentation refuse may be added after the first mixture has fermented, if less than 13 parts were originally used. The process would then begin again. Tests show that the finished product has a pH of about 7.5, and is about 66 percent water, 1.25 percent nitrogen, and approximately 3.63 percent nitrogen in the dry substance.

INT-0230

Allan, F. Compost mixing machine. Great Britain 704,403; filed July 5, 1951; issued Feb. 24, 1954.

This machine produces compost from natural or artificial manure with a straw basis. The

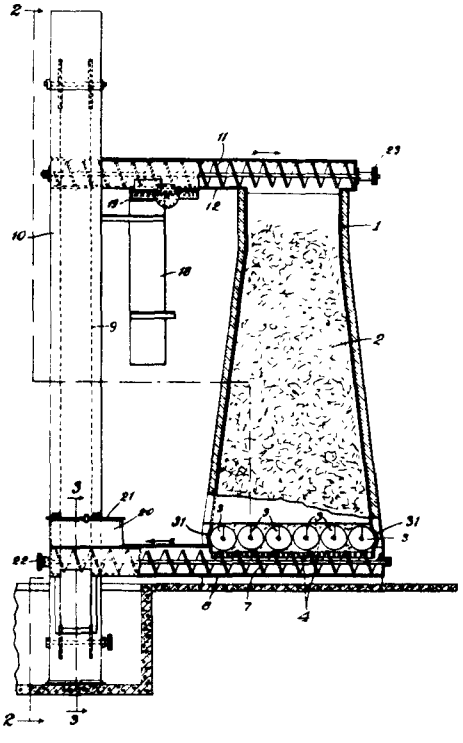


machine comprises an elevating or conveying mechanism which discharges into an elevated hopper fitted with a series of spikes projecting from a transverse axle or drum, adapted to be oscillated through an angle of less than 180 degrees. These spikes cooperate with one or more series of fixed combs, the teeth of which mesh with the spikes and extend wholly or partly across the lower part of the elevated hopper. Two such combs extend downward and inward toward each other from the lower edges of the hopper, parallel with the axis of the oscillatory axle or drum. The two combs are spaced from, and extend partly around, the lower circumference of the axle or drum, which is mounted in or just below the lower end of the elevated hopper. The axle or drum is provided with two rows of spikes at an angle of less than 180 degrees to each other, and at an angle of about 115 degrees. The conveying mechanism may comprise an endless elevator of the scraper type, and a fixed comb suspended over the elevator and cooperating with it. A loading hopper is provided at the lower end of the elevator. The entire device is mounted on a wheeled carriage to provide a readily mobile machine.

INT-0231

Morrison, W. L. Improvements in or relating to method and apparatus of composting raw manure. Australia 164,518; filed Sept. 1, 1953; issued Aug. 9, 1955.

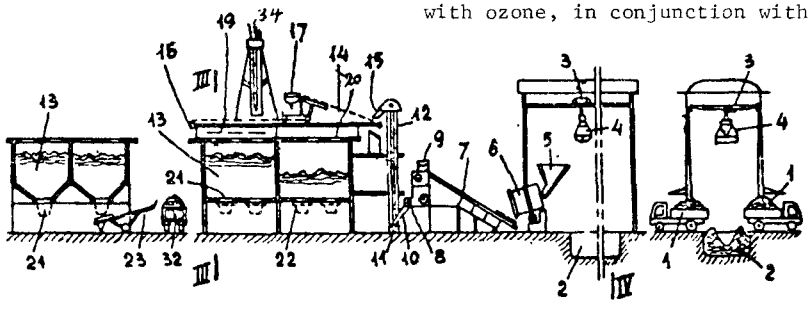
A method of composting manure consists of maintaining a vertically disposed mass of manure in a composting zone which is open to ambient atmosphere at both ends. Some of the manure is withdrawn from the bottom, aerated, and returned to the top. The process is continued until the entire mass has been treated. Air is forced upward through the mass to increase the circulation rate. This composting machine includes an open-ended chimney, means for supporting the mass, and a propeller to move from the bottom of the chimney the layer of material to be delivered to the top. A separate conduit and blower circulate pressurized air through the chimney. Gas is discharged from the chimney by the blower. The propeller comprises a number of conveyor screws arranged side by side and extending across the bottom of the chimney to form a grate, and means to rotate them. The screws propel some of the manure in the chimney along the foraminous floor below the screws.



INT-0232

Boggiano-Pico, N. Procedure and installation for converting urban waste and similar materials to fertilizer or sterile substances. Italy 537,793; filed July 6, 1955; issued Jan. 4, 1956.

Urban wastes are transformed through a complete cycle of mechanical operations, completely removed from human handling. The method is based on the action of an oxidizing fluid, such as air or air enriched with ozone, in conjunction with the

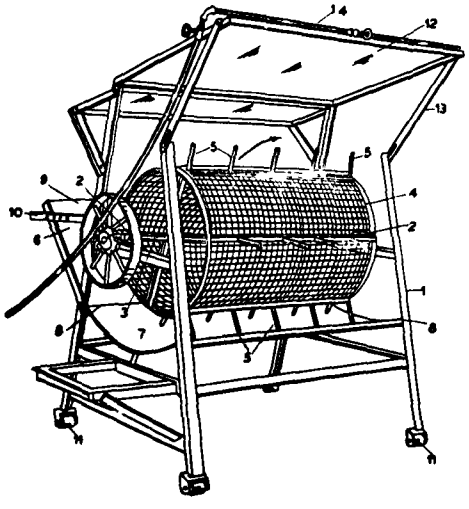


energizing action of an electrical field. The mechanical operations include the following: removal from the ditch or conveyance of the waste material; mixing; electromagnetic separation of ferrous material; grinding; distribution to silos; conversion under the action of an oxidizing fluid and electrical field; and collection of the resulting fertilizer or sterile materials. The process offers the advantages of accelerating the conversion process, dealing with the lack of homogeneity of the raw materials, and permitting the use of a more compact processing plant. (See also Great Britain 717,785) (Text in Italian)

INT-0233

Robertson, W. E. Improvements in machines for teasing, aerating, and stacking compost. Great Britain 767,938; filed Nov. 13, 1952; issued Feb. 13, 1957.

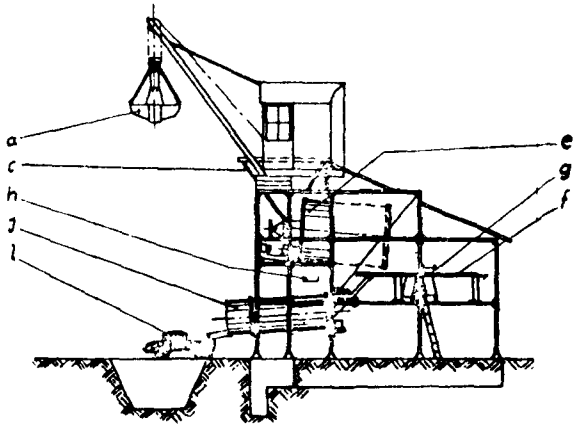
The machine features a frame which is normally stationary during its operation, and a drum mounted on the frame, having radially projecting spikes. There is a device for rotating the drum at a speed at which the spikes pick up material from a feed supply and project it tangentially away from the upper surface of the drum and beyond the frame; a hood is fitted over the drum to direct the material thus projected. The inclination of the hood may be varied by adjustable supports. The drum is made of wire mesh in the form of a trommel. The machine may be used for teasing, aerating and stacking the compost.



INT-0234

(Passavant-Werke). Plant for refuse treatment. Germany 962,691; filed May 13, 1954; issued Apr. 25, 1957.

A plant for the treatment of communal and agricultural refuse consists of charging equipment, a sifting drum with gradually widening holes, a separator for nonputrescible refuse, and a mixing drum for the sifted refuse and sewage sludge. This equipment can also be used for treatment of composted refuse. In that case, the mixing drum and the sewage sludge intake are closed. The nonputrescible refuse can be used as ground cover material in the drying beds over which the sludge is spread. The refuse is loaded into a hopper. It is brought to the sifting drum through a screw conveyor. Holes of 10-mm diameter are recommended for the first stage, 40 mm for the second stage and 100 mm for a third stage. The material separated between 40 and 100 mm in size is suitable for composting. It is passed to the mixer, which is simultaneously charged with sewage sludge. The material then goes to drying beds. After about 6 months, composting is completed. The compost is sifted in the same manner as untreated refuse. The fine compost from the first stage is sent to nurseries. The compost from the second and third stages is shredded into smaller grains. (Text in German)

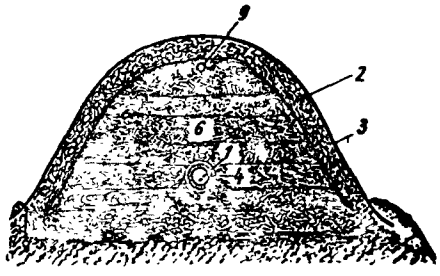


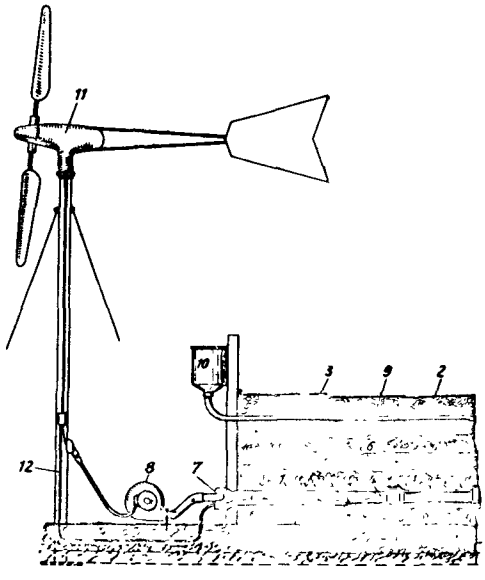
INT-0235

Koester, F. Procedure and method for preparation of compost from organic plant wastes. Germany 1,013,300; filed Nov. 8, 1954; issued Aug. 8, 1957.

This procedure accelerates the processes promoting growth of microorganisms in the preparation of compost, especially in cold, windy climates. Organic plant wastes, manure, earth and other supplements are

loosely stacked in heaps covered with a layer of straw over which is placed a layer of tar paper to prevent moisture loss. Ventilation of the innermost layers is provided by a tube placed horizontally through the center of the compost heap layer. Heat is provided by an electric heating element which maintains temperatures between 25 and 30 C. Moisture is provided by pumping water through a finely perforated tube which runs through the length of the compost heap. Power for driving the air and water supply mechanisms is obtained from a windmill. (Text in German)





INT-0236

Mayer-Krapoll, H. (Ruhr-Stickstoff A.G.). Improvement of fertilizers from garbage and/or clarified sludge. Germany 1,013,299; filed Jan. 20, 1956; issued Aug. 8, 1957.

A process is provided for obtaining improved fertilizer from garbage and clarified sludge, separately or combined. Fermentation is induced in the presence of added ammonia, particularly in the gaseous form. Garbage, clarified sludge or a mixture of the two are treated with ammonia gas (or in aqueous form), before, during or after fermentation. The amount of ammonia incorporated is approximately 80 to 120 percent of the nitrogen content of the crude starting product. (Text in German)

INT-0237

Onoda, K. Chemical to accelerate composting. Japan 33-9,220; filed May 7, 1956; issued Oct. 17, 1958.

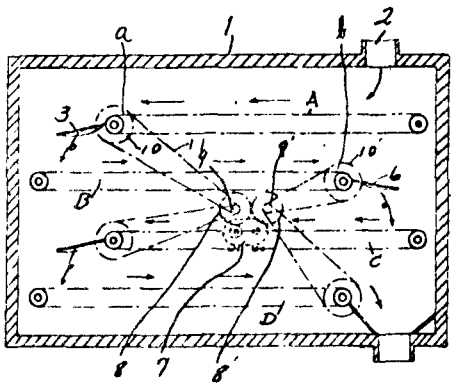
A chemical that accelerates composting is primarily a mixture of phosphate, nitrogenous compounds, and potassium salts with the addition of such reducing substances as soluble ferrous salts and hydroquinone. For the phosphate, nitrogenous compounds, and potassium salts mixture, a small amount of manganate (e.g. manganese sulfate), molybdate (ammonium molybdate), silicate (ammonium silicate) and borate (ammonium borate) may be added, although these are not absolutely necessary. About 200 to 400 g of the chemical, dissolved in 40 gal of water, is used for about 625 kg of rice straw, wheat straw, or leaves that are either soaked in water or mixed with stable compost or human wastes. The soluble ferrous salt yields ferrous ions which react with the substances in the compost heap to form complex ferrous salts, while the sulfides and chlorides formed and liberated during this process act on lignin to soften and dissociate its fibrous structure, thus aiding infiltration by aerobic bacilli. Usually, bacilli discharge various organic acids to live, but the presence of the acids is detrimental to further growth and propagation. Because the ferrous salts help to neutralize these acids, uninterrupted propagation of the bacilli can occur and the complete composting process may finish within 30 to 50 days, rather than in the usual period of several months. (Text in Japanese)

INT-0238

Igarashi, M. Garbage digestion method. Japan 34-8,875; filed Aug. 27, 1956; issued Oct. 2, 1959.

In a new biological garbage treatment method, both pyrolytic aerobic bacteria capable of decomposing cellulose elements, and spores of filamentous fungus capable of dehydrating garbage, are inoculated into garbage. Fertilizer can thus be economically produced from garbage. The digestion tank has four endless belt conveyors, all of which run horizontally within the tank, and which are installed one under another. Slightly twisted triangular plates are attached to the end of each of the conveyors, except the lowest. If the triangular plate for one is twisted leftward, the one below it is twisted

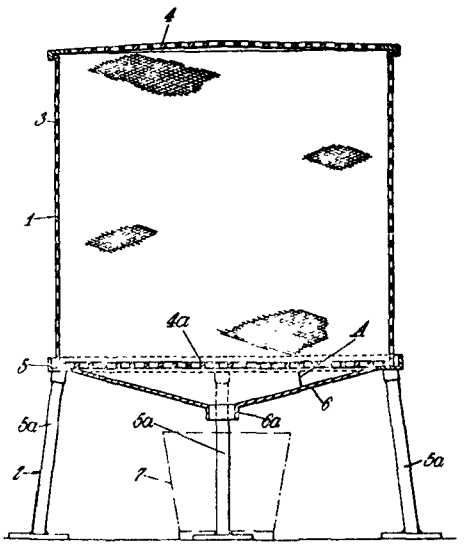
rightward, etc. At the end of the conveyor, the top garbage layer is turned over as it drops from the triangular twisted plate onto the second conveyor, thus exposing the inner layer to the air. The same turning occurs at the end of the second conveyor. This aeration accelerates the propagation of the bacteria and the active fermentation of the garbage. The conveyor is usually set at a speed to allow ample fermentation (about 8 hr per conveyor). At the end of the third conveyor (24 hr after feed-in), the temperature reaches a maximum of 80 C, indicating active fermentation. Thereafter, the temperature gradually drops to about 50 C as fermentation activity decreases. However, the garbage will still contain a water content of 40 to 50 percent. Although the filamentous fungus is killed by a temperature as high as 80 C, its spores survive. As the temperature decreases, the filamentous fungus begins to propagate and absorb the water content until the garbage becomes dry. The dry material is easily powdered for use as a lightweight fertilizer. (See also Japan 30-9,119) (Text in Japanese)



INT-0239

Smith, F. H., and L. C. Salter. Improvements in or relating to apparatus for preparing compost. Great Britain 824,391; filed Jan. 30, 1957; issued Nov. 25, 1959.

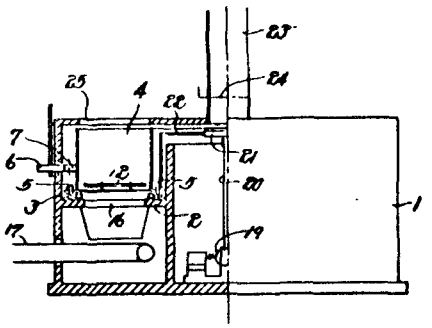
The apparatus for preparing compost from animal or vegetable matter comprises a container with perforated walls to provide aeration and moisture penetration. The assembly is supported by a lower frame which is sufficiently raised to allow proper ventilation and means for collecting drained liquids of decomposition. The compost container is cylindrical and of perforated metal. The top rim is fitted with a detachable cover to allow introduction of raw material. The bottom is a circular, perforated disc below which is a conical funnel to direct drained liquids into a receptacle.

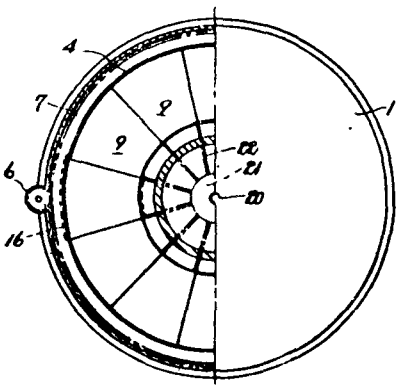


INT-0240

Kobayashi, Y. High-speed composting of garbage. Japan 35-5,876; filed Nov. 27, 1957; issued May 27, 1960.

This tubular fermentation tank's upper half is

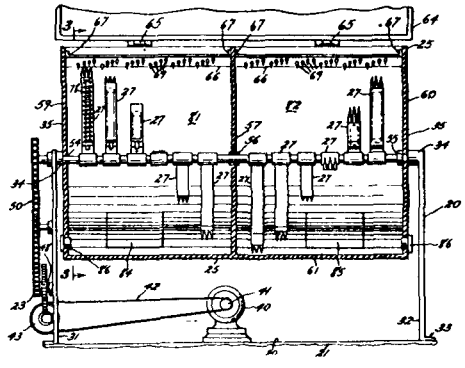




a rotary drum, having a number of small inner compartments arranged radially. The bottom, which has a castor attached, is hinged to the compartment at one side. Also, on the bottom is an aeration device, a pipe connected to the main air pipe by means of a swivel coupler. Since the external circumference of the drum is toothed all around and engaged with the drive gear from the outside, it can revolve very slowly (once every 3 days). Under the drum is the horizontal, partitioned floor on which run bottom castors. A drop hole is provided in one part of the floor. As a compartment of the drum moves over the drop hole, the bottom of that compartment swings open downward to let its contents fall to a belt conveyor. Before composting, the garbage must be separated from metal scraps, glass, plastics, rubber, and other unfermentables, and then crushed. (Text in Japanese)

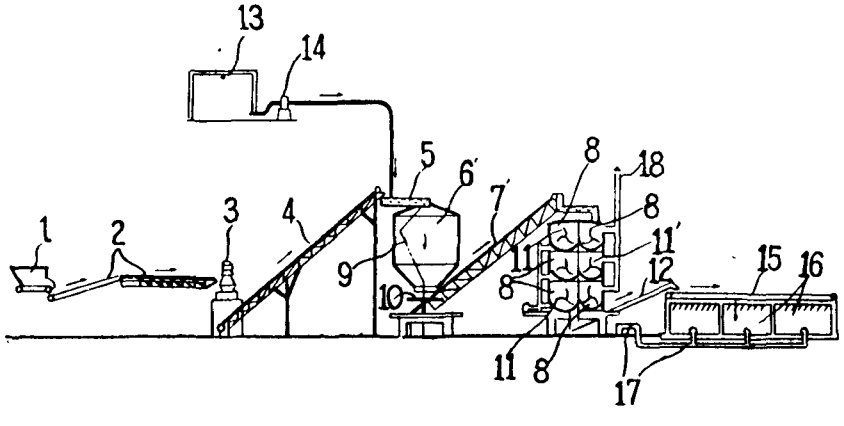
INT-0241
Carmichael, J. Compost making device. Great Britain 838,897; filed Apr. 9, 1958; issued June 22, 1960.

The compost-making device includes an assembly of two upright end supports attached to a base as the mounting facility for the driving mechanism, the tank element, and the bearing support for the shredding mechanism. The steel tank element includes parallel side and end walls and a lower curved wall. The interior is divided into two equal chambers, for continuous operation by alternate filling and emptying. The upper side forms a flat, hinged cover. A rotatory axis runs longitudinally through the tank end bearing supports, and extends to carry driving sprockets of the powered chain drive. The shredding assembly includes a set of teeth fixed to the interior of the tank wall. Rotating tooth elements are mounted at the ends of rotating radial arms, attached at intervals to the central power-driven axis. The tooth mountings feature a spring-hinged device to provide flexibility under excessive load impact. Interaction between the fixed and the rotating teeth provides the shredding action.



INT-0242
Umibuchi, Y. (Kobe City). High-speed garbage composting device. Japan 35-12,629; filed Feb. 14, 1959; issued Sept. 3, 1960.

Fully fermented and safe composts and effective organic fertilizers can be produced from raw garbage with a few days of processing. The garbage is thrown onto a conveyor system where glass, ceramics, metals and the like are removed by hand. The garbage is then fed into the crusher and conveyed to the mixer in which it is mixed with piped-in human wastes or activated sludge. The mixture drops to the table feeder under the mixer, then is carried to the fermentation tank. The interior of the tank is horizontally divided into three main chambers, and each chamber is further divided vertically into two compartments. Each compartment is equipped with a three-bladed, propellorlike stirrer, mounted on a horizontal shaft. The stirrer turns very slowly, at about

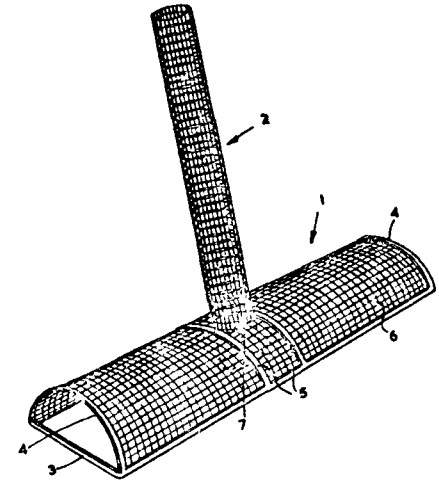


one-fifth of a revolution per minute. The garbage received in the uppermost chamber is slowly stirred and moved through all the compartments. It is discharged in about 48 hr. Old garbage, amounting to about 10 percent, may be retained in the tank and mixed with new garbage for effective fermentation. Each compartment is adjustably supplied with air. The storage/finish tank is used for secondary fermentation. Air is blown in to promote the fermentation necessary to dehydrate the initially treated garbage, and to assure complete decomposition. (Text in Japanese)

INT-0243

Whittall, J. A. (Taywit Industries Limited). Improvements in or relating to devices for use in the production of compost from vegetable matter. Great Britain 852,492; filed June 27, 1958; issued Oct. 26, 1960.

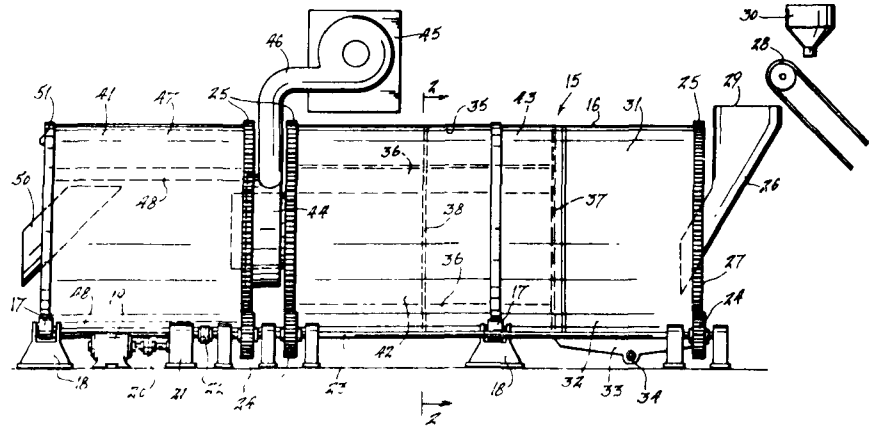
Production of compost from vegetable matter, farmyard manure, and soil is facilitated by means of stacks or vents which traverse and aerate the compost heap. The assembly comprises a base framework with an attached cladding of wire mesh or perforated sheet material, and a vertical cylindrical chimney of the same material. One end of the chimney is detachably assembled to the base. The perforated base portion is of semicircular section with open ends.



INT-0244

Earp-Thomas, G. H. Digestors for composting organic wastes. Canada 613,004; filed May 2, 1958; issued Jan. 24, 1961.

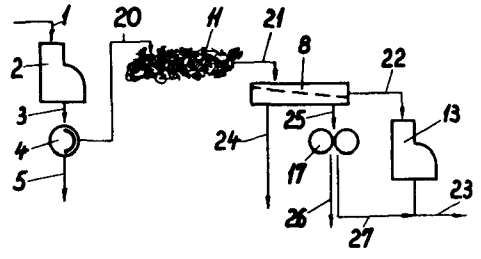
Equipment for composting organic wastes in both continuous and intermittent operation comprises a rotatable drum with a longitudinal horizontal axis. The two divisions of the drum, a treating chamber and a drying chamber, are connected by a narrow passage. There is an inlet in the drum at one end of the treatment chamber, and an outlet at one end of the drying chamber. Several screens, extending radially inward, partition the treating chamber into sections. Several of these sections have a series of inwardly directed, radial and inclined baffles to agitate the material being treated. The material passes from one section to another through central openings in the partitions. A similar series of flanges in the drying chamber causes agitation of the material, while hot air is forced through the chamber.



INT-0245

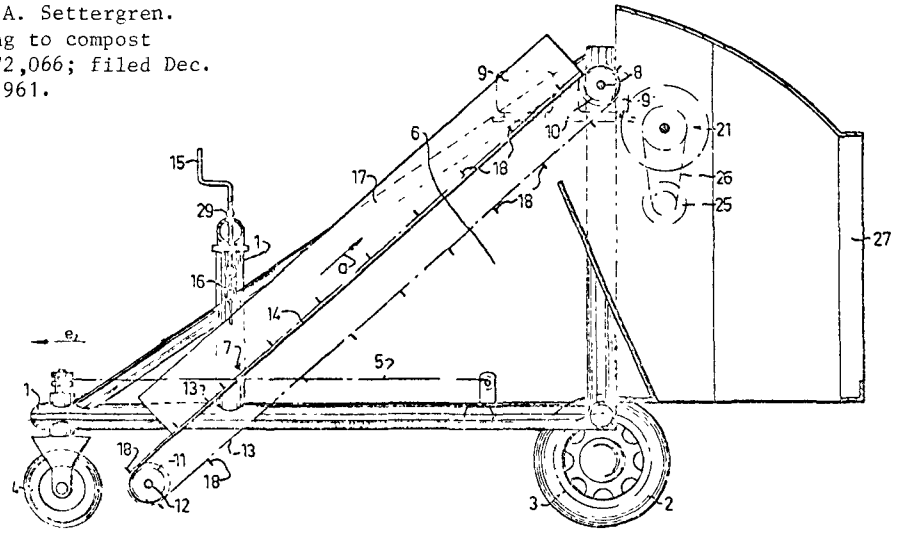
Bollinger, J., and H. E. Naef (G. Buehler). Method and equipment for refuse disposal. Switzerland 352,295; filed July 12, 1957; issued Apr. 14, 1961.

Three versions of the process and the plant are schematically outlined. The refuse is ground by a hammermill, then processed by a magnetic separator. The ferrous fraction is sent to a scrap press. The rest is placed in a swing sieve where the heavier fraction falls through the sieve opening, while the softer fibrous fraction remains. The latter goes to a composting clamp where it is decomposed over a period of 100 days. In the second version of the system, the softer fraction is first processed in a mill before it goes to the clamp. The harder fraction is reground to the grain size of sand, and then mixed with the softer fraction. According to the third version, the refuse goes to the clamp after it has been separated from the iron portion. After composting, it is separated into soft and hard fractions, which are separately ground. The resulting products are completely sterile. (Text in German)



INT-0246

Stridsberg, H., and O. G. A. Settergren. Improvements in or relating to compost turners. *Great Britain* 872,066; filed Dec. 16, 1959; issued July 5, 1961.



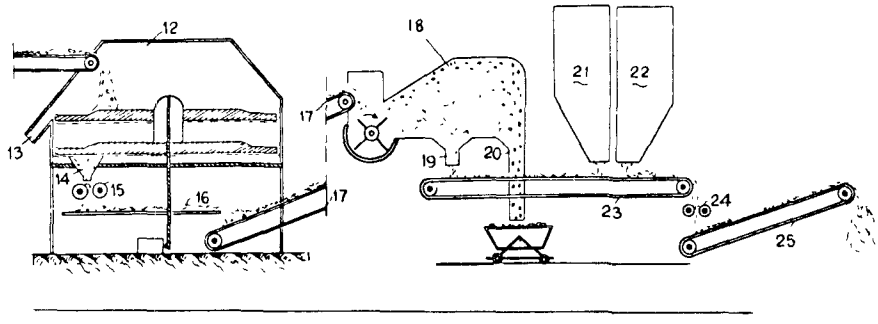
The compost turner comprises a framework carried by drive and guide wheels. Compost is fed onto an inclined conveyor, then into a motor-driven cylindrical shredding member, equipped at its ends with helical blades which carry the compost to radially projecting, tearing elements. In operation, the compost turner is moved slowly into the compost pile, parts of which are conveyed upward to the shredders and discharged through a hopper at the rear of the vehicle.

INT-0247

Fiorenzo, B. Urban solid wastes treatment and transformation into organic-mineral fertilizers. Italy 623,312; filed May 23, 1959; issued July 12, 1961.

Solid wastes are separated by a rotary screen into two fractions (greater than and less than 12 mm), then graded by hand to eliminate paper, rags, glass, bones, and nonferrous metals; eventually the waste is submitted to electromagnetic separation of ferrous parts. The product is titrated, passed through a roll crusher, and then sent to a ballistic separator (hammer crusher) to separate the heavier part of the wastes, such as wood and rubber, which are burnt in a furnace. The finer part, containing the organic matter, is mixed with phosphate rock, potassium and ammonium salts, peat, etc., and sprayed with bacterial cultures which pro-

duce acid fermentation (e.g. whey, lactic acid) and prevent possible alcohol or methanolic fermentations. The action of these organic acids on calcium carbonate and calcium phosphate increases the phosphoric anhydride solubility, either in citric acid or in ammonium citrate. This solubilization can be improved by addition of sulfuric acid or acid salts; the deodorizing and disinfecting action can be accentuated by the addition of formalin, phenol, etc. (Text in Italian)



INT-0248

Usse, J., and H. Spindler (Compagni Electro-Chimique du Centre). Humus fertilizers by fermentation of garbage. Germany 1,126,895; filed Jan. 21, 1960; issued Apr. 5, 1962;

Alkali-containing wastes from the sodium hydroxide treatment of straw are used as agents for the neutralization of fermented garbage acidity, prior to composting. This considerably shortens the time needed for the biological autoregulation of the compost pH value. The wastes contain further silicates and organic substances, such as lignin, that modify the colloidal state of the garbage, thus forming large, reactive contact areas. The wastes are also good nutrients for microorganisms. Thus, an alkali waste is mixed with garbage in the ratio of 35,000 liters to 100 tons. The composting is carried out in air for 4 to 5 weeks. A granular substance is obtained containing 40 percent water. The yield is 70 percent. (Text in German)

INT-0249

(Urbiochimica- S.p.A.). Organic-mineral fertilizers. Italy 640,590; filed Nov. 17, 1959; issued May 30, 1962.

Organic refuse is treated with mixtures of an acidifying microorganism, such as Lactobacillus pentoaceticus, L. fermenti, or L. plantarum, a microbiological activator, and an acidifying liquid, such as phosphoric acid. The mixtures obtained are fermented anaerobically, and then aerobically. Aqueous solutions containing about 10 percent (culture plus activator) and 5 to 10 percent phosphoric acid are used. (Text in Italian)

INT-0250

Clement, H., and P. Clement. Production of fertilizer from bagasse by-products. France 1,303,380; filed Oct. 12, 1961; issued July 30, 1962.

A procedure is provided for the production of fertilizer from by-products of sugarcane processing. Wild bagasse and screenings are separated by pneumatic aspiration or other means during transport to the heating chamber. The material is inoculated with bacteria mixed with mineral salts and hormones, in amounts to create proper balances of phosphoric anhydride and potassium oxide and N-nitrogen. The mixture is stored in stacks for 4 weeks and yields a composition comparable to that of the soil in which it is to be used. (Text in French)

INT-0251

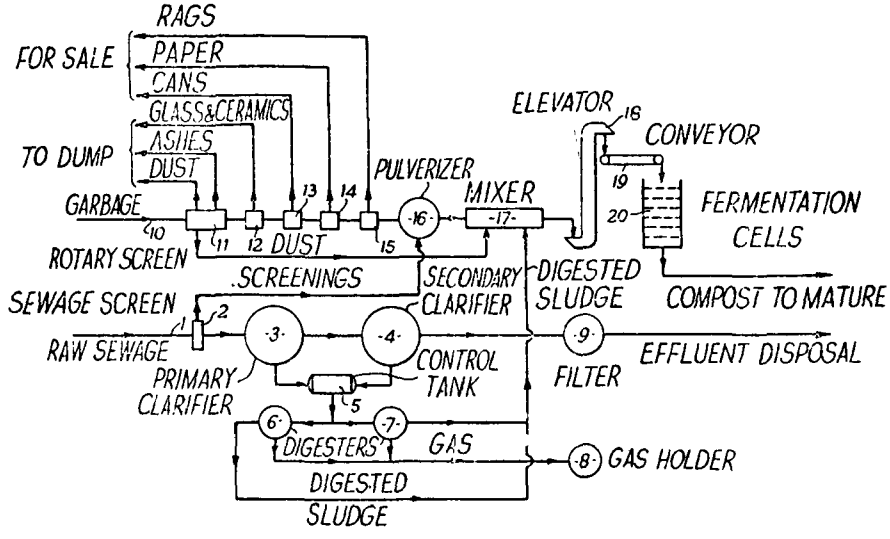
Ruckstuhl-Scherrer, E. (Investment Trust). Conversion of refuse, sewage sludge, etc. into compost. Germany 1,137,050; filed Feb. 12, 1960; issued Sept. 27, 1962.

This process is carried out in a closed fermentation system in which material withdrawn from the bottom of the vessel can again be fed into the top. The starting material is left static for 3 to 24 hr, with only the air/gas mixture being circulated from the bottom to the top of the system. The material is then transferred by batch from the bottom to the top in the presence of an increased amount of carbon dioxide in the air. Some fresh air may be added. Then the material is subjected to further aeration by batch, with the addition of larger quantities of fresh air, and finally rotated continuously in an abundant supply of air. (Text in German)

INT-0252

Flounders, J. M. A process and apparatus for the treatment of sewage and garbage. Great Britain 925,485; filed Jan. 23, 1961; issued May 8, 1963.

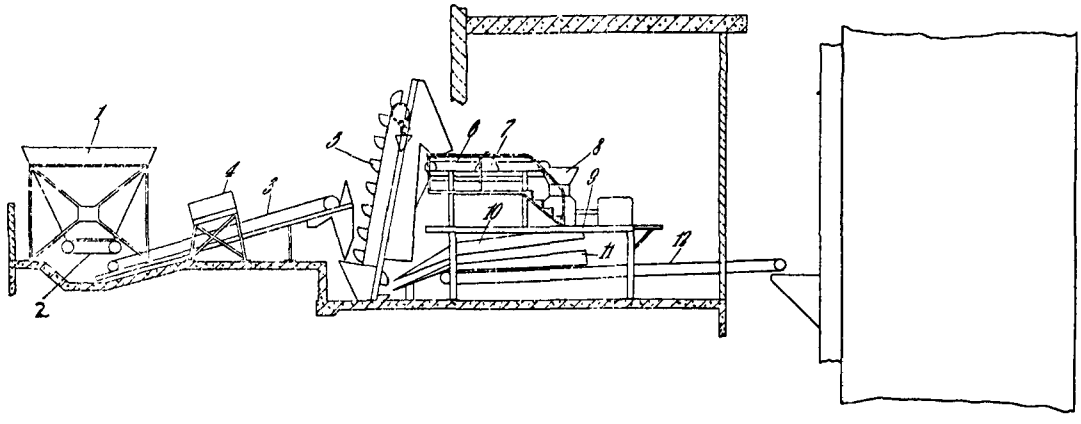
This process treats sewage and garbage to produce compost. The apparatus is adapted to treat all habitation wastes from a community, including garbage and sewage sludge. Large solids are removed from the raw sewage liquid. Sludge is separated from the liquid and conducted to a digestor. The garbage and large solids removed from the raw sewage liquid are pulverized. The pulverized material is mixed with the sludge from the digestors, and the mixture is fermented to obtain a soil fertilizer. A screen is used to remove the large solids from the sewage liquid. A rotary drum is used to mix the pulverized material with sludge from the digestor. The temperature of the fermenting mixture rises to at least 160 F within 24 hr, and is maintained at this temperature for a period of time sufficient to ensure that all dangerous bacteria are destroyed. Fermentation usually takes 5 to 10 days. (See also Great Britain 925,484)



INT-0253

Binns, J. Process and apparatus for the treatment of domestic refuse. Great Britain 926,790; filed Mar. 19, 1962; issued May 22, 1963.

Domestic refuse is treated in this process to produce a compost for horticultural and agricultural use. The process includes an improved screening method. The refuse is first wetted and then partially fermented by static exposure to air. Metallic material is removed from the mass, which then proceeds to a grinding mill. The ground material arrives at a double stage vibrating device, which screens out relatively large compressible objects made of rubber or polyethylene, which would not subsequently be shattered in a hammermill in a later stage of the process. Material passing through

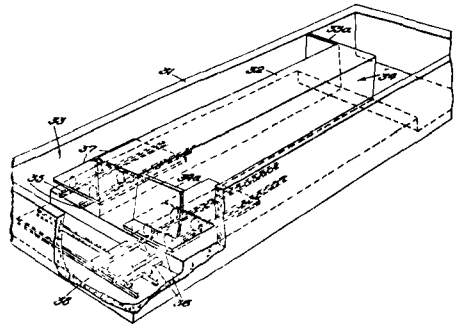


the screens falls onto a conveyor belt which carries it toward a fermentation container, to complete the process. Fermentation of the finely ground material is completed under controlled temperature and moisture conditions. (See also Great Britain 919,955 and 974,047)

INT-0254

Rees, D. F., S. A. Gothard, and L. P. Brunt (Compost Engineers Limited). Improvements in or relating to the treatment of organic refuse or the like material. Great Britain 929,870; filed Oct. 7, 1960; issued June 26, 1963.

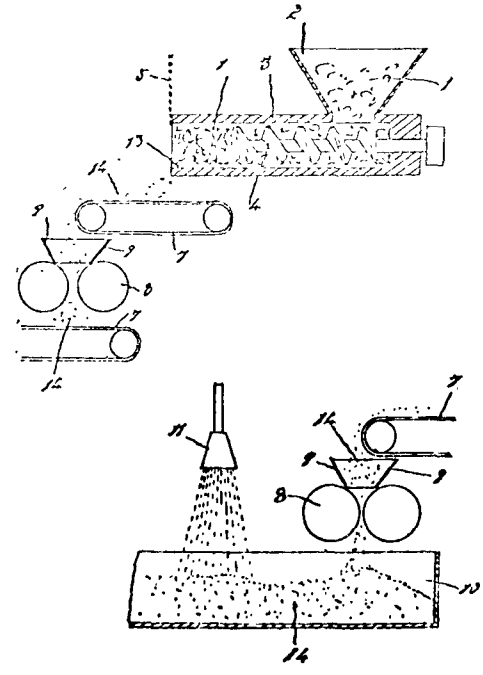
Organic refuse is treated by aerobic fermentation in this process. The material is aerated by being mechanically disturbed to allow substantially complete exposure to air. The material is continuously fed into a trough, which is provided with a device for moving the material along. Material is continuously lifted from the first trough, and allowed to fall freely onto a conveyor. This effects aeration. Half of the material on the conveyor is returned to the first trough to be recirculated. The remainder is passed to a second trough, which also has a device for moving the material. By this method, partly fermented and unfermented materials are mixed in substantially equal proportions. Material may be continuously removed from the second trough by elevator to a conveyor. About half of this material is then recirculated through the second trough; the other half is conveyed away from the trough. Moisture content of the material may be increased through the use of water sprays, or decreased by use of a hot air tunnel. The electrical resistance of the material is measured to indicate the moisture content. The temperature of the material will have a significant bearing upon the speed of decomposition. A device may be provided to measure and vary the temperature of the material.



INT-0255

Kubo, K. (H. Konoshima, and T. Aizawa). Disposal method for kitchen and regular garbage. Japan 38-11,541; filed Apr. 26, 1960; issued July 8, 1963.

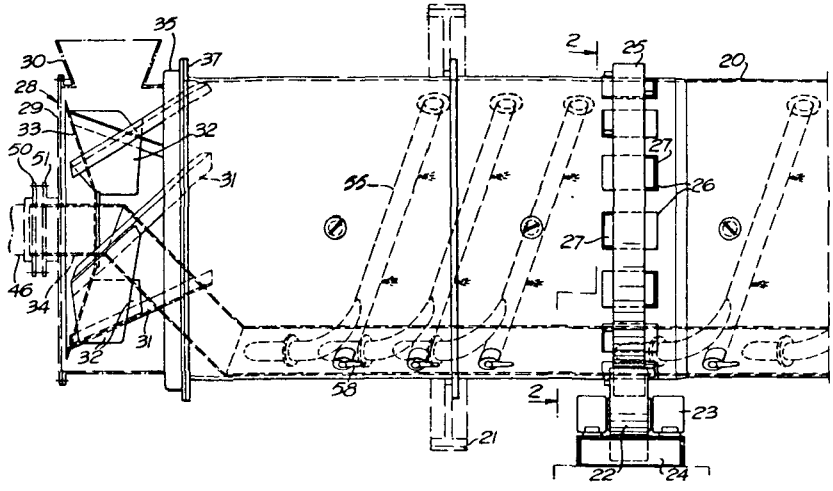
An antiseptic agent, such as slaked lime, is added to ground kitchen and regular garbage before it is pressed into cakes. Pebbles, ceramics, metals, etc., are first removed by the appropriate separation process. Then the garbage is fed into a hopper, whose bottom opens into a screw feeder with a rotary wheel equipped with shredding edges. The ground garbage drops to a belt conveyor, and then into another hopper. A roll press squeezes the water out of the garbage, before it drops to another conveyor and is carried to a storage basin. An antiseptic sterilizer agent such as slaked lime is sprayed over the garbage in the storage basin. While the agent is added, the garbage is stirred until it reaches the proper viscosity. If the garbage is intended for use as a fertilizer, a silicate is added. The slaked lime reacts with the remaining water to form an alkaline calcium water solution, which prevents the generation of bad odors and the propagation of bacteria during storage. After pressing, the sanitary cakes of garbage can be easily transported from urban areas to farming localities and stored. When the cakes are to be used to make compost, they are thoroughly wetted and heaped for necessary fermentation. (Text in Japanese)



INT-0256

Pictor, J. W. D., E. D. Woodhouse, and A. Jakobson (Head, Wrightson and Company Limited). Method and apparatus for the continuous treatment of municipal refuse or other organic matter for the production of manures. Great Britain 931,365; filed Feb. 16, 1961; issued July 17, 1963.

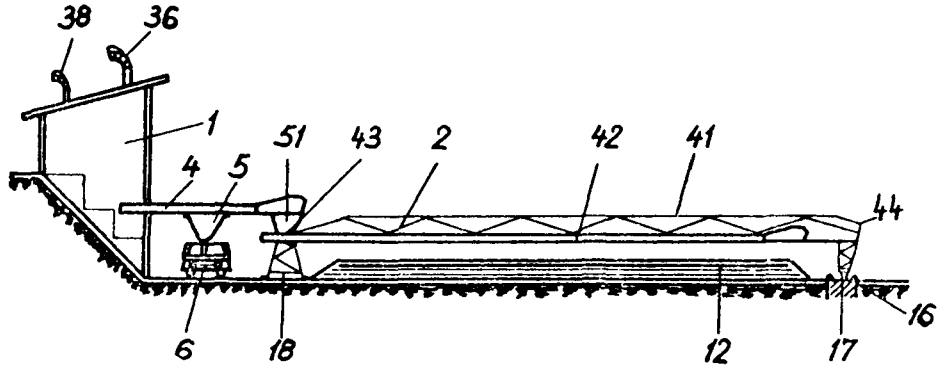
Municipal refuse or other organic matter, such as sludge or sewage filter cake, is continuously treated to produce humus and/or manure for agricultural fertilizer or soil conditioner. A quantity of municipal refuse is mixed with a quantity of sewage sludge, and fed to a fixed feed chamber. The chamber is provided with a series of rotatable vanes for shredding and mixing the material. The material is propelled out of the chamber, and is received by a slowly rotating fermenting drum. The drum is horizontally arranged adjacent to the chamber to receive the mixed and shredded material. Groups of nozzles are spaced along the axial length of the fermentation drum. The nozzles direct jets of air in an axial direction into the material. Also included is a rotating discharge device, through which the material passes after treatment. A liquid, for example water or ammonia solution, can be introduced into the material prior to or during the mixing and shredding operation to control its moisture content.



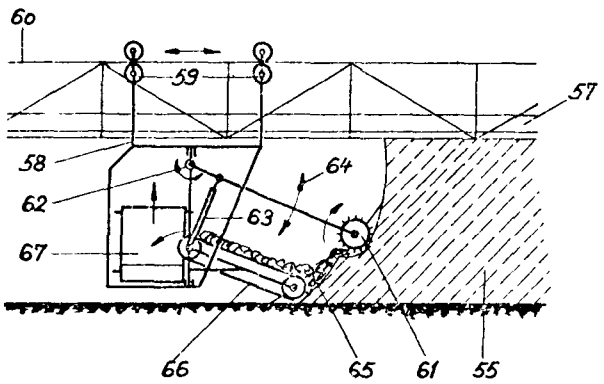
INT-0257

Naef, H. (G. Buehler). Refuse utilization plant. Switzerland 372,012; filed Jan. 10, 1959; issued Sept. 30, 1963.

This plant consists of a shredder and a fully mechanical discharge device for heaping refuse at the composting clamps. A shredder and a discharger are connected by a drag chain conveyor, which is equipped with a bunker so shredded refuse can be rerouted for other purposes. The conveyor is partially open at the bottom to guarantee free discharge to the first composting clamps. It is adjustable in height, so that the refuse, heaped in layers, can be covered successively by composted



material or ordinary soil. The discharge device can be moved about a fixed point. The composting clamps are spread out in the form of a sector. They are fenced in by a circular driveway, concentric with the fixed point. The composting clamps may also be arranged in a star-shaped pattern. The vertical arms of the discharge device rise upward from the fixed point to form truncated pyramids. The discharge device may be equipped with a compost removal implement, or it may have a double-acting drag chain conveyor for return of the finished compost. (Text in German)



INT-0258

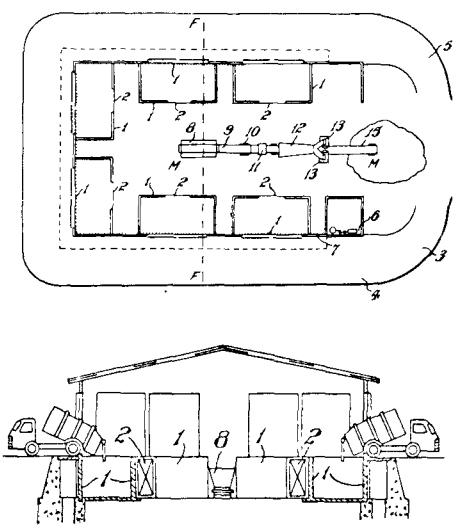
(Societe Auxiliaire de Nettoiement, S.A.). Treatment of compost originating from household waste for conversion into humic phosphates. France 1,357,467; filed May 22, 1963; issued Apr. 3, 1964.

The treatment uses pulverized phosphoric anhydride to achieve drying while converting calcium carbonate into dibasic calcium phosphate and calcium dihydrogen phosphate. For even distribution, the pulverized calcium phosphate is diluted with talc. The compost should contain 25 to 30 percent water for the conversion of the calcium phosphate into phosphoric acid and calcium phosphates. For the exothermic reaction and subsequent cooling, the mixtures are left 24 hr, in large heaps. (Text in French)

INT-0259

Prat, F. Improvements in and relating to the fermentation of waste organic material for agricultural purposes. Great Britain 955,338; filed Aug. 5, 1960; issued Apr. 15, 1964.

The waste is placed, with a minor proportion of compost from a previous fermentation, in an open vat. The vat's sidewalls are formed to allow abundant natural aeration of the contents, which are sprayed with water containing a nitrogenous compound in solution. The amount of this compound, according to the water, carbon, and nitrogen contents of the waste, should bring the water content of the waste to 50 to 60 percent, and the ratio of carbon to nitrogen in the waste to 25 to 35 to 1. Not more than 85 cu m of household waste must be placed in the vat, which has a volume of not more than 100 cu m. Not more than 30 percent sewage sludge must be included with the household waste. The additions to household waste of the sludge, compost, and aqueous solution are effected in four stages at the time of loading in the vats. The apparatus removes the fermented mass from each vat; and receives, conveys, and treats the material. This includes sieving, metal removing, fine particle separating, and residue crushing.

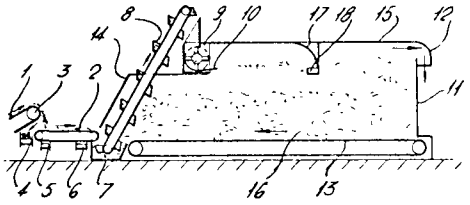


INT-0260

(Paul Treckmann and Company). Method and apparatus for the treatment of refuse for conversion into fertilizers. Great Britain 963,804; filed Mar. 15, 1963; issued July 15, 1964.

A method of treatment of refuse for conversion into fertilizers utilizes conveyors and a pulverizer. The refuse is sorted by centrifugal action. Because of this, that portion of the refuse which is fed to and ejected by the pulverizer, and which is suitable for conversion into fertilizers, is enriched by air. Afterward, the refuse is continuously discharged, blown by an airstream, into a bunker. After a period of fermentation in the bunker, the material

is drawn off and recycled in a continuous stream to the pulverizer, with further untreated refuse. It is again discharged into the bunker, after which the cycle is repeated several times, until part of the bunker contents are discharged.



INT-0261

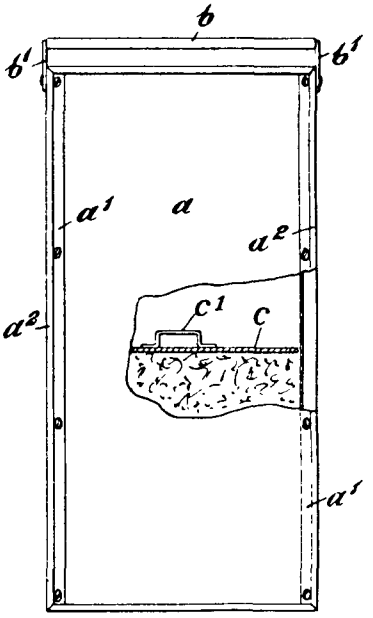
Tapin, J. H. Treatment of urban refuse. Great Britain 1,002,550; filed June 23, 1964; issued Aug. 25, 1965.

Urban refuse is initially processed for agricultural use by sorting out the inorganics. This is followed by pulverization and fermentation. An additional postfermentation sorting by a pneumatic fluidizedbed technique lowers the inorganic content still further. The undesirable mineral matter is thus separated from the fermented mass.

INT-0262

Reynolds, H. An improved compost bin. Great Britain 970,757; filed Aug. 25, 1962; issued Sept. 23, 1964.

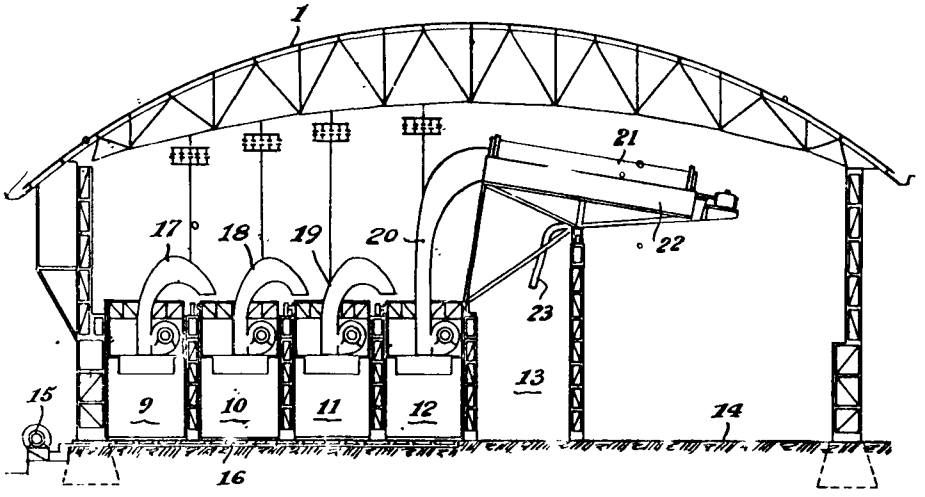
The compost bin is composed of an upright container open at the top and bottom. The upper part is provided with a pivotally mounted lid, which admits air when closed. A hand-controlled, gravity actuated plate is kept within the container. The plate is independent of the container. The contents of the container can be compressed by using the plate manually; the weight of the plate effects compression when unattended. The bin is for use in domestic gardens, enabling a gardener to keep the grounds tidy, and at the same time turn garden rubbish into useful compost.



INT-0263

(Societa Agricola Industriale Tevere). Organic fertilizer production. Italy 668,778; filed May 17, 1962; issued Oct. 5, 1964.

Solid waste matter from city and town sewage is sifted in the beginning of this process. Useless material is separated and ferrous materials are eliminated. The product is

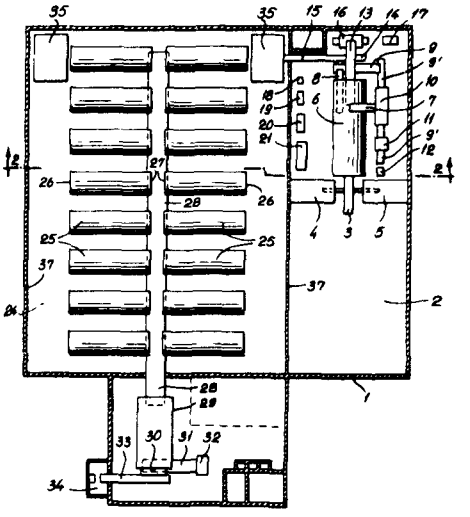


spread and exposed to air and a catalyst is added. The material is subjected to aerobic fermentation, sifted once again, and further processed to give an organic fertilizer. (Text in Italian)

INT-0264

Lavallee, W. (General Society of Refuse Recovery Limited). Method and apparatus for treating garbage. Canada 695,780; filed July 20, 1960; issued Oct. 13, 1964.

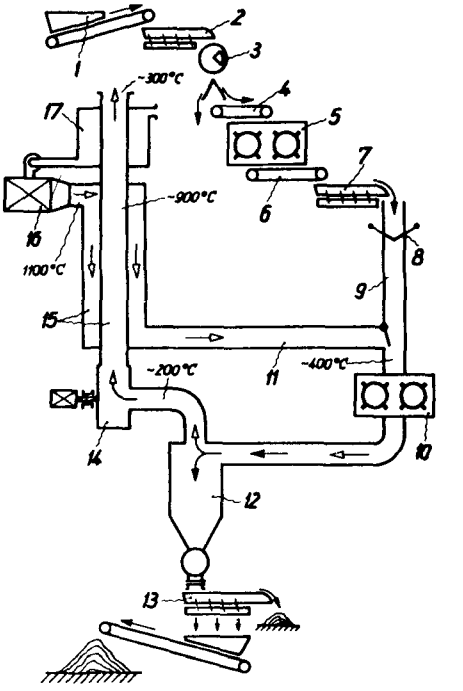
Garbage containing foodstuff, metal, paper, rags, and other hard and soft materials is treated with a proportionate amount of fertilizer additives. The resultant mixture is subjected to a breaking action. The comminuted material is screened; the unscreened ferro-magnetic material is magnet-separated. Rags and paper are sorted and recovered. The screened material is subjected to a digesting process, consisting of exposing the material to air under cyclically varying pressure. The digested material is dried, and screened, and recovered as compost. The fertilizer additives used are lime and phosphate rock. The separated ferro-magnetic material is subjected to a suitable temperature to remove paint, tin, and other substances, and the resultant cleaned material is recovered. The breaking and screening action is performed on the raw garbage in a continuous flow process. The screened material is digested by a batch process.



INT-0265

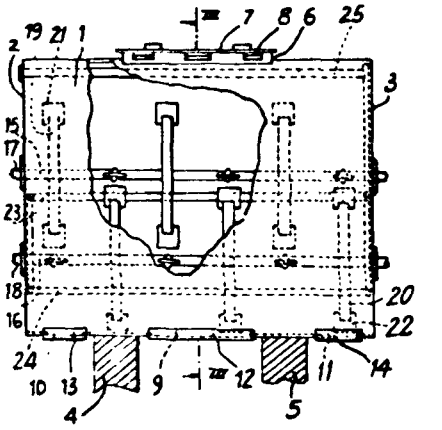
Leutelt, H., and K. Suchowski. (Hartzerkleinerungs- u. Zement-Maschinenbau-G.m.b.H.). Refuse preparation. Germany 1,192,992; filed Apr. 8, 1964; issued May 20, 1965.

Refuse is prepared for composting in an installation comprising several comminution and grading stages. Screen oversize, after a particular comminution stage, is thermally treated at a temperature at which it is dried and shrunk, but not combusted. It is then further comminuted. The heating and comminution can take place either successively or simultaneously. (Text in German)



INT-0266

(Societe des Applications Rationnelles de Constructions Metalliques et Etudes de Manutention). Apparatus for the fermentation of household wastes transformed into compost. France 1,426,317; filed Dec. 16, 1964; issued Jan. 28, 1966.

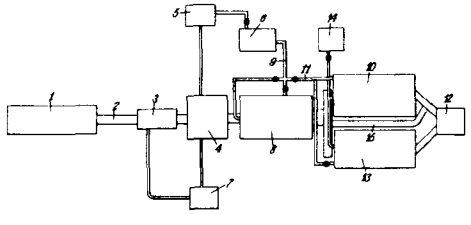


An apparatus consisting of sieves, a separator, a mixing system, mills, a cylindric container with an interior mixing system, a distributor of air, an irrigation system, and a control apparatus (manometer, thermometer, pH meter, hydrometer) is provided for the accelerated fermentation of household wastes. The procedure consists in sieving the wastes to eliminate metal parts, grinding to a predetermined size, fermentation with automatic control of temperature and acidity, and eventual air intake under pressure. (Text in French)

INT-0267

Brock, G. An improved method of and apparatus for processing town waste to produce compost. Great Britain 1,023,467; filed Oct. 16, 1963; issued Mar. 23, 1966.

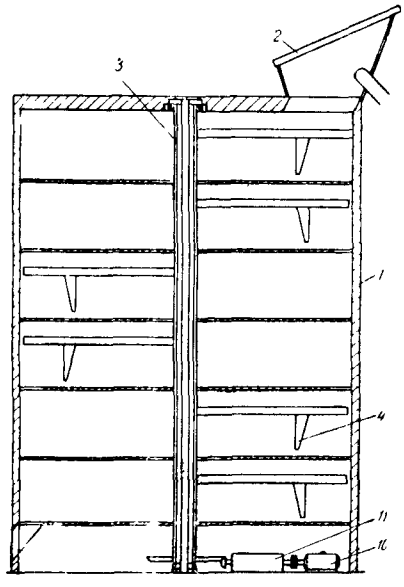
This refuse treatment method processes town waste to produce a compost suitable for use as a fertilizer. The waste is separated so that any salvageable material, such as cardboard, glass, or metal objects, may be recovered for reuse. Then the waste is fed into a rotating drum where it is mixed with sludge and disintegrated. This disintegrated waste is passed to a jacketed drum where it is treated with air and steam to create the conditions necessary for bacterial action, due to thermophilic organisms, to occur. The mixture is rotated for roughly 48 hr so that when it emerges from the discharge end of the drum, it is suitable for disposal, use in agriculture, or storage and subsequent use.



INT-0268

Mirnyy, A. N., and N. F. Gulyayev. Multistory fermentation installation for transforming refuse into compost. U.S.S.R. 185,349; filed June 17, 1965; issued Aug. 13, 1966.

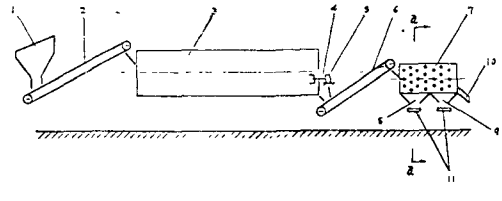
A multistory cylindrical tower is provided with a charging hopper, which contains a centrally rotating, full-length, vertical shaft enclosing a coaxial stationary rod. Each story contains three mutually parallel horizontal rods, two of which are fixed to the hollow shaft. The third is threaded and connected at one end to the stationary rod, while its other end pivots in the end plate joining the free ends of the other two rods. A tiller share is supported by the pair of unthreaded rods, and driven by the third, threaded rod. In operation, the three-rod assemblies, carrying the tiller shares, rotate with the driven hollow shaft about its axis, engendering the rotation of the threaded bar about its own axis, and the consequent displacement of the tiller share toward, or away from, the center of the tower, depending on the sense of rotation of a speed reducer. (Text in Russian)



INT-0269

Sekino, M., and T. Wada (Mitsubishi Heavy Industry Company, Ltd.). Device to extract vinyl materials from composts of the composting machine. Japan 41-15,234; filed Mar. 14, 1963; issued Aug. 27, 1966.

When compost containing vinyl scraps is applied to fields, the vinyl does not improve the soil, and does not decompose. To eliminate vinyl and similar materials from compost, the garbage is dumped into a hopper at the treatment plant and carried to the fermentation tank by a conveyor. Such items as canvas shoes, wooden clogs, vinyl bags, and wooden pieces are removed after fermentation. The scraps of plastic are picked out when the compost contacts the surface of a hot roller. Another hot roller



melts the remaining scrap. The melted plastic is then scraped off the surfaces of the rollers. The rollers rotate constantly on the motive force of the conveyor. This invention can be applied not only to the rotary kiln-type composting machine described here, but to all other types of garbage composting devices. (Text in Japanese)

INT-0270

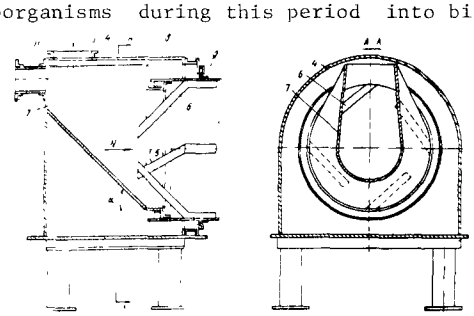
Isnack, H. S. Enzymes for activating composts. France 1,460,727; filed Oct. 2, 1965; issued Dec. 2, 1966.

Enzymes such as occur in slugs, snails, locusts, ants, and grasshoppers, and which degrade cellulose rapidly, are added to the organic matter in a composting process. (Text in French)

INT-0271

Begidzhanov, M. N., Y. V. Matveyev, and L. G. Karanova (All-Union Scientific-Research and Experimental-Design Institute of Municipal Machine Construction). Device for treatment of refuse. U.S.S.R. 190,193; filed Nov. 1, 1965; issued Dec. 16, 1966.

The device consists of a cylindrical drum resting on roller supports, and rotated about its axis by a motor drive. The ends of the drum extend partly into the stationary inlet and outlet chambers. Four equally spaced pusher vanes of box-type cross section, bent in the shape of segments of a conical helix, are fastened to the inner surface of the drum at its inlet end. Their free ends extend into the inclined horseshoe-shaped chute. The slope angle of the chute is close to the angle of dynamic slip of the refuse to be treated. Refuse is charged by conveyor into the opening of the inlet chamber, and slides forward on the chute under its own weight until it interferes with the pusher vanes. As they move past the chute walls, the vanes propel the refuse into the drum. Dusty and malodorous air is sucked away through a port. The refuse remains in the drum for 1 to 3 days, and it is converted by the action of microorganisms during this period into bio-

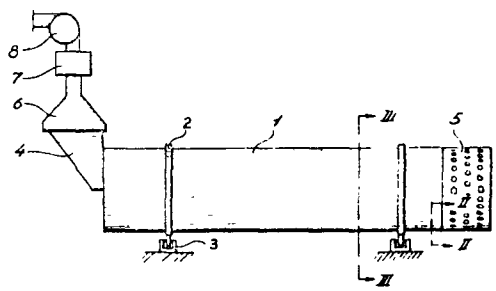


fuel or compost. These are discharged from the outlet chamber. (Text in Russian)

INT-0272

(Dano Ingenioerforretning og Maskinfabrik Ingenioer Kaj Petersen's Fond). Aerobic fermentation of solid organic waste material. Netherlands 6,610,357; filed July 22, 1966; issued Jan. 23, 1967.

Waste material, e.g. household refuse, is fermented under aerobic conditions in a horizontally rotating container filled to about 80 percent capacity. The gases are removed and exchanged by air. This exchange is intermittent, because the air inlet valves are blocked by waste material when they are in the lower part of the rotating container. The valves are cone-shaped and positioned in the wall at the end, in the side of the container, or in a connecting side structure. Fresh material is added at one side of the container, and fermented material is removed at the other end. The gases are removed countercurrent to the flow of the waste material. (See also Great Britain 820,999) (Text in Dutch)



INT-0273

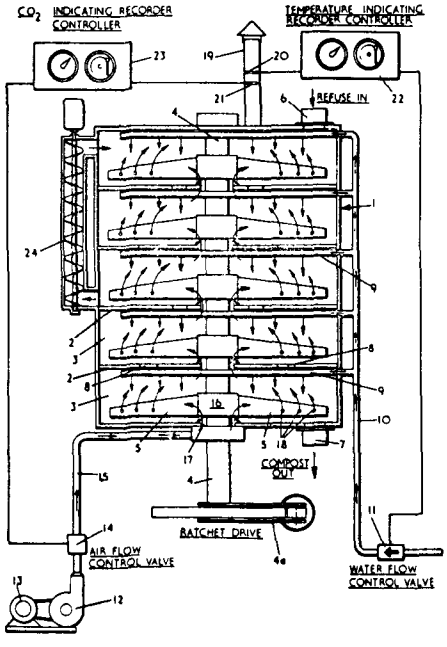
(Traitement Industriel des Gadoues). A chamber for the treatment of household waste by accelerated fermentation. France 1,473,141; filed Jan. 17, 1966; issued Feb. 6, 1967.

A chamber for the fermentation of household refuse is built in the form of a hyperboloid frustum with a 60-degree base angle. This shape prevents the lateral pressures which can result in compressive blockage. The entire structure is built from prefabricated, lozenge-shaped units of concrete or metal, of progressively diminishing size from base to top, which, when assembled, result in the prescribed hyperboloid form. (Text in French)

INT-0274

Abson, J. W., and D. Broadhurst (Simon Handling Engineers Limited). Improvements in bacteriological digesters for conversion of organic waste. Great Britain 1,060,461; filed Jan. 28, 1964; issued Mar. 1, 1967.

A method is described for operating a vertical, tower-type, bacteriological digestor for the continuous composting of municipal refuse. The temperature and carbon dioxide content of the gases of decomposition are continuously measured, and quantities of water and air, fed to the digestor, are automatically controlled in accordance with these measurements. To stimulate bacteriological activity, a small quantity of bacteriologically active material is withdrawn from an intermediate state in the digestion, and fed back to freshly received material. The digestor comprises a tall, hollow cylinder, divided into compartments by horizontal plates, with coaxial rotating shafts passing into all compartments from the bottom to the top of the cylinder. The air and gases of decomposition pass successively through each superimposed compartment to an outlet port at the top of the cylinder, where means are provided for detecting changes in the temperature and composition of the gas.



INT-0275

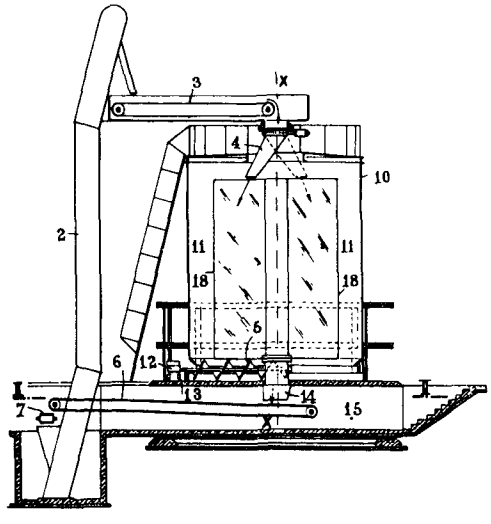
Bulmer, L. Composts or plant growth media for horticultural and the like purposes. Great Britain 1,068,753; filed Apr. 27, 1965; issued May 10, 1967.

Equal parts of fly ash, furnace bottom ash or precipitated ash, and sphagnum peat moss are mixed by mechanical means to form a compost. Small amounts of fertilizing materials may be added. In one example, these might be 1.5 oz of superphosphate, 0.75 oz of chalk, and 0.25 oz of potassium nitrate to a bushel of the mixture. The product may be molded into blocks for convenience in handling with the addition of cement or other bonding agent, or simply pressure-molded in a moist state and wrapped or coated. Advantages in the compost are: freedom from weed seeds, grubs, and plant diseases; and inexpensive production.

INT-0276

Tenaille, G. (Traitement Industriel des Gadoues). Apparatus for transforming organic waste into compost. Switzerland 429,789; filed Jan. 12, 1965; issued Aug. 15, 1967.

An apparatus for the transformation of organic waste material into compost has at least one fermentation tower, whose floor is shaken horizontally by a helical drive mechanism. This device is cogged, and its exterior end is movable by means of a wagon. A conveyor feeds the fragmented refuse into a funnel, which conducts it to a horizontal conveyor. This brings it to an oscillating chute leading to the fermentation tower. The waste is distributed between the two chambers in the tower by the chute. Ventilation is provided by adjustable devices, and the contents are stirred regularly. (Text in German)

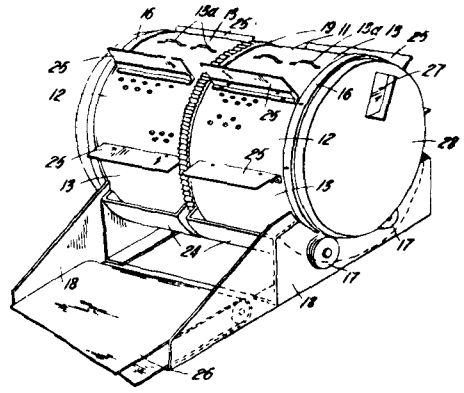


INT-0277

Rees, D. F. (Compost Engineers Limited, and John Thompson Industrial Constructions Limited). Apparatus for the aerobic fermentation of organic matter and method for its operation. Switzerland 437,380; filed Dec. 27, 1963; issued Nov. 30, 1967.

An apparatus for aerobic fermentation and composting of organic material consists of a

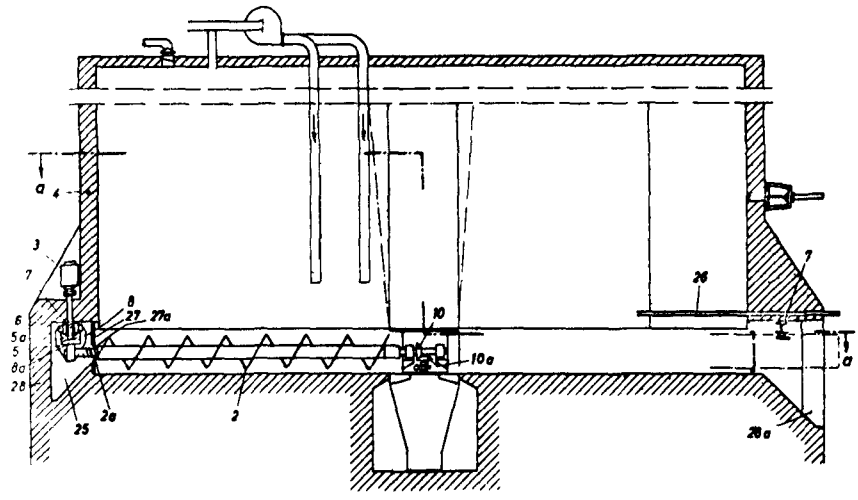
cylindrical drum, mounted horizontally, and with a lockable aperture for filling. The drum assembly has alternately perforated and solid wall plates to provide for aeration, sifting organic matter, and emptying the drum. The plates are removable. Flanges, extending radially from the outside drum surface, shovel material to a conveyor belt. The material within the closed drum is pulverized by rotation. Air is brought in periodically by the perforations, between intervals for fermentation when the apertures are closed. (Text in German)



INT-0278

Ruckstuhl, E. (Maschinenbau Ruckstuhl and Company). Refuse composting equipment. Germany 1,263,034; filed Aug. 7, 1962; issued Mar. 14, 1968.

The equipment comprises a mechanism for turning over the material in closed fermenters by bottom discharging and recharging to the top of the fermenter. Time is allowed for variable fermenting in the fermenters. These are in the form of a segmented vertical cylinder, divided by radial partitions, with a bottom extractor moving around the periphery on a center pivot. The extractor worm has supplementary cutters on the edges of its flights. (See also Germany 1,250,844) (Text in German)

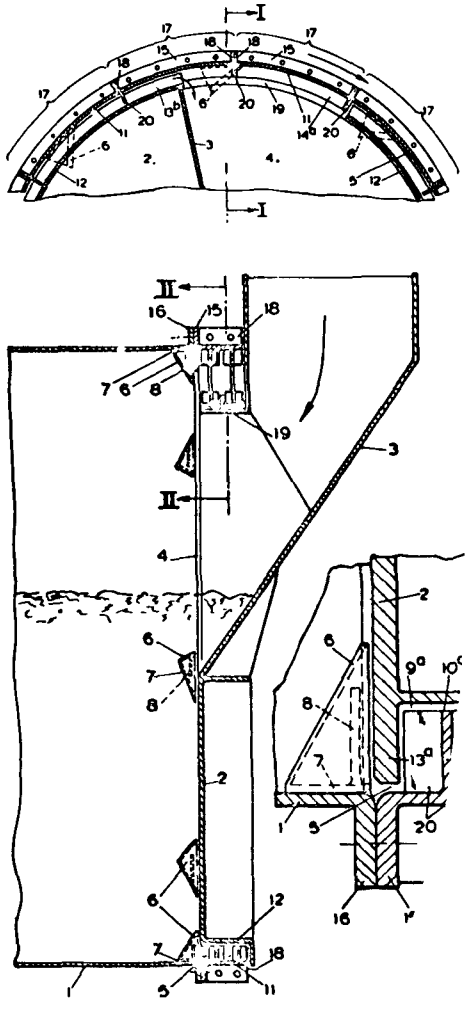


INT-0279

De Roever, J. G. (Rheinstahl Industrie-Planung G.m.b.H.). Equipment for conditioning of waste material containing organic constituents such as domestic refuse. Switzerland 454,191; filed June 8, 1965; issued Apr. 15, 1968.

A horizontally rotating drum is provided with an outlet opening, a stationary cover with an inlet opening which closes the drum at one end, a chute for charging the material through the inlet to the drum, and a seal between the drum and the cover. The improved seal is of the labyrinth type, formed of concentric, annular ribs, alternately fixed to the flanges of the stationary cover and the rotating drum. The material being conditioned in the drum oozes into the clearance spaces, providing a pliant sealant which readily adapts to any eccentricity of the sealing area. The bulkhead plates return the excess sealant to the drum through an opening located above the charging chute. To facilitate cleaning the seal, the flange of the drum is made of short, bolted segments, which can be removed and replaced

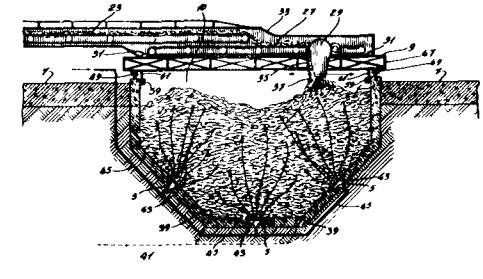
individually. (See also Switzerland 454,925) (Text in German)

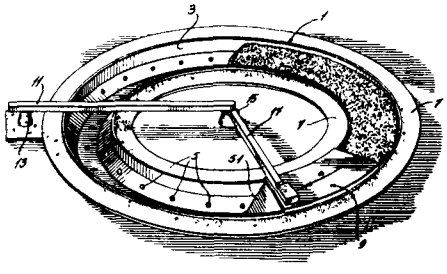


INT-0280

Balu, A. Composting of organic refuse under aerobic conditions. Canada 784,640; filed July 10, 1965; issued May 7, 1968.

Organic refuse is composted by feeding it into a closed chamber, a trench with a movable roof. Air is blown through the refuse to activate fermentation. The refuse remains in the chamber until it has decomposed to the point of practical elimination of putrid and foul odors. The refuse is then allowed to stand in the open air; and additional air is also forced through the refuse until complete decomposition occurs. The refuse is retained in the chamber for approximately 12 days, and in the open air, with forced air injection, for 8 days. The refuse is ground before it is fed into the closed chamber.

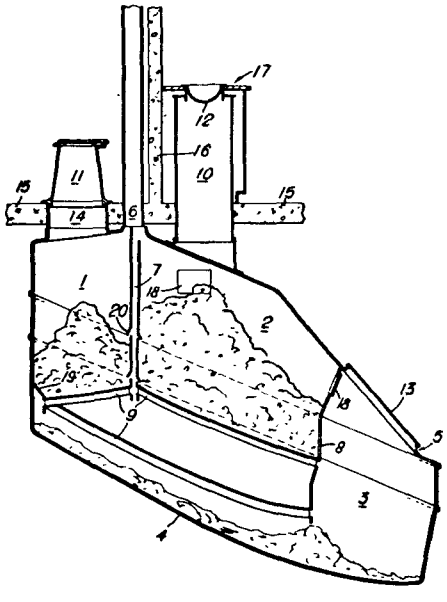




INT-0281

Lindstrom, R. E. An arrangement for the composting of organic waste material. Great Britain 1,126,520; filed Aug. 31, 1967; issued Sept. 5, 1968.

An arrangement for composting organic waste material comprises a container, which, by means of two substantially vertical, transversely extending partitions, is divided into three compartments, communicating with each other at their lower portions. The bottom of the container has such a longitudinal inclination that waste material introduced into any of the two upper compartments will, by gravity, slide downward to the lowest compartment at a rate at which, upon arriving

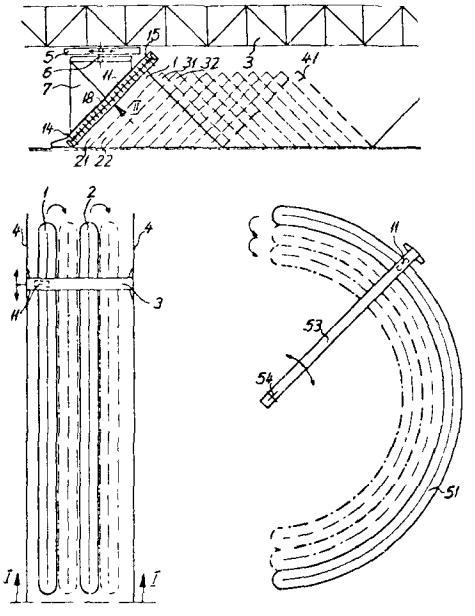


at the last compartment, it is composted. Ventilation is provided for the interior of the container via an air inlet in the lowest compartment, an outlet at the uppermost portion of the container, and channels extending longitudinally along the container. These channels terminate at their lower ends in a ventilated part of the container. The partition between the two upper compartments is hollow, and forms a ventilating shaft. Through this shaft, the channels are in communication with the air outlet at the upper end.

INT-0282

Hofer, H. (Gebrueder Buehler A.G.). Methods and device for turning compost piles. Switzerland 466,800; filed Aug. 25, 1966; issued Dec. 15, 1968.

A method of turning compost piles is characterized by scraping the top layer on one side of the pile, and throwing the material over the top of the pile onto the other side. The operation is repeated until the entire pile has been turned. An oblique chair conveyor with scrapers moves along the clamp, and performs the operation. It is attached to a support which runs alongside the clamp, in a guide rail. (See also Great Britain 1,165,058) (Text in German)



INT-0283

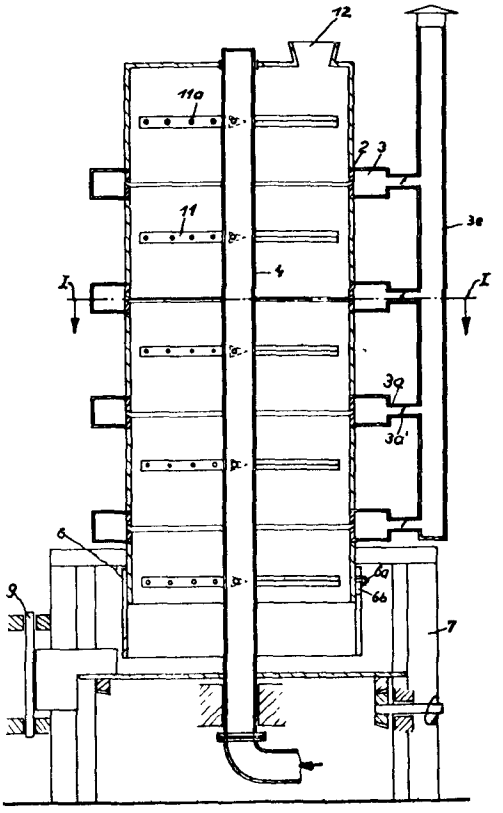
Coll, J. Compost container and mold. Great Britain 1,149,156; filed Mar. 26, 1968; issued Apr. 16, 1969.

Organic refuse is treated by composting, and the resulting compost is shaped in a device comprising a circular or multisided tube. The tube is open at both ends, and tapers inward from the base to the top. The device is preferably large enough to hold half the organic refuse suitable for composting derived annually from the average home and garden. The slope of the sides of the device is sufficient to facilitate easy removal of the device from a compacted compost heap. Refuse is preferably introduced periodically through the top of the apparatus, and is compacted naturally as it accumulates; compost-making powder is added at one or more levels. The device provides an attractive, ready-to-use, stable, and portable container which suits the requirements of the average home. The container protects accumulating refuse from weather and birds, and encourages the retention of moisture.

INT-0284

Truemper-Boedemann, E. (Hartzerkleinerungs- und Zementmaschinenbau). Composting tower for production of humus fertilizers from ground refuse. Germany 1,292,678; filed Oct. 28, 1961; issued Apr. 17, 1969.

The cylindrical sidewall of the composting tower has radial boreholes which are connected

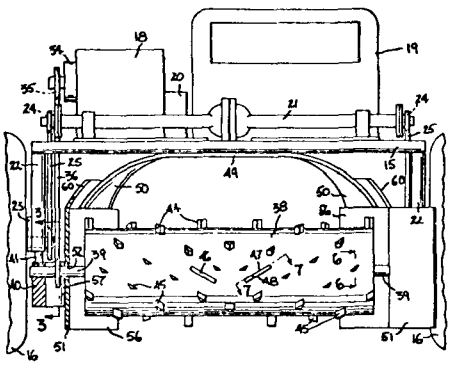


with an air compressor, and which incorporate a coaxial, perforated, cylindrical air duct. The radial boreholes are in spacer rings lying between the successive cylindrical sidewall segments, and are connected with an air compressor by annular ducts surrounding the spacer rings. In another version, the annular ducts are connected with a vertical stack, and the cylindrical air duct is provided, at several levels, with sets of hollow, radial, stirrer arms of wedge-shaped cross section, with perforations in the vertical sides opposing the respective leading edges. In both versions, standard pipe sections are used in the tower assembly, and the supply of oxygen to the several segments of the tower can be regulated to provide optimal conditions for each stage of the fermentation process. The second version enhances the homogeneity of the end product by mechanical stirring. (See also France 839,321) (Text in German)

INT-0285

Cobey, H. T. Compost turner and windrow turning machine. Great Britain 1,151,952; filed May 23, 1967; issued May 14, 1969.

A self-propelled, wheeled, compost-turning apparatus has a straddle frame defining a longitudinally extending passageway in its direction of travel. A compost turning and fragmenting toothed drum is rotatably secured on the frame and in the passageway to implement rotation about an axis transverse to the passageway. A pair of vertically disposed retaining wings are mounted on the frame in a transversely spaced relationship, and they extend forward from the drum to define the feed throat of the apparatus, and rearward to define the discharge throat. A power means is connected to the drum to cause rotation, and thus transfer compost material from the feed throat through the passageway to the discharge throat.



INT-0286

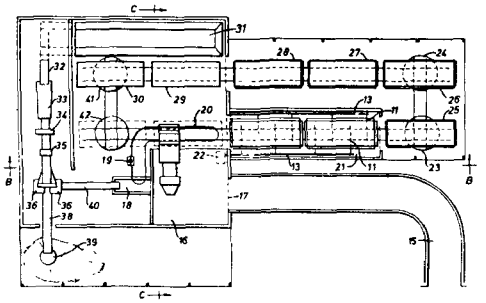
Abson, J. W., C. Howe, and D. Broadhurst (Simon Handling Engineers Limited). Improvements in or relating to the treatment of materials comprising compostible organic matter. Great Britain 1,152,705; filed Oct. 25, 1966; issued May 21, 1969.

A method is disclosed for removing offensive odors from exhaust gases. These gases are produced in an aerobic bacterial digestion stage of a process for the conversion of compostible organic matter, such as municipal refuse, into compost. The gases are sprayed with an aqueous solution of oxidizing agent, such as acidic potassium permanganate. The concentration of potassium permanganate in the solution is maintained between 10 and 35 g per liter. The acid concentration is not greater than five times the minimum necessary to fully utilize the oxidizing properties of the permanganate. The treatment is carried out in a substantially void tower in which the solution is sprayed in concurrent flow with the gas.

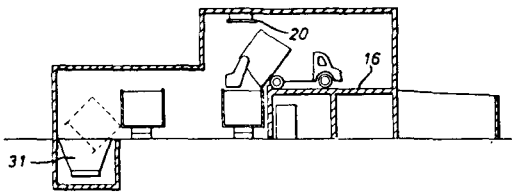
INT-0287

Prat, F. Improvements in and relating to a method and apparatus for the production of compost from household waste. Great Britain 1,153,587; filed June 27, 1966; issued May 29, 1969.

The garbage, as it is collected, is emptied directly into mobile silos, whose external aeration surface is adjustable by a device uncovering or covering openings provided in the bottom and sidewalls of the silos. The material in the silos is then subjected, in succession, to forced aeration under optimum elevated temperature and humidity conditions, then to natural aeration, and, finally, to retarded aeration. This stepwise reduction of aeration produces variations in fermentation intensity, making it possible to attain a temperature of 65 C rapidly and to maintain such a temperature without exceeding it. The duration of the fermentation may be only about 4 days. The mobile silos can then be moved to an installation for screening, for auto-



matic extraction of iron residues, and for crushing and elimination of plastics.



INT-0288

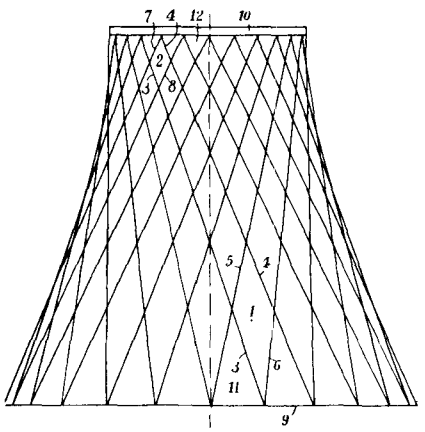
Tree, S. B. (Fisons Fertilizers Limited). Composts. Great Britain 1,155,327; filed Sept. 11, 1967; issued June 18, 1969.

This process is for the manufacture of compressed tablets of compost containing peat which expand upon watering to form an effective media for plant growth. The method consists of admixing together a peat, with a water content in excess of 20 percent by weight, with fertilizer and other components, in an amount comprising 5 to 20 percent of the dry weight of the peat. The mixture is dried to a water content of 3 to 20 percent by weight, and compressed into tablets by molds employing a pressure in the range of 0.1 to 5 tons per sq in. The fertilizer components contain some or all of the nutrient elements nitrogen, potassium, and phosphorus with or without trace elements.

INT-0289

Tenaille, G. (Traitement Industriel des Gadoues). Cell for the treatment of domestic wastes prepared by said process of accelerated fermentation. Switzerland 472,347; filed Dec. 12, 1966; issued June 30, 1969.

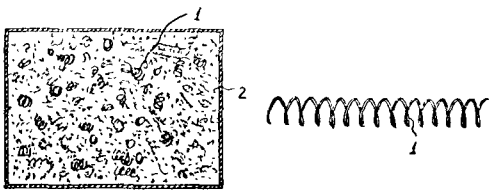
To treat waste prepared through accelerated fermentation, the sewage received during a day is amassed in the first cell and passes successively into three other similar cells. The treatment is completed in 4 days, and each day a cell is freed in order for a new treatment cycle to begin. The installation should comprise four cells capable of receiving the waste collected during 1 day, or if the amount of sewage is too much for one cell, it should be comprised of several groups of four cells each, so all of the waste collected can be stored in a single cell of each cell group. (Text in French)



INT-0290

Wakiyama, M., N. Michiko, and F. Sozaburo. Composting method. Japan 44-17,967; filed Sept. 17, 1961; issued Aug. 7, 1969.

The traditional compost-making method is to sprinkle human feces on the piled material, and stir it from time to time to expose the inside of the pile to oxygen and thus quicken the maturing. However, this requires a great deal of effort and time. This invention improves the air circulation of compost, quickens maturing, and mixes metal salts, etc., into the compost. The spiral metal scrapings obtained from the shaping of iron bars on a lathe are mixed with compost material to quicken the maturing process. Because of the spiral scrapings, there are numerous irregular gaps in the compost, enabling the aerobic fermentation of bacteria by exposure to oxygen. The propagation of bacteria is promoted and at the same time, without stirring the compost, the fermentation bacteria are saved from being destroyed because of the heat they emit. Putrefaction of compost is also accelerated. Oxidation of spiral-shaped iron scrapings is quickened because of water contained in the compost and because of human manure sprinkled on the compost. The oxidized iron is dissolved in the compost, improving the effectiveness of compost as fertilizer. Because the iron scrapings are oxidized, there is less danger of personal injuries during the course of handling the compost. The scrapings and compost material are spread in alternate layers. (Text in Japanese)

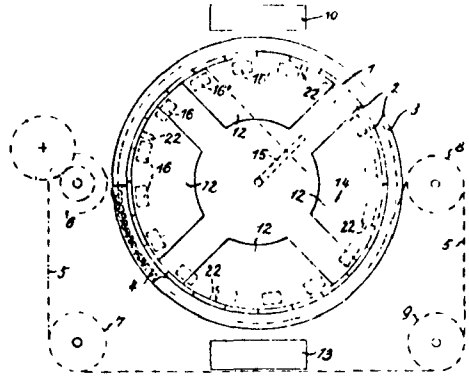


INT-0291

Emmet, E. Method and equipment for the preparation of compost from organic wastes. Germany 1,300,957; filed Feb. 15, 1963; issued Aug. 14, 1969.

Compost is obtained from organic wastes, especially town refuse, clarification sludge, kitch-

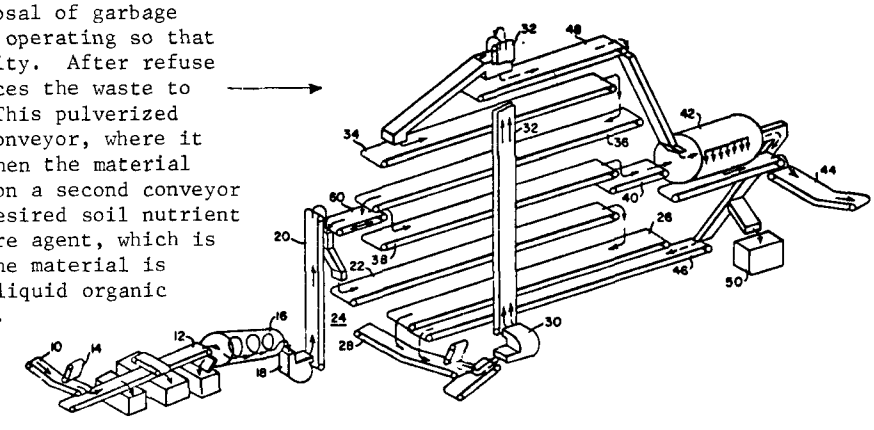
en garbage, and fecal matter, by fermentation in rotating containers. The surface of the waste is intensively treated with warm (40 to 65 C), moist air so that, as a result of the rotation, the waste is alternately exposed to and substantially excluded from aeration. The fermented material is placed in airtight sacks or containers, and left to ripen. The apparatus for composting consists of a rotary drum with charging and discharging devices, and means for the removal of air. The aeration conduit is axial and rotatable, and follows the drum walls in an approximate U-shape, the aeration aperatures being disposed in the horizontal plane. Compost can be obtained in 1 to 3 days. Before aeration, the waste is treated with hot or superheated steam to combat pathogenic bacteria and to make it amenable to fermentation. The waste may be treated with bacteria (e.g. Nitrobacter) before fermentation. (Text in German)



INT-0293

(Westinghouse Electric Corporation). Refuse reclamation system. Great Britain 1,174,714; filed Apr. 29, 1968; issued Dec. 17, 1969.

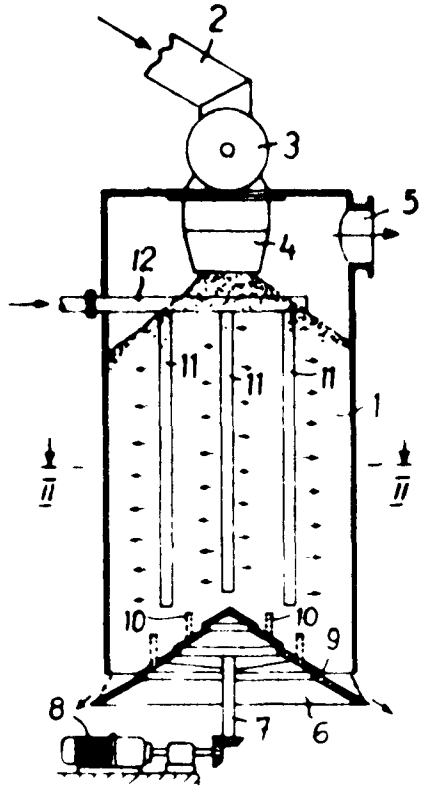
This system effects the disposal of garbage and trash bacteriologically, operating so that it can be located within a city. After refuse is deposited, a grinder reduces the waste to uniformly small particles. This pulverized material is picked up by a conveyor, where it remains for a short time. Then the material is again ground, and placed on a second conveyor where it remains until the desired soil nutrient has been formed. The moisture agent, which is added to the refuse before the material is pulverized, may be water or liquid organic waste, such as sewage sludge.



INT-0292

Litzenburger, T., G. Diettrich, and K. Beisner. (Kloeckner-Humboldt-Deutz A.G.). Refuse composting tower. Germany 1,301,828; filed Jan. 15, 1966; issued Aug. 28, 1969.

This refuse-composting tower provides for once-through downward passage of material by means of internal air-distributing pipes. The discharge means extends across the entire width of the tower base, and the pipes are suspended vertically. (Text in German)

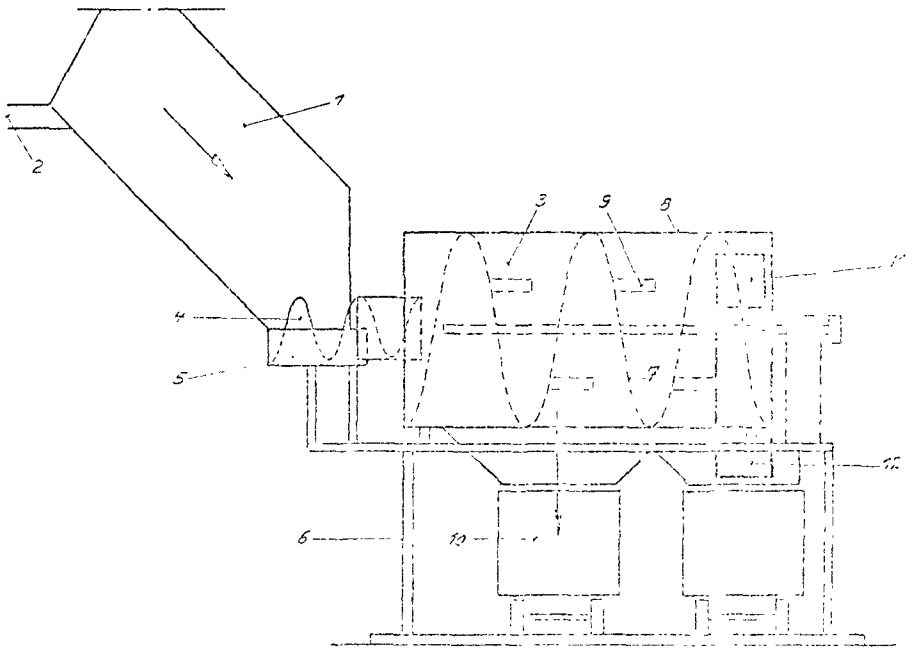


DISPOSAL

INT-0294

Seifert, H. (Alpine Aktien-Gesellschaft Eisengiesserei und Maschinenfabrik). Disposal equipment for refuse and other wastes. Germany 814,431; filed Oct. 30, 1948; issued Sept. 24, 1951.

The waste is prepared through sifting, crushing, grinding, mixing, and sorting for biological decomposition. All parts of the equipment for preparation of the refuse are arranged on a transportable base. The equipment comprises a storage bunker, a conveyor, a mixing and sifting drum, and, if necessary, a crusher. The conveyor is coupled with the mixing and sifting drum to permit delivery of an adequate quantity of material for every drum speed. The drum may be made of perforated sheet steel or wire mesh. The number of revolutions of the drum is adjustable. The sifted refuse falls into a truck at the end of the drum and is removed for biological treatment. The parts retained in the drum are sifted into usable and nonusable material. Cans, bottles, metal parts, and rags are removed. The remainder is shredded and mixed with the other material for biological decomposition. (Text in German)



INT-0295

(H. Streit). Procedure for the incineration of garbage. Switzerland 295,342; filed Feb. 4, 1952; issued Dec. 31, 1953.

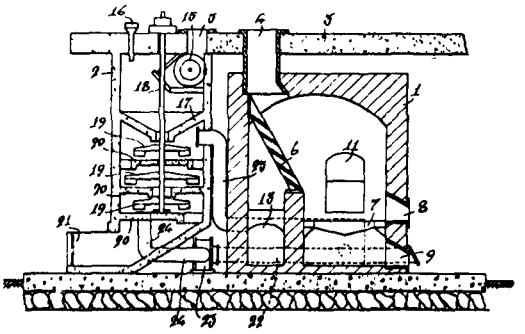
Garbage delivered by collection trucks is first sifted with sieves of 8- to 10-mm mesh size. After metal is removed, the coarse garbage is introduced into a closed vessel, where it is subjected to pressurized steam at 150 C. Hot air then dries the garbage to a moisture content of less than 5 percent. Both processes together last about 1 hr. Paper and textiles can then be removed and utilized elsewhere. The fine garbage obtained by sifting is added to the dried garbage, and the mixture is incinerated. The heat content of the mixture can be as high as 4,000 cal per kg, so no additional fuel is necessary. Very little smoke develops. The heat can be used to produce the steam and hot air necessary for drying and sterilizing. Paper and textiles may be removed before drying, but then they will not be sterilized. (Text in French)

INT-0296

Yano, M. (Sanki Kogyo K.K.). Incinerator with food garbage tank fermentation. Japan 33-7,741; filed Oct. 15, 1955; issued Sept. 2, 1958.

This incinerator is also equipped with a fermentation tank. The rectangular incinerator and the round fermentation tank are connected. The incinerator has an inclined echelon grate, above a horizontal fire grate. The mouth of the main stack,

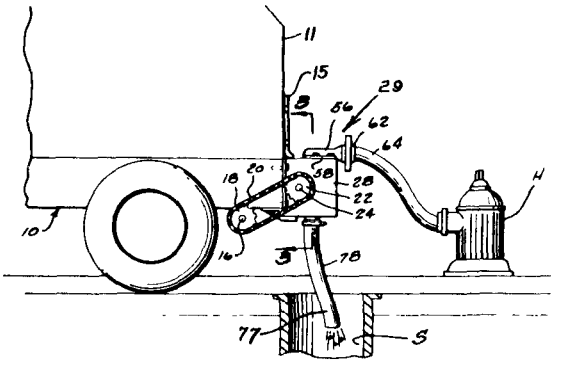
that has a damper and leads to the chimney, is located on a furnace above the lower grate. A substack behind the inclined grate communicates with the main stack via another damper, thus allowing adjustment of the combustion gas for the inclined grate. The upper half of the fermentation tank is a funnel-shaped chamber; the lower half is divided into three small compartments, each provided with a stirrer blade mounted on the central rotary shaft which runs vertically through the center of the tank. Under the lowest compartment is another room to store fermented garbage. An air blower connects to a pipe that opens in the bottom of the fermentation tank. The top cover of the equipment serves as a work platform for separating garbage according to moisture content. The drier garbage is dropped into the incinerator so that heavy, difficult-to-burn materials are caught on the inclined grate, while the rest falls onto the horizontal grate. The portion of combustion gases that do not exit through the main stack pass through the inclined grate to the substack, thus drying the garbage. The wetter garbage is dropped into the fermentation tank, where it is crushed, funneled into the compartments below, and stirred to cause fermentation, which is further accelerated by the heated air blown in by the air pipe. The fermented garbage drops into the storage room below. The gas generated during fermentation is discharged through the exhaust pipe. The fermented garbage is dried and used as compost. (Text in Japanese)



INT-0297

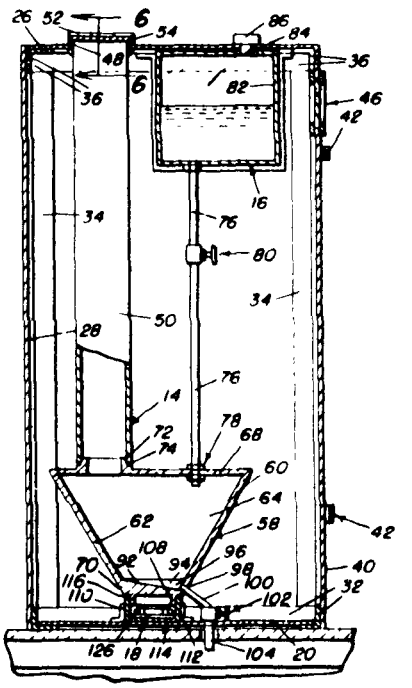
Veen, H. V. Garbage disposal truck. Canada 564,852; filed Jan. 6, 1958; issued Oct. 21, 1958.

A horizontally elongated housing encases a grinding chamber which contains a pair of meshed, threaded grinding rolls attached to the partition walls. On one side of the grinding chamber is a gear case, and on the other, a discharge chamber. A drive shaft connects the gears and the rolls. Beneath the rolls is a screw conveyor in the apex of the V-shaped bottom of the grinding chamber. The conveyor forces the ground garbage through a foraminous plate into the discharge chamber. One end of a water spray nozzle is connected to the top of the grinding chamber, and the other end to a fire hydrant or other water under pressure. A hose connected to a sewer outlet hangs down from the discharge chamber. As the garbage is ground, it is sprayed, forced into the discharge chamber, and discharged into the sewer.



INT-0298

Robedee, L. C. (H. M. Robedee, V. L. Rioux, F. C. Morin, W. F. Morin, D. E. Zieminski, and J. E. Zieminski). Waste disposal device. Canada 598,790; filed May 29, 1959; issued May 24, 1960.

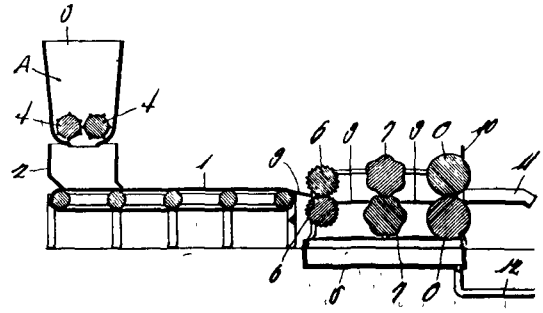


A waste treating and disposal unit consists of a disposal chute, a disposal hopper at the bottom of the chute, and a gravity-fed, disintegrating chemical supply reservoir elevated above, and in communication with, the hopper. A control mechanism between them controls the amount of disintegrating chemical used in the process. The hopper includes a downwardly inclined bottom sump portion from which a controlled outlet rises to communicate with, and direct dissolved refuse to, a sewage outlet. A controlled heat source is in communication with the hopper to increase the chemical reaction between the disintegrating chemical and the refuse.

INT-0299

Nadamoto, M. Solid waste disposer. Japan 35-10,395; filed Nov. 12, 1957; issued Aug. 1, 1960.

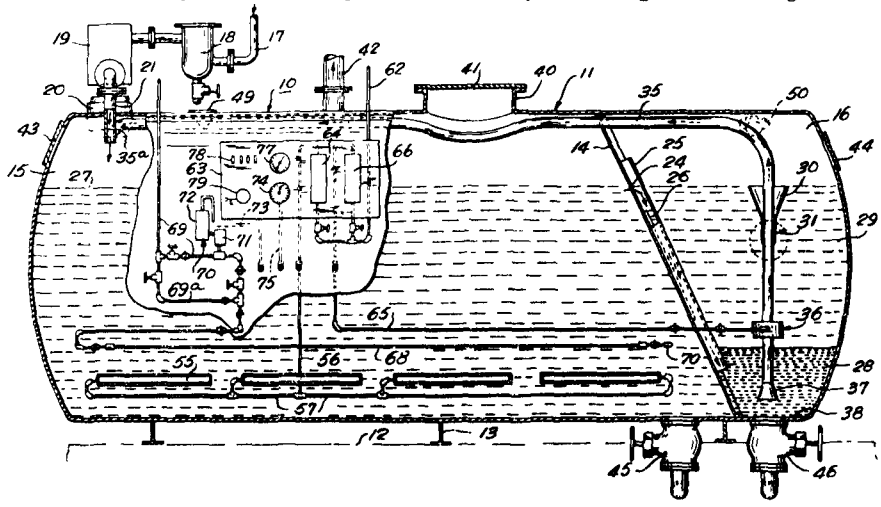
A crushing device consists of a pair of spiked, drumlike rollers fitted at the bottom of the hopper above a belt conveyor. Above the receiving box at the end of this belt conveyor, are three pairs of rollers; the first pair is toothed, the second pair is roughly corrugated, and the third is plain. The space between the end of the belt conveyor and the first pair of rollers, and those spaces between each successive set of rollers are bridged by a plate connection sheet. Solid wastes are first crushed at the bottom of the hopper before they drop onto the belt conveyor, which carries them to the rollers. The first set of rollers completes the crushing process; the other two dewater the pulverized material. The water is collected in the receiving box until it is removed through the discharge pipe for use as a fermentation agent in sludge treatment. The crushed and dewatered wastes are finally incinerated. (Text in Japanese)



INT-0300

(The American Ship Building Company). Waste disposal apparatus and method. Great Britain 886,585; filed Apr. 21, 1960; issued Jan. 10, 1962.

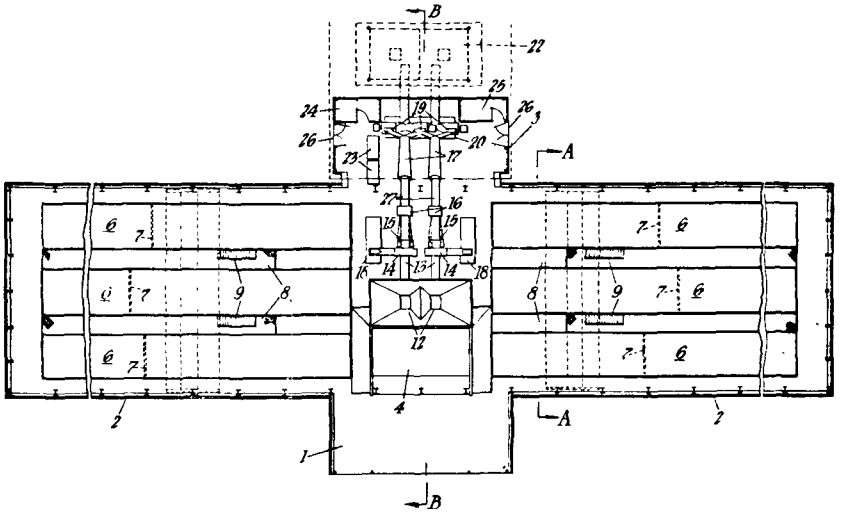
The waste disposal apparatus includes a waste collecting chamber (including a comminuting device), an outlet chamber, and a connecting passage between them. A mechanism leads from the outlet chamber to discharge effluent, and also to provide for the normal retention of a quantity of bacterially active sludge containing biological digestion organisms. A transfer device returns a portion of the sludge in the outlet chamber to the collection chamber, in order to promote aerobic digestion of the material. Also included are: air supply, air diffusing, heating, and temperature-responsive control devices. The method of disposal includes: collecting waste material in the collection chamber; transferring a portion of it into a second chamber; discharging effluent from the second chamber; retaining in the second chamber a body of sludge containing the biological



digestion organisms; returning a portion of the sludge to the first chamber to promote aerobic digestion of the material; aerating the first chamber to promote aerobic digestion; and heating the collected material in the first chamber to promote digestion and pasteurization without destroying the digestive action of the organisms.

INT-0301
Binns, J. Process and apparatus for the treatment of domestic refuse. Great Britain 919,955; filed Nov. 1, 1961; issued Feb. 27, 1963.

Domestic refuse is treated to produce a compost for horticultural and agricultural use. The refuse is first wetted, and then partially fermented by static exposure to air. Metallic material is removed from the mass, which is then ground and screened. Fermentation is then completed under controlled temperature and moisture conditions. If necessary, prior to the partial fermentation stage, the wet refuse may be reduced in size by treatment in a cutting mill. The mass will then be more compact, to facilitate subsequent fermentation stages of the process. Nitrogen-containing substances, such as sodium nitrate or ammonium hydroxide, may be added in aqueous solution to assist the primary fermentation. The refuse may also be supplemented with sewage sludge. The equipment for this treatment includes primary and secondary fermentation containers. Equipment is also included to transfer the mass from one container to the other, while separating the metal magnetically and electronically. Grinding and screening devices are also provided. (See also Great Britain 921,006, 921,007, and 1,081,810)



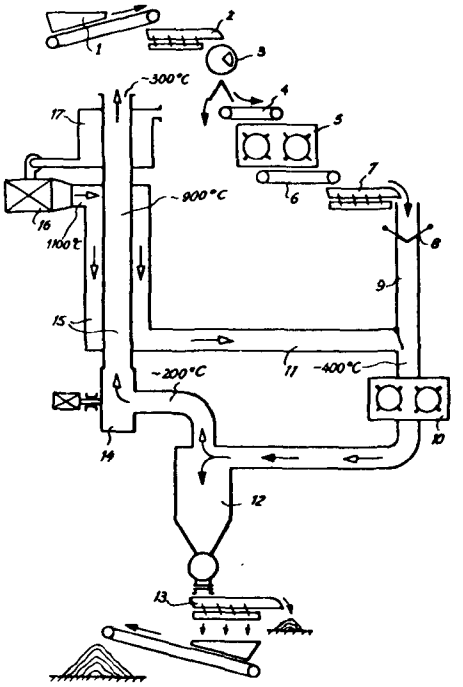
INT-0304
Aretz, W., and R. W. Aretz. Refuse destruction. Germany 1,173,851; filed Mar. 30, 1962; issued July 16, 1964.

This method of refuse treatment comprises a combination of the following work stages: heating the untreated refuse until the organic constituents are charred or melted at temperatures below the melting point of the inorganic constituents; comminution and screening of the carbonized residue; sorting the magnetic constituents from the first screen residue by electromagnets; and separating the first screen residue by flotation. The settled material is selectively comminuted and classified by screening. This is followed by postgrinding of the second screen residue. (Text in German)

INT-0303
(Hazemag Hartzerkleinerungs- und Zement-Maschinenbau-G.m.b.H.). Process and installation for treatment of household waste. France 1,430,626; filed Apr. 6, 1965; issued Mar. 4, 1966.

The processing of plastic, paper, and textiles to compost is covered. Crude sieved waste is submitted, after a separation process (e.g. sieve or shaker), to heating to 400 C, at which it is dried but not burned. After further heating and separation, the

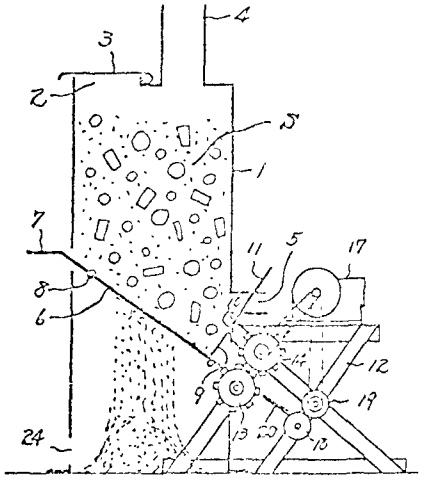
various elements are either conveyed to compost or burned. Noxious gases are eliminated by heating the effluent to 900 C. A considerable reduction in bulk is provided. (Text in French)



INT-0304

Kobayashi, Y. (Japan Public Sanitation Association). Disposers for waste tin cans. Japan 42-20,666; filed Aug. 12, 1964; issued Oct. 14, 1967.

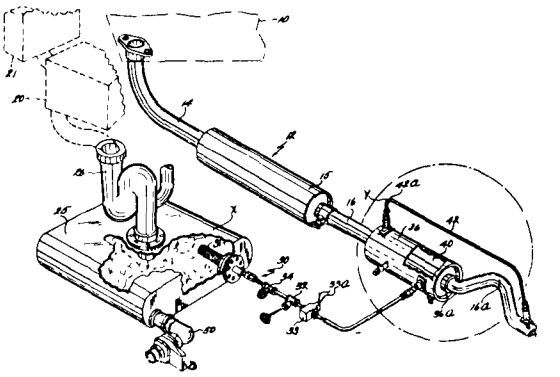
A disposer, which not only disposes of garbage, but also of bulky waste cans and containers, consists of a compressor, an incinerator, and a hopper. After the hopper's lid is closed, the incinerator is lighted and slipped into the box. After combustion, the grid at the bottom is shaken to remove the ash. The gas is emitted from a funnel. The motor of the compressor is then started. The shaking of the grid continues; the cans, which were sintered, are drawn to the rollers by magnetic claws. Since they are sintered, it is easy to compress them. Thus, the waste's bulk is markedly decreased. Because of the magnetic claws, the rollers can be small, and the disposer itself can be compact, enabling easy transportation. The combustion grid is slanted, and the angle can be freely adjusted. The other grid, which pushes the cans, etc., into the rollers, can also be easily adjusted. (Text in Japanese)



INT-0305

Reid, J. S. (Standard Products Company). Waste disposal system. Great Britain 1,139,277; filed Sept. 19, 1967; issued Jan. 1, 1969.

A waste disposal system for use in a motor vehicle has a toilet connected to a tank for receiving human wastes, and a flushing source which carries the waste material to the tank. Anaerobic bacteriological action takes place in the tank, and converts the waste material into a fluid state. A conduit delivers the fluid from the waste tank to a container, which is heated by an electric heating element or a gas burner. Most of the liquid is vaporized and discharged to the atmosphere.

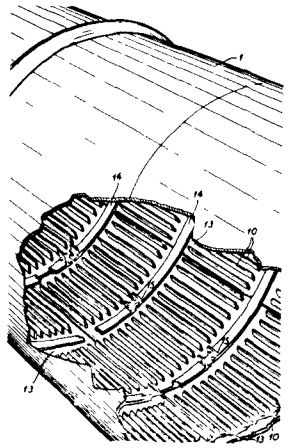


INT-0306

(Dano Ingeniorforretning og Maskinfabrik Ingenior Kaj Petersen's Fond). Rotary drum for mixing, crushing, or composting refuse. Germany 1,297,120; filed Feb. 23, 1963; issued June 12, 1969.

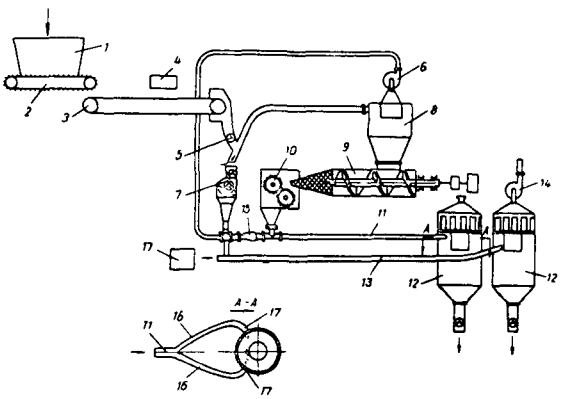
A rotary drum mixer/crusher/composter for refuse which clogs or sticks is charged at

one end and discharged at the other. Shallow ribs inside the drum casing, parallel to the axis and vertical to the casing, are spaced so a troughed and solid protective layer of clogged or sticky refuse forms between them. (Text in German)



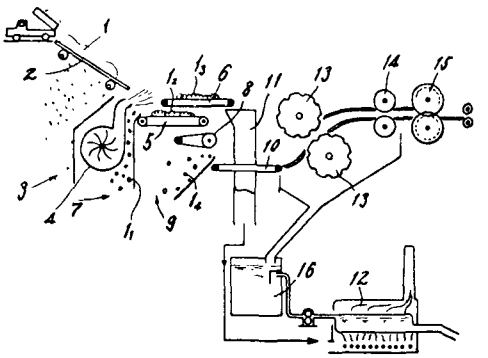
INT-0307
Myagkov, M. I., N. A. Shirokov, S. D. Shemyakin, and I. A. Smirnov (Mechanical Engineering Research Institute). Installation for processing of domestic refuse. U.S.S.R. 247,445; filed Aug. 11, 1967; issued July 4, 1969.

This installation provides for the separation, comminution, and biothermal treatment of domestic refuse. The crushed refuse is preheated and comminuted. In operation, the arriving refuse is discharged into an input hopper, then transported on a slat conveyor to a conveyor belt, passing under a magnetic separator for removal of its ferromagnetic constituents. It then enters, through a feeding valve, into a pneumatic conduit. Pieces of refuse whose weight exceeds their positive lift in that stream (such as stones, glass fragments and bones), drop into a hammermill, where they are crushed, and then transported into a comminution chamber. Pieces whose weight is less than their lift are carried up into a cyclone and fed into a worm crusher. The crusher output drops onto serrated cylinders which shred its fibrous constituents. It then is transported, by pneumatic conduit, to another comminution chamber. The air-refuse mixture moving in this conduit is preheated, and, therefore, accelerated as well, in passing through a combustion chamber whose heat output is controlled to maintain the temperature of the refuse at 55 to 60 C. The mixture enters the comminution chamber through two mutually opposed inlet nozzles, in which the two branches of the split conduit terminate. The two opposing jets of the air-refuse mixture impinge into each other, pulverizing the solid constituents of the mixture. This also occurs in the other chamber, and output from both chambers is again transferred for biothermal treatment. (Text in Russian)



INT-0308
Kawada, T. (Kawada Kogyo K.K.) Garbage disposal method. Japan 44-23,302; filed July 6, 1966; issued Oct. 3, 1969.

To prevent air pollution in urban areas, the garbage is not burned, but after dehydrating and crushing, it is conditioned so that it will not putrefy, cut into even sizes, and wrapped in synthetic resin film for use as reclamation material. The garbage is shaken to remove sand and earth. It is then sifted by blower into heavier kitchen garbage containing water, and lighter material containing scraps of paper, etc. At the same time lumps of tile, gravel, broken bottles, and similar materials are eliminated. Next, a magnetic selector eliminates metal pieces. Then the heavier garbage is subjected to a crushing roller, and dehydrated. Lighter garbage is burned. The waste water, which results from dehydration, is heated to sterilize it. The crushed garbage is cut to suitable size, tightly wrapped in synthetic resin film, and

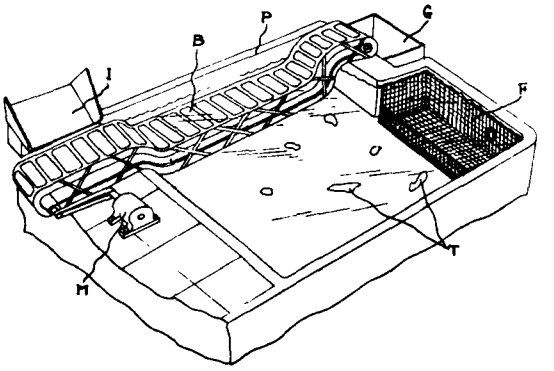


then disposed. There is no danger of breeding flies, and the garbage can be transported to the reclamation site sanitarily. The waste water, after heating in the boiler, is discharged into a river with no danger of polluting the water. (Text in Japanese)

INT-0309

Yoshida, Y. Garbage disposal method. Japan 44-23,303; filed July 9, 1966; issued Oct. 3, 1969.

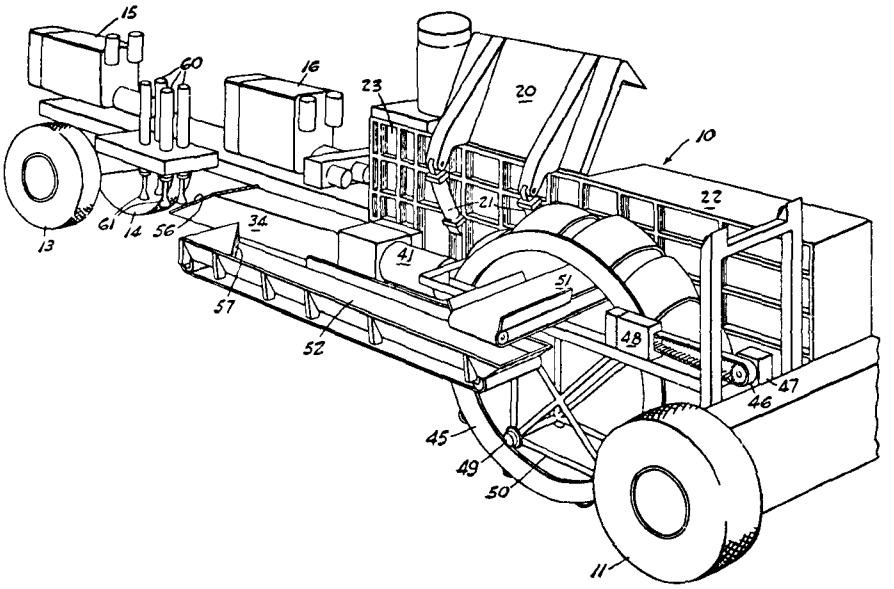
In this method, wastes are placed in water to separate the nonflammables from the inflammables. The inflammables float, and can be collected. They are then pressed, dehydrated, and made into a suitably shaped solid. Treatment by vacuum incineration and burning follows. Incineration of these blocks requires little fuel and time. The nonflammables, such as cans, bottles, etc., are removed from the tank by a belt conveyor. Some of the materials can be reutilized after recovery processing. (Text in Japanese)



INT-0310

Jackson, S. M., and E. L. Carnes. Refuse disposal apparatus. Great Britain 1,167,172; filed Sept. 5, 1966; issued Oct. 15, 1969.

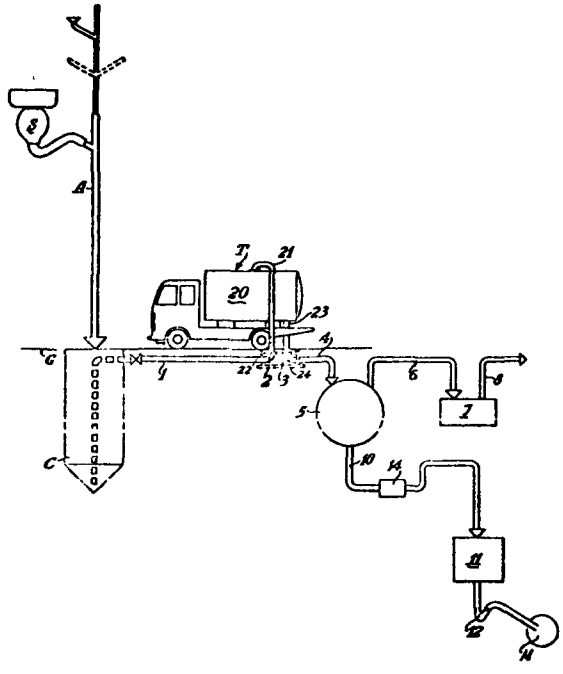
This apparatus is intended for handling trash, as distinguished from garbage. The trash, after initial compaction, is maintained under continuous pressure until it is disposed of in tightly compacted form. The apparatus is constructed and arranged to move along the ground at the site where the refuse is to be deposited, and it includes trenching devices, adjacent to its forward end, for forming a continuous trench along the ground in which compacted trash from the apparatus will be continuously deposited, as the apparatus moves forward. The apparatus may be so arranged that the earth removed by the trenching apparatus is conveyed, within or upon the apparatus, to a more rearward portion, where it is continuously deposited in the trench directly upon the compacted material. The refuse is immediately covered and is not exposed at any time. The apparatus comprises a wheeled vehicle including trenching devices, a chamber or charging box, a ram in the chamber for compacting the refuse, a second ram in a second chamber to shear the compacted refuse, a third ram in a third chamber to further compact the refuse, and a fourth ram in a fourth chamber to again compact the refuse and discharge it into a trench.



INT-0311

Venison, D. M. (Matthew Hall and Company, Ltd.). Disposal of household refuse. Australia 294,939; filed Mar. 19, 1964; issued Oct. 15, 1969.

Refuse, in a collecting pit or chamber which forms part of the household drainage system, is collected by periodically transferring it to a mobile disposal tank. The refuse is subjected to filtration inside the tank in order to separate the solid matter from the liquid. The separated liquid from the mobile disposal tank is discharged into a static liquid-receiving tank. The tank is in communication with a sewage system and is adapted to be connected to a vacuum source. In operation, on placing the liquid-receiving tank under vacuum, refuse can be transferred from the collecting pit to the mobile disposal tank, and the solids can be extracted from the refuse without interrupting the discharge of liquid.



HAZARDOUS WASTES

INT-0312

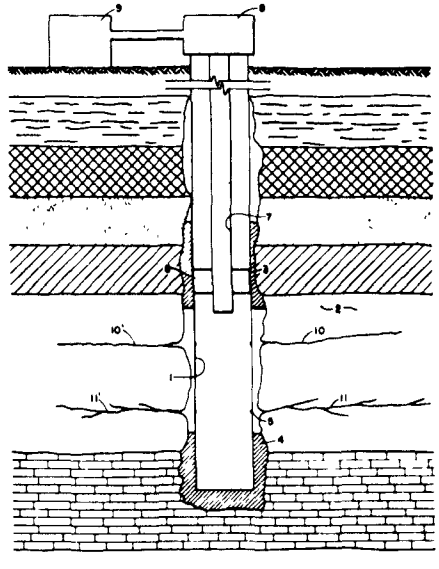
Gant, P. L., D. A. Spock, and J. D. Sudbury (Continental Oil Company). Method of fixing atomic wastes for disposal. Australia 237,098; filed Nov. 30, 1959; issued Jan. 24, 1962.

A method of fixing radioactive wastes for disposal comprises first recovering the fissionable elements, then adding natural clay, lime, and caustic to the resulting waste fluids. The preferred amount of natural clay added is 25 to 45 percent based on the weight of the total mixture. Lime was found to be most efficient in concentrations of 2 to 30 percent based on the weight of the waste fluids. A caustic solution of about 50 to 75 percent of any commercial grade of basic metal hydroxide is added until the pH is within the range of 10 to 13. At this pH range, treated radioactive waste may be solidified at temperatures as low as approximately 20 C. The treated fluid is pumped into a subterranean formation, preferably lower than 50 ft, and below the water table. (See also Australia 247,046)

INT-0313

Reynolds, J. J., and D. A. Shock (Continental Oil Company). Underground disposal of radioactive liquids or slurries. Canada 650,443; filed Aug. 18, 1959; issued Oct. 16, 1962.

A method of subterranean disposal of radioactive waste involves providing a wellbore having a casing which penetrates an impermeable rock formation. Sealing between the casing and the impermeable rock formation provides a sealed zone. This zone is fractured through to give at least one fracture which extends into the formation at an angle with respect to the axis of the wellbore. Radioactive waste from a nuclear reactor is treated to recover fissionable elements, and then the resulting waste is injected into the fracture. The fracture must be at a depth sufficient to provide shielding at the surface from the

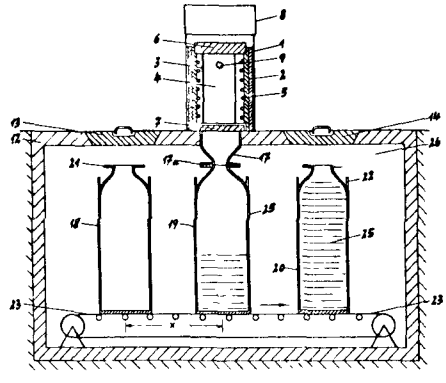


most active fraction of the wastes, and must be confined within the permeable rock formation. A sealing material is injected into the fracture to seal the radioactive waste in the formation. (See also Australia 247,046)

INT-0314

Michaelis, O. (Michaelis Industrieofenbau Kommanditgesellschaft). Incinerator. Germany 1,162,504; filed Oct. 29, 1959; issued Feb. 6, 1964.

An incinerator for hospital wastes and radioactive wastes comprises a shaft furnace whose combustion chamber consists of a polygonal or cylindrical insert, and is closed at top and bottom by a withdrawable, heat-insulating cover or bottom. Underneath the combustion chamber, which is screened against radiation, there is a pit, also screened against radioactive radiation, and provided with a conveyor band for moving continuously underneath the discharge funnel of the shaft furnace. (Text in German)



INT-0315

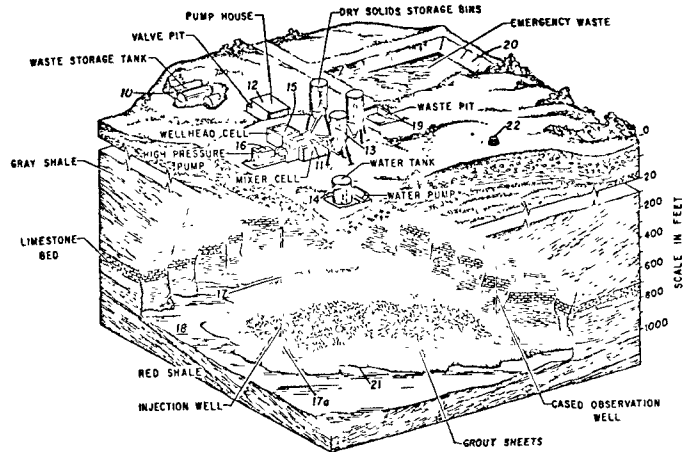
Masson, M. Waste disposal in ground by means of hydraulic injection to form cavities, or to extend existing ones in the ground. France 1,443,938; filed Mar. 12, 1965; issued July 1, 1966.

The opening in the ground is made by high-speed sand or liquid jets, into which the waste solutions or materials, including radioactive wastes, may be introduced. The charge is then covered by cement, polymers, plaster, or hydraulic lime, or any other suitable sealer. The opening which is formed may also be extended to dispose of larger quantities of wastes. In the case of radioactive wastes, the soil and sealer have to be radiation-proof. (Text in French)

INT-0316

(Halliburton Company). Method of disposing of waste materials particularly radioactive waste. Great Britain 1,054,740; filed Sept. 16, 1965; issued Jan. 11, 1967.

A method of subterranean disposal of waste materials, especially radioactive wastes, comprises providing a wellbore which has a casing which penetrates on earth formation. The earth formation is fractured through to provide at least one fracture which extends into the formation wellbore. A low-viscosity fracturing slurry is injected into a fracture formed in this manner. This slurry comprises the waste material, hydraulic cement, an adsorption type clay, and an agent which reacts chemically with the cement and retards its setting. The fracturing slurry is allowed to set, in the formation fracture, into a hard mass, thereby confining the waste material in the formation of the fracture.



INT-0317

(Societe Europeenne Pour le Traitement Chimique des Combustibles Irradies Eurochemic). A process for solidifying radioactive wastes. Great Britain 1,116,319; filed Nov. 18, 1966; issued June 6, 1968.

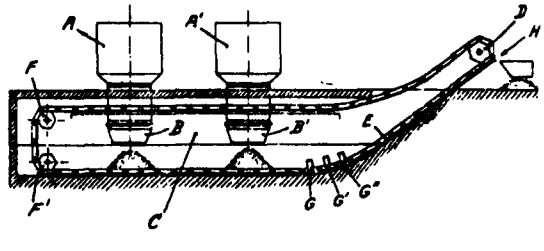
This process is utilized for solidifying radioactive wastes containing water-soluble fluoride, water-soluble sulfate, or both. At least one liquid waste is mixed with sufficient lime to neutralize the free sulfuric acid and/or precipitate the free fluoride. The water present in the product is subjected to evaporation to provide a paste, which is hardened to a block, and is then enclosed in a watertight cover. This method can be applied to almost all radioactive compounds.

INCINERATION

INT-0318

(L. von Roll Aktiengesellschaft fuer kommunale Anlagen). Equipment for wet slag tap-off in rubbish incinerators. Switzerland 241,610; filed Oct. 27, 1943; issued Mar. 31, 1946.

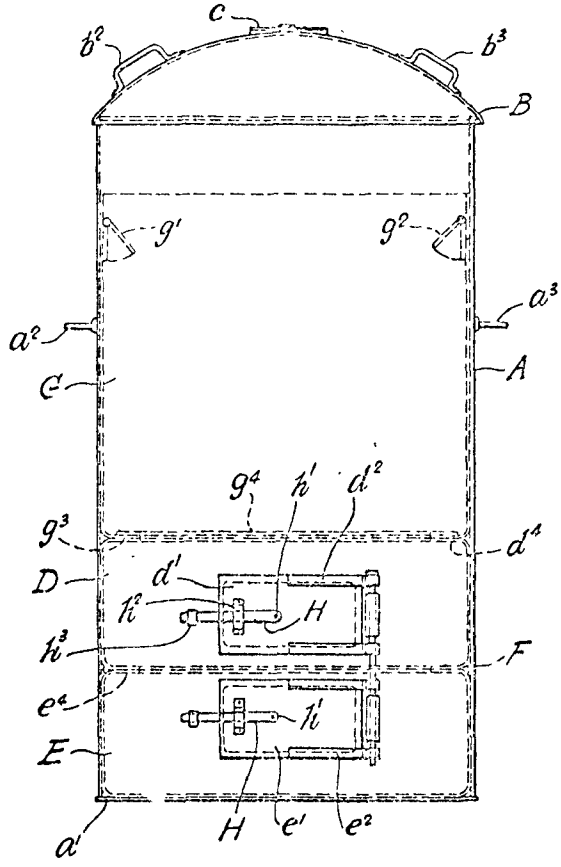
Slag from rubbish incinerators contains high amounts of material such as dust and pieces of iron, cans, and wire. To help avoid penetration of such components into the links of the slag tap-off chain belt, the chain conveyor consists of links bifurcated on one side and rounded on the other. The rounded end is closely fitted into the bifurcated end of the following link so that no foreign parts are allowed to enter. At least one pair of adjustable plow-shaped guide pieces is installed to prevent the chain from lifting out of the groove. Crossbars connect the two parallel chains of the slag conveyor at intervals. (Text in German)



INT-0319

Griffiths, D. A. C. A combined refuse bin and incinerator. Great Britain 577,412; filed June 5, 1944; issued May 16, 1946.

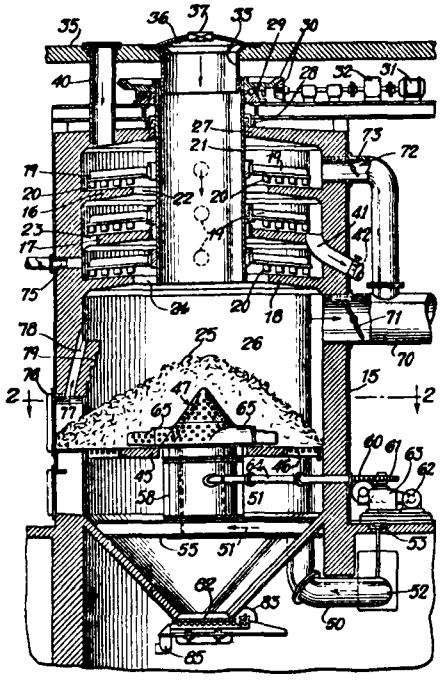
A combined refuse bin and incinerator is useful in the disposal of kitchen or garden refuse, which, by its use, can be converted into a valuable fertilizer. The device consists of a container in which a firebox is secured. The firebox has large openings in its roof and floor. The floor is provided with firebars or a perforated bottom plate. There is an ashbox under the firebox. The ashbox has in its roof a large opening registering with the lower opening of the firebox. Each of the boxes has in its wall an opening adapted to be closed by a hinged or other door in the container casing. In the upper part of the container is a larger receptacle or refuse pan adapted to be lifted out of the container, and having a perforated bottom. The device is preferably of cylindrical shape, covered by a domed lid comprising a valve to open and close a vent.

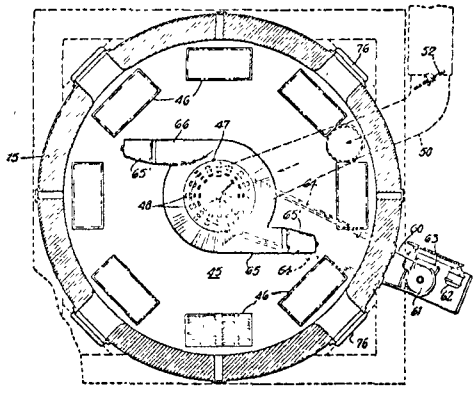


INT-0320

Nichols, C. W. (Nichols Engineering and Research Corporation). Apparatus and method for drying and incinerating waste materials. Canada 442,766; filed May 5, 1944; issued July 8, 1947.

An incinerating apparatus comprises a furnace chamber whose central floor area comprises a stationary hearth surrounded by a grate. A device rotates about a vertical axis through the mid-portion of the hearth and agitates the material on the hearth, advancing it onto the grate area. A rotatable vertical hollow shaft opens into the upper part of the chamber for introducing the material. One or more horizontal hearths surround the shaft. The top of the furnace is formed with another opening for admitting more material onto the hearths. Rabbling devices advance the material over the hearths. The method of drying and incinerating sewage sludge and conjointly burning other municipal waste calls for maintaining a pile of the waste in the furnace chamber. The material is slowly advanced outward, while supplies of air are introduced into the interior of the pile. The peripheral portions are burned, while the middle portions are dried and burned. The hot gaseous products of combustion dry the continuous supply of the sludge. The pile is replenished by additions of the waste and dried sludge to the central region of the pile. (See also Australia 200,447)

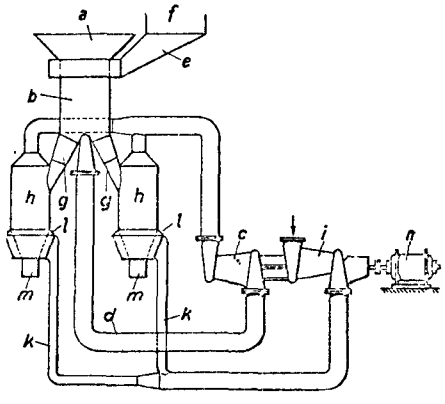




INT-0321

(Aktiengesellschaft Brown, Boveri and Company). Methods and plants for the utilisation of refuse. Great Britain 595,947; filed July 10, 1945; issued Dec. 23, 1947.

The method is characterized by the fact that the refuse is used to produce hot-pressure gas to operate a gas turbine plate with compressed air and power generators. The compressed air is taken from the plant for combustion of the refuse. Refuse is dried by exhaust and gas from a gas turbine. Pressure in shaft furnaces is maintained by a compressor which draws in atmospheric air to supply primary and secondary air to the furnaces. The residual mechanical power to drive the compressor is converted into electrical power by a generator.

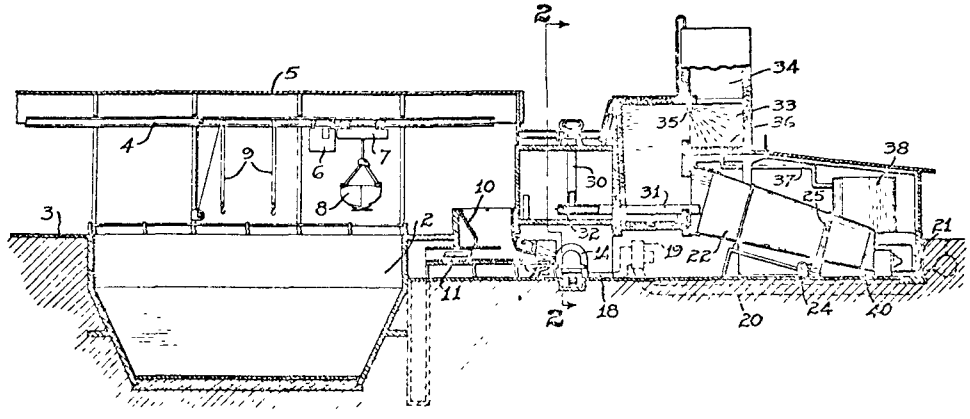


INT-0322

Duerr, H. O. Method and apparatus for incinerating municipal waste. Canada 457,593; filed Dec. 10, 1946; issued June 28, 1949.

An apparatus for incinerating municipal waste comprises an inclined rotary incinerating kiln,

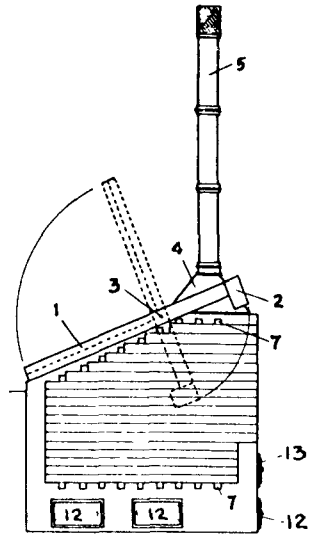
with its higher end communicating with a secondary combustion chamber. The waste to be incinerated is fed into a shredder, where the air-buoyant portion of the shredded material is conducted, along with the air supply, into the lower end of the kiln. Nonbuoyant material is fed into the higher end of the kiln. An enclosed ash conveying system is connected to the lower end, and a water spray device in a third chamber purifies the waste gases. This system requires no manual labor in feeding waste into or removing products of combustion from the incinerating zone. No dirt, dust, or other air pollutants are released to the atmosphere.



INT-0323

Langlois, C. Outdoor incinerator with natural circulation. Canada 462,960; filed Dec. 8, 1948; issued Feb. 7, 1950.

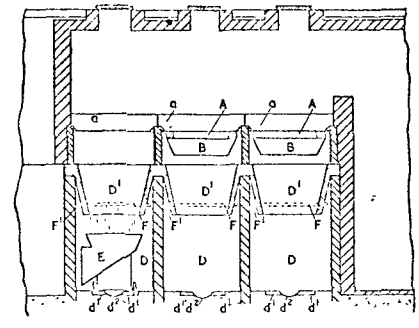
An incinerator has a combustion chamber whose walls have canals communicating with the outside air, which circulates through the canals to cool the incinerator. The canals do not communicate with the combustion chamber. The upper part of the chamber has a loading door, enabling the material to be incinerated to be loaded directly into the chamber. The door is protected from fire by a lining of reinforced refractory concrete supported by structural pieces. It is protected from the exterior by a metal plate. The rest of the upper part of the combustion chamber is similarly made of reinforced refractory concrete, and protected by a metal plate. It forms the base of the chimney. The combustion chamber has, in its bottom, an immovable grate inclined at an angle of 5 to 30 degrees to facilitate residue removal. (Text in French)



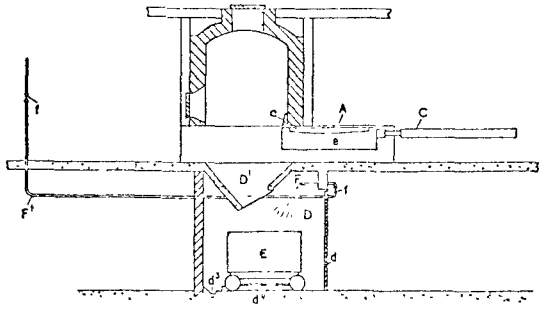
INT-0324

Wareham, R. C. (Heenan and Froude Limited). Improvements relating to refuse destructor furnaces. Great Britain 663,402; filed Mar. 11, 1949; issued Dec. 19, 1951.

An improved method for the removal of clinkers from sliding incinerator grates is provided by rapidly cooling the clinker with sprays of water or other coolants after its discharge from the grate into the receiving chamber.



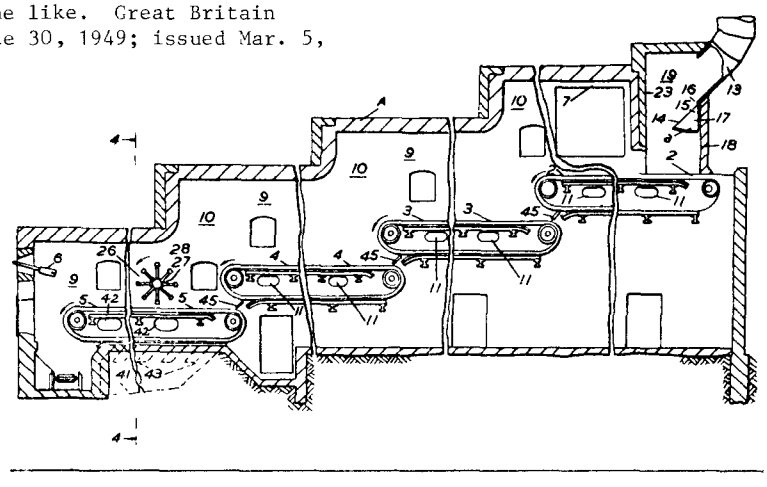
The clinker is scraped off the grate by a scraper and fixed within the combustion chamber, after which it falls via a chute into a cart, which is moved on rails to bring it into position to receive the clinker. Coolant is sprayed onto the discharged clinker from valve-controlled nozzles, fed by a common-supply line. Ducts in the floor of the clinker chambers collect and drain off the residual coolant.



INT-0325

Dehn, S. G. Traveling grate incinerator for city refuse and the like. Great Britain 667,572; filed June 30, 1949; issued Mar. 5, 1952.

The furnace is an elongated, massive structure, with reinforced fireproof walls and ceiling, and built to house a series of five horizontally disposed stepped, power-driven, endless traveling chain grates. The garbage, which is introduced through a feed pipe, is progressively advanced on the grates through the furnace until it is discharged as ash and clinker, from the last of the grates. Heat is provided by gas or oil burners adjacent to the last grate. Each grate traverses a series of stepped, individual combustion chambers, and thus constitutes a continuous combustion space. Air combustion is supplied by a regulated blower motor through an air trench, which feeds into a vent beneath each grate. Smoke becomes progressively less dense as it traverses the grates and, together with steam and gases from the garbage, is directed towards a main exhaust stack. Remaining gases pass through a scrubbing tank. Even distribution of garbage on the grates is done by a unique spreading device. Bulky lumps are disintegrated by a lump breaker. The incinerator is virtually smokeless and odorless.

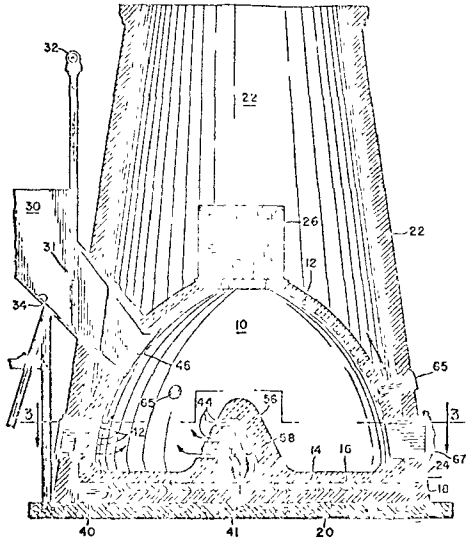


INT-0326

Toepel, F. C. Garbage disposal unit. Canada 491,980; filed Aug. 8, 1949; issued Apr. 14, 1953.

This garbage incinerator consists of a circular domed primary combustion chamber whose walls join with a central conical pillar to provide an annular combustion chamber. Tangentially-directed air jets produce a swirling action within the primary combustion chamber. Concentric to and spaced around the primary chamber is a shield which forms a secondary combustion chamber. Air openings around the base of the shield supply air to the secondary chamber. Air intakes in the wall of the shield and above the dome of the primary combustion chamber furnish preheated air to the primary chamber; discharge openings direct this air to the refuse. A chute, which is adapted to regulate the flow of refuse, leads from a hopper, through the shield, into the primary chamber. This unit is constructed so as to provide maximum efficiency in the rapid destruction of materials by combustion. The maximum of volatile gases is generated from the refuse, and these gases are continuously circulated around the annular chamber until they are consumed. The process proceeds in a minimum of time, requires a minimum of space,

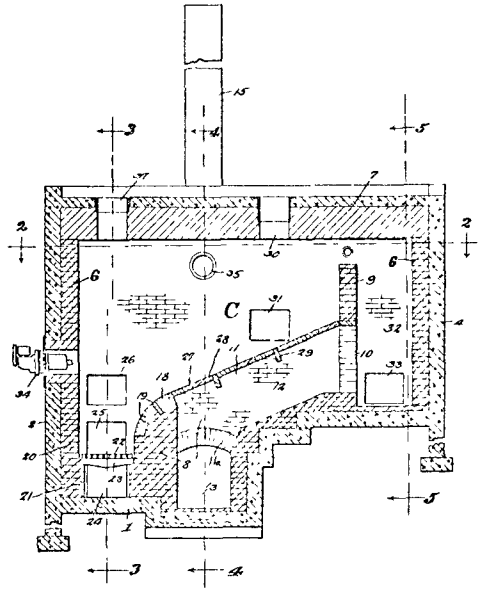
and does not require the usual stacks or chimneys.



INT-0327

Hommon, H. B. Garbage incinerator with associated drying hearth. Canada 493,295; filed Apr. 22, 1950; issued June 2, 1953.

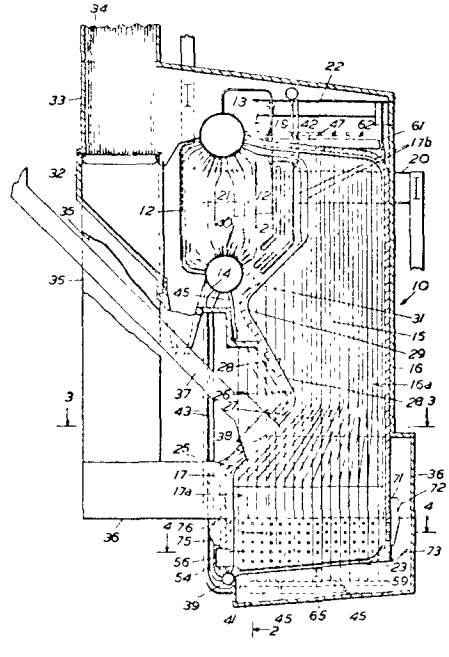
A drying hearth for garbage incinerators includes a base, a transverse fire wall at the front, and several longitudinal vertical walls extending backward from the firewall and defining longitudinal flow channels which open at the rear between them. Openings in the longitudinal walls adjacent to and to the rear of the firewall provide a transverse outlet flue. A hearth of thin material having a high thermal conductivity is supported on the walls and extends from the crest of the firewall upward and backward over the transverse flue outlet, and over part of the longitudinal flow channels. As garbage passes downward and forward on the hearth and over the firewall, hot combustion gases flow from the firewall upward and backward over the garbage and onto the hearth, in the open rear ends of the flow channels, and through the channels to the transverse outlet flue. While they are in the channels, the gases transfer heat to the hearth, and thus to the garbage. In this way, the garbage is dried and partially burned from above and below.



INT-0328

(Babcock and Wilcox Limited). Improvements in or relating to vapour generators. Australia 152,382; filed Dec. 6, 1951; issued July 16, 1953.

The vapor generator is comprised of a vertically extending furnace chamber and a vapor generating section which is arranged to receive heating gases from an upper region of the furnace chamber. Vertically extending vapor generating tubes line the peripheral walls of the furnace chamber, a lower portion of which is divided into a number of refuse burning cells. Separating adjacent cells is a chamber arranged to receive combustion air and to supply air to the cells. The rows of tubes lining the faces of the refractory walls extend upward, in spaced relation, from the

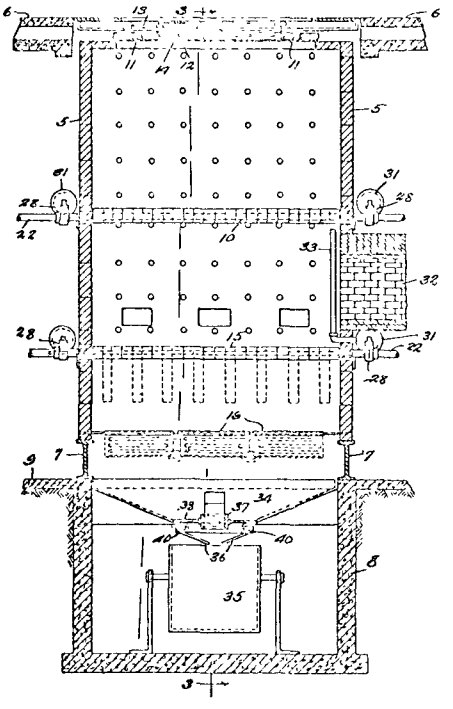


bottom of the furnace chamber, and converge at the top of the combustion-air chamber. Air supply to the burning cells can be controlled by the air supply ports. One of the furnace walls is formed as an arch, and means are provided for delivering combustible refuse through the arch to the respective cells.

INT-0329

DeCarie, F. O. Incinerator. Canada 494,553; filed June 20, 1949; issued July 21, 1953.

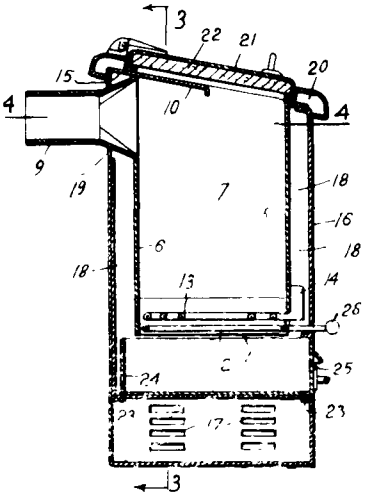
This incinerator includes superimposed groups of movable, air-cooled grates. Vertically spaced pairs of horizontal pipes extend transversely through the body portion. The pipes have openings, around which are clamped hollow grate bars. These grates form the bottoms of the storage chambers in which the refuse under treatment is contained. The firing grates are adjacent to the bottom of the main chamber, so that refuse stored in the chambers is held in direct line with the fire and products of combustion as they pass upward toward the flue. As the refuse progresses from each grate to the adjacent lower grate, it becomes dried and partially burned. By the time it reaches the firing grates, it burns readily and rapidly.



INT-0330

Morris, A. H. Improved incinerator. Australia 159,313; filed Dec. 5, 1952; issued Oct. 14, 1954.

An incinerator, which is primarily for domestic use, consists of a combustion chamber which is open at the top and bottom, and has the top sloping upwardly to the back where there is an outlet to a flue. A deflector plate is positioned to direct products of combustion into the flue outlet. Above the grate at the bottom is a sheathed grid-like electric element leading to the power supply. The combustion chamber is mounted in a casing which extends below the combustion chamber. Between the walls of the combustion chamber and the casing is an air space. Air inlets in the casing are near the bottom, and an outlet is juxtaposed to the flue. A hollow lid, filled with insulating material, is mounted in a frame fixed to the top of the casing. An ash tray, which is mounted in the casing, has an air inlet through the front to the combustion chamber.

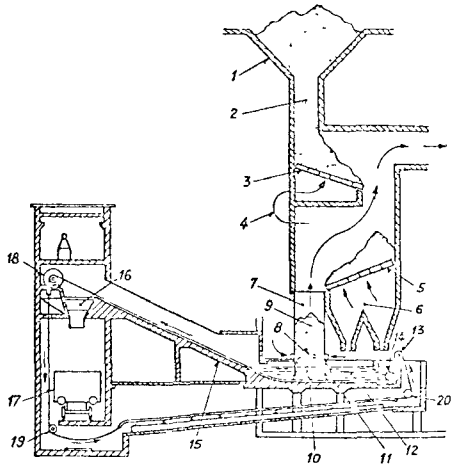


INT-0331

(L. Von Roll A.G.). Furnace for the combustion of domestic refuse and other inferior-grade fuels. Great Britain 726,582; filed Mar. 25, 1953; issued Mar. 23, 1955.

A furnace for the combustion of domestic refuse and other inferior-grade fuels has a continuous and automatic cycle of operation. In this cycle, refuse which is fed to a predrying grate, subsequently descends to a combustion grate for incineration. The clinker-producing gas generator, which is connected directly with the combustion grate, includes a substantially vertical shaft which receives the residue from the combustion grate. There

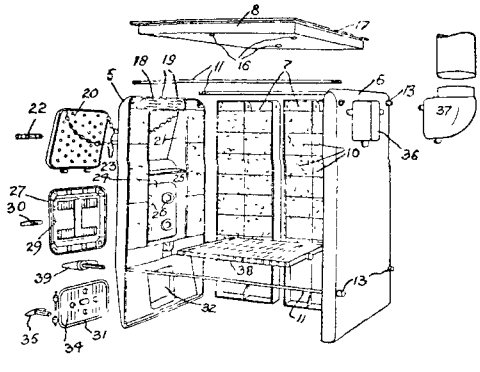
is a scraper chain provided below the gas generator which supports the contents of the vertical shaft and continuously removes the clinker produced.



INT-0332

(Kernerator and Wall Bed Company of Australasia 'Proprietary' Limited). Improvements in incinerators for the disposal of garbage or the like. Australia 164,464; filed Sept. 30, 1953; issued Aug. 4, 1955.

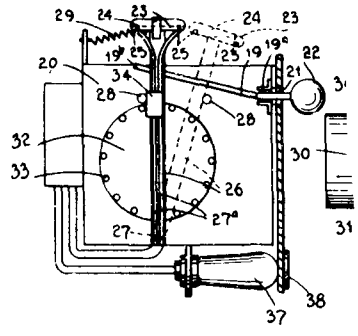
An incinerator for domestic purposes is constructed in a series of casing or body units which are fitted and fastened together to enclose the incinerator chamber. The hollow top unit contains an air box with inlets, and a series of air jets. A feed opening is in the upper portion. An air torch assembly is below the feed door. An ash door is in the lower portion, and a dumping grate is mounted within the chamber. An outlet flue is provided at a suitable location. The body units are of a hollow, box-like form, with a series of ribs on the interior about the incinerator chamber, and with firebricks fitted within the cavities formed between the ribs. The meeting edges of the units are shaped to nest together.



INT-0333

(Avon Metal Industries Limited). An improved destructor for waste material having time switch mechanism. Australia 166,055; filed June 12, 1953; issued Nov. 18, 1955.

Destructors of waste material have a time switch mechanism adapted to allow control over the supply of electricity to the element, and to allow heating of the element for a predetermined length of time. The mechanism consists of a mercury switch, which is controlled by a time dial and which is rotatable by means of an electric motor included in the circuit of the resistance element. The mercury switch operates to close the circuit and set the motor and time dial in motion. The time dial moves the mercury switch during a predetermined period, to a position in which the mercury switch can be operated to open the circuit. A switch lever operates the time mechanism. The opening of the flap, which covers the entrance to the destructor, moves a pivot arm, which, in turn, moves the switch lever. Fixed stops limit the movement of the pivot arm.

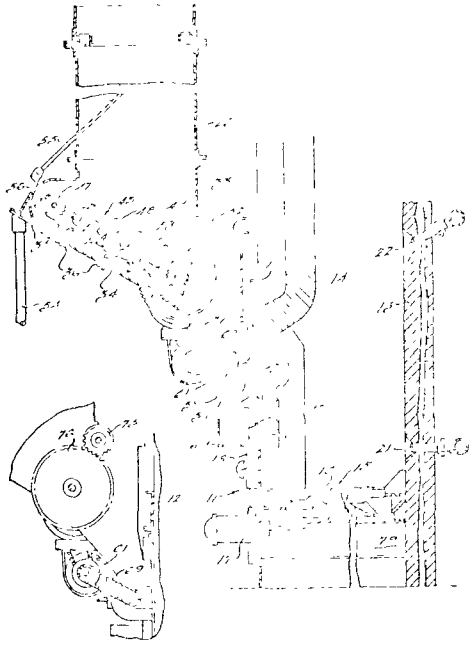


INT-0334

Wagner, H. L. (Detroit Stoker Company). Refuse feeding device for furnaces. Canada 520,282; filed Dec. 12, 1951; issued Jan. 3, 1956.

A device for metering and feeding refuse fuel and the like into a furnace uses a variable speed conveyor. The conveyor carries fuel from a delivery chute, which is inclined with respect to the conveyor, to a gravity spout or hopper. A feed roll, having a number of fingers travelling faster than the conveyor, delivers a portion of the fuel from the conveyor into the gravity spout or hopper. From the gravity spout or hopper, the fuel is fed into a variable speed rotary spreader-stoker which is mounted at a feed opening of the furnace below the gravity spout or hopper. The fuel drops onto spinning rotor blades which throw it into the combustion chamber. Air jets spread the fuel particles uniformly over the

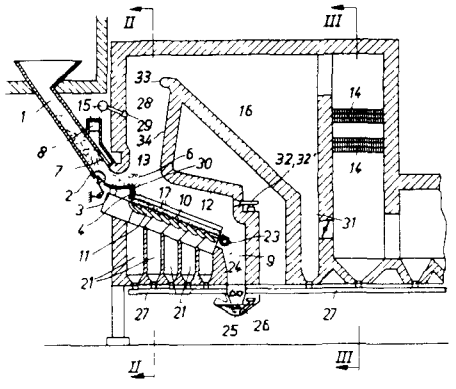
grate area so that the fuel is burned uniformly over the entire grate.



INT-0335

Martin, J. A method and apparatus for the incineration of domestic refuse. Australia 167,178; filed Feb. 4, 1954; issued Mar. 7, 1956.

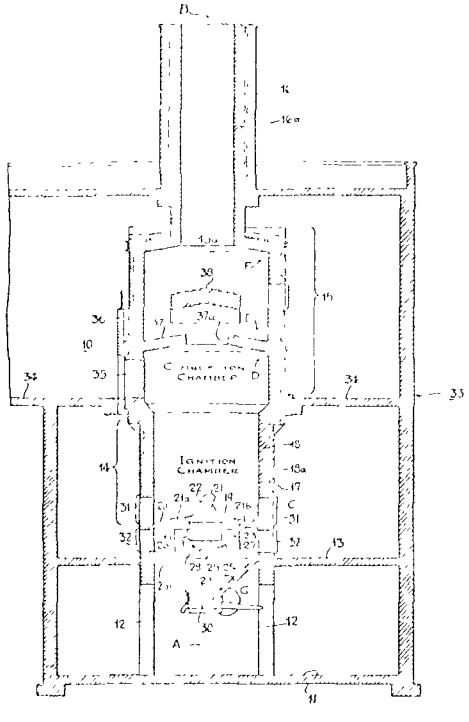
Refuse is fed at intervals into the region of the furnace where the most intense heat production takes place, by means of an inclined chute, the bottom of which is equipped with a reciprocating device with an adjustable stroke. A reciprocating stepped grate works toward the feeding end of the furnace being used. Additional burners are directed toward the refuse to start up combustion. A dust-free discharge of all residues of combustion is effected. The apparatus comprise a reciprocating stepped grate with steps working upward toward the feeding end which acts as a carrier for a layer of combustible refuse in a furnace. This is fed with hot air and provided with water-cooled sidewalls. The furnace is equipped with an inclined suspended arch arranged above the rear part of the grate, the arch extending towards the ledge over which the incoming refuse falls. The front part of the arch curves upwards and lines up with the rear wall of the combustion chamber of the furnace where the chamber enlarges to its highest point, and is provided with jet nozzles. Below the suspension arch, additional burners are directed toward the feed ledge. The ash pit discharges into a curved trough which is filled with water and provided with a reciprocating ash-removing piston.



INT-0336

Frankel, J. I. (Nichols Engineering and Research Corporation). Incinerators. Canada 523,498; filed May 10, 1951; issued Apr. 3, 1956.

An incinerator comprises an ignition chamber in the bottom of a hollow structure. A hearth, in which there are a number of perforations, rests on the floor of the chamber. Air is introduced into the pile of trash supported on the hearth. A combustion chamber is above the ignition chamber; it is larger than the

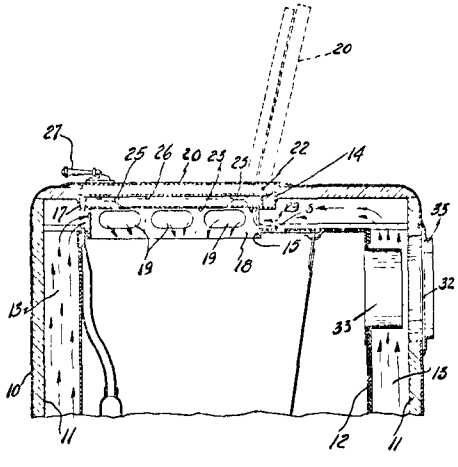


ignition chamber. These two chambers are in communication via a passage equal in area to the cross sectional area of the ignition chamber. Refractory material lines the chambers. A baffle element is mounted midway in the combustion chamber, and it has an orifice in it through which upwardly flowing gases pass. A second baffle element is mounted above the orifice and has an underfurnace which is spaced from the first baffle, and an upstanding stack in communication with and above the combustion chamber. The ignition chamber, combustion chamber, and stack are thus superimposed one upon the other, and, in operation, are so constructed and arranged that the highest negative manometer pressure occurs slightly above the hearth. The negative manometer pressure decreases numerically toward the top extremity of the stack, where it reaches zero. Thus the superimposed ignition chamber and combustion chamber coact with the stack as draft-producing elements, enabling the use of a relatively low stack. The baffle elements also accomplish a delay of the flow of gases through the combustion chamber to insure complete combustion.

INT-0337

Herbert, J. W. (Calcinator Corporation). Refuse incinerator. Canada 525,013; filed Apr. 2, 1952; issued May 15, 1956.

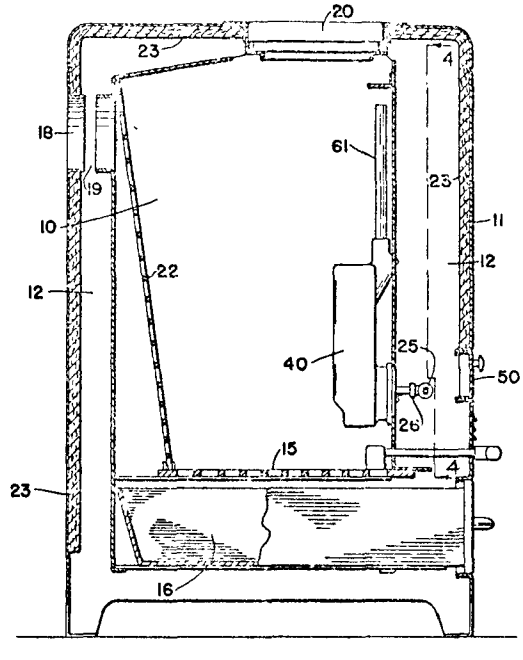
A refuse incinerator comprises an upright housing having front, rear, side, and top walls, and an inner casing supported within the housing. The inner casing is spaced from the housing in such a way as to create an insulating and air-conducting chamber. The top wall of the housing has a charging opening aligned with a charging opening in the casing. A door frame, supported by the housing and extending through the charging opening in the housing, provides a charging passage to the casing. The door frame is formed with laterally spaced openings, which connect the air chamber and the charging passage, so that air may be transmitted from the chamber to the casing. An outward-swinging charging door normally closes the opening in the housing. The swing of the door is limited by a U-shaped door stop hinged to the door. Its legs extend through the laterally aligned openings in the frame, so that the intermediate portion of the stop can be brought into bearing engagement with the frame when the door has been swung outwardly a predetermined distance. (See also Canada 473,018)



INT-0338

Friedberg, H., and J. A. Morse (Waste King Corporation). Incinerator. Canada 538,208; filed Oct. 23, 1953; issued Mar. 12, 1957.

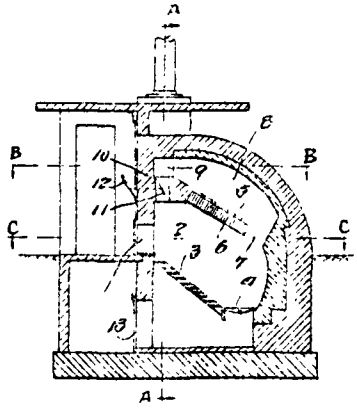
An incinerator comprises an enclosed, vented combustion chamber adapted to receive refuse to be incinerated, and a gas burner having a flame end which extends into a flame shield within the chamber. The flame shield includes air intake devices, a flue at its top, and otherwise imperforate walls. Maximum fuel efficiency is assured at all times, and incineration time is reduced by more than 30 percent over conventional gas-fired incinerators. The burner may be readily removed for cleaning, repair, or replacement without disturbing the remainder of the structure.



INT-0339

Kuichi, T. Garbage incinerator. Japan 32-10,090; filed July 25, 1955; issued Dec. 3, 1957.

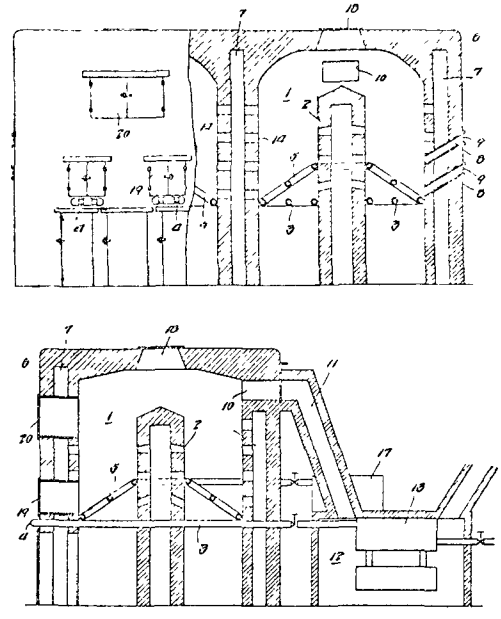
This incinerator assures efficient incineration of trash, garbage, or similar wastes without the use of auxiliary fuels such as coal or heavy oil. A stairway-like iron fire grate assembly runs aslant downward from the central feed-in port. A horizontal fire grate is connected to the end of the first grate. An assembly of arched iron plates, lined with a number of radiation plates, parallels the stairway grate assembly from above, thus forming the combustion chamber. The open space between the end of the arched iron-plate assembly and the inner wall of the furnace leads to the smokestack. At the base of the arched iron-plate assembly is an adjustable gas outlet directly connecting the combustion chamber with the stack. The ash discharge/air intake port is located below the feed-in port. Garbage on the horizontal grate burns first; that on the stairway grates burns in sequence from the bottom to the top. The stairway grates allow greater aeration and therefore more effective combustion; the arched-plate assembly radiates heat to dry the garbage. When the gas outlet is opened, water vapor ascends through the outlet directly from the combustion chamber to the stack. In the stack, heat causes the vapor to expand and the suction action of the stack is accelerated. (Text in Japanese)



INT-0340

Yamamoto, D. Incinerator equipped with device to reclaim waste heat. Japan 32-10,091; filed Aug. 24, 1955; issued Dec. 3, 1957.

This incinerator both effectively incinerates solid wastes and utilizes the heat generated by incineration for water heating. At the center of the combustion chamber is a hollow dryer column that has holes on the upper sidewalls. On both sides of the lower part of the column are two rostrums, each made up of several parallel water pipes. Auxiliary rostrums are slanted against each side of the column, above the main rostrum. All the rostrum or grate pipes are connected to the main circulation water pipe leading to the water tank, installed in the waste heat utilization chamber provided outside of the combustion chamber. The



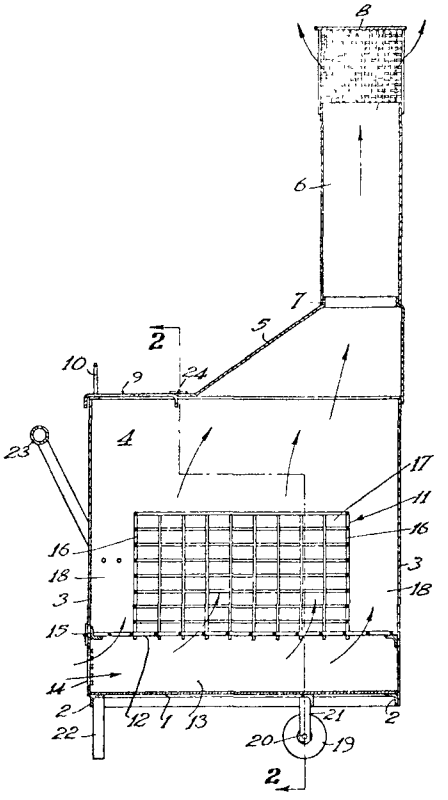
furnace has an outer wall which has a few air intake ports directly connecting with the combustion chamber, and an inner wall which has a few openings to allow direct communication between the hollow inside of the furnace and the combustion chamber. On the upper part of the rear wall of the furnace is the smoke suction port, which also is connected to the waste heat utilization chamber by means of a stack. The combustion gas and smoke enter both the dryer column and sidewalls, and ascend through the hollow interiors back into the combustion chamber, from which they go into the smoke suction port and the stack. During this flow of the hot gas, water in the rostrum water pipes is heated, wastes in the combustion chamber are effectively dried from all sides, and water in a tank in the waste heat utilization chamber is also heated. (Text in Japanese)

INT-0341

Nicholls, A. N. (A. N. Nicholls and E. O. A. Nicholls). An improved incinerator. Australia 212,100; filed Jan. 12, 1955; issued Jan. 8, 1958.

This incinerator comprises a chamber with walls, a floor, and a closed top. Burning takes place in the chamber on a grate which is raised from

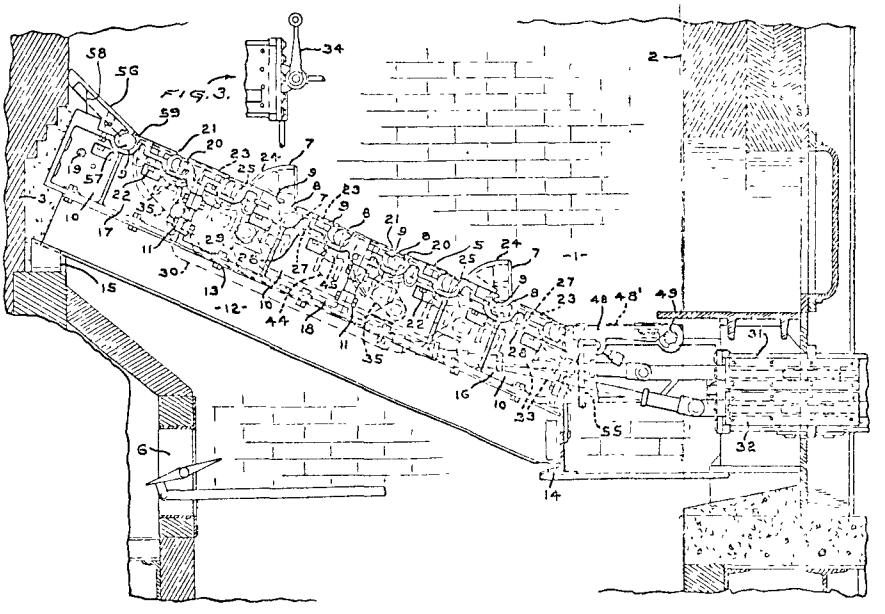
the floor. A door above the grate gives access to it. A chimney in the top of the chamber allows the gases of combustion to leave the chamber; an air inlet allows the entry of combustion air. A basket grate, formed by special arrangement of the bottom grate member and a raised frame, improves combustion and protects the chamber. A guarded ash pit provides protection against fire when the incinerator is in use.



INT-0342

Mallows, J. A. Refuse burning furnace. Great Britain 802,849; filed Nov. 9, 1956; issued Oct. 15, 1958.

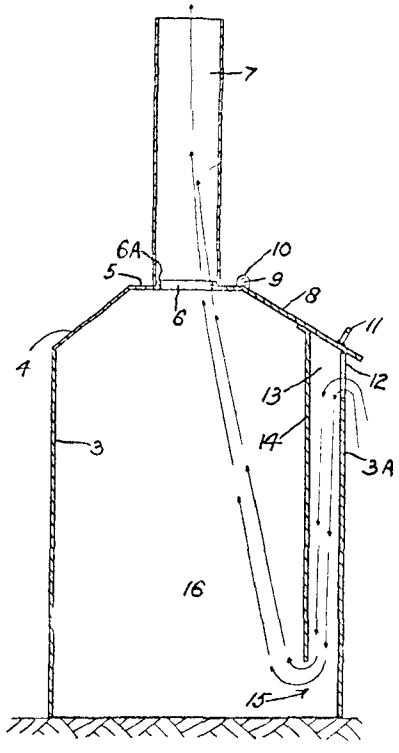
The furnace combustion chamber for burning refuse comprises a front wall, a bridge wall, an escape flue for the combustion gases, and a grate sloping angularly downward from the bridge wall, toward the front wall. The opening for receiving refuse is situated at the top over the grate, which features grate bars mounted at their forward edges on horizontally disposed pivots. Means are provided for tilting the rear edges of the pivotally mounted grate bars, in order to feed burning refuse forward. These bars alternate with stationary grate bars. Means are provided on the bridge wall to allow for expansion and contraction of the grate. The furnace is constructed in sections so it can be easily installed.



INT-0343

Hales, L. M. An incinerator. Australia 219,596; filed Aug. 13, 1956; issued Dec. 5, 1958.

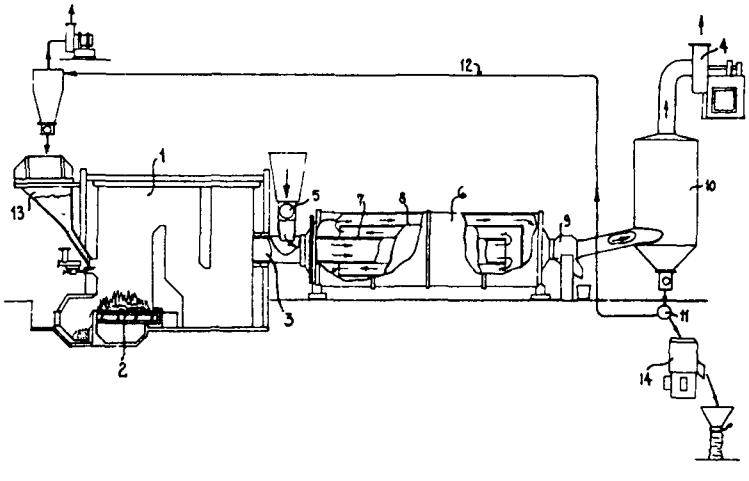
This incinerator has four flat, steel sidewalls enclosing a combustion chamber. A flue pipe extends upward from the domed top of the chamber. A hinged door is arranged above the loading opening at one side of the top. An air inlet opening extends along the top of one sidewall below the door, and leads to a downdraft passage. This passage extends across the interior of the sidewall to the bottom of it, and connects to the combustion chamber.



INT-0344

Streit, H. Process for continuous drying of garbage for incineration and installations for its realization. Switzerland 334,562; filed Mar. 18, 1957; issued Dec. 15, 1958.

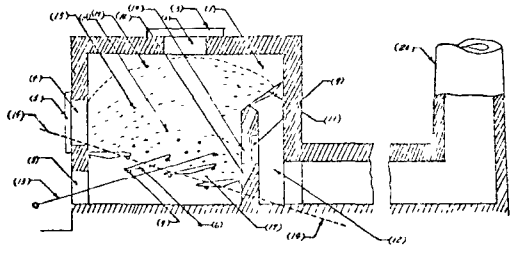
If the energy produced from the incineration of refuse is to be utilized, it is desirable to be able to adjust the rate of incineration to the energy demand. It must therefore be possible to store municipal waste in bunkers. To accomplish this, garbage is dried and sterilized in a rotating, horizontal drum through which the hot stack gas from the incinerator is routed. After passing a metal-collecting device, garbage enters a cyclone which separates gas from solids. The solids are then pressed into bricks. Typical operating temperatures of the drier are 600 to 800 C at the beginning, and 120 to 140 C at the end. Only about 25 percent of the municipal waste must be incinerated to effectively dry the other 15 percent.



INT-0345

Kishimoto, K. Incinerator. Japanese 34-2742; filed Mar. 5, 1954; issued Apr. 20, 1959.

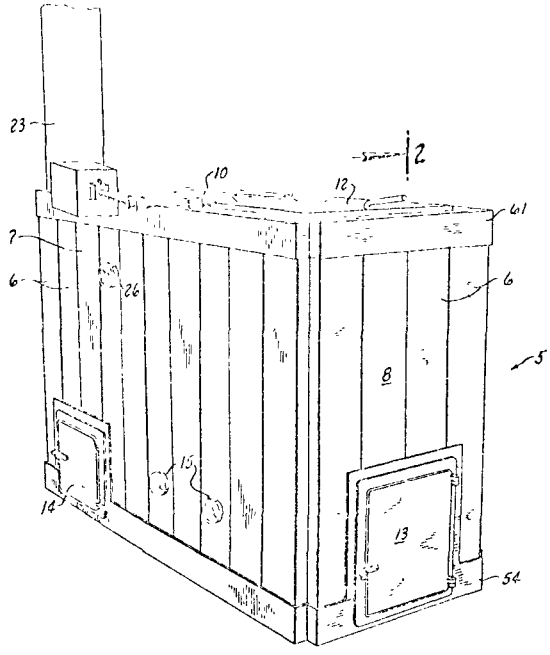
This newly designed incinerator features a grate arrangement which permits easy removal of ash and noncombustibles. The incinerator, which is shaped like a rectangular box, has a feed-in port in the top side, an ash-discharge port in the lower front, and a fire hole above the ash discharge port. Both the feed-in port and the fire hole are provided with lids, which are closed during combustion. Between the partition wall and the rear wall is a vertical stack that connects to the chimney via a horizontal stack. An inclined fire grate is mounted to bridge the top of the partition wall and the rear wall of the furnace, thus preventing garbage from falling into the vertical stack. A vertical grate, or bar screen, is built into the middle part of the partition wall. The lower edge of the fire hole is higher than the counterpart of the bar screen hole provided in the partition wall. A few crossbars are installed parallel to the front and rear walls. Several forwardly inclined short bars are fitted at right angles to each crossbar. The entire, ladderlike grate assembly is inclined backward. (Text in Japanese)



INT-0346

Naulin, M. Incinerator wall construction. Canada 580,594; filed Apr. 16, 1957; issued Aug. 4, 1959.

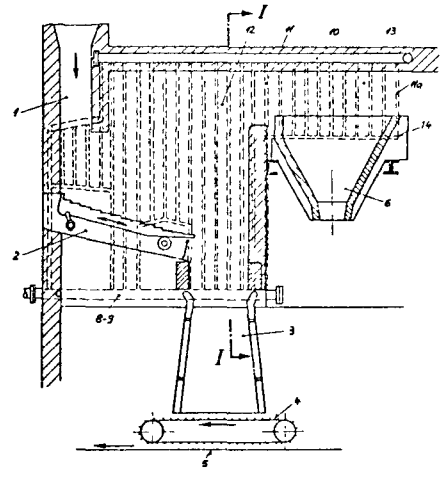
This incinerator may be assembled onsite from lightweight, sturdy, prefabricated wall sections. There is a rectangular, sheet metal outer wall, and an inner refractory liner of cementitious material, anchored to the outer wall. Each section of the outer wall has a flange with an outwardly projecting tongue, bent laterally outward and back on itself, to define a slot in which the flange on an adjacent section may be placed. The refractory liner may be made entirely from any cementitious aggregate; it is preferable however, to include a vermiculite in a mixture with some other aggregate. The outer wall is preferably cut from standard metal roof decking. A basic wall section for a 75- to 100-lb-per-hr incinerator would measure 12 by 41½ in., and with the refractory liner, it would weigh 60 lb.



INT-0347

Ludin, W. (L. von Roll A.G.). Furnace for incineration of low-grade fuel, such as domestic rubbish. Switzerland 336,151; filed Feb. 15, 1959; issued Nov. 11, 1959.

This incinerator contains a structure of hollow elements in which a cooling agent circulates. The structure has fasteners for holding fireproof

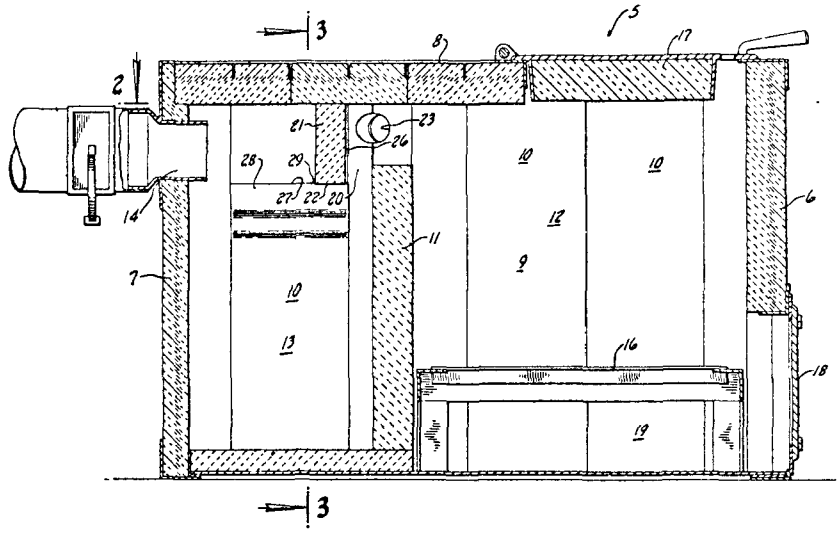


stones. Rubbish falls through the vertical inlet shaft onto the step grate where drying takes place. Then the rubbish is transported slowly into the slag shaft where combustion occurs. Slag is removed by a scraper and a conveyor. The relatively heavy fly ash falls into an ash bin. The furnace is covered by a sheet steel jacket. All the incinerator parts are prefabricated and can be put together in a short time. (Text in German)

INT-0348

Naulin, M. A. Incinerator. Canada 593,215; filed Apr. 16, 1957; issued Feb. 23, 1960.

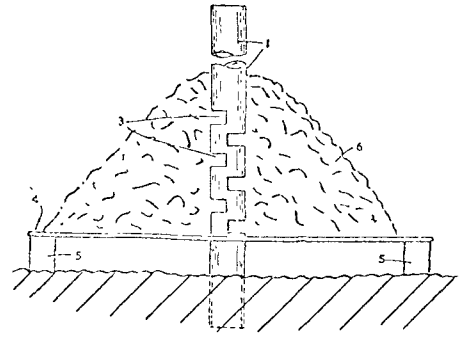
An incinerator includes front, back, side, top, and bottom walls defining an enclosure. An upright partition wall, parallel to the front and back walls, divides the enclosure into a combustion chamber at the front and an expansion chamber at the rear. A grate is located in the lower portion of the combustion chamber. Refuse is deposited through a charging door in the top wall above the grate. A drop wall, having its top edge contiguous with the top wall and its bottom edge below the top of the partition wall, is supported by opposite horizontal ledges on the sidewalls. As combustion gases pass the combustion chamber, they flow downward along the rear of the partition wall to the bottom of the expansion chamber. A combustion gas outlet is located near the top of the expansion chamber.



INT-0349

Colton, F. R. (J. S. Wright and Company, Ltd.). Improvements in or relating to incinerators. Great Britain 829,465; filed Sept. 15, 1958; issued Mar. 2, 1960.

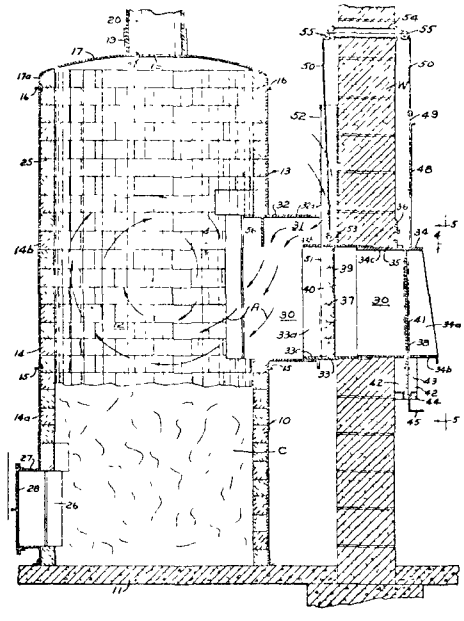
A square, metal screen grid is horizontally mounted in a frame set upon feet which serve to hold the grid in a raised position. A vertical metal pipe passes through an opening in the screen and is driven into the ground. The lower portion of the pipe is provided with a series of rectangular openings which provide for aeration of refuse. The material for incineration is piled upon the screen grid around the pipe. An alternate base structure is comprised of two metal strips joined at their centers with a device for supporting the chimney.



INT-0350

Peterson, R. M., P. W. Spencer, G. R. Peterson, and B. F. McLouth (Burn-Zol Company). Incinerator. Canada 602,139; filed Nov. 12, 1958; issued July 19, 1960.

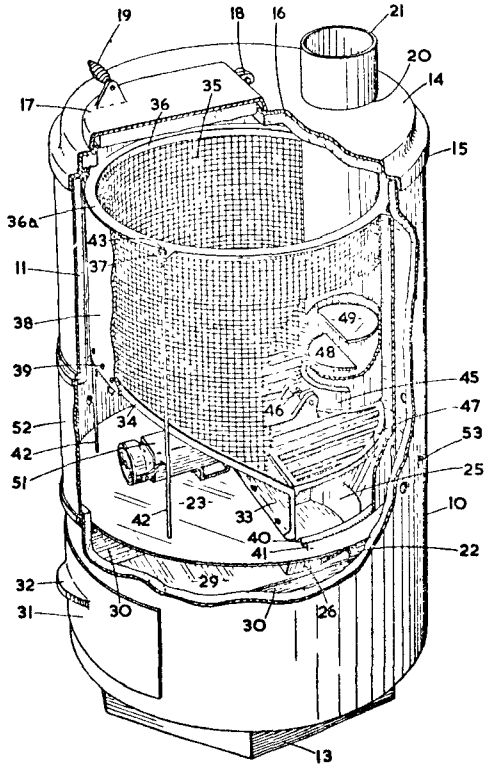
An incinerator, comprising a fire pot with a smoke and gas outlet in the upper portion, is on one side of a building wall. It has a feed opening accessible from the other side of the wall. A feed passage connects the fire pot, a fire door, and the access door. The feed door is vertically mounted in the feed passage, and can alternately open and close the air inlet and feed passage to supply air to the fire pot. Restricted spaces around the doors permit continuous, limited air flow around the doors and through the passage. Thus, the access door is maintained at a temperature cool enough to permit manual handling. A swingable cleanout door is mounted in the lower portion of the incinerator and is accessible from the outside.



INT-0351

Bisztyga, A. Z. (Tobac Curing Systems Limited). Incinerator. Canada 597,086; filed Mar. 20, 1958; issued Apr. 26, 1960.

A waste incinerator of the gas-fired type is suitable for domestic use. The unit is comprised of a casing having within it a primary combustion chamber to receive a charge of refuse to be burned. A grate is located at the bottom of the chamber. The casing is closed at the top and has a charging door, through which refuse may be admitted to the chamber. The only channel for admitting air into the chamber is adjacent to the top of the chamber. A secondary combustion chamber extends vertically through the primary combustion chamber. The lower end



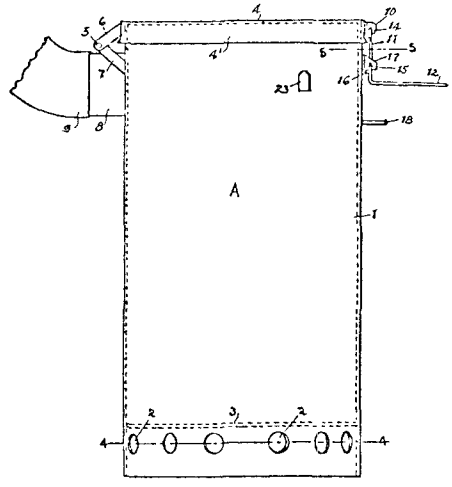
of the secondary chamber is open and lies beneath the grate. The upper end of the secondary combustion chamber is provided with a collar whereby it may be connected to a flue, and with a burner mounted so as to direct the flame horizontally beneath the grate, into the open lower end of the secondary chamber.

INT-0352

Schmid, J. Garbage burner. Canada 609,412; filed May 15, 1958; issued Nov. 29, 1960.

This garbage burner includes a metallic casing with an open top and a closed bottom. A sheet metal cover is provided for closing the top. A smoke pipe leads from the upper part of the casing. Distributed along the length of each flue are air inlet openings for communicating with the interior of the casing. A thermostatically controlled valve is associated with each flue, and is responsive to burning tempera-

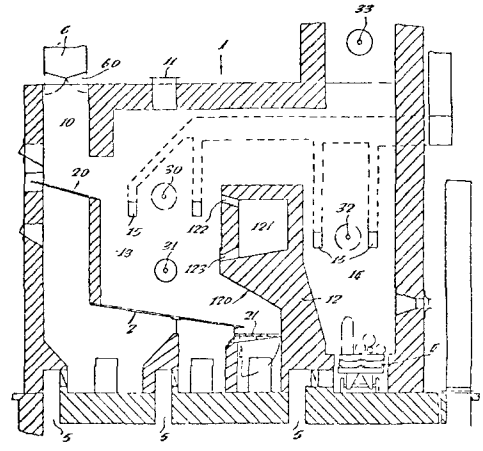
tures developed within the casing. This valve controls the volume of air admitted through the ports.



INT-0353

(Ofenbau-Union G.m.b.H.). Process for burning waste products. Great Britain 865,901; filed Sept. 19, 1958; issued Apr. 19, 1961.

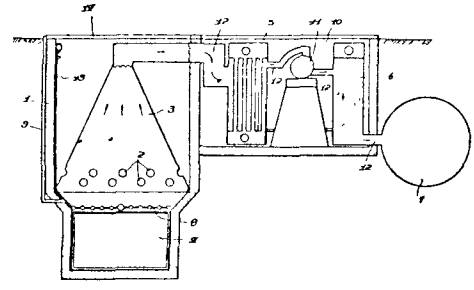
This furnace is constructed for burning waste materials, spent products, or the like. Material to be burned is fed into a zone which may be heated at a controlled rate. This zone serves as a precombustion chamber. It is possible for the furnace to be constructed as two separate units. The controlled heating of the waste material would take place in one and the actual combustion in the other. It is preferable, however, to arrange for the two stages to be performed within a single furnace. In this case, the zone into which the material is fed initially can be heated by the combustion gases flowing from the main combustion region of the furnace.



INT-0354

Endo, T. Underground incinerator. Japan 36-11,725; filed Sept. 19, 1959; issued July 27, 1961.

An underground incinerator, combined with a smoke scrubber, contains a combustion chamber with a hollow, cone-shaped cup. The tip of the cup is connected to a duct leading to the pipe cooler. The conical cup has holes in its lower part. A rotary grate is located above the ash storage tank in the lower part of the chamber. Running along the sidewall of the furnace is an air intake pipe, one end of which opens at the ground surface, and the other end of which opens at the bottom of the combustion chamber. A smoke duct connects the cooler to the scrubber whose discharge port is connected



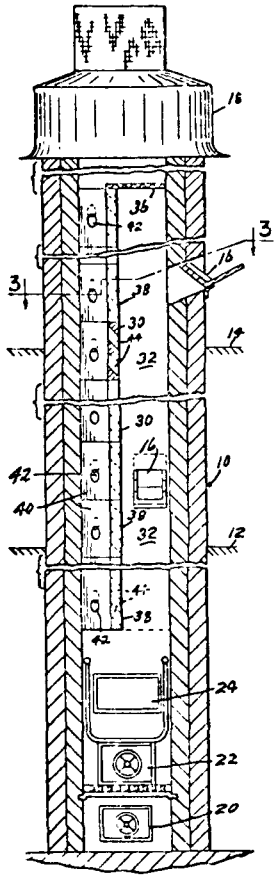
to a drainpipe. Between the cooler and the scrubber is a suction pump which draws smoke and gas from the combustion chamber. The top cover of the combustion chamber is flush with the ground surface. Trash, fallen leaves, and other combustible wastes in the combustion chamber are ignited at the lower part of the heap. Trash gradually falls into the conical cup through its holes and burns with air taken in through the air intake pipe. By the suction of the pump, smoke and gas generated by the incineration are drawn through the cooler, and the scrubber, where the smoke and gas are mixed with a continuous supply of water. The resultant liquid is then discharged into the drainpipe for disposal. (Text in Japanese)

INT-0355

Fortin, J. J. An improved incinerator for a building. Great Britain 883,451; filed Nov. 4, 1959; issued Sept. 29, 1961.

This incinerator is intended to serve a multi-story building. It comprises a refractory, brick-lined vertical tower, surmounted by a top cap flame arrestor. The interior of the tower is separated longitudinally by a vertical brick wall which provides separate main chutes for

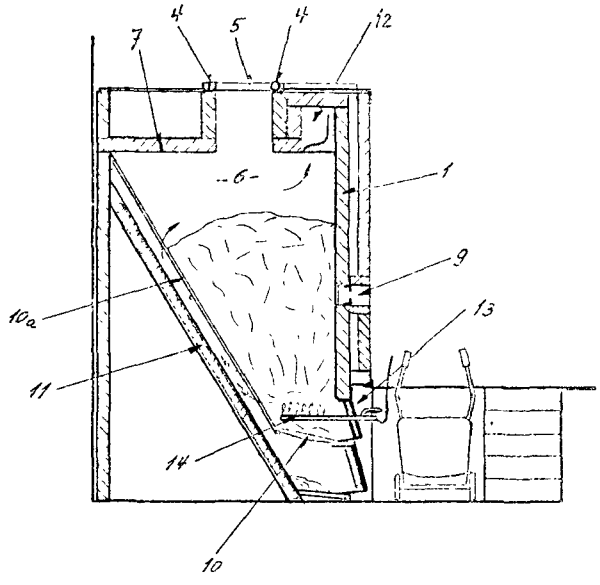
the refuse supply channel. Individual floor chutes are connected to the main chutes. A fire door, a charging door, and an ash door are provided at the base of the incinerator.



INT-0356

Haeusermann, E. Refuse incinerator. Switzerland 357,135; filed Apr. 5, 1960; issued Sept. 30, 1961.

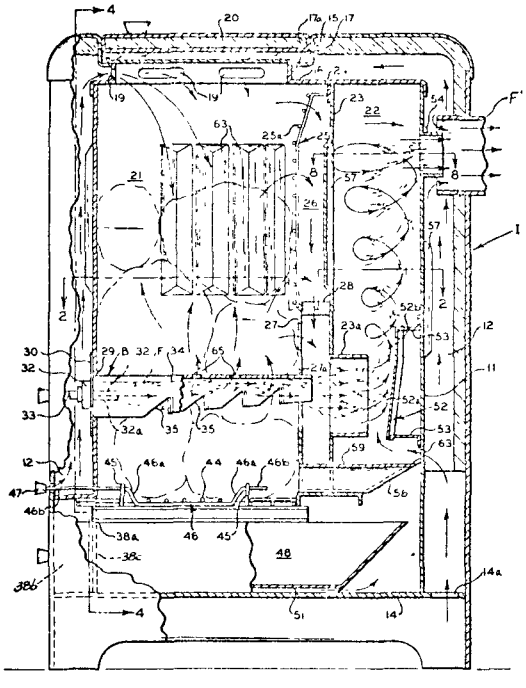
This refuse incineration plant consists of two furnaces that are set up next to each other, and connected to one stack. Each of the two furnaces has a conically shaped inlet which narrows toward its lower end for charging the refuse. The inlets are closed by a lid which moves on rollers and can be pushed sideways. The furnace also has a vaulted combustion chamber with the inlet on top, and an inclined grate. A flat grate forms a basket shape with the inclined grate. Burners are used for ignition. In another version of the furnace, the combustion chamber is so large that it is able to accommodate a mobile cart-shaped grate which is almost as high as the vault. Air is injected by a blower. The flue gases are passed upward through the burning refuse, and also sideways through the walls into the stack. (Text in German)



INT-0357

Herbert, J. W., and P. LaRue. (Calcinator Corporation). Incinerators. Canada 628,897; filed Aug. 29, 1958; issued Oct. 10, 1961.

This refuse incinerator includes a primary and a secondary combustion chamber. Fuel is fluid-fed to the primary chamber in an axial, generally longitudinal stream to produce an elongate,



torchlike flame, which is directed toward the secondary chamber. The gases resulting from refuse incineration are collected and channeled into the secondary chamber. There they are drawn into vertical cyclones with the vertices of the funnels near the lower end of the chamber, and the upper ends of the funnels near a flue outlet opening. Tongues of flame intermingle with the whirling gases, thus assuring thorough combustion of the gases. (See also Canada 625,644)

INT-0358

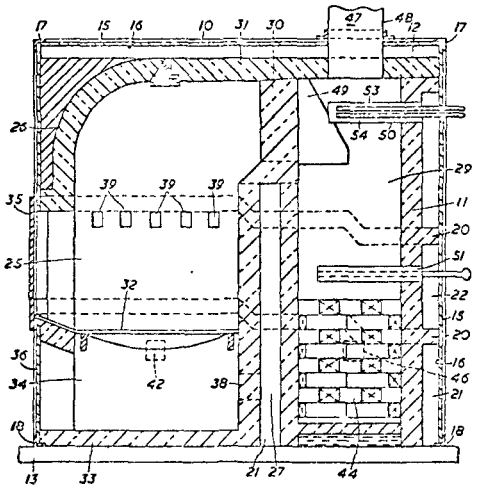
(Vereinigte Kesselwerke Aktiengesellschaft). Refuse combustion. Germany 1,133,493; filed July 26, 1960; issued July 19, 1962.

Refuse combustion is carried out with the aid of high value fuel such as gas, oil or powdered coal, in a steam generator. The additional burner is arranged in the flue gas flow after the refuse furnace, and the air supply to the refuse furnace is controlled at a constant ratio to the volume of refuse supplied. The quantity of additional fuel is controlled by the temperature in the refuse furnace. (Text in German)

INT-0359

Cooke, W. H. (W. H. Cooke Limited). Improvements relating to incinerators. Great Britain 906,993; filed Oct. 2, 1959; issued Sept. 26, 1962.

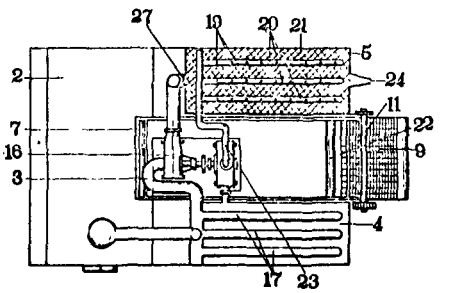
The incinerator comprises a rectangular casing enclosing an internal firebrick structure. The outer casing is made up of rectangular perforated steel sheets lined with asbestos (Durasteel). A space between the two layers is divided by two horizontal elements. The firebrick structure is divided into a primary combustion chamber fitted with a firebar grate with an ash pit below, a secondary combustion chamber, and a downtake flue and settling chamber. Primary combustion air enters below the level of the grate, and secondary combustion air enters above the level of the grate. The burning of refuse is started by a butane gas ignition burner. Adjustable dampers control the flue draft and assist complete combustion in the secondary combustion chamber.



INT-0360

Miyadai, S. Mobile incinerator. Japan 37-17,088; filed Dec. 17, 1960; issued Oct. 22, 1962.

This mobile incinerator is built onto a truck. The drum-shaped incinerator, which is mounted across the front half of the rear body of a truck, is combined with the water tank and the atomizer chamber on the rear body of the truck. Suspended from the rear end of the truck chassis is a garbage-receiving box that connects to the incinerator by means of a belt conveyor. A filter screen in the receiving box is linked with the shaft of the conveyor roller by means of a crank so the screen moves back and forth as the conveyor is driven. The cooling pipe in the water tank has one end connected, via an air pump, to a smoke duct leading from the incinerator pump; the other end is attached to another smoke duct opening into the atomizer chamber. A water atomizer, which consists of a few pipes with ejection holes, is installed in the upper part of that chamber. The atomizer is connected to the bottom of the water tank via a water pump. A smoke discharge port is in the rear side of the atomizer chamber. After the garbage is filtered by the screen, it is carried into the incinerator by the conveyor. The smoke and gas from combustion are blown into the water tank to be cooled. After the exhaust is cooled with water, it flows into the atomizer chamber where its pyroligneous acid content is separated and collected. A screen net under the atomizer protects against shocks and vibration. (Text in Japanese)

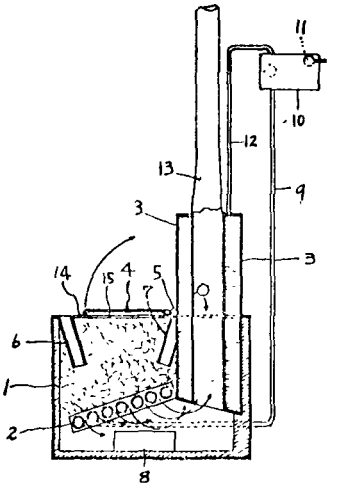


Incineration

INT-0361

Takamatsu, Y. Incinerator. Japan 38-5,387; filed Jan. 17, 1961; issued May 8, 1963.

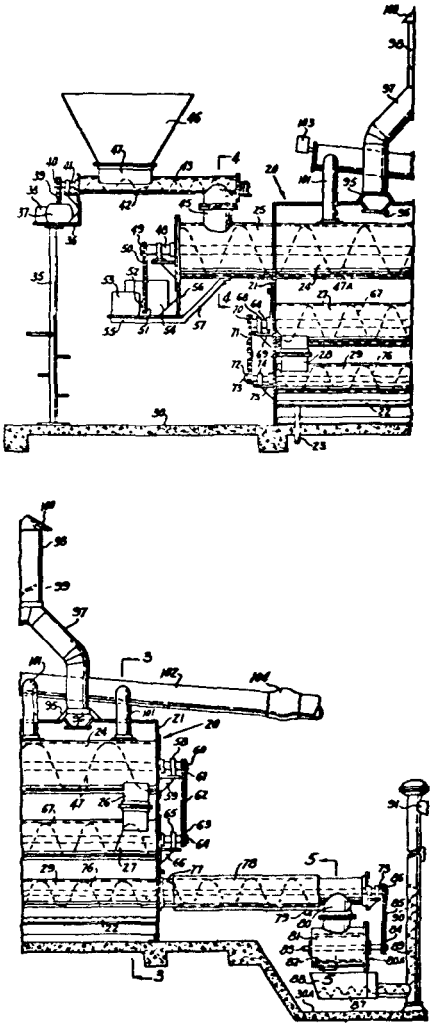
Fundamentally a downdraft furnace, this incinerator uses an inclined fire rostrum or grate made of water pipes for two purposes: to produce hot water from the heat of incineration; and to cool the grate with water to avoid overheating due to the high temperatures (about 800 C) produced in a downdraft furnace. The furnace is oblong-shaped. The inclined rostrum or grate is in the lower part of the combustion chamber above the ash discharge port. The vertical stack or chimney opens into the lower part of the combustion chamber at about the level of the rostrum. The lower half of the stack is surrounded with a hollow double-pipe tube which is partially buried in the furnace. Above and outside of the furnace is a water tank, from the bottom of which a water pipe extends down and under the rostrum to connect to the farthest pipe of the rostrum. This arrangement heats the water. The rostrum pipe closest to the stack connects to a hollow double-pipe tube which leads to the water tank by means of a hot water pipe, opening in the top side of the water tank. During combustion, air is sucked in from above and leaves from below, through the stack. A red-hot carbon layer, which can rapidly evaporate the water content of garbage, is eventually formed, thereby raising the furnace temperature to about 800 C. This is hot enough to melt glass and to remove bad odors. (Text in Japanese)



INT-0362

Lantz, D. C. (Lockheed Aircraft Corporation). Refuse converters. Australia 247,041; filed Mar. 8, 1961; issued Sept. 17, 1963.

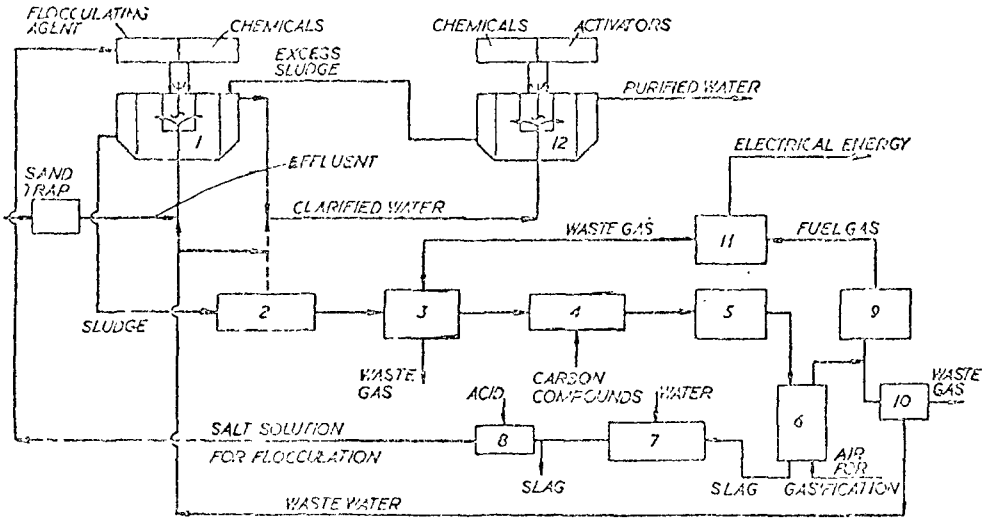
A continuously operating refuse converter includes a housing which contains a combustion chamber. Extending horizontally from the housing, and communicating with a refuse receiving hopper, are three pipes, each containing a helical conveyor. The conveyors in these pipes operate in alternating directions. Between the first and second pipes at the ends opposite the hopper is an outlet passage; a second outlet passage is located between the second and third pipes at the ends opposite the first outlet passage. The end of the third pipe, which extends out of the housing, is surrounded by a cooling system. The refuse is conveyed through the pipes, and by the time it passes through the cooling system, all the creosote liquids and gases have been removed to a storage unit through an outlet that leads from the first pipe. The carbonaceous residue is discharged through an outlet at the end of the third pipe. This residue is conveyed to suitable storage bins.



INT-0363

Zimmer, H. J. (Firma Hans J. Zimmer Verfehrenstechnik). A method and a device for purifying industrial and domestic effluents and for utilizing the solid matter contained therein for the generation of energy. Great Britain 937,051; filed Nov. 7, 1960; issued Sept. 18, 1963.

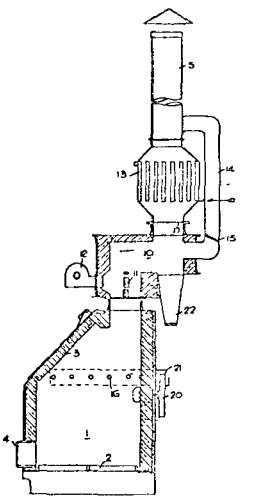
This process includes equipment to dewater solid matter to a water content of less than or equal to 30 percent by weight. Carbon and/or carbon compounds, such as peat, peat dust, or wood dust, are added to the matter to obtain a constant calorific value of 1,000 to 3,000 kcal per cu m when gasified in an air, steam, and/or oxygen atmosphere. Domestic and industrial refuse are included with the dried sludge before gasification. The refuse must be pretreated by magnetic separation, comminuting, or sifting. The mixture can be briquetted prior to gasification. The fuel gas obtained from the gasification process is cooled and used for the generation of electrical current. The hot waste gases are used for drying the separated solid matter and/or other input materials. The clarified effluent from the solids dewatering is purified.



INT-0364

Morton, K. R. (Thomas McDowell Limited). Improvements in incinerators. Great Britain 944,480; filed June 23, 1961; issued Dec. 18, 1963.

An incinerator is composed of a primary combustion chamber, a secondary combustion chamber above the primary combustion chamber, and a heat exchanger located above the secondary combustion chamber. The heat exchanger is located in a stack. The secondary combustion chamber includes a horizontally positioned baffle and a pressure jet oil burner. A duct couples the secondary combustion chamber to the stack and bypasses the heat exchanger. The primary combustion chamber has ports through which air is fed by a fan. The secondary combustion chamber also includes a hopper for the removal of particulate matter.

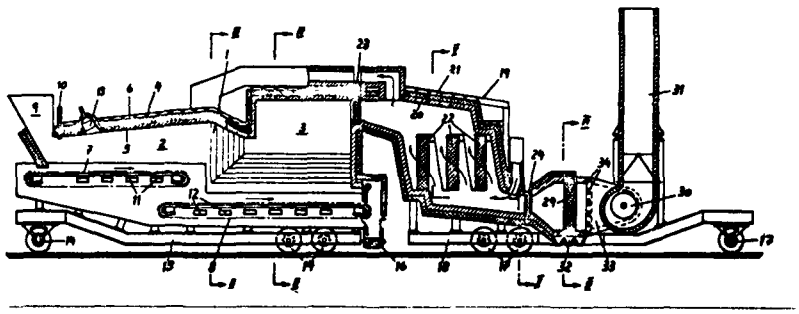


Incineration

INT-0365

Weyrauch, H., and H. Seidl (Deutsche Babcock and Wilcox-Dampfkessel-Werke A.G.). Incinerator for city refuse. Germany 1,162,503; filed Mar. 29, 1962; issued Feb. 6, 1964.

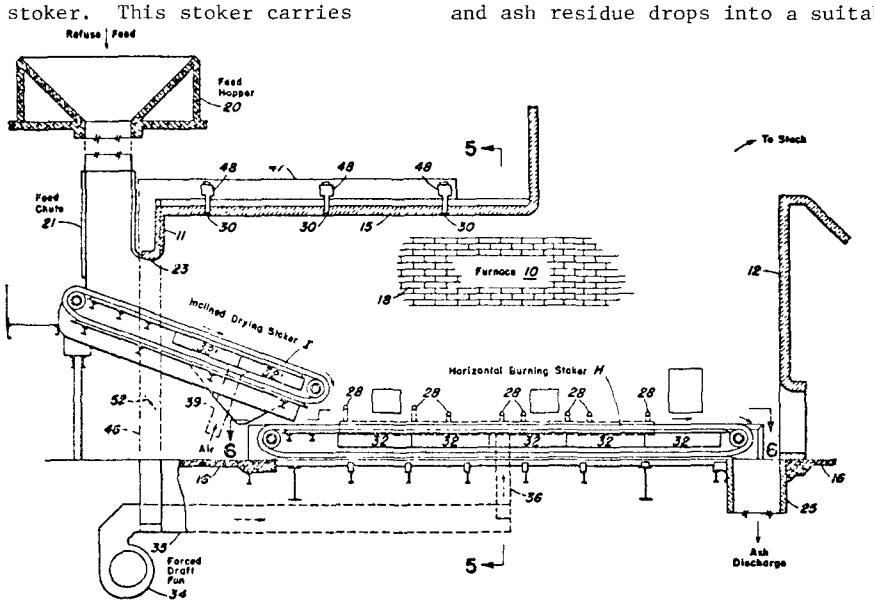
An incinerator is composed of a combustion chamber with at least two feed grates and a heat exchanger. The preheating and combustion chambers are constructed with their open lower ends juxtaposed to the two grates located at different levels. The combustible material is carried from the entrance hopper and falls from the end of the higher to the beginning of the lower grate. The air required for combustion is introduced through vents located beneath each feed grate. An oil or gas burner is located in the preheating chamber cover. The entire combustion chamber assembly is mounted on wheels. A conveyor is located at the end of the lower grate to provide for the removal of slag. Mounted on a separate frame which is equipped with wheels, a heat exchanger-regenerator unit is housed within an insulated chamber. (Text in German)



INT-0366

Funk, M. O. (Combustion Engineering, Inc.). Traveling grate incinerator furnace with novel overfire air and operating method that boosts burning effectiveness. Canada 680,389; filed Mar. 13, 1961; issued Feb. 18, 1964.

A new incinerator for burning cellulose has been developed. This furnace is composed of a combustion chamber, a traveling grate, jet nozzles, an ash discharger, and a stack. Refuse is fed into a chute which drops the trash onto the inclined drying stoker. This stoker carries trash to the furnace at the rate of 40 to 60 ft per hr. Once the refuse reaches the incinerator, it is deposited onto a horizontal stoker where up to 200 tons of refuse may be burned per day. Jet nozzles are located on either side of the furnace and they serve three purposes: to stir up refuse, so that trash at the bottom of the layer will be combusted; to supply oxygen for the burning process; and to cool the air so that slagging will be prevented. Hot combustion gases flow out of the stack, and ash residue drops into a suitable hopper so

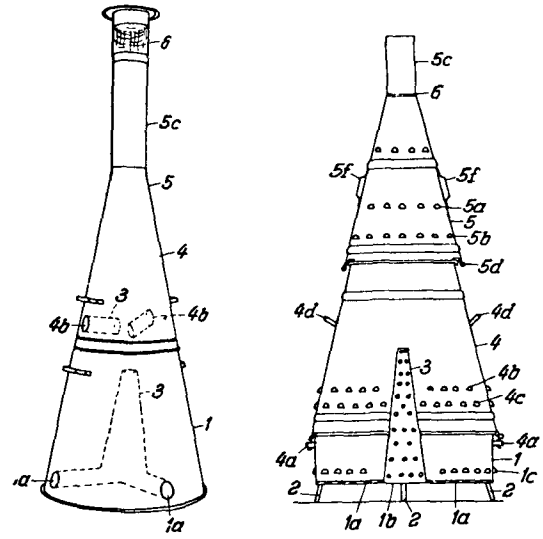


it can be disposed of conveniently. This improved incinerator furnace is capable of burning refuse more completely than a traveling-grate furnace apparatus in which these inventions are not incorporated.

INT-0367

Claassen, A., and F. Bienick. (Thuringia G.m.b.H.). Improvements in and relating to the incineration of paper articles difficult to burn. Great Britain 952,582; filed Jan. 2, 1963; issued Mar. 18, 1964.

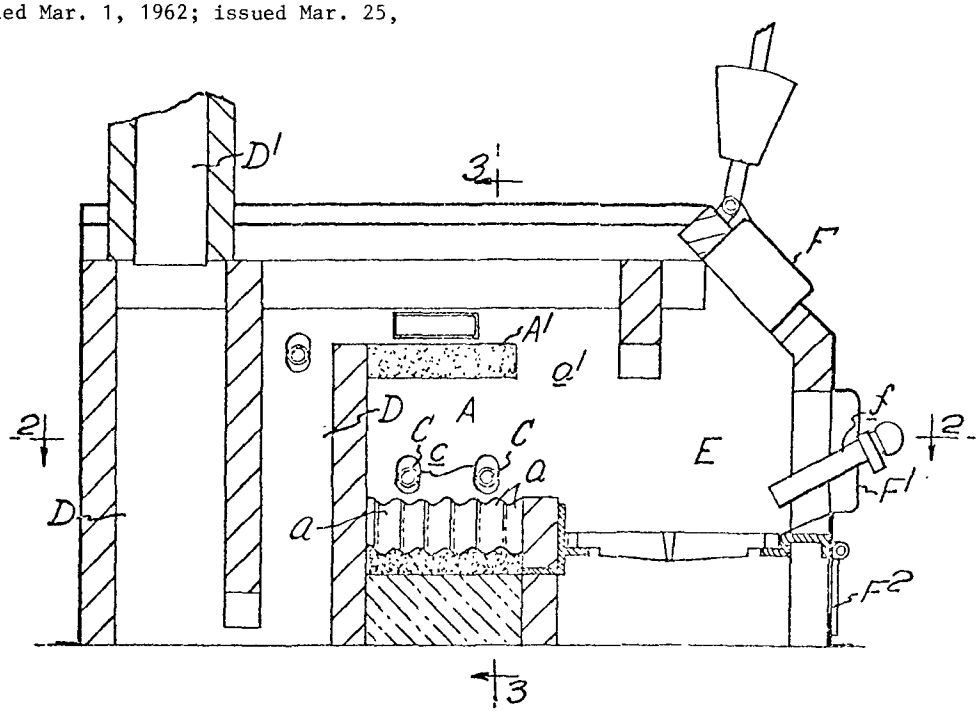
An incinerating device, composed of a combustion box on which are superimposed hoods that converge upward, is intended for the smokeless incineration of paper articles difficult to burn such as cardboard, paper bottles, bundles of files, and books. Quantities of combustion air are supplied to the combustion chamber of the device via wall apertures and perforated ducts arranged at various levels in the chamber wall. Through the apertures, fresh air can flow into the device; through the ducts, air can be conveyed upward. Paper can be inserted into the combustion chamber and ignited from above, causing combustion to occur from the top downward; the draught of combustion air can flow from the bottom upward. In flowing upward at increased velocities, the air becomes heated in the ducts, and thereby helps to incinerate paper objects that are difficult to burn. In addition, some ducts supply fresh air directly to an afterburner situated above the combustion chamber. This device burns the smouldering fumes and gases produced by incineration. (See also Germany 1,146,220)



INT-0368

Charleson, E. (A. B. Scorer Limited). Improvements in refuse incinerators. Great Britain 953,147; filed Mar. 1, 1962; issued Mar. 25, 1964.

The floor of the hearth of the incinerator is trough-shaped and is inclined downward from the charging door, and upward to the opposite side

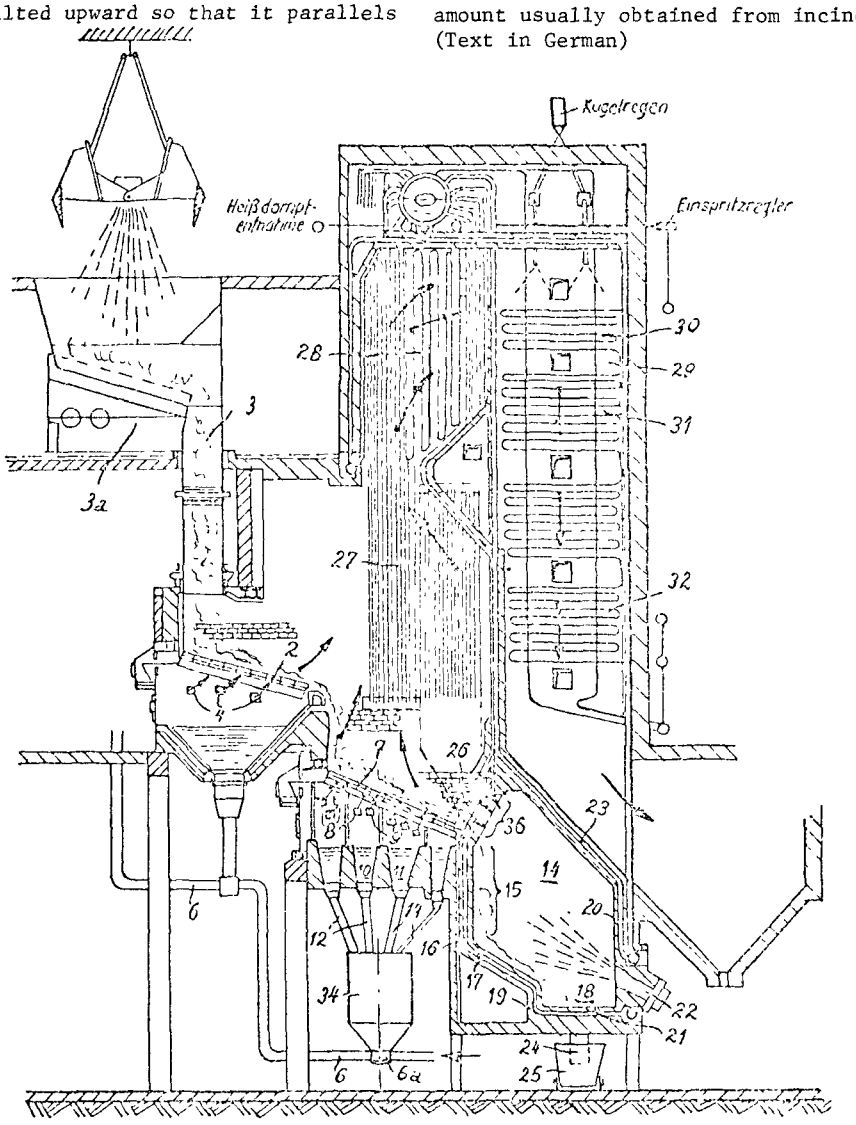


of the hearth. The floor has a corrugated surface. The corrugations are arranged transversely to the hearth. The heating burners are located at one end of the corrugations so that the products of combustion from the burners will be directed into the ends of the valleys of the corrugations. The products will tend to travel along these valleys, thereby insuring the combustion of all the material on the hearth. The inclined sides of the trough floor may be equal, but it is preferable that the side inclined upward toward the burners be shorter and steeper than the other side.

INT-0369

Wisnewski, H. (Von Roll A.G.). Method for operation of a refuse incinerator. Switzerland 376,604; filed Apr. 15, 1964; issued May 30, 1964.

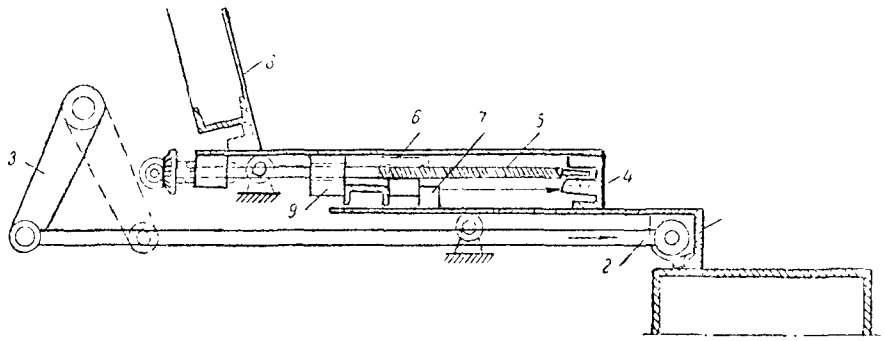
Combustion residues fall from the grate onto a vertically descending wall. This wall serves as a melting chamber wall and is heated by a burner that is tilted upward so that it parallels the inclined surface. The drying grate is likewise connected to the melting chamber. The walls of the melting chamber, including the vertical wall, are lined with a water curtain, and inside they are plastered with fireproof clay. When the residues leave the melting chamber, they are solidified in water. They contain no usable calories, so no energy is lost. The volume of these residues is much less than the amount usually obtained from incineration. (Text in German)



INT-0370

Martin, I. Z. Charging device for combustion chambers. U.S.S.R. 161,297; filed Feb. 14, 1963; issued Apr. 29, 1964.

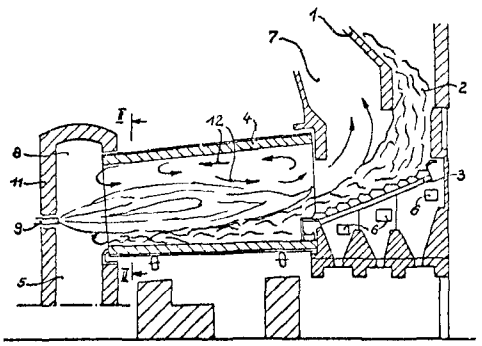
A charging device incorporates two pushing slides placed one on top of the other at the entrance to the combustion chamber. The upper one is entrained by the directly-driven lower one. The lower pushing slide has a fixed lug on its top and is driven by an oscillating crank. The upper slide has on its underside a fixed rear stop and a pair of mobile stop nuts engaged by a pair of threaded rods. Via these rods, the nuts can be moved to and held at any position along that slide between its front and rear stop. The lug of the lower slide runs alternately against the front stop and the stop nuts of the upper slide. Thus is imparted to the slide a reciprocating motion, with a pause at every stroke. The duration of the pause and the stroke of the upper slide, respectively, increase and decrease with the distance between the two stops. Each stop can be adjusted by changing the position of the stop nuts. (Text in Russian)



INT-0371

Leupold, K. ('Wistra' Ofenbau G.m.b.H.). Refuse incinerator plant. Germany 1,170,105; filed May 30, 1961; issued May 14, 1964.

A refuse incinerator plant has drying, primary, and secondary combustion (rotary cylinder) zones. Some of the hot gases traverse the drying zone, and some, the secondary zone. At the exit of the rotary cylinder, air is blown into the fuel residue, and the resultant exhaust gases, together with the combustion gases, are drawn off in a direction opposite to the fuel residue flow. (Text in German)

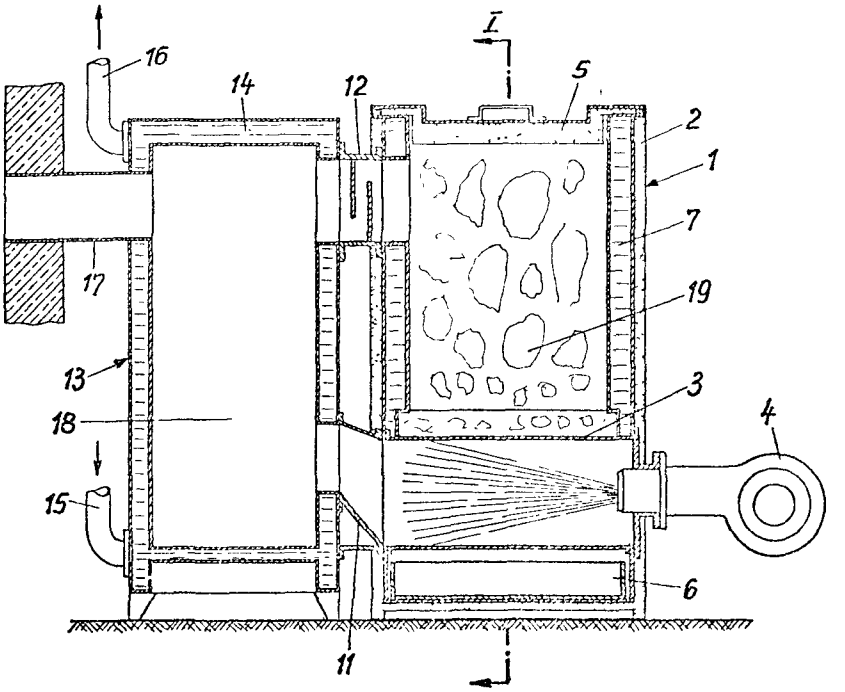


INT-0372

Meschkat, W. Oil-fired boiler heater with shaft for refuse incineration. Germany 1,161,655; filed July 9, 1960; issued July 30, 1964.

An oil-fired boiler heater has an additional refuse combustion shaft. The shaft is pierced by a muffle tube which is equipped with an oil burner. The tube reaches across to the boiler shaft. The incineration shaft is clad with a water-cooled jacket. A movable grate and an ash bin are located in the bottom of the incineration shaft; in the upper section, a waste gas pipe which leads to the boiler shaft is installed. The refuse falls from the top onto the glowing muffle tube, where it is incinerated at a low temperature. The incompletely burned refuse clings closely to the muffle tube and continues to burn. The distance between the muffle tube and the grate can be adjusted according to the type of refuse being burned. The heat produced during combustion can be used for heating a boiler. Both the refuse incineration shaft and the boiler shaft may form one unit. The cooling jacket of the incineration shaft may form part of the steam

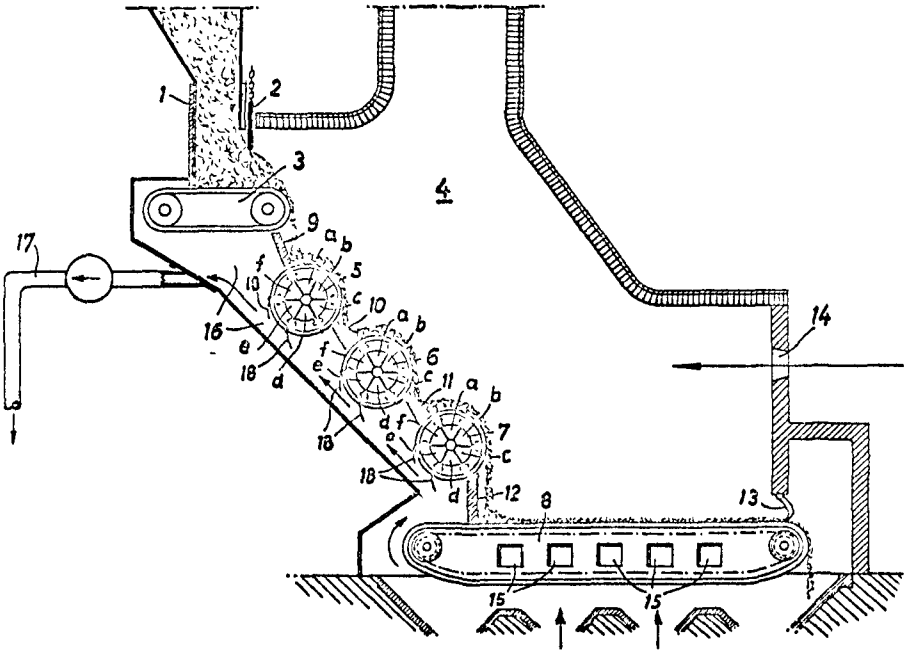
system of the boiler. In this case, the muffle tube extends to the hot-gas flues of the boiler. The cooling jacket is pierced by a tube for the waste gas. (Text in German)



INT-0373

Engel, W., and A. von Weihe. (Stadt Duesseldorf). Continuous refuse incinerator. Germany 1,176,783; filed Apr. 22, 1960; issued Aug. 27, 1964.

A continuously operating refuse incinerator has a movable inclined grate that is charged from a distributor through a feed shaft. The grate is made up of several successive roller grates with baffle walls between them. These baffle walls

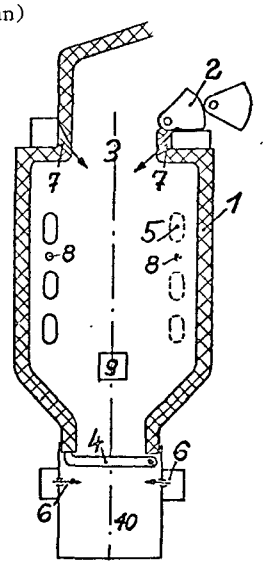


are in the vicinity of the plane that runs through the roller axis, and they form, together with the rollers, pockets into which the material drops as it comes from the distributor. The material is then turned by the adjoining roller and passed onto the next pocket. (Text in German)

INT-0374

Weiand, H. (Maschinenfabrik Esslingen). Refuse incinerator. Germany 1,176,781; filed Mar. 15, 1961; issued Aug. 27, 1964.

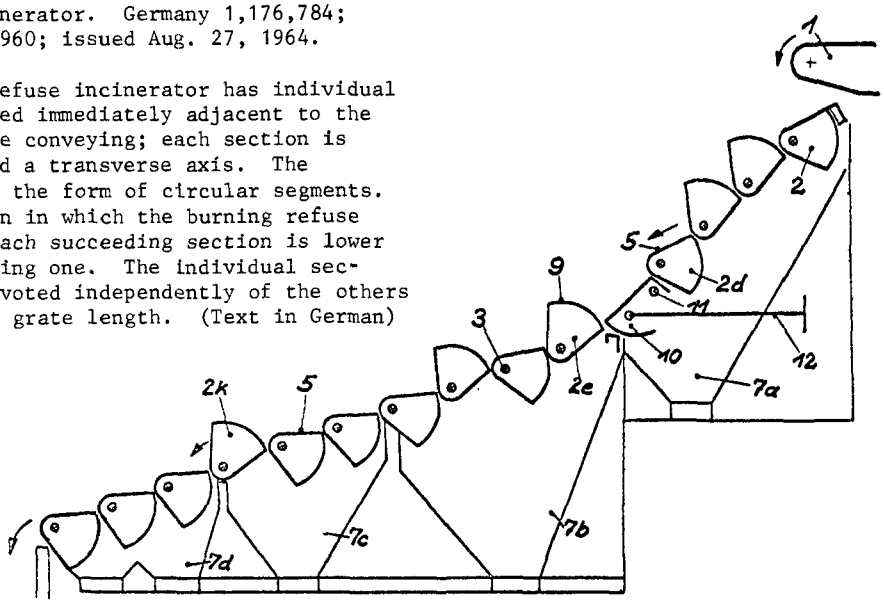
This cylindrical refuse incinerator is designed along a vertical longitudinal axis and has an afterburner arranged immediately after the burner grate. Air jets in the incinerator are arranged in such a manner that the streams of air emitted by them increase the falling time. This is sufficient for combustion of the residual particles falling through the afterburner chamber. (Text in German)



INT-0375

Weiand, H. (Maschinenfabrik Esslingen). Grate for refuse incinerator. Germany 1,176,784; filed Nov. 9, 1960; issued Aug. 27, 1964.

A grate for a refuse incinerator has individual sections arranged immediately adjacent to the direction of the conveying; each section is pivotable around a transverse axis. The sections are in the form of circular segments. In the direction in which the burning refuse is being fed, each succeeding section is lower than the preceding one. The individual sections can be pivoted independently of the others over the entire grate length. (Text in German)



INT-0376

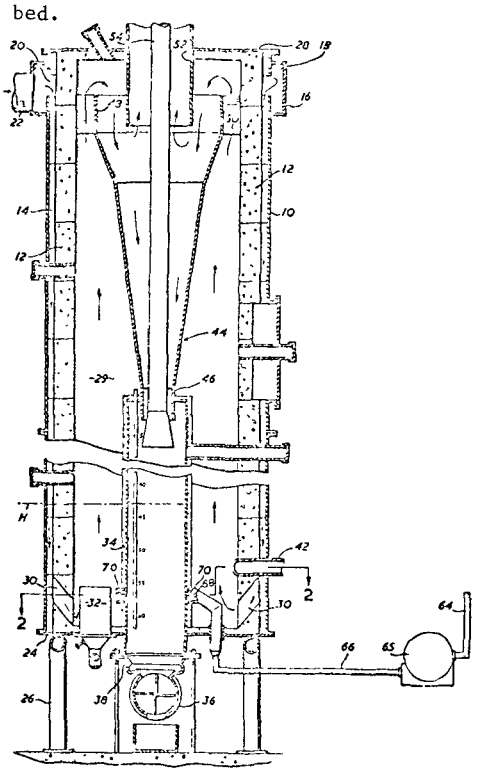
Riedel, E. O., and F. Scherer (J. Riepl, F. Scherer, and E. O. Riedel). Method of preparation of preliminary sorted refuse for use as fuel. Germany 1,177,273; filed June 30, 1959; issued Sept. 3, 1964.

Refuse is prepared for use as fuel by crushing its hard components and shredding the soft components, followed by drying to a uniform water content. Prior to entry into the combustion chamber, the refuse is mixed with solid, liquid or gaseous fuel; or, the refuse may be injected or carried into the combustion chamber by air. The quantity of auxiliary fuel added to the prepared refuse must suffice for combustion of the mixture at temperatures of more than 1,500 C. The ground and mixed fuel may be transported into the combustion chamber by preheated primary air. The molten slag is quenched with water or liquid air. (Text in German)

INT-0377

(Mount Royal Rice Mills Limited, and Canada Rice Mills Limited). Method of removing volatile constituents and carbon from rice hulls. Great Britain 969,538; filed Oct. 20, 1961; issued Sept. 4, 1964.

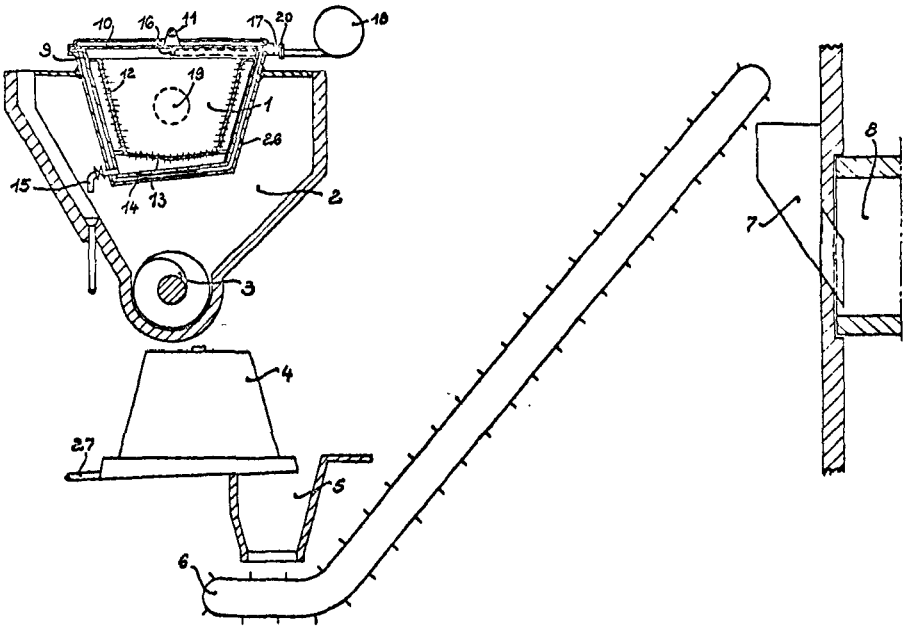
Volatile constituents are removed from rice hulls by: introducing an oxygen-containing gas and the rice hulls into a chamber; maintaining particles of the hulls in dispersed form, suspended in a rising column of the gas; and maintaining a temperature of between 500 and 800 C whereby combustion of the volatile constituents takes place and a carbonaceous ash is produced. Carbon is removed from the ash by: forming a bed of the ash; causing oxygen-containing gas to flow upward through the bed at a rate of 55 to 174 lb per hr; and maintaining the temperature between 500 and 800 C until all the carbon is removed. The controlled rate of flow ensures that combustion of carbon monoxide takes place at the surface of the bed.



INT-0378

Rohsaint, H., and H. Block (Wistra Ofenbau-G.m.b.H.). Garbage burning furnace. Germany 1,177,766; filed Aug. 8, 1960; issued Sept. 10, 1964.

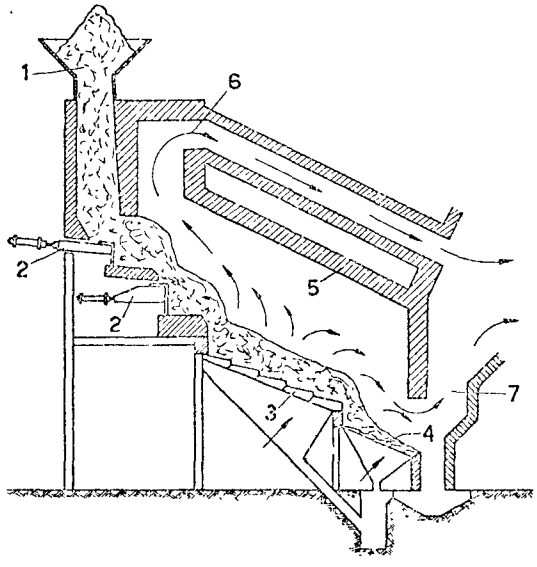
A garbage-burning furnace which is designed especially for vegetable waste of high moisture content has drying and combustion zones. The drying zone is preceded by a dehydrating device consisting of a container with inlets for hot gas, air or steam, and with drain holes. The device is mounted in a second container which has a liquid drain. (Text in German)



INT-0379

De Bartolomeis, R. (S.p.A. Forni ed Impianti Industriali Ingg. De Bartolomeis). Inclined grated furnace for combustion of solid refuse. Switzerland 381,795; filed Jan. 21, 1963; issued Sept. 15, 1964.

The furnace consists of an inclined main grate and an afterburning grate. Combustion occurs on the main grate by the addition of air. On the afterburning grate, combustion of the residues takes place. The inclined top of the furnace has an upper and a lower outlet. The hot gases passing through the upper outlet are used for drying the refuse on the main grate; the hot gases passing through the lower outlet are used for the final combustion of the refuse. (Text in Italian)



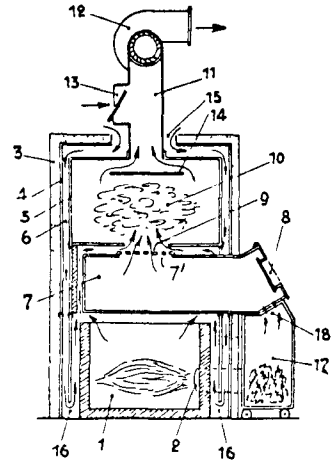
INT-0380

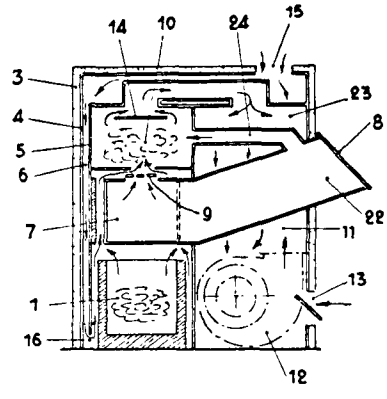
Schueffler, J. (Wistra Ofenbau-G.m.b.H.). Refuse incinerator. Germany 1,178,165; filed Sept. 5, 1962; issued Sept. 17, 1964.

A method is disclosed for the combustion of refuse with the addition of solid, liquid or gaseous fuel. The additional firing is accomplished in the flue gas stream behind the refuse combustion chamber and/or in this chamber. The temperature in the combustion chamber is kept constant and the amount of additional fuel is controlled in accordance with the temperature of the flue gas in the combustion chamber and/or in the postburning chamber, or alternately in accordance with the requirements of a subsequent heat utilization installation. The air for the additional firing is metered not only in accordance with the amount of additional fuel, but is also corrected by the composition of the total flue gas, for example, the oxygen content. (Text in German)

INT-0381

Fabry, F. A. M. Process and apparatus for the distillation, carbonisation, and incineration of waste matter. Great Britain 970,612; filed Mar. 6, 1962; issued Sept. 23, 1964.



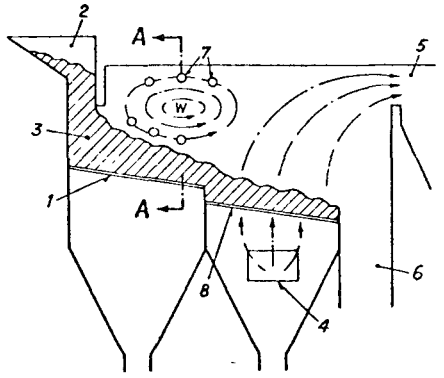


A process for the incineration of waste matter comprises heating it to a high temperature in a container, open only at its top, until the matter is calcined. The gases given off by the matter are mixed with heated air so that the temperature of the gas/air mixture is above its self-ignition point. Then the mixture is burned. The air for mixing with the gases is fed into the top of the container through an air jacket in the casing which is heated by the combustion of the matter.

INT-0382

Yonner, A. (L. von Roll A.G.). Refuse incinerator. Germany 1,178,542; filed July 25, 1958; issued Sept. 24, 1964.

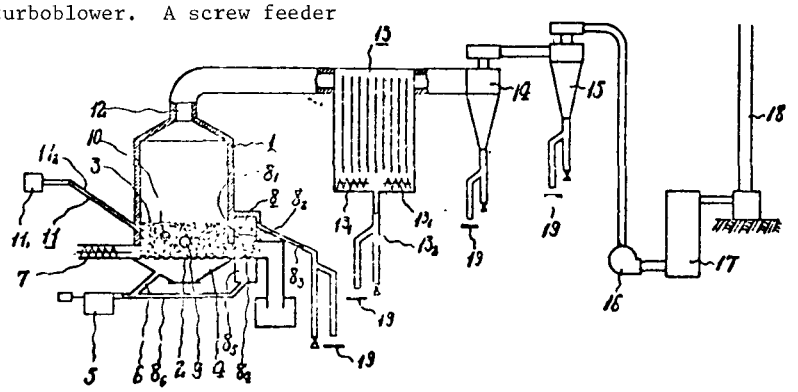
A refuse incinerator is provided with a preliminary drying grid and an incinerating grid. There are nozzles provided for the injection of air, vertical to the forward movement of refuse material. Arranged in the walls on both sides of the preliminary drying grid, the nozzles are parallel to the feed movement of the material to be incinerated. As a result, the combustible parts of the carbonization gases are mixed with the noncombustible parts of the injected air, and the concentration of the combustible matter in the mixture is reduced to below its ignition point. Also, the mixture is pressed against the heaters as a result of the additional air volume. (Text in German)



INT-0383

Saito, T., and M. Tada. Device to dispose of combustible wastes. Japan 39-25,175; filed Apr. 27, 1963; issued Sept. 28, 1964.

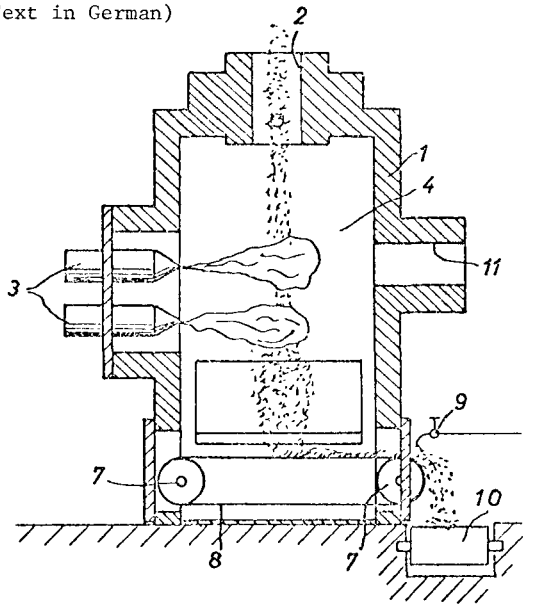
A fluid layer of sand ensures the effective incineration of wastes. The incinerator consists of a vented lower rostrum which holds the sand layer and under which is a connection to a turboblower. A screw feeder



INT-0384

Wuergler, R. Garbage incinerator. Switzerland 382,355; filed Feb. 14, 1961; issued Sept. 30, 1964.

The incinerator consists of a steel casing with a refractive lining. Garbage falls continuously through a vertical loading duct into the combustion chamber. Two oil burners on the lateral wall produce heat for the incineration of the falling refuse. In the bottom of the combustion chamber is a nonperforated plate, whose top side is somewhat curved and inclined. This plate consists of a frame with a number of individual segments closely fitted together. They are made of fireproof material and are replaceable. The entire plate rests on a vertical and/or horizontal vibrator. On the bottom side of the plate is an adjustable cooler which also serves to preheat the primary air for combustion. The residues are removed from the furnace by a conveyor and sprinkled with water outside the furnace to reduce dust development. (Text in German)

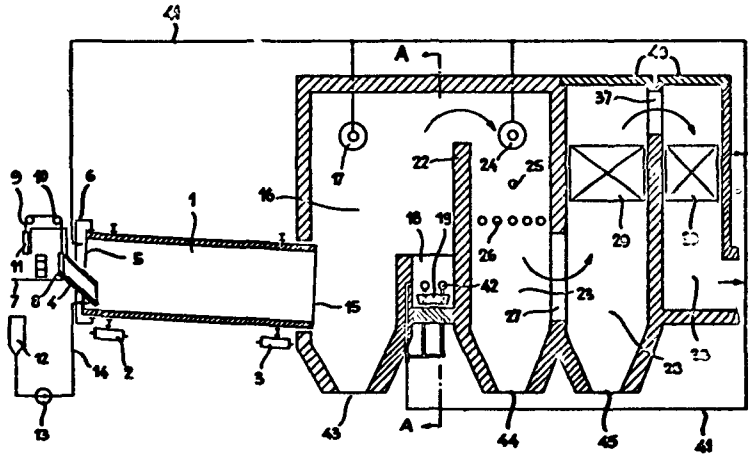


located in the lower sidewall opens immediately above the rostrum. Above the screw feeder is a night soil feeder device whose pipe opening is in the sand layer. An overflow device, primarily a small compartment alongside and connected to the sand layer, is opposite the screw feeder. An overflow pipe connects to the outer wall of the compartment; a wind box is provided under the compartment. An oil burner is also installed in the layer. A smokestack, a pair of cyclone dust collectors, a hot air fan, a water-cooling tower, and a chimney comprise the emission system. A screw discharger is provided on the bottom of the cooler device. After the furnace is started by feeding in sand-fuel mixtures to form a fluid layer, the wastes are added. When the temperature in the furnace reaches about 750 C, the burner is extinguished, and air with a velocity of 40 to 60 cm per second is blown into the furnace to completely fluidize the layer and keep the furnace temperature at around 950 C. When incinerating solid wastes alone, the temperature often rises too high; it must be lowered by water-cooling. In this case, night soil is added in order to prevent extremely high temperatures. (Text in Japanese)

INT-0385

Leib, H., and H. Womann (Badische Anilin- and Soda-Fabrik Aktiengesellschaft). Apparatus and method for combustion of solids, liquids, or pastes. Belgium 647,921; filed May 15, 1963; issued Nov. 16, 1964.

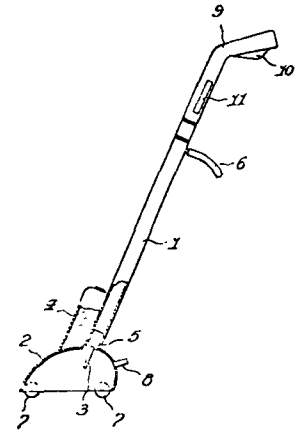
This process is for burning various substances while eliminating the emission of smoke. The substances are introduced into a rotatory combustion chamber along with preheated air, and ignited. The gases formed are led to a post-combustion chamber which is divided into several sections. The gases are burned with water vapor, combustible gases, and/or air in the various parts of the chamber. Part of the resulting heat, when the gases are cooled, is used for preheating the air. (Text in French)



INT-0386

Tsujiwara, Y. Portable incinerator-cleaner. Japan 39-28,489; filed Sept. 12, 1963; issued Dec. 9, 1964.

A portable incinerator-cleaner is designed to remove such materials as gum from road or floor surfaces. It is shaped like an electrostatic floor cleaner and rolls on fireproof castors fitted to its bottom. A hollow handle stem is fitted to the top of the combustion chamber unit alongside the liquid fuel tank. Under the handle is the fuel ejection pipe that is connected to both the fuel tank and the air duct running inside of the handle stem. An exhaust gas outlet is also provided in the upper part of the chamber unit. Control

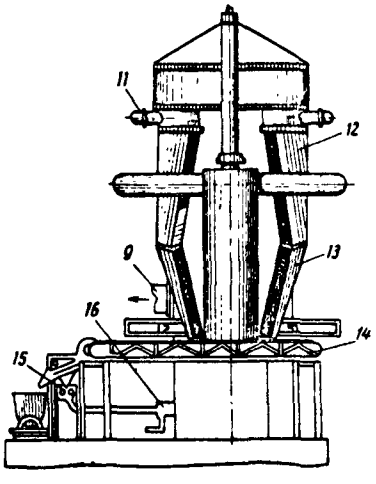


devices are located in the upper part of the handle stem. The pressurized air inlet is located below the fuel tank pressure-control device. One end of an air hose is connected to the inlet; the other end is connected to an air compressor or pressurized air bomb. When fuel is injected into the combustion chamber and ignited, the device is manually moved about on the road or fireproof floor to incinerate the gum or sticky waste materials. (Text in Japanese)

INT-0387

Smol'nikov, N. P. Shaft furnace for thermal processing of wood and wood wastes. U.S.S.R. 129,635; filed June 16, 1959; issued Feb. 26, 1965.

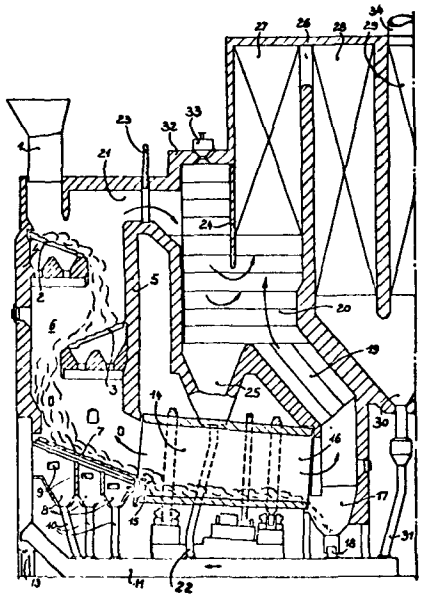
The shaft furnace is made of refractory materials. It rests on an annular foundation, is topped by a roof, and is provided with one lower outlet opening and two upper inlet openings. An interior coaxial circular table can be raised or lowered by a vertical lift. A telpher, running on a monorail, charges the wood into a hopper to be processed. A combustion chamber is connected with the shaft by a vertical duct and an annular manifold leading to openings, as well as a bypass duct terminating in the furnace roof. Two cooling bunkers are provided, and cooled charcoal is discharged onto a horizontal conveyor where it is sorted with the aid of vibrators. Pulverized charcoal is conveyed from a roller crusher to a pulverized-coal burner of the combustion chamber. In operation, the wood to be treated is cut into pieces of about 5-cm mean diameter, which are charged into the hopper; they are then discharged onto the circular table by means of a tilting platform. This table rises slowly while the combustion gases from the chamber enter the shaft through openings and move downward, heating the charged wood. These gases and the gaseous products of wood decomposition are withdrawn together through an opening. The wood becomes progressively more carbonized and finally slides off near the top of the furnace into the cooling bunker. (Text in Russian)



INT-0388

Urban, B., H. Block, and H. J. Mueller (Wistra Ofenbau-G.m.b.H.). Garbage destruction plant. Australia 258,712; filed Apr. 9, 1962; issued Apr. 20, 1965.

This garbage destruction plant uses one or more inclined drying grates and an inclined burning grate below the lower end of the lowest drying grate. Dried and partially burned garbage falls from the drying grate to the burning grate, then to an afterburning device. As hot waste combustion gases are withdrawn past the drying grates to a mixing chamber, the garbage on the grates is dried. The gases are mixed in the chamber with waste gases from the afterburning device and then passed through a heat recovery system to a chimney.

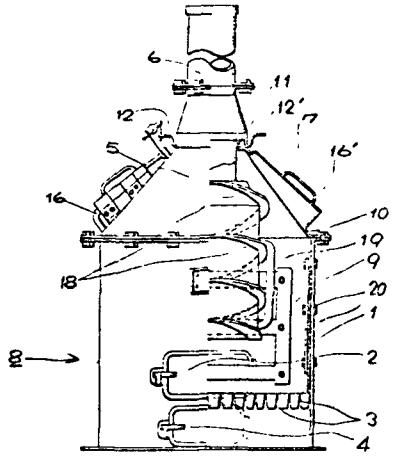


INT-0389

Shibata, K. Incinerator. Japan 40-17,872; filed Feb. 16, 1963; issued Aug. 12, 1965.

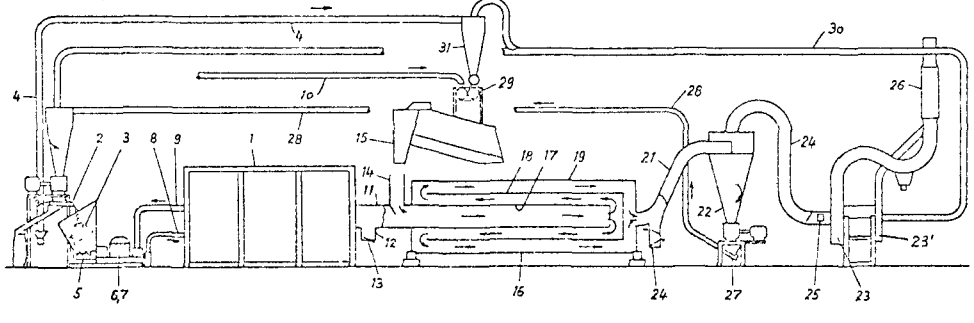
The device which opens and shuts the lid of the incinerator is, in this case, connected with the device governing the automatic transfer and stirring of the garbage. At the bottom and to one side of the square, pillar-shaped incinerator is the incinerating device. On the under-

side of the device is the grid and the opening for ash removal. A square, cone-shaped lid covers the top opening for charging. Bearings connect the lid with the movable cylinder which radiates heat inside the incinerator chamber. From the flange at the top of the heat-radiating cylinder extend two boards in which there are two holes through which rods can move. When the lid is opened, the heat-radiating cylinder moves, and the extended board stirs the materials which fall to the bottom of the incinerator. The next batch may then be added. When necessary, the rods can be slipped through the holes so that the heat-radiating cylinder can be operated manually. As the garbage is agitated, more surface area is exposed and incineration increases. This device not only speeds up incineration, but also provides a sufficient air supply to permit high-temperature burning. (Text in Japanese)



INT-0391

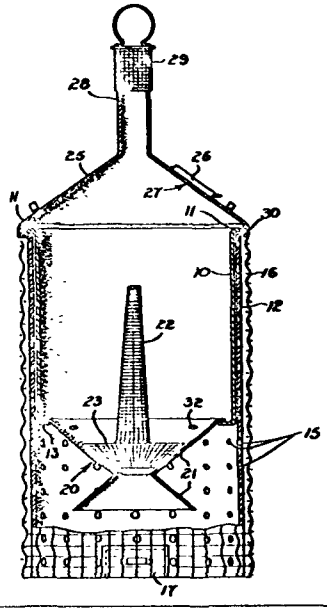
Seiler, H. (Hermann Seiler Limited). Method for drying and incinerating a mixture of waste water sludge and crushed garbage, and plant for carrying out the method. Switzerland 400,425; filed Jan. 10, 1962; issued Oct. 15, 1965.



INT-0390

Turner, L. D. Up-draught disposable residue incinerator. Australia 261,882; filed Nov. 8, 1961; issued Sept. 1, 1965.

This rubbish incinerator includes a sleevelike container adapted to fit into and be supported by a stand. Two frustumlike pieces secured to one another at their smaller ends, and having a common central aperture, make a double funnel. This funnel is located in an opening in the base of the sleevelike container. Positioned over the common central aperture of the funnel is a perforated cone with its base supported by the funnel. There is a lid over the sleevelike container. A chimney with a spark arrester extends above this lid. Supplementary draft openings extend through the funnel. A strong updraft in constant contact with the flame in the incinerator insures that the refuse is burned with a minimum of smoke.



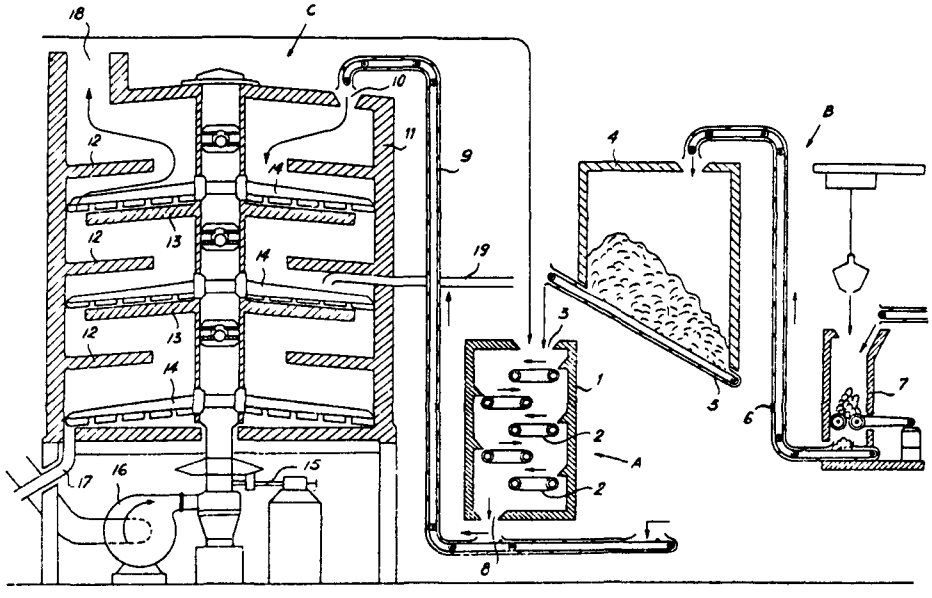
Dried sludge and garbage are preheated by hot waste gases from an incinerator and are then

incinerated in a plant which includes a mixer, an incinerator, and a drying drum. The latter consists of three concentrically arranged cylinders for drying the mixture of wet and dried sludge, and crushed garbage. Hot combustion gases are passed to the cylinders. The gas and refuse mixture is deflected twice by 180 degrees. The fractions which dry most rapidly, and are the lightest, are drawn off by ventilators. A separator through which the waste next passes removes glass, iron, sand, stones, etc. Then, the waste gases and the evaporated water are separated from the solid material in the cyclone. The waste gases are scrubbed before they are allowed to enter the atmosphere. The solid material goes to a sieve; the sifted fine material is mixed with wet sewage sludge, and then incinerated. (Text in German)

INT-0392

Gujer, H. Method and equipment for combustion of sewage sludge and garbage. Switzerland 403,140; filed Sept. 25, 1963; issued Nov. 30, 1965.

Prior to incineration, sludge and garbage are mixed to form a combustible product with a 70-percent water content. The cascade mixer used for this purpose consists of several conveyor belts staggered above each other. The mixer is connected with the incinerator where the waste material falls from one level to another. The solid waste material is shredded before it is mixed with sewage sludge. The sewage sludge is dehydrated to a water content of 80 percent before it is mixed with garbage. The furnace is equipped with rotating arms on each level. The loading of refuse is halted momentarily while an arm passes underneath the inlet. (Text in German)

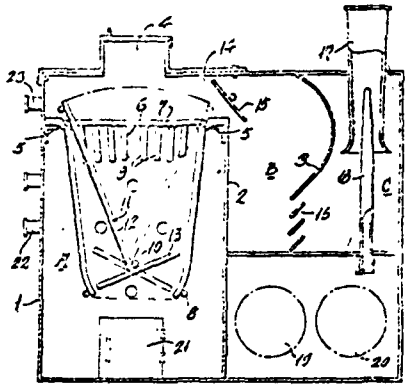


INT-0393

Masuda, T. (Masuda Kogyo Company, Ltd.). Incinerator. Japan 40-27,637; filed Oct. 12, 1963; issued Dec. 6, 1965.

An incinerator for the complete combustion of kitchen garbage consists of a primary and a secondary combustion chamber, and a jet-type smoke elimination chamber. In the first chamber, there is a basket container, vertically divided into two sections by an inverted T-shaped grid consisting of many rods. The center of the grid is fixed to an axis so it can rotate freely. Garbage enters alternately either side of the basket container. Then, a blower jets air through a nozzle to create a draft in the chamber, and combustion occurs. A device on the top of the first chamber dumps the residue into the second combustion chamber. There, gases emitted during primary combustion are mixed with air and recombustion occurs. A passage from the second chamber leads to the smoke elimination chamber, which has a chimney attached. As

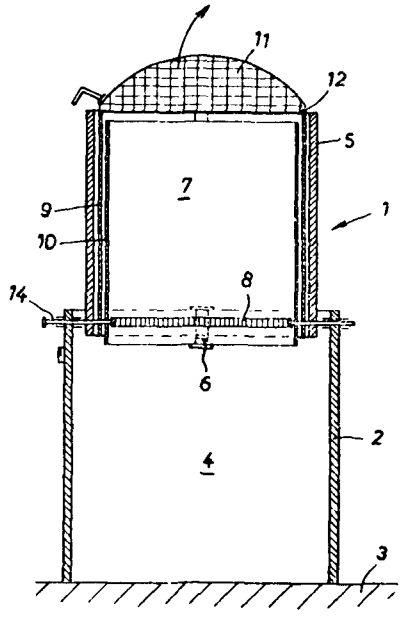
air is blown into the chimney from the smoke elimination chamber, a nozzle in the chimney withdraws and emits the smoke. At a suitable time, the positioning rod in the basket container is tilted to make room for another batch of garbage. (Text in Japanese)



INT-0394

Egli, W. Refuse incinerator. Switzerland 407,392; filed Jan. 24, 1963; issued Feb. 15, 1966.

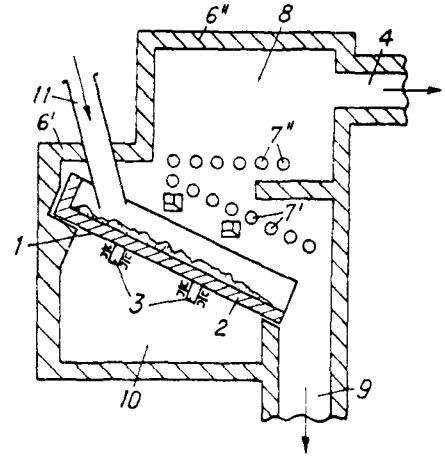
The incinerator consists of a tubular lower section, and a tubular upper section that has a smaller cross section than the lower part so there is an annular aperture between them. The upper section protrudes into the lower section, and rests on supports rising from it. In the lower section, a grate separates the combustion chamber from the ash compartment. The grate, which can be fixed in horizontal position, is mounted on a rotatable axis. Steel tubes are arranged radially inside the upper part. The innermost tube juts more deeply into the lower section than does the upper part. The upper part has a wire mesh lid for charging. The combustion air, and the air for cooling the sheet steel jackets and the upper section, is drawn in through the annular aperture. Because of the reverse air jet, the upper part of the ash compartment is ventilated so that an afterburning of unburned matter which has fallen into the ash results. The upper and lower sections of the incinerator may be made of cement asbestos. A refractive lining may be installed in the upper section. (Text in German)



INT-0395

Staesche, W. (Von Roll A.G.). Furnace for the incineration of solid, pasty and liquid wastes. Canada 728,936; filed July 17, 1963; issued Mar. 1, 1966.

A furnace for the incineration of solid, pasty, and liquid wastes consists of a furnace enclosure defining a fire chamber and a semicylindrical trough lined with refractory material mounted within the enclosure. The trough is inclined along its longitudinal axis and can be rocked about that axis. Openings in the sidewalls of the furnace provide for the introduction of combustion air. Combustion residues are removed at the lower end of the trough. (See also Switzerland 442,591 and Germany 1,107,365)

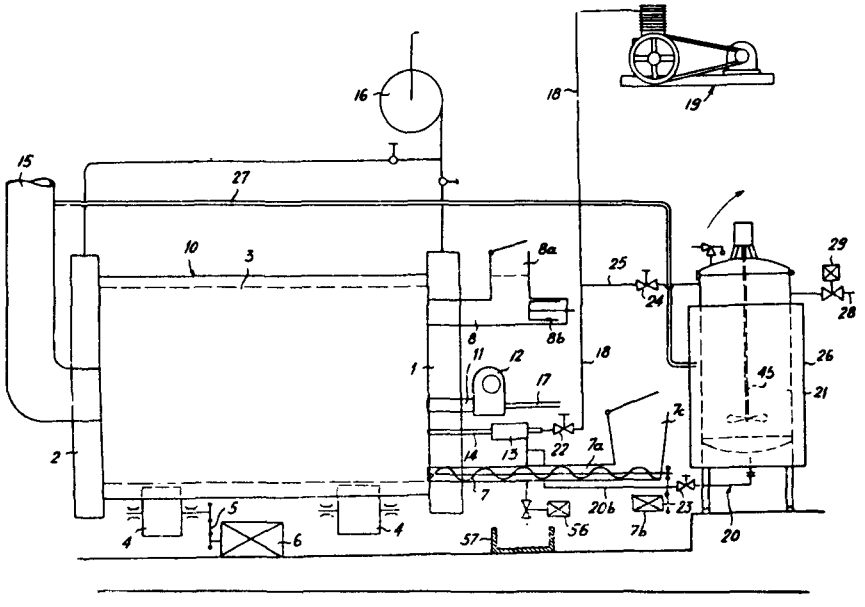


Incineration

INT-0396

Keller, O. Incinerator for waste products. Switzerland 409,210; filed June 5, 1964; issued Mar. 15, 1966.

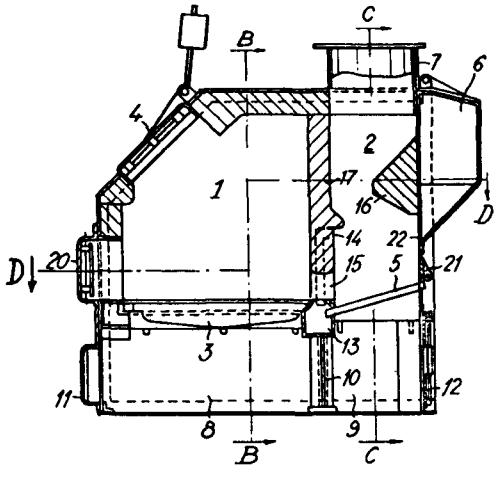
The incinerator consists of a horizontal, rotatable cylindrical body with two stationary walls on either side. The main burner, an auxiliary burner, and separate inlets for sludge and solid refuse are on one stationary wall. On the other, the ash tap-off and flue gas outlet are installed. The main burner reduces waste oil, oil/water mixtures, solvents, and other combustible waste liquids. Sludge and solid refuse are burned by the auxiliary burner. A screw conveyor transports the sludge into the furnace. Operation of the screw conveyor as well as the chute is blocked if the auxiliary burner is not operating. Through the rotary movement of the cylindrical body, which does not interfere with the combustion of liquid refuse, sludge and solid waste are constantly held in motion to prevent the formation of slag layers which could hamper the combustion process. (See also Switzerland 379,679) (Text in German)



INT-0397

Ekman, C. O. A., E. O. V. Ekman, and B. Brundin (Firma Licentia, Ekman and Brundin). Refuse incinerator. Great Britain 1,024,773; filed Jan. 25, 1963; issued Apr. 6, 1966.

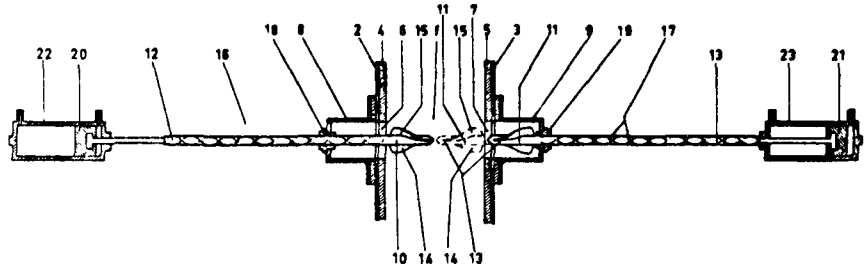
An incinerator comprises a refuse shaft lined with refractory, heat-insulating material, and a charge opening. There is also a shaft for high-grade solid fuel. Each shaft is provided with a grate, being separated by a common intermediate wall, and communicating with each other by way of an opening in the intermediate wall adjacent to the grate of the refuse shaft. This opening is disposed so gases and vapors from the burning refuse are forced through the fuel bed in the fuel shaft during operation of the incinerator. The fuel shaft is provided with an intake for secondary combustion air, and at its upper end it is connected to a flue. Both shafts have separated ashpits, and at least one duct extends from the ashpit of the fuel shaft to the upper portion of the refuse shaft. Through this duct any vapors and gases above the refuse bed are drawn off during operation of the incinerator.



INT-0398

Gimbel, E. Refuse agitator for incinerators. Germany 1,213,945; filed Nov. 13, 1964; issued Apr. 7, 1966.

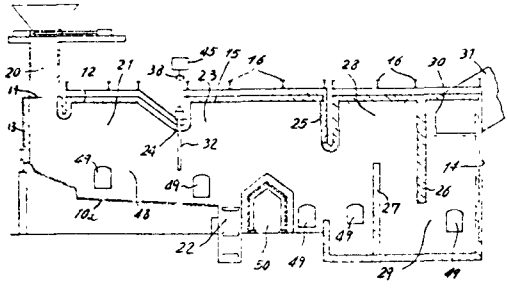
An agitator for stirring refuse during combustion has removable blades that are axially displaceable, and can be inserted into the rotating mechanism simultaneously. The blades are attached to the free end of a shaft and can be manipulated by pull or pressure on its other end, which is attached to a fixed device. The shaft is supplied with a spring coil arrangement. When not in use, the stirrers are enclosed in a hood. (Text in German)



INT-0399

Nishikawa, F. (Japan Ply-Brico Company). Incinerator. Japan 41-6,718; filed Apr. 5, 1963; issued Apr. 16, 1966.

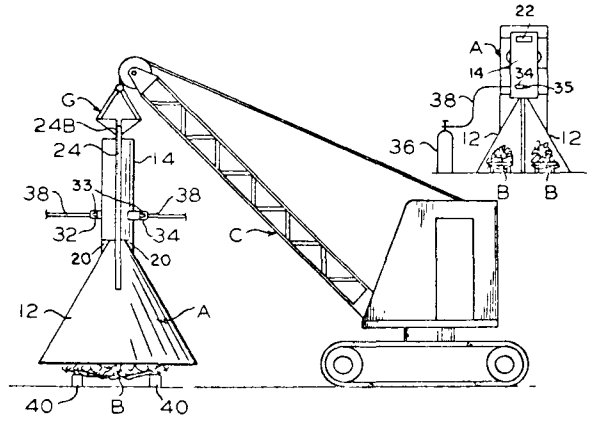
The amount of ash which remains in the incinerator, irrespective of the quality of the burned material, can be minimized by complete combustion, by the proper adjustment of temperature. The adjustment depends on the volume of heated gas allowed into the incinerator. The incinerator is divided into a first combustion chamber, in which the garbage is preheated and burned, and a second chamber, in which the gas from the first chamber is heated and expanded. A vertically movable dumper can change the dimension between the two chambers so that the flow of gas from the first chamber to the second is adjusted, thus controlling the temperature of the first chamber. The driving mechanism of the dumper is connected with a thermostat so its operation is automatic. When the temperature of the first chamber rises higher than the lowest optimum temperature for desired incineration, the dumper rises; this increases the flow of heated gas from the first chamber, and, therefore, lowers the temperature. The reverse occurs if the temperature is too low. Since the dumper has numerous holes that open toward the second chamber, it is kept cool, and combustion in the second chamber is promoted. (Text in Japanese)



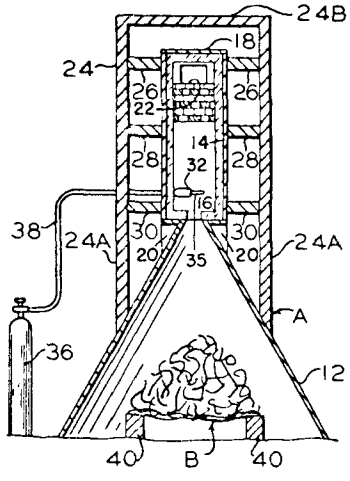
INT-0400

Spitz, A. W. Incinerator for wire scrap. Great Britain 1,026,757; filed Jan. 21, 1963; issued Apr. 20, 1966.

A portable incinerator for the removal by burning of organic materials, e.g. insulation, from metal substances without melting or oxidizing the metal portion, is described. The incinerator comprises a frustoconical sheet metal primary combustion chamber, which is superimposed on a random pile of scrap, in situ. An upright, refractory-lined, sheet metal chimney is located at the apex of this chamber, and it is equipped with a gas exit near its top and a fuel burner with an air inlet near



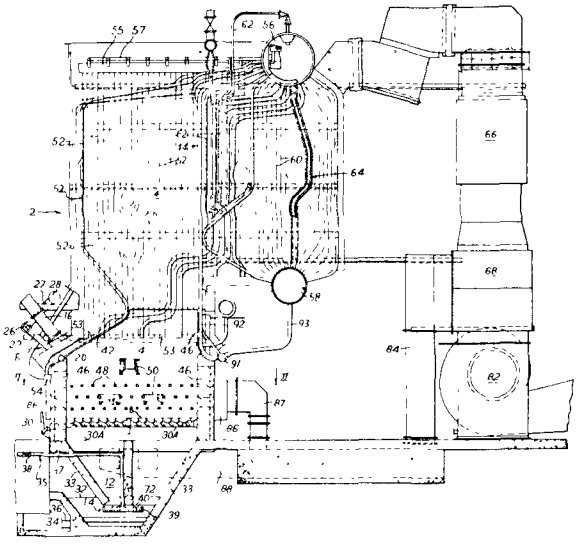
its lower end, forming the secondary combustion chamber. A pile of insulated wire or scrap metal is placed upon two rails resting on the ground. Readily ignitable fuel is added to start the fire. The temperature in the lower chamber is kept below the melting point of the metal so only the smoke and gases, given off by the burning organic materials, enter the secondary chamber for complete combustion. The unit is transported by a vehicle equipped with a crane and caterpillar treads.



INT-0401

Tutt, R. N. (Babcock and Wilcox Limited). Improvements relating to boilers utilising waste material. Great Britain 1,029,660; filed Nov. 5, 1962; issued May 18, 1966.

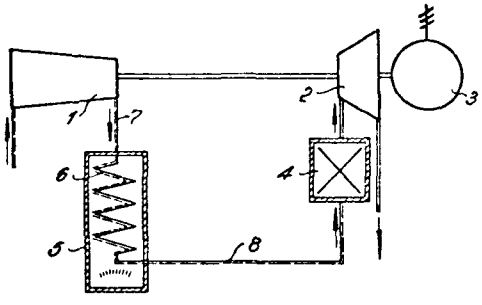
This boiler has a furnace capable of burning bagasse, wood chips, or other combustible wastes. Pressurized air spreads the waste over the separately operable sections of the combustion grate. As the fuel falls from a chute, the air distributes the waste over the grate. A flushing device washes the ashes from the ash receptacle, which is positioned below the grate.



INT-0402

(Gutehoffnungshutte Sterkrade A.G.). Method of and apparatus for utilizing heat, derived from garbage or refuse incinerators. Great Britain 1,031,412; filed Jan. 31, 1963; issued June 2, 1966.

A method for converting heat, derived from the combustion of garbage or other refuse, into usable energy involves using heat in a gas turbine plant. The plant contains a heater formed by an incinerator, through which extend ducts for the passage of the working fluid of the plant. The inlet of the ducting is connected to the inlet of the combustion chamber of the plant. The energy provided by the turbine plant can be used as mechanical energy, or preferably, to drive an electric generator. Heat is used to indirectly heat the working fluid downstream of the compression stage of the cycle. The working fluid is further heated by the heat generated in a combustion chamber before reaching the expansion stage of the cycle. Alternatively, by means of a transformation process, the heat is used to cool the working fluid upstream of the compression stage.

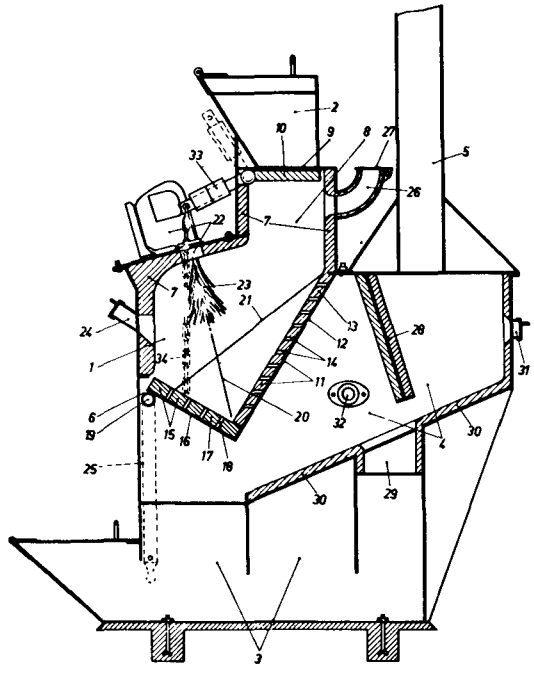


INT-0403

Gimbel, E. Refuse incinerator. Germany 1,220,072; filed Jan. 19, 1963; issued June 30, 1966.

The incinerator consists of a refractory-lined combustion chamber, with an inclined impact plate. Approximately perpendicular to this, there is a rebound plate; the two plates form a trough for reception of the refuse. An oil or gas burner terminates in the combustion chamber. A flap-closed refuse feed funnel is placed over the combustion chamber. A water-cooled residue catcher is attached. The charge

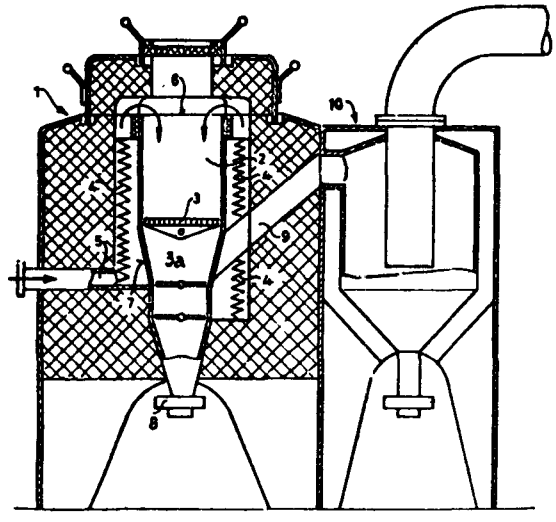
opening to the incinerator is over the impact plate. This plate, to achieve a longitudinally extended sloping of the charge, is more steeply inclined than the rebound plate. The burner is mounted so that the flame envelops the lower part of the refuse pile. (See also Germany 1,239,797) (Text in German)



INT-0404

Ruppmann, W. Refuse incineration muffle furnace. Germany 1,224,861; filed Nov. 18, 1958; issued Sept. 15, 1966.

Ducts are provided between the furnace lining and the outer wall of the muffle. These are

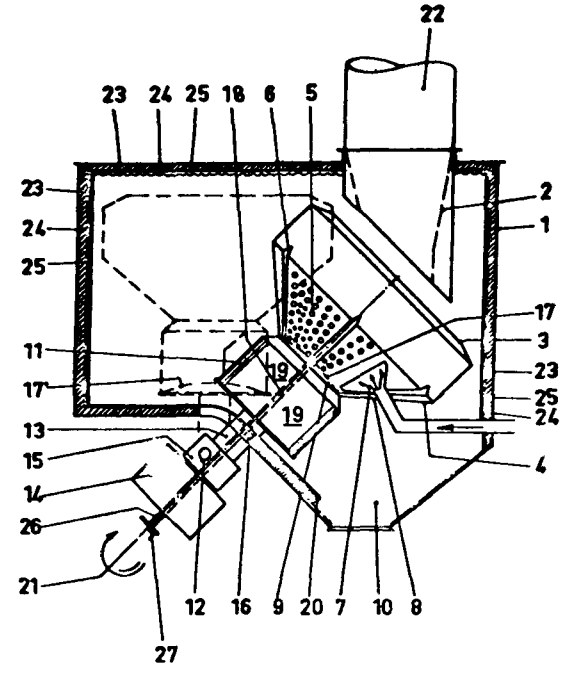


for electric heating elements, by which incineration air is heated before entering the muffle, flowing over its upper edge and downward through it. A tilting grate is arranged inside the muffle, with a combustion gas discharge flue beneath it. (Text in German)

INT-0405

Roder, K., and H. Goldscheid (Hilgers A.G.). Refuse incinerator. Germany 1,227,188; filed July 15, 1964; issued Oct. 20, 1966.

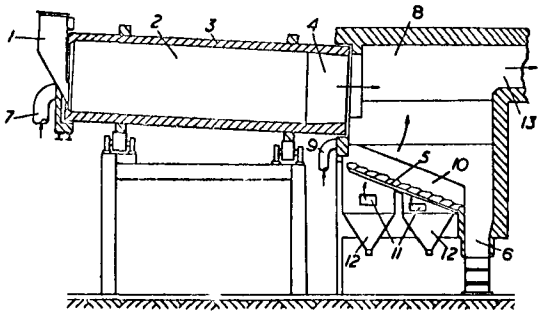
A refuse-burning furnace has a rotary grate tapering in a frustoconical form in the direction of movement of refuse into the furnace. The grate is mounted on a rocking axis, perpendicular to its axis of rotation, in order to rock between an operating position in which its lowest boundary is horizontal or rises slightly toward the outlet end of the grate. There is an emptying position, with its axis of rotation approximately vertical and its emptying opening at the bottom. The rotary grate is on a shaft extending axially from the outlet end of the grate. This shaft passes passes through a slot in the bottom of the furnace enclosure wall; at its outer end, it is carried by the driving gear for the grate. This gear is arranged to rock with respect to the fixed structure of the furnace. (Text in German)



INT-0406

Schuffler, A., and H. Block (Wistra Ofenbau G.m.b.H.). Process and apparatus for the disposal of garbage. Australia 271,057; filed May 22, 1963; issued Nov. 1, 1966.

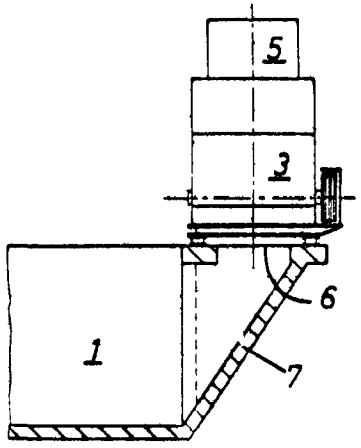
This apparatus for garbage disposal includes a revolving tubular furnace in which fine-grained, pasty, liquid, and/or solid waste is dried, ignited, and partially burned. The remainder of the burning and the slag discharge is performed by one or more stationary or moving combustion-completing grates which follow the furnace. Positioned at the end of the furnace, and above the final grates, is a mixing chamber which receives flue gases and vapors exhausted from the furnace, and mixes them with flue gases from the grates. The mixed gases then flow to a heat exchanger.



INT-0407

Beuel, H. (Aktien-Gesellschaft 'Weser'). Refuse incineration plant. Germany 1,234,632; filed Oct. 19, 1965; issued Feb. 23, 1967.

The plant includes a preliminary stock bunker and a mobile charging crane whose service range covers the bunker. There is also a charge mechanism to the incinerator furnace. At the edge of the bunker is a comminutor for coarse refuse, with its charging opening within the range of the mobile crane, and whose discharge is at a height from the bunker base. (Text in German)



INT-0408

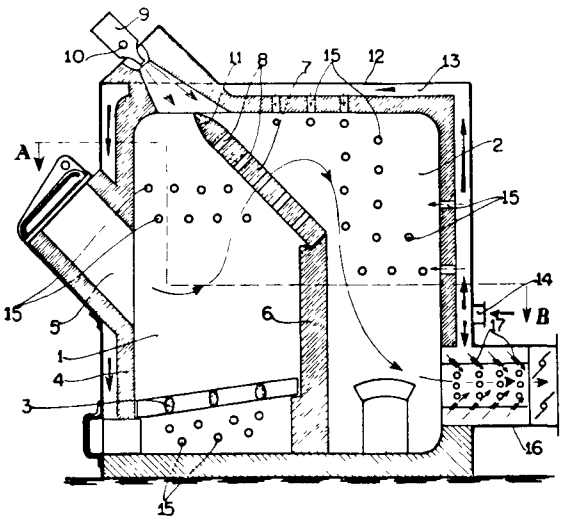
Gartner, W. (Deutsche Gold- und Silber-Scheideanstalt). Refuse incineration procedure. Germany 1,241,933; filed Sept. 6, 1963; issued June 8, 1967.

Refuse is burned by the addition of an oxidizing agent (e.g. sodium peroxide) immediately before the incineration of the refuse. The quantity of oxidizing agent added depends on the temperature in the combustion area, and on the moisture of the refuse, and is governed by these two variables. (Text in German)

INT-0409

Volhardt, F. (Schmidt'sche Heissdampf G.m.b.H.). Incinerator. Germany 1,248,211; filed Oct. 29, 1964; issued Aug. 24, 1967.

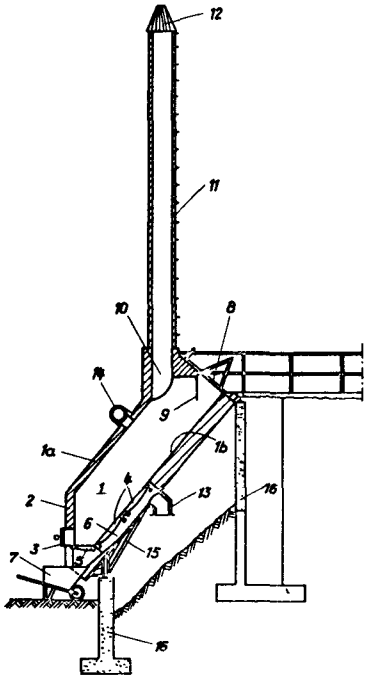
An incinerator for paper, and similar material, includes a partition, separating the furnace from the postcombustion space, which has screenlike perforations, and is inclined to the furnace. An additional burner is arranged tiltably in the roof of the furnace, in line with the longitudinal axis of the partitions, and at right angles to its upper edge. (Text in German)



INT-0410

Bie, I. (A.B. Skanska Cementgjuteriet). Incinerator for various types of material, for example refuse. Switzerland 431,787; filed July 15, 1964; issued Sept. 15, 1967.

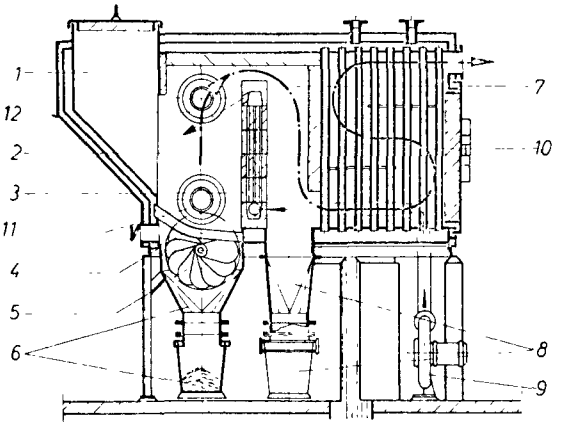
An incinerator for burning various substances features an inclined chute, with fireproof sides, bounded at its lower end by a vertical front wall provided with a door. A grate, with the same slope as the chute, is situated on the underside of the chute. Underneath this grate is a second, horizontal grate that can be vibrated. The outlet duct for the incineration products is situated underneath the top grate, and is on a slope. A filling entrance is situated at the top of the chute, above a screening device. A vertical chimney is built into the top of the chute, which has two built-in ducts for bringing preheated air into the chute. (Text in German)



INT-0411

Giese, H. J. (Gebr. Froling). Procedure for continuous incineration of waste by means of small incinerators. Switzerland 432,705; filed Mar. 8, 1965; issued Sept. 15, 1967.

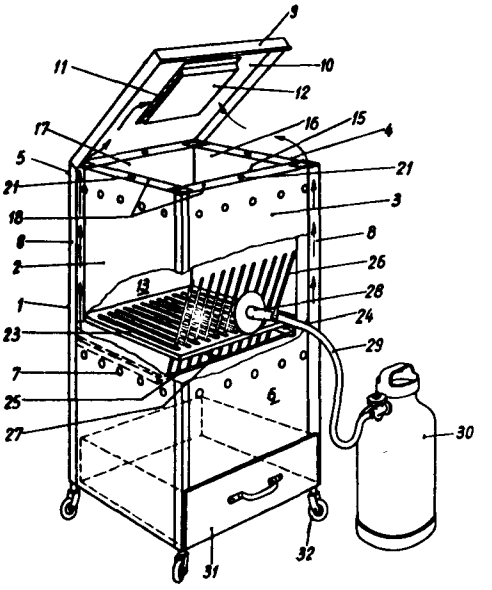
In the continuous incineration of waste by small incinerators, the charge is introduced into the combustion chamber through a chute, having been predried and prefragmented by a motor-driven device. The gases of combustion are conducted through a hot firewall with air vents, and through a postcombustion chamber where they are completely burned. The filling chute is water-cooled. A funnel for collection of ashes is located under the grate, and space is allowed for the placement of an ash can under this grate. An oil or gas burner can be mounted over the water-cooled grate, for which a muffle is supplied. (Test in German)



INT-0412

Perret-Gentil, J. Incinerator. Switzerland 432,704; filed Nov. 29, 1965; issued Sept. 15, 1967.

An incinerator that processes many kinds of waste consists of a rectilinear, hollow case of sheet metal whose sides are welded to a supporting frame and fitted with a hinged metal cover. A removable hearth, in the form of a chest without top or bottom, is supported

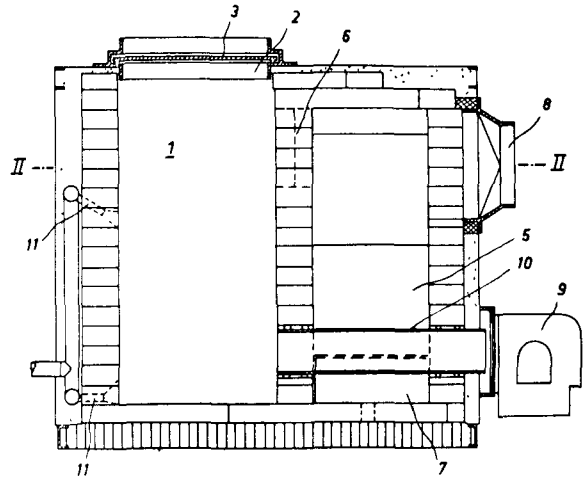


within the case with a space between the respective walls. The upper sides of the chest are bent toward the outside to rest upon the supports of the outer case; the lower sides are bent inward to form the support for the grill. The harrow has bars that are inclined toward the case, and fixed below the grill. A hinged cover, fitted with a fireproof casing on its underside, forms a central grilled duct for smoke removal. A removable burner in the side of the case is connected to the compressed gas cylinder by a flexible tube. (Text in German)

INT-0413

Frank, H. (H. R. Heinicke G.m.b.H.). Refuse incinerator. Germany 1,250,586; filed Apr. 14, 1964; issued Sept. 21, 1967.

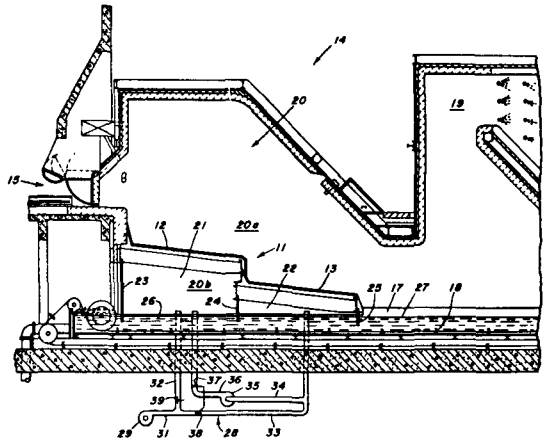
An oven burns refuse by means of a gas or fuel burner. The flame is in direct contact with the combustion chamber and the afterburning area, for purposes of heating and treating the gases of combustion. The burner flames are first led into the afterburning area and then into the combustion chamber, which receives the waste. The flames are led into the afterburning area by a duct whose walls are solid (for the indirect heating of the gases of combustion); then, by means of vent holes in the duct, direct flames contact the refuse for burning. (Text in German)



INT-0414

Reilly, B. B. A method of controlling the combustion of refuse in an incinerator, and an incinerator for carrying out the method. Great Britain 1,084,970; filed June 11, 1965; issued Sept. 27, 1967.

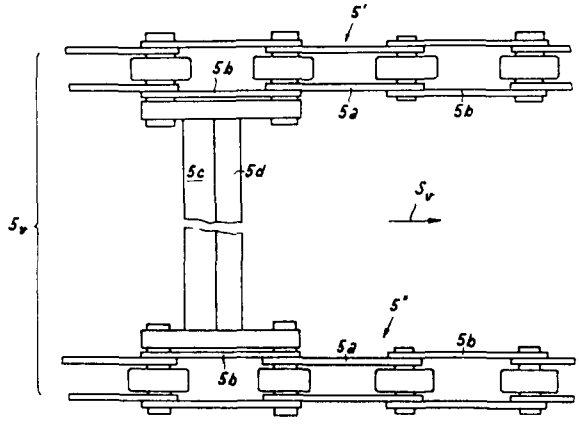
An incinerator with a grate is first operated with an updraft through the entire area of the grate and subsequently, with an updraft through only a section of the grate. Combustion gases are drawn downward through another part of the grate to mix with the combustion air flowing through the first section. The grate has a combustion space above it, with two windboxes beneath. Combustion air can be selectively supplied to both windboxes, or to the first only. A mechanism is provided for withdrawing combustion gases through the second windbox, and supplying these gases to the first.



INT-0415

Bauer, H. (Von Roll A.G.). Mechanical wet-slagging in incinerators especially selected for burning refuse. Switzerland 434,540; filed Dec. 8, 1965; issued Oct. 14, 1967.

An incinerator especially designed for burning refuse makes use of mechanical wet-slagging, and includes a bath in which water is kept at a constant level. The bath is set into the framework at an angle, so the slag will drop to the bottom, and it is equipped with sprocket wheels over which a chain runs continuously



inside the bath. The slag is introduced into the water through a funnel which lies directly over a side of the slanting bath. On the sidewalls of the bath, several filling funnels may be included. By continuously running the chain in one direction only, the problem of the slag sticking to the chain is avoided, since the chain is washed by the upper level of the water. (Text in German)

INT-0416

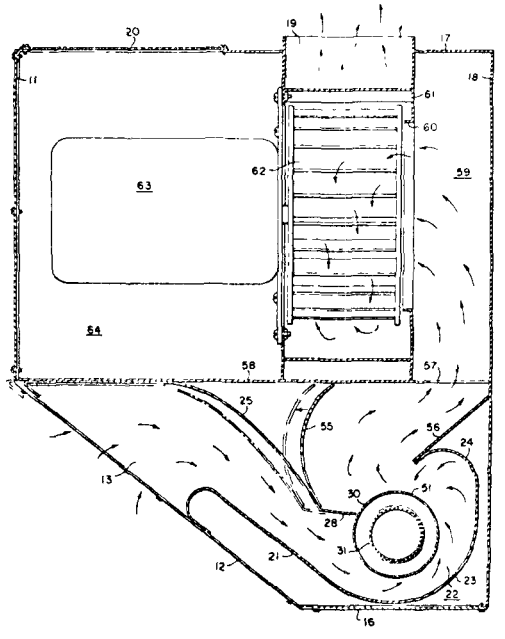
Rausch, H., F. Cappel, and H. Korth (Metallgesellschaft Aktiengesellschaft). Procedure for improving performance of waste processing by incineration and sinter formation. Switzerland 435,164; filed July 31, 1964; issued Oct. 31, 1967.

A procedure for improving waste incineration by means of burning and sinter formation includes putting the smaller particles of the refuse (below 5 mm) through a sieve before burning. These are subsequently mixed with the fragmented slag of the burned larger particles of the refuse. The mixture increases the quantities of refuse processed, and some of the exhaust gases are incorporated in the sinter machine procedure. (Text in German)

INT-0417

(Luxaire Incorporated). Grease incinerator. Great Britain 1,091,509; filed May 24, 1966; issued Nov. 15, 1967.

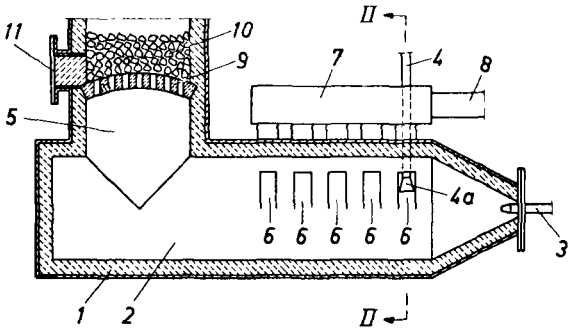
A grease vapor incinerator comprises a housing through which air, in which grease particles are suspended, is passed. The housing has inlet and outlet openings. Baffle and duct portions in the housing define an annular chamber between the openings. The power fan in the duct, which moves the air from the inlet through the annular chamber toward the outlet, imparts a circular motion to the air in the annular chamber. There is also a portion which has a heatable cylindrical surface, positioned coaxially within the annular chamber to incinerate grease particles in the air passing through the chamber and impinging on the cylindrical surface.



INT-0418

Javorski, B. S. (Aktiebolaget Celleco). Procedure and preparation for destructive incineration of highly contaminated waste products. Switzerland 439,559; filed Oct. 22, 1965; issued Dec. 29, 1967.

A procedure for the destructive combustion of highly contaminated waste products begins by subjecting these products to almost complete combustion by the use of high pressure in an oven's whirlpool chamber. The combustion gases are subjected to temperatures exceeding the sinter formation temperatures of the contaminants. A filter layer is provided for the separation of the gross fireproof particles, which are deposited on the filter with the contaminants. The combustion in the whirlpool chamber, aided by accessory flammable fuel, is effected by the use of small quantities of waste products, and by maintaining a surplus pressure in the whirlpool chamber of at least 200 mm water. The combustion must be carried out so that the temperature of the combustion gases is at least 1,000 C. (Text in German)

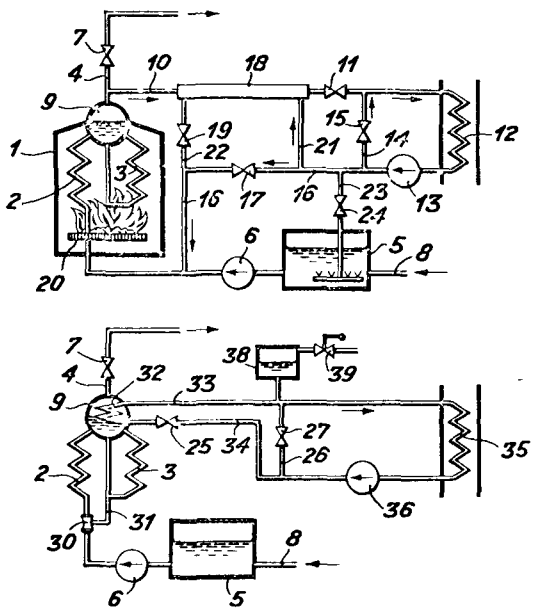


INT-0419

Rudmann, F. (Gebruder Sulzer, A.G.). Refuse incinerator. Switzerland 440,528; filed June 10, 1965; issued Dec. 29, 1967.

An incinerator for burning refuse includes walls covered with cooling pipes that enclose

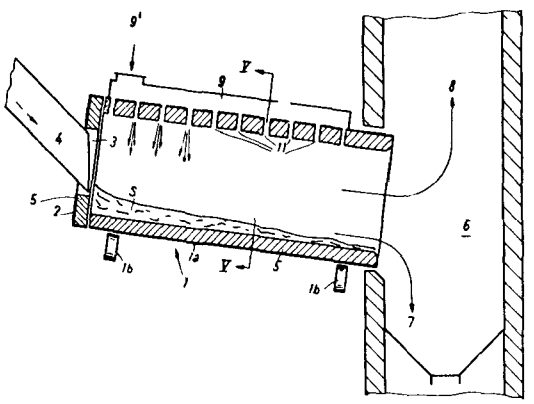
a vaporizing chamber. When refuse is burned, the water vaporizes in the pipes. The vapor collects in the chamber, and is conveyed to another system of cooling pipes, so condensation occurs. The reverse cooling cycle is separate from the vaporizing chamber, and is effected by a servomechanism. (Text in German)



INT-0420

Studer, R. (Von Roll A.G.). Oven for burning solid, viscous and fluid waste. Switzerland 440,526; filed July 22, 1966; issued Dec. 29, 1967.

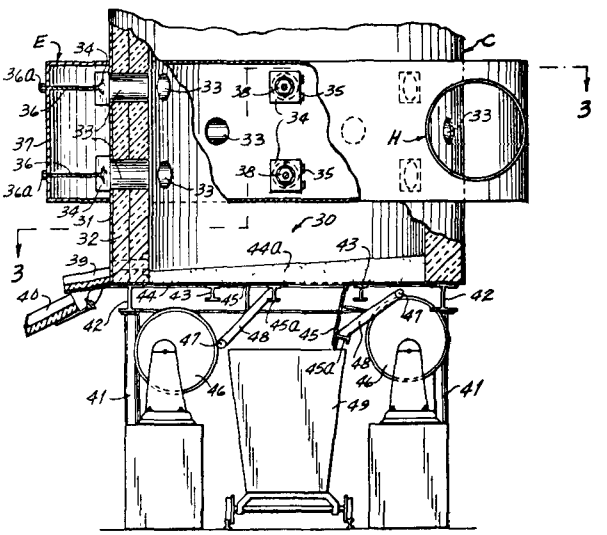
An oven for burning solid, viscous, and fluid waste material consists of a cylindrical chambe. and a front opening for introduction of material, both lined with sheet steel. The body of the oven is tubelike in appearance, and is mounted on rollers. A shaking device can be regulated according to the amplitude and frequency required. The structure is covered with fireproof material on the outside. The shaker is constructed so that its rear end fits into a fireproof chamber for receiving the combustion products. The air vents, placed in the center of the upper part of the shaker when it is in the mid-position, may be regulated. The front part of the oven body is attached, and when closed, is sealed tightly. (Text in German)



INT-0421

(American Design and Development). Incinerator. Great Britain 1,097,340; filed Mar. 15, 1966; issued Jan. 3, 1968.

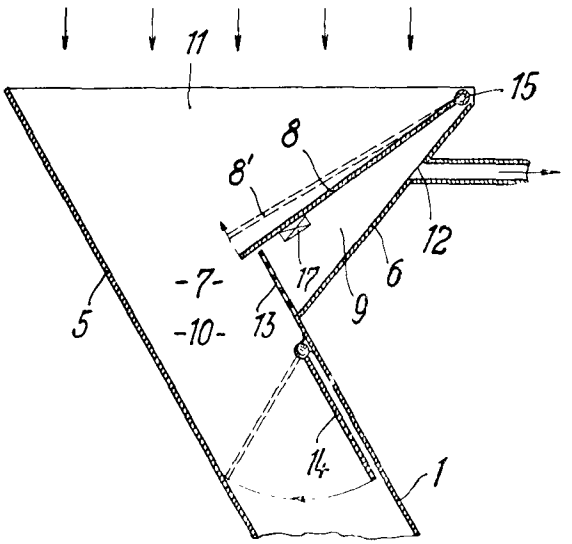
A method of disposing of waste includes charging the material into a cylindrical stack at or above a combustion zone maintained in its lower portion. Combustion air is introduced into the zone through circumferentially arranged air nozzles. Screening is provided in the upper portion of the stack for trapping the finer products resulting from combustion, and for returning the trapped unconsumed matter and hot gases from the upper portion of the stack, to the combustion zone. The incinerator comprises the stack, the upper section of which is constituted by fine mesh screens with multisided vertical sections, with a top screen-enclosing section for trapping larger particles of fly ash. A return bypass duct is positioned above the screen enclosure. It extends downward outside the stack, and into a forced draft fan to return of fly ash and hot gases into the lower combustion area.



INT-0422

Martin, J. J. Chutes for processing refuse. Switzerland 441,597; filed May 13, 1966; issued Jan. 15, 1968.

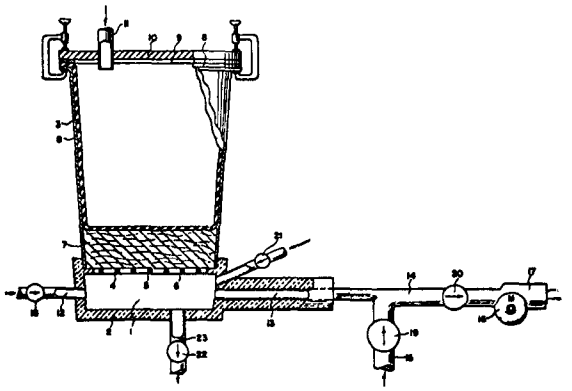
A chute for processing refuse, particularly for incineration, features variously inclined slide surfaces, and one with a flat rebound plate installed in its angle of inclination. Beneath this rebound plate is a dust removal device and a shutoff valve that regulates the chute. The dust chamber is screened from the chute by a filter, or grating plate. The rebound plate can be vibrated. (Text in German)



INT-0423

Miller, B. (Westinghouse Electric Corporation). Waste disposer. Canada 776,945; filed Feb. 13, 1965; issued Jan. 30, 1968.

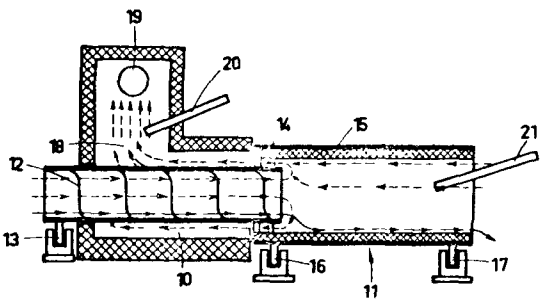
This electrical device disposes of waste materials such as trash, garbage, and other material ordinarily gathered and set aside for collection. The unit may be positioned among other conventional household units, such as clothes washers and dryers, and it requires no more hot gas disposal means than a piece of plastic tubing such as that required by clothes dryers. The odorless gaseous product of combustion is less than 200 F in temperature, and is disposed through the tubing to avoid overheating the room. A supply of fresh air is piped into the combustion chamber, and a vent is provided to exhaust the products of combustion. A temperature of 1,500 F has been found to be sufficient to eliminate smoke and odor. A device applies pressure to the top of the mass of the waste material in the trash bin which surmounts the combustion chamber. A minimum of ash remains.



INT-0424

Pfieffer, H., and K. Apelt (Dr. Schmitz and Apelt, Industrieofenbau G.m.b.H.). Refuse incinerator. Germany 1,260,069; filed Sept. 26, 1963; issued Feb. 1, 1968.

This incinerator incorporates a rotary drum receiving the charge at one end. The waste is continuously progressed to the other end, which comprises drying and combustion sections. Air is supplied to both ends of the drum in parallel flow in the charge end, and in counterflow to the discharge end. Air is also supplied to the externally open transition zone between the two drum sections. The charge section, which is exposed to gas circulation, lies in the aftercombustion chamber, leading to the stack, to which flow both drying and combustion gases through the transition zone between the drums. (Text in German)



INT-0425

Kremer, H. (Vereinigte Kesselwerke A.G.). Rubbish burning system. Germany 1,260,665; filed May 23, 1967; issued Feb. 8, 1968.

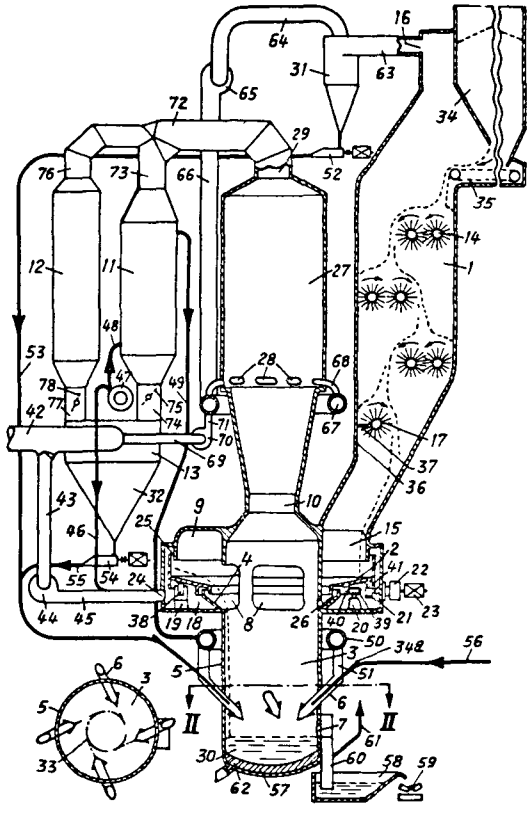
A rubbish-burning system has a roller grate with a grate covering. The covering has rods arranged differently, to correspond to the differing resistance of the burning layer. Thus, the largest area of resistance of the

burning layer meets with a large free surface, and the smaller area of resistance with a smaller free grating area. (Text in German)

INT-0426

Rummel, R. (Von Roll A.G.). A process and an apparatus for the combustion of solid wastes. Great Britain 1,104,605; filed May 6, 1966; issued Feb. 28, 1968.

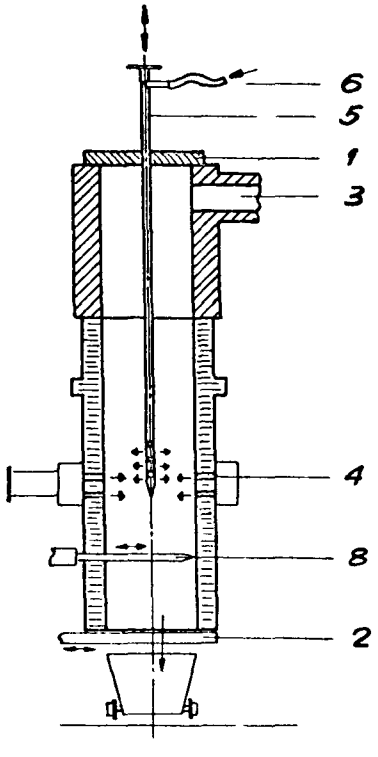
A process for the combustion of solid waste comprises passing the waste through a pre-heating chamber. The hot waste is then delivered to a circular conveyor in such a way that it is distributed around an inside wall of a fusion chamber, so that it falls down the sidewall. This supplies a combustion-supporting agent at high speed to the fusion chamber, via at least some of the nozzles arranged around the inside of the wall, and projecting into the fusion chamber through the falling waste. In this way, the combustible components are burned with considerable turbulence, and the incombustible components are fused and melted. This removes from the fusion chamber the molten components and the gases, and recovers heat from the gases. An apparatus for this combustion includes: the heating chamber, in which the waste is passed for heating; the circular conveyor that receives the heated waste from the heating chamber; and nozzles arranged around the inside of the sidewall to project into the fusion chamber. A mechanism is provided for removing the molten components from the fusion chamber, and there is a duct for leading the gases from the chamber. A heat recovery mechanism connected downstream of the duct recovers heat from the gases. (See also Switzerland 432,703)



INT-0427

Reusser, P. U. Blast furnace for incineration for sweepings or sweepings and sludge. Switzerland 445,705; filed Sept. 3, 1965; issued Feb. 29, 1968.

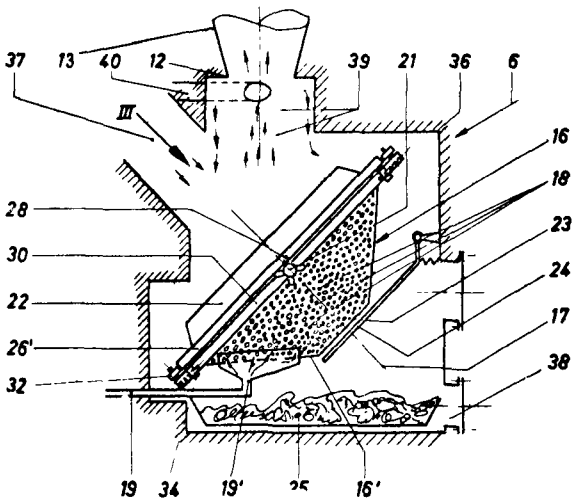
A blast furnace constructed to burn both sludge and sweepings overcomes the limitation of the size of cross section of the combustion chamber. Air ventilation is furnished by an overhead movable pipe which can also act as a stirrer, and which connects to a central area of the chamber. In addition, air inlets are provided around the outside of the oven near the adjustable fuel injectors. These inlets may be adjusted so that air is ejected in only one position of the axis. Air supply is automatically pressure dependent, and can be also supplied at the bottom of the oven through a closable disc. (Text in German)



INT-0428

Schoppe, F. Incinerator. Germany 1,263,214; filed June 8, 1962; issued Mar. 14, 1968.

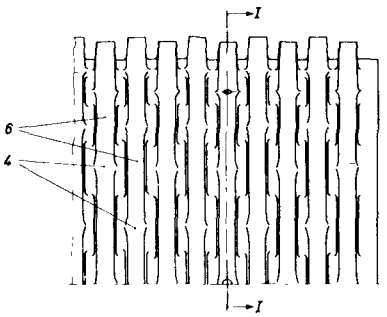
This incinerator, which burns solid refuse, incorporates a frustoconical drum section, with the base open for the waste, and a cone angle of 90 to 120 degrees. The axis of rotation is angled so the lower outline of the cone is horizontal, or inclined slightly downward. The feed for combustion air issues into a section of the drum in which a movement of waste is produced by the rotation of the cone-shaped drum. (Text in German)

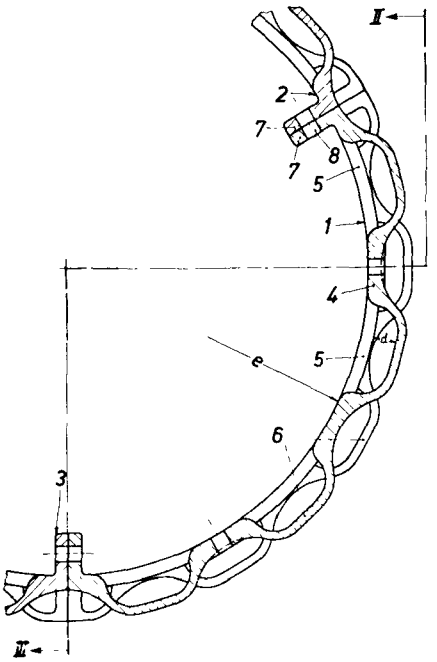


INT-0429

Vollmann, J. (Eisenwerke Fried. Wilh. Dueker G.m.b.H. and Company). Roller for grates used primarily for incineration of refuse. Switzerland 452,767; filed Oct. 21, 1965; issued Mar. 15, 1968.

A hollow, cylindrical roller shell is provided with grate openings for the passage of combustion air from the interior of the roller to the layer of burning material. The grate openings of the roller shell are perforations, distributed over its surface. These are provided with cover strips located at a certain distance from the perforations which prevent entry of pieces of the burning material. The ends of each strip lie at the ends of the perforation it covers, and arch outward. The grate openings may be rectangular, about 35 mm wide, about 100 mm long and may be spaced about 200 mm between centers, on about 35-mm-wide circumferential bands. The openings are staggered on successive circumferential bands, which are spaced about 100 mm apart. (Text in German)

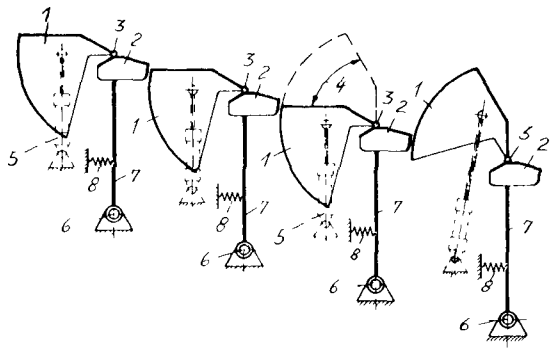




INT-0430

Holstein, R., and H. Voigt (Haniel and Lueg G.m.b.H.). Waste combustion grate. Switzerland 454,334; filed Mar. 15, 1967; issued Apr. 15, 1968.

This waste combustion grate is formed of grate segments pivoted on transverse axes, alternating with bridging segments which

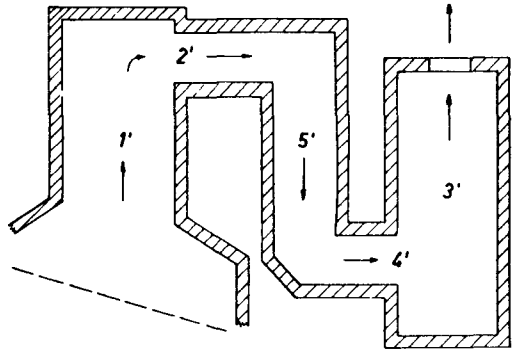


yield elastically in a direction opposite to the direction of travel of the burning material. These bridging segments are subdivided in the transverse direction into several independently mounted sections. (See also Switzerland 454,334; 454,333, and 447,452, Great Britain 1,149,548, and 1,144,292, and Germany 1,301,420) (Text in German)

INT-0431

Iacobovici, T. (Von Roll A.G.). Combined combustion plant for litter and sewage sludge. Switzerland 455,123; filed June 15, 1967; issued Apr. 30, 1968.

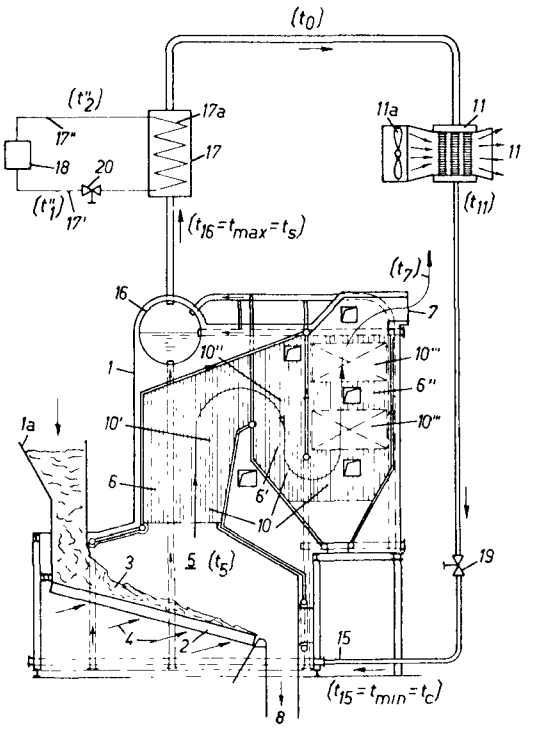
This combined combustion plant consists of a furnace for litter and a story furnace for sewage sludge. Both furnaces are coupled energetically by leading the hot flue gas from the litter furnace into the story furnace, to be used as a source of heat for the combustion of sludge. The flue gas outlet from the litter combustion furnace and the flue gas inlet into the sludge furnace are located on the same level, and are connected by a short, straight, and approximately horizontal duct. (Text in German)



INT-0432

Tanner, R. (Von Roll A.G.). Combustion furnace for low grade fuels; refuse, for example. Switzerland 455,122; filed Dec. 3, 1964; issued Apr. 30, 1968.

A heat exchanger lies in the path of the flue gas of the furnace, and it is traversed by a coolant. A second heat exchanger, located outside the furnace, serves as a cooler for the spent coolant. For direct utilization of at least a part of the heat generated, an additional heat exchanger is located outside the furnace. For greater efficiency of heat transfer, the heat exchangers inside and outside match the nominal yield of the furnace. Both the original closed circuit and the secondary circuit of the additional heat exchanger are provided with flow-control valves, whose setting is automatically adjusted on the basis of the current heat supply and demand. (See also Switzerland 428,068, 436,545, 452,093, 455,122; Great Britain 975,344, 1,052,177, 1,165,349; Germany 1,291,046; and Canada 787,139) (Text in German)

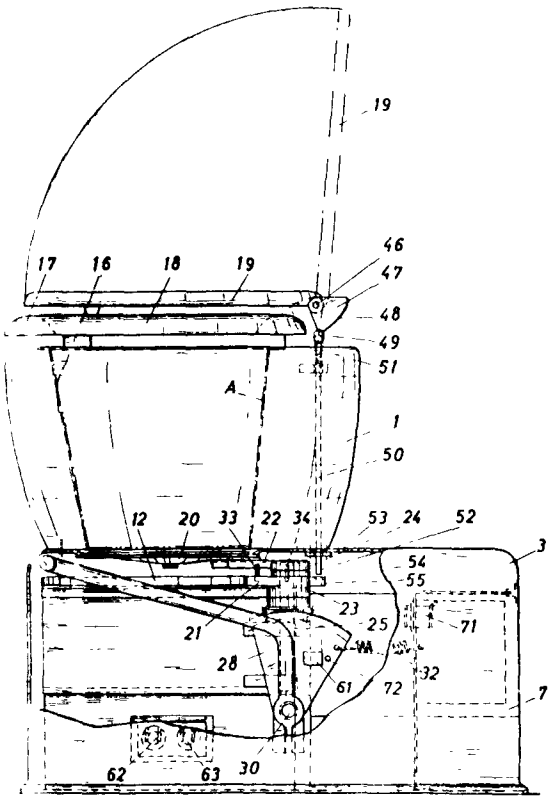


INT-0433

Nordstedt, H. J., and L. F. Delin (Aktiebolaget Hakanssons Industrier). Electrical toilet. Switzerland 456,014; filed July 5, 1966; issued May 15, 1968.

This electrical toilet incorporates a combustion chamber heated by an electric heating element; an electrically driven blower; a switch provided with a coil located between the terminals of a current source and the heating element; thermostatically controlled, preset circuit breakers responding to the combustion temperature; and an activating contact. Human excrement is reduced to gases and a sterile, bacteria-free ash. Provisions are included to prevent any possibility of discomfort or injury from the

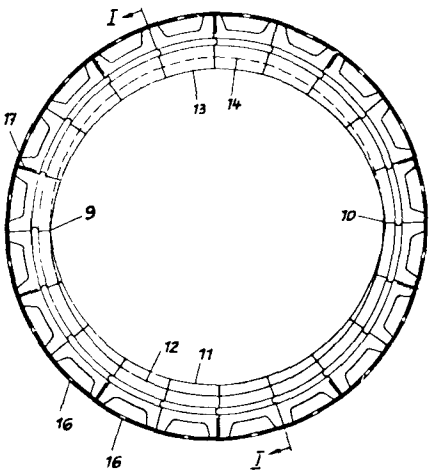
heat generated in the combustion chamber. (Text in German)



INT-0435

Wiedermann, W. Rotary refuse incinerator. Germany 1,270,728; filed Dec. 19, 1963; issued June 20, 1968.

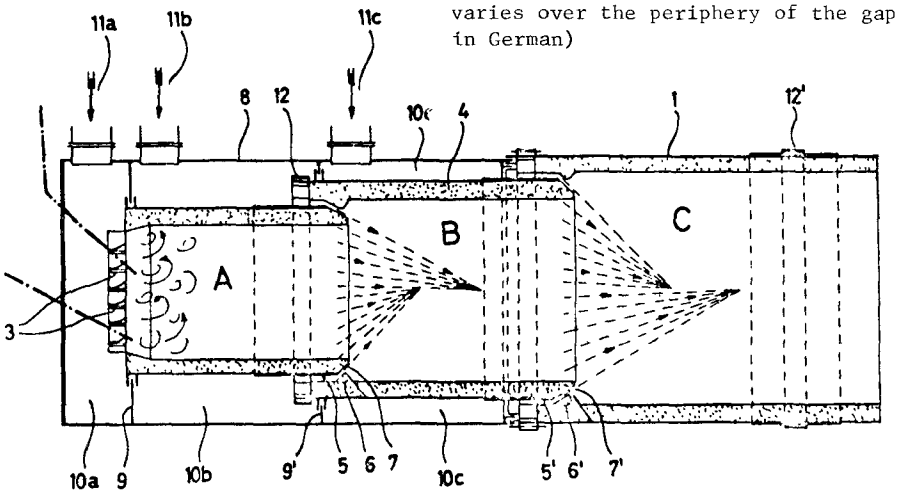
A rotary refuse incinerator is lined with fiber bricks joined by tongue and grooved joints. The bricks have boundary faces which are inclined in the direction of the charge motion. A projection located between two adjacent rows of bricks extends over approximately the entire periphery of the lining to block the movement of the charge. (Text in German)



INT-0434

Malmberg, M. (Badische Anilin-and Soda-Fabrik Aktiengesellschaft). Refuse incinerator. Germany 1,270,727; filed Aug. 31, 1963; issued June 20, 1968.

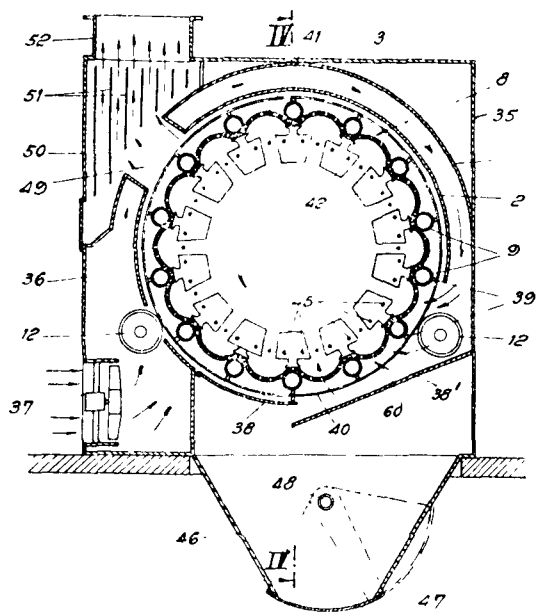
This rotary-type incinerator has a stepped section of different diameters. There are air inlets along the walls of the incinerator. Individual kiln sections have overlapping gaps for this purpose also. On their discharge ends, facing the combustion space, these gaps are bounded by conical surfaces enclosing an acute angle with the kiln axis. This angle varies over the periphery of the gap. (Text in German)



INT-0436

Brola, G. (Societe Anonyme Generale Thermique). Incinerator for domestic or industrial refuse. Switzerland 458,597; filed May 2, 1967; issued June 30, 1968.

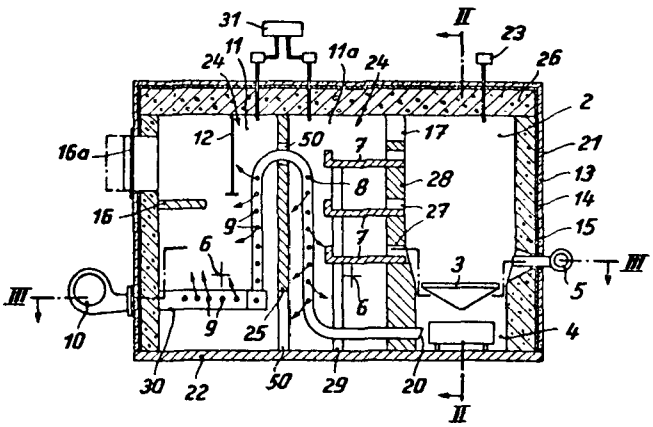
This incinerator comprises: a stationary, double-walled cylindrical housing; a cage formed by a cylindrical array of parallel tubes, which is coaxial with the housing and capable of rotating about the common axis; an electric motor for driving the cage; and a suction fan for drawing combustion gas toward the chimney. The housing is provided with apertures for admission of outside air into the double wall of the housing, the tubes forming the cage, and the combustion space. The flow of cooling air and the combustion can be controlled independently of each other. Radial, inward-facing blades or tube segments are attached to the tubes forming the cage and are interconnected by plate segments in a helical arrangement. As the burning refuse is continually pushed toward the axis of the cage by the helically arranged plate segments, each tube segment delivers additional air. (Text in French)



INT-0437

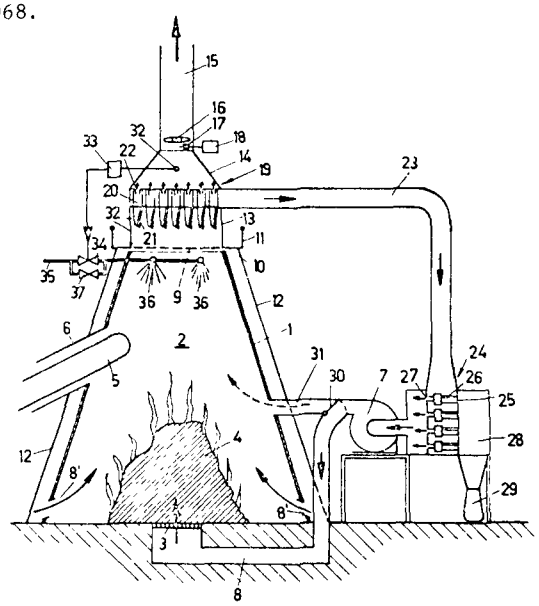
Jess, J. (H. von Aulock). Furnace for burning rubbish and refuse. Great Britain 1,118,855; filed Apr. 22, 1966· issued July 3, 1968.

This refuse incinerator has a main ignition burner and a grate for the main combustion chamber. A device is provided for supplying air to the main chamber. There is also an afterburner arrangement at the side of the main chamber; the two are separated by a wall which has openings for passage of the combustion gases. The afterburner is divided into two side-by-side chambers by a partition which also has openings for passage of the combustion gases. There are auxiliary ignition burners for each of these chambers. There is also a waste-gas exit and a catalyst bed to which the combustion gases are exposed as they pass through the openings in the separating wall or partition. The air-supply device for the main chamber includes an air inlet pipe, which extends through the two divisions of the afterburner and opens into the main chamber below the grate.



INT-0438

Ernst, T., and H. F. Stauffer (Disposa A.G.). Refuse combustion plant. Switzerland 459,438; filed Feb. 2, 1967; issued July 15, 1968.

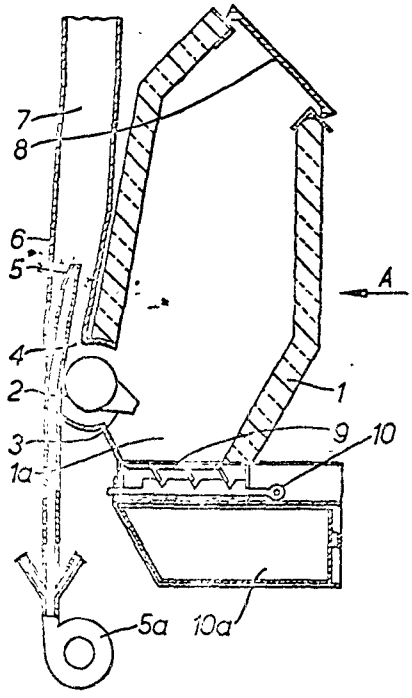


This refuse combustion plant has a firebox which is surrounded by a truncated, cone-shaped jacket. This jacket has inlet openings for secondary air and dust extraction equipment. A supporting walkway platform, provided above the jacket, is structurally independent of and not in contact with it. Each dust extractor is equipped with an individual fan which draws the combustion gases from the firebox through an individual coarse sieve. This sieve forms a part of the central section of the platform. If dry dust extractors are used, one is mounted on the platform and a second one, in series with the first, is placed near the ground. If wet dust extractors are used, two are mounted symmetrically on the platform to work in parallel with one another. (Text in German)

INT-0439

Moores, P. C. L. (Pemberton and Sturgess Limited). Incinerators. Australia 284,697; filed Sept. 26, 1963; issued July 26, 1968.

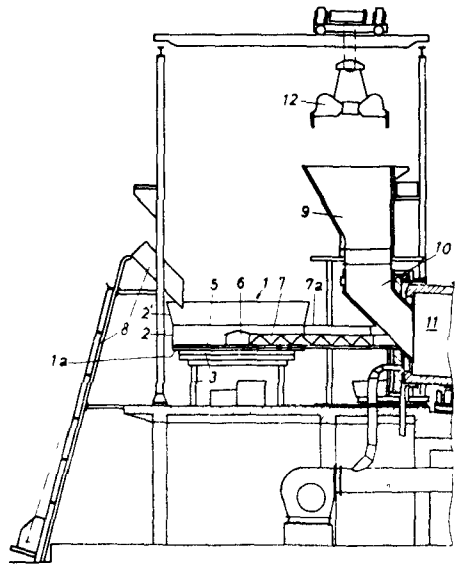
This incinerator comprises a combustion chamber that is shaped so that material placed within it will move toward a combustion zone. In this zone, the material is ignited by streams of hot air which are directed at the material through nozzles. A fan, a blower, or the like draws the gaseous effluent away from the combustion zone without passing it through the unburned material. The gaseous effluent is heated to remove any carbonaceous or smoke-producing substances.



INT-0440

Mueckenheim, H. (Von Roll A.G.). Equipment for charging of rotary-type drum furnaces for combustion of semiliquid wastes. Switzerland 460,228; filed Nov. 28, 1967; issued July 31, 1968.

The equipment consists of a stationary, circular hopper provided with a disc capable of rotating in its own plane about a vertical axis. The hopper is equipped with a motor drive and a horizontal conveyor. The conveyor extends through the sidewall of the hopper to the inlet chute of the rotary-drum furnace. The circular disc in the hopper may be heated. The speeds of rotation of the circular disc and the conveyor are adjustable independently of each other. (Text in German)

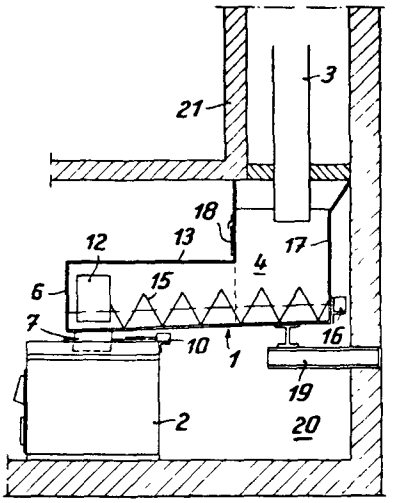


INT-0441

Jess, J. (H. von Aulock). Device for feeding a rubbish or refuse burning furnace. Great Britain 1,124,399; filed Apr. 22, 1966; issued Aug. 21, 1968.

In a device for feeding material to a refuse-burning furnace, a single feed screw, which is horizontally arranged, feeds the material to be burned from an input opening to a discharge opening. Material is discharged through the latter opening into the combustion chamber of the furnace. Within the furnace is a housing which surrounds the screw. A vertical cross section of the housing shows increases in width and in height from the lowest point, where it conforms in shape with the normal play of the screw. The width and height both increase up to at least 1.25 times the diameter

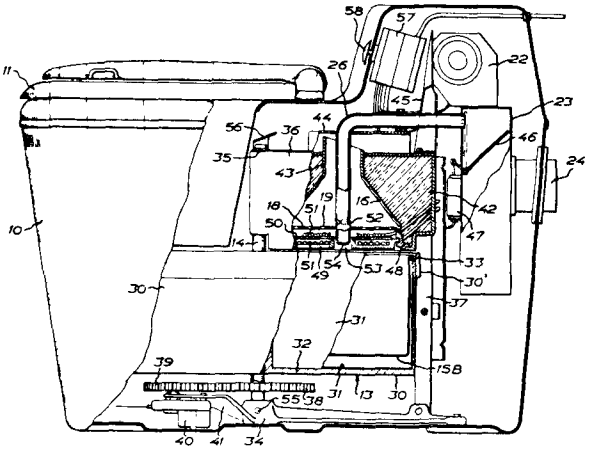
of the screw. There is a feed-disrupting mechanism rigidly mounted on the output end of the screw above the discharge opening of the combustion chamber, to cooperate with the screw in effecting the discharge.



INT-0442

Sundberg, H. M. Toilet with combustion device. Switzerland 461,688; filed Sept. 20, 1967; issued Aug. 31, 1968.

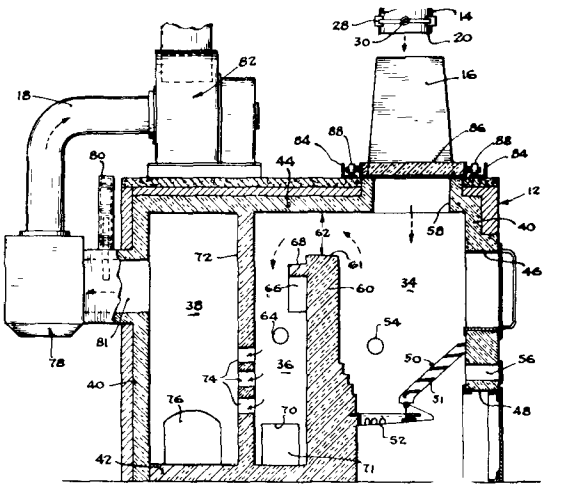
The combustion device is located in a stationary hood which is open at the bottom. The hood functions as a secondary combustion chamber; it has an inlet duct for admitting air and an outlet duct for discharging the combustion gas. Either of two containers can be moved from the charging position to the combustion position. In the combustion position, the top opening is aligned with the bottom opening of the hood. The latter is covered by at least one perforated ceramic disc. An electric heating element is located below and/or above this disc. One end of the waste gas pipe is connected to a pump which draws combustion gases into a plenum, which is, in turn, connected to a chimney. (Text in German)

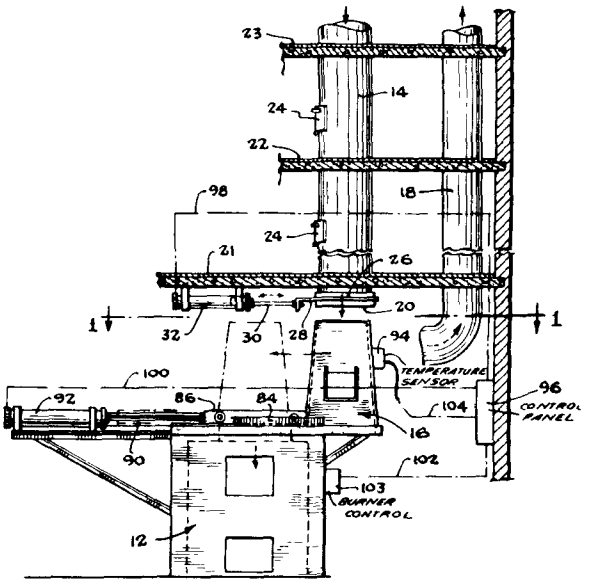


INT-0443

Goder, R. Incinerator. Canada 793,590; filed Dec. 9, 1966; issued Sept. 3, 1968.

This refuse incinerator assembly for a multistory building includes a primary combustion chamber, a secondary combustion chamber, and a precipitator chamber. The primary



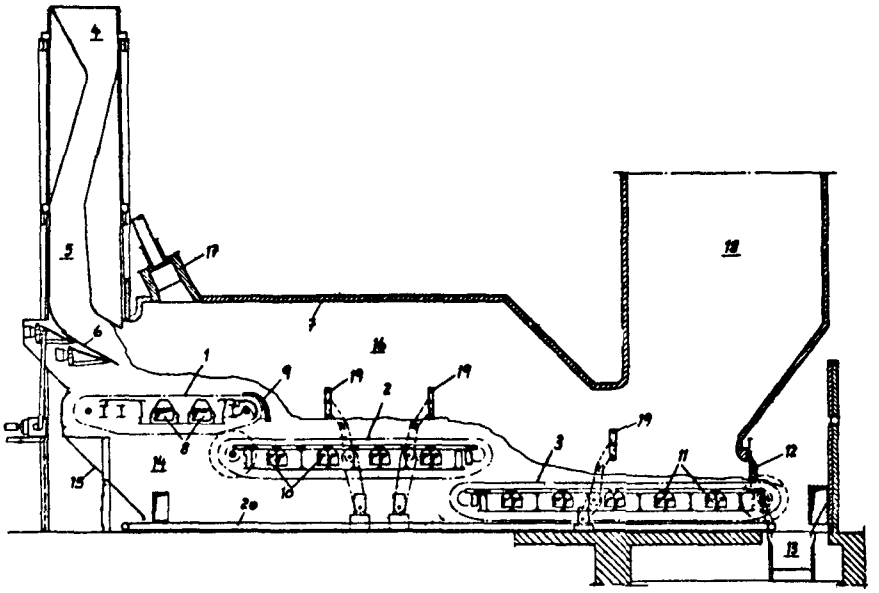


chamber has a grate assembly for supporting refuse, a materials charging opening, and fuel and air supply devices. A wall extends from the floor of the incinerator and terminates below the roof, separating the primary chamber from the secondary chamber. A second wall, that extends continuously from the floor to the roof, separates the secondary chamber from the precipitator chamber, except where there are openings to provide for the passage of high-velocity gases. The gases slow down and drop particles from suspension into the precipitator chamber, before being discharged through a stack. A charging chute extends continuously from the incinerator through each story of the building and has an opening at each story where waste materials are introduced. At the combustion end, which is offset from the materials charging opening of the incinerator roof, the chute has a discharge opening. A movable charging hopper in its first position can receive materials from the combustion end of the chute. When the hopper is operated, it moves to another position and discharges the waste into the charging opening in the incinerator.

INT-0444

Hennecke, H. (Deutsche Babcock und Wilcox-Dampfkessel-Werke-Aktiengesellschaft). Refuse incinerator. Germany 1,277,502; filed Jan. 2, 1962; issued Sept. 12, 1968.

This incinerator has several individual grates. Each grate is individually regulated and supplied with combustion air from beneath. The first travelling grate is preceded by a controlled output conveyor table, also forming the seal to the bunker shaft base. The cross section of this base increases uniformly downwards. (Text in German)

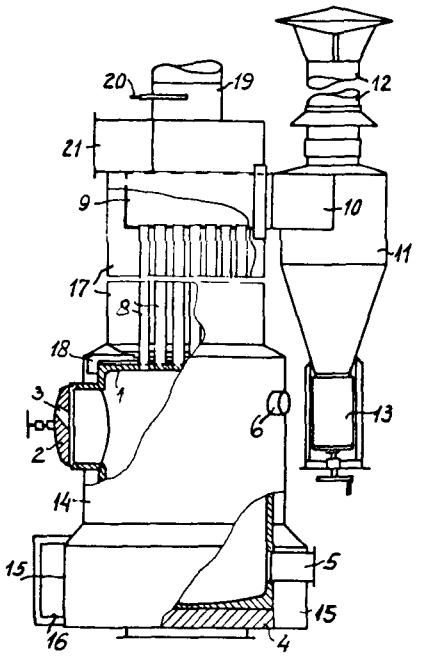


INT-0445

Nihot, C., E. R. Nihot, and P. A. H. Saueressig. Furnace with a vertical combustion space for burning fibrous waste products. Great Britain 1,131,169; filed May 16, 1967; issued Oct. 23, 1968.

This furnace is characterized by a vertical combustion space to which the waste products are circumferentially supplied by air. This air also serves as combustion air. The combustion gases produced are carried off, upward from the combustion space, through a cyclone separator. A jacket is arranged around the combustion space; the air to be heated is supplied to the jacket space and removed from above the combustion space. This is accomplished by means of a heat exchanger formed by a number of flue gas pipes which connect to the combustion space at their bottom ends; their upper ends lead

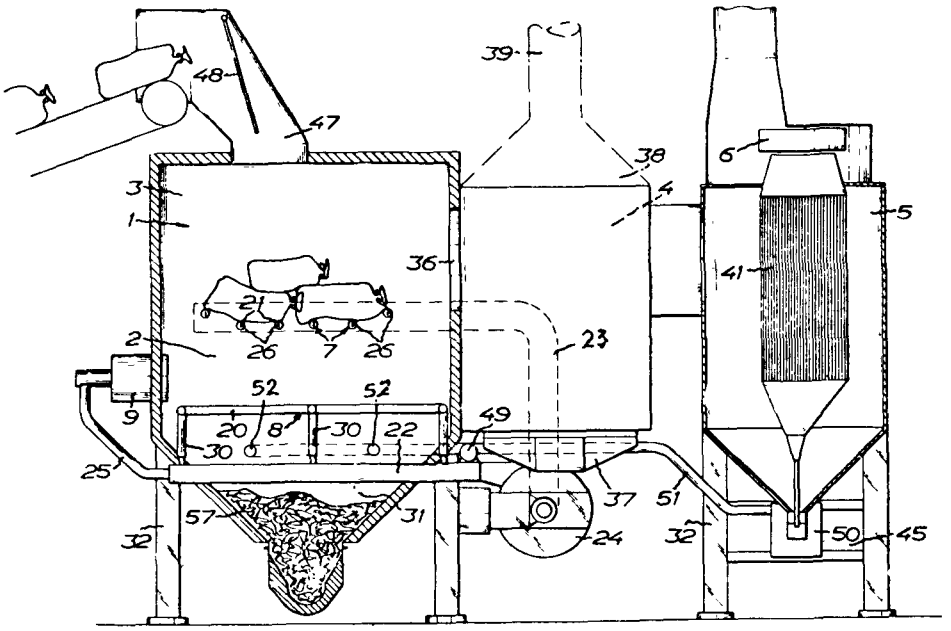
to a flue gas compartment which is connected to the cyclone separator.



INT-0446

Palme, S. L., N. I. Westin, and B. I. Fridh (Bjoerklund and Vedin N.V.). Refuse incinerator. Switzerland 467,433; filed Nov. 15, 1967; issued Jan. 15, 1969.

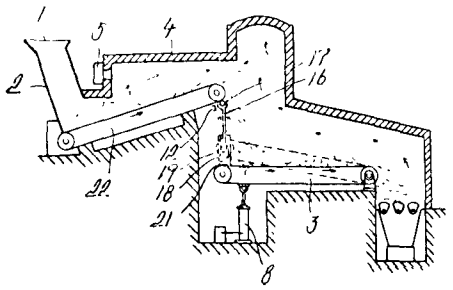
This refuse incinerator has a combustion chamber enclosed by outside walls, a dust collector and a flue gas blower. It has two grates installed one above each other. Between the combustion chamber and the dust collector there is a cooling chamber for the combustion gases. Air and combustion gases are conducted via different paths through the incinerator. Due to the fact that no cooling air is required for the flue gases, the flue gas blower and the dust collector are rather small-dimensioned. The grates consist of pipes connected to a source of compressed air. The pipes of the lower grate are connected by bars. Through air vents in the pipes an air flow is directed toward those bars. The lower grate is attached to a shaking device. Between the lower grate and the heat bed, a pipe is connected to a blower whose intake side is connected with the lower part of the dust collector. The combustion chamber consists of two sections. It is walled by outside walls with guideways on the inner side for fastening the refractory lining. The space between lining and wall is filled with insulating material to which some binding agent may be added to give it some body. The refuse enters the incinerator via a hopper. The incinerator is well-suited for burning even wet refuse completely and without an auxiliary oil burner. The ash is discharged by a screw conveyor. The temperature in the combustion chamber is 800 C. The flue gases are cooled to 400 C before they enter the dust collector. (Text in German)



INT-0447

Funahashi, K. Sealing device for stoker to change heat load in combustion. Japan 44-2,158; filed Oct. 26, 1965; issued Jan. 29, 1969.

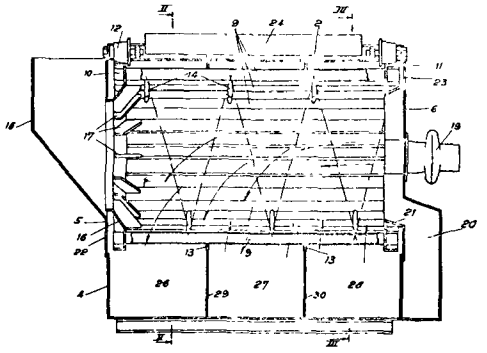
A device to adjust the combustion heat load within the incinerator by radiation and convection currents consists of a mechanism to change the slant of a stoker placed below the main stoker. A sealing mechanism attached to the end of the slanting stoker prevents the flow of cold air into the incinerator from the back of the stoker. The sealing bar is placed at the top of the incinerator; below is the hollow sealing board which expands at the bottom where it is inserted into a water tank. When the sealing rod moves, the slanted stoker also moves so that it is always in contact with the fixed stoker above. This movement changes the heat conditions within the incinerator. (Text in Japanese)



INT-0448

(Generale Thermique). Improvements in or relating to domestic or industrial refuse incinerators. Great Britain 1,141,562; filed May 4, 1967; issued Jan. 29, 1969.

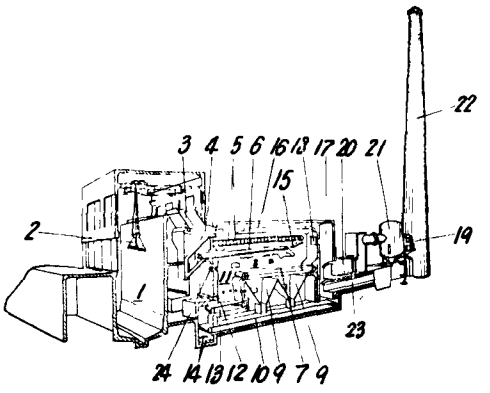
In order to burn wet refuse or dry compacted refuse, it is necessary to continuously stir the refuse so as to aerate it. The incinerator which is described consists of: a burner; a rigid body; a rotatable grid which is comprised of tubes arranged in the manner of a cylindrical annulus to define a combustion zone; means for rotating the grid; and means for circulating cooling air within the tubes of the grid. When the grid turns, the elongated members raise the refuse to the periphery of the grid and thus play the part of a fork stirring the refuse continuously.



INT-0449

Hiraoka, H. Incinerator. Japan 44-2,156; filed Sept. 7, 1965; issued Jan. 29, 1969.

An incinerator is equipped with a combustion chamber, a stoker, a conveyor to remove ash, and a smoke duct for exhaust gas. The refuse, which is stored in a pit, is dumped into the hopper by a crane bucket. Rotation of a teeth-shaped roller conveyor separates it according to size. The smaller-sized refuse drops through the gap of the roller onto the drying apron conveyor. The bulkier refuse falls to the end of the combustion stoker. The smaller material is then dropped on top. Two layers of flame are used in the incineration stoker, the top one is smaller, and the lower one is larger. Unburned refuse is sent to the after-burner chamber to be burned by heated air provided by tubes on the sidewall of the chamber. The gases from the combustion chamber and the afterburner are routed to the drying area before exiting through a smoke duct to the reburning chamber, where odor is eliminated. The exhaust is then discharged by means of a blower. (Text in Japanese)

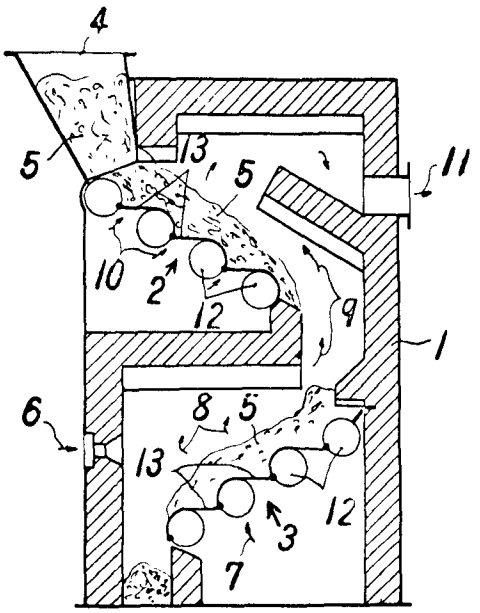


INT-0450

Hiroe, S. Device to stir and transmit garbage for drying or for combustion. Japan 44-2,159; filed Oct. 28, 1965; issued Jan. 29, 1969.

Burning and drying garbage is much more thorough when the garbage is stirred and smoothed to an even thickness. Several

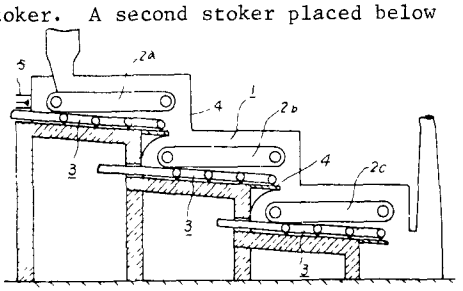
drums, each with a flexible-chain fire grid, are placed as steps in a series. As they alternately rotate in opposite directions, they stir the garbage and maintain an even depth, while transporting it down the series. The fire grids are chained together so that they do not interfere with one another. Air cylinders at both sides of the drums form an air supply circuit with pistons. When the drum moves counterclockwise, the upper layer of garbage moves forward and the lower layer moves backward. The opposite occurs when the drum rotates clockwise. The revolution is usually limited to 180 degrees, but can be adjusted. (Text in Japanese)



INT-0451

Makita, K., and A. Kamimoto (Hitachi, Ltd.). Incinerator. Japan 44-2,149; filed Nov. 30, 1964; issued Jan. 29, 1969.

Garbage incinerators, using step-type stokers, often must be stopped to allow the removal of piles of earth and sand from the bottom of the incinerator which have fallen from the stoker. A second stoker placed below

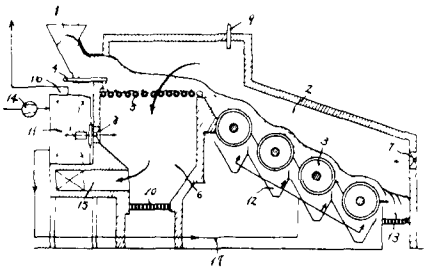


the first solves this problem. The wall of the incinerator at the bottom of the step-type stoker slants downward from the sidewalls; the tip of the stoker is covered at the bottom. Water is jetted from holes in the incinerator walls to clean the stokers and the walls. If necessary, the water can be used to extinguish the combustion chamber. (Text in Japanese)

INT-0452

Yamada, M. (Kawasaki Heavy Industry Company). Incinerator. Japan 44-2,151; filed May 10, 1965; issued Jan. 29, 1969.

An incinerator is improved by providing a drying fire grid and a combustion fire grid, and by making the combustion gas flow in an opposite direction of the garbage entering the incinerator. If the steam generated while the garbage is drying goes into the combustion chamber, it cools the combustion gas, and obstructs the speed of combustion. If the gas flows in the opposite direction of the incoming garbage, it provides drying heat, and the temperature of the gas in the combustion chamber is not lowered. When the organic material is heated to about 700 C, it is broken down and no obnoxious odor is produced. In the incineration grid, the air is directed upward, and in the drying grid, the gas goes downward. At the bottom of the drying grid is a supplementary combustion device. When the temperature of the gas in the incineration chamber is checked, it may be used, if necessary. The heat can be recovered by the air-preheater, and as air temperature goes up, it can be fed back to the incineration chamber. (See also Japan 44-2,153 and 44-19,238) (Text in Japanese)

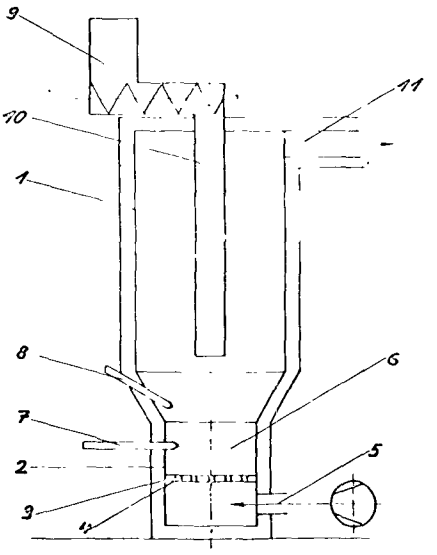


INT-0453

Heinz, E., and W. Heinz (Haniel and Lueg G.m.b.H.). Fluidized bed furnace for the incineration of sewage sludge. Germany 1,288,277; filed Mar. 19, 1963; issued Jan. 30, 1969.

A fluidized bed furnace for the incineration of sewage sludge, which has been predried

in a press or filter, is characterized by a pipe for charging the sludge. The pipe begins at the top of the furnace and projects deeply into the combustion chamber, terminating 1 m above the fludized bed. The length of this pipe can be varied. The sludge is dried on its way through the pipe, and the developing

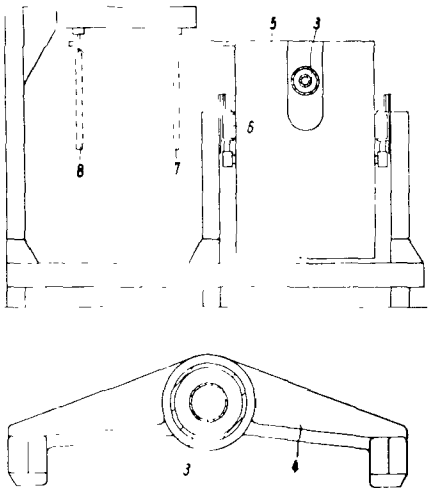


odorous gases are burned in the combustion chamber. An illustration of the furnace is given for a capacity of 1,000 kg of sludge per hr. The sludge has a water content of 65 percent, and ash content of 16.3 percent; 18.7 percent of the sludge is combustible substance and it has a lower heating value of 710 kcal per kg. The furnace comprises a cylindrical combustion chamber with a ceramic lining. It has a diameter of 1.20 m and a length of 1.70 m. At the bottom it narrows into a cylinder of 0.8-m diameter and 80-cm length. In the second cylinder there are air nozzles through which the preheated (370 C) air is injected. This keeps the 30- to 80-cm layer of ceramic grains in suspension. Two auxiliary oil burners are installed in the furnace. The temperature above the fluidized bed is 550 to 950 C. (Text in German)

INT-0454

Schumann, W. (Polyma Maschinenbau Dr. Appelhans G.m.b.H.). Device for de-ashing and de-slagging a refuse incinerator. Germany 1,289,234; filed Jun. 27, 1967; issued Feb. 13, 1969.

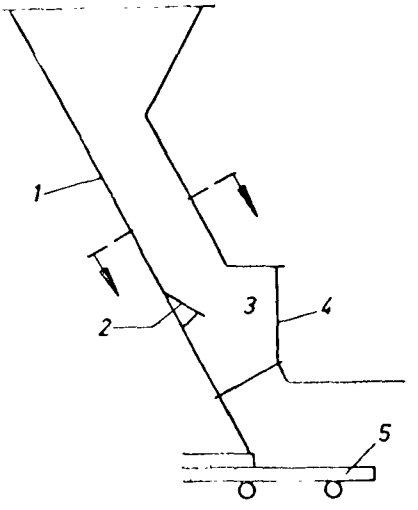
A de-ashing and deslagging device for a refuse incinerator consists of a horizontally reciprocating section which can also rotate about its long axis. At the end which enters the incinerator, a nonrotating plate is installed perpendicular to the direction of the movement. It has a scraper edge on one side, and a tined edge on the other. The device pivots in a vertical plane. A power drive is installed to move the device. A guide block supports the device and holds the pivot for rotational movement. (Text in German)



INT-0455

Auchter, E. (Vereinigte Kesselwerke A.G.). Feed chute for charging device of a refuse incinerator. Germany 1,289,233; filed Dec. 7, 1966; issued Feb. 13, 1969.

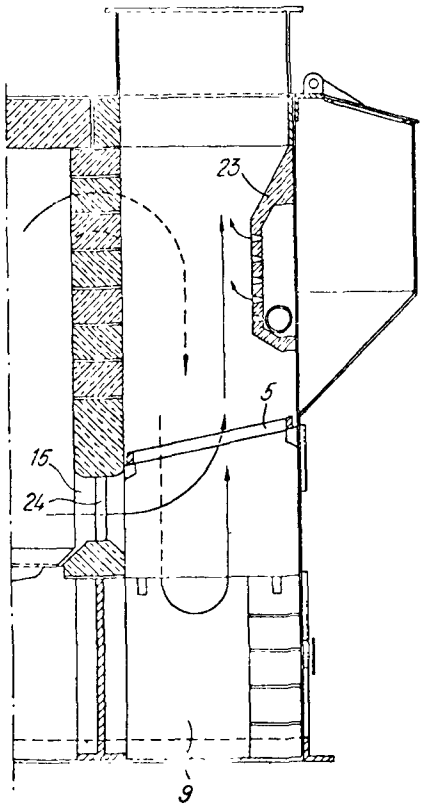
A refuse incinerator feed chute incorporates a guide plate with curved discharge edges. The chute is expanded to a larger volume in the region of this guide plate. (Text in German)

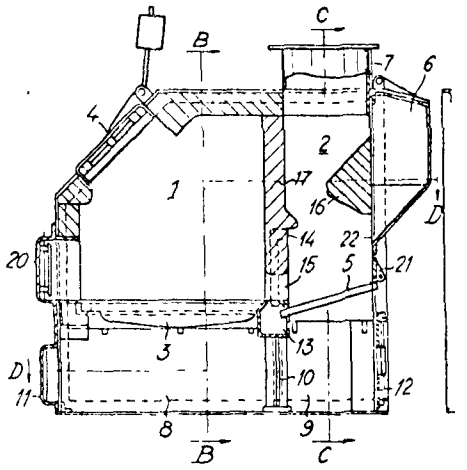


INT-0456

Wernheim, S. O. (Licentia, Ekman, and Brundin) Refuse incinerator. Germany 1,289,232; filed Jan. 22, 1963; issued Feb. 13, 1969.

This incinerator has a refractory insulated refuse shaft, a high calorific value fuel shaft, and grates and ash boxes. Gases and vapors from burning refuse pass through the fuel bed into the fuel shaft. The fuel shaft has a secondary air supply via a connnection between the top of the refuse shaft and the fuel shaft ash box. In the space above the refuse bed, extraction openings for smoke are provided in a partition leading to the fuel box. This partition passes through the fuel bed to a flue gas duct in the upper part of the fuel combustor. (Text in German)

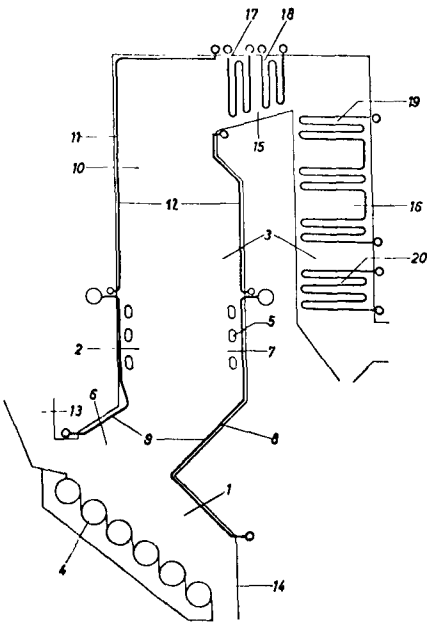




INT-0457

Adrian, F. (Duerrwerke A.G.). Refuse incinerator combined with a pulverized coal fired boiler for maximum pressure and temperature. Germany 1,289,938; filed Mar. 26, 1966; issued Feb. 27, 1969.

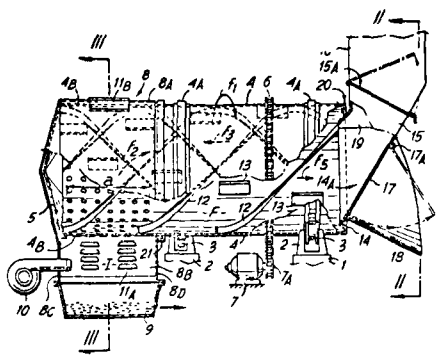
A refuse incinerator, combined with a maximum pressure and temperature pulverized-fuel-fired boiler, allows incinerator gases to enter the PF combustion chamber. The combustion chamber cooling walls for the refuse chamber and PF combustion chamber are formed from the tubes of an intermediate-pressure evaporator. The cooling walls of the connected radiation section are formed from the tubes of a maximum-pressure evaporator. Gases from the refuse combustion chamber issue into the bottom end of the vertical PF combustion chamber. (Text in German)



INT-0458

Matteini, S. Improvements in or relating to incinerators. Great Britain 1,144,403; filed Feb. 1, 1967; issued Mar. 5, 1969.

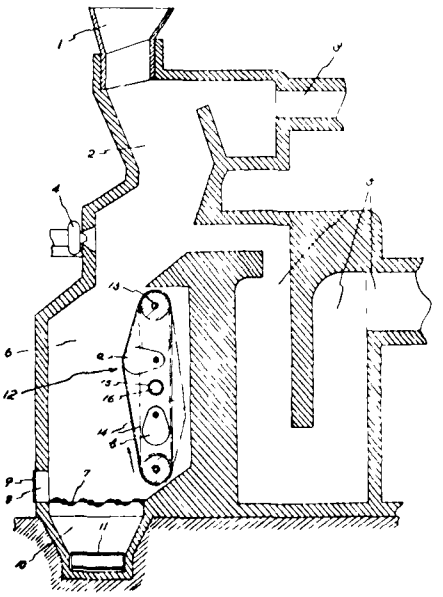
A rotary trash incinerator consists of: a tubular body which allows rotation in opposite directions about a substantially horizontal axis; a stationary end member having a loading hopper; an unloading door; and a smoke draft device. The tubular body has internal helical projections for distributing trash. An outer shell surrounds a perforated portion of the tubular body, remote from the end member, and forms a chamber. A burner extends into the chamber to initiate combustion of trash. Depending on the composition of a load of material, the burner may be required to burn continuously to ensure complete combustion. It may alternately be quenched after initial combustion if the material is of such composition as to sustain combustion. (See also Switzerland 422,206 and Great Britain 1,104,232)



INT-0459

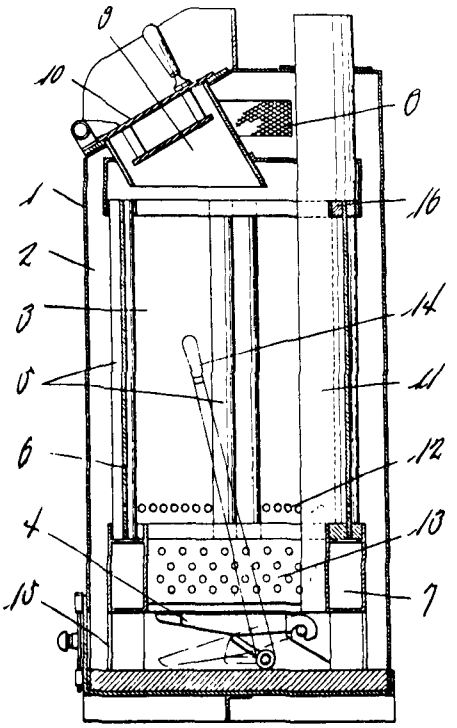
Fujimori, M. Method of helping combustion in incinerator and its device. Japan 44-6,360; filed Dec. 3, 1965; issued Mar. 18, 1969.

A method of assisting combustion has three steps: utilization of the sidewall of the incinerator; supply of the material to be burned; and application of mechanical stirring action. A movable vertical chain belt runs along the inside of the backwall of the incinerator. An air supply pipe opens at the point where the chain belt is fixed. An adequate draft is therefore supplied. When the garbage carried by the conveyor falls into the drying chamber, the burner flame evaporates its moisture. The steam is removed through a passageway. As the garbage moves into the incineration chamber, it is ignited. The chain belt, which moves with the rotation of an offcenter cam, causes stirring of the garbage. Two cams are used, and the tension on the chain belt is constant. Combustion time is cut in half when this system is used. (Text in Japanese)



INT-0460

Sato, Y. Garbage incinerator. Japan 44-6,359; filed Nov. 24, 1965; issued Mar. 18, 1969.



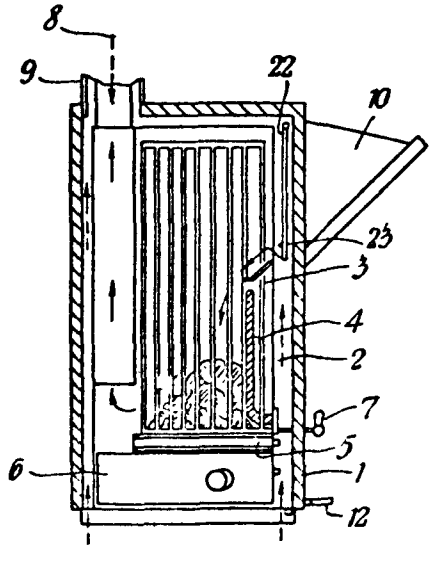
Incineration

An incinerator, which dries garbage with the heat generated by burning material, consists of a combustion chamber separated from its outer shell. A loading portal and an opening to admit air are at the top of the incinerator. The fire grid is in the lower portion of the chamber. Smoke is collected in a duct and then released to the atmosphere through an exhaust pipe. While in the duct, the smoke is heated so that when it passes near the garbage, it dries the material. The air that enters the combustion chamber is preheated because it passes along the sides before entering at the top. (Text in Japanese)

INT-0461

Harmer, J. H. E. (Allied Metals Limited). Improvements in or relating to incinerators. Great Britain 1,146,727; filed Nov. 13, 1967; issued Mar. 26, 1969.

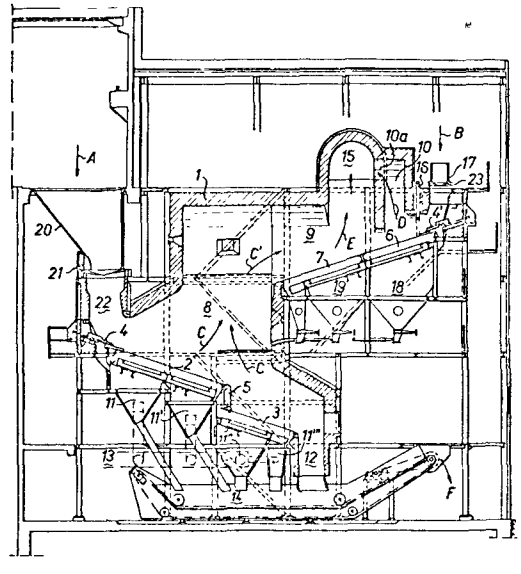
The incinerator can be used for destroying soiled sanitary towels, septic dressings, germ-laden bandages, cartons, paper, packing straw, documents, banknotes and filled refuse bags and sacks. The incinerator consists of a loading hopper, a safety shield, and a mechanism for opening and closing the hopper and automatically actuating the shield. It has a heavy-duty refractory outer casing and a heavy, aluminum-coated sheet steel inner casing. A combustion basket is suspended in the inner casing. It has electric heating elements. Beneath the basket is an ash grid, below which is an ash drawer. The construction of the internal flue and the chimney spigot is such that smoke is drawn back through the ignited materials before it enters the flue to be mixed with flowing air.



INT-0462

Tanner, R., T. Tacobovici, and F. Wuethrich (Von Roll A.G.). Combined incinerator for simultaneous incineration of rubbish and sewage sludge. Switzerland 470,632; filed Apr. 26. 1968; issued Mar. 31, 1969.

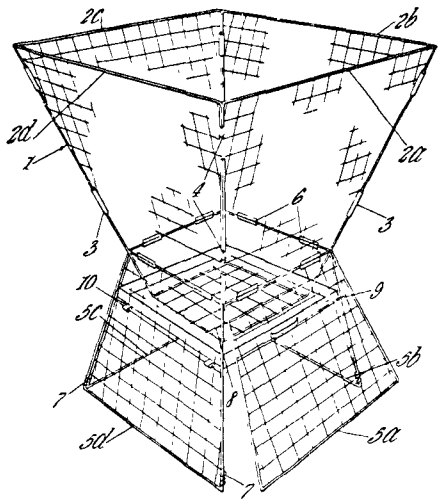
A combined incinerator for simultaneous incineration of rubbish and sewage sludge consists of two separate combustion chambers. Mechanical, underfed grates, divided into zones, are included. It has installations for the supply of preheated or nonheated primary air and/or for recirculation of the flue gases. The two combustion chambers for rubbish and sewage sludge are openly connected. They have a common outlet for flue gases. The combustion chamber for the incineration of rubbish consists of a forward stoking grate. The rubbish is loaded by a crane into the hopper. From here it falls through a chute onto the grate. The first section of the grate dries the rubbish and ignites it. Combustion takes place on the second section of the grate. The slag falls into a water tank and is discharged. The sewage sludge is similarly incinerated. The same grate system is used. In the first section of the grate, the sludge is dried to a water content of 20 percent. The very hot combustion gases from the rubbish incineration are conducted over the predried sludge to promote its complete incineration. The flue gases are thereby cooled. The grates of the two combustion chambers are oppositely oriented, and installed at different heights in the incinerator. The discharging end of the grate for sludge is approximately above the midpoint of the grate for rubbish. The thickness of the sludge layer on the grate can be regulated by an adjustable ram. (Text in German)



INT-0463

Hunt, E. T. Improvements in or relating to garden incinerators. Great Britain 1,147,237; filed Sept. 7, 1967; issued Apr. 2, 1969.

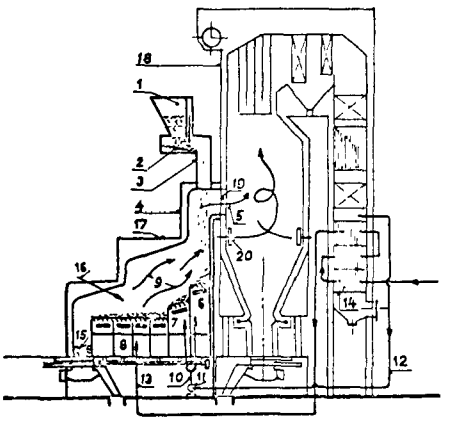
A garden incinerator consists of: a container formed from side panels which taper inward and downward; a fire-support means mounted in the container; and a final support means attached to the container. The incinerator is collapsible for storage. The advantages of including an ashpan are that the incinerator may be used on a lawn without causing damage, and the ash is readily available for use in the garden. A fire is started in the container with paper, shavings, waste wood or sticks, and it is fed with relatively dry material. Refuse is then placed vertically in the container. The heat rising from the fire will dry the material above it, and cause it to lose its rigidity and fall into the fire.



INT-0464

Syrovatka, Z., and M. Dolezal (Prvni Brnenska Strojirna, Zavody Klementa Gottwalda, Narodni Podnik). Improvements in or relating to the burning of low-grade combustible materials with a high water and/or ash content. Great Britain 1,148,056; filed June 16, 1966; issued Apr. 10, 1969.

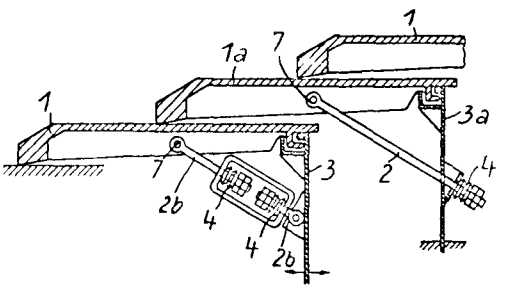
A method of burning low-grade combustible materials with a high water and/or ash content, such as refuse or garbage, involves feeding the raw materials down a shaft to a two-part mechanical grate. The grate consists of a main grate and a drying grate at the bottom of the shaft. The flames and combustion gases flow up the shaft in counterflow to the combustible materials passing from the main grate over the drying grate. Part of the flue gases is supplied below the drying grate. Efficient predrying and preheating of the combustible materials is due to the fact that the refuse, supplied to the drying grate, has already been partly dried and carbonized. After the waste falls onto the drying grate, and drying and carbonization are completed, ignition and combustion begin.



INT-0465

Martin, J. J., and W. J. Martin. Improvements in grates. Great Britain 1,148,714; filed Apr. 29, 1966; issued Apr. 16, 1969.

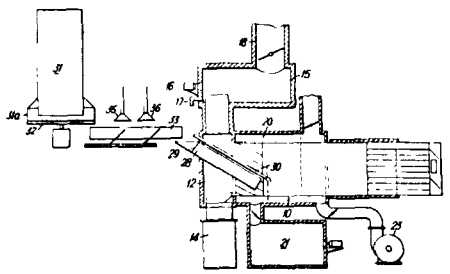
A grate for a large furnace has successive, shiftable, stationary, or rotatable grate elements. These grate bars or grate bar groups or lead-on plates to slag rollers are pressed onto underlying or adjacent grate elements by a force exceeding the sum of their own weight, and the weight of any load they support. The grate elements are pulled downward by spring tie rods which are articulated to the grate elements and engage the grate bar carriers. The tendency of the free ends of the grate elements to lift and the tendency for burning material to pass beneath the grate, is thus reduced without limiting the necessary vertical movement at the free ends of the elements. *(See also Germany 1,301,421)*



INT-0466

(International Alloys Limited). Process and apparatus for the treatment of metallic wastes contaminated by volatile or combustible substances. France 1,569,199; filed June 7, 1968; issued Apr. 21, 1969.

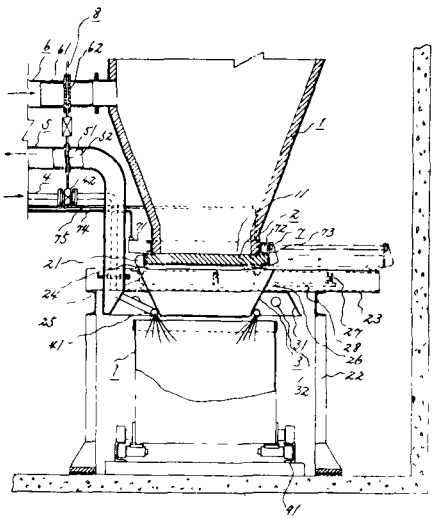
Contaminated shavings or swarf of aluminum alloys (or other similar wastes) are subjected to vaporized oil or water, after which combustion is effected. The formation of the vapors is regulated automatically as the function of the temperature in the region of combustion. In an apparatus for carrving out this process, a feeding device guides the waste material, through the vapors, to a combustion chamber. The control device regulates the vapors, and furnishes hot gases around the combustion chamber. The feeding device receives waste from the hopper on a transporter (such as a rotating table). The control device stops the production of the vapors if the level of waste in the hopper falls below the level of a probe, or if the transporter stops moving. The control also regulates the frequency and length of vapor production, and the temperature of combustion. (Text in French)



INT-0467

Kazama, H. (Tamagawa Kikai Kinzoku Company). Device to take out ash from garbage incinerator. Japan 44-9,158; filed Jan. 25, 1966; issued Apr. 26, 1969.

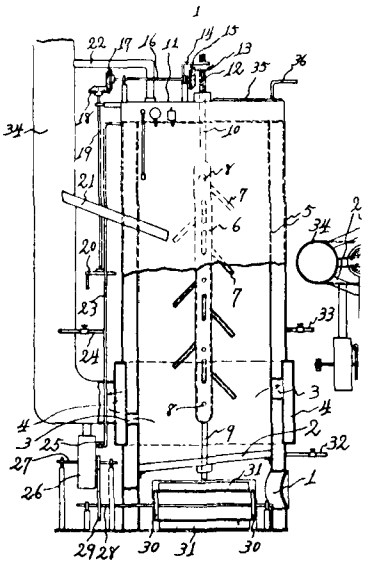
A device which enables the removal of ash cleanly and completely consists of an opening at the bottom of the incinerator which opens and closes with the dumper. A chute underneath the opening leads to a trap with a lid, but no bottom; it also passes by a spray pipe. An obstacle duct, which sucks in air, surrounds the exhaust holes drilled in the trap. When ash collects in the hopper, the operating rod turns so that the draft duct dumper closes, shutting off the draft; the cock opens, allowing water to spray out, and the dumper operates the hopper so that the ash falls through the chute into the bucket. Water from the spray extinguishes any burning ashes. Steam, gas, and fine ash are sucked into the holes of the trap and poured into the ash-collecting hopper below. When the control rod is returned to its original position, the sequence is reversed. (Text in Japanese)



INT-0468

Ono, T., and Y. Hirakawa (Nishi Nihon Sanki K.K.). Incinerator. Japan 44-9,157; filed Jan. 22, 1966; issued Apr. 26, 1969.

This incinerator, which allows gradual feeding, consists of two cylinders equipped with ventilation holes, a fire grid, and smoke-ejecting holes connected to the smoke-collecting duct. From the center of the cylinder radiate pipes inclined downward. The axis at the bottom of the stirrer-moisture-absorber is inserted

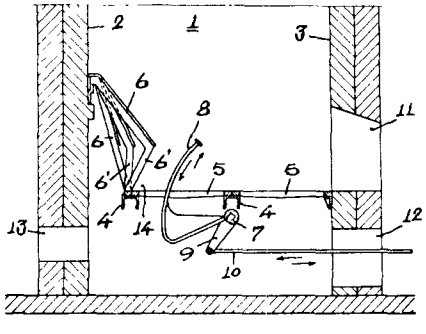


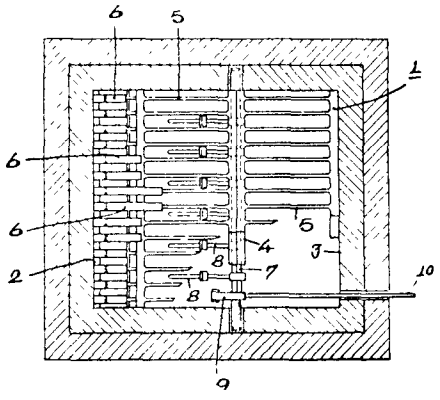
loosely into the fire grid. It is fitted with umbrella-shaped wheels at the top of the axis. The wheels are installed at both ends of horizontal axis, and the vertical axis transmits motion to them. At the bottom of the vertical axis is a handle. When the burner at the bottom is ignited, the smoke goes through the holes and then the duct, and is discharged through the chimney. Air is let in for combustion through the ventilation holes. After complete combustion, ash falls from the fire grid. With the combustion heat, the water from the top garbage gradually becomes steam, and is let out through the steam ejector. In order to accelerate the process, the stirrer-moisture-absorber in the center is rotated and shaken vertically, so combustion can take place in the chamber below. The stirrer-moisture-absorber is cylinder-shaped with holes which absorb steam from the burnt garbage. (Text in Japanese)

INT-0469

Tamura, H. (Sanki Kogyo K.K.). Automatic stirring type incinerator. Japan 44-9,159; filed Feb. 9, 1966; issued Apr. 26, 1969.

An automatic, stirring-type incinerator has a slanting fire grid, whose slanting angle decreases by stages as it gets farther from the center of the backwall of the combustion chamber. The lower part of the grid is bent, and it touches the horizontal fire grid, forming a gap which does not receive pressure from the garbage, which, dumped through the rear of the horizontal axis, moves the bent grid up and down to stir the garbage. The slanting grid dries the garbage, and transmits it to the horizontal grid. Combustion also takes place in the gap below the slanted fire grid so that the entire grid is effectively used. As the angle of the slanting fire grid decreases, the garbage falls to both sides of the walls. It is piled up higher on the sides than in the center. Combustion is concentrated in the center, progressing to both sides gradually. Combustion can be controlled in this way. (Text in Japanese)

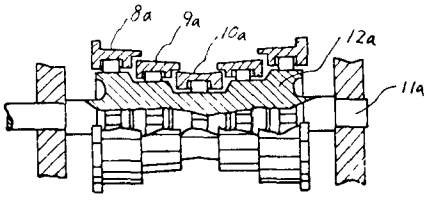


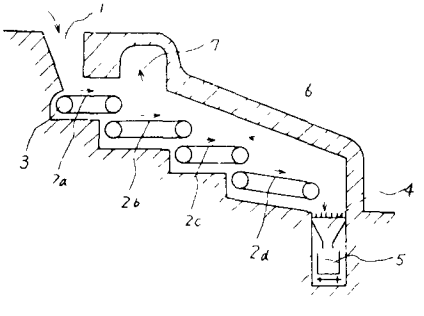


INT-0470

Uemoto, A., and Makita, K. (Hitachi, Ltd., and Babcock Hitachi Company). Incinerator. Japan 44-9,153; filed Mar. 12, 1965; issued Apr. 26, 1969.

A series of stokers ensures thorough mixing and ventilation of garbage so that drying and combustion are accelerated. Several stokers running at different speeds cause the garbage to move backward as well as forward. The side stokers are operated at approximately the same speed. Gas generated in the combustion process flows over the stoked refuse, heating it continuously. (Text in Japanese)



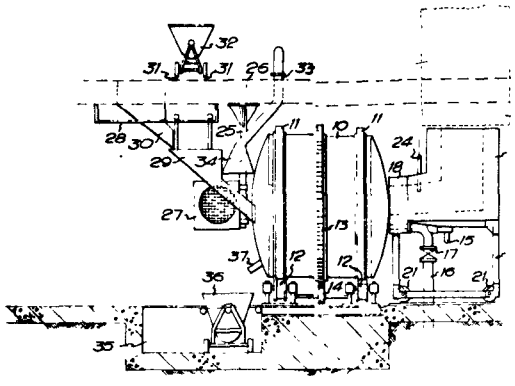


Incineration

INT-0471

Heise, C. H. Method of and apparatus for disposing of refuse. Great Britain 1,150,372; filed Sept. 1, 1966; issued Apr. 30, 1969.

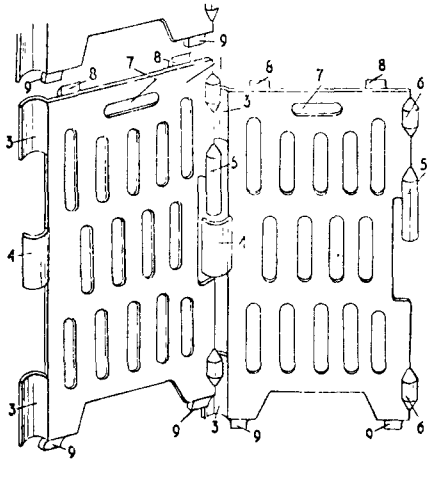
Refuse is burned in a rotary drum furnace of short axial length, adapted for continuous or batch feed and batch molten slag discharge in a molten melting bath. The composition of the bath can be varied according to the nature of the refuse to be disposed. The melting bath may be a mixture of sand and soda, and contain additions such as iron, which are effective in reducing the fusion temperature of noncombustible components of the refuse. A basic or acidic lining is provided within the furnace according to the refuse being incinerated.



INT-0472

Tutton, W. G. (Radiation Limited). Incinerator and panel therefor. Great Britain 1,150,681; filed Dec. 13, 1967; issued Apr. 30, 1969.

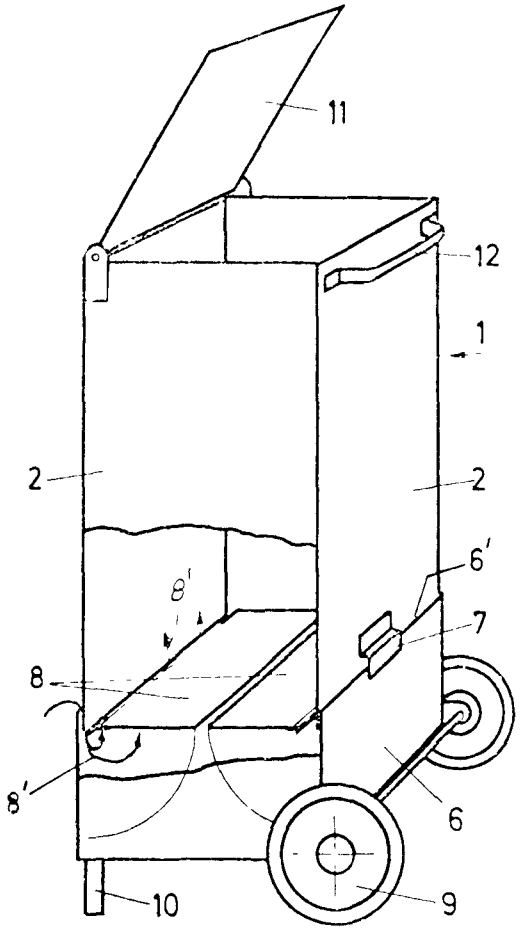
A cast iron side panel may be used for constructing a dismantlable incinerator by fitting the vertical edges of the panel to the vertical edges of two adjoining panels of similar form, to build a hollow chamber of polygonal shape in horizontal cross section. The panel has hinges on its vertical edges to enable it to be disengageably hinged along the edges of the adjoining panels without the insertion of a pin. The incinerator can be assembled for use or dismantled for ready storage with ease, and without small loose parts. The cast iron panels are robust and are constructed to withstand very hard wear.



INT-0473

Maegerle, M. (Praezisions-Apparatebau A.G.). Container for the incineration of paper. Switzerland 472,634; filed Mar. 23, 1967; issued May 15, 1969.

A container has been devised with perforated walls and a lid in cylindrical or rectangular shape for the incineration of paper. The lid on the container is hinged. The container may be placed on top of a separate ash box. The perforated grate between the ash box and container (it is actually attached to the container) can be tilted downward. For an additional supply of air, the container may



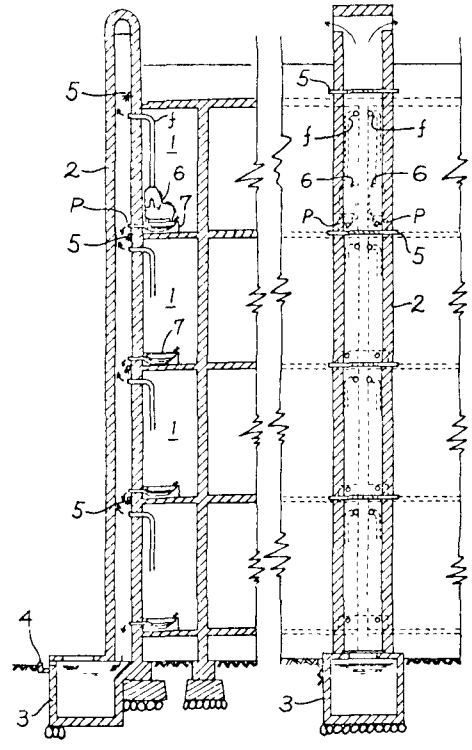
be equipped with a perforated tube installed in the center and open at the bottom. The container is made of sheet steel. (Text in German)

INT-0474

Ito, F. Method of garbage combustion and disposal in high-rise apartment houses. Japan 44-10,870; filed Feb. 11, 1966; issued May 20, 1969.

Dry waste and wet garbage can be incinerated by high-rise apartment units cleanly and efficiently. An incinerator is placed on each floor. An exhaust pipe, connecting all the floors, extends between the ash trap and the chimney. Easy-to-burn materials are first burned at the bottom of the pile. The wet garbage on top is dried as a result. A filtering net covers the entrance from the incinerator to the exhaust pipe. It prevents nonflammables from falling into the ash trap. A water jet at the filtering net has a dual purpose: to clean the smoke, and to wash the ash down the pipe. The length of the pipe ensures combustion efficiency and thorough cleaning of the smoke. A lid allows easy cleaning of the ash trap.

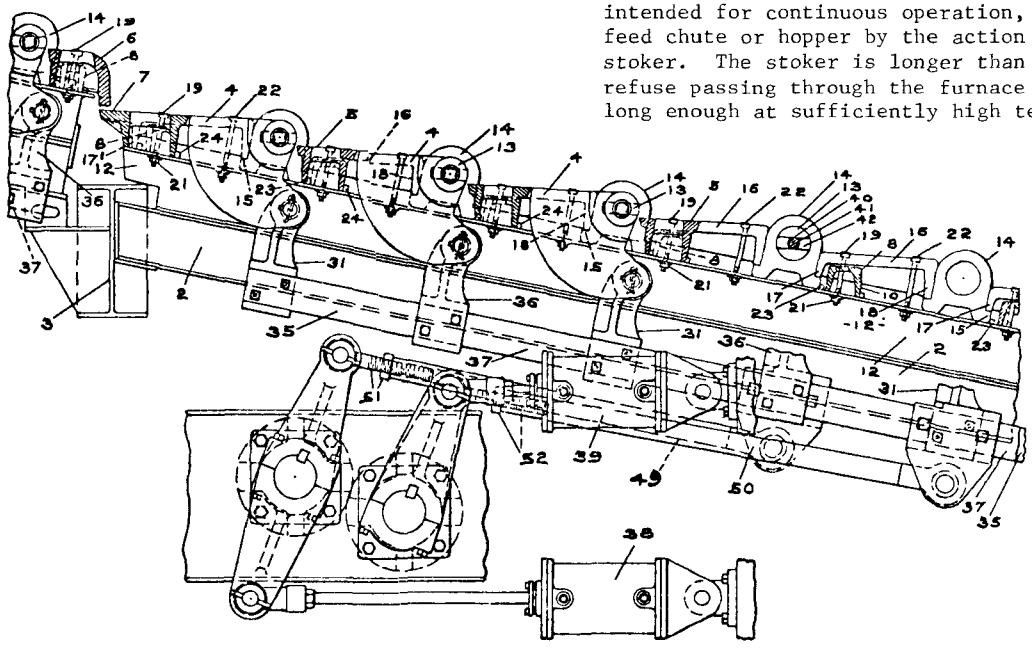
The apartments are distant from the process. (Text in Japanese)



INT-0475

Turner, J. F., W. H. Bartman, and C. H. Smith (Flynn and Emrich Company). Incinerator stoker grate construction. Great Britain 1,152,715; filed June 1, 1966; issued May 21, 1969.

Mixed refuse from residential, commercial, and industrial sources is fed into a furnace intended for continuous operation, from a feed chute or hopper by the action of the stoker. The stoker is longer than wide so the refuse passing through the furnace remains long enough at sufficiently high temperatures

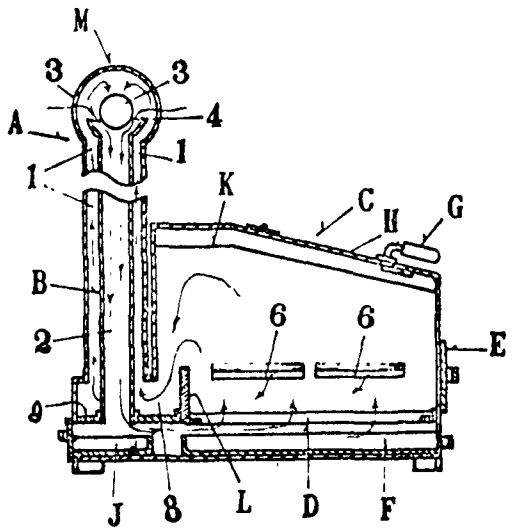


to reduce all combustible material and develop a sterile residue. This material is kept porous, clinker-free, and moving, by the action of the stoker. The stoker imparts a cascading motion to the refuse. Using alternate motion, the stoker grates lift the material on the grate surface, agitate it, and thrust it forward. This action fills in the voids which develop from rapidly burning refuse, and breaks compacted masses. (See also Great Britain 1,152,716)

INT-0476

Naito, J., and S. Fujii. Incinerator. Japan 44-11,707; filed Mar. 24, 1966; issued May 28, 1969.

Incinerator efficiency is improved by a double-cylinder chimney. Heated air is blown into

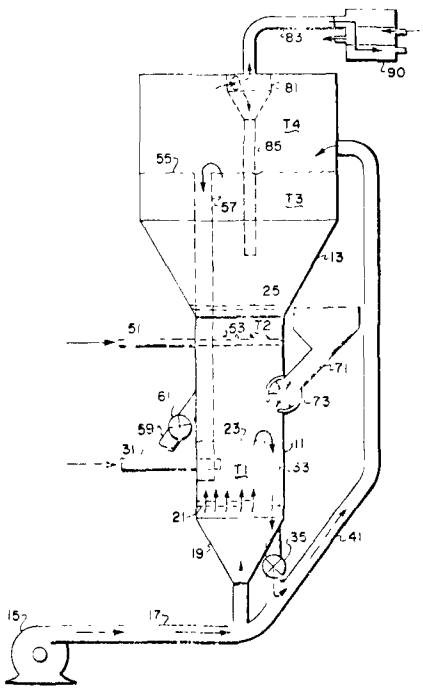


the incinerator, utilizing the difference in air pressure. There is a suitable gap between the cylinders, and the top is covered with a lid. Around the lid there are several holes to admit smoke and mix the air. Condensed smoke descends from the inner cylinder to the bottom. The outside air is blown to the draft duct, heated by heat escaping from the incinerator, and then sent from the inner cylinder to the incinerator to reduce the smoke. Wastes which burn more easily are thrown in first; more difficult-to-burn materials are added on top, and then ignited. Easily-burned wastes heat the moist material. Since there is a difference in pressure between the air in the incinerator and outside air, the smoke and exhaust gases go up to the top lid, heating the wall of the inner cylinder, exit through the holes in the top lid, join the outside air sucked in, and go down the inner cylinder, where they are heated by the wall of the inner cylinder. The gases are then sucked to the bottom and heated by the wastes burning on the grid. An appropriate amount of air is sent to the incinerator, and the rest mixes with the air blown in through the draft holes at the bottom of the incinerator wall. Thin smoke and gas escape via the holes around the top lid; the condensed smoke, containing water and ash, accumulates in a box at the bottom. The ash from the grid also accumulates in a box which can be removed. The components can be adjusted, so that it can be used both as an incinerator for general homes or as an incinerator for documents of companies, banks, etc. (Text in Japanese)

INT-0477

Campbell, D. L. (Esso Research and Engineering Company). Plant for the incineration of refuse. Switzerland 473,359; filed Dec. 30, 1966; issued May 31, 1969.

An incinerator, operating on the fluidized bed principle, consists of at least two combustion zones, a fuel supply line, and a burner to maintain a constant temperature for the gassification of refuse. An air blower keeps the particles of nonmeltable material in suspension. In the lower zone, the suspended particles are kept in turbulence. The gases and vapors from the lower zone rise and keep the solid particles in the upper zone in suspension. The liquid refuse enters

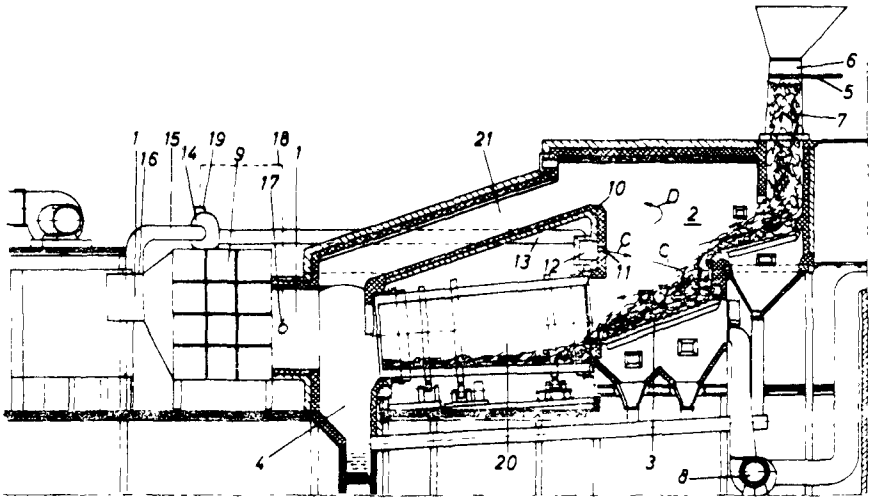


the incinerator through a pipe, the solid refuse through a funnel. The incinerator may be designed as one unit or as two chambers, one atop the other. The temperature in the lower zone should range between 430 and 650 C. At this temperature all refuse, liquid or solid, is either evaporated, cracked, or burned. The rising gases are heated to 1,090 C and their components are converted to the final oxidation products. The hot gases then flow through the upper fluidized bed, losing some of their heat. They are cleaned in a cyclone, the solid particles are returned to the bed, and the gases are cooled. The heat is used for the generation of steam. (Text in German)

INT-0478

Blach, E. (Aktieselskabet Volund). Method of incinerating solid fuel. Canada 814,187; filed Mar. 23, 1964; issued June 3, 1969.

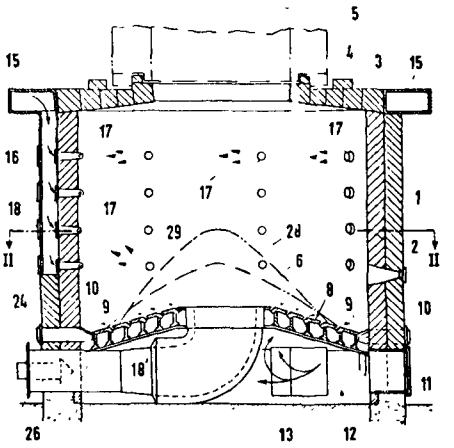
This furnace controls the burning of solid fuel, especially refuse and garbage, so that complete combustion is achieved. Fuel is burned on a grate which forms the lower boundary of a combustion chamber. Air is introduced below the grate, while cooled combustion gas is injected just above the fuel. At a temperature of about 200 C, the comparatively cold gases keep the temperature in the combustion chamber below 950 C. The volume of gas introduced is controlled by a temperature-sensing device. This incinerator eliminates melting clinker, which reduces clogging of the grate, damaging of the furnace walls, and unsatisfactory combustion.



INT-0479

Heilala, A. K. (Aktiebolaget Goetaverken). Underfeed grate for refuse incinerator. Germany 1,296,732; filed Oct. 16, 1964; issued June 4, 1969.

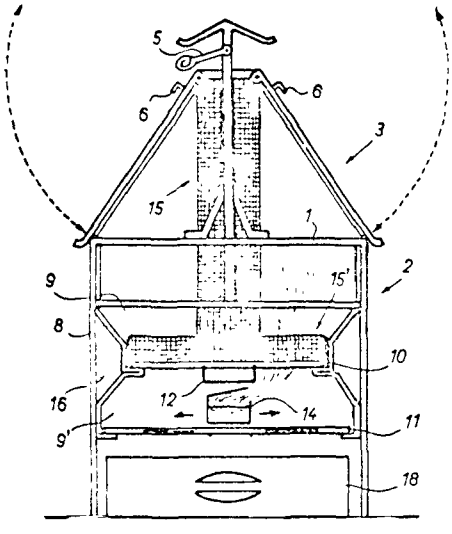
Refuse is fed to the center grate of this incinerator, which has an underfeed grate system. The primary air supply openings in the grate system are inclined downward toward the combustion chamber sides. As refuse burns, the residues pass down the periphery of the grate, so that more complete combustion of the waste is effected. (Text in German)



INT-0480

Turati, N. Refuse incinerator. Germany 1,297,803; filed Nov. 22, 1966; issued June 19, 1969.

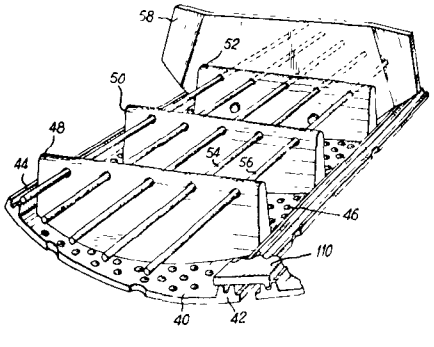
This kennel-shaped refuse incinerator has a steel frame and a protective jack roof. The interchangeable, removable grates are mounted on reinforcements. Beneath them, a metal box for ash is located. Flames and smoke pass through a grid-form tube and are then exhausted through the space between the roof and the jack roof. (Text in German)



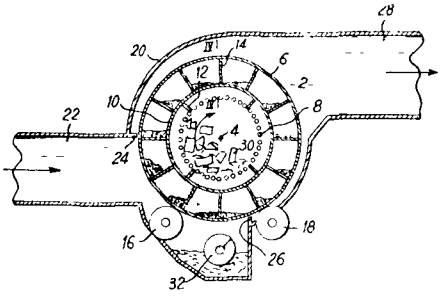
INT-0481

Lerner, P., and G. Poterlot (La Soudure Autogene Francaise). Continuously operating waste incinerator. Switzerland 472,633; filed Mar. 1, 1968; issued June 30, 1969.

The waste incinerator, which operates continuously, contains a drum which turns on its axis, and an exterior impermeable to gas. A support permeable to gas is on the interior of the covering. It contains the waste to be incinerated. Compartments attached to the



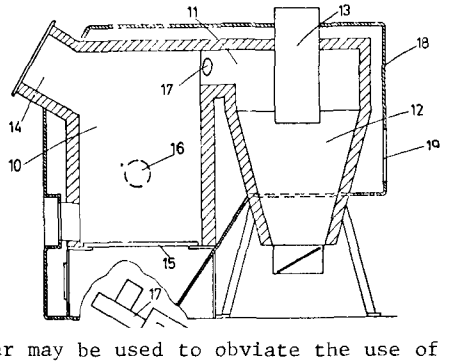
covering and to the support form longitudinal canals for the emanation of gases. The construction of the incinerator may be varied with a support, parallel to the covering, and containing along at least half of its length a perforated surface. A grating with wooden bars, parallel to the rotation axis, is attached to the interior of the pierced surface. The distance between the bars varies from 2 to 15 cm. (Text in French)



INT-0482

Apelt, K. (Dr. Schmitz and Apelt Industrieofenbau G.m.b.H.). Incineration plant for wastes such as rubbish. Switzerland 475,510; filed Jan. 28, 1969; issued July 15, 1969.

The incineration plant consists of: a combustion chamber that can be fired with liquid, gaseous, or pulverized fuels; a cyclone dust separator which also serves as an afterburning chamber; an auxiliary burner; and a sheath enclosing both chambers with a clearance and an air intake opening. Combining the functions of afterburning and dust separation results not only in fewer parts and smaller space requirements, but also in a more effective afterburning process. The sheath serves to preheat the combustion air by the heat escaping through the walls of the combustion and afterburning chambers. An auxiliary



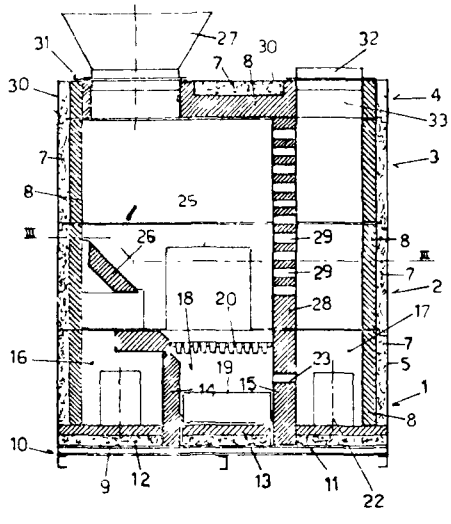
burner may be used to obviate the use of a waste gas exhaust fan by accelerating the gas leaving the combustion chamber, and by creating a slight overpressure in the

afterburning chamber which propels the waste gas into the flue. (Text in German)

INT-0483

Guarducci, M. (Shunt Italiana S.p.A.). Rubbish incinerators with adjustable components, for civil and industrial use. Switzerland 473,358; filed Jan. 19, 1968; issued July 15, 1969.

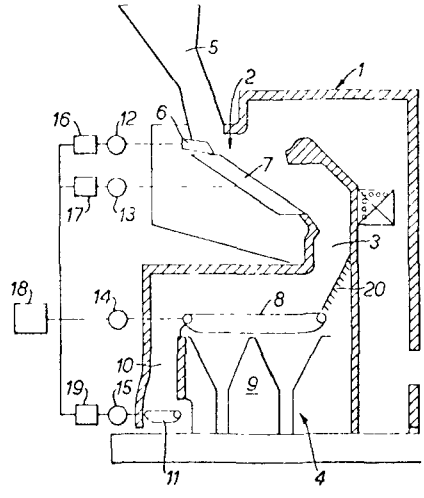
An incinerator consists of three or more components: a base unit containing the burner; a ceiling unit which includes the opening by which the waste material is introduced; and one or more intermediate units which form the combustion chamber and the flues. The components are constructed in such a way that a vertical partition separates the combustion chamber from the main flue. The flue is in turn divided into a vertical flue and a series of horizontal flues which communicate with the combustion chamber by openings built into the partition. The flue system is constructed in such a way that the smoke must traverse a considerable distance within the incinerator before reaching open air, allowing time for a certain percentage of the soot to settle and be collected in removable containers. The base unit can be equipped with either a grating or solid floor of refractory material. (Text in Italian)



INT-0484

Yamane, H. (Takuma Kikan Seizo K.K.). Improvements in and relating to incinerators. Great Britain 1,159,087; filed Mar. 1, 1968; issued July 23, 1969.

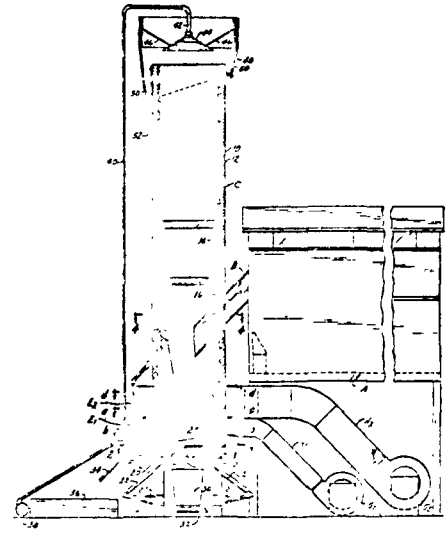
An incinerator consists of a device for drying refuse, and a combustion device for incinerating dried refuse. Four conveyors are adapted to move at variable speeds. They convey the refuse to the drying device, through or past the combustion means to incinerate it, and convey the ash from the apparatus. A predetermined ratio is maintained between the speeds of the conveyor, regulated by a selector and a control device.



INT-0485

Hanover, W. S., and D. H. West (American Design and Development Corporation). Refuse incinerator shaft. Germany 1,301,868; filed Mar. 10, 1967; issued Aug. 28, 1969.

A refuse incinerator shaft incorporates a combustion zone at the base with tuyeres issuing from an external header which supplies combustion gas. Material is charged above the combustion zone, and discharged at the shaft base. Two or more gas supply headers

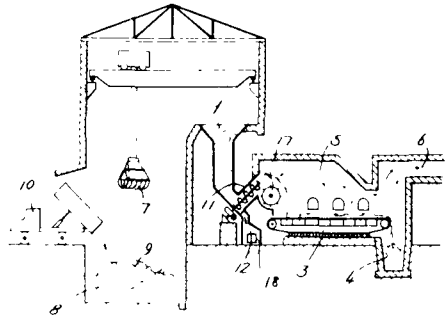


are fed by a blower supplying independently controllable quantities of combustion gases. The tuyeres connected to these are at different heights in the shaft. (Text in German)

INT-0486

Kano, S. (Ishikawajima Harima Heavy Industries). Incinerator utilizing the heat of exhaust gases for heating and dehydrating water containing solid wastes. Japan 44-20,587; filed Sept. 15, 1965; issued Sept. 4, 1969.

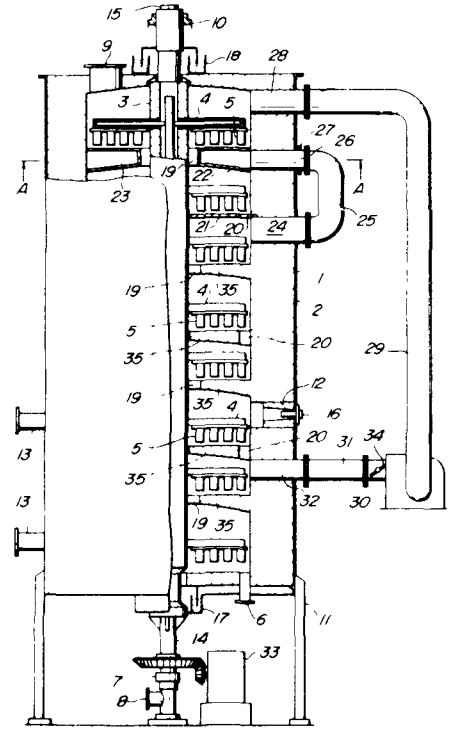
A preheater at the inlet heats the wastes by passing the exhaust gas in the opposite direction. The waste is led to a hopper from the top of the preheater. The bottom of the preheater opens to a cooling chamber through a screen. The exhaust gas, after heating the wastes, is cooled in the chamber to remove water vapor by condensation. The gas is heated again in a combustion chamber and deodorized by decomposition. With the conventional incinerator, wastes are fed to a grating to be dried by hot air from the bottom, and heat radiation from the combustion chamber. However, those flammable wastes such as papers or straws start to burn while they are still on the grating. Wet wastes remain wet on the grating, and the combustible parts of the wastes are burnt away before all the waste is heated. To remove this drawback, exhaust gas, low in oxygen and at high temperatures, was used. Devices using air to lower the temperature were ineffective in preventing combustion on the grating, because of the high oxygen content. Another drawback of the conventional incinerator is that the odorous smoke from the drying wastes is released to the air without being heated and decomposed. The present system has removed these drawbacks. (See also Japan 44-26,638) (Text in Japanese)



INT-0487

Tagawa, K., T. Kayano, and T. Kuwabara (Tsukishima Machine Manufacturing Company). Multistage incinerator with heat recovery and deodorizing units. Japan 44-20,588; filed Sept. 16, 1965; issued Sept. 4, 1969.

Solid wastes are fed to the incinerator from the top. The incinerator has eight stages, and the wastes proceed from stage to stage after a complete revolution around the center column. A burner is provided at the bottom of the incinerator, with an inlet for air. The wastes are heated by the hot air coming from the bottom while they are being moved by a screw conveyor. The resultant odorous gas, which comes from the heating, is led through a duct to the combustion chamber. The gas is finally released to the open air after being deodorized by high-temperature decomposition. The remaining wastes are moved to a combustion chamber after being heated by a heat exchanger. After complete combustion, ashes are removed from an outlet at the bottom of the chamber. Thus, the combustion heat is used to heat the upcoming air, which in turn heats the wastes. Since the gas is completely decomposed, the exhaust can be released to the open air without fear of pollution. (Text in Japanese)

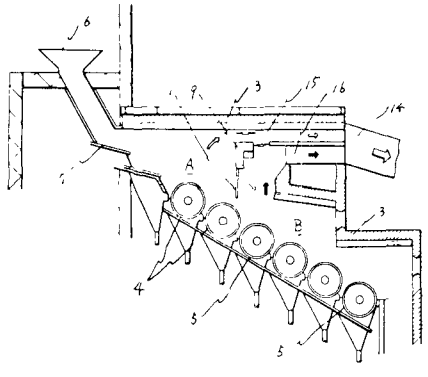


INT-0488

Shida, Y., and J. Kato (Kawasaki Heavy Industry Company). Partitioning device within garbage incinerator. Japan 44-20,948; filed Aug. 27, 1965; issued Sept. 8, 1969.

A partitioning device is within an incinerator that has a sloping garbage-feeding device, rotating drying fire grids, rotating combustion

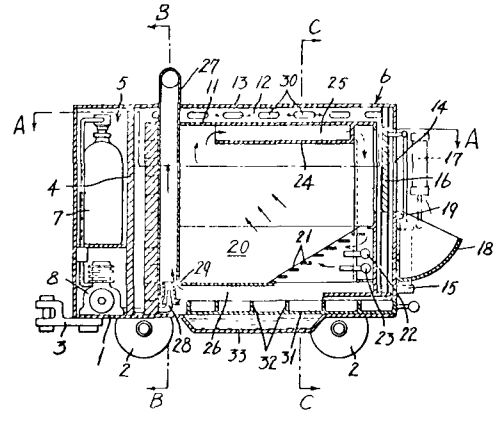
grids, and an ash-discharging opening at the top. Above the border of the drying grids and the combustion grids is a partitioning wall. From the bottom of the wall there is a partitioning board, hung to the top of the rotating fire grids. The partitioning board is made to rotate, with the bottom edge of the partitioning wall as the center. Thus the incinerator is divided into drying and combustion chambers. with smoke ducts to the main flue. The drying and combustion chambers are independent. Thus, the low-temperature gas generated in the drying chamber is prevented from entering the combustion chamber and lowering the inside temperature. Opening and closing the partitioning board is automatic, according to the change in the garbage volume supplied. The partitioning board maintains a gap just big enough to let the garbage through. Usually it is difficult to keep the temperature within the combustion chamber at 800 to 1,000 C, the range required for complete combustion. By partitioning, temperature maintenance is possible, and garbage can flow continuously from the drying chamber to the combustion chamber. (Text in Japanese)



INT-0489

Hayashi, K., and S. Naito. Mobile trash incinerator. Japan 44-21,795; filed Oct. 6, 1965; issued Sept. 17, 1969.

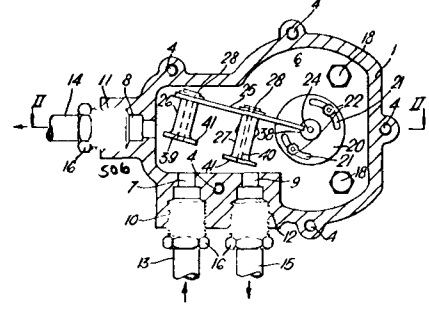
A mobile trash incinerator is provided in view of increasing amounts of trash which need incineration and the shortage of collection and incineration plants. A coupling metal gear connects the top of the chassis to an automobile. The chassis is divided by an insulating wall. On one side of this wall there is a fuel gas bomb, a motor, an air compressor, and a compressed air tank; on the other side, there is the incinerator. In front of the incinerator, there is an opening through which fuel gas is jetted to the bottom of the incinerator. The jet stream goes upward, along the wall of the incinerator, comes back to the bottom of the incinerator, and goes into the combustion chamber again to ensure complete incineration. When the door in front of the incinerator is operated along with a dumping bucket, the bucket rotates in the direction that the trash is to be dumped. Labor for collection can be saved because the incinerator itself is pulled by the car, is transported to a desired spot, and incinerates the trash where it is collected. By providing a fuel gas bomb, a motor, an air compressor, and a compressed air tank on the chassis, the fuel gas necessary for incineration can be supplied, as well as the motive power necessary for dumping trash and compressing air. Around the incinerator, there is air partition wall that keeps the outer side of the incinerator cool. (Text in Japanese)



INT-0490

Mann, R. W., and J. G. Bradley (Victor Products 'Wallsend' Limited). Gas-fired incinerators. Great Britain 1,164,120; filed Nov. 16, 1966; issued Sept. 17, 1969.

This gas-fired incinerator has a main combustion chamber, an afterburner located in the path of the combustion products, an adjustable gas-proportioning valve and a thermostatic device which controls the proportion of gas which is fed to the main burner. When the temperature of the incinerator exceeds a predetermined value, the valve is adjusted by the thermostatic device to reduce the amount of gas fed to both the main burner and

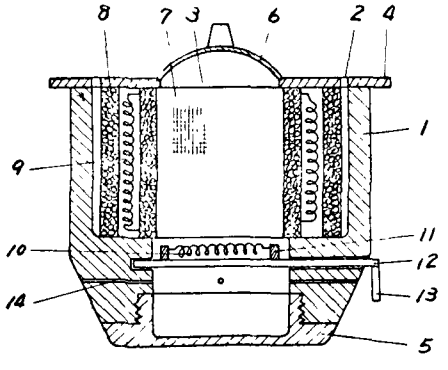


the afterburner. The valve includes a pivoted, regulating arm controlled by the thermostatic device to proportion the gas supply flowing to the afterburner. Bleed holes extend through the valve members so that a small supply of gas is always fed to both burners.

INT-0491

Mizuno, K., and K. Kato (Nippon Denso Company). Incinerator. Japan 44-21,796; filed Oct. 13, 1965; issued Sept. 17, 1969.

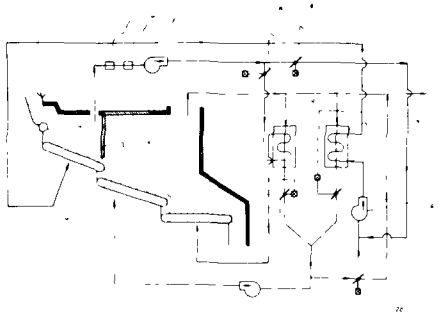
A small incinerator designed to replace the ash tray in a car contains a cylinder-shaped layer of oxidation-promoting catalyst which is activated by a heat coil. Cigarettes are thrown into the top of the tray incinerator. The heat coil is activated, causing combustion. The gas which is generated goes through the catalyst layers where unburned materials in the smoke are oxidized. The final gas discharged is primarily carbon dioxide and steam. When a lever is turned, the ash falls through the bottom of a supporting stand to a removable trap. The catalyst may be any oxidation promoter such as copper chrome. (Text in Japanese)



INT-0492

Sakamoto, S., and R. Asukada (Mitsubishi Heavy Industries). A refuse incincerator. Japan 44-22,276; filed July 20, 1966; issued Sept. 24, 1969.

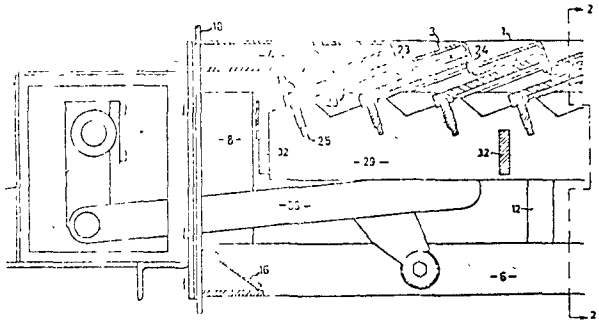
The main features of an incinerator for low-grade refuse with a large water content are a predrying chamber, a preheater of air for drying, and also a preheater of air for combustion. Air is heated by the preheater before entering the predrying chamber, where it is brought into contact with the refuse. A part of the hot air is supplied to the combustion chamber, while the rest is mixed with the fresh air entering the preheater. The part of the hot air which is to be supplied to the combustion chamber is again heated. The lowering of the temperature of the combustion chamber is avoided by this process. Due to this process, enough oxygen is supplied for combustion. Since the malodorous air, which was in contact with the refuse for drying, is mixed with the fresh air and recirculated, the bad odor, together with its heat, is not released to open air. The supply of air is controlled by chamber temperatures. Complete combustion of the refuse and no air pollution are expected. (Text in Japanese)



INT-0493

Enerus, B. R. (Aktiebolaget Destructor). Liquid cooled reciprocating grate for the combustion of sludges. Germany 1,526,051; filed June 15, 1965; issued Sept. 25, 1969.

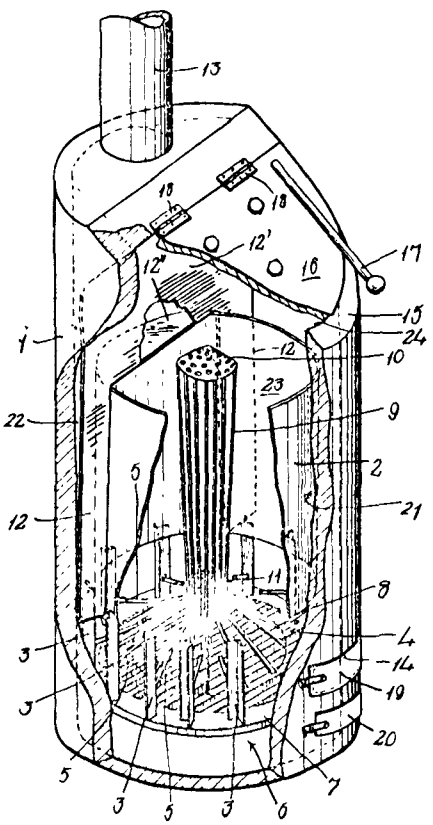
This liquid-cooled grate for use in incinerators has hollow, parallel bars, between which are pushers. These pushers are sliding plates which can be reciprocated by a mechanism beneath the grate in order to clean it. The path of reciprocation is on a slope to accommodate the use of flat-section bars, overlapping like roof tiles. (Text in German)



INT-0494

Katayori, S. Incinerator. Japan 44-22,712; filed Nov. 17, 1965; issued Sept. 29, 1969.

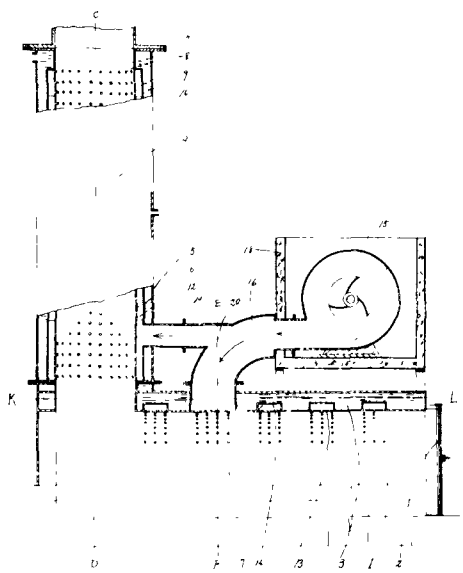
An incinerator, suitable for efficiently burning the varied garbage from homes, stores or factories, minimizes the problems of excessive moisture and odd shapes. Little supplementary fuel is needed for drying and burning the garbage. Steam, smoke, and odor generated are separated from the garbage as soon as possible. At the bottom of the incineration chamber is the fire grid; in the center is an inner cylinder. The space between the outer cylinder and inner one is the passage for exhaust gases. There are pipes inside the inner cylinder. The tops of these pipes are open to the top of the burning passage; the bottoms are open to the top of the fire grid. At the bottom of the inner cylinder, there is the device to prevent lumps of garbage from falling down into the incineration chamber. The steam, smoke, and odor are let out through the pipes of the inner cylinder, go through the burning passage, reenter the incineration chamber, and are then discharged through the exhaust passage. As radiating rods prevent the garbage from falling into the incineration chamber, the necessary burning space is available. The garbage under the restraining rods burns first, and the steam generated goes through the guiding pipes in the center. (Text in Japanese)



INT-0495

Kusano, K. Perfect combustion incinerator. Japan 44-22,710; filed Sept. 11, 1965; issued Sept. 29, 1969.

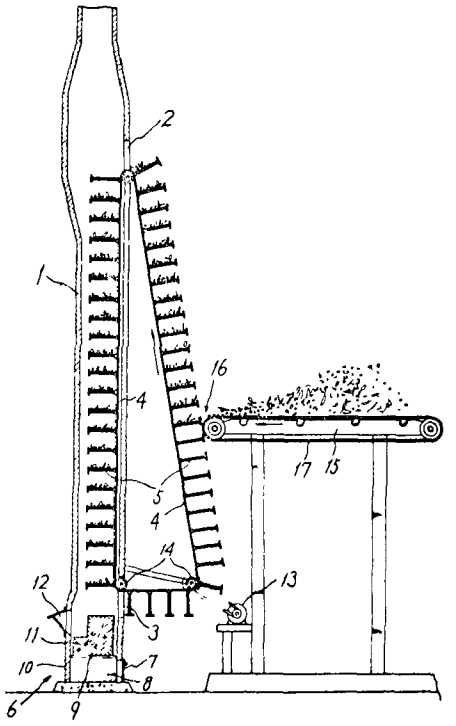
An L-shaped combustion chamber consists of two concentric cylinders. To the outer surface of the inner cylinder, a number of channel-shaped steel members are welded so as to form air preheating chambers. A number of passages are provided in the inner cylinder to connect the air preheating chambers to the inside of the inner cylinder. The space between the two concentric cylinders is filled with water. The fresh air from a blower is supplied from the top of the combustion chamber. Also, the air heated in the preheating chambers is supplied to the stream of incompletely burned gas to ensure complete combustion. Overheating of the combustion chamber is prevented by the use of the cooling water. A large amount of hot water or vapor is available for other uses. The air passages in the inner cylinder are slanted downward so that a rotational movement of the air is generated in the chamber. This movement of the air prevents the ashes from going out of the chimney, and also helps to clean the inside of the chamber. (Text in Japanese)



INT-0496

Moritsune, T. Incinerator. Japan 44-22,714; filed Jan. 25, 1965; issued Sept. 29, 1969.

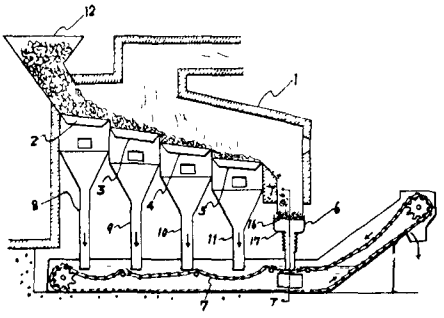
This incinerator that effectively and continuously burns wet garbage is extremely durable because the belt conveyor that transmits the waste is cooled with each revolution. Usually, the belt is placed horizontally within the incinerator. This system creates problems with incomplete combustion and with conveyor overheating. A vertical cylinder conveyor, placed both inside and outside of the incinerator, corrects these defects. Wire net shelves on the conveyor assure that the garbage will dry as it descends, and then be evenly burned. Before entering the incinerator, the garbage is also turned and loosened. Several conveyors can be used side by side according to need. The speed of each can be individually adjusted. (Text in Japanese)



INT-0497

Sugimoto, N. (Locomotive Manufacturing Company). Vibratory incinerator. Japan 44-23,304; filed July 12, 1966; issued Oct. 3, 1969.

When ashes, noncombustibles, and clinkers are removed from the combustion bed, combustion is more complete than with conventional incinerators. The vibratory part of the system consists of a horizontal bed and vertical duct. Trash and garbage are burned on the horizontal bed. The vibratory motion of the bed separates small particles of ashes from noncombustibles, and also helps to expose combustibles directly to air. The bed is equipped with a screen through which the ashes fall into the duct. Dampers located on the bed control the feeding of raw materials and the removal of noncombustibles. A provision for the disposal of the noncombustibles is made. A chain conveyor transfers medium- and small-size objects to the outlet. Large size objects, which cannot be handled by the conveyor, remain on the screen and are removed through the damper. Since the combustion bed is constructed in a gutter form, clogging by the noncombustibles is prevented. Air required for combustion is routed through the falling ashes so that the air is warmed up, and the ashes are cooled down. Since the vibratory motion of the bed does not allow the ashes to remain heated up on the bed, clinker formation is much reduced. Conventional vibrators are applicable for this method. An appropriate damper should be used to absorb the vibration before it reaches other parts of the incinerator. (Text in Japanese)

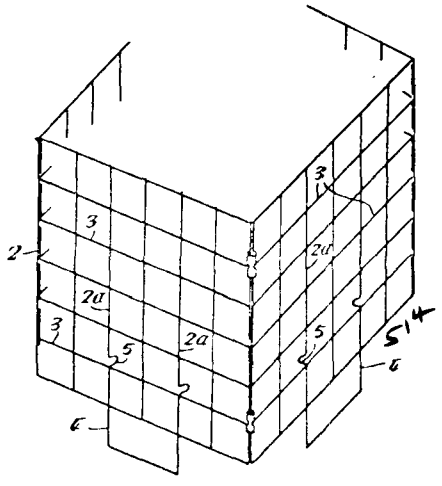


INT-0498

Barnshaw, F. R. (Zamba Company Limited). Collapsible incinerator or like container. Great Britain 1,166,623; filed Dec. 14, 1966; issued Oct. 8, 1969.

The collapsible incinerator comprises four perforated walls hinged together and a separate perforated bottom. The walls and bottom are formed of intersecting wire members. At least two of the walls are deformed to provide inward projections for supporting the bottom. Each inward projection is formed by providing an excess of wire in the length of a vertical member. The excess wire is bent inwards to form the projection. Triangular incinerators can be similarly constructed. The hinges used

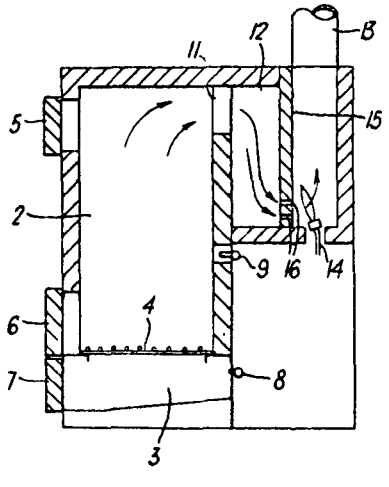
to connect adjacent sidewalls may be clips. Instead of being made from intersecting wires, the walls and bottom can be made of perforated sheet metal or expanded metal.



INT-0499

Douglas, N. M. (G. and R. Gilbert Limited). Improvements in or relating to incinerators. Great Britain 1,168,137; filed June 16, 1967; issued Oct. 22, 1969.

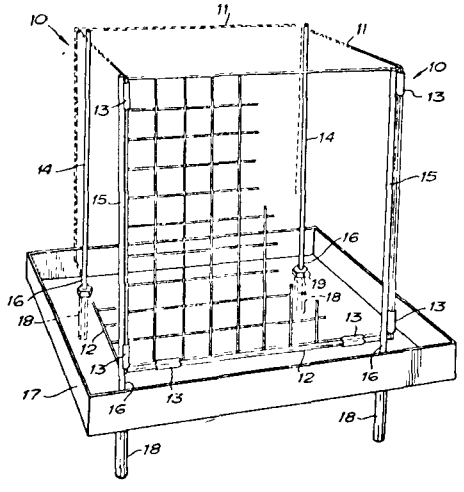
This incinerator ensures complete combustion of refuse through the use of an afterburner. After refuse is burned in the main combustion chamber, any remaining combustible products flow to an auxiliary chamber. The flow of products into the chamber is dispersed as it passes through small openings in a baffle wall. Flames from the afterburner, which is located in the secondary chamber, burn the matter completely. This incinerator satisfactorily burns material such as plastic, which normally causes the production of dense smoke.



INT-0500

Seller, C. K. (Latchford Wireworks Limited). Improvements in or relating to garden incinerators. Great Britain 1,169,468; filed June 21, 1967; issued Nov. 5, 1969.

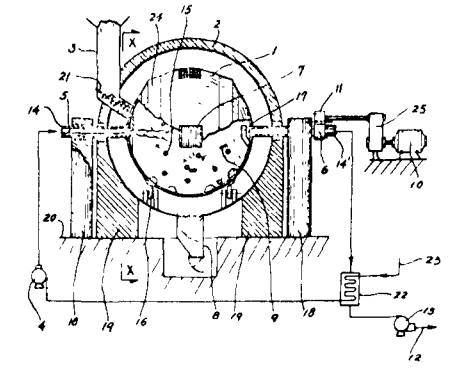
This incinerator burns garden and other refuse without scorching the ground or dropping ashes. A fire basket is supported by legs, and an ashpan is positioned below the basket but above the ground. The incinerator may be of any desired shape, but preferably is of collapsible construction for storage and transport purposes.



INT-0501

Kaneharu, Y., and Y. Nitta. Spherical garbage incinerator. Japan 44-28,144; filed Sept. 19, 1966; issued Nov. 20, 1969.

A spherical, rotary combustion chamber in a fixed frame minimizes heat loss and space waste. A hopper for mixing and feeding garbage as well as a damper for removing the ashes, are both fixed to the stationary frame. Plates protrude from the wall so that ashes on the incinerator walls are removed. The rotary burner is supported by two shafts, one an

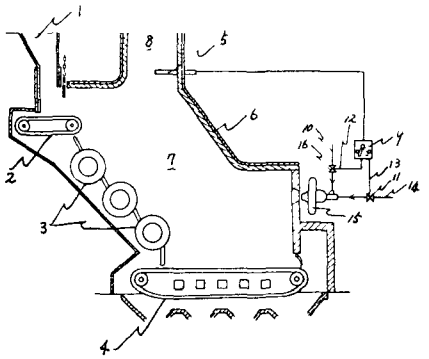


inlet, the other an outlet. A screw feeder in the hopper opens near the burner mouth inside the incinerator. A motor, a ventilation system, and a heat exchanger are also provided. The exhaust heats entering air at the heat exchanger. Many sorts of waste can be incinerated by this device. Dust collectors or other pollution-removal devices can be attached. (Text in Japanese)

INT-0502

Yamamoto, T., and N. Suzuki (Kawasaki Heavy Industries). Garbage incinerator with jet device. Japan 44-29,792; filed Apr. 14, 1966; issued Dec. 3, 1969.

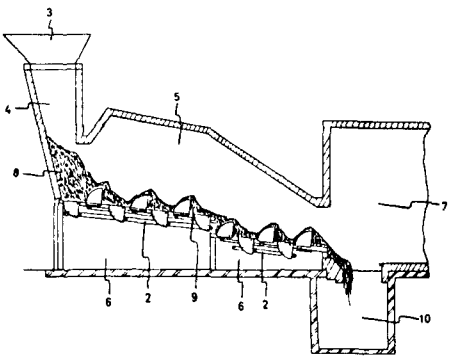
Combustion control is effected by the ejecting fuel or water jets described. Since the water content and heating value varies among garbage types, temperature control of the combustion chamber is required for effective combustion. When the temperature reaches below 700 C, liquid fuel is ejected, with air, to effect auxiliary combustion. The fuel quantity is controlled so that the ejected fuel temperature is kept within the prescribed range. When the temperature is above 1,100 C, water is injected into the chamber to lower its temperature. Since low combustion temperatures result in incomplete decomposition of organic materials, thus generating bad odors, it is important to keep the temperature above a certain level. At high combustion temperatures, inorganics in the garbage reach a molten state, and adhere to the inner wall of the combustion chamber. With the present device, air pollution is abated, and simpler incinerator construction is made possible. (Text in Japanese)



INT-0503

Nishikawa, S. (Japan Breibrico Company). A rotary stoker of garbage incinerator with grates rotating alternately in a zigzag motion. Japan 44-30,310; filed Oct. 26, 1966; issued Dec. 6, 1969.

More uniform and complete combustion is effected by loosening the garbage bundles that are fed into the incinerator by the stoker. With the conventional rotary stoker, the grates, arranged according to the feeding direction, simultaneously rotate so that the garbage is made into a column. The merits of the rotary stoker are greatly reduced by this result. The present version of the rotary stoker rotates grates, in adjacent rows, in opposite phases so the garbage is kept loose while being carried. The fixed grate has rows and columns of the rotary grates so that rapid and complete combustion is ensured. When more than one stoker is employed, they are placed stepwise so that the garbage bundle is broken up at the steps while falling down. Air is led to the combustion chamber from the grates below. An auxiliary combustion chamber is provided to burn the remaining combustible gas after the primary combustion. (Text in Japanese)



INT-0504

Rode, W. (A/S Mustads Fabrikker). Incinerator. Switzerland 482,987; filed Nov. 26, 1968; issued Dec. 15, 1969.

This refuse incinerator incorporates a device for indirect heating of the material to be destroyed, as well as a device which effects the control of the supply of combustion air and of thermal energy to the combustion chamber of the furnace. The device for controlling the supply of combustion air is so adjusted that it does not permit any supply of air during heating of the material. When the ignition point is reached, however, it does permit the supply of air to the combustion chamber in an amount just sufficient to effect complete combustion. The devices for controlling the supply of combustion air and thermal energy may be located in the combustion chamber itself, in the outlet duct leading from the combustion chamber, or in the vicinity of the source of heat of the incinerator. (Text in French)

INDUSTRIAL WASTES

INT-0505

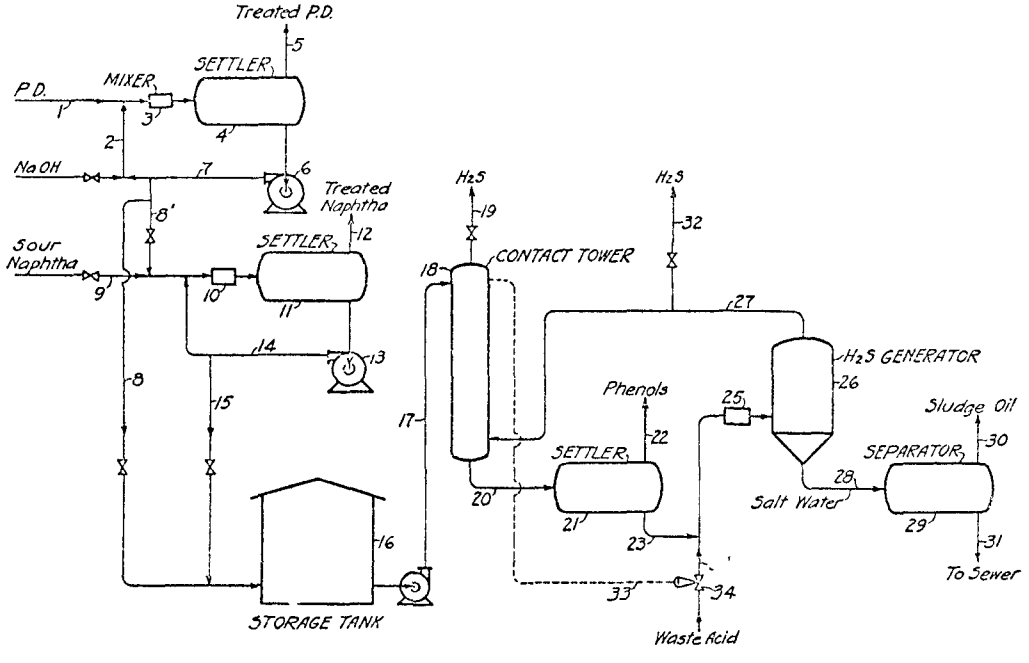
Freeman, H. (Consolidated Paper Corporation Limited). Paper industry waste product recovery. Canada 434,345; filed Nov. 2, 1944; issued Apr. 23, 1946.

This method comprises washing the bark or wet woody material in waste liquor in at least two stages. In the first stage, the natural waste liquor is used, and in the second stage, a concentrated liquor is used. When using kraft liquor it is preferable to omit the initial use of weak liquor to avoid loss of chemicals. The wet bark, woody material, or peat is arranged in a pile or in a bin where it drains. It is then washed with hot waste sulfite liquor which may contain about 8 to 10 percent dissolved solids. The washing may be carried out in any way, so long as the liquor is distributed over the mass of woody material, and is allowed to contact all of its particles. The liquor may be sprayed over the surface of the mass and allowed to percolate through it; the mass may be flooded with liquor; or the liquor may be admitted at the bottom of the mass and caused to rise through it to displace the water and deposit solids therein. This treatment removes superficial water, and the spraying or washing is continued until no more water is removed. This also preheats the woody material. This partially dried material is now treated with a concentrated liquor, containing about 50 percent dissolved solids. This treatment reduces the water content of the bark from about 65 percent to about 38 percent, and increases its solids content from about 35 percent to about 62 percent.

INT-0506

Malson, P. E. (Shell Development Company). Disposal of refinery wastes. Canada 444,676; filed May 22, 1943; issued Oct. 21, 1947.

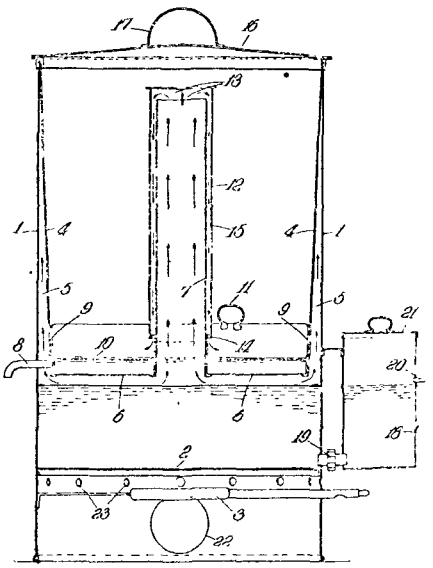
Cracked hydrocarbon distillates and the like, which contain alkyl phenols, are treated at about room temperature with a strong aqueous solution of a caustic alkali such as an alkali metal hydroxide. A spent aqueous solution containing alkali metal alkyl phenolates is produced. This solution is saturated with hydrogen sulfide to liberate the phenols, which are then separated. The remaining aqueous solution is contacted with a waste acid, such as the acid sludge produced in refinery operations, under conditions which are conducive to the liberation of hydrogen sulfide. The hydrogen sulfide is recirculated in the process, an aqueous salt solution containing suspended organic material is produced. The organic matter is settled and removed, and the waste salt solution run off into the sewers.



INT-0507

Olsen, A. Apparatus for the clarification and recovery of fats and oils. Great Britain 602,157; filed May 14, 1946; issued May 20, 1948.

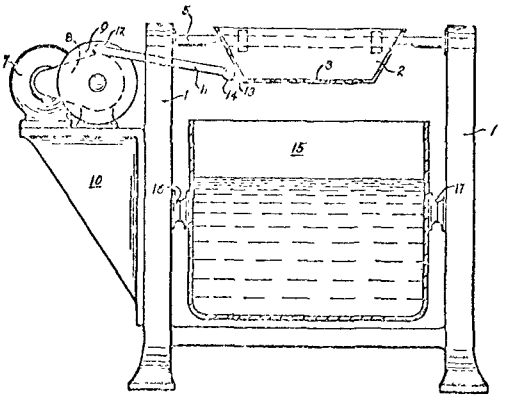
This apparatus is utilized for clarifying and recovering fats and oils from waste fried products. It is comprised of an open top vessel which is formed by an inner casing within, and at least partly spaced from, an outer casing. There is an upstanding, open-ended tube in the bottom of the inner casing. A fluid outlet, which arises from near the bottom of the inner casing, leads to outside of the outer casing. In the outer casing, there is a source of heat for heating water. A removable tray with a perforate bottom is disposed above the fluid outlet within the inner casing. The vessel is closed by a lid, and the source of heat is a gas burner.



INT-0508

Chew, F. D., and C. D. Baker (Aluminum Company of America). Methods of recovering metals. Canada 471,624; filed Dec. 27, 1943; issued Feb. 20, 1951.

This method for recovering the metallic values from flux material calls for melting the heels and disintegrating the melt into droplets. The droplets are then introduced into a liquid which is capable of dissolving the salts of the sludge and causing the molten metal to solidify. After the salts have been allowed to dissolve, the metal is separated from the liquid and dissolved salts. Further treatment removes from the metal any oxides and nitrides which are associated with the sludge.



INT-0509

Bergstrom, H. O., and K. G. Trobeck. Process for utilizing waste liquor. Canada 481,587; filed May 26, 1943; issued Mar. 11, 1952.

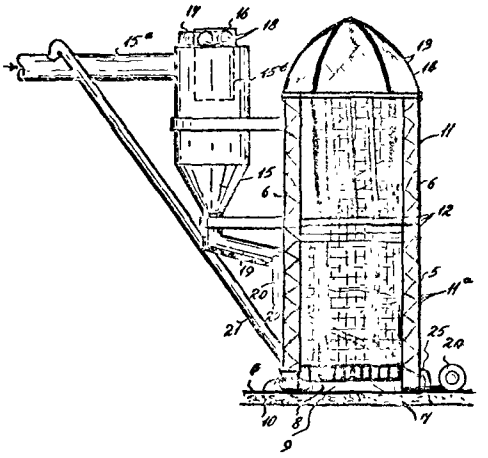
A process for utilizing waste cellulose liquors and other fluids involves the use of a particular system of concentration and treatment. The sulfate pulp process consists of subjecting waste liquor ('black liquor') to an oxidizing treatment via intimate contact between the liquor and an oxygen-containing gas, preferably at an elevated temperature. The oxidizing treatment is carried out without any substantial evaporation of the liquor until the oxidizable sulfur compounds present in the liquor have been practically oxidized. Losses of sulfur during the subsequent evaporation of the liquor are thereby eliminated.

INT-0510

Watts, D. H., and G. R. Watts. Improved incinerator particularly for wood waste. Australia 148,646; filed Sept. 5, 1950; issued Oct. 15, 1952.

An incinerator which is especially adapted for wood waste comprises a cylindrical casing lined with firebrick as a refractory material. It also has, in its lower part, a grate comprising firebricks spaced apart and supported on transverse bars over an ash pit. Baffles within the casing intercept incoming material and direct it to a low point. The baffles are both vertical and circumferential shelves arranged in stepped formation. A delivery duct forces combustible waste and air from the factory or establishment to the interior of the casing. A spark arrestor surmounts the

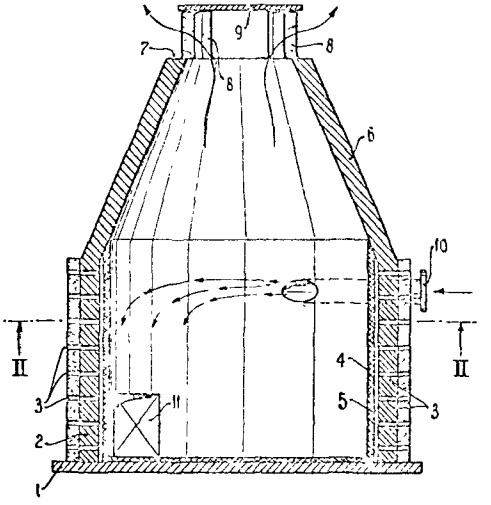
incinerator. The quantity of air drawn into the casing is regulable by an air vent that is furnished with openings which are adapted to be opened or closed to any desired degree by a sliding shutter. The spark arrestor is wire mesh secured to a metal frame. The hot zone of the incinerator is concentrated at a low point above the grate. Cold incoming air, introduced below the grate, maintains the lower part of the casing in a relatively cool condition.



INT-0511

Kruydenberg, J. W., and J. Wils. Improvements in or relating to apparatus for burning waste from flax-working or wood-working machines. Great Britain 689,421; filed Jan. 23, 1951; issued Mar. 25, 1953.

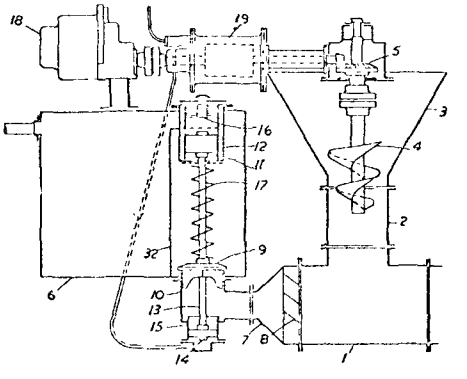
The furnace, which rests on a concrete foundation, comprises a cylindrical combustion chamber with a truncated conical stack that has a central flue gas discharge opening. Both are made of building brick. The portion comprising the combustion chamber is lined with refractory material. Cooling ventilation is provided by holes through the outer wall which extend into the air space left between the wall and the refractory lining. A tangentially disposed nozzle, extending into the interior of the furnace, is connected to the air blast conduit which furnishes air for combustion, and transports the waste material from the machines into the furnace. Ashes are removed through an ash door located at the lower part of the furnace wall. The upper end of the flue is provided with four openings to allow escape of fumes, and surmounted by a plate to prevent exit of unburnt material. Dimensions of a typical installation are presented.



INT-0512

Rich, E. (The Rio Tinto Company Limited). Improvements in the stowing of waste in mines. Great Britain 717,136; filed Nov. 7, 1951; issued Oct. 20, 1954.

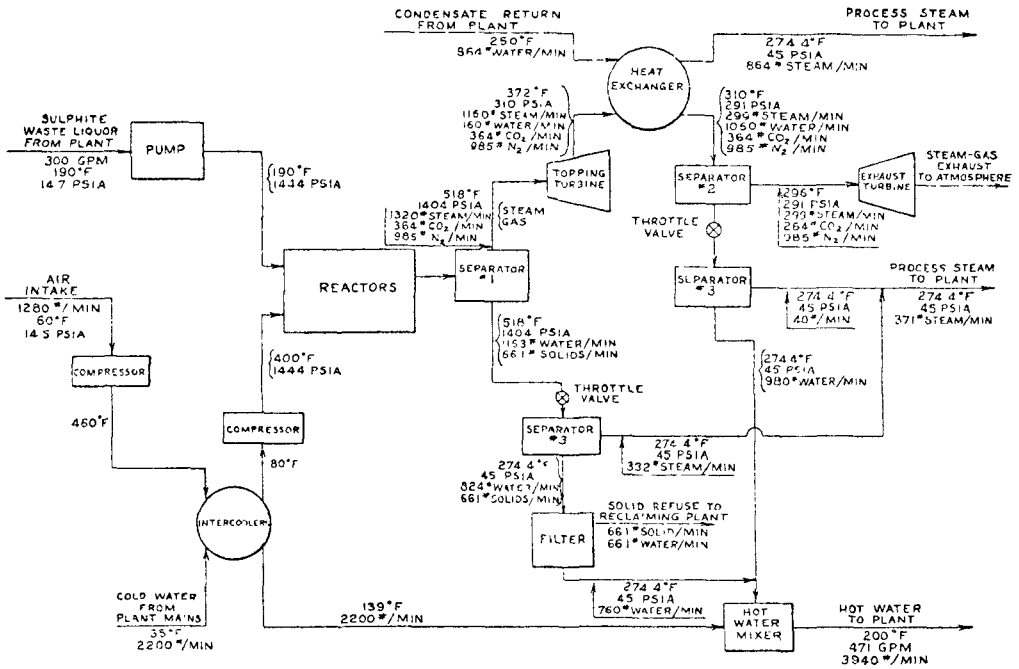
During a process for the pneumatic stowing of industrial waste in mines, the material to be stowed is compacted into a breech, while air under adequate pressure is compressed in a receiver to form a charge. The compacted slug of material is projected from the breech by the rapid release of the charge of compressed air. The apparatus includes a screw feeder for the compacting of material from a hopper into the breech, with the feeder thread diminishing in diameter toward the breech. A pipe connects the breech and the hopper, with the screw feeder operating in the lower part of the hopper and the upper part of the pipe. The apparatus also includes a container for compressed air and a valve operated by the screw feeder which releases compressed air from the container to the breech.



INT-0513

Zimmermann, F. J. (Sterling Drug Incorporated). Waste disposal. Canada 514,642; filed June 7, 1950; issued July 12, 1955.

A continuous process for the treatment of industrial wastes containing combustible organic substances and water calls for the introduction of a gaseous oxidizing agent containing free oxygen into the waste liquor in a reaction zone. The zone is maintained at a temperature above 450 F and has a superatmospheric pressure sufficient to keep the water in the zone primarily in the liquid phase. The amount of free oxygen introduced is equal to that which is theoretically necessary in converting substantially all of the carbon in the waste to carbon dioxide and all of the hydrogen in the waste to water. An effluent comprising essentially inorganic salts and water is the only non-gaseous product discharged. This method is specifically used to oxidize the organic matter in sulfite waste liquors.



INT-0514

Randaccio, C. Recovery of metals from scrap. Italy 531,121; filed Apr. 7, 1955; issued July 22, 1955.

During smelting operations, acid washing of the metal scrap or the addition of a suitable flux prior to melting and fusion leads to an efficient and economical process for the recovery of certain metals. These metals include aluminum, zinc, copper, and lead from powders, filings, and other types of industrial scrap. Ammonium chloride, boric acid, hydrochloric acid, and perchloric acid are used. (Text in Italian)

INT-0515

Baum, E. A. (Chemicals 'East Africa' Limited). Improvements in and relating to the treatment of decortication wastes. Great Britain 742,480; filed Dec. 4, 1952; issued Dec. 30, 1955.

A process for recovering the cuticle from a mixture of leaf cuticle and pulp results from decortication of sisal and is effected by subjecting the mixture to aerobic fermentation under a spray of water containing dissolved oxygen. The process occurs in a vat having a spray and a perforated base through which liquid is

removed. The cuticle is recovered from the retted mixture in the vat via washing with water. Water and plant juices are removed from the mixture so that they can be treated before the mixture is conveyed to the vat for fermentation. The sticky layer formed during the fermentation is removed from the fermenting mixture. The vat is emptied after 5 to 10 days, before the fermentation is complete, and the partly retted mixture is allowed to ferment further without additional spraying, with the oxygen carrier being added to the spraying water.

INT-0516

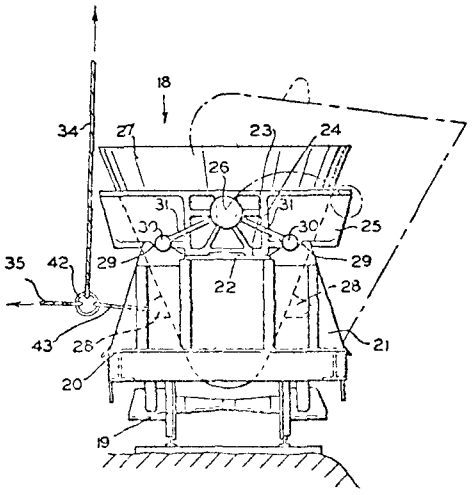
(International Minerals and Chemical Corporation). Improvement in or relating to process for treatment of waste liquor from beet sugar molasses. Great Britain 749,804; filed May 20, 1954; issued May 30, 1956.

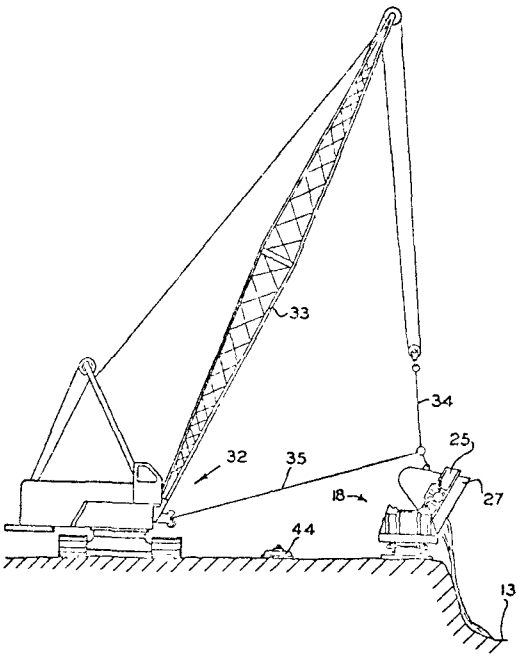
A process for treating the waste liquor from beet sugar molasses after the sugar has been at least partially removed, involves hydrolyzing the waste liquor with barium hydroxide. The hydrolysate is neutralized with an acid reagent, which forms a water soluble barium salt. Then, sufficient methanol is added to the neutralized hydrolysate to precipitate barium glutamate, after which the precipitate is separated.

INT-0517

Heckett, E. H. (Harsco Corporation). Method and apparatus for disposing of open hearth slag and refuse. Canada 546,906; filed June 3, 1953; issued Oct. 1, 1957.

This method for disposing of the waste slag from an open hearth steel mill allows concomitant recovery of steel scrap from the slag. The process involves collecting the molten slag from the furnaces in tiltable slag pots carried on railway cars. The slag is retained in the pots for a sufficient length of time to allow a substantial part of the steel, which is contained in the slag, to collect in the bottoms of the pots. At a place away from the mill, the contents of the pots are dumped directly from the cars into a pit. While a hoist line tips the pots, a drag line prevents the heavy steel skulls from overturning the pots and cars. The slag and skulls are cooled in the pit, after which the skulls are removed. The residual slag is excavated from the pit, and its metal-bearing components are magnetically separated.

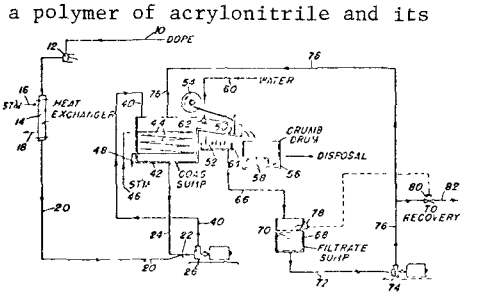




INT-0518

(American Cyanamid Company). Recovery of polymer crumb from waste dope. Great Britain 823,243; filed June 1, 1956; issued Nov. 11, 1959.

A method is described whereby waste dope, e.g. a polymer of acrylonitrile and its

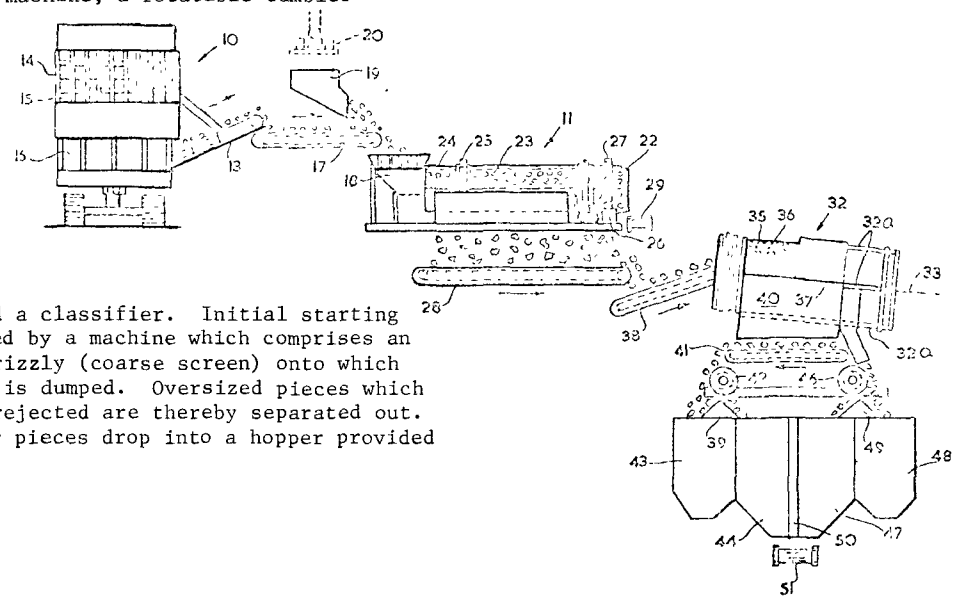


liquid solvent, is recovered for productive reuse. Waste dope is dispersed in a hot liquid coagulant such as dilute, aqueous sodium thiocyanate, to yield a pumpable slurry of polymeric solids in a hot liquid of given concentration. The temperature of the waste dope is raised as the dope is pumped through a heat exchanger. It is then admixed with a flowing stream of hot sodium thiocyanate solution. The mixed stream is directed into a centrifugal pump, where the partially coagulated dope is broken up by the shearing forces in the pump into a friable crumb, which is screened out and collected for recovery. The liquor is collected in a filtrate sump, from whence it passes on to a centrifugal pump, and then to the thiocyanate recovery system.

INT-0519

Heckett, E. H. (Harsco Corporation). Method of and apparatus for, recovering magnetisable metal-bearing material from scrap and/or refuse. Great Britain 844,372; filed July 20, 1956; issued Aug. 10, 1960.

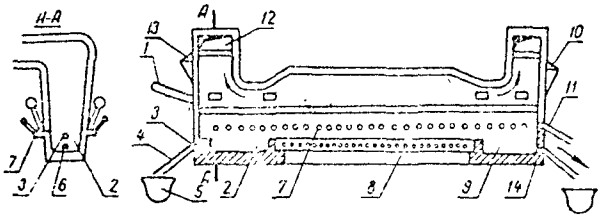
The apparatus is used for treating the scrap which arises from the open hearth department of a steel-making plant. Three main items of equipment are included: a transportable separating machine, a rotatable tumbler barrel, and a classifier. Initial starting is performed by a machine which comprises an inclined grizzly (coarse screen) onto which bulk scrap is dumped. Oversized pieces which are to be rejected are thereby separated out. The smaller pieces drop into a hopper provided with conveyors and a primary magnetic separator which collects pieces containing magnetizable metal. The remaining non-magnetizable residue is rejected from the process. Slag, masonry, and other encrusted material thus cleaned is conveyed via belt conveyors to a classifier. The classifier comprises a double-screened, rotating, inclined barrel which is provided with a magnetic separator. The separator collects the fumes from the waste and refuse.



INT-0520

Var'yan, S. M., and V. Y. Lunev. Method of reprocessing molten slags containing zinc, lead and other volatile nonferrous and rare metals and furnace for implementation of this method. U.S.S.R. 134,874; filed Oct. 8, 1956; issued Jan. 10, 1961.

Molten slag is charged at one end, and the product is discharged at the other end of a slag-subliming furnace which has a slightly sloping bottom. The length of the furnace must not be less than 6 to 8 times greater than its width, so that the slag will remain in the furnace between 90 and 150 minutes. The front part of the furnace is provided with a heat-insulated separation



tank from which the floating matte is discharged, through an opening, onto a chute and into a ladle. The lead which settles on the bottom is discharged through another opening. A carbon-air mixture with an air excess of 0.5 provides a reducing atmosphere for the reduction and sublimation of all the zinc present in the charge. When copper is present in the slag, the rear portion of the furnace is provided with a separation tank in which its supplementary sulfidization is carried out via the introduction of a pyrite concentrate through a funnel. The waste slag, freed of zinc, lead and copper, is led through a chute and into the granulator. Sublimates and other gases are led through flues to cooling and dust retention equipment. Settled lean matte is discharged through an opening. (Text in Russian)

INT-0521

Polyvyannyy, I. R., P. S. Demchenko, Y. Z. Malkin, and V. D. Solov'yeva. Method of reprocessing dust wastes of the lead production and of those other heavy nonferrous metals, and of decoppering lead. U.S.S.R. 137,261; filed Oct. 10, 1960; issued Apr. 10, 1961.

Lead dust is mixed with 20 to 25 percent sodium sulfate, 5 to 10 percent lead sulfide, and 4 to 5 percent of a carboniferous reducing agent. This mixture is melted in an electric furnace at 1,050 to 1,150 C. The output of this process is crude lead, cadmium sublimates, and a melt of thio salts containing minor amounts of rare metals, zinc, and copper. The crude lead is refined, the cadmium sublimates are reprocessed by the sulfuric acid method, and the thio-salts are used in decoppering the crude lead which is smelted in the shaft furnace. The lead is further refined, while the thio-salts melt, which is enriched during the lead decoppering process with copper, zinc, arsenic, and rare metals, is lixiviated by water. During lixiviation, arsenic and sodium go into solution. The arsenic is then precipitated by aluminum, and the sodium is extracted by carbonization following the removal of the arsenic. The cake obtained as a result of the thio-salt lixiviation contains zinc, copper, indium, tellurium, selenium, and gallium, and is reprocessed by sulfation with sulfuric acid. This method can be used for reprocessing the dusts from the shaft furnace and agglomeration shops of lead smelteries, the dusts from tin smelteries, the sublimates from fuming and rotary ore-processing furnaces, and the lead cakes and slags from sulfuric acid plants. (Text in Russian)

INT-0522

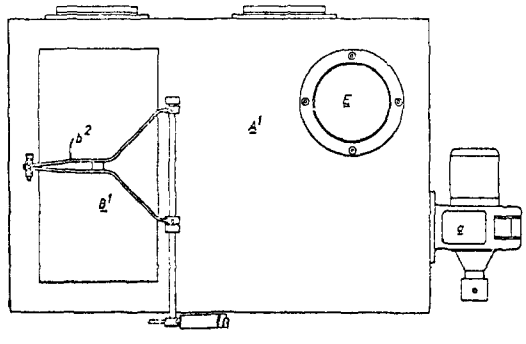
Fedorova, M. V., M. A. Eydenzon, and S. N. Kholmogorov. Method of reprocessing solid wastes of the titanium-magnesium production. U.S.S.R. 138,058; filed Sept. 1, 1960; issued May 10, 1961.

The wastes are dissolved in warm water, and the resulting solution is treated with caustic magnesite so that the hydrates of iron, aluminum, manganese, and silicon will be precipitated out. The pulp which is thereby filtered, and the filter residue, consisting of neutral hydroxides, is discarded. The filtrate, which is a mixture of magnesium, sodium and potassium chlorides, is oxidized. Following a second filtration, the mixture is placed into a reactor which contains a predetermined amount of spent electrolyte from carnallite baths. After the electrolyte has dissolved, a hot, saturated solution of magnesium and potassium chlorides remains. A synthetic carnallite precipitates from this solution on cooling. (Text in Russian)

INT-0523

Charleson, E. (A. B. Scorer Limited). Improvements in incinerators or refuse destructors. Great Britain 906,933; filed Mar. 25, 1960; issued Sept. 26, 1962.

This incinerator is particularly useful for the cremation of animal carcasses but can also be used for the disposal of industrial wastes. It comprises a primary combustion chamber in which oil or gas burners produce hot products of combustion, and an adjacent incinerating furnace, into which refuse is fed, and to which hot gases from the primary chamber are delivered through holes below the furnace grate. A portion of these gases is diverted through the dividing wall between the two compartments to aid in the combustion of volatiles from the refuse. The refuse is

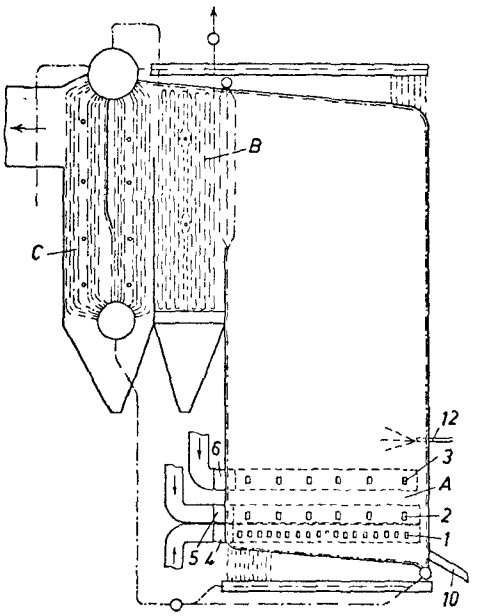


fed into the furnace through an aperture equipped with a counterbalanced lever-operated cover. A secondary combustion chamber, which is located next to the furnace, completes the combustion of the combustible material. The gases finally emerge through a chimney after passing through a dust extracting chamber.

INT-0524

Vegeby, A. U. I. (Aktiebolaget Gotaverken). Combustion of waste liquors. Canada 650,344; filed Mar. 13, 1956; issued Oct. 16, 1962.

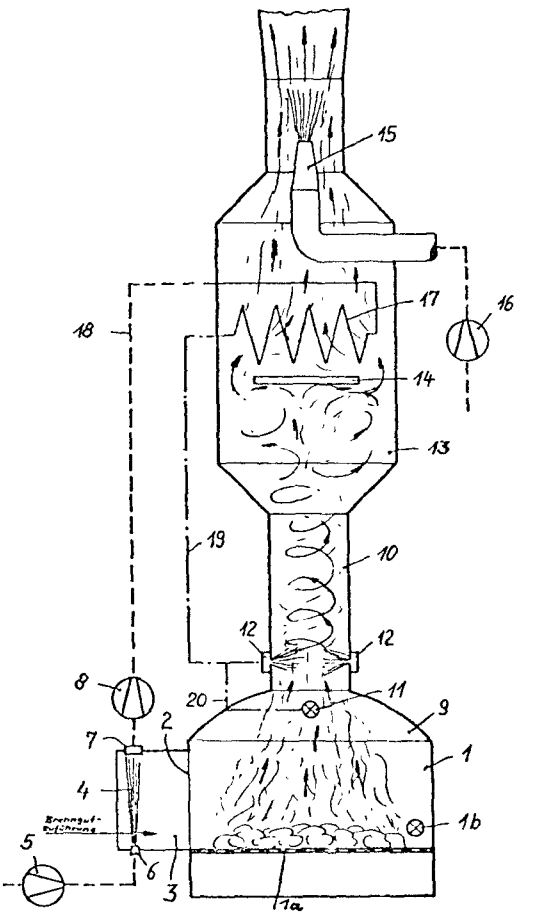
A method of burning waste liquors which contain combustible organic matter and inorganic salts involves spraying the liquor into a furnace so that it comes into intimate contact with an ascending stream of combustion gases. Partially dehydrated liquor residues are distributed over the horizontal bottom of the furnace to form a fuel bed; they are burned off by means of primary air, which is supplied in sufficient quantities in relation to the waste liquor supply to maintain a reducing atmosphere. The inorganic salts are recovered and withdrawn in molten form, and the primary air is divided into two streams. The first is directed, at relatively low pressure, through a set of nozzles which are arranged immediately above the surface of the bed. The second stream is directed at a relatively high pressure through a second set of downwardly inclined nozzles which are arranged above the first set. Thus, the combustion zone is extended over the whole cross-sectional area of the furnace, and maintains the fuel bed constant and level. The temperature at which the burning takes place can be lower, and the vapor pressure of the inorganic salts is lower than if all the air were supplied at one level. Thus less vaporization of the salts occurs. The final drying of the fuel occurs more slowly, and less organic material is entrained by vaporized moisture.



INT-0525

Schmick, W., W. Liebrich, and K. Tafel. (Kabel- und Metallwerke Neumeyer Aktiengesellschaft). Furnace for smokeless combustion of waste, especially that containing metal. Germany 1,146,661; filed Oct. 15, 1959; issued Apr. 4, 1963.

A furnace provides for the smokeless combustion of wastes, especially those such as cables which contain metal. It comprises a primary stage heating chamber and a secondary combustion chamber for burning the carbonizing gases. They are designed so that the combustion chamber is a narrow, extended, heat-insulated tube which is locked to the



head end of the carbonizing chamber and equipped at its lower end with carbonizing gas jets. Burners are provided to heat the combustion chamber, and compression of the hot air is effected by a bellows. A further heat insulated combustion chamber is attached to the secondary chamber, and it has an increased diameter so as to decrease the velocity of the combustion gas flow. A heat reflector and heat exchanger are housed within this chamber. An exhauster provides an exit. (Text in German)

INT-0526

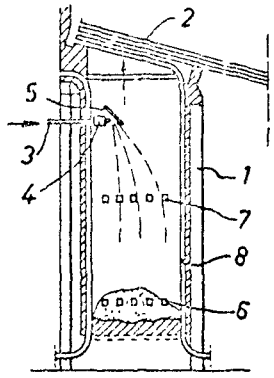
Fulton, L. M. (Dominion Steel and Coal Corporation, Ltd.). Utilization of waste pickle liquor. Canada 668,691; filed Apr. 25, 1961; issued Aug. 13, 1963.

Hot sulfuric acid solution is used to remove scale and rust from steel furnaces. After this solution has reached its capacity to dissolve, it is drawn off, and the resultant fluid is termed pickle liquor--a waste product which contains unreacted sulfuric acid solution, ferrous sulfate, and ferric sulfate. To remove the reclaimable products, two steps are necessary. The first is directly related to the reclamation of ferric oxide. Water is added to the pickle liquor to prevent separation of the suspension, and the mixture is filtered to remove large solid particles. Then sodium carbonate is added to change the pH from acid to alkaline. The resulting solution is heated, with concurrent agitation, to drive off the carbon dioxide. When all of the gas has been driven off, the iron carbonate which was formed is centrifuged out, washed, and dried. This solid is exposed to heat, at temperatures from 500 to 2,500 F, in the presence of oxygen; the end-product is ferric oxide, with more carbon dioxide being formed as a by-product. The second step involves the reclamation of sodium sulfate. It is obtained from the solution that remains after centrifugation when the solution is evaporated. The resultant solid is sodium sulfate or 'saltcake.'

INT-0527

Paren, E. V. A. Method and apparatus for burning waste liquor. Canada 669,172; filed Mar. 4, 1958; issued Aug. 27, 1963.

A method of burning waste liquor involves the introduction of the liquor into a jet-shaped furnace. The liquor is subdivided into coarse and fine droplets, and it spreads through rising flue gases. The jet is subdivided and reflected downward by a screen, so that at least the fine droplets move in a direction opposite to the flue gases. The ejection mechanism and the screen are adjustable so as to render possible a change in the direction of movement and spreading of the droplets over the cross section area.



INT-0528

Gorodinskii, B. Y., A. F. Gaevskii, V. M. Shimanskii, and S. I. Shkolnik. Waste polyesterurethan utilization. U.S.S.R. 159,028; filed July 23, 1962; issued Nov. 22, 1963.

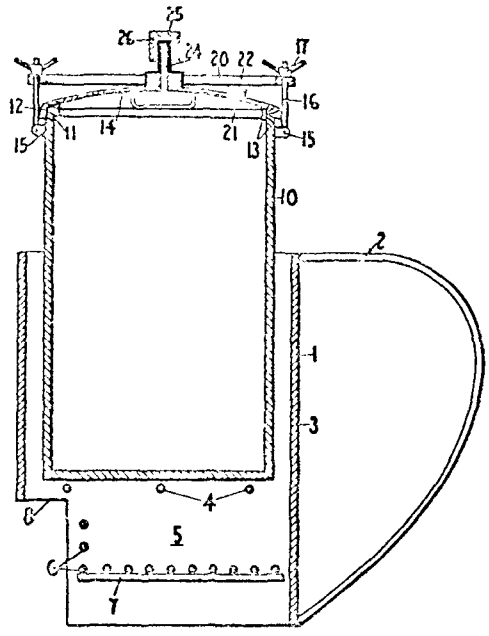
Waste polyesterurethane is dissolved in a mixture of a dihydric alcohol and a dicarboxylic acid, and the mixture is heated to facilitate a reaction between the dihydric alcohol and the dicarboxylic acid. Diisocyanate is added to the resultant mixture to produce a polyesterurethane. (Text in Russian)

INT-0529

Laurie, K. An offal disposal unit. Australia 248,460; filed Nov. 23, 1959; issued Dec. 11, 1963.

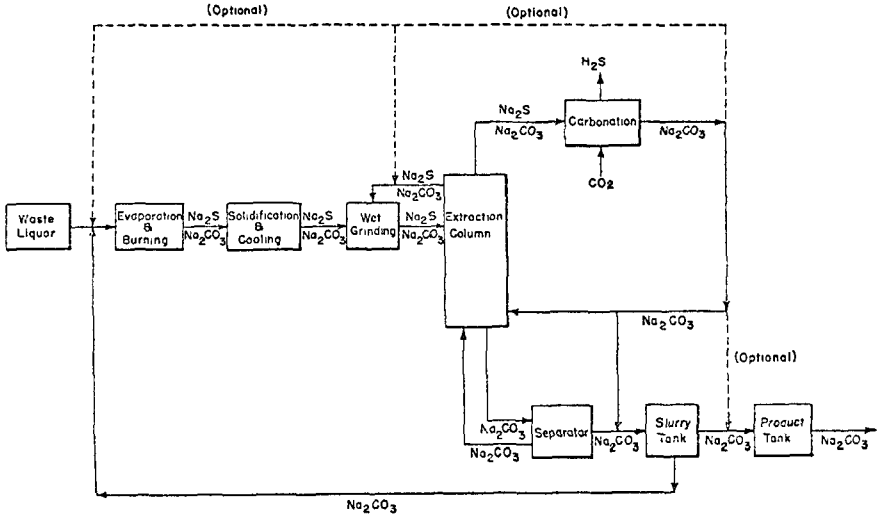
A unit to be used in the preparation of carcasses for food purposes includes an open-ended cylindrical housing with an inner grid. Beneath the grid is a firebox. A cylindrical pressure vessel, which extends partly out of the housing, has a closed lower end and an open upper end and is welded at its base to the grid. Hinged to a pair of lugs on the walls of the pressure vessel is a pair of diametrically opposed bolts; a locking bar between these bolts forms a domed lid over the upper end of the vessel. There is a resilient sealing ring between the domed lid and the vessel, and an outlet tube in the lid is

closed by a weight. As a result, the pressure in the vessel is limited. The lid also contains a diaphragm type blow-off valve. Two arcuate tipping devices, whose ends are secured to the outer face of the housing, are positioned so that they can come into contact with the ground, allowing the unit to be tilted from its vertical position to and beyond a horizontal position. In operation, a carcass is loaded, along with a small amount of water, into the vessel, and then is steamed under pressure. When the steaming is completed, the lid is removed, and the unit is tipped so that the carcass and liquor are dumped out.



INT-0530
(Rayonier Incorporated). Recovery of sodium carbonate from waste liquors. Great Britain 965,162; filed July 25, 1962; issued July 29, 1964.

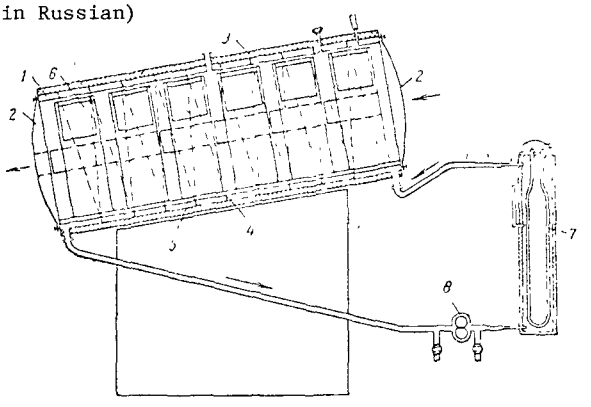
Spent soda-base liquor from the digestion of wood is evaporated and burned under reducing conditions to form a sodium carbonate and sodium sulfide smelt. The smelt is then cooled and solidified when it is poured onto a cooled metal surface, after which the solid smelt is ground, while wet, with a solution of sodium carbonate and sodium sulfide. Then the ground smelt is brought into contact with a concentrated solution of sodium carbonate so that the sodium sulfide is dissolved.



INT-0531
Gaydovksiy, V. M., and K. S. Goreglyad. Equipment for utilization of animal corpses and slaughterhouse wastes. U.S.S.R. 165,361; filed Jan. 28, 1963; issued Sept. 23, 1964.

The equipment consists of an inclined double-walled autoclave with: flat-tubing helices installed between its walls; a rail track near the interior bottom; containers supported on the track; and a mechanical

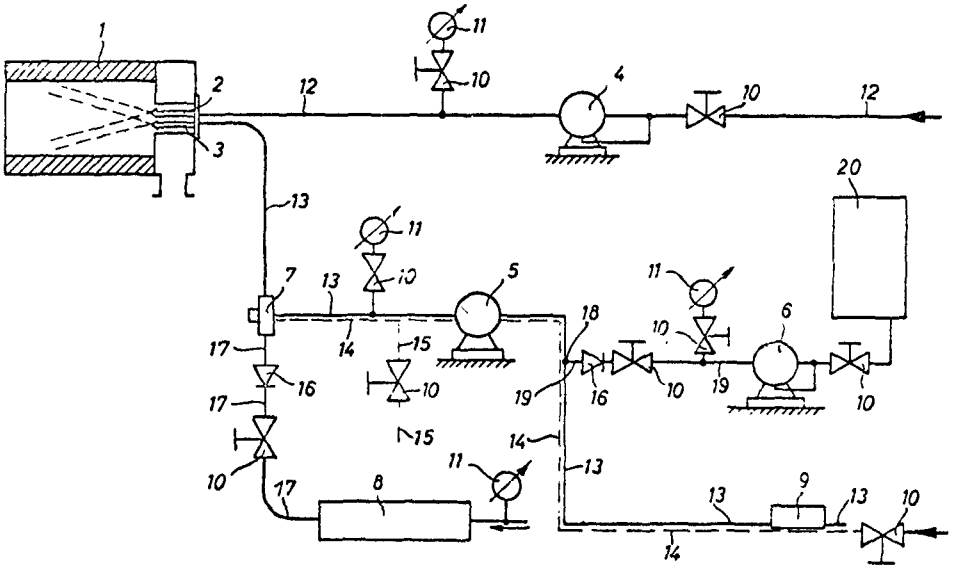
unloader incorporating a hand-operated hoist installed in the lower end. Mineral oil is heated in an electric heater and pumped through the flat tubing which is helically wound along the entire length of the autoclave body in the space between its inner and outer walls. This insures uniform heating of the autoclave's interior. The meat is treated in containers so that it will not be scorched, and so that the interior of the autoclave will be kept dry. The containers are rolled by gravity along the inclined track. By the use of the hand hoist and a catch, one container at a time is turned upside down, and its meat discharged into a shredder. (Text in Russian)



INT-0532

Kaluza, L., and B. Winkler (Naturin-Werk Becker and Company). A procedure for the disposal of tar waste byproducts. Germany 1,180,479; filed Mar. 14, 1963; issued Oct. 29, 1964.

A fire clay lined combustion chamber is penetrated by two spray nozzles, one for oil and the other for tar. The former is connected to a feed line leading from an oil pump, and the latter is connected to a feed line through which filtered tar is conducted. A steam line runs parallel to the tar feed line and both can be enclosed by a common heat insulated jacket. Heat is transferred from the steam to the tar line, thus maintaining the tar in a fluid state. A pump in the tar line leads to a mixing chamber where heated compressed air combines with the tar. The air-tar mixture is then ejected as a spray into the combustion chamber where it comes into contact with the adjacent burning oil spray. The combustion of the tar is thereby effected. (Text in German)



INT-0533
Sveshnikov, M. A., N. K. Bartosevich, I. F. Morozov, P. I. Zhukov, V. S. Gerasimov, and N. I. Panasova (Shchelkovo State Chemical Plant). Method of processing of selenium-bearing wastes and scrap. U.S.S.R. 177,621; filed Dec. 15, 1964; issued Dec. 18, 1965.

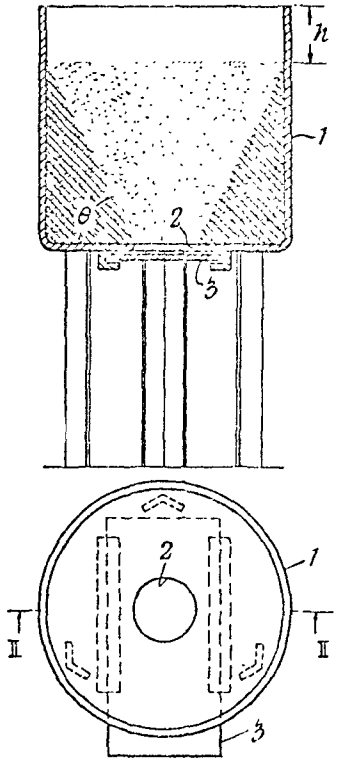
The original selenium-bearing wastes (or scrap) are treated with a solution consisting of 3 parts sodium sulfide and 1 part sodium selenosulfide, and are kept in circulation in leaching tanks. In one tankful of this solution, three batches of the wastes are leached out in succession. In this way, the 3 to 1 ratio of the solutes is changed to about 3 to 11 or 3 to 12. There is a corresponding increase of the selenium concentration in the solution. Depending on the selenium content of the original wastes, the final selenium concentration in the solution will be between 20 and 35 g per liter. (Text in Russian)

INT-0534
(Farbenfabriken Bayer Aktiengesellschaft). Process for improving the recovery of fibres and fillers from the waste liquors of paper machines. Great Britain 1,015,747; filed Oct. 23, 1963; issued Jan. 5, 1966.

A process for improving the recovery of fibers and fillers from the waste liquors of paper machines is carried out according to the flotation or sedimentation principle. According to this principle, the end-products of a reaction between 1 mole of a di- or poly-amine (the amino groups of which are separated by at least 3 carbon atoms) and less than 1 mole of epichlorhydrin or alpha-dichlorhydrin, are added to the waste liquors of the catch pots. Between 0.02 and 1.00 mg of the end-product is added to each liter of waste liquor.

INT-0535
(Toyo Rayon K. K.). Improvements in or relating to the treatment of waste synthetic thermoplastic resinous material. Great Britain 1,015,750; filed Dec. 6, 1963; issued Jan. 5, 1966.

Waste synthetic thermoplastic resinous material which can pass through a 6-Tyler mesh wire gauze but not through a 10-Tyler mesh gauze, and which has an angle of rest (the angle which the surface of the material remaining in the cylindrical container forms with the horizontal plane) of over 70 degrees, is reusable. The recovery treatment comprises heating and deforming the waste material as it is being agitated. This procedure is continued until the material reaches a temperature above its deformation temperature (that temperature at which the waste material begins to change in shape from its original form), but below its melting point. Afterward, the treated waste material is cooled and removed.



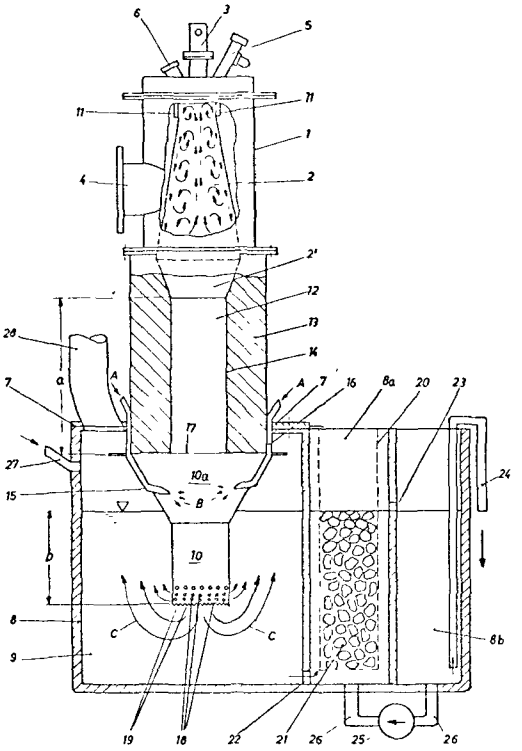
INT-0536
Krumnikl, F., V. Durcansky, and R. Pelzl. Synthetic slags in the refining of steel. Czechoslovakia 117,190; filed Nov. 28, 1964; issued Jan. 15, 1966.

Scrap and grindings from the manufacture and remelting of aluminum and alloys make good slags following the addition of lime and the removal of particles larger than 3 mm. Thus, scraps left from the remelting of aluminum, aluminum magnesium, and aluminum silicate, which contained about 70 to 80 percent aluminum oxide, 5 percent silica, 1 percent ferrous oxide, and 14 to 24 percent magnesium oxide, can be homogenized with lime. The ratio of scrap to lime in the process should be about 56 to 50. The homogenized mixture is subject to the Perrin process, or another process in which powdered slag is blown into a furnace or added to tapped steel. (Text in Czechoslavakian)

INT-0537

Schaefers, J., and F. Schoppe (F. Schoppe). Incineration of residues containing trichloroethylene or perchloroethylene, Germany 1,219,768; filed June 8, 1962; issued June 23, 1966.

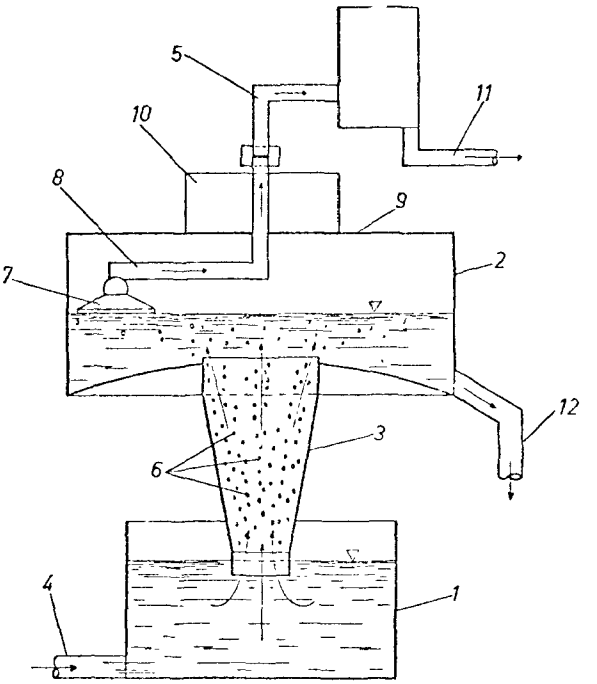
A method for incinerating the distillation residue from industrial cleaning solutions which contain oil, grease, and residual trichlorethylene or perchloroethylene, involves passing the incineration gases into water and neutralizing the absorbed hydrochloric acid. The material is finely dispersed before burning and steam is added to the incineration gases so that the wet hydrochloric acid is more easily absorbed by water. (Text in German)



INT-0538

Barkman, L. O. (Lilla Edets Pappersbruks Aktiebolag). A method for the recovery of fibers from the waste water from the manufacture of paper. Great Britain 1,053,946; filed July 5, 1963; issued Jan. 4, 1967.

Waste water containing O-fibers is treated by adding a flocculating agent together with a buffer, which causes the formation of agglomerates. The agglomerates are separated from the water by means of flotation. Starch, which has been swollen by treatment with an alkali, e.g., sodium hydroxide, is used as the flocculating agent, and aluminium sulfate is used as the buffering agent. Durability of the swollen starch is increased by the addition of sodium silicate. Conglomerates thus formed are very stable, and are collected by and retained on the Fourdrinier wire, along with 'normal' fibers. Flotation of the conglomerates can be achieved by blowing air through the water to form small bubbles which adhere to the conglomerates and make them rise to the surface. An apparatus to be used for flotation in the proposed process comprises a collection chamber and a superimposed flotation chamber with a tube connecting the two. Waste water with aluminium sulfate added is introduced into the chamber, along with swollen starch. A



vacuum, which is applied to the flotation chamber, forces the waste water up into the flotation chamber. The dissolved air in the water forms bubbles which adhere to the conglomerates. The conglomerates then rise to the surface for collection by a surface-sweeping suction device, and are led off to the paper machine's Fourdrinier wire.

INT-0539
(Farbwerke Hoechst Aktiengesellschaft, Vormals Meister Lucius and Bruening). Process for improving the recovery of fibrous material from waste waters of the paper, cardboard and cellulose industry. Great Britain 1,091,177; filed Mar. 15, 1965; issued Nov. 15, 1967.

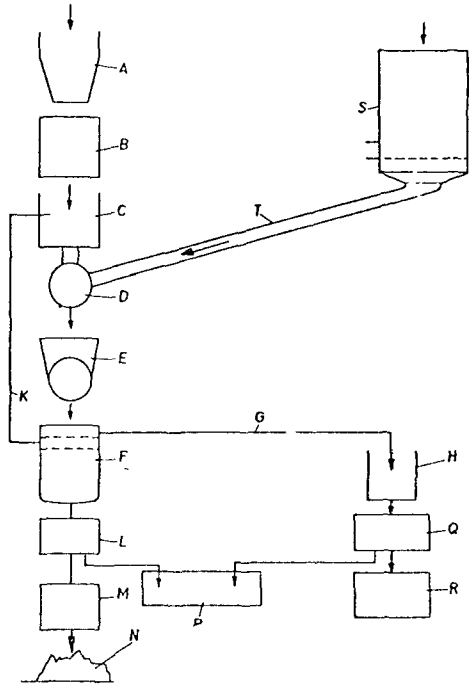
A nitrogenous condensation product of urea (1 mol) and a 1,2-alkyleneimine with a substitutable hydrogen-atom on the nitrogen-atom (e.g. ethyleneimine-1 mol) or an oligomer thereof, is added to the waste water in a concentration of 0.1 to 4 percent as related to solid and suspended particles. The yield is recovered in a flotation cell.

INT-0540
Widmer, O. Process for the production of paper and cardboard with recirculation of waste water. Great Britain 1,111,855; filed Sept. 14, 1965; issued May 1, 1968.

This process for the production of paper and cardboard comprises dissolving 100 parts by weight of colophony in 50 to 60 parts by weight of a boiling 10 percent solution of calcined soda. The resultant solution is clarified to form the hot mixture by boiling with 12 to 16 parts by weight of an approximately 40 percent solution of sodium hydroxide. A 40 percent solution of sodium hydroxide is added to a boiling mixture comprising 55 to 65 parts by weight of paraffin wax, 13 to 17 parts by weight of stearin, and 20 to 30 parts by weight of colophony. The milky solution thus obtained is cooled. One to 15 parts by weight of the cooled mixture is mixed with 85 to 99 parts by weight of the hot mixture, and the resultant mixture is cooled. Then 25 parts by weight of starch is dissolved in 160 to 200 parts by weight of a 3 1/2 percent sodium hydroxide solution in the cold, to yield a clear starch solution. Then, 100 parts by weight of the second cooled mixture are mixed with 15 to 40 parts by weight of the clear starch solution, and the solution thus obtained is added to the cellulose pulp in a conventional papermaking process. Fifteen parts by weight of starch are suspended in 50 to 80 parts by weight of water, and 10 parts by weight of sodium hydroxide in the cold, to form a second starch solution. One-hundred parts by weight of the second starch solution are mixed with 3 to 5 parts of a portion of the second cooled mixture, adding the filtrate additive so formed to backwater drained from paper being processed. The water in a material-recovery plant is separated from fibrous and filler substances, and these substances are recycled to the cellulose pulp. The clear water issuing from the material-recovery plant is mixed with lime water to impart a pH of at least 6.

INT-0541
Marti, E. Method of processing slaughterhouse wastes and animal carcasses. Switzerland 456,660; filed Sept. 29, 1967; issued May 31, 1968.

In this process, slaughterhouse wastes are precooked, chopped, cooked, and sterilized. The incoming material with bones is separated from the material without bones. The waste which contains bones is precooked to the extent that the meat readily separates from the bones. The meat wastes are shredded, and the bones remain in the precooker until they are cooked to a state of complete disintegration. (Text in German)



INT-0542
Smelkov, V. K., and I. S. Shestakov (Moscow Technological Institute of Light Industry). Collagen dispersions from collagen-containing waste products. U.S.S.R. 220,420; filed Feb. 14, 1967; issued June 28, 1968.

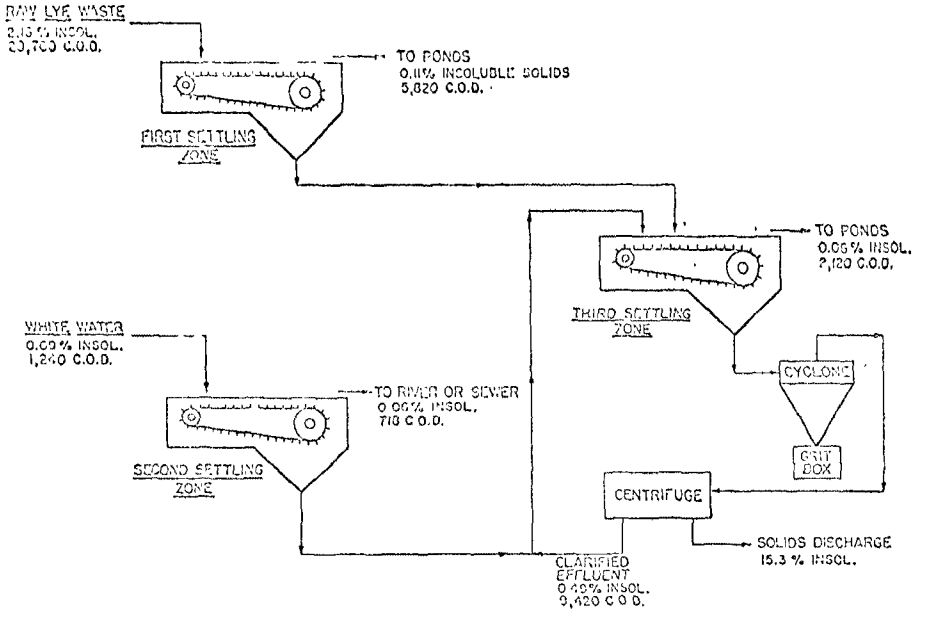
Waste products, such as glue stock, are rinsed with a surface-active agent, ground, subjected to alkali-salt treatment, and

passed through a hydrodynamic apparatus. To shorten the production cycle, the wastes are treated with sodium hydroxide in a saturated sodium sulfate solution, and are subsequently rinsed and pulverized. (Text in Russian)

INT-0543

Corey, R. C. (Pennsalt Chemicals Corporation). Treatment of alkaline vegetable wastes. Australia 286,316; filed June 17, 1964; issued Oct. 14, 1968.

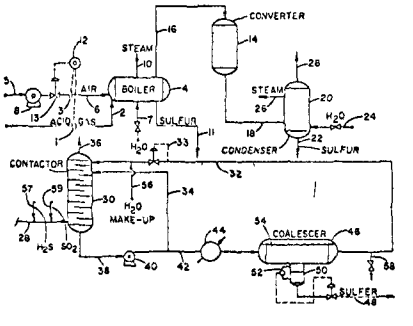
A process for conditioning potato peeling lye waste and potato white water comprises delivering the lye waste and white water to two successive settling zones, where bacterial organisms are allowed to act on the waste. Underflow streams from the first and second zones are directed to a third settling zone; an underflow stream from the third zone is withdrawn and centrifuged to separate the solids and aerate the supernatant liquor. The solids are discharged, and the aerated liquid is recycled into the underflow stream between the second and third zones. Overflow liquid streams are withdrawn for discharge from each of the settling zones.



INT-0544

Kunkel, L. V. (Pan American Petroleum Corporation). Recovery of sulfur from plant effluent. Canada 797,739; filed July 25, 1966; issued Oct. 29, 1968.

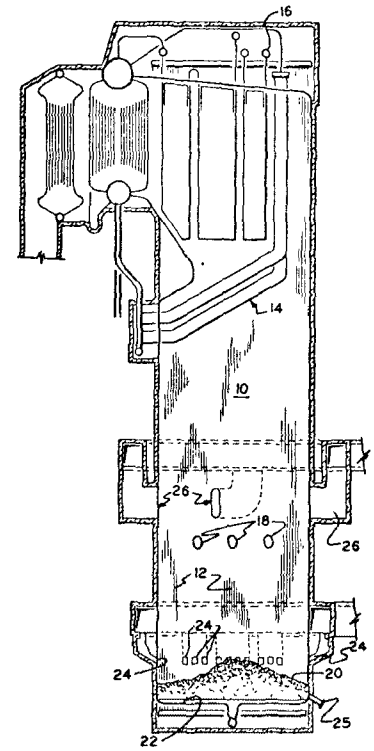
A process for recovering free sulfur from a gaseous stream containing hydrogen sulfide, such as that emitted by a Claus-type sulfur recovery plant, involves reacting hydrogen sulfide and sulfur dioxide in a reaction zone in accordance with the equation: 2(hydrogen sulfide) plus (sulfur dioxide) yields 3(sulfur) plus 2(water). Elemental sulfur, unconverted hydrogen sulfide and sulfur dioxide are withdrawn from the reaction zone in a gaseous stream, and the elemental sulfur is removed. The resulting sulfur-denuded stream is scrubbed with water, in a contacting zone, at a temperature up to the boiling point of water. An aqueous slurry of solid-free sulfur is withdrawn, then heated to convert the sulfur to liquid form, and the liquid sulfur is removed.



INT-0545

Lewis, E. C., and R. G. Tallent (Combustion Engineering, Inc.). Chemical recovery unit. Canada 803,788; filed July 15, 1966; issued Jan. 14, 1969.

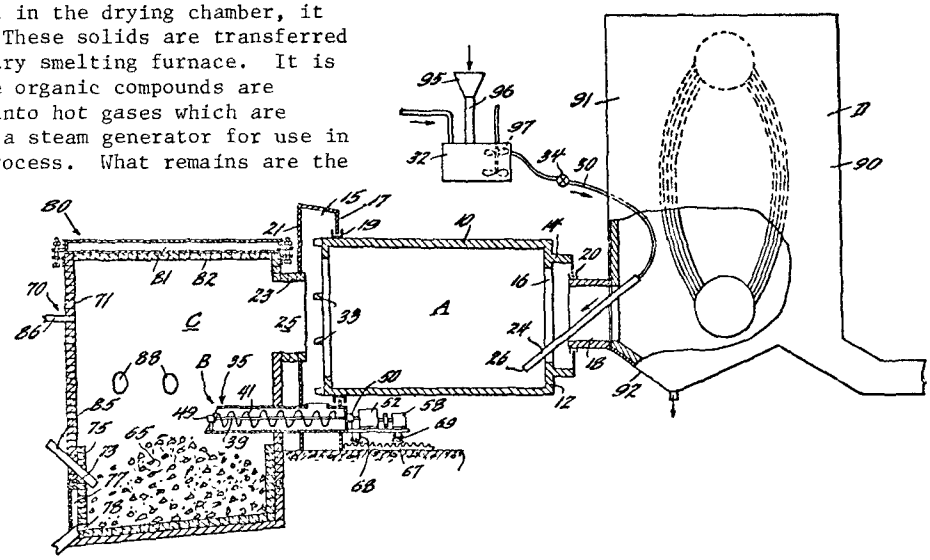
The 'black liquor' produced from the kraft-pulping process is fed into this furnace. There the combustibles in the liquid are burned, while the noncombustible chemicals are smelted and recovered. This upright furnace is lined with steam-generating tubes that are capable of producing steam of at least 900 lb per sq in. The primary air-induction ports are located at the bottom of the furnace, allowing a jet of air to be directed at the pile of combustibles. A unique feature of the system protects the steam-generating tubes with sheets of perforated stainless steel. The steel sheets are welded to the tubes, and they protect the tubes from solidified chemicals.



INT-0546

Lenz, W., A. Tirado, and R. Gaytan (Fabricas de Papil Loreto y Pena Pobre). Method and apparatus for heat and chemical recovery from waste liquors. Canada 805,061; filed June 23, 1966; issued Jan. 28, 1969.

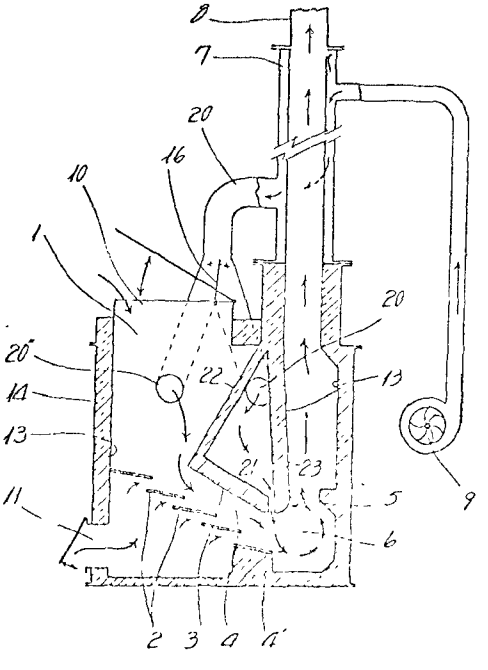
Waste liquors which result from the production of pulp by chemical and semichemical processes can be reduced to inorganic chemicals. Concurrently, the heat values which can be derived from the organic compounds contained in the liquor can be utilized. Waste liquors are carried by gravity into a rotary dryer. As the liquor comes into contact with the hot gases present in the drying chamber, it solidifies. These solids are transferred to a stationary smelting furnace. It is here that the organic compounds are transformed into hot gases which are channeled to a steam generator for use in the drying process. What remains are the inorganic compounds that were present in the waste liquors. This invention makes it economically feasible for low-capacity pulp mills to invest in a system of this type.



INT-0547

Nakagawa, T. (Nakagawa Kogyo Company, Ltd.). Device to incinerate rubber and synthetic resins that emit smoke. Japan 44-2,150; filed Apr. 5, 1965; issued Jan. 29, 1969.

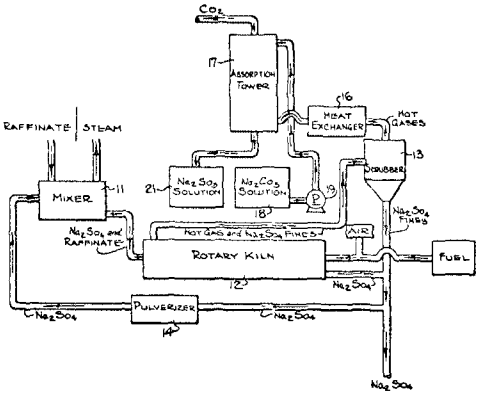
This device will completely incinerate materials such as rubber and synthetic resins, which usually emit a lot of smoke so as to emit only colorless and transparent fuel-forming gas which is free from soot or black smoke. The inside of the incinerator is covered with fireproof bricks, and at the top of the incinerator is the dumping opening. Under this opening there is a bin which stores the material to be burned. There are grids onto which the liquefied material falls. At the bottom of the fuel storage chamber, there is the primary incineration chamber, whose roof ignites, and which leads to the secondary incineration chamber. The primary incineration chamber gradually narrows down, and at the narrowest end it opens into the secondary incineration chamber. At the narrowed part, there is an air-jet opening which supplies sufficient air to the incompletely burned gas passing through the primary incineration chamber. At a suitable place in the secondary incineration chamber, a smoke duct is opened to emit the exhaust gas. The fuel storage chamber slants slightly so that flame and heat will not liquefy the refuse in too great a quantity at one time. When the material is liquefied, it falls into the combustion chamber. The equipment is compact, simple to handle, costs little, and can be used in urban areas. A simple, durable, and inexpensive gas-cleaning device is attached to eliminate sulfur dioxide and hydrogen chloride. (Text in Japanese)



INT-0548

Biggs, W. A. (Sonoco Products Company). Process for the recovery of sodium carbonate and sodium sulfate from spent sulfite liquor. Canada 806,072; filed June 7, 1966; issued Feb. 11, 1969.

The waste liquors which result from a sodium-based sulfite pulping process can be reduced to reusable chemicals. A particulate noncombustible constituent, such as sodium sulfate, is mixed with a solids-containing liquor. When sodium sulfate is utilized, a raffinate of acid, which is extracted from the sulfite liquor, is employed. The mixing process occurs at a temperature range of 750 to 1,250 F and at a ratio of sodium sulfate to raffinate within the range from 2 to 1 to 9 to 1. During this combination process, the volatile components within the mixture are removed as they evaporate. The organic matter is burned off, and the desired constituent remains as the residue. A portion of this residue is channeled back into the recovery process to be remixed with the waste liquors.

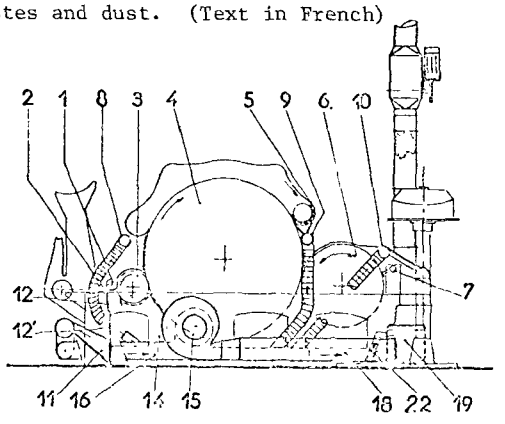


INT-0549

(Ste. Ame des Etablissements N.E.U.). Installation of means for the release of dust and the clearing of textile machine wastes. Switzerland 470,498; filed Nov. 29, 1966; issued Mar. 13, 1969.

The operation of combing machines poses two important problems: air pollution, and a rapid obstruction of the waste bin. The installation of a means for the release of

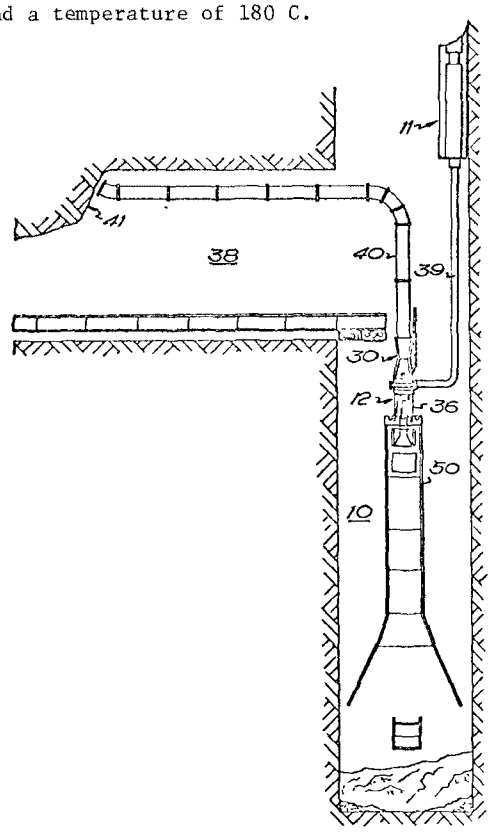
dust and the clearing of textile machine wastes provides for the simultaneous suction and release of dust and fluff, as well as of the wastes produced underneath the machines. A ventilator is situated on the side of the machine. Its suction hole is connected to the interception tubes in the dust zone and to an opening placed at the back of the machine, under the waste bin, in order to create a pneumatic sweeping action to draw off the wastes and dust. (Text in French)



INT-0550

Holter, H. Method of and apparatus for stowing mine waste, in underground mine workings. Great Britain 1,150,041; filed Mar. 3, 1967; issued Apr. 30, 1969.

Compressed air at an elevated temperature is supplied by a compressor directly to an expanding nozzle conveyor to which mine waste is fed, and which serves to forward the waste to a desired stowing location. The hot air is permitted to expand and cool before escaping from the conveyor into the ambient atmosphere. Lubricating oil for the compressor is remote from the air. The compressed air may be at a pressure of 2.5 atm above ambient pressure and a temperature of 180 C.



INT-0551

Nakamura, T., Y. Yamada, Y. Ono, and M. Seo (Toyo Ink Manufacturing Company Limited). Improvements in or relating to the treatment of waste cyanide-containing liquids. Great Britain 1,150,096; filed Sept. 13, 1967; issued Apr. 30, 1969.

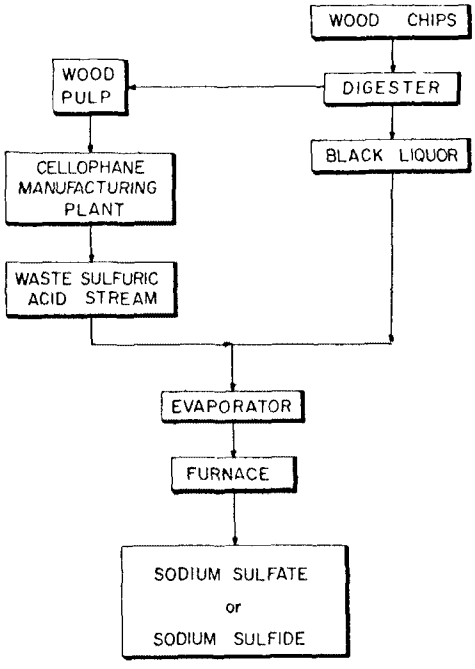
A method of detoxifying cyanide-containing waste liquids consists of treatment with an agent containing an organic carbonyl compound. The organic carbonyl compound employed is an aliphatic aldehyde, such as formalin. The organic carbonyl may be used together with sodium hydrogen sulphite or in the form of an addition compound with sodium hydrogen sulphite. The cyanhydrin produced by the treatment is converted into other nontoxic compounds before the waste is discharged. In the case of cyanide compounds in the waste water of general plating factories, it is desirable to precipitate the sulphides of heavy metals, and to separate and discharge the supernatant liquid into the drainage system.

INT-0552

Hanway, J. E., and G. R. Smithson (Container Corporation of America). Sodium-base pulping waste liquor treatment. Canada 814,311; filed June 3, 1966; issued June 3, 1969.

This treatment recovers sodium compounds from waste liquors for subsequent reuse in the manufacture of wood pulp. Waste liquor, which contains combustible organic matter, inorganic salts, and complex organo salts, is combined with a solution consisting essentially of sulfuric acid.

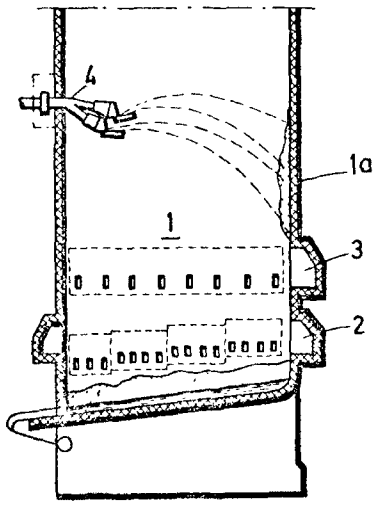
The acid should be in sufficient quantity to adjust the pH of the resulting solution to between 6 and 8. Evaporation concentrates the mixture, which is introduced to a fluidized bed furnace maintained at a temperature of from 1,000 to 1,800 F. Organic matter is burned away leaving a granular product consisting of sodium compounds. Under oxidation conditions, sodium sulfate is recovered; under reduction conditions sodium sulfide is recovered. Waste liquors which emanate from wood pulping operations, can be utilized for recovering chemicals which are used in the production of wood pulp.



INT-0553

Wessberg, J. E. (Aktiebolaget Goetaverken). Combustion furnaces for waste liquor. Canada 817,094; filed Apr. 4, 1967; issued July 8, 1969.

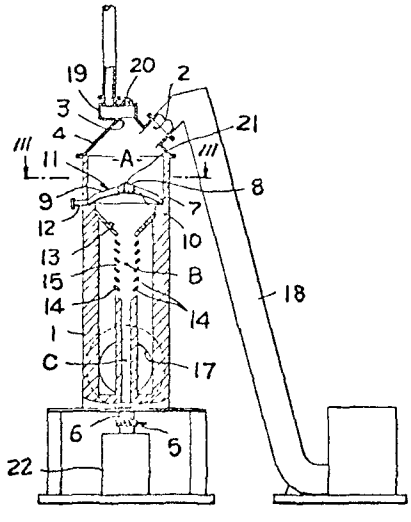
This injection device, when used in combustion furnaces, recovers waste liquors derived from the manufacture of pulp. Two nozzles protrude through one side of a vertical combustion furnace. The nozzles, arranged one above the other, are provided with horizontal spraying plates. A lower nozzle sprays one plate to cause the waste liquor to be dehydrated into solid particles and gasified components. Waste liquors which emanate from the upper nozzle contact the products discharged from the lower nozzle. This injection device reduces the spattering caused when the emitted liquor hits the spraying plate, thereby resulting in an improved droplet dispersion that is sprayed into the furnace.



INT-0554

Mizobuchi, I., and T. Yamaga (Hirakawa Iron Works). Furnace suitable for the rejuvenation of waste charcoal and sludge combustion. Japan 44-18,154; filed May 27, 1966; issued Aug. 8, 1969.

A special type of incinerator effects the elimination of water, the heating and roasting of used activated charcoal, and the treatment of industrial waste water. The vertical incinerator has an opening at the top for charging, and at the bottom for discharging. Below the drying chamber is the combustion chamber, which has many draft holes to

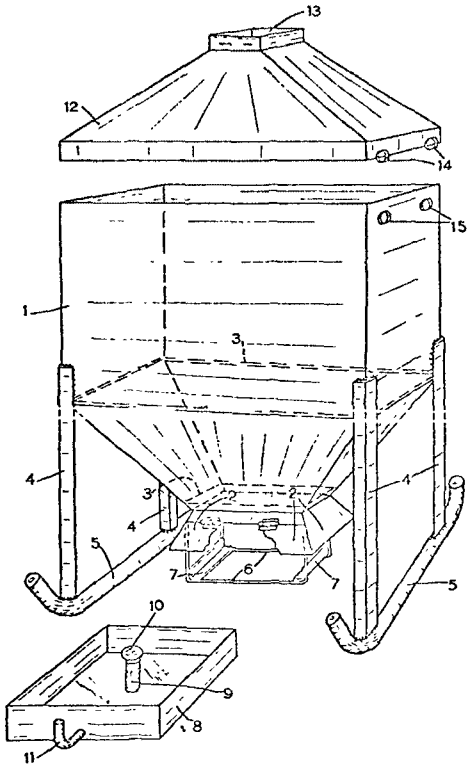


facilitate air circulation. The discharge opening empties the roasting chamber, which is below the heating chamber. When the burner is ignited, the combustion gas flows around the outside of the roasting and heating chambers, and then rises to the drying shelf and drying chamber from which it is discharged. Part of the water from the material placed in the drying chamber evaporates and is discharged. The other part collects on the walls of the chamber, runs along the drying shelf, and is released outside. The old activated charcoal, now 30 percent water, loses its adhesive qualities, and drops down into the next chamber where the organic material is burned. The 700 C gas from below forms a porous surface on the remaining material. When this is roasted without air supply and at a high temperature, activated charcoal is reclaimed. (Text in Japanese)

INT-0555

Marsh, C. J. Improvements in or relating to offal and carcass disposal burners. Australia 293,876; filed Nov. 8, 1965; issued Sept. 1, 1969.

An incinerator for the disposal of animal carcasses consists of a bin which is tapered from a wider upper portion to a narrower lower portion, and which is open at its lower end. A grate is supported within the bin, and a fuel container is located below the open lower end of the bin. The fuel container is arranged so that a space is provided to admit external air into the lower portion of the bin between the fuel container and the lower portion of the bin. The lower portion of the bin and the fuel container are shaped and arranged in relation to each other so that when the fuel within the container is ignited the hot combustion products of the burning fuel rise through the grate within the bin. Melted fat from the carcass which is being burned can flow down through the lower portion of the bin into the fuel container where it can be burned. The bin may be made of sheet steel and may be supported on a concrete block. The grate may be in the form of a basket having sides parallel to the sides of the bin. The fuel container is preferably separable from and slidably engaged with the lower portion of the bin.



INT-0556

Mannbro, N. V. (Skogsagarnas Industri Aktiebolag). Method of reducing the discharge of waste products from pulp mills. Canada 828,653; filed July 25, 1967; issued Dec. 2, 1969.

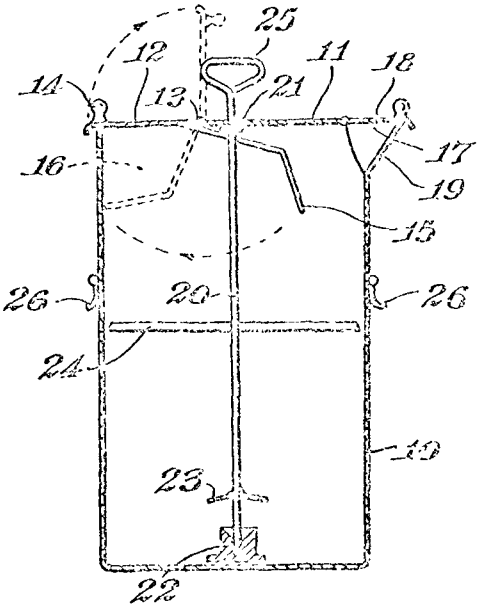
This process recovers the waste liquor discharged from cellulose pulp mills in order to regenerate the digestion chemicals. First the pulp is bleached, and the resultant waste liquor is treated to reduce the BOD of the fibrous waste products. At the same time, coarse or incompletely digested materials are converted into useful cellulose pulp after being dewatered. After the fibrous waste is treated, oxidized sulfides and chlorination products of resin acids are extracted by washing with water, alkali or other solvents; the residues produced are separated from the pulp suspension as filtrate. Bleached fibre can be recovered and returned to the pulp manufacturing process. This process decreases the amount of pollutants discharged from pulp mills.

INSTITUTIONAL WASTES

INT-0557

Barrington, D. Improvements in and relating to sanitary pails and like refuse receptacles for the disposal of soiled sanitary towels and septic bandages. Great Britain 589,267; filed Mar. 21, 1945; issued June 16, 1947.

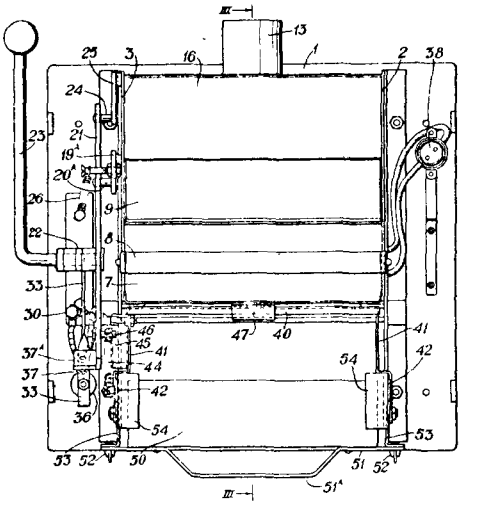
A pail or similar refuse receptacle for the disposal of soiled sanitary towels and bandages comprises a container for a liquid capable of reducing the matter to be disposed of to liquid form. This container has a closed upper end incorporating a hinged, segmented lid and an opening through which the contents of the container can be discharged when it is tilted. The lid has, secured to its inside, a plate which will, on opening the lid, form the bottom of a chamber at the upper end of the container. An agitator located within the container consists of a rotating vertical rod, and is furnished with a mechanism or mechanisms for effecting turbulence of the container contents when the rod is manipulated.



INT-0558

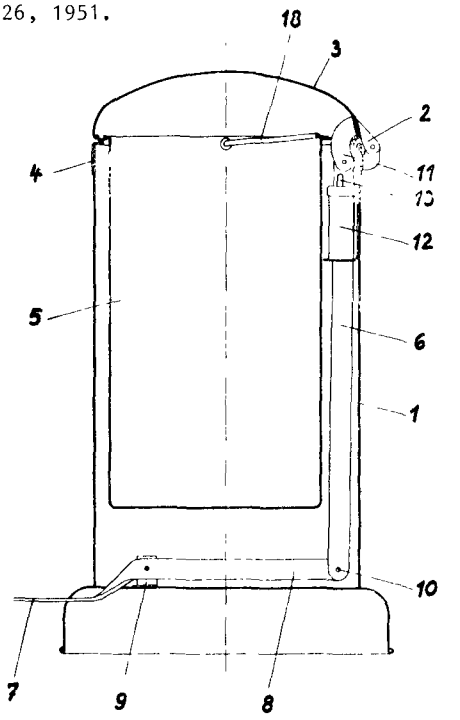
Huber, H. E. C. Improvements in or relating to incinerators. Great Britain 621,085; filed Jan. 1, 1947; issued Apr. 4, 1949.

This incinerator provides a self-contained unit for the disposal of soiled bandages. The incinerator comprises a combustion chamber having a stationary grate at its lower side and a flue at its upper side. There is an electric heating device associated with the combustion chamber, and a switch for controlling the current supply to the heating mechanism. This device is operated in conjunction with a time-delay mechanism which ensures that when the switch is closed to allow current to be supplied to the heating device, the current continues to flow for a predetermined period. An opening in the flue permits bandages to be introduced into the combustion chamber. A closure device for the opening can be swung to an open or closed position. Beneath the stationary grate is an ash scraper. There is also a mechanism for simultaneously swinging the closure device, operatively displacing the scraper, and operating the switch device so a bandage can be introduced into the combustion chamber and burned.



INT-0559

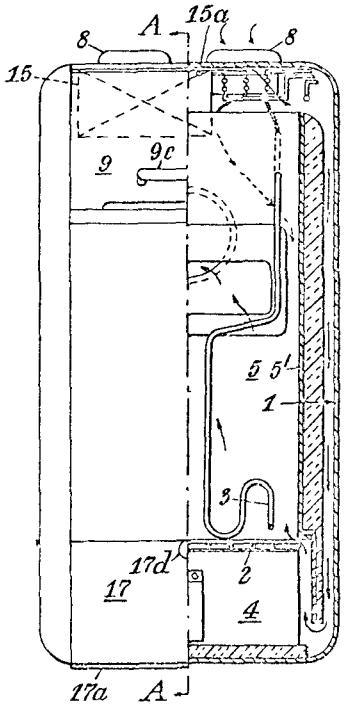
Guenther, H. (Quarzlampen G.m.b.H.). Garbage can, primarily for the use by medical doctors. Germany 822,376; filed May 4, 1950; issued Nov. 26, 1951.



A garbage can devised primarily for use in the offices of medical doctors has a removable container and a lid operated by a foot pedal. The connecting rod, which is between the foot pedal and the lid and which ascends between the casing and the container, is connected to a pneumatic brake. The latter is accommodated between casing and container. The axis of the brake cylinder is arranged parallel to the connecting rod, and the piston of the pneumatic brake, which rotates around its axis, is connected at an angle to the connecting rod. By closing the lid, an enclosed air volume is compressed in the brake cylinder. The compressed air leaves through a small opening in the brake cylinder. Upon opening of the lid, a valve opens so that only a slight resistance impairs the movement. The garbage can is tightly sealed on top by an intermediate lid which has an eccentric opening for receiving the container. The distance between casing and container is greatest in the vicinity of the link for the lid. The foot pedal can be locked in the open position. (Text in German)

INT-0560

Knowles, D. J. Improvements in and relating to incinerators for the destruction of surgical dressings, catamenial appliance and the like. Great Britain 693,487; filed Nov. 23, 1949; issued July 1, 1953.

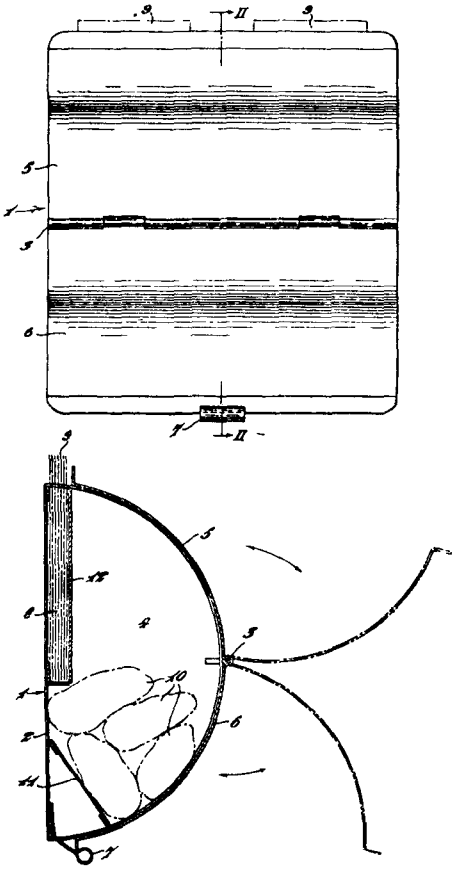


The incinerator comprises a rectilinear outer casing, with an inner wall forming a combustion chamber provided with longitudinal electric heating elements formed as a basket, and a grid at its lower end. A space for a removable ash box is located beneath the grid. Waste is introduced through an insulated door at the top. A heat-insulating wall surrounds the combustion chamber and is separated from the outer casing by a cooling air space. Air is drawn through louvers at the top or, alternatively, at the side, down through the grid and air space, and out through a flue pipe. A fan in the flue pipe accelerates airflow.

INT-0561

Betts, E. I., and J. Gordon (Willet and Robinson Limited). Sanitary disposal unit. Great Britain 721,069; filed Nov. 5, 1952; issued Dec. 29, 1954.

A semicylindrical container, with two equally sized, horizontally-hinged covers opening outward, is mounted vertically. An inner pocket for holding a fresh supply of sanitary bags consists of a metal sheet fixed parallel

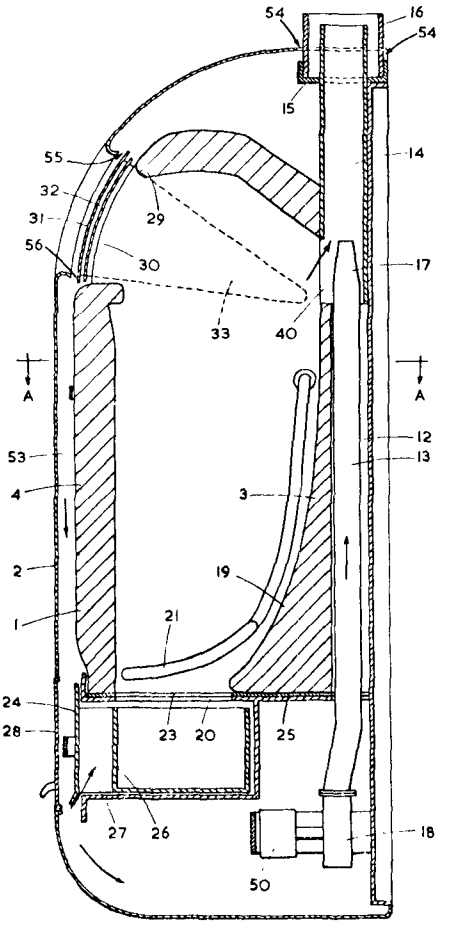


to and at a distance from the interior surface of the flat rear wall. The upper swinging door is normally closed by its own weight; the lower is held shut by a spring clip.

INT-0562

Buckle, E. P. Incinerator. Canada 512,160; filed Apr. 24, 1954; issued Apr. 26, 1955.

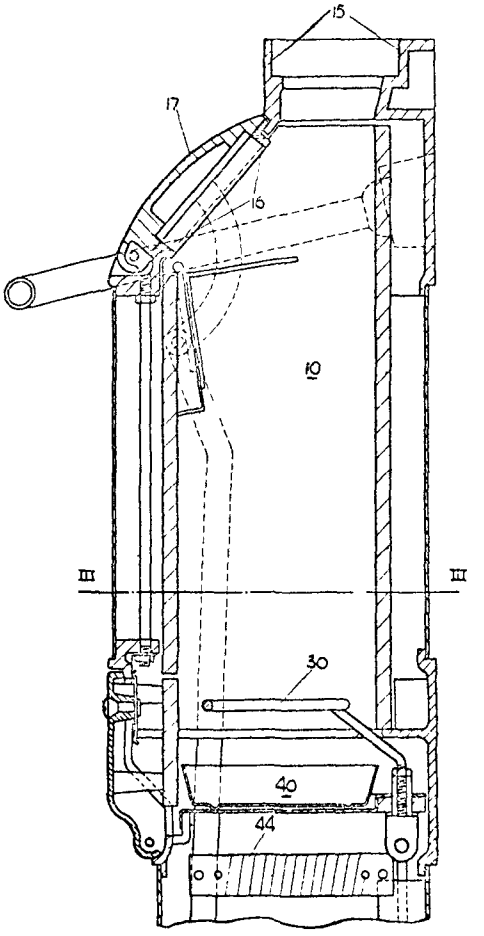
An incinerator for hospital wastes consists of a furnace made of a ceramic substance and containing a heating element. A casing surrounds the furnace, leaving an air space between the exterior side and front walls of the furnace and the casing. Cooling air is circulated through the air space by a fan driven by an electric motor the same fan, draws the gases of combustion through an outlet in the casing. When the lid of the furnace is opened, an electric relay closes a switch which sets in operation the heating element, the fan motor, and a clock motor. The clock motor opens the switch after a predetermined interval.



INT-0563

Leng, T. R., and F. H. Morris (The General Electric Company Limited). Improvements in or relating to electric incinerators. Great Britain 750,038; filed Oct. 25, 1951; issued June 6, 1956.

The incinerator is designed for the disposal of soiled bandages, towels, or pads, chiefly of cellulose wadding. Such material is dumped through an entry door directly into a combustion chamber. At the bottom of the chamber is a main grid-like heating element which, at full power, initiates combustion. A transformer is provided to supply about 4 1/2 volts AC to the grid. An ashpan provided with air passages lies beneath the grate. A flue extends from the upper part of the incinerator chamber. Additional resistance elements are mounted

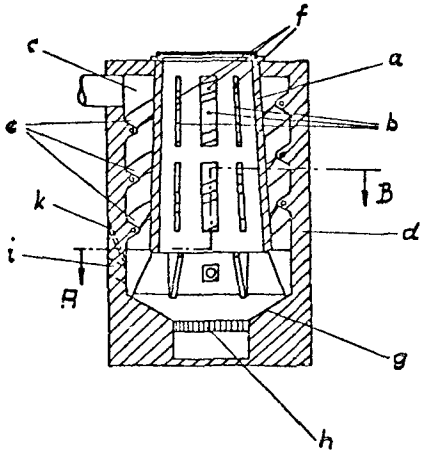


below the ashpan to preheat the air entering the combustion chamber. A feature of the apparatus is the provision of means to maintain continuous heating of the main element at a reduced temperature, except

when higher temperatures are required to initiate combustion, thereby maintaining a constant flue draft.

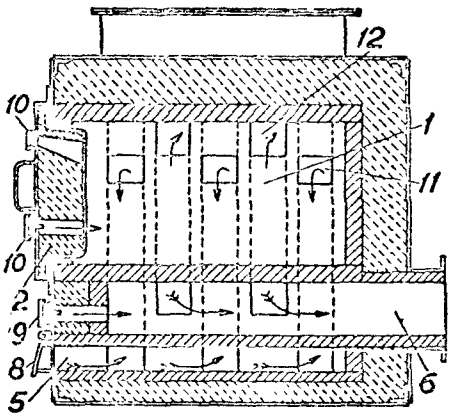
INT-0564
Kraupner, H. (G. Moller). An incinerator for burning hospital, abattoir, and other waste matter. Germany 1,098,662; filed Aug. 27, 1954; issued Feb. 2, 1961.

An incinerator for burning waste products from hospitals and slaughterhouses comprises at least one vertical filling and combustion shaft and an afterburning chamber for the gases of combustion. On the interior side of the oven walls, and inside the shaft walls, are air vents. The inner side of the exterior wall of the oven is provided with screw-shaped pipes serving as heating units, so that preheated air is conducted through the gas combustion chamber and through the vents in the shaft wall. The gas burner is situated in the bottom part of the combustion chamber so that the flames are directed toward the upper surface of the lower part of the shaft. The ashes are withdrawn through a door on a level with combustion chamber. (Text in German)



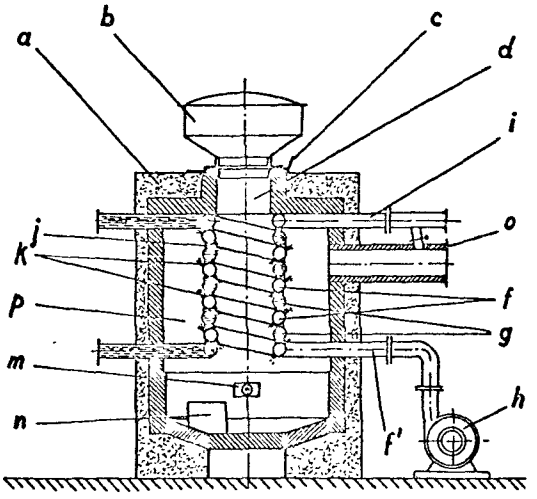
INT-0565
Hakenstad, A. (Svenska Metallverkens Ugns Aktiebolag). Incinerator. Germany 1,121,262; filed Dec. 5, 1952; issued Jan. 4, 1962.

This incinerator is used particularly for the combustion of waste in a hospital. The combustion is initiated by introducing into the furnace chamber air heated with the aid of electric resistors. Combustion gas discharge ducts are disposed between the air feed ducts in the furnace walls. (Text in German)



INT-0566
Schutter, H. (G. Moller). Incinerator. Germany 1,128,588; filed Nov. 7, 1956; issued Apr. 26, 1962.

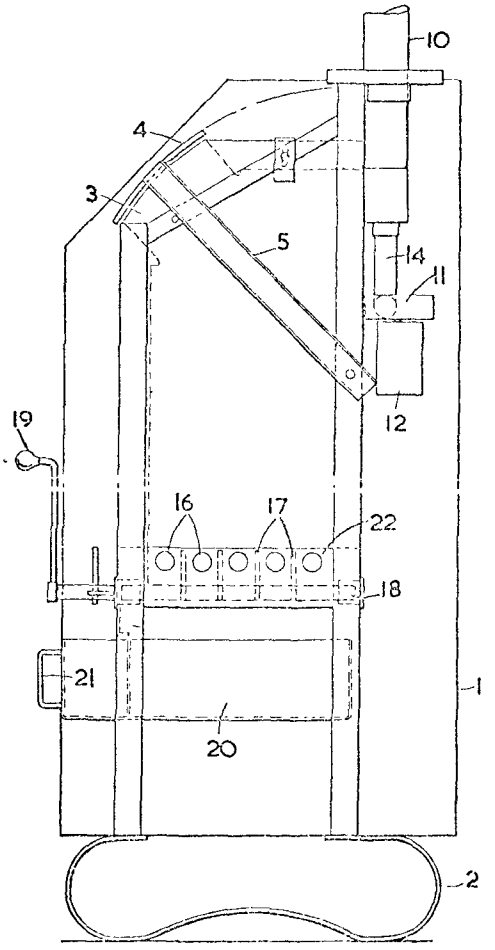
An incinerator provides for the combustion of waste from hospitals, slaughterhouses, and other sources. This device has at least one vertical filling and combustion shaft, surrounded by an afterburning chamber. The incinerator is modified so that the fresh air discharge openings are not on the inside of the furnace wall, but on the inside of the filling and combustion shaft. The shaft consists of one or more hollow parts (preferably tubes), connected to an air blower. (Text in German)



INT-0567

Buckle, E. P. Improvements relating to incinerators. Great Britain 895,931; filed Jan. 24, 1958; issued May 9, 1962.

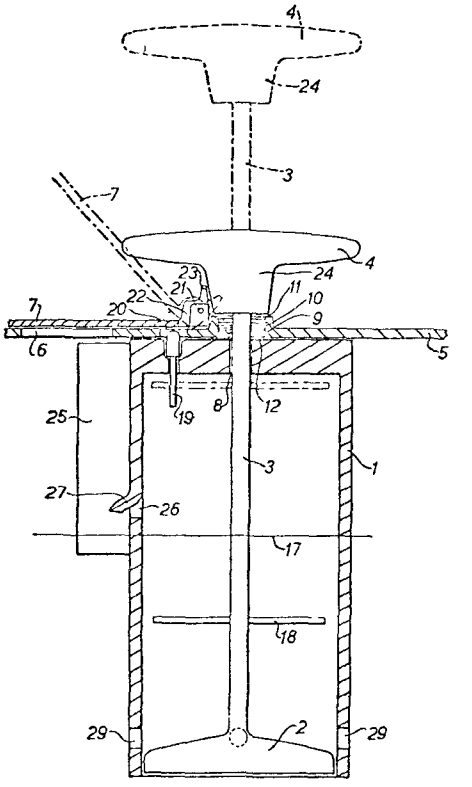
This incinerator burns wet, damp, or otherwise moist material, as well as dry material. It is composed of a combustion chamber with an outer casing, and a device for cooling the outer casing by circulating air and/or gases and for withdrawing the gases of combustion by an induced draft. One or more electrical heating elements are provided at the base of the combustion chamber. The elements are adapted to provide a greater or lesser amount of heat as required. The elements are shrouded to protect them from the material being burned and to enable the removal or introduction of one or more elements without contact with the combustion chamber or its contents. Movement of the lid of the incinerator automatically switches on the heating elements for a predetermined period. The incinerator operates economically in the use of heat required to burn the material. The incinerator is especially useful for hospitals.



INT-0568

Colbourn, W. G. (Thanet Foundry and Engineering Company, Ltd.). Improvement in disposal means for waste matter. Great Britain 1,021,749; filed Dec. 23, 1963; issued Mar. 9, 1966.

This container holds a caustic or acid solution which dissolves swabs, dressings, and towels in a sanitary manner. A piston is mounted within a column and is attached to an externally operable plunger. The plunger is operated to force a jet of acid through one or more holes in the column. This impregnates with acid any material which has been placed within the container to be destroyed.

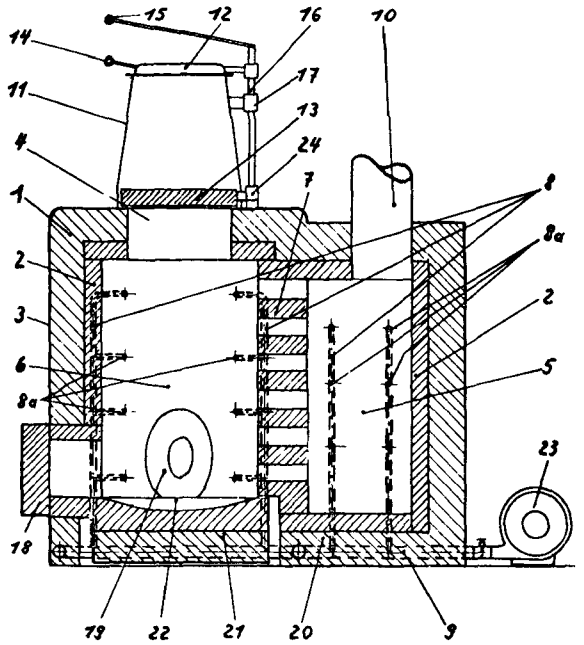


INT-0569

Michaelis, H., and H. Mettenborg (D. Althoff). Waste incinerator. Switzerland 430,018; filed June 5, 1964; issued Aug. 15, 1967.

An incinerator for the burning of all types of refuse, including hospital wastes, is constructed to permit the introduction of

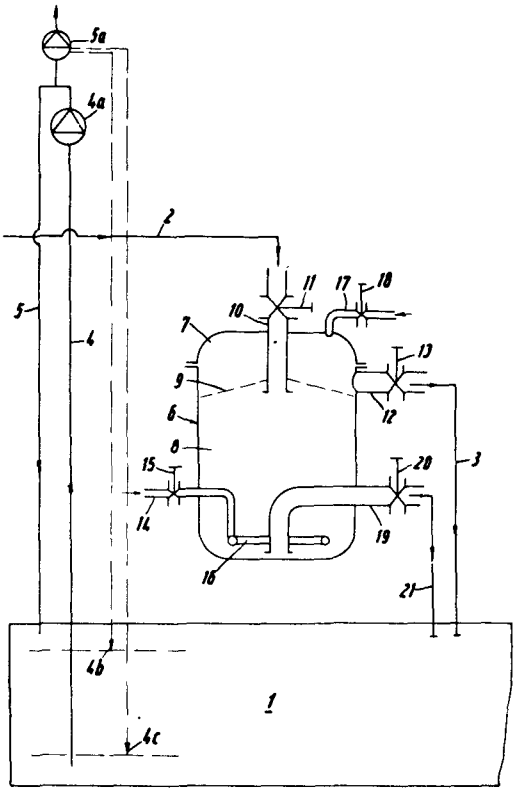
waste in a sanitary manner, and the removal of gas-forming combustion products completely and without odor or smoke. The principal combustion chamber is heated by whirlpool firing, and is connected at its upper end to a filling chamber provided with washable plates. The removable floor of the main combustion chamber is provided with a tray to catch the liquid waste products. A second chamber, next to the combustion chamber, provides a chimney with a blower system and suction. Vents are installed at different levels for air access. (Text in German)



INT-0570

Broege, K., and H. J. Schramboehmer (Rud. A. Hartmann Gross-Apparate und Spezialmaschinen G.m.b.H. and Company). Facility for automatic disinfection of solids carrying waste waters. Switzerland 471,043; filed Apr. 4, 1968; issued Apr. 15, 1969.

Solid hospital or similar wastes are pulverized by a grinder installed in the path of the solids-carrying waste water. The grinder is, at the same time, a pump which takes the solids and the waste water from a collection tank and again recirculates the wastes. The tank is equipped with a smaller feed pump, operated in accordance with the water level in the tank. The feed pump passes the ground solids and waste water over a heat exchanger and a disinfection boiler to the outlet. In the inlet path to the collection tank there is another chamber separated by a sieve grid into lower and upper sections. The larger lower section receives the solids-containing liquid. It has an inlet for steam, to disinfect the solid substances. The smaller upper section passes the liquid into the collection tank. This section has a steam inlet also. The discharge for the disinfected solids in the lower section is also equipped with a steam inlet for postdisinfection. The upper section of the chamber has an inlet for the freshly arriving solid refuse and waste water mixture. All outlets are equipped with manually or automatically controllable valves. (Text in German)

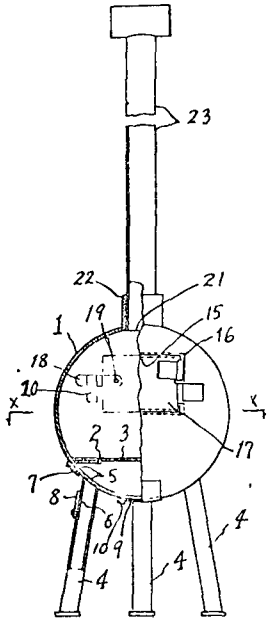


INT-0571

Hayashi, T. (Hokkai Tekkosho). Globe-shaped incinerator. Japan 44-9,156; filed Dec. 29, 1965; issued Apr. 26, 1969.

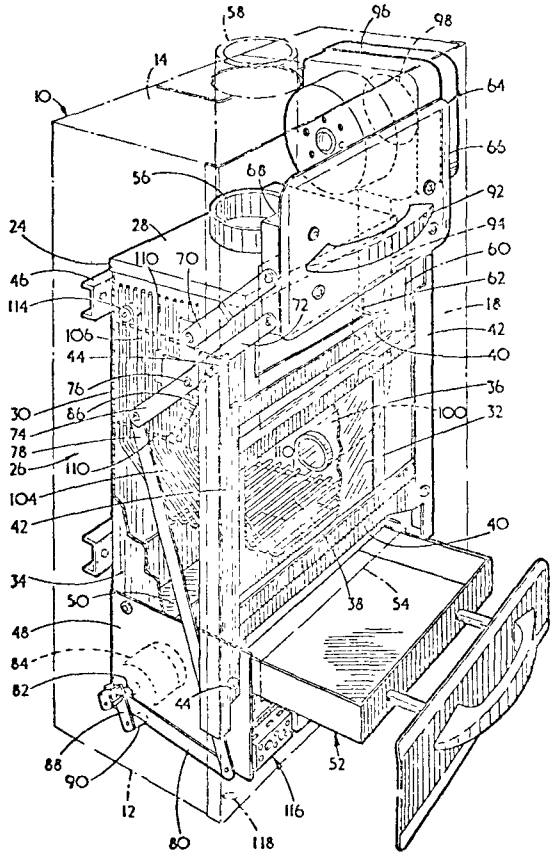
A compact, globe-shaped incinerator, for destroying classified documents in offices or for similar functions, consists of two hemispheres welded together. Inside, a horizontal fire

grid made of fireproof material and drilled with draft holes lies below a combustion chamber. A chimney that is detachable extends from the top. Openings at the top and bottom of the structure enable charging and discharging of materials. The incinerator is supported by stable legs. Since the combustion chamber is spherical, a draft is created which promotes complete combustion of matter in the gas exhaust. The shape of the incinerator makes it easily portable. It also minimizes heat loss. (Text in Japanese)



INT-0572
Price, E. E. (T. Price and Son Stampers Limited). Improvements in electric incinerators. Great Britain 1,162,495; filed June 16, 1967; issued Aug. 27, 1969.

An electrically heated incinerator for disposal of articles such as sanitary towels, dressings, and bandages, consists of a combustion chamber provided with a flue opening. Another chamber contains an electric heating element disposed between an air intake opening and a hot air inlet. A power-operated fan is arranged to cause a forced air draught to pass through the air heater chamber and thus heat the air passing into the combustion chamber. This effects combustion of the combustible articles, and then the air passes to the flue opening. A deflector is disposed opposite to and inclined downward toward the hot air inlet.

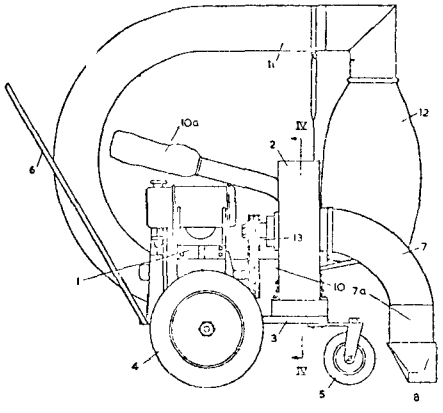


LITTER

INT-0573
Parsons, B. Improved machine for collecting litter. Great Britain 822,186; filed May 15, 1957; issued Oct. 21, 1959.

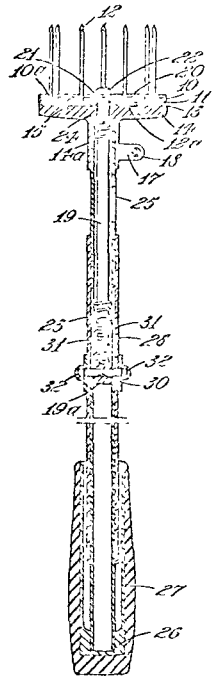
The machine comprises a chassis base supported by a pair of rear wheels and a front castor wheel. A hinged push handle is located at the rear of the chassis. A small gasoline engine, also mounted at the rear, drives a rotary three-bladed blower which provides the suction necessary for collecting the litter. The intake of the blower is connected to a tube with an intake device extending downward.

The litter is drawn up through this tube into a large collecting bag.



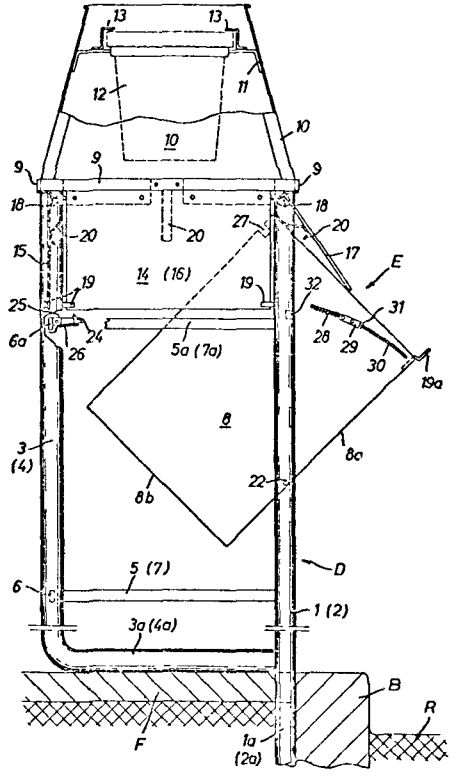
INT-0574
Helmore, W. Improvements in or relating to means for collecting litter. Great Britain 851,758; filed Dec. 9, 1957; issued Oct. 19, 1960.

A fork for collecting litter and other debris, particularly from between plants in flower and vegetable beds, consists of a series of pointed metal tines mounted in a circular plate. This plate is fastened to a hollow flanged supporting plate. The handle which fits into this flange comprises two telescoping tubes; the upper one equipped with a rubber grasp and the lower with an enclosed, spring-controlled rod, which depresses a terminal plate over the tines to remove debris collected on it. Alternative tine arrangements are described.



INT-0575
Golan, H. Z. (J. Holzer, and H. Z. Golan). A litter collecting bin. Germany 1,116,595; filed July 7, 1959; issued Nov. 2, 1961.

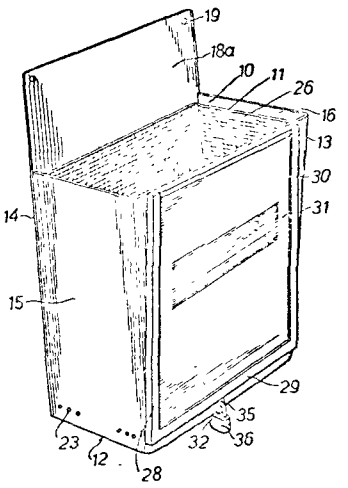
A litter-collecting bin is composed of a rectilinear frame structure having a rooflike cover. Housed vertically within is a similarly shaped container, open at the top. It is pivoted so that in emptying, it assumes a horizontal position. Pivotal flaps are arranged on all four sides of the frame structure. The cover is arranged to contain a planter. (Text in German)



INT-0576
Wetlesen, R. B. Litter bin or basket. Australia 247,215; filed Dec. 9, 1960; issued Sept. 25, 1963.

A litter bin or basket includes an outer container which has a closed base, and an open top and which is secured to a support.

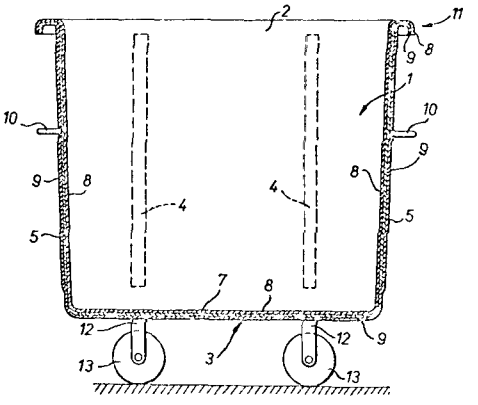
Within the outer container is a removable inner basket with a closed bottom and an open top. A removable, poster-bearing plate is mounted on the wall of the outer container so that the poster is exposed. The container, the inner basket, and the plate have adjacent parts with registering holes; a locking device engages the holes to lock these portions together. This prevents unauthorized removal of the inner basket or the plate. The plate and the inner basket are removed simultaneously when the litter bin is emptied.



INT-0577

Seiler, H. (Hermann Seiler Limited). Mobile refuse cart. Switzerland 454,735; filed Aug. 7, 1967; issued Apr. 15, 1968.

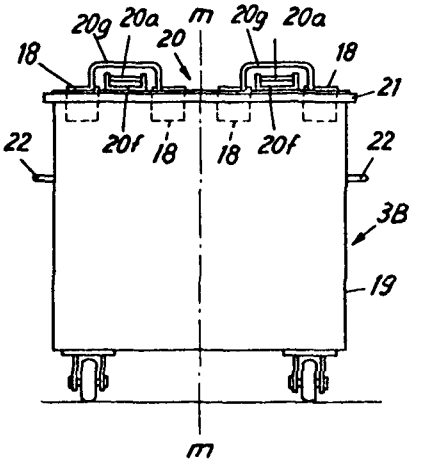
The handcart is comprised of a container with a U-shaped upper edge formed by a single, self-supporting piece of glass fiber-reinforced polyester. Metal stiffeners are embedded into the sidewalls and bottom. U-shaped tubular handles are fastened to the metal inserts in the two narrower sidewalls of the container. Metal brackets, holding the pins of the four rollers, are welded or bolted to the metal inserts in the bottom of the container. (Text in German)

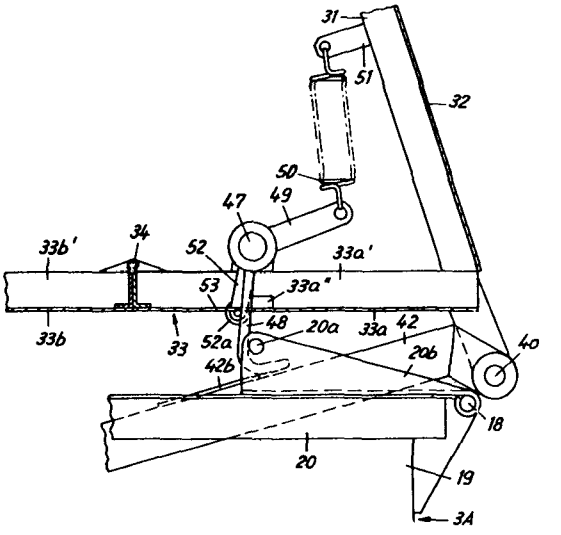


INT-0578

Ochsner, A. (J. Ochsner and Company A.G.). Bulk container discharge device mounted on a litter collection truck. Switzerland 455,634; filed Oct. 1, 1963; issued Apr. 30, 1968.

The discharging device incorporates an upper dust sheet and a lower dust sheet inclined at nearly right angles. The lower sheet can be coupled to the cover of the container by means of a coupling device, and it consists of two hinged sections. The first is rigidly connected to the upper dust sheet, while the second is elastically attached to the first.

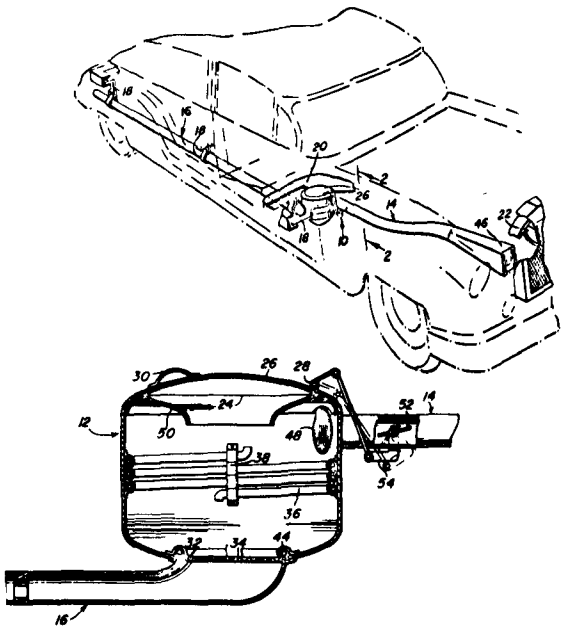




The coupling device is mounted on the first part of the lower dust sheet. In addition, a second coupling device may be mounted on the same part which couples the cover of the container to the lower dust sheet. Both coupling devices may be mounted symmetrically with respect to the longitudinal, vertical, central plane of the litter collection truck. Each is provided with a hook to engage a handle on the cover of the bulk container. (See also Switzerland 460,629) (Text in German)

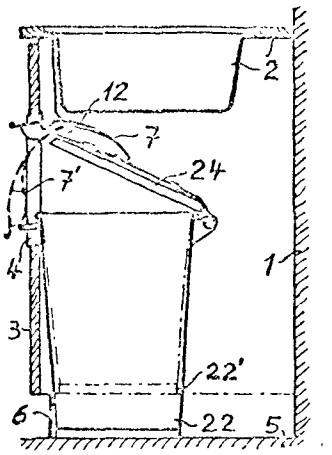
INT-0579
Baldine, J. J. Motor vehicle litter disposal. Canada 786,476; filed June 28, 1965; issued May 28, 1968.

A litter disposal device for use on vehicles consists of a cylindrical combustion chamber with an access opening in its top and a discharge opening at the bottom. The access opening is covered by a pivotally mounted airtight closure, and the discharge opening is covered by a foraminous guard. In the chamber is an electric heating element for igniting the refuse. A valve-controlled airflow is introduced through an intake pipe whose end is in communication with a source of moving air, and whose other end leads to the upper interior of the chamber. The air swirls about the interior of the chamber and out the guarded discharge opening; this tends to ensure a complete burning of the refuse. Only a fine, powdery ash is discharged. This device is designed to allow rapid and clean disposal of any combustible litter with only a minimum amount of effort.



INT-0580
Tschalaer, A. Litter cabinet. Switzerland 462,037; filed Aug. 25, 1966; issued Aug. 31, 1968.

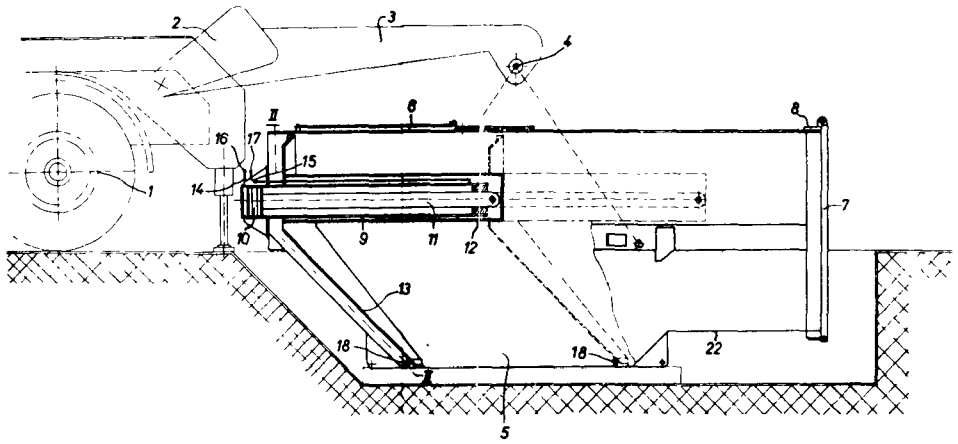
The cabinet contains a litter bin with a front door covering at least the lower part of the bin. The cabinet also has a front opening through which the litter can be deposited into the bin, while the door remains closed. The bin is firmly supported inside the cabinet, and it is provided with a hinged lid linked to a sliding cover so that when the lid shuts the litter bin, the cover lies behind the front opening. When the lid opens, the cover slides upward and out of the way. (Text in German)



INT-0581
Wirz, E. (Ernst Wirz A.G. Kipper- und Maschinenfabrik). Exchangeable charging box for loose material, particularly for litter. Switzerland 462,718; filed Dec. 5, 1967; issued Sept. 15, 1968.

In order to increase transport capacity, the charging box has a built-in or attachable compacting device. The compacting device incorporates a shiftable or tiltable presser plate connected to a hydraulically or pneumatically operated press. The compacting device is located in the front of the charging box interior, and a door is provided in the back wall. The bottom of this box extends horizontally to the back, from the tipping pivot bearing of the box to its back wall. The sidewalls of this box may be pulled inward, along their upper edges, to provide clearance for the rocker arms of the tipping device. A retaining device is built into the charging

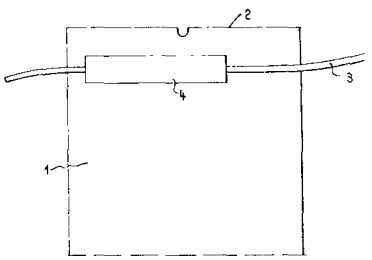
box interior to retain the compacted loose material in the rear part of the charging box when the presser plate returns to its initial position. (Text in German)



INT-0582

Paetzold, W. (PAPRO A.G. fuer Papierverarbeitung). Litter bag and method of its manufacture. Switzerland 464,068; filed Sept. 22, 1967; issued Oct. 15, 1968.

This litter bag has a tie string fastened to the bag wall, below its opening, by means of a paper cover strip glued to the bag wall. The two ends of the string, extending on both sides of the cover strip, are of unequal length. The litter bag is automatically produced in a bagmaking machine. (Text in German)

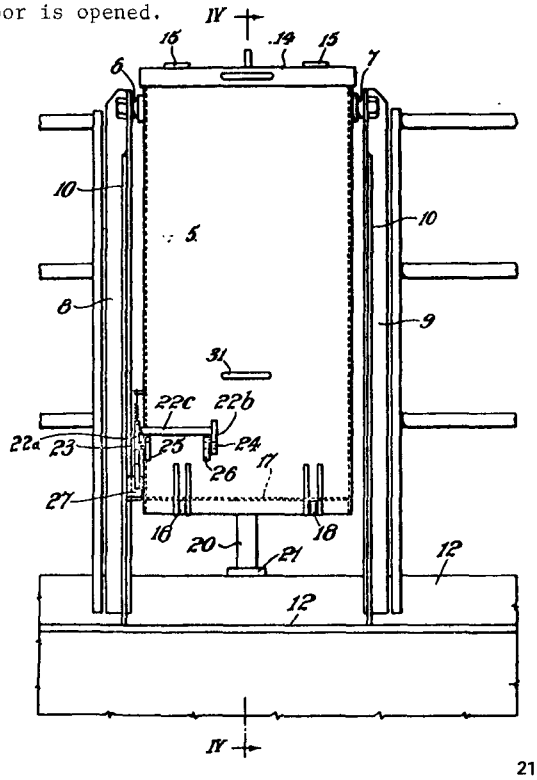


OCEAN DISPOSAL

INT-0583

Lamb, J., and J. C. J. Croome (Shell Refining and Marketing Company Limited). Improvements in or relating to refuse receptacles. Great Britain 711,931; filed Apr. 23, 1952; issued July 14, 1954.

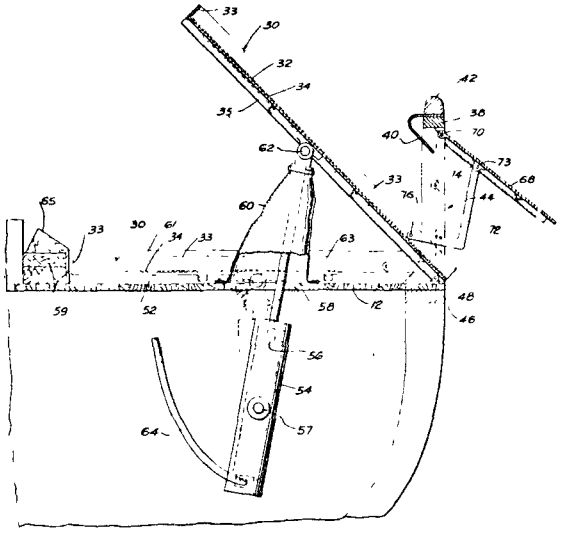
A pivotally mounted waste container disposes of galley garbage and engine room wastes overboard. The container is mounted on a supporting base. It is held upright during filling, and pivoted to an inclined outboard position during emptying. A hinged lid with spring attachment covers the top. The bottom, also hinged, can be opened by a foot pedal when the container is tilted overboard for discharge. Replaceable disposal bags of temporary oil- and liquid-proof paper material are supported on the inside of the container, and they slip out intact when the discharge door is opened.



INT-0584

Gorton, T. S., Jr. Apparatus for dumping debris from the deck of a vessel. Canada 609,839; filed Aug. 9, 1957; issued Dec. 6, 1960.

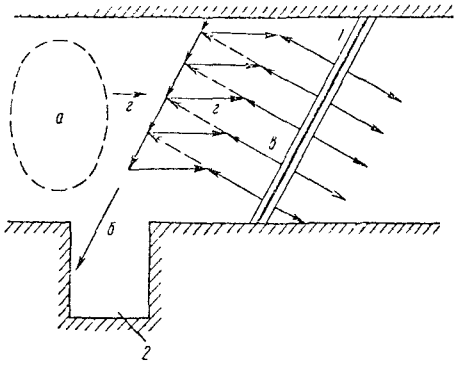
An apparatus for automatically discharging debris from the deck of a vessel comprises a pivoted auxiliary deck, adjacent to a side of and on top of the main deck. The adjacent side rail has an opening near the pivoted end of the auxiliary deck. Debris is dumped onto the auxiliary deck which is raised, while a cover on the opening in the side rail is simultaneously opened to permit the debris to slide down the auxiliary deck, through the opening, and into the sea.



INT-0585

Bazilevskiy, I. V. Method of cleaning rivers. U.S.S.R. 159,140; filed Oct. 16, 1962; issued Nov. 22, 1963.

Compressed air is injected into the flowing river water through a perforated pipe. The pipe is laid between the riverbanks on the

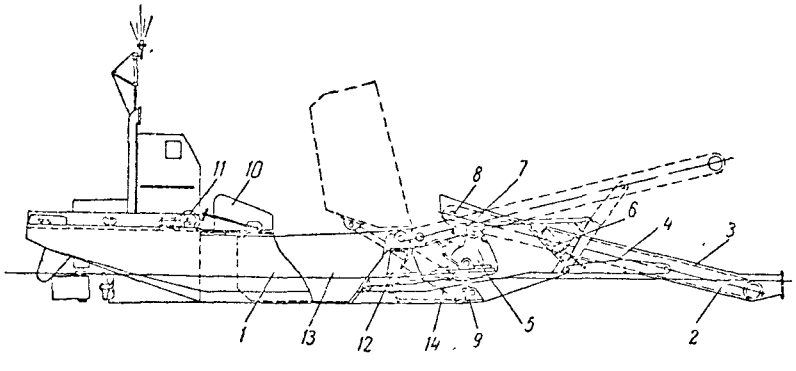


bottom of the river at an oblique angle to the direction of the flow. In rising to the surface, the injected air induces a back- and upward-directed flow of water, parallelling the perforated pipe. This produces a stationary swell at the water surface, extending as an oblique strip across most of the river. This swell intercepts flotsam and oil with the surface layer of the water and deflects it toward riverbank traps. (Text in Russian)

INT-0586

Yatsenko, V. A. Self-propelled barge for removal of flotsam from bodies of water. U.S.S.R. 176,809; filed Dec. 30, 1963; issued Nov. 17, 1965.

The barge has a reversing conveyor with a water-permeable wire screen belt attached to it. The alternative working positions of the conveyor are: a lower one for collecting flotsam from the water surface and conveying it to a container, and an upper one for discharging it from the conveyor to the shore. A dumpcart running on a rail track on the barge is attached by cable to a reversible winch. In operation, the screen belt of the

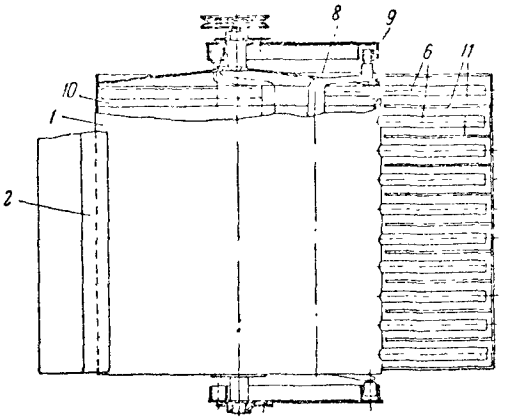


conveyor, in its lower working position, has its far end dipping into the water. It moves from the water surface to the dumpcart, and it entrains the flotsam during the forward motion of the barge on the water, and conveys it into the dumpcart. When the cart is full, the reversing winch pulls it along the container into which its contents are dumped, manually or with the aid of a special tipping device. When the container is full, the hydraulic cylinders turn the conveyor to its upper working position, in which it is inclined upward toward the shore. The movement of the conveyor belt motion is reversed while the hydraulic cylinder slowly turns the container, discharging its contents onto the moving conveyor belt. (Text in Russian)

INT-0587

Derzhavets, A. Y., P. G. Kogan, and V. N. Golubov (Central Planning-Designing Bureau No. 3). Device for cleansing bodies of water of floating contaminants. U.S.S.R. 187,636; filed Apr. 5, 1965; issued Oct. 11, 1966.

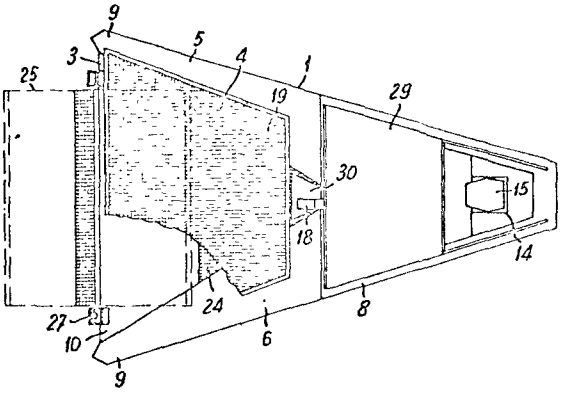
The device incorporates: a drum partially immersed in water; a scraper for removing oil film sticking to the drum; a comb for the removal of floating debris; a container for collecting oil; and a container for collecting solid flotsam. In operation, teeth of the comb pick up debris floating in front of the drum and discharge it into the container. Oil drains through openings in the container into the oil container, from which it is pumped into floating or shore-based storage tanks. When full, the flotsam container can be lifted out and emptied. (Text in Russian)

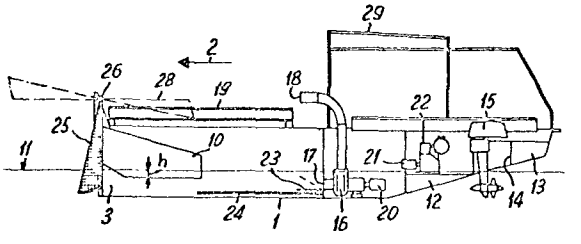


INT-0588

Meisser, M. Equipment and method for cleaning level water surfaces covered with floating refuse and/or hydrocarbons. Switzerland 457,297; filed May 31, 1966; issued May 31, 1968.

The method involves encircling the polluted area, collecting the surface layer by displacement of a collecting device relative to the water surface, treating the superficial layer of water to eliminate the pollutants, and discharging the treated water. The pollutants are stored with a view toward their ultimate elimination. One design variant of the collecting device is a motor-driven, single-hull vessel whose forepart consists of an essentially horizontal screen of suitable mesh size, fixed between two floating arms opening towards the front. This vessel is tied by a floating crossbar. While small objects are sucked in by a pump located at the juncture of the two floating arms, large pieces of debris are picked up by a stiff, netlike scoop. (Text in French)



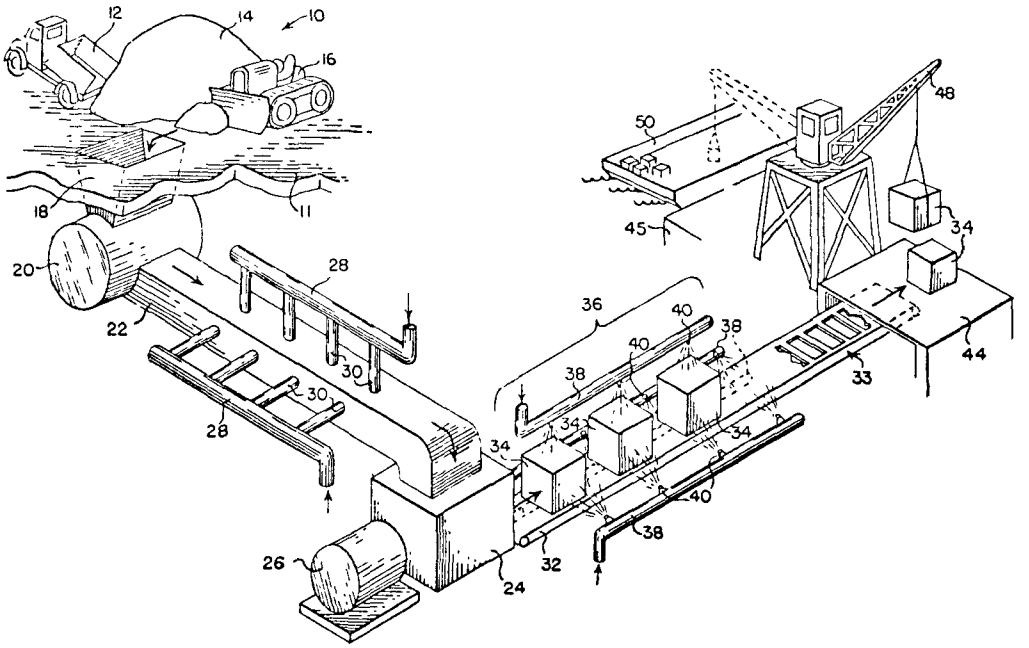


INT-0589

Dunlea, J. V., Jr. Bulk disposal of rubbish. Germany 1,274,051; filed Dec. 8, 1965; issued Aug. 1, 1968.

The bulk disposal of rubbish is carried out by grinding the rubbish, spraying it with adhesive, compacting it into units denser than water, and disposing of the units at

sea. The outer surfaces of the units are sprayed with adhesive or bound with wire to prevent them from disintegrating. Conveyors transfer the rubbish through the processes of grinding, spraying, and compacting. (Text in German)

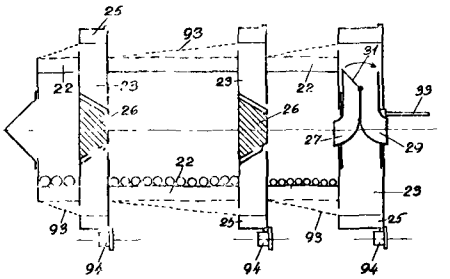


PROCESSING/REDUCTION

INT-0590

Petersen, K. Method of treating garbage. Canada 439,477; filed Feb. 7, 1938; issued Jan. 28, 1947.

Garbage containing a substantial quantity of relatively solid components is supplied to a rotatably mounted container. The garbage is consolidated and the moisture is distributed by the rotation of the container. The action of the relatively solid components effects grinding of the garbage. The operation is continued until the garbage is a loose and gritty mass. The ground matter is subjected to screening to separate the uniform mass from the residue. The apparatus comprises a rotary grinding chamber, with a grid forming its circumferential walls. A fine conical screen surrounds the grid. A rotary elevating device is provided with at least one inlet opening to the interior of the conical screen, and two outlet openings, one of which connects with the interior of the grinding chamber and the other with the exterior of the grinding chamber. A swingable flap valve delivers the materials from the conical screen to either of the outlet openings. The position of the flap valve determines to which of the openings the materials are sent.

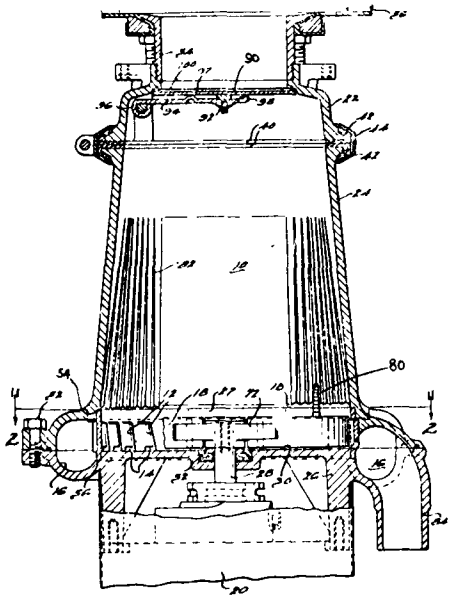


INT-0591

(Eureka Vacuum Cleaner Company). Improvements in or relating to garbage reducing apparatus for attachment to a sink. Great Britain 604,516; filed Nov. 18, 1944; issued July 6, 1948.

A garbage-reducing apparatus for a sink comprises a receiving chamber at its discharge end, with cutting teeth and an outlet for reduced material. A power-driven rotary device impells the material against the teeth. This device comprises a hub, and a hammer pivotally connected to it. The

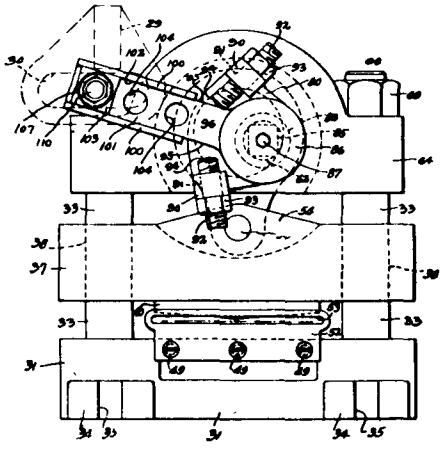
hammer projects outward from the hub, so the outer end of the hammer may yield in a direction opposite to that in which it is driven, in the event its movement is obstructed during the operation of the rotary device. The hammer, in its extended position, extends close to the cutting teeth without engaging them.



INT-0592

Haller, J. Scrap cutter. Canada 466,768; filed Sept. 6, 1947; issued July 25, 1950.

A scrap cutter, connected to and operated by a material-working machine having a reciprocal member, includes a frame with a guide structure and a blade carrier. One cutting blade is connected to the frame; another is connected to the blade carrier in shearing relationship with the frame blade.

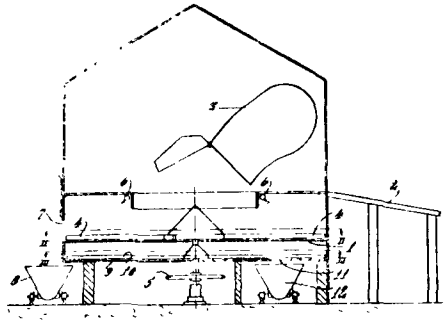


Adjacent to the frame blade is a device for guiding material to the frame blade. The blade carrier and the reciprocal machine member are interconnected by a mechanism that moves the carrier in timed relationship with the machine member. The mechanism includes a lost-motion connection between the carrier and the machine member, whereby the carrier is moved a predetermined distance in response to a different distance of motion of the machine member.

INT-0593

Weststrate, W. A. G. Disposal equipment for refuse and similar waste material. Germany 804,191; filed Mar. 23, 1949; issued Apr. 16, 1951.

The refuse is ground on a shredder-type surface which is opposed by one or several friction-producing devices. Shredding surfaces and friction-producing devices are moved so that the refuse is pressed down on the shredding surface. The shredding surface acts as a sieve. For more efficient shredding, the refuse may be wetted. Underneath the shredding surface is a collection plate with one or more arms for removal of the sifted refuse to the outlets. The arms have the form of a W. The collection plate consists of a fine-meshed sieve. The friction-producing devices are mounted to an endless chain or band which moves them over the shredding surface. The device may also be mounted onto a wheel or cylinder. (Text in German)



INT-0594

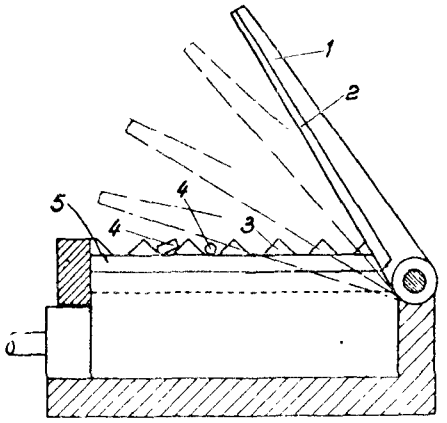
Hanhart-Sauberli, E. Method for reducing the volume of small pieces of scrap iron. Great Britain 662,819; filed July 19, 1949; issued Dec. 12, 1951.

A roof-shaped hearth is constructed of connected wooden laths partly filled with readily combustible material such as paper, wood chips, or small wood pieces. The outer surface of this structure is then covered with

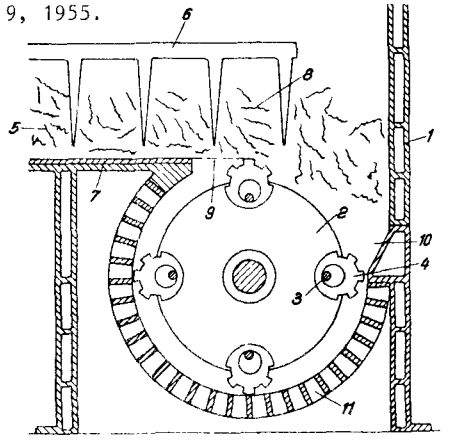
metal turnings and other small pieces of scrap iron. Ignition and stirring of the wooden structure readily converts the metal pieces into a plastic condition, which can then be separated into pieces of required size which cool quickly for further disposal.

INT-0595
Lindemann, W. Improvements relating to scrap packaging and baling presses. Great Britain 709,867; filed July 1, 1952; issued June 2, 1954.

A box for a baling press is provided with a hinged cover and a fixed cutting edge. The edge of the box is of zig-zag form, which prevents overhanging material from sliding along the edge when the cover is being closed. Knives are fitted to the inside edge of the box and fixed by a clamping bar of zig-zag shape, allowing ready interchange of blades when required. (See also Germany 960,052)



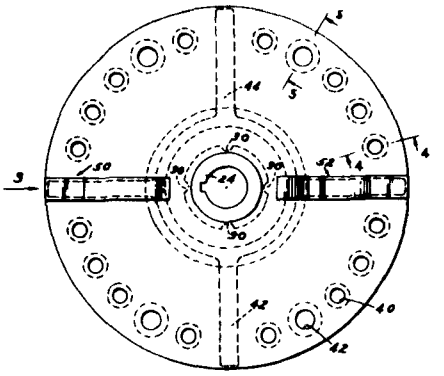
INT-0596
Lindemann, W. Improvements relating to scrap-breaking machines. Great Britain 740,119; filed Mar. 16, 1954; issued Nov. 9, 1955.



A scrap-breaking machine has a rotor provided with hammers or similar implements and a chute, or the like, in which the scrap is fed to the rotor. The chute is provided with a charging device in the form of a rake, and the bottom of the chute is tangential to the curve described by the rotating hammers, or the like, of the rotor. (See also Great Britain 725,641)

INT-0597
Hammes, E. J. Rotor for waste comminuting device. Canada 565,295; filed Aug. 26, 1955; issued Oct. 28, 1958.

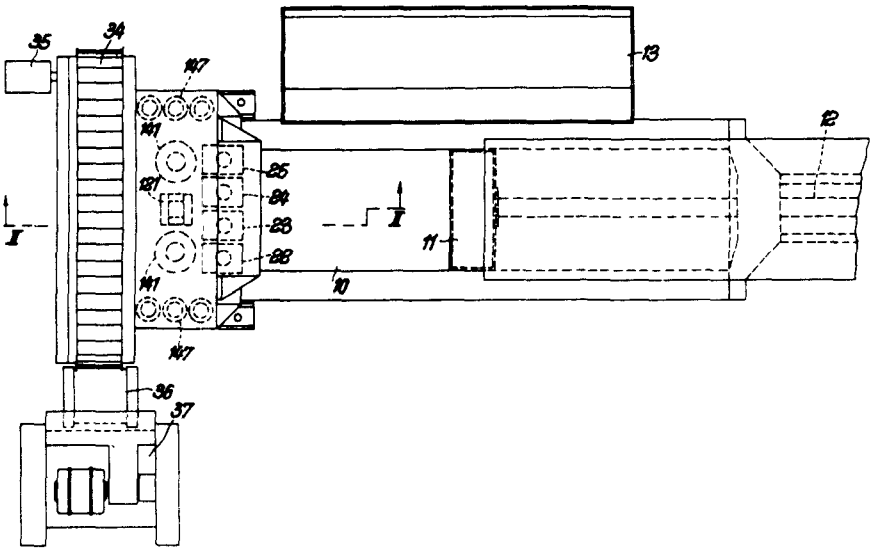
A rotor unit is used in a machine for carrying food waste in a rotary path to contact with a comminuting ring. The unit is comprised of a relatively soft center insert and an outer circular cast plate, mechanically and molecularly bonded to the insert. This plate has radial ribs on the top surface that extend outwardly from the insert. At least one of these ribs has an off-center upward projection extending above the ribs. A mechanism for fastening the rotor substantially fills the space between the ribs in the center. The rotor has an annular row of holes formed in the cast plate, adjacent to the outer rim. The holes have an increasing diameter from top to bottom through the plate. These holes permit insertion of a puller tool.



INT-0598
Lindemann, W., and F. Van Endert (W. Lindemann). Scrap shearing machine. Australia 218,961; filed Mar. 4, 1957; issued Dec. 5, 1958.

A scrap-shearing machine has plungers arranged side by side, with shearing means adjacent to them. Before being fed to the shears, the scrap is compressed. The shearing means is driven hydraulically. Each plunger comprises a hollow cylinder in which there is a piston;

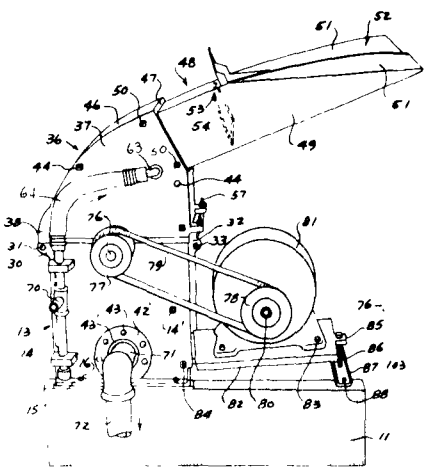
each cylinder is movable relative to the piston. Inclined guide surfaces widen to the shearing means, which comprises a beam and guide members, an upper shearing blade mounted on the beam, and a fixed lower shearing blade. A conveyor moves the scrap from the first shearing means to the second, which cuts the scrap in a direction transverse to that of the first shears.



INT-0599

Van Hook, H. B. Disposal apparatus. Canada 567,722; filed Dec. 23, 1957; issued Dec. 23, 1958.

A refuse disposal apparatus particularly suitable for pulverizing, grinding, or shredding waste matter, has a body with a horizontally disposed upper open end, and opposed, downwardly and inwardly converging front and rear walls, which are connected at their lower ends. Thus, they form the bottom of the apparatus. An outlet in the body adjacent to its bottom is adapted for connection to a drain. An arcuate screen is supportably nested within and below the open end, spaced from the front and rear walls, and extending laterally across the body. A power-operated hammermill rotor is situated partially within the open end, supported inside the screen. A cover is mounted by a hinge on the body with a lateral inlet. The cover has a horizontally disposed lower open end, registering with the open end of the body, and secured on it. The body and cover include vertically registering sidewalls, with opposed, semicircular slots formed in the walls. Spaced bearings are centrally mounted on the upper end of the body outside these slots; the hammermill rotor, including a drive shaft, extends through the slots and bearings. A sealing ring is mounted in the slots. Flexible inner and outer annular sealing elements respectively engage the shaft and slot-defining portions of the sidewalls. Opposed annular discs on the opposite sides of the ring engage the opposite sides of the corresponding sidewall to retain them.

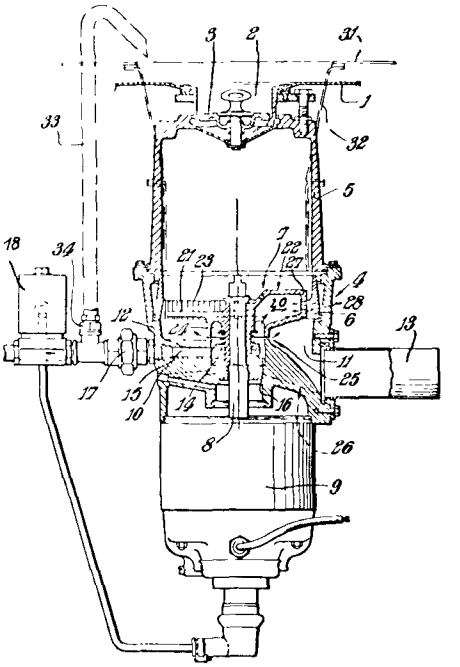


INT-0600

Shepherd, T. C. R. Shredding device for waste matter. Germany 1,054,810; filed Oct. 5, 1956; issued Apr. 9, 1959.

The shredding device for waste matter is operated in the outlet of a kitchen sink, so the outlet can be stoppered when desirable.

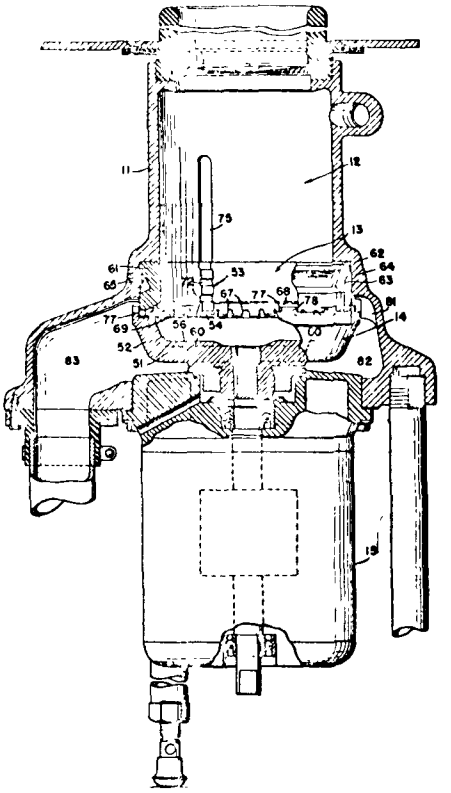
When the drain is open, the waste matter falls into the shredder which comprises a housing featuring a cogged ring and a rotor, driven by an electric motor. The well attached to the motor is directly connected with the refuse reception chamber, and it is provided with a drain located directly underneath the rotor. The rotor area is also provided with a water spray directed outward, which keeps the rotor components clean. (Text in German)



INT-0601

Strehlow, R. W., and G. W. Quast (Chain Belt Company). Device for shredding household waste matter. Germany 1,056,458; filed Mar. 3, 1955; issued Apr. 30, 1959.

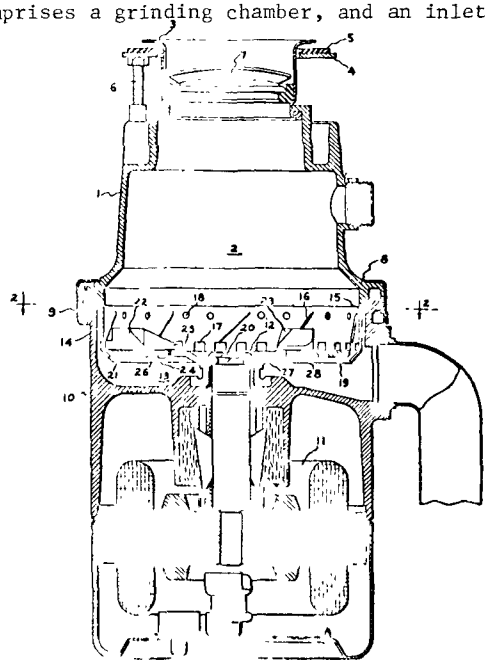
A shredding apparatus for household waste is particularly recommended for food disposal in restaurants or hospitals. This device consists of a housing whose top part serves as a shaft, and whose lower part is equipped with a grinding chamber. The bottom of the grinding chamber is a rotating disc driven by an electric motor, provided with a housing for allowing water to flow through. Centrifugal force drives the ground pieces outward and upward. The shredding device is also characterized by radial slits in the outer rim of the revolving disc, which have teeth working together with the shredder. (Text in German)



INT-0602

Macemon, H. J. (General Electric Company). Garbage disposer. Germany 1,066,135; filed Oct. 14, 1957; issued Sept. 24, 1959.

A garbage disposer includes a housing that comprises a grinding chamber, and an inlet

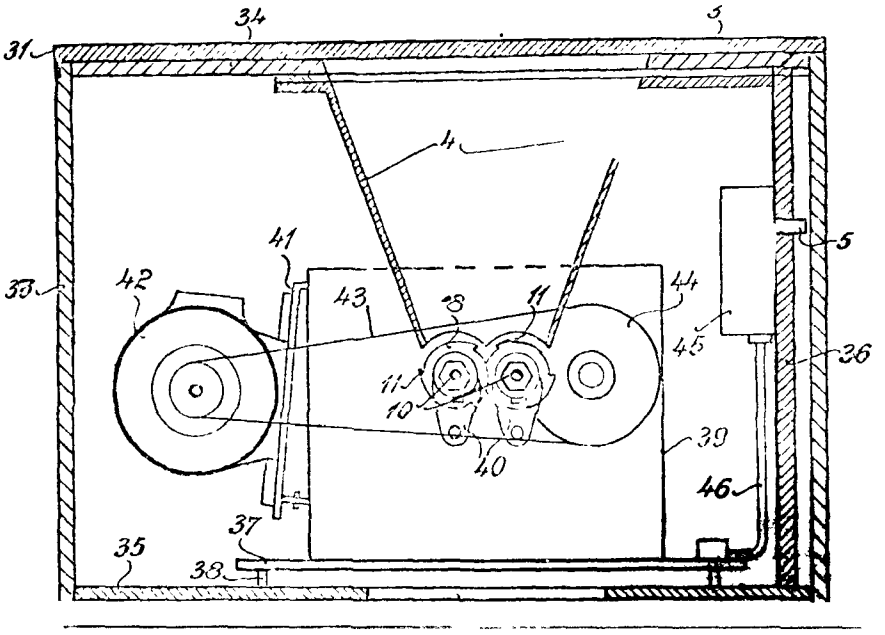


at the upper end for water and waste material. The grinding chamber is provided with a moving plate with flywheels on opposite sides. Each flywheel is firmly connected by a pin, fitting into a slit, with a narrow and a broad end. The lower part of the housing has a flange for a housing and an electric motor. (Text in German)

INT-0603

(Buroma Buromaschinenvertriebs-G.m.b.H.). Apparatus for shredding paper, cardboard and other material. Great Britain 823,661; filed Feb. 20, 1957; issued Nov. 18, 1959.

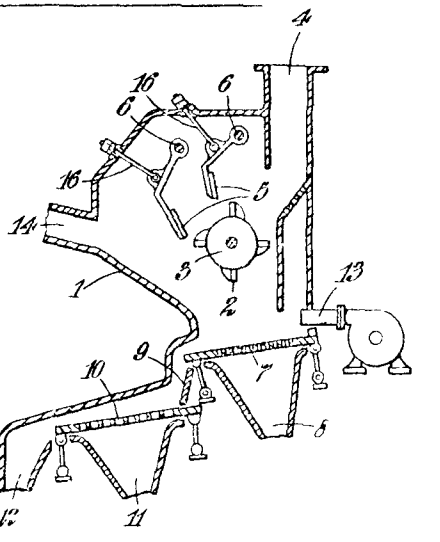
The apparatus improves the shredding process, mainly for destruction of documents but also for comminution of feathers, leather, foam materials, etc., for filling beds or bolsters. Raw material is dumped into a hopper which feeds a shredding assembly, consisting of two rotating cutter rollers on parallel shafts. Each roller has a series of axially spaced cutter discs, with radially projecting, saw-toothed cutter teeth. The teeth on the two discs engage so their peripheries overlap. Shredded material drops into a collecting compartment in the lower portion of the unit casing. Power is provided by an electric motor, with controls mounted on a front panel with a safety cutoff button. The whole assembly is encased in a sheet metal cabinet.



INT-0604

(Hartzerkleinerungs- und Zement Maschinenbau G.m.b.H.). Improvements in or relating to methods of and machines for comminuting accumulator scrap. Great Britain 828,021; filed July 24, 1957; issued Feb. 10, 1960.

A combination centrifugal impact and air grinding mill selectively comminutes accumulator scrap without preliminary sorting. A high-speed impeller with projecting cutter blades is mounted in a housing with a feed opening through which raw material is introduced. Impact plates, mounted opposite to the impeller periphery, reflect material back to the impeller for further comminution. Two inclined shaker screens, respectively fine and coarse, receive comminuted material from the impeller through the action of a blower

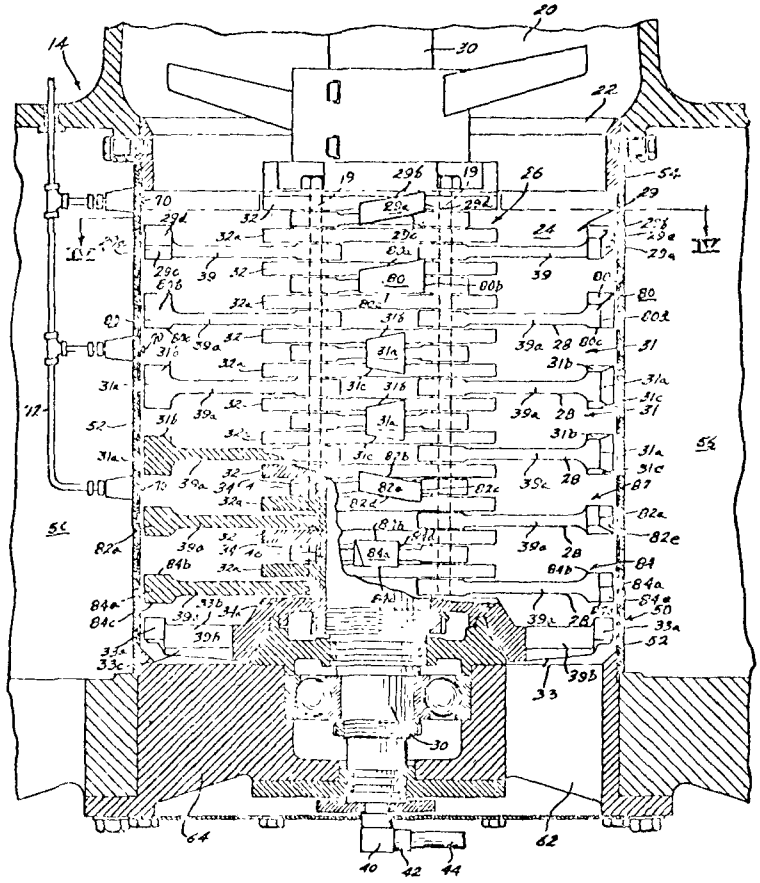


delivery pipe. Receptacles below the screen collect screened material, with the excess led out through an overflow. An outlet pipe is situated high in the opposite wall. Fine material is predominantly soft lead; coarse is primarily hard lead, with high antimony content.

INT-0605

Dunwody, A. B. Process for cleaning and pulping waste paper and rag pulps. Canada 596,312; filed Sept. 17, 1957; issued Apr. 19, 1960.

An aqueous suspension of wastepaper and fibrous material of 2.5 to 5 percent by weight is subjected to impact action in a cylindrical disintegrating zone, having a vertical axis to release fibers from the material and propel them outwardly. The thrown material is screened; radial streams of water separate the fibers further if they do not pass through the screen. The speed of the centrifugal action is 2,700 to 3,600 rpm. This process prevents the excessive shortening of the fibers of the cellulosic material, and cleans the material by removing contaminants with a minimum loss of good pulp, and without the need for excessive pulping in a conventional beater or hydrapulper. (See also Canada 672,539)

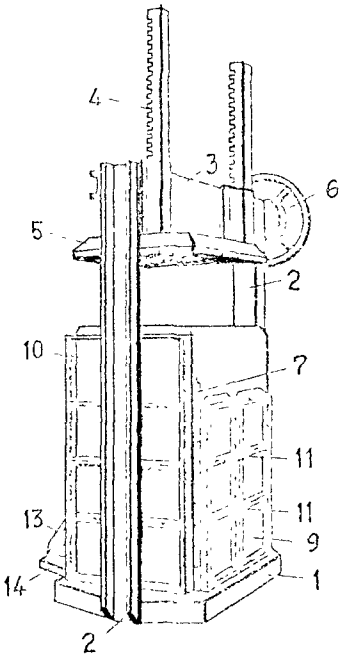


INT-0606

Jonsson, E. J. J. Improvements in or relating to bale presses for paper, rags, straw, peat and the like. Great Britain 836,713; filed Aug. 17, 1956; issued June 9, 1960.

The press structure comprises a floor base supporting two opposite parallel channel iron uprights, held by a cross member at the top. The compression assembly comprises a pressure plate fixed to two rachet piston bars supported by the top cross member, and operated

by a manually driven wheel. The container walls are six rectangular steel sheets connected at their vertical edges by hinges. After locking the walls into position, the material for baling is dumped in, and compressed. Upon completion of baling, the hinged walls are unfolded, and the bale discharged.



INT-0607

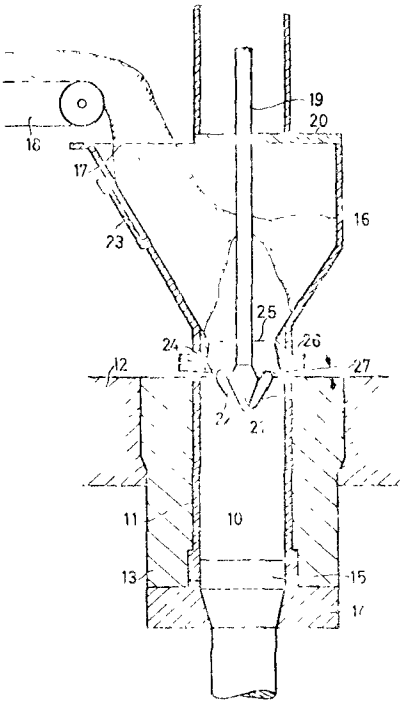
Riedel, E. O. Procedure and device for processing municipal waste. Germany 1,082,861; filed Jan. 15, 1958; issued June 9, 1960.

This is a procedure and a device comprising metal components for the processing of municipal and industrial waste. The waste matter is sorted into hard and soft components, the former being ground to dust and the latter into fibers, and thoroughly mixed. The ground material is compressed and sealed in airtight containers. The advantages of this procedure are in the double action of the processing--that of grinding the hard particles, and of tearing apart the fibers. Preparation of the material for aerobic fermentation is also part of this process. (Text in German)

INT-0608

Lindemann, W. Improvements relating to scrap briquetting presses. Great Britain 849,031; filed June 18, 1958; issued Sept. 21, 1960.

This press provides a means for briquetting metal turnings, shavings, and the like. The press comprises a chamber, a plunger movable in the chamber, and a precharging chamber in front of the charging opening of the press chamber. There is a ram reciprocable in the precharging chamber toward and away from the charging opening. This ram is provided with blades which project radially outward. The ram pushes the material from the precharging chamber to the press chamber, and operates satisfactorily even if the composition and structure of the material varies greatly. The ramming device not only effects the filling of the press chamber, but also enables a considerably greater weight of material to be introduced into the chamber than would be possible with vibrators or a stirring mechanism. The stroke or frequency of the stamping device, or both, are adjustable so when the composition of the material to be briquetted changes, the machine may be adjusted to maximum efficiency.

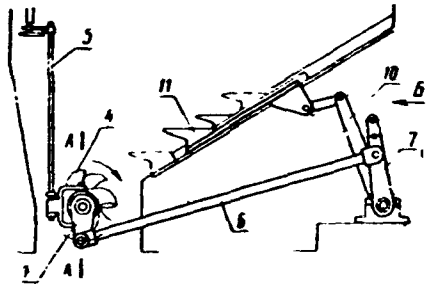


INT-0609

Levishko, A. A. Device for feeding metal and wood shavings in roller crushers. U.S.S.R. 137,332; filed Oct. 31, 1960; issued Apr. 10, 1961.

A crank is coupled to a rotating crusher-roller shaft by shifting a clutch lever, thereby setting a plate into reciprocating motion.

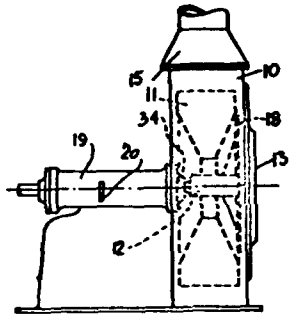
The teeth of the plate hook into and drag along, during the downward stroke, the shavings charged into the hopper, and unhook during the upward stroke. The upward displacement of the shavings is restrained by retaining teeth. The length of the plate stroke (and the amount of shavings fed per stroke) can be adjusted. The amount of shavings fed per unit time can also be controlled by intermittent coupling and uncoupling of the device from the crusher-roller shaft. (Text in Russian)



INT-0610

Holman, F. L. (W. Goodall Proprietary Limited). Combined waste chopper and exhaust fan. Australia 235,441; filed Apr. 29, 1959; issued Sept. 7, 1961.

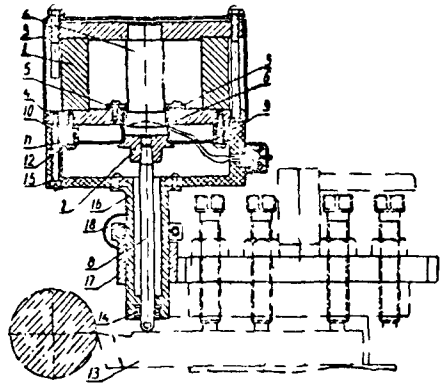
A pneumatic waste-conveying system has an axial flow centrifugal fan. The fan has a rotor consisting of a plurality of spokes. Each spoke, with a fan blade, radiates from a central boss, fixed to a shaft journalled in or to one side of the casing of the fan. The casing has spaced sidewalls, one giving space for the shaft or journal, and the other incorporating the air inlet. At least one stationary blade extends across the air inlet, and at least one blade rotates with the fan near the inlet blade. Pieces of paper, leather, plastic, and other waste materials are chopped by the blades while passing through the air inlet, and are carried by the stream of air to the outlet. The stationary blades have replaceable cutting edges.



INT-0611

Chalyy-Prilutskiy, A. N., and V. A. Prilutskiy. Equipment for vibratory cutting and chopping of shavings. U.S.S.R. 147,412; filed Mar. 28, 1961; issued May 21, 1962.

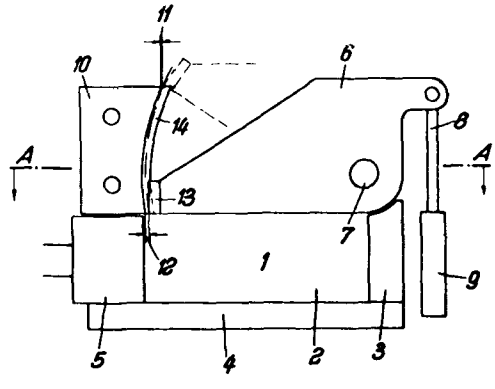
The essential features of the equipment are a frequency generator and an electromagnetic driver, serving as a vibrator, whose core acts on a cutting tool. The rod transmitting the vibrations of the driver to the cutting tool is guided near its lower end by a ball-bearing guide, improving the performance of the driver. The entire driver can be raised and lowered by a wheel to establish the proper contact between the rod and the cutting tool during assembly. The driver works in conjunction with the frequency generator, and it can be mounted in any position. (Text in Russian)



INT-0612

Maldaner, H. (W. Lindemann). Scrap baling process. Germany 1,135,764; filed Feb. 8, 1958; issued Aug. 30, 1962.

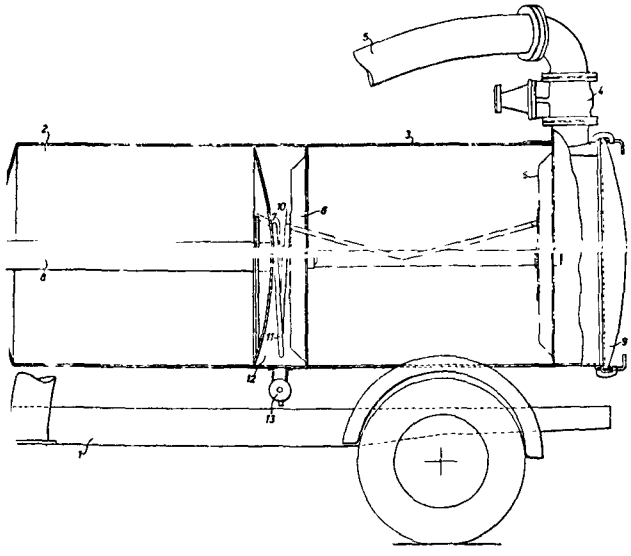
A scrap-baling press consists of a chamber with a hinged lid on one side. There is another cover arranged parallel to the face of the first lid. Very little is between them. Both covers are provided with serrations that engage when the covers are closed. (See also Germany 802,784) (Text in German)



INT-0613

Riddell, L. H. (Deighton's Patent Flue and Tube Company Limited). Apparatus for collecting water-borne refuse. Great Britain 917,710; filed Mar. 13, 1959; issued Feb. 6, 1963.

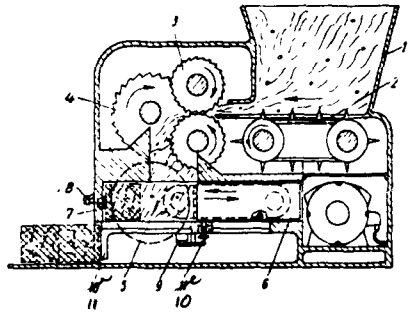
Waterborne refuse is dewatered in a tank in which a partial vacuum can be produced. The refuse is sucked through a valve-controlled, large-capacity inlet near one end of the tank. A reciprocating pusher plate is power-operated, and it compresses the refuse toward the end of the tank adjacent to the refuse inlet. This presses the surplus liquid from the refuse, and ejects the refuse through a discharge aperture of the tank. A device limits the stroke of the pusher plate so it stops short of the inlet. This arrangement ensures that all incoming refuse is fully compressed and dewatered, and minimizes the possibility of solid refuse spilling over the pusher plate at the inlet opening and getting behind this plate. This would interfere with its operation or cause trouble in the liquid disposal conduits. The apparatus is vehicle-mounted. (See also Great Britain 934,769)



INT-0614

Lukashov, V. F. Device for shredding waste paper. U.S.S.R. 157,214; filed Sept. 24, 1962; issued Sept. 25, 1963.

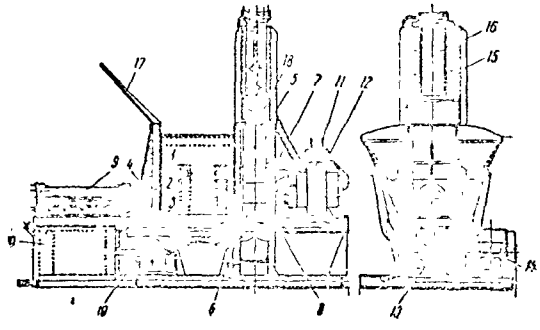
The device consists of: a charging section, consisting of a hopper and a chain conveyor; a shredding section, consisting of two feed rollers formed of spaced discs; a cutting drum, which is similarly formed of spaced discs interlaced with those of the rollers; and a compacting section. Wastepaper charged into the hopper is entrained by the chain conveyor, and advanced toward the feed rollers. The wastepaper is then fed by them to the cutting drum. The paper is cut into separate 3-mm-by-2-mm chaff. The paper then drops into the loading chamber where it is compacted into a briquette. (Text in Russian)



INT-0615

Vtyurin, N. I. Unit for briquetting metal shavings with the aid of electric heat. U.S.S.R. 145,898; filed Sept. 12, 1960; issued Oct. 18, 1963.

The unit incorporates a pressure mold of variable volume. In operation, metal shavings charged into the hopper fill the 1-m-by-1-m-by-0.5-m pressure mold, whose side panels are turned to a vertical position. A mobile insert is pushed by the carriage of a hydraulic cylinder, compacting the charge and confining it to a 1-m high, 0.25-m long, 0.5-m wide volume. The piston of the hydraulic cylinder now pushes down, compacting the charge again, while an electric current is passed through the charge (40 to 60 amperes at 12 to 15 volts). Owing to high local resistance at numerous contact spots among the shavings, the metal heats so the briquette is sintered while being compacted. After releasing the piston pressure and returning the mobile insert to its initial position, the briquette is

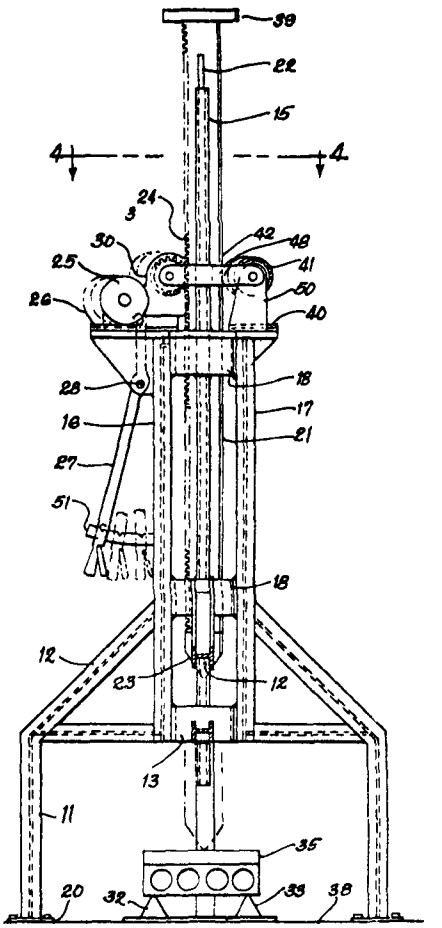


pushed out onto the roller conveyor. The process of making one briquette requires 3 minutes. (Text in Russian)

INT-0616

Raizk, A., and L. Raizk (Selec Enterprises, Inc.). Scrap metal breaker. Great Britain 953,163; filed Feb. 12, 1963; issued Mar. 25, 1964.

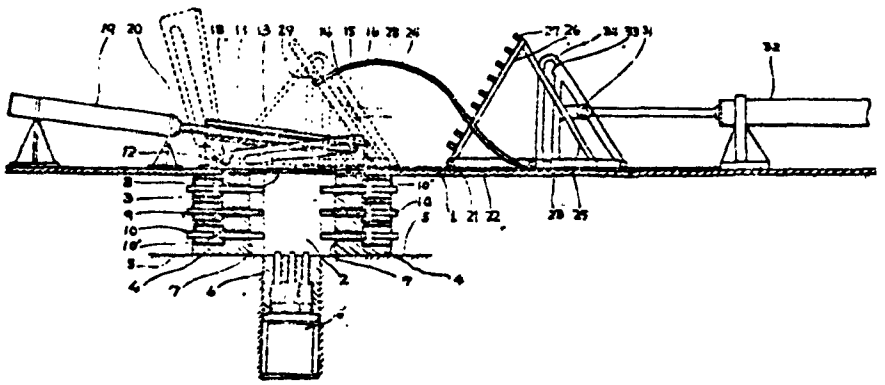
A scrap metal breaker comprises vertical guide channels held by a frame. The frame includes leg structures extending outward and downward to support the guide channels above a floor. There is a cylindrical dropping bar, which has opposed protrusions parallel to its axis and embraced in the guide channels. There is a gear rack on the dropping bar parallel to the protrusions. There is a breaking tip in one end of the dropping bar. A prime mover assembly includes a motor and a gear, shaped to engage the teeth in the gear rack. The prime mover assembly is connected to the frame so that it has restricted movement in a direction nonaxial to the dropping bar. There is a device to move the prime mover assembly relative to the frame, into and out of engagement with the rack. The rack extends upward from the breaking tip of the dropping bar to a distance which is at least equal to the height of the gear above the floor.



INT-0617

Hashiyama, K. Steel and iron lathe cutting scrap compressor. Japan 39-6,041; filed Feb. 10, 1963; issued Apr. 30, 1964.

This compressor effectively presses spiral chips and similar scraps of steel and iron produced by the lathe-cutting process. The press block is equipped with reciprocating striker rods which drastically reduce the tremendous deformation stress caused when scrap is pressed evenly, thus making it possible to operate the compressor with less hydraulic power. The device consists of a feeder, a cover, a pair of horizontal press blocks (one on the left and the other on the right) and a vertical press block. Power other than hydraulic may be used. Both the feeder and the cover are on the platform of the equipment. Operated by a hydraulic

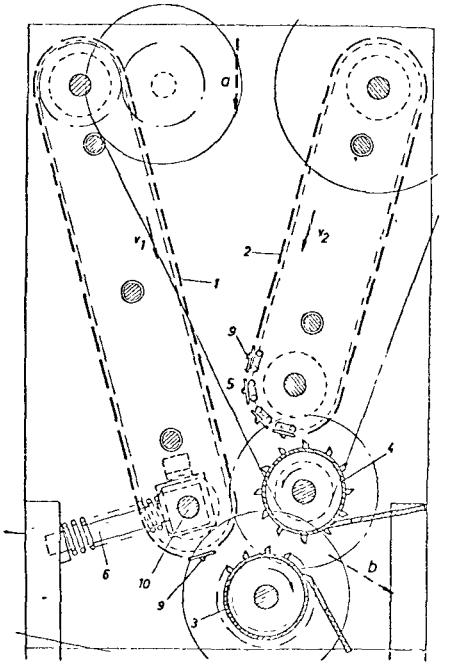


cylinder, the former, which is located on one side of the feed-in port, slides along the platform as its scraper turns downward to push the scrap into the compression room below. The latter, located on the other side of the feed-in port, turns downward to close the cover securely. Each horizontal press block is equipped with several pistons, which reciprocate rapidly to strike he scrap as the entire horizontal press block operates. The vertical press block, also equipped with piston rods, moves upward along the inner ends of the horizontal press blocks while in operation. (Text in Japanese)

INT-0618

Martin, W. J. Equipment for conveying and fragmenting refuse. Germany 1,173,403; filed Jan. 20, 1960; issued July 9, 1964.

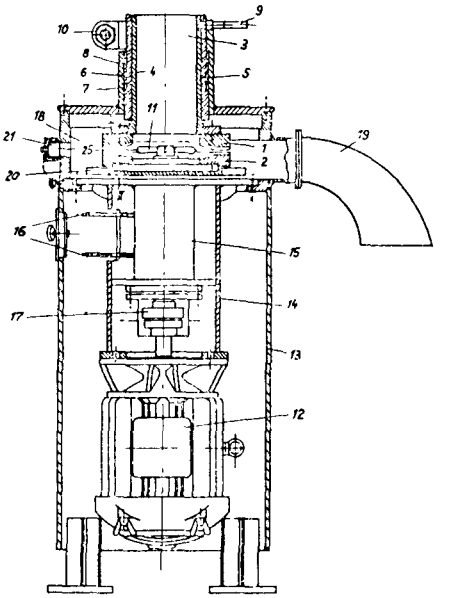
Equipment is provided for reducing large pieces of conveyed refuse to a size acceptable for incineration. It consists of two converging, endless conveyor belts or chains. They are mounted in a framework and move at variable individual speeds to transport the introduced refuse through a space between them. Provision is made for reversing the direction of motion of the conveyors. Oversize pieces of refuse are made smaller by means of rollers, with sharp projecting teeth, located at the opening confluence of the two conveyors. Following their passage through these rollers, the fragmented refuse passes on for subsequent incineration. (Text in German)



INT-0619

Heinz, A., and F. Klasse. Disc crusher for breaking up old paper and other paper waste. Switzerland 379,901; filed July 28, 1960; issued July 15, 1964.

This device consists of an upper stationary disc, and a lower disc movable about a vertical axis. The waste material enters via a vertical inlet duct above the two discs. The inlet is equipped for the adjustment of distance between the two discs. The inlet duct ends perpendicularly on the lower one. Distribution of the waste material between the discs is achieved by a distributor shaped like a propellor. The lower disc is driven by an electric motor. The discs have radial, wavy protrusions. Their tops cooperate linearly. The shredded material which falls over the edges is collected in a chamber. The mill is cleaned with a water jet. The shredder has the advantage of tearing the paper without shortening the binding fiber. The shredded waste material is therefore suited for reuse. (Text in German)

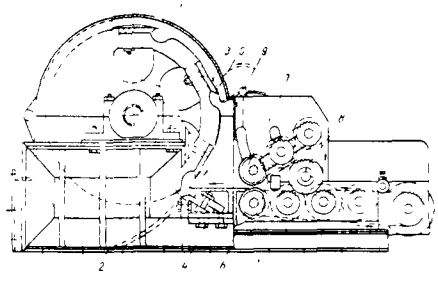


INT-0620

Fadin, P. L. Machine for reprocessing timber-sawing and lumber-dressing wastes into industrially usable wood chips. U.S.S.R. 164,786; filed June 4, 1963; issued Aug. 19, 1964.

The machine comprises a cylindrical drum whose walls have bosses of a shape for positioning and fastening five cutting knives. The cutting edges of the knives are positioned

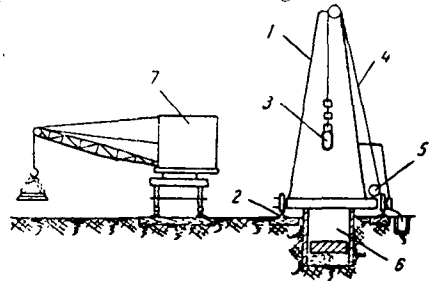
at an angle between 28 and 30 degrees with respect to the entering wood wastes. This makes it possible to fix the length of the chips within specified limits, and to split the wood along the grain. A stationary counterknife is mounted on the frame of the machine and placed at an angle between 29 and 31 degrees with respect to wood wastes. Wood waste is fed by a device consisting of lower and upper serrated rollers. A template is hinged to the frame, which can be swung out of the way, and which serves to insure the required clearance (0.2 to 0.3 mm) between the drum knives and the counterknife when the former are being positioned and fastened on the drum. (Text in Russian)



INT-0621

Leontyev, I. A., and N. M. Nikitin. Mechanized drop hammer for smashing metal scrap. U.S.S.R. 167,121; filed June 12, 1961; issued Dec. 12, 1964.

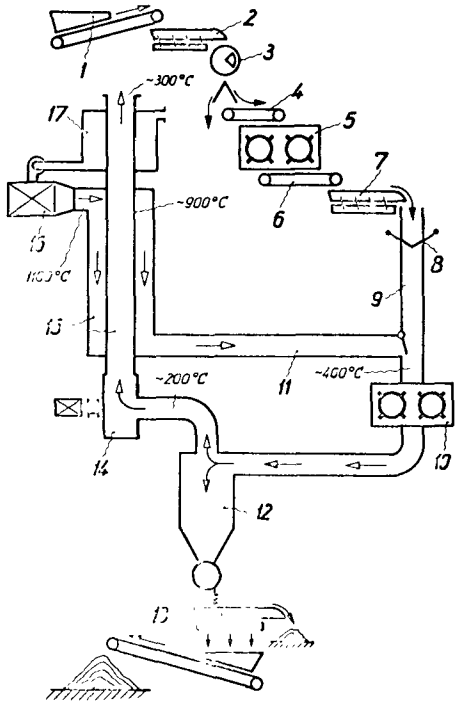
The equipment consists of a drophammer mounted on a platform travelling on a rail track, and straddling an anvil strip on the bottom of an open trench. It includes a separate travelling jib crane, provided with a load-lifting electromagnet. The drop-weight is permanently attached to one end of the load cable, on which it is suspended above the anvil strip. The other end of this cable is fastened to the drum of a winch connected with its drive shaft. To lift the drop-weight, the clutch is engaged to wind the load cable on the drum. To let this weight drop, the clutch is disengaged, and the cable unwinds. In operation, the crane places scrap metal onto the anvil strip and lifts out its fragments at various positions along the trench, so that the smashing operation can be performed by the travelling drophammer with very brief interruptions. (Text in Russian)



INT-0622

Bode, J., W. Nickel, and F. Pyter (Schuechtermann and Kremer-Baum Aktiengesellschaft fuer Aufbereitung). Refuse incinerator residue treatment. Germany 1,192,994; filed Nov. 9, 1964; issued May 20, 1965.

Refuse incinerator residues are worked up by comminution and classification. The ash and clinker are sieved out of the residues in a size fraction between 0 and about 30 mm, and postclassification is carried out. The oversize from the preclassifying screen is reduced in a breaker, and the ferrous components are separated by magnets. The mineral components are combined with the material passing the screen, and classified further. (Text in German)

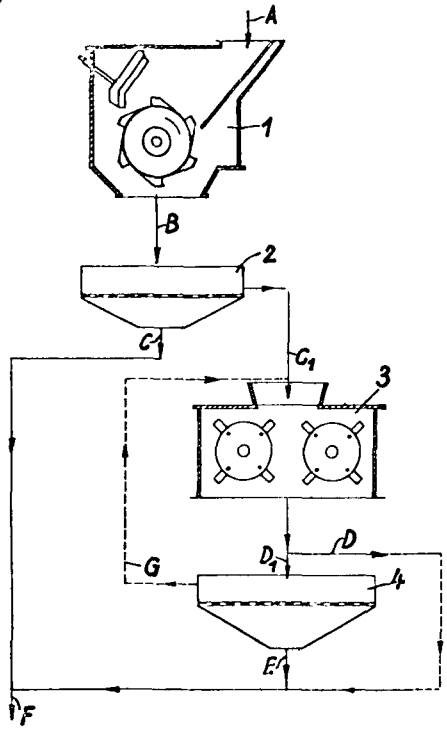


INT-0623

Conrad, E. von Hartzerkleinerungs und Zement-Maschinenbau Gesellschaft). Mechanical pretreatment of mixed garbage and industrial waste. Germany 1,204,604; filed Oct. 19, 1962; issued Nov. 11, 1965.

Raw waste material, consisting of hard and soft constituents, is initially passed

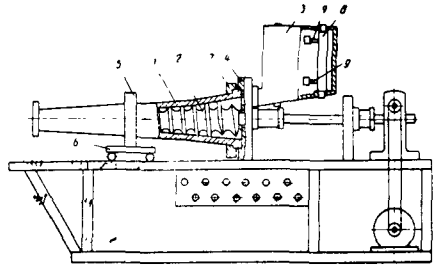
through a coarse grinder onto an intermediate sieve. The unscreenable coarse residue is then passed through a secondary hammermill and subsequently sifted through another sieve. *The combined residues comprise the final* comminuted product. In order to remove ferrous material, a magnet is introduced immediately before the initial grinding. (Text in German)



INT-0624

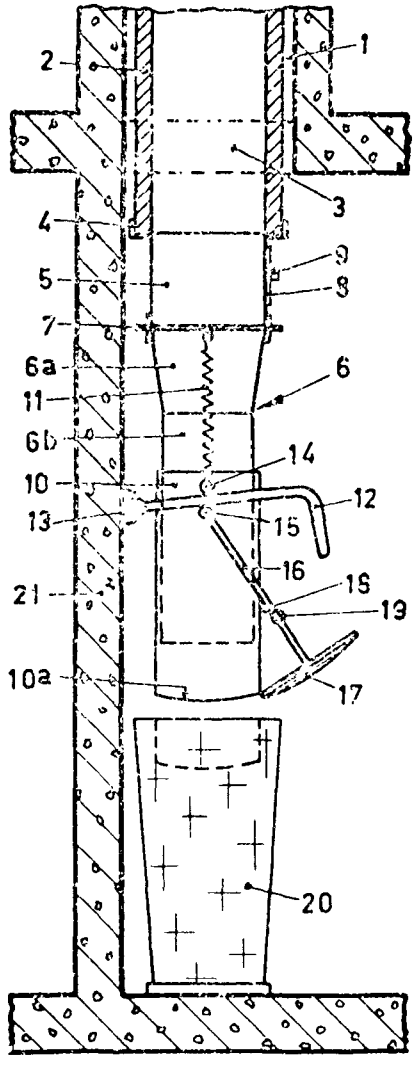
Rukas, V. A., and E. S. Klenovskiy. Screw injection machine for reprocessing thermoplastics. U.S.S.R. 176,676; filed Oct. 28, 1963; issued Nov. 17, 1965.

The machine consists of a screw and a hopper mounted on flanges. The constant-pitch screw has three segments, and the first one-and-a-half turns of the thread have sharpened crests whose radial distance from the axis increases, like that of a point of an Archimedian spiral, from the center. The hopper is equipped with rotating rollers pressed against each other by springs. In operation, large pieces, crumpled films, or tube-production wastes are charged into the hopper and are fed, by the rollers, into the housing through an opening in the flange. The sharpened turns of the slowly rotating screw score the pieces of plastic and pull them into the space between the turns. The design makes it possible to attain compacting ratios between 1 to 8, and 1 to 12. (Text in Russian)



INT-0625

Moesch, J. (Fornax A.G.). Compacting device for a central refuse disposal facility in apartment houses. Switzerland 405,154; filed July 30, 1963; issued Dec. 31, 1965.

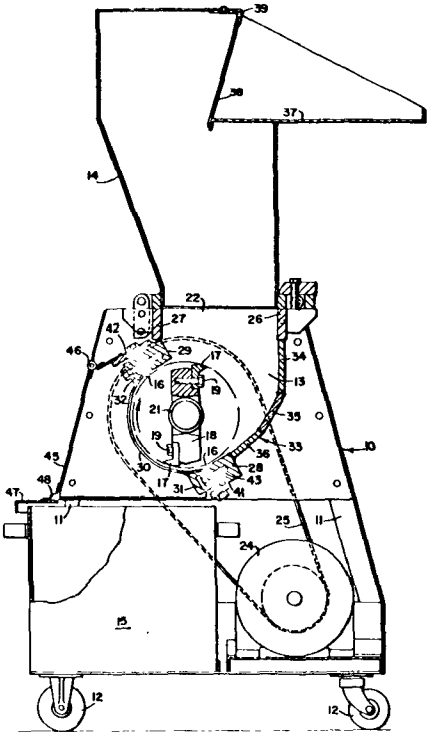


The compacting device consists of the usual tube whose end narrows, is covered by a coaxial tubular shell which can be moved on the tube and is retained by springs. The device, which consists of a pronged compacting unit, is flexibly arranged at the tubular shell. In the rest position, it is outside the range of the refuse container in the basement. For use, the compactor is moved over the container and lowered. After compaction, the unit is lifted by springs and manually returned to the rest position. (Text in German)

INT-0626

Bondkirch, J. A. (Foremost Machine Builders, Inc.). Plastic waste grinder. Germany 1,210,663; filed Nov. 4, 1961; issued Feb. 10, 1966.

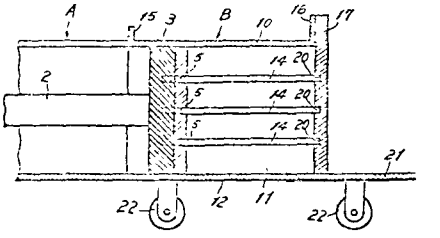
A plastic waste grinder has a feed hopper and a cutting chamber, whose casing contains a rotor with knives that act together with stationary blades. The grinder is provided on the discharge side with a sieve. The opposing stationary knives are arranged at an acute angle, in relation to the direction of rotation. The wall leading from the top to the opposite lower knife, first extends vertically, and then forms a conical feed channel with the circumference of the rotor. (Text in German)



INT-0627

Iwaasa, Y. Scrap compressor. Japan 41-3,957; filed July 10, 1963; issued Mar. 7, 1966.

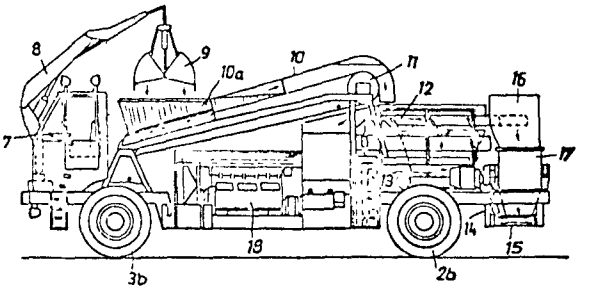
This compressor can operate on differing materials such as iron, which once compressed, does not resume its volume, or materials of a flexible or elastic nature, such as paper, textiles, and rubber, which must be bound in order to prevent their return to original volume and shape. In compressing iron scrap, compressor A is used. The scrap is dumped through the lid, compressed between the board attached to the hydraulically-operated rod and the sidewall of the box, and removed. When scrap such as paper is to be compressed, the sidewall of compressor A is unhinged, and that of compressor B is connected. The scrap is then compressed between the board attached to the rod and the sidewall of the compressor B. The belt for binding the material is inserted through the ridge of the board or the sidewall. The bundled material is taken out after unhinging the sidewall of compressor B. (Text in Japanese)



INT-0628

Conrad, E. von (Hartzerkienerungs und Zement-Maschinenbau-Gesellschaft). Self-propelling assembly for refuse treatment. Germany 1,221,587; filed Apr. 30, 1962; issued July 28, 1966.

This mechanism comprises a transport belt, magnet rolls, a screening machine, and a beater mill. The aggregate is mounted on a

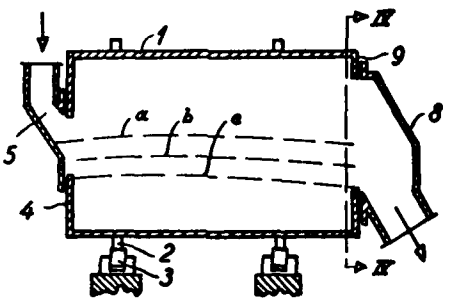


chassis which has individual hydraulic wheel drive. Centrally at the front, and immediately to the side of a visual control, is a grab crane pivoting on a vertical pylon, with hydraulic drive and hydraulic control. A reception hopper is directly behind this, having its base as a conveyor belt. A current generator is centrally placed on the chassis, approximately at the center of gravity, and the beater mill is placed at the end of the chassis. (Text in German)

INT-0629

Alleso, S. G. S. (Dano Ingeniorforretning og Maskinfabrik, Ingenior Kaj Petersen's Fond). Refuse mill. Germany 1,224,594; filed Oct. 19, 1963; issued Sept. 8, 1966.

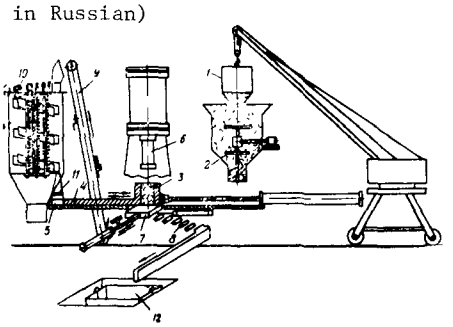
The refuse mill has a cylindrical grinding chamber which is fed through one end and discharges through the other. The discharge end is fitted with a perforated disc which is designed to present the outgoing material with a cross sectional area that varies in an amount directly proportional to the amount of material in the chamber. This is accomplished by several designs which concentrate the cross sectional area of the disc at its center. (Text in German)



INT-0630

Dorofeyev, Y. G., B. A. Lebedev, and N. T. Zherditskiy. Installation for compressing metal shavings. U.S.S.R. 187,054; filed Mar. 15, 1965; issued Oct. 11, 1966.

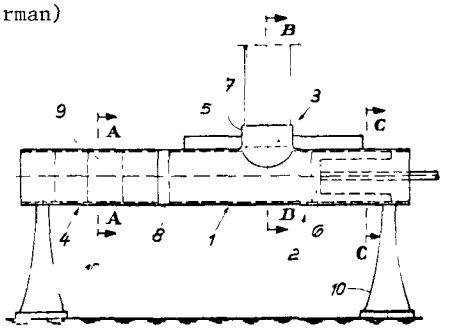
The installation consists of a charging hopper with a worm conveyor; a compacting die and a pressing die mounted on opposite ends of a horizontal slide plate alternately shifted between two working positions; a press with a movable anvil and a conveyor located below it; an elevator; a heating furnace; a discharging chute; and a storage container. Metal shavings charged into the hopper are fed by the worm conveyor into the compacting die, while the slide plate is in its right-hand position. The slide plate is next shifted to the left-hand position, placing the filled compacting die below the plunger of the press, which compresses the shavings into an intermediate compact. The anvil is pulled aside, and the compact is pushed out of the die. The compact travels by conveyor to the elevator to be charged into the heating furnace, from which the heated compact is fed by the discharging chute into the pressing die. The heated compact is pressed into a final briquette and is stored in a container. (Text in Russian)



INT-0631

Faerber, L. Procedure and device for baling of refuse. Germany 1,235,223; filed Aug. 27, 1965; issued Feb. 23, 1967.

Refuse is baled in a packing container, where it is stirred and mixed with a liquid or pulverizing agent before compression. From there it emerges in the shape of discs. The binder used in the mixture is of an easily inflammable kind, and in addition, sterilizing and deodorizing agents are incorporated. The container for packing the refuse is provided with several pressure chambers, and with a mixing device which uses air pressure or a stirrer. (Text in German)

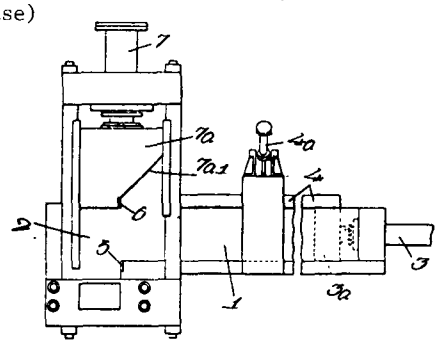


INT-0632

Tezuka, K. (Tezuka Kosan Company, Ltd.). Scrap cutting and compressing device. Japan 42-8,258; filed Jan. 13, 1965; issued Apr. 7, 1967.

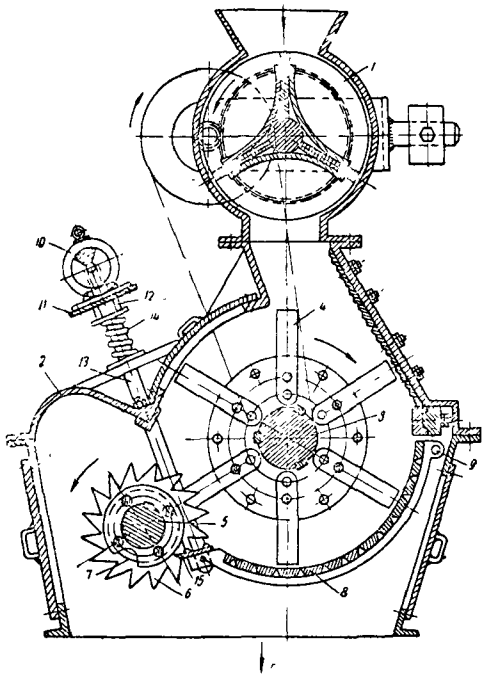
A device for cutting and compressing large scrap, such as used cars, reduces the material's

bulk, increases its specific gravity, makes it easy to handle, and lowers the transportation cost. The device consists of two connected parts: one to transfer the scrap, and the other to cut and compress it. The scrap is pushed by the cylinder to the compressing and cutting part. After compression, the board with the cutting blade comes down on the fixed blade below, and the scrap is cut. Then, with the operation of a compression cylinder, it is again pressed so it has a high specific gravity. Since the cutting and compressing part is connected with the part which transports the scrap, the device can be operated very efficiently. It can cut and compress continuously. (See also Japan 41-1,752 and 42-6,795) (Text in Japanese)



INT-0633

Yazikov, M. P. Hammermill for crushing refuse. U.S.S.R. 196,537; filed Dec. 21, 1965; issued May 16, 1967.

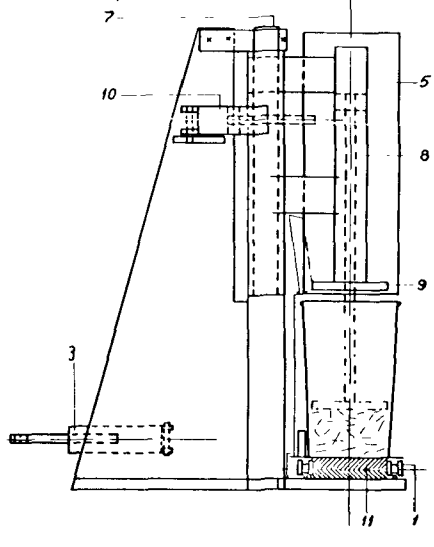


A hammermill consists of a housing in which a rotor equipped with hammers is located. The lower part of the housing contains a shaft with milling cutter disks mounted on stiff annular shock absorbers. It also contains a grating, one side of which pivots on an axis, while the other is attached to a vibrator. In operation, sorted domestic refuse is fed steadily by the feeder into the housing, where it meets the hammers of the rotors, is crushed in flight, and thrown against the walls of the housing lined with abrasive plates. The final crushing and pulverization of the material takes place on the grating, kept in oscillation motion by the vibrator. This motion promotes the pulverization of the refuse and the self-purification of the grating from particles of moist refuse stuck to it, and wedged in its openings. Uncrushed fibrous material is pulled through by the rotor hammers between the milling cutters, and this material is cut owing to the difference of circumferential speeds of the hammers and milling cutters. (Text in Russian)

INT-0634

(Komprimator A.B.). Refuse collector. Germany 1,256,870; filed Jan. 28, 1959; issued Dec. 21, 1967.

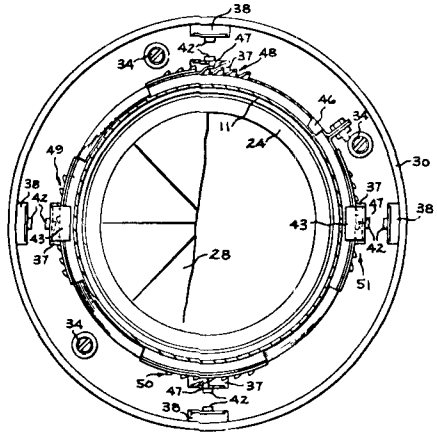
A refuse collector that can compact bin contents passed in a stream under the refuse shaft comprises an extension below the shaft which moves away from the mouth and connects at one side to the compactor punch. Extension and punch are steered by a scanner over the respective bin. A feeler, subordinate to the punch, probes the bin level, and, if full, a pusher moves the bin out and brings an empty one in under the shaft. No refuse is fed during compacting. (Text in German)



INT-0635

Clements, F. J., and J. W. Yartz (General Electric Company). Mounting of a garbage grinder below a kitchen sink. Switzerland 450,309; filed Apr. 22, 1965; issued Jan. 15, 1968.

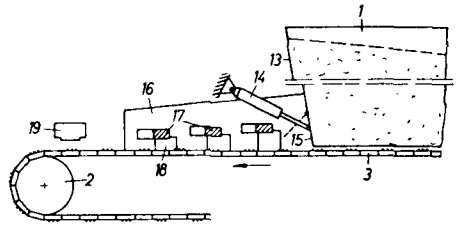
This grinder may be firmly attached to the sink and aligned with the waste pipe of the sink, without subjecting the sink to undue distortion and consequent internal stresses. There is a set of identical S-shaped clamps. These are hooked into pairs of slots in a ring clamped around a special sleeve, fitted into the outlet opening of the sink. The neck of the grinder is supported by a packing ring. By rotating the supported grinder, the required angular alignment of its outlet opening is readily effected. (Text in German)



INT-0636

Hofmann, H., and D. Stickelberger (Voith Mullex G.m.b.H.). Apparatus for the processing of refuse. Switzerland 441,179; filed May 20, 1966; issued Jan. 15, 1968.

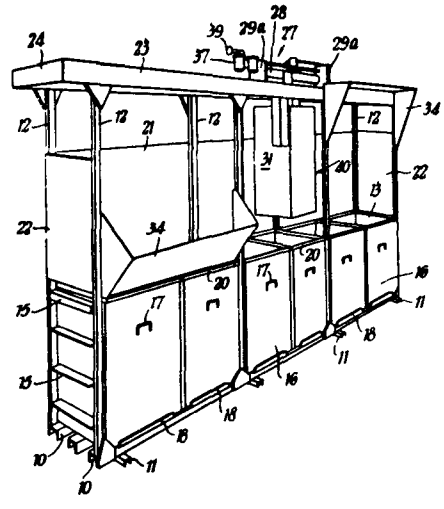
An apparatus designed to process decaying domestic and industrial wastes features a bin for the matter, under which is a device for fragmentation. The fragmentation action is regulated by the pressure of the material fed into the bin , and is effected by an impact, vertical to the grater surface. That surface consists of a revolving band, whose receiving end is constructed to catch the matter from the bin in a receptacle, and which has a built-in deflecting plate. The grater is fitted with a device to control the incoming material from the bin. The grater is enclosed in a rotating cylinder that acts as a sieve. (Text in German)



INT-0637

Lundgren, G. A. L. (Komprimator A.B.). Machines for receiving and compressing material such as rubbish and other refuse. Great Britain 1,112,958; filed Nov. 16, 1966; issued May 8, 1968.

The machine comprises a series of containers, arranged in a row, into which refuse is collected and compressed. The entire assembly is supported and interconnected by a common channel iron framework. Each unit is provided with a front panel door for removal of waste, and a metal panel which encloses the rear area. Compression of refuse is achieved by a power-driven device provided with a piston-driven ram. This unit moves on horizontal rails at the top of the assembly. When it is automatically aligned above each container, the ram is operated to compress the refuse. Since the containers are lined with bags, the compressed garbage can easily be removed.

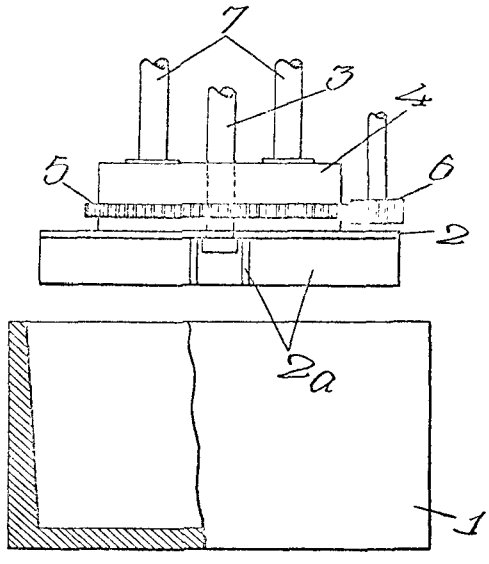


INT-0638

Tezuka, K. Scrap compressor. Japan 43-10,946; filed Mar. 18, 1965; issued May 8, 1968.

This scrap compressor reduces power consumption while it utilizes a set of suitable compression plates that operate on respectively smaller areas. The vertically movable disc, which is lowered into the cylindrical scrap chamber,

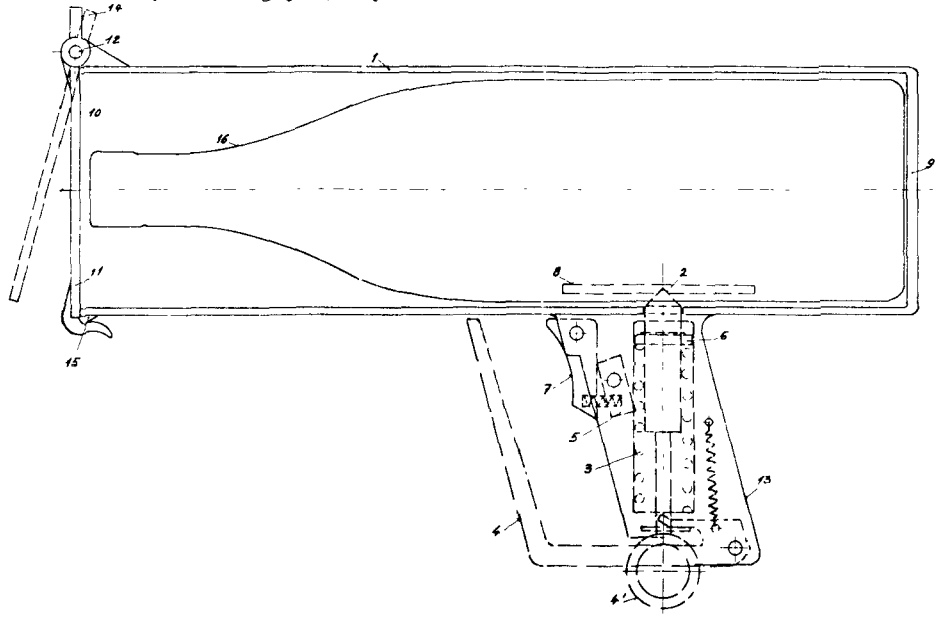
has compression plates fixed to its surface. The disc can be rotated either vertically or axially. In proportion to the economy of the power in use, the compressor can be lightweight. (Text in Japanese)



INT-0640

Gros, A., and P. Buhrer. Device intended for breaking packaging, particularly glass bottles. Switzerland 460,499; filed July 22, 1966; issued July 31, 1968.

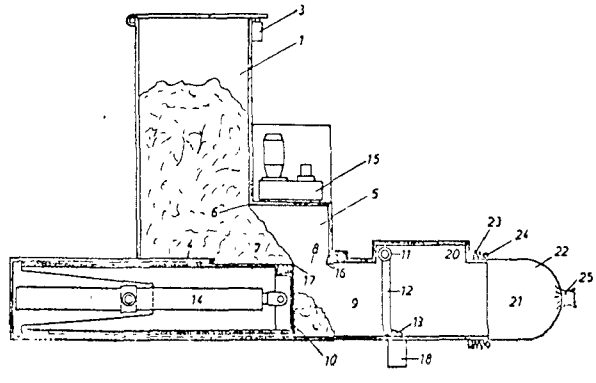
This device consists of a container enclosing the bottles to be broken, a firing pin, capable



INT-0639

Neuenburg, K., and H. Born (DEMAG A.G.). Refuse compactor. Germany 1,269,944; filed Aug. 5, 1966; issued June 6, 1968.

This refuse compactor collects material in a container and passes it to a compression chamber, where a plunger forces it against a releasable abutment. Beside the fill chamber, a transfer space, secured by the cone of material carried by the plunger itself, connects through a transfer hole to the compression chamber. Transfer and compression chambers are offset so that as it strokes forward, the plunger both compacts the material in the compression chamber and moves material being loaded toward the transfer hole. The material falls through the transfer hole to the compression chamber, each time the plunger strokes backward. (Text in German)

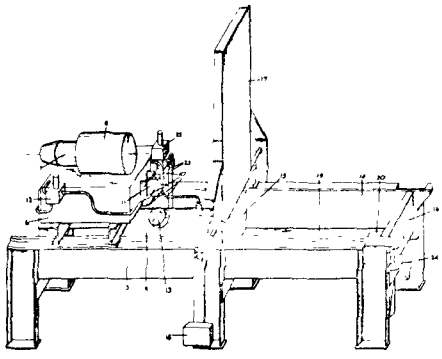


of being cocked, and a triggering device for releasing the firing pin which strikes the bottles. The firing pin may be propelled by a compression spring which is cocked manually, directly or through the intervention of a lever, or else by compressed air. The firing pin, the cocking device, and the triggering device may be installed in a handle attached to the container. The container may have the shape of a gun, a beer mug, or a flatiron, and may be provided with hinged covers at one end only or at both ends. (Text in French)

INT-0641

Broadhurst, D. (Simon Handling Engineers Limited). Improvements in or relating to a press for baling scrap metal. Great Britain 1,122,492; filed Nov. 24, 1965; issued Aug. 7, 1968.

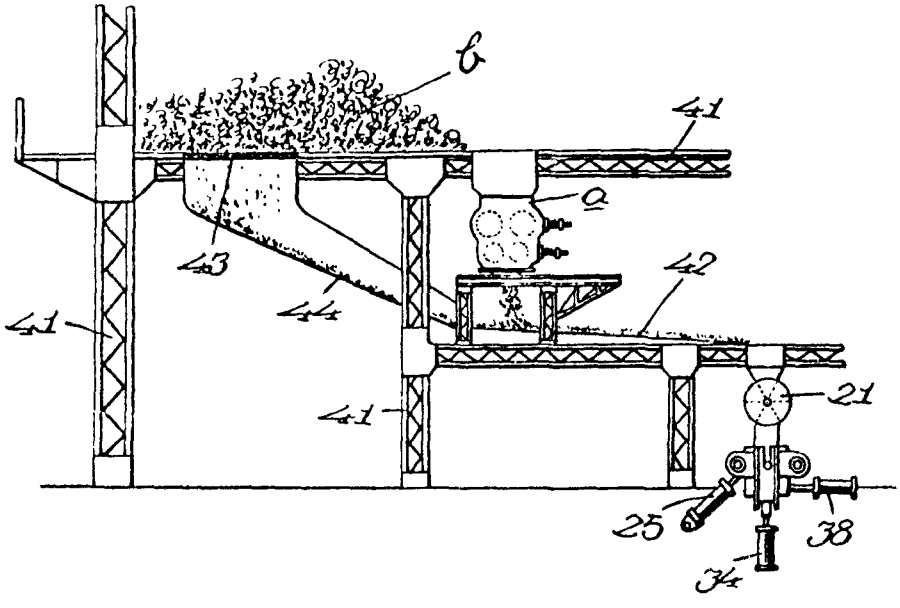
This baling press for scrap metal has a top-loading compression chamber which is closed by a releasably locked lid during a baling operation. A hydraulically operated ram effects the baling operation, and a hydraulic ejector ram raises a portion of the compression chamber floor. When the floor is elevated, a forklift truck can be used to remove the bale.



INT-0642

Ryo, S. Automatic compression of metal scraps. Japan 44-3,940; filed Aug. 15, 1961; issued Feb. 18, 1969.

This device to cut, compress, and mold the metal scraps from lathes, etc., works by the rotation of rollers with different speeds. Scrap metal is dropped into the device in a certain quantity at regular intervals. The device revolves and has wings spaced at even intervals. A pair of arc-shaped boards open and shut the cylindrically shaped compression case. The first compression section dumps, receives, and carries out preliminary compression. The molding section forms an approximate parabola shape in cross section, and compresses the metal scrap again. These operations are carried out automatically and efficiently in continuous operation. It takes 5 seconds to dump the metal scraps, 3 seconds to close the case, 20 seconds to ram or compress it, and 14 seconds to ram back. If one pack weighs 150 kg, it is possible to process about 90

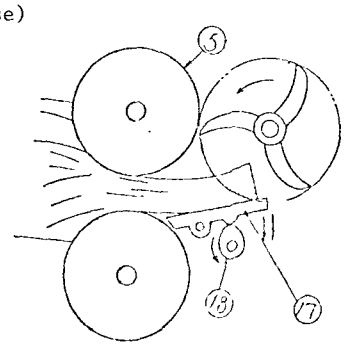


tons in a 7-hr day. With this device, the defects of the box-shaped press, the small cylinder press, and the friction press are eliminated. This device is more effective because compression occurs in a unidirectional movement. (Text in Japanese)

INT-0643

Matsubayashi, Y. Device for garbage pretreatment before incineration. Japan 44-4,720; filed Sept. 1, 1965; issued Feb. 26, 1969.

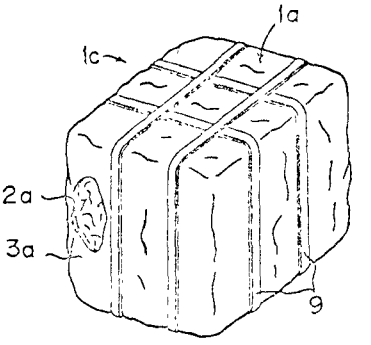
A pretreatment device for garbage incineration provides a device to compress the dumped garbage at the bottom of the charging hopper, or in the course of sending the garbage from the hopper to the incinerator. There is a rolling mechanism provided to adjust the gap size. The cake, which is sent out from the roller, is cut and unfurled by the rotating, cutting, and scraping device. Although the lower roller is stationary, the upper roller can move up or down by the adjustment screw, so that the compression ratio can be adjusted. The compressed cake is pushed out onto the movable table, which is kept at horizontal position for a certain period of time. Then the table tilts at an angle for a certain period of time, and goes back to the horizontal position. While the table is in a horizontal position, the cake is moved onto it without being touched with the rotating blade. After a period of time, the cake is pushed to the bottom of the rotating blade. It is then cut vertically into small pieces and scraped; it falls into the incinerator by the rotating centrifugal force. (Text in Japanese)



INT-0644

Tezuka, K. Blocks of solid wastes enveloped by a concealing material. Switzerland 467,707; filed Feb. 26, 1968; issued Mar. 14, 1969.

Blocks of solid waste, which can be used to fill up rivers and embankments, are composed of dehydrated, compacted refuse enveloped by concealing materials. The density of these blocks of covered wastes should exceed 1.1 in the case of sea disposal. The forms and dimensions of the waste blocks should be so determined as to facilitate their easy transportation and stacking. The blocks can also be used as construction material. The covering material can be metallic or synthetic resin sheets frequently reinforced by a network of thread or wire; reticular coverings can also be utilized. Blocks of waste can contain quicklime, washing powder, carbolic acid, cresol, boric acid, salicylic acid and similar substances, to prevent ultimate fermentation, decomposition, and growth of fungi within the blocks. (Text in French)

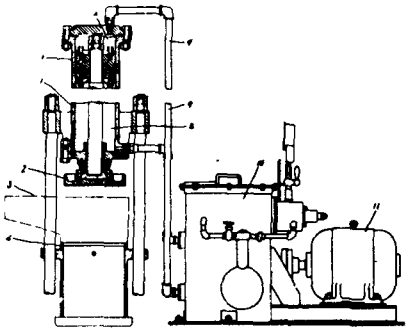


INT-0645

Hasegawa, T. (Kitajima Seisakusho). Device to eliminate water from garbage. Japan 44-6,357; filed Dec. 9, 1965; issued Mar. 18, 1969.

A device to eliminate water from garbage, after separating inflammables (wood, bamboo, garbage, paper, etc.) from nonflammables (earth, stone, sand, glass, metals, etc.), works by compression. The inflammables are separated from the nonflammables by utilizing the differences in specific gravity in water. The water adheres to or penetrates into the wastes so that the garbage contains a considerable amount. Therefore, dehydration is the next stage of treatment. This pretreatment is continuous. At the bottom of the lower cylinder is a receiving piston; the upper cylinder has the pushing piston. The two cylinders are equipped with an oil pump, which transmits pressurized oil in order to operate these two pistons. There is also a horizontal cylinder which operates a horizontal piston to let the compressed garbage fall out of the compression cylinder after it has been compressed, dehydrated, and ejected by the falling of the receiving piston. During the compression, water contained in the garbage is dehydrated approximately 60 percent under the pressure of 3 to 20 kg per cu cm. The

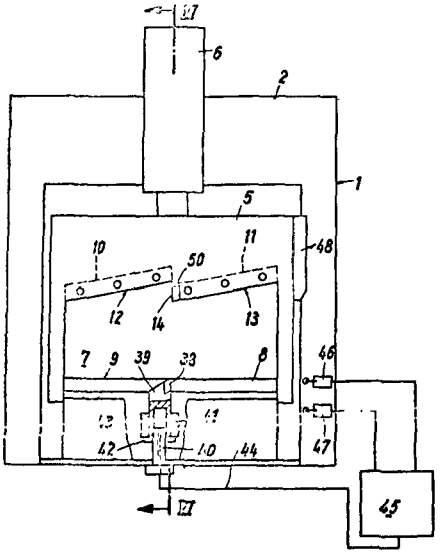
compression and dehydration operation is carried out automatically; thus, the dehydration of large quantities of garbage can occur continuously, simply and efficiently. (Text in Japanese)



INT-0646

Van Endert, F. (Lindemann Maschinenfabrik G.m.b.H.). Shears for cutting up scrap and the like. Australia 290,104; filed Aug. 11, 1964; issued Apr. 2, 1969.

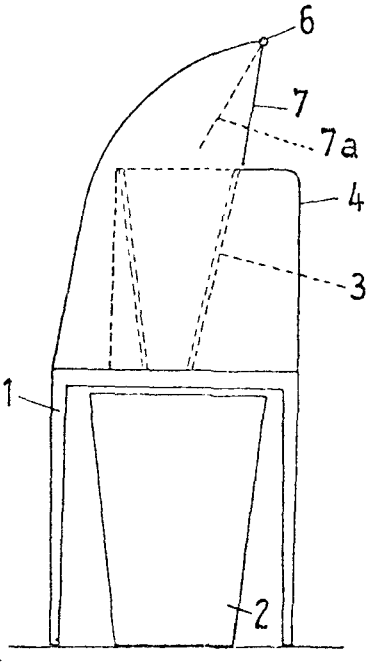
Shears for cutting scrap are composed of a main blade which lies in a cutting plane extending across the direction in which the scrap is moved into the shears. The cutting edge is inclined in this plane and includes two portions which are inclined in the same direction relative to the cutting edge of the coacting blade. A drive is provided to move one blade toward the other. Between these is a step and two cooperating auxiliary blades located in a cutting plane perpendicular to that of the main and coacting blades. The two cooperating auxiliary blades pass through the step. One of the auxiliary blades is fixed to the main blade, and its cutting edge passes through the projecting corner of the step. The other auxiliary blade is attached to the coacting blade so the two auxiliary blades make a cut through the scrap in a direction at right angles to that made by the main and coacting blades.



INT-0647

Gross, C. (LOCA Holding- und Finanz-G.m.b.H.). Crusher for bulky waste. Switzerland 471,660; filed Dec. 15, 1967; issued Apr. 30, 1969.

A crusher has been devised for glass bottles and cans. It consists of a rigid oblique wall and a movable oblique opposite wall. The two walls face each other in a funnel shape. A shaft is formed by the two sidewalls. The bottles and cans fall through this shaft while being crushed. The crushed waste falls through a flap into a container underneath the crusher. The two steel walls are ribbed, to prevent bottles and cans from slipping back toward the entrance. The movable wall is operated by an eccentric crank drive. The centerline of the connecting rod cuts the movable wall in its center. (Text in German)

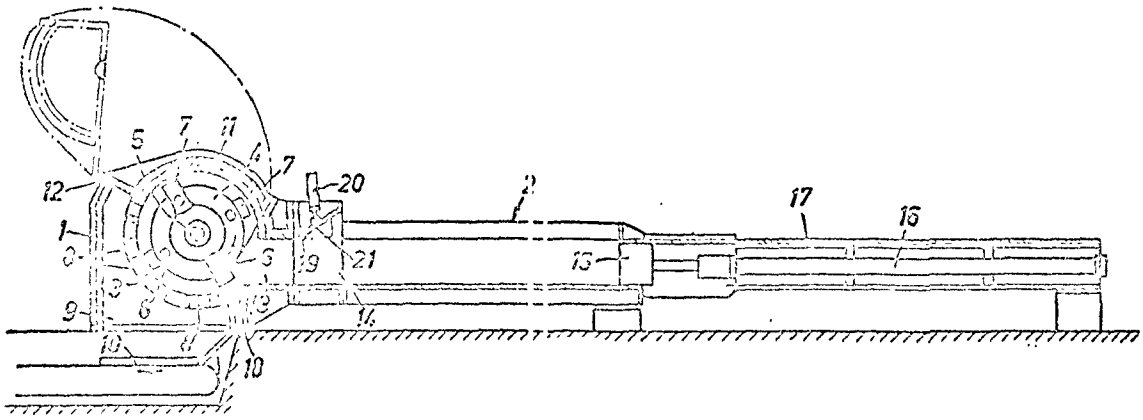


INT-0648

Van Endert, F. (Lindemann Maschinenfabrik). Improvements in the processing of scrap metal. Australia 291,295; filed Dec. 9, 1964; issued May 27, 1969.

Processing/Reduction

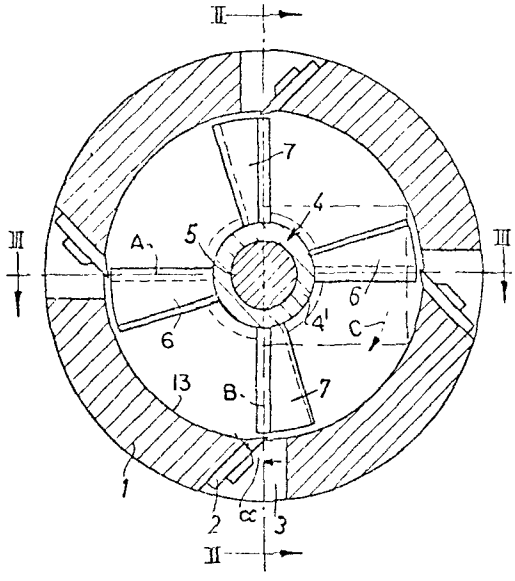
Scrap metal is processed by an impact-breaking machine. The pieces of metal are pushed by a mechanical feeder, positively and continuously, and at a speed that can be varied, into the impact tools of the machine. The machine has a charging aperture at one side, and a trough which leads to the charging aperture, and it is open at the top. The trough has a feed plunger which is movable at an adjustable speed for feeding scrap from the trough into the aperture. A flap is positioned at the charging aperture. The flap constricts the inlet and forms a funnel. The flap has a power drive by which it can be swung down to compress scrap and assist its entry into the charging aperture.



INT-0649

Voelskow, P. (Hombak Maschinenfabrik K.G.). Chopping machine for wood waste in small pieces. Canada 815,871; filed Nov. 17, 1965; issued June 24, 1969.

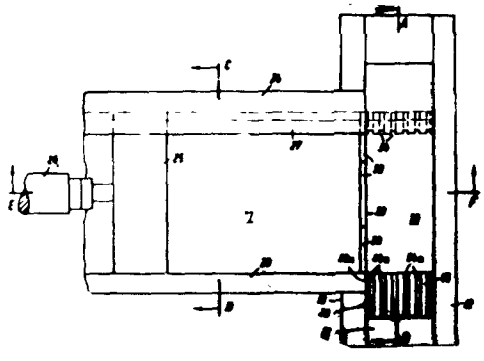
This machine reduces wood waste to small pieces. The blades of the cutter are obliquely set at an angle to the shaft, so that they are arranged approximately like the blades of an axial fan. Similarly, they are twisted alternately to the right and left, which subjects the chips in the cutter ring housing to back-and-forth tumbling, largely avoiding crosscuts. The cutter ring is rotatable in the same direction as the blade wheel, but it moves more slowly so a differential velocity exists between the two rotating parts. Wood chips strike the blades and are sliced along the grain to produce fiberlike or rodlike particles.



INT-0650

Herbord, H. (I. Schoeme). Scrap iron press. Germany 1,298,881; filed Feb. 5, 1960; issued July 3, 1969.

The scrap metal press has: a compression mold closed by a pivotal lid; a plunger trough, with its outlet above one of the sidewalls

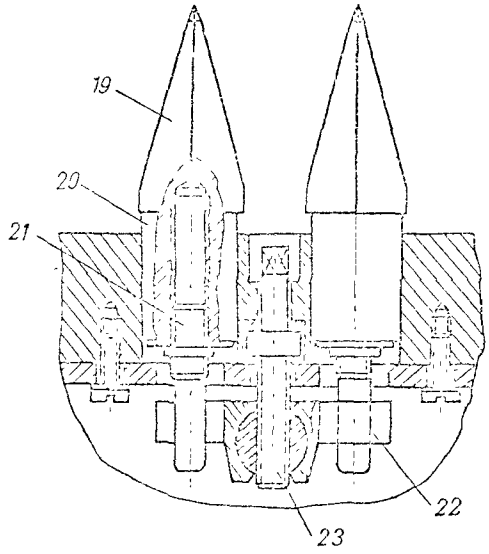


of the compression mold on one hand, and flush with a sidewall of the lid on the other; and a wall that is flush with the plunger trough. The wall has a cylindrical guide surface, concentric with the pivotal axis of the lid. Upper and lower edges of the plunger trough sidewall abut the cylindrical configuration. (Text in German)

INT-0651

Nozdrovskiy, A. S., K. F. Antipov, V. F. Dyuzhenko and S. M. Kolodin ('Gipronikel' Planning and Scientific Research Institute). Metallic waste shredder. U.S.S.R. 238,996; filed July 30, 1967; issued July 16, 1969.

A metallic waste shredder has two drums assembled and attached to an internal frame by flanges for easier servicing. A centering rod, with one end flanged and the other drilled and tapped to take a bolt, supports the drum in position, and permits removal without dismantling the machine. For easy removal and refitting of the teeth, each tooth has a T-shaped bolt and a tapered shank.

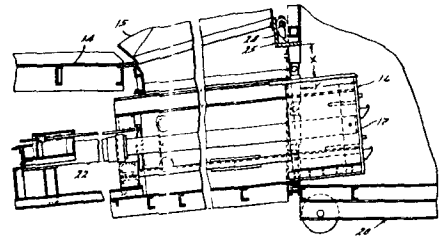


The teeth are held in pairs by a slotted, locking plate. To remove a tooth, the locking plate is slackened, and the tooth is turned through 90 degrees to allow the T-bolt to pass through the plate. The new tooth is replaced in the reverse sequence. (See also U.S.S.R. 179,581) (Text in Russian)

INT-0652

Pioch, R. J. Handling and compacting apparatus for loose bulk material. Great Britain 1,159,921; filed July 19, 1966; issued July 30, 1969.

A handling and compacting apparatus for loose bulk material is of particular (though not exclusive) application for compacting refuse and loading it into containers for disposal, with a minimum of equipment and labor. The apparatus can handle materials differing in density, size, moisture content and other characteristics, such as those encountered in general refuse collected from household sources, as well as industrial wastes. The device has: a container with a rectangular charging opening; a compacting unit including sidewalls defining an open-topped rectangular ram chamber; a ram, having a rectangular front plate, which is movable through the chamber from a retracted position, by the charging opening, to a projected position in which it extends into the container through the charging opening. The width of the ram substantially conforms to the width of the charging opening; the height of the ram is substantially less than the effective height of the charging opening; and the ram in the projected position has the upper portion of its front plate extending into the container at a distance at least equal to the difference between the height of the ram, and the effective height of the charging opening. (See also Great Britain 1,159,922)

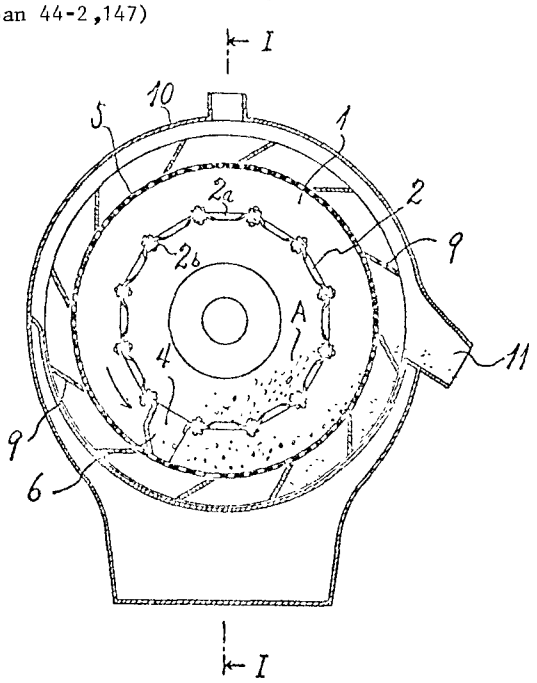


INT-0653

Hefkel, A. T. Garbage crushing device. Japan 44-17,835; filed Aug. 17, 1965; issued Aug. 5, 1969.

A device designed to crush garbage finely enough to be used as compost consists of two bands wound around the outer surface of a revolving cylinder, whose axis is approximately horizontal. The bands are attached to a supporting wheel which causes the cylinder it supports to revolve. A second cylinder with a grid is placed within the first. During cylinder revolution, the garbage is crushed, and it drops through the screen, out of the inner cylinder. Rough garbage, not sieved through the screen, is scooped by shovels in the grid cylinder for further crushing. A few blades which rotate with the revolving cylinder perform the scraping. Inorganic garbage is discharged at one end of the grid cylinder. Treated garbage, after dropping to

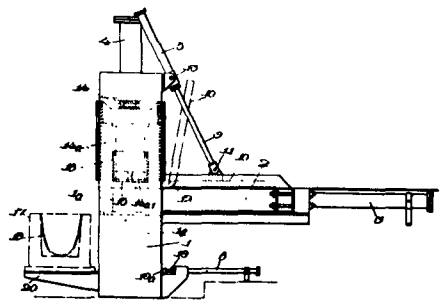
the bottom of the outer shell, is removed through an outlet which may be directly connected to a composting machine. (See also Japan 44-2,147)



INT-0654

Tezuka, K. (Tezuka Kosan K.K.). Scrap compressor for electric furnace. Japan 44-19,143; filed Sept. 28, 1965; issued Aug. 20, 1969.

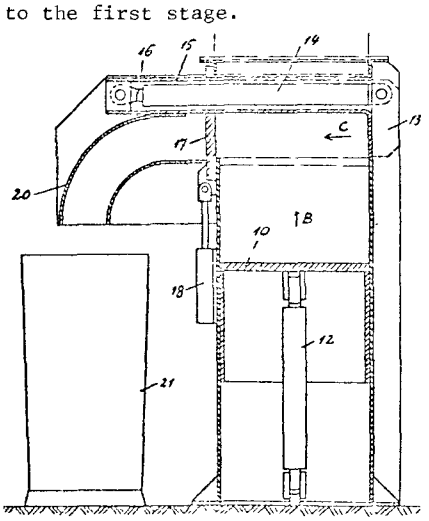
A device molds compressed scrap to the shape of the electric furnace so the operation is efficient and economical. A pushing board, with an arc-shaped concave part, is attached to the plunger of a horizontally pushing cylinder. Opposite the pushing board is the first compressing section, which forms a concave shape; below the first section is a second compression section, into which the casing, which has a shape similar to that of the inside of an electric furnace, is slipped. On top of the second compression section, a plunger of a vertically pushing cylinder is situated. Another pushing board, which can rotate, is affixed to the plunger. Below that is another pushing board, which has a groove on which a cross-shaped board moves vertically. When the device is charged and the lid closed, the horizontally pushing cylinder works the plunger. The pushing board at the tip of the plunger compresses the scrap into cylinder form. Next, the vertically pushing cylinder works the plunger, forcing the scrap into the casing where it is again compressed and where the cross-shaped board gives local pressure. When the cross-shaped board goes up, the plunger rotates, and the compression is repeated. The final compressed scrap is in the shape of the inside of an electric furnace. The scrap may be efficiently melted in an electric furnace as a result. (See also Great Britain 1,122,607, 1,149,404 Canada 818,186) (Text in Japanese)



INT-0655

Smolka, K. Method of and a press for compressing refuse. Great Britain 1,164,428; filed May 15, 1968; issued Sept. 17, 1969.

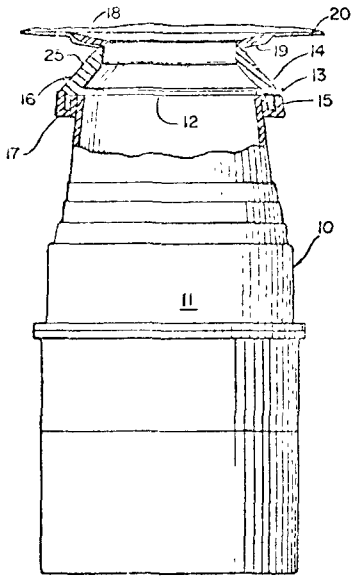
This is a method of compressing refuse in a chamber in three successive stages with compacting actions at right angles to each other. The first-stage compression is effected by a compacting plate hinged at its lower edge. It acts on the refuse in a horizontal direction when it is moved into position. It forms a wall of the compression chamber for succeeding stages, and closes the charging chute. This plate has an extending curved section, and when in the second position, it provides an inclined surface for guiding refuse from the chute into the compression chamber. Second-stage compression is effected by a second compacting plate. It compresses the refuse in a vertical upward direction, at right angles to the first stage.



INT-0656

Mlinar, R. J. (Whirlpool Corporation). Food waste disposer. Canada 824,352; filed June 20, 1967; issued Oct. 7, 1969.

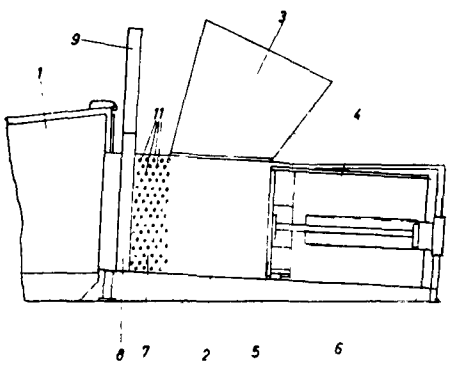
Two annular rings, located at the top and bottom of single, truncated cone, form a multicomponent rubber mounting that increases a garbage grinder's resistance to shock and vibration. The annular rings are relatively stiff, 75 to 95 durometer, while the connecting truncated cone has an intermediate hardness, 40 to 80 durometer.



INT-0657

Ries, A., and L. Stephan (Firma Adolf Ries). Compacting device for compressing all types of waste materials. Switzerland 479,464; filed Dec. 20, 1968; issued Oct. 15, 1969.

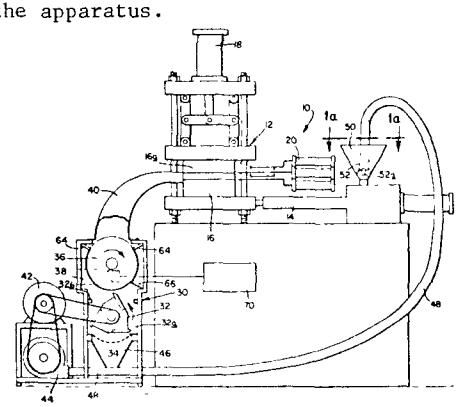
This compacting device is adapted for compressing all types of wastes, including bulky, elastic, and wet rubbish. The device consists of a large-capacity container, a feeding hopper which terminates in a guiding duct, and a pressing device with a hydraulically operated piston in the duct beyond the hopper. A prepressing chamber is between the container and the feeding hopper. The presser piston moves into the prepressing chamber; this chamber is closed off from the container by a vertically moving slide plate operated by hydraulic cylinders. The wall of the prepressing chamber may be provided with drainage holes. The piston is equipped with pressure switches. (Text in German)



INT-0658

Straus, W. (Pennwalt Corporation). Injection molding scrap grinder. Canada 826,555; filed Aug. 28, 1967; issued Nov. 4, 1969.

This scrap grinder, which receives waste materials from a plastic injection-molding machine, avoids feedback from the grinder to the mold. Plastic scrap passes to a drum while the drum is in its receiving position. When the drum rotates to a second position, scrap is discharged into a round pulverizer. This machine returns predetermined amounts of ground plastic to the plasticizing portion of the apparatus.

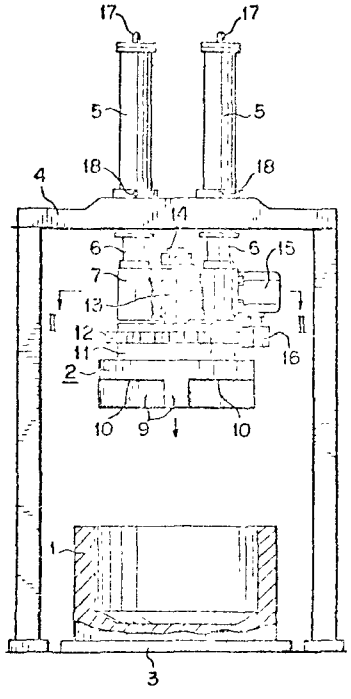


INT-0659

Tezuka, K. (Tezuka Kosan K.K). A rotary compressor for metal scraps. Great Britain 1,172,701; filed Jan. 3, 1967; issued Dec. 3, 1969.

This rotary scrap compressor makes pressed blocks with a weight and volume suitable for charging into a melting furnace for reprocessing. This press acts upon the scrap in two ways. First, a single plate compacts the metal which is placed in the compression chamber. Then, a rotary displacement is caused between the compressor elements. By repeating the compression and rotary displacement operations, scrap lumps are pressed into

uniform and compact pressed blocks. This machine requires a relatively low compression force.



RECYCLING

INT-0660

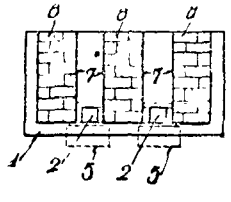
Cavanagh, P. E. Metal recovery from steel slags. Canada 424,784; filed Sept. 26, 1942; issued Jan. 2, 1945.

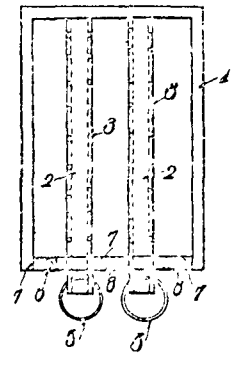
A process for the recovery of metal from molten oxidizing slag which has been removed from a steel bath comprises the addition of an exothermic agent to the slag. Such an exothermic agent is calcium silicon carbide. In this compound, the calcium is converted to calcium oxide, a very strong base; the silicon releases tremendous exothermic heat; and the carbide is a powerful reducing agent. This exothermic agent is convertible to a basic oxide as it absorbs oxygen in the slag, with the basic oxide replacing the particles of metal separating themselves from the slag. In this manner, the exothermic action, in conjunction with the replacement of the metal particles, retains the fluidity of the slag as the metal is being precipitated. The slag and the separated metal are then introduced into an arc furnace, the slag is removed from the metal, and a portion of the removed slag is placed into a second furnace. Coke is added to the slag in the second furnace to produce an exothermic agent which is convertible into a basic oxide.

INT-0661

Iwai, M. Device to produce fertilizers by using the heat of incineration of solid wastes. Japan 170,087; filed Apr. 15, 1944; issued Mar. 2, 1945.

In this furnace, phosphate rock or any similar ore can be reduced to fertilizer by the heat obtained from the incineration of solid wastes. The incineration is controlled so that the solid wastes are charred. The charred solid wastes may be added to the phosphate fertilizer at the desired mixing ratio. The furnace, which is about 3.6 m wide, 5.4 m long, and 1.8 m deep, has two smokestacks at the bottom. The stacks, each about 30 cm sq and running across the bottom of the furnace, are provided with air intake holes on each side, at intervals of about 60 cm. They may incline toward the front of the furnace where they are connected to the upright stacks or chimney. Phosphate rocks are piled in the furnace up to the height of the stack; care is taken to avoid clogging the side air intake holes. Dried solid wastes are then spread uniformly over the phosphate rocks and set on fire. Dried solid wastes are continuously fed into the furnace and then pile up to a height of about 30 cm. Finely shredded trash is spread over the voids in the stack of solid waste until they are filled. The solid waste is thus covered with a 3- to 6-cm-thick layer of trash. Burned in this arrangement for about 10 hr, the solid wastes become completely charred. Dried solid wastes are then spread and burned as explained above. This process is repeated seven times, after which the exits of the stacks will be closed to put out the fire. The phosphate rocks become so fragile that they can be easily powdered to make fertilizer. (Text in Japanese)





INT-0662

Hartill, W., P. R. Childe, and L. Stocks (Thos. W. Ward Limited). Improved plastic or mouldable material and method of producing the same. Great Britain 569,623; filed July 17, 1943; issued June 1, 1945.

A plastic, moldable material is obtained from sawdust, chippings, shavings, and other industrial wood wastes by: delignifying the material with a caustic alkali, such as sodium hydroxide, varying strength from 2.5 to 20 percent, at temperatures from 0 to 115 C, for times varying from 48 hr to 5 min; removing the alkali by washing or acidification, for example, in an acid bath of 5 percent sulfuric acid; and subjecting it to heat and pressure to bind the mass together. Waterproofing material may be added at any time up until the binding process; a suitable material would be 3 percent paraffin wax by weight.

INT-0663

(Sandvikens Jernverks Aktiebolag). Process of refining stainless steel scrap having a high chromium content. Great Britain 569,785; filed Aug. 16, 1943; issued June 8, 1945.

A process of refining stainless steel scrap having a high content of chromium, or of chromium and nickel or molybdenum, consists of melting the stainless steel scrap to form a molten steel bath. The refining operation is performed by blowing air through the molten steel bath for such length of time, that owing to oxidation of a portion of the chromium present in the bath, the chromium content of the steel bath is reduced to below 10 percent, and the carbon content is reduced to approximately one-hundredth of the remaining chromium content. The heat required for the refinement is generated mainly by the oxidation of chromium. In this process, the chromium content of the steel is reduced to below 5 percent.

INT-0664

Groom, E. J. Improved process for the recovery of light-alloy scrap. Great Britain 570,166; filed Nov. 29, 1940; issued June 26, 1945.

This process provides a means whereby aluminum-base alloy scrap, or swarf is freed from any tramp iron and foreign matter (such as cutting oils) present. The metal is comminuted, preferably to a fineness such that 80 percent will pass through a 200 to 240 I.M.M. sieve. The metal is then subjected in a die to a pressure of between 5 and 80 tons per sq in. with or without tne simultaneous application of heat. The process also provides a means by which magnesium-base alloy scrap or swarf is purified. The powder produced should preferably be angular or sphero-angular. Heating in this process may be effected either by direct flame heating of the die, by resistance heating obtained by passing current through the mass, or by induction heating. The temperature chosen should be such as not to lead to the formation of a liquid phase; usually around 350 to 450 C is adequate.

INT-0665

De Irsa, G. I. (Wood Impregnation Limited). Improvements in or relating to the production of boards and sheets from waste fibrous materials. Great Britain 571,280; filed May 7, 1943; issued Aug. 17, 1945.

The process for producing boards and the like from waste fiber consists in silicifying the fiber by the addition of a binder, and by forming the material so treated into boards or sheets by the action of heat and pressure. The sawdust or other waste material is first treated with a solution of 2 percent sodium fluoride or other fireproofing salt, in a 5 percent solution of mercuric chloride in 100 parts of limemilk. In the second operation the material is treated with fluosilicic acid, along with bitumen and cryolite to prevent moisture absorption. Where insulation against electric currents is not necessary, the sawdust is treated with iron salts and then sodium silicate. After the sawdust has been mineralized, made water resistant and fireproof, it is dried to the advisable moisture content, and then mixed with the binder and compressed into desired forms and sizes in hot hydraulic presses. The purpose for which the material is desired dictates the kind of binder which is used. The quantity of binder is also dictated by the kind of sawdust and its dry weight.

INT-0666

Holford, H. J. (Holford Processes Limited). Improvements in or relating to processes for the production of organic fertilizers and apparatus therefor. Great Britain 572,171; filed Aug. 19, 1943; issued Sept. 26, 1945.

Organic fibrous or semifibrous materials are mixed with a bacterium-containing liquor, such as sewage sludge, preferably of the lagoon or activated type. The mixture is subjected to artificial aerobic digestion.

As heated air is passed through the mixture to pasteurize it, some of the moisture is removed. Finally, it is subjected to mechanical pressure to remove another portion of the moisture content. Inorganic fertilizers, such as ammonium sulfate and sodium nitrite may be incorporated in the mass prior to its pasteurization.

INT-0667

Mukoyama, M., and S. Katakura (Nitto Kokogyo Company). A manufacturing method for inorganic artificial fibers. Japan 175,011; filed Aug. 21, 1944; issued Mar. 24, 1947.

In making mineral fibers from the fusion of inorganic raw materials or slag from ore refining, the proportion by weight is chosen so that the silicon dioxide plus alumina to calcium oxide plus magnesium oxide ratio is 1.3 to 1.82, and the silicon dioxide plus alumina to ferrous oxide ratio is 10 to 12. The fused material is allowed to flow down, and reducing gases are blown into it in such a way that a whirlpool is formed, causing the material to fall in a feather-like form. (Text in Japanese)

INT-0668

Yoshii, T. (Chichibu Cement Company, Ltd.). Manufacturing of titanic iron-containing alumina cement. Japan 174,763; filed June 15, 1945; issued Mar. 24, 1947.

Titanic iron-containing alumina cement, which compares in strength and chemical resistance to high-quality portland cement, can be manufactured from limestone mixed with materials such as red mud, ore tails, or slag, coal ash, and clay. The baking is done at a low temperature (ranging from 1,200 to 1,400 C), thus saving fuel by about 20 percent. The new black cement has the combined characteristics of high chemical resistance and low baking temperature. The blending of the secondary materials or additives with the main material should result in the mixture having a hydraulic modulus of 1.60 to 2.00, a silica modulus of 0.60 to 1.80, and an iron modulus of 0.6 to 1.80. In terms of weight percentage, the additives should be kept within 5 to 25 percent of the total. (Text in Japanese)

INT-0669

Giuffrida, A. Cellulose from wine branches. Italy 429,624; filed Mar. 24, 1947; issued Jan. 29, 1948.

Vine branches are ground and treated with dilute nitric acid at room temperature for a few hours; then the mixture is raised to boiling point. The material is washed and treated with dilute sodium hydroxide solution at 100 C, then washed, bleached, and dried. The nitric acid treatment can be substituted by a steam treatment in an autoclave at 3 to 4 atm for 2 hr. (Text in Italian)

INT-0670

Aldovrandi, F. Synthetic gasoline. Italy 430,078; filed Apr. 8, 1947; issued Feb. 9, 1948.

Vegetable wastes are digested with water for 24 hr. By subjecting such a suspension to the electric arc under direct current (with graphite cathode and copper anode), hydrocarbon vapors are formed at the cathode as a transformation of the hydrocarbon contained in the water. By collecting and cooling the hydrocarbon vapors at minus 15 C, a gasoline (specific gravity 0.75 to 0.80) is obtained. (Text in Italian)

INT-0671

Suzuki, S. A manufacturing method for special magnesia cement. Japan 176,348; filed Oct. 23, 1946; issued Feb. 10, 1948.

Serpentine or slag from nickel refining is treated with an equivalent amount of magnesium chloride, bittern, or hydrogen chloride. The mixture is then heated for 2 to 5 hr at 500 to 550 C in order to give a free magnesium oxide in the ore. The clinker thus obtained is hardened by adding the required amount (10 to 20 percent) of magnesium chloride. (Text in Japanese)

INT-0672

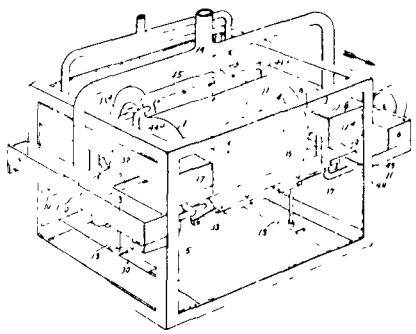
Mizuno, H. (G. Mizuno). Garbage and trash disposal device used in conjunction with animal feeding. Japan 176,506; filed Oct. 4, 1944; issued Apr. 15, 1948.

A kiln housed in an underground chamber either smokes trash or makes charcoal out of it. The smoked trash can be used as a fertilizer. Heat generated by incineration is utilized for cooling. Chimney gas is led by a pipe through the cooling tank. The tar produced by cooling the gas is collected. Garbage that is usable as animal food, is separated out for feed. The excreta from the livestock thus fed falls into the combustion chamber of the kiln by means of a slanted floor. A workshop for handling the charcoal, tar, and fertilizer is provided underground beneath the animal-feeding area. (Text in Japanese)

INT-0673

Webb, A. H. Apparatus for saving fine metals by amalgamation with mercury. Australia 128,912; filed Mar. 17, 1944; issued Sept. 9, 1948.

This apparatus provides for the recovery of metals, particularly gold, from ore slimes. There is a rotatably mounted drum encased in sheet copper. Mercury is applied to the circumferential surface of the drum. The material from which the metal is to be extracted must be in the form of finely divided particles suspended in water. This material is projected by compressed air in a thin film or fine spray upon the circumference of the drum. The lower part of the drum is immersed in a shallow trough containing mercury, so that during its rotation, its mercury-coated surface is continuously renewed. Water with the slimes to be treated is gravitated through a breeche pipe to two receiving tanks, in which the level of the slimes and water can be regulated by float valves which control the supply. Compressed air produced by any convenient means is delivered to an air trunk. Pipes lead from the air trunk to a series of atomizers to which the slimes are conducted; here they are acted upon by the compressed air.



INT-0674

Mueller, H., and W. Oversohl (AGLUKON G.m.b.H.). A method for producing aluminum chloride and iron chloride. Germany 802,936; filed Dec. 1, 1948; issued Feb. 26, 1951.

Tailings and slag piles from coal-mining operations generally consist of slate minerals containing 20 to 40 percent occluded coal which cannot be separated by mechanical means. This waste product can be utilized by treating it with chlorine at temperatures between 600 and 1,000 F in rotary kilns or shaft furnaces. The resulting products are: carbon monoxide, which can be partially recycled to sustain the reaction; a mixture of aluminum chloride and iron chloride, which is condensed in cooled receivers; and a residue containing about 90 percent silica, which can be used as a catalyst carrier, filler, or pigment. Industrial fly ash can be converted in the same manner. (Text in German)

INT-0675

(National Oil Products Company). Improvements relating to the reclaiming of waste wax paper. Great Britain 615,254; filed Apr. 30, 1946; issued Jan. 4, 1949.

This process for reclaiming wax paper (wax cuttings and the like), comprises disintegrating the paper in water heated to a temperature sufficiently high enough to melt the wax constituent. A cationic surface-active agent is added to the fiber and wax suspension to fix the wax on the fibers. The cationic surface-active agent is an amino-amide or a glyoxalidine cyclized from such an amino-amide.

INT-0676

(A. G. E. Robiette, and P. F. Hancock). Improvements in and relating to the recovery of metals from scrap. Great Britain 620,221; filed Jan. 9, 1947; issued Mar. 22, 1949.

This process provides for the recovery of metals from scrap containing volatile metals. The scrap metals are melted by the controlled oxidation of solid carbon via a gas containing at least 30 percent by volume of oxygen, and heated to such a temperature that most of the volatile metal present is removed by volatilization. The combustion conditions are controlled so that the gaseous products form a mixture substantially nonoxidizing to the volatile metal. Generally, the gas, containing at least 30 percent by volume of oxygen, will be oxygen or oxygen-enriched air, although other gas mixtures may be used--for example, oxygen mixed with one or more inert gases such as nitrogen or argon. Preferably the oxygen content should be as high as possible since this decreases the volume of the combustion gases. Preferably, a relatively pure form of carbon such as charcoal, pitch or petroleum coke, or graphite is used so the metals will not be detrimentally affected by the sulfur content of the fuel.

INT-0677

Bijma, J. Cattle feed. Netherlands 63,778; filed Sept. 6, 1946; issued July 15, 1949.

Garbage is granulated by milling, and then heated at 50 C while mixing, until a sticky

mass is obtained. This mass is kneaded, formed if desired, and finally baked. The baked product obtained may be employed directly as cattle feed or preserved by drying at 80 C in a finely divided form. The garbage may be mixed with other foodstuffs, such as hay, straw, chaff, or brans. In an example, garbage, composed of 50 percent potato skins, 25 percent vegetable refuse, 10 percent bread, and 15 percent grain waste, hay, or straw, is milled and then heated in a steam-jacketed vessel at 50 C. This mixture is stirred for 1 hr or more until a sticky mass is formed. This mass is kneaded for 15 minutes until a dough is obtained; this dough is molded and then baked for 1½ to 2 hr at 100 to 200 C. (Text in Dutch)

INT-0678

Freni, S. S. Fertilizer. Italy 476,402; filed Dec. 10, 1952; issued Jan. 23, 1950.

Bones, blood, horns, and similar wastes are ground, subjected to the splitting action of a fermenting agent such as trypsin, and warmed in an autoclave at 165 to 168 C. They are then subjected to the action of other polyhydroxylated aldehydes. They are treated with 24-degree Baume sulfuric acid, diluted to 18-degree Baume by denatured 90 percent ethyl alcohol solution, separated, and concentrated. Myosin, creatine, creatinine, sarcosine, and inosinic acid are said to be formed in the fertilizer mass. (Text in Italian)

INT-0679

Ito, Y. (Yonezawa Shoyu and Company). A manufacturing method for amino acid from fish entrails. Japan 25-625; filed Dec. 17, 1947; issued Mar. 1, 1950.

Fish entrails are heated at 60 to 100 C in a solution of 10 to 24 percent hydrochloric acid at 20 degrees Baume. After the floating oil is removed, it is concentrated. A 20 to 25 percent hydrochloric acid solution (by volume), which is also at a specific gravity of 20 Baume, is added to the concentrate. The mixture is boiled to decompose the remaining proteins. Following neutralization with alkali, the amino acids are separated out. (Text in Japanese)

INT-0680

Nakagawa, K., and S. Ishida. Method of treating sweet potato starch refuse. Japan 25-610; filed July 27, 1949; issued Mar. 1, 1950.

The sweet potato residue produced during starch extraction can be turned into a highly nutritious food material. The raw sweet potato waste is put into a cloth sack and pressed to remove 20 to 30 percent of the water content. The dewatered residue is then mechanically crushed. After adding sodium carbonate, the refuse is left for 3 hr. Then, sulfurous acid soda is stirred in, and the mixture left for 30 minutes. Following the subsequent immersion in 0.3 percent dilute sulfuric acid solution, the refuse is put into a rinsing machine for 30 minutes. The refuse, with water, is then fed into a centrifugal separator equipped with stirring blades. The whirlpool resulting from the stirring action causes the sand or earth contained in the refuse to be discharged through the bottom of the separator. The remaining product is removed and dehydrated in a cloth sack, thus producing a refined product. (Text in Japanese)

INT-0681

Glaubert, S. Treating wood shavings. France 960,228; filed Jan. 10, 1948; issued Apr. 13, 1950.

Wood shavings are first treated under 200-mm pressure with an aqueous solution of a weak acid (such as pentanoic acid) at 22 percent strength, the weight of the solution being 0.5 percent of the weight of wood, then with 15 percent strength sulfuric acid, the weight of the acid solution being 0.25 percent of the weight of the wood. An organic substance, 3 percent having 5 to 6 carbon atoms per molecule and having an alcohol or aldehyde group, is added, and the mixture is stirred for 10 minutes at room temperature. The mass can then be molded under heat and pressure. (Text in French)

INT-0682

Behera, H. A process of manufacturing fibrated cement articles. India 40,868; filed Jan. 26, 1949; issued Jan. 10, 1951.

Hydraulic cement mixed with pulps and fibers of vegetable matter is made plastic with water, and then molded into a desired pattern in a skeleton having holes and gaps in it, and constructed from bamboo, cane, reed, and the like. The amount of pulps and fibers in the mixture may be 2 to 12.5 percent of the cement by weight in dry state. Pulps and fibers are obtained from paper pulps, waste-papers, waste cardboards, cotton, jute, hemp, coir, manila, etc. Sawdust, paddy husk, straw, etc. may be incorporated into the mixture as filling agents. A coating

cement, or a cement mixed with colored pigments and/or abrasive powder, which is made sirupy with water, may be applied over the article produced by the above process. The article, after it has completely set, is treated with paraffin wax or mineral oil to make it resistant to the absorption of water and the action of weak acids. Some of the articles manufactured include roofing tiles, writing boards, slates, hollow-wares, containers, and dishes.

INT-0683

Creuze, P., P. J. Malvezin, and L. Rignault. Acids from cellulosic material. France 974,067; filed Sept. 27, 1950; issued Feb. 19, 1951;

Paper waste, wood pulp, and particularly algae that have been treated to remove iodine, bromine, and alginic acid, are hydrolyzed to give a six-carbon sugar which is fermented by Bulgarinus alginis to give a complex acid. This can be neutralized by sodium hydroxide or mixed with a six-carbon sugar and catalytically hydrogenated to give a complex that can be made into a soap or used as a lubricant. (Text in French)

INT-0684

Tinani, K. T. Manufacture of artificial wood. India 40,491; filed Nov. 2, 1948; issued Feb. 28, 1951.

A composition suitable for making artificial wood sheets is obtained by mixing with a filler, such as sawdust, wood waste, or rice husk, a mixture containing 77.0 percent magnesium oxide, 11.0 percent magnesium chloride, 2.0 percent French chalk, 2.0 percent chalk, 1.0 percent calcium oxide, 0.3 percent sulfuric acid, 0.7 percent hydrochloric acid, 2.0 percent sodium sulfate, 2.0 percent alum, and 2.0 percent soap.

INT-0685

(Vencore Veneers Proprietary Limited). Improvements in the manufacture of core-boards, artificial lumber, and the like. Australia 140,539; filed Aug. 5, 1948; issued Mar. 28, 1951.

Core-boards are molded under heat and pressure from a mixture of sawdust and animal glue or a synthetic resin glue, which does not decompose at the temperature and pressure at which the boards are molded. The cellulosic material (sawdust) was first treated with calcium disaccharate, which is prepared by mixing 10 gal commercial molasses with 8 gal quicklime and 20 gal water. The mixture is molded between heated platens at a pressure within the range of 200 to 550 lb per sq in. A wood or metal foil veneer can be attached to each or either side by reducing the moisture content of the molding mixture, and moistening one side of the veneer with liquid glue before placing it in the mold.

INT-0686

Sato, S. (Science Laboratory). A manufacturing method for fertilizer. Japan 26-2,964; filed Jan. 26, 1950; issued June 9, 1951;

Aluminum slag that contains 4.37 percent nitrogen and 16 percent aluminum is mixed with a 2 percent calcium fluoride solution; this is heated for 1 hr at 1,000 C, while passing nitrogen gas through the chamber, in order to produce a material containing 11.87 percent nitrogen. By heating the product in water for 30 minutes at 100 C, or letting it stand in water for 1 week at 25 C, 50 to 75 percent of the total nitrogen becomes ammoniated nitrogen. (Text in Japanese)

INT-0687

Kittelberger, P., and F. Burkhardt (P. Kittelberger). Wood concrete. Germany 808,690; filed Jan. 24, 1950; issued July 19, 1951.

Wood chips or sawdust are impregnated and suspended in a mixture of whitewash, lime cement, sodium silicate, magnesium fluosilicate, calcium hypochlorite, and inert colloidal matter, such as clay and bentonite. A concrete containing 1 part (by volume) cement to 1.5 parts prepared sawdust has a compressive strength of 500 kg per sq cm, and a wearing capacity (because of abrasion) of 7.4 cc per 50 sq cm. (Text in German)

INT-0688

Buenger, A. Impregnation of fiber batts. Germany 809,432; filed Jan. 8, 1949; issued July 30, 1951.

Paper, wood, textile fibers, and leather scrap can be cut and beaten, and then formed into batts on paper machines or similar devices. After drying to about 20 percent moisture, the batts are immersed in a bath containing the impregnating emulsion. The amount of emulsion absorbed can be regulated by the moisture content of the partially dried batt, and by pressing. The emulsion in the impregnated batt can then be broken by a current of steam;

the batt is dried completely on the paper machine or by other suitable means. This procedure results in a saving of impregnant. (Text in German)

INT-0689

Frank, W. Building materials. Germany 809,536; filed Oct. 2, 1948; issued July 30, 1951.

Materials for construction are made by using mineralized wood in combination with cement. The wood is mineralized in a strong solution of a hydrolyzable chloride. Air-dried sawdust (100 kg) is mixed with 20 liters of either a 37 percent aluminum chloride or 50 percent zinc chloride solution in a rotary barrel equipped with a beater. Water and cement are then added, and the materials are thoroughly mixed. (Text in German)

INT-0690

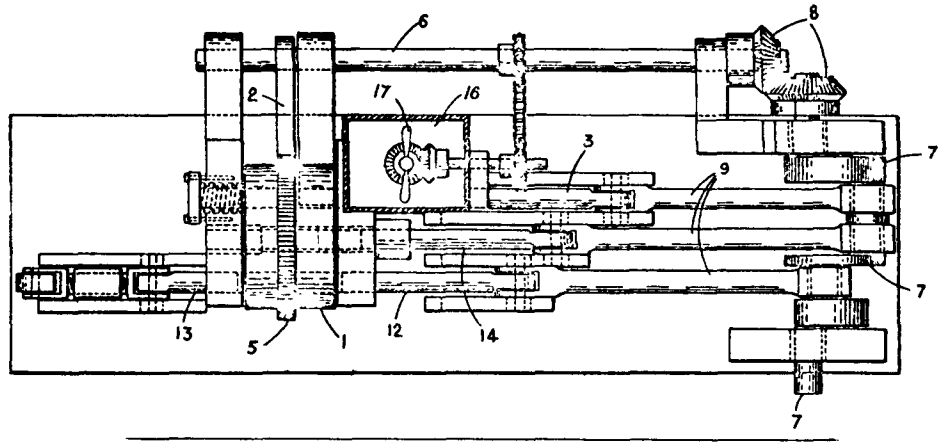
Forster, A. Light-weight construction materials. Germany 809,535; filed Apr. 23, 1949; issued July 30, 1951.

Lightweight materials for construction purposes are formed from calcined straw or similar plantlike material which is mixed with a binder, such as cement, and with building constituents, such as gypsum or pumice mixed with pitch-covered sawdust. Slag or steel wool is added to the mixture, and diatomaceous earth is sometimes added. (Text in German)

INT-0691

Blakey, G. G. Improvements in or relating to machines for moulding fuel briquettes from woodwaste, and like material. Great Britain 661,659; filed July 7, 1948; issued Nov. 28, 1951.

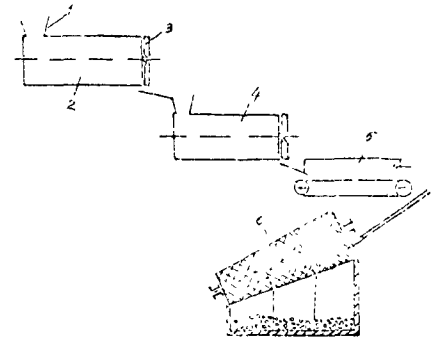
A machine is described for molding fuel briquettes from wood waste or the like. Raw material is fed through a hopper with an impeller, into a heated, intermittently rotating drum, having a series of radial molding bores into which the material is forced by a number of pistons. The material is compressed by opposing, corresponding, coordinated compressor pistons, then ejected into a cooling chamber by ejector pistons.



INT-0692

(R. Tricerri and Son). Fertilizer from tannery wastes. Italy 467,254; filed Apr. 20, 1950; issued Dec. 1, 1951.

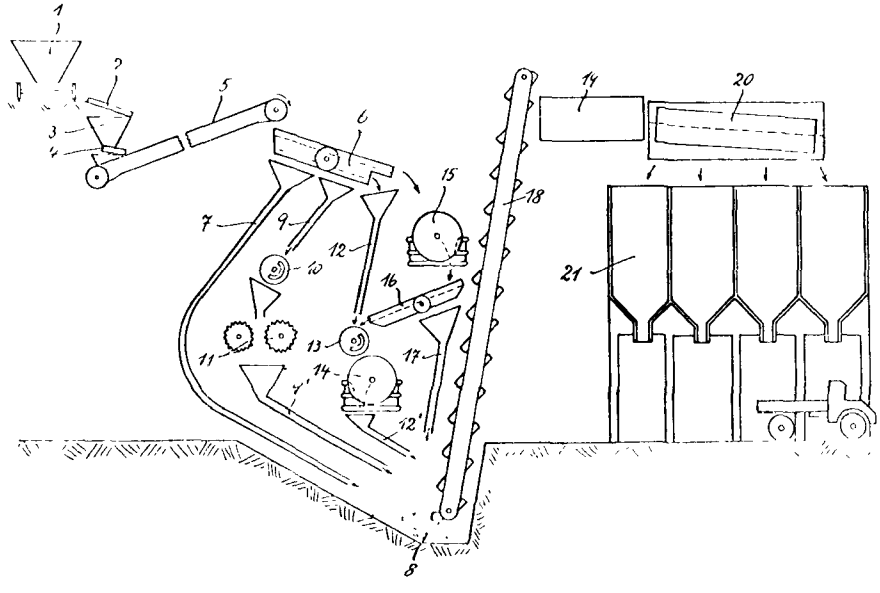
The flesh part of the hides is separated as a byproduct from the leather part, pulped in a cutting mill or meat chopper, and dehydrated in an air stream at 80 to 100 C to give granules suitable for use as fertilizer. (Text in Italian)



INT-0693

(Sueddeutsche Baustoffe G.m.b.H.). Method and equipment for the preparation of debris for reuse. Germany 830,284; filed Oct. 2, 1948; issued Feb. 4, 1952.

The debris is crushed, washed, and separated into the various grain sizes in the presence of water. Through a combination of dry and wet treatment, no preliminary sifting process is required, and the entire debris can be reused. No residual matter is left for dumping. Prior to water treatment, the debris is separated into groups of equal grain size. Each group is then crushed so that finally all groups are of about the same grain size. The components of the debris suspended or dissolved in the water are carried off in the wash water, so that pure sand and gravel are passed to the subsequent water sifting. The sand carried off with the washing water is collected in a sand trap. The material treated this way can be reused for the manufacture of bricks. The equipment comprises a conveyor belt, a vibrating screen, and conduits for the separated debris groups, into which crushers and toothed rollers are built. All equipment of the first stage (dry stage), with components arranged on top of each other, is erected next to the equipment for the wet stage. Between the first and the second stage, a bucket conveyor transports the material upward. (Text in German)



INT-0694

(Societe de Traitement et d'Exploitation du Poisson). Nuclein- and lecithin-containing product. France 1,002,919; filed Nov. 14, 1951; issued Mar. 12, 1952.

Fats and oils are removed from wastes of fish or other sea animals. The remainder of the wastes is put into solution with water, and hydrolyzed by the addition of an acid, e.g. hydrochloric acid. The pH of the mixture is adjusted to 6 to 6.2 by the addition of an alkali; the mixture is allowed to settle, and is filtered, dried, and comminuted to give a very fine powder useful for various industrial applications, e.g. in the manufacture of cosmetics. (Text in French)

INT-0695

(Svit, Narodni Podnik). Process for producing artificial fertilizers from leather manufacture waste products. Great Britain 672,071; filed April 25, 1950; issued May 14, 1952.

The methods described produce artificial fertilizers of high biological value and of loose, crumbly constitution, which greatly facilitates even distribution. Leather waste products are hydrolyzed in acid at temperatures over 60 C, followed by neutralization by calcium or potassium salts together with an admixture of granulating substances, e.g. comminuted bark, soil or sand. The process allows utilization of tanning byproducts such as waste acids, waste lime, and other

inorganics, as well as leather and hair wastes, tanning bark, and horny substances. The composition of the fertilizer can be altered to meet the nutritive requirements of various soils.

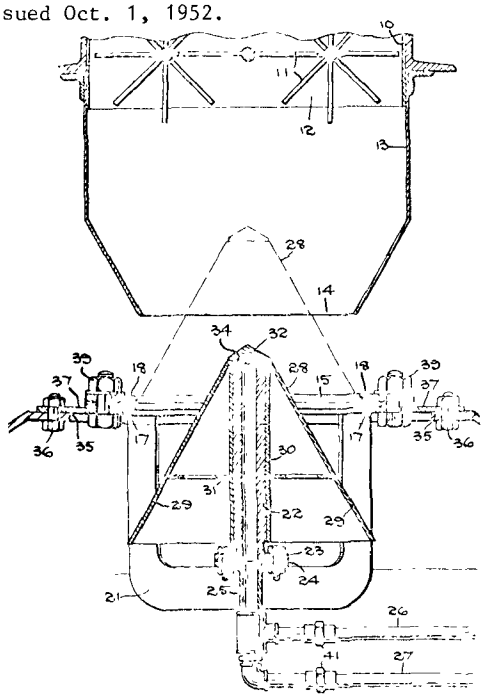
INT-0696

Vogel, R. E. Manufacture of porous bricks from filtered ash of soft coal. Germany 841,728; filed June 30, 1950; issued June 19, 1952.

A method for the manufacture of porous bricks has been devised by mixing soft coal filtering ash with water and a known effervescent agent. The mass is beaten, shaped and hardened in carbon dioxide-laden air. The brown coal filtering ash must have a grain size of 2 to 5 microns. Half of the calcium in the ash must consist of calcium oxide. The ratio between calcium oxide and iron (III) oxide and magnesium oxide may not be greater than 3 to 1. Fine sand or quartz sand, with or without cement, can be added. Also 2 parts of soft coal filtering ash with 1 part burnt gypsum can be used. The mass is hardened in an overheated vapor which is rich in carbon dioxide. (Text in German)

INT-0697

Dossor, J. Improvements in or relating to plant for converting kitchen and offal waste and the like into animal feeding stuffs. Great Britain 680,238; filed Dec. 7, 1950; issued Oct. 1, 1952.



The plant comprises a pulverizing vessel which is connected at its base to a discharge chute. The chute's lower end is directed vertically to a circular opening of a blow tank, which receives pulverized waste from the pulverizer above it. A conically-shaped valve assembly is seated within the central opening in the blow tank; the assembly is fitted with tubes for introducing compressed air or other fluid under pressure, and for removing excess lubricant. After pulverized waste is sufficiently discharged into the tank, the valve assembly is raised to its closed position, and the compressed air is admitted to the interior of the blow tank. This transfers the pulverized waste material under pressure to another container via one or more pipes connected to the pressure blow tank.

INT-0698

Herren, F. (F. Herren, and J. Kersten). Solid fuel. Germany 855,987; filed Feb. 23, 1951; issued Nov. 17, 1952.

A mixture of calcium sulfate or other sulfates with refuse fats can be pressed into various shapes with or without the addition of combustible substrates such as sawdust, paper dust, or coal dust. The resulting briquettes can be used as a substitute for coal. Without substrate, the product is easily ignitible and can be used to light fires without paper and wood. Slaughterhouses and sewage-clarification systems are a source of inexpensive refuse fats used for producing this fuel. (Text in German)

INT-0699

Dietz, K. (Farbwerke Hoechst, formerly Meister Lucius and Bruening). Method for the production of self-hardening masses. Germany 859,426; filed Aug. 2, 1942; issued Dec. 15, 1952.

A method has been devised for the production of self-hardening masses by using fly ash, accumulating at the heat production in industrial plants, and waste lime sludges, which are obtained at the decomposition of calcium carbide. Fly ash and lime sludge are mixed until the required thickness is reached. If necessary, water is added. Usually 100 weight units of pasty waste lime are mixed with 100 weight units of fly ash. The mass is shaped into bricks by an ordinary press. These bricks have a crushing strength of 150 kg per cu cm at a volumetric weight of 1.2 kg per liter after a 2-week storage in open air. Depending on the pressure used for shaping the bricks, a volumetric weight

of 1.0 kg per liter can be also achieved with a crushing strength of about 50 kg per sq cm. (Text in German)

INT-0700

Banbury, F. H., D. A. Comes, and C. F. Schnuck (Lancaster Chemical Corporation). Process of treating waste material containing rubber. Canada 490,658; filed May 19, 1948; issued Feb. 17, 1953.

A process of treating waste rubber stock having a nonvulcanized rubbery butadiene polymer as a component, includes subjecting a mass of such stock to intense shearing action and mechanical pressure in a confined space. The pressure is sufficiently high enough to enable the shearing action to develop a power input averaging at least 1.5 hp per lb of stock for a period of time within the range of 3 to 12 minutes. This compacts the mass and increases its density, raising its temperature to above the vulcanizing temperature of the polymer, and thereby causing the polymer to become vulcanized early in the process. The thus vulcanized polymer becomes devulcanized, and the mass is converted into a homogeneous plastic condition later in the process.

INT-0701

Stops, F. (Stoka-Holzfaserplatten G.m.b.H.) Fiber plates from wood wastes. Austria 174,476; filed July 24, 1951; issued Apr. 10, 1953.

Wood wastes, e.g. shavings, plywood wastes, wood wool, bark, or straw, are mixed with a mass obtained by stirring together cellulose xanthogenate (consisting of cellulose, sodium hydroxide, and carbon disulfide in the ratio of 2 to 1 to 1) and hydrated lime in the amount of 40 to 80 percent of the weight of the dry cellulose. This gives a pulp which is then shaped into plates by pressing for a short period of time at approximately 15 atm and 105 to 180 C. Thus, 160 g low-grade cellulose is mixed with 620 g 12 percent sodium hydroxide. After the mixture is ripened, 80 g carbon disulfide is added, and the cellulose xanthogenate which is formed is then mixed with an aqueous suspension of 100 g powdered hydrated lime, and stirred to give a homogeneous mass. Wood chips (1,000 g) are then mixed with 500 to 1,000 g of the binder mass. The mixture is placed into molds and pressed at 1 to 15 atmospheres at 105 to 180 C. The resulting fiber plates have improved water-resistance and bending strength, as compared with plates manufactured without the addition of hydrated lime. (Text in German)

INT-0702

Suzuki, S. A method for disposal of sawdust. Japan 28-2,236; filed June 6, 1951; issued May 20, 1953.

Sawdust is utilized by immersing 100 g derived from cryptomeria in 200 g of 5 percent ferric chloride solution for 3 hr at 50 C. After drying, the sawdust is added to 200 g of 0.2 percent sodium alginate solution, and then dried again. The surface of the material is then covered with iron alginate, making it suitable for use in the preparation of concrete. (Text in Japanese)

INT-0703

Vorreiter, L. Molded articles from sawdust. Austria 175,380; filed Oct. 18, 1951; issued July 10, 1953.

Molded products, especially plates, are made by mixing sawdust, which has been dried at 110 to 180 C, with a five to tenfold amount of cellulose xathate solution which serves as a binding agent. To the solution of cellulose xanthate, a saturated hydrocarbon of the heptane-to-dodecane series is added in the amount of two-thirds of the solvent. The mixing, shaping, and pressing of the mass is conducted at 5 to 10 C; the hardening of the shaped bodies is conducted at 90 to 120 C, preferably by blowing carbon dioxide at this temperature into the molding forms. (Text in German)

INT-0704

Jayme, G., and F. Branscheid (G. Jayme). Removal of meltable and soluble impregnation mediums from waste paper. Germany 891,358; filed Aug. 10, 1951; issued Sept. 28, 1953.

Impregnated wastepaper is defibrated with an 18 percent benzene extraction. The density of the medium is fixed at 2 percent and the temperature is raised to 40 C. A cooled, metal cylinder rotating at a speed of 10 rpm is dipped a few centimeters into the suspension. The molten impregnation medium coming to the surface sticks loosely on the cylinder and is washed away from this. After 3 hr, the benzene extraction is not more than 6.8 percent. It is preferable to work at 50 to 60 C, and to add 2 percent sodium hydroxide, calculated on the weight of the fiber, 1 percent sodium carbonate and 2 percent sodium oleate, or 5 percent xylene. (Text in German)

INT-0705

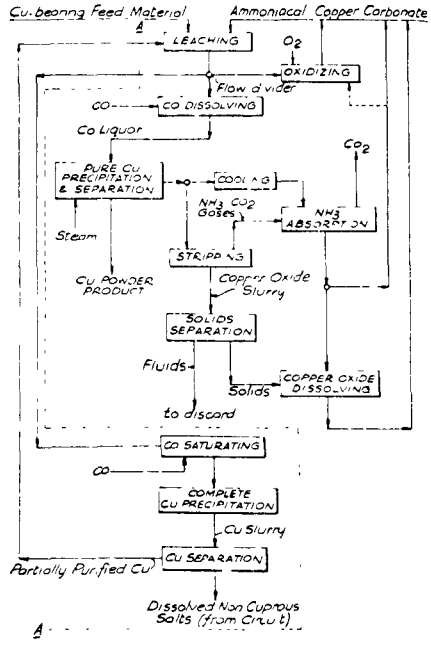
Allen, L. N., Jr., P. J. McGauley, and E. S. Roberts (Chemical Construction Corporation). Improvements in or relating to process of recovering copper from copper material. Great Britain 699,303; filed Dec. 15, 1950; issued Nov. 4, 1953.

Copper is recovered by leaching waste material with an aqueous ammoniacal copper salt solution and chemically precipitating the copper from the leaching liquor. Leach liquor is circulated continuously over the material at 0.05 to 1 ft per second. Leach liquor is withdrawn and a portion of this spent liquor is oxidized and then returned to the leaching operation. Another portion of the spent liquor is withdrawn and treated with a nonsulfidizing reducing gas for sufficient time to effect partial precipitation of 99.9 percent pure copper.

INT-0706

Yanagi, R. (Kanto Denko Company). A method for treating phosphorus fertilizer. Japan 29-2,472; filed Jan. 28, 1952; issued May 6, 1954.

One hundred kg of magnesium phosphate slag that contains 20.9 percent (20.5 percent citrate-soluble) phosphoric anhydride, 21.9 silicon dioxide, 31.6 calcium oxide, and 18.3 magnesium oxide is treated with 71 kg of phosphoric acid (with a density of 1.17). The resulting product contains 20.5 percent (10.7 citrate-soluble, 9.5 water-soluble) phosphoric anhydride and can be mixed with ammonium salt without the loss of ammonia. (Text in Japanese)



INT-0707

Steenwijk, Carel Baron de vos van. Soil conditioner. Netherlands 74,799; filed Mar. 14, 1952; issued May 15, 1954.

Waste pulp of paper mills, obtained from the waste waters of these mills by separating the fine paper fibers and kaolin by sedimentation, centrifugation, and/or flocculation, is dried by air, by pressure and/or heat, and the dried pulp is then granulated or shaped into flakes by milling or grating. The product serves to improve the structure of the soil with respect to water-retention capacity, aeration, and erosion of furrows. To prevent nitrogen depletion of the soil by excessive growth of microorganisms feeding on cellulose, the product can be mixed with nitrogen-containing fertilizers, such as urea, ammonium nitrate, sodium nitrate, ammonium sulfate, or liquid manure. (Text in Dutch)

INT-0708

(Winterswijksche Steen- en Kalkgroeve N.V.). Filler for bitumen. Netherlands 75,299; filed Apr. 2, 1951; issued July 15, 1954.

Fly ash from power plants with powdered coal as fuel is broken up into several fractions by sifting in an air stream. Some of these fractions must be ground; others can be used as they are as fillers for bitumen or similar subtances or as activators in weak fillers. (Text in Dutch)

INT-0709

Russell, J. K., D. Craig, G. J. Byrd, and R. L. Maeder (Lignosol Chemicals Limited). Treatment of waste sulphite liquor and products thereof. Canada 505,355; filed Apr. 11, 1950; issued Aug. 24, 1954.

This treatment of waste sulfite liquor provides for the production a new and useful product. The waste sulfite liquor has a weight ratio of sulfur dioxide to lime of 1 to 14. It is treated with an alkali such as ammonia, ammonium hydroxide, magnesium hydroxide, or sodium hydroxide, to obtain a pH of not less than 6.5 to precipitate calcium monosulphite. The precipitate is then removed and the liquor concentrated to not less than 50 percent solids. This process adjusts the sulfur dioxide and lime content of the liquor to substantially equimolar proportions.

INT-0710

Albert, K. Process for the production of refractory masses or bricks from slags. Great Britain 718,397; filed Mar. 10, 1952; issued Nov. 10, 1954.

Refractory masses and blocks with high durability and resistance to temperature change are obtained by comminuting slags, derived from electric furnace production of titanium, or by the aluminothermic reduction of titanium ore. The powder is then mixed with a binder, such as water glass; after the mixture is molded and compacted to shape, it is dried at 100 to 200 C. Such cold-bonded blocks are of particular advantage in the prevention of scale formation.

INT-0711

Kalis, K. P. (N.V. 'Matepa',Tot Exploiteeren van Octooien en Licenties). Improvements relating to a method of producing methane. Great Britain 721,823; filed Mar. 20, 1950; issued Jan. 12, 1955.

A method of producing methane utilizes municipal garbage. Town garbage is comminuted and homogenized to form a mass which has a moisture content lower than 60 percent and which is porous enough to have gases pass through it. In a closed silo, the garbage is then heated to 30 C, the temperature at which methane fermentation begins. Efficiency is increased by passing hydrogen or carbon dioxide, or both, from coke-oven gas through the mix. The gas produced has a calorific value twice that of illuminating gas, and the residue is useful as an agricultural compost.

INT-0712

Munakata, E., and H. Sagawa (Asahi Kasei Kogyo K.K.). Manufacturing method for water granulated slag suitable as additive to raw cement material. Japan 30-1,590; filed July 1, 1952; issued May 9, 1955.

Much of the water-granulated slag obtained by rapid water-cooling of slag which is produced by the combustion of coal or semicoke fuel in a slag-tap producer is not suitable as an additive to cement materials. The lime content is usually too low, and the alumina and the silicic acid too high. In this process, the coal is burned without any addition of lime. Heated lime is added to the slag later, thus avoiding the combustion difficulties that result when lime is added before combustion. The lime is preheated in order to keep the slag temperature from dropping. After rapid water-cooling, the slag contains 40 to 55 percent lime, 25 to 35 percent silicic acid, and 10 to 25 percent alumina. In an experimental case, slaked acid and slaked lime (85 parts) heated to 1,500 C was added to 100 parts slag. The product contained 27 percent silicic acid, 3.04 percent iron, 50 percent ash, 17.3 percent alumina, and 3.56 percent other materials. The concrete made from the mixture of 50 kg of this slag and 50 kg of portland cement gave a compression resistance strength (kg per sq cm) of 25 with 3 days of hardening, 134 with 7 days, and 302 with 28 days. (Text in Japanese)

INT-0713

Nystroem, E. H. B. (Aktiebolaget Statens Skogsindustrier). Organic filler for plastics. Sweden 150,743; filed Apr. 17, 1952; issued July 12, 1955.

To give a plastic material satisfactory water resistance, the filler is subjected to heat treatment. The starting material, i.e. wood meal, sawdust, etc., is transformed to plates by simultaneous pressing and heat treatment. These plates are hardened at 10 to 60 kg per sq cm and 150 to 200 C; then they are ground to a powder. (Text in Swedish)

INT-0714

Vavalli, V. A. An improved physico-chemical process for the extraction of celluloses from vegetable materials in general, and a product obtained thereby. Great Britain 733,364; filed Sept. 25, 1952; issued July 13, 1955.

Agricultural or forest waste materials, such as straw or wood chips, are crushed mechanically, then hydrolyzed in a dilute, alkaline solution of an oxidizing agent, such as sodium hypochlorite, calcium hypochlorite, hydrogen peroxide, or potassium hypochlorite. This process should occur at 65 C for 1 to 3 hr (nonwoody materials) or 3 to 6 hr (woody materials). The products are washed with warm water, and then filtered to remove knots and other impurities. A high-yield pulp, free of lignin and other encrusting substances, is thus obtained.

INT-0715

(N.V. Zuid-Nederlandsche Spiritusfabriek). A process for the recovery of ash rich in potassium from the waste material of industries working up molasses. Great Britain 734,102; filed Apr. 28, 1953; issued July 27, 1955.

A process for the recovery of an ash, rich in potassium, from waste liquors of industries working up molasses, concentrates the waste liquor by evaporation and burning of the concentrated mass. This is done preferably by combustion under reducing conditions, with subsequent conversion of the potassium sulfide formed into potassium carbonate by means of carbon dioxide. Prior to the combustion, alkali metal carbonate is added to the waste liquor and the precipitate is removed.

INT-0716

Graf, J., and O. Graf. Briquets from sawdust, oil, and pitch. Germany 931,824; filed May 22, 1952; issued Aug. 18, 1955.

Sawdust is dried at 105 F and cooled. A mixture of 87 percent sawdust, 3 to 7 percent pulverized coal-tar pitch, and 4 to 10 percent used motor oil is formed. This mixture is briquetted at 120 to 250 F and 1.5 tons per sq cm; heating is begun after the mold is closed. The briquettes have a heating value of 4,800 kcal per kg. (Text in German)

INT-0717

Fortress, F., and B. B. White (Celanese Corporation of America). Fermentation of wood pulp waste liquor. Canada 516,724; filed Nov. 1, 1950; issued Sept. 20, 1955.

A process is provided for the production of commercially valuable products from wood pulp waste liquor with propionibacterium. During fermentation, the liquor is kept at a pH of 6.5 to 7.5, and at a temperature between 28 and 34 C. Fermentation normally takes 8 to 14 days; if it is carried out continuously, the time may be reduced to 3 to 4 days.

INT-0718

Kono, M. (Daishowa Seishi K.K.). De-inking of old prints by alkaline pulp waste liquor. Japan 30-7,351; filed Oct. 7, 1953; issued Oct. 14, 1955.

This easy and economical way to de-ink old printed matter avoids the disadvantages of conventional methods--low yield rate and yellow color. Printed matter is immersed in the alkaline pulp waste liquors and stirred to dissociate the fibers. During this process, the free carbon of the printing ink is adsorbed by the lignin in the waste liquors. The fiber is further cleaned with resin soap formed in the waste liquors. The alkaline pulp waste may be any pulp waste liquor discharged as a result of steam-boiling soda pulp, kraft pulp, or nonalkaline sulfide pulp. The liquor usually contains 4 to 6.5 percent sodium trioxide. Pulp waste liquor from pin wood contains 2 to 3 percent oil and about 10 percent alkali lignin, thus forming a resin soap from the fatty oil and the alkali. If 35 kg of paper is mixed with alkaline pulp waste liquor at a 0.7 to 1 percent concentration, boiled at 50 to 70 C, stirred for 3 to 10 minutes, and washed in a Belmer-type washing machine for 5 to 6 hr, the de-inked wet pulp yields 28 to 35 kg. (Text in Japanese)

INT-0719

(Perfogit Societa Per Azioni). Process for the recovery of synthetic polyester scrap. Australia 166,184; filed July 29, 1953; issued Dec. 1, 1955.

Synthetic polyester scrap is heated in polyvalent and high-boiling monovalent alcohols until a clear solution is formed. The alcohols employed in dissolving the scrap are the same polyvalent alcohols used to produce the polyester. The solution is treated with low-molecular-weight alcohols in an acid medium at temperatures above 100 C to form an ester of the alcohols. The ester may crystallize entirely or in part, or separate, and can easily be filtered.

INT-0720

('Mixolit' Kunststofferzeugung G.m.b.H.). Binder. Austria 184,651; filed Nov. 14, 1952; issued Feb. 10, 1956.

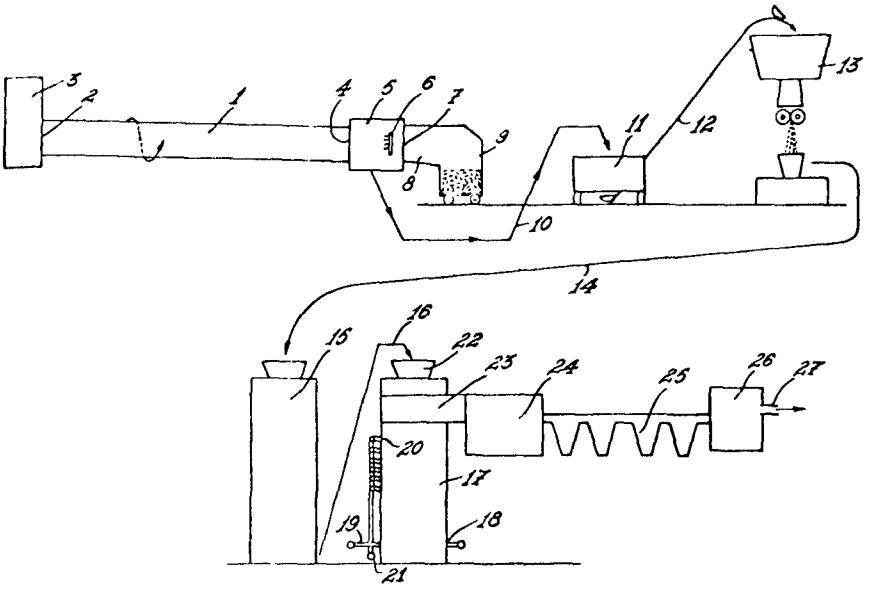
Binder material is made from plant fiber wastes by milling the precomminuted starting materials, e.g. sawdust, in aqueous suspension in a bypass apparatus at high temperature and pressure. The optimum reaction occurs at 8 to 10 atm and at 160 to 200 C; the particles of the material reach an average diameter of 4 microns. Optionally, the starting material may be quickly steamed at 8 to 10 atm before milling, and hydrolyzed during milling by an additional chemical treatment, e.g. by adding 1 to 3 percent to the aqueous suspension. (Text in German)

INT-0721

Barbezat, L. C., and H. Bernet. Recovery of metallic constituents from used dry cells. France 1,112,969; filed Oct. 21, 1964; issued Mar. 21, 1956.

Used dry cell batteries are fed into a rotary kiln where they are mechanically crushed and

combusted. Almost no external fuel is needed once the combustion has started. Water is injected at the lower end of the kiln, and a powder containing all of the zinc and manganese of the cells passes through a screen in this part of the kiln. This powder is mixed with powdered coal, water, tar, and pitch. The mixture is formed into pellets, and these are precoked in an oven in a slightly reducing atmosphere at moderate temperatures. They are then transported to a second oven. The gaseous products leaving the first oven are discarded. In the second oven there is a higher temperature and at least a partially oxidizing atmosphere; in its lower portion, there are inlets for recycled air and water and a series of tubes for air injection into its upper portion. The zinc oxide vapors are recovered in boxes placed at the sides of the upper end of the oven, and cooled with air which is recirculated to the lower part of the apparatus. The zinc oxide, condensed and recovered by conventional methods, has a high degree of purity. The residues from the second coking show a high manganese content. (Text in French)



INT-0722

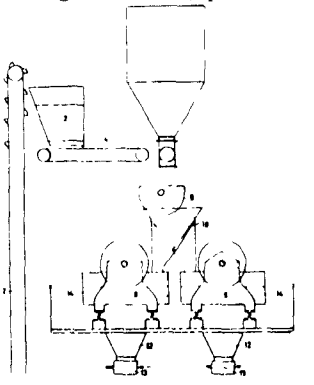
(Aschaffenburger Zellstoffwerke A.G.). Process for the recovery and purification of vitamin B 12 concentrates. Great Britain 748,043; filed Sept. 22, 1953; issued Apr. 18, 1956.

A process for the production of vitamin B 12 concentrates from sewage sludge consists of: incorporating cobalt slats and/or bacterial cultures promoting decomposition and favoring the formation of vitamin B 12 during the anaerobic digestion of the sewage; treating the moist digested sludge with 0.2 to 1 percent ferric chloride and/or aluminum sulfate; and adding sulfur dioxide or water-soluble sulfites in sufficient quantity to bring the content of sulfites up to 0.05 to 0.2 percent. The digested sludge (pH of 5 to 8) is heated at temperatures between 50 and 120 C, and then filtered or centrifuged. The resulting solution is processed into a vitamin B 12 concentrate.

INT-0723

(W. Eirich, and G. Eirich). Spreadable fertilizer from feces. Germany 942,516; filed Jan. 31, 1953; issued May 3, 1956.

Feces are mixed with lime, garbage, and peat in a counterflow mixer. A spreadable fertilizer (1 to 5 mm grain size, pH 12.7) can be



obtained from a mixture of 41 percent human feces, 32 percent freshly screened garbage, 23 percent quicklime, and 4 percent pulverized peat. The product contains: 93.5 percent dry substances, 6.49 percent water, 82.20 percent minerals, 11.31 percent organic substances, 0.66 percent total nitrogen, 0.70 percent phosphoric anhydride, 0.76 percent potassium oxide, 31.71 percent calcium oxide, and 0.83 percent magnesium oxide. The mixtures are free from noxious bacteria. The feces can be utilized without storage to decrease the dissemination of pathogenic bacteria. (Text in German)

INT-0724

Foulger, F. (D. S. Grant, and L. W. Lyon). Utilisation of flue dust or fly ash in the manufacture of cement. Great Britain 765,677; filed Aug. 26, 1953; issued Jan. 9, 1957.

Flue dust or fly ash is used to provide a bulky ingredient in the production of portland cement. The already finely divided ash is introduced separately, or mixed into a rotary kiln, with pulverized coal. The high kiln temperature gasifies and expels unwanted constitutents of the ash. The remainder is collected and fused with normal clay and chalk for production of cement and clinker.

INT-0725

Hauptmann, H. (Chemische Fabrik Gruenau Aktiengesellschaft). Protein recovery by hydrolysis of leather. Germany 1,000,388; filed Oct. 2, 1953; issued Jan. 10, 1957.

Scrap of chrome-tanned leather is decomposed to proteins by hydrolysis. The proteolysis is carried out with water or aqueous ammonium at high temperatures under pressure. For example, 100 parts by weight chrome-leather scrap (50 percent dry matter, 35 percent proteins) and 300 parts water are mixed in an autoclave and heated to 180 F for 90 minutes with stirring. Small amounts of ammonium evolved are washed out. After cooling, the insoluble compounds are filtered off. The solution contains highly pure proteins. (Text in German)

INT-0726

(Dano Ingeniorforrettning og Maskinfabrik Ingenior Kai Petersen's Fond). Methane by fermentation of garbage. Denmark 81,803; filed Apr. 4, 1950; issued Jan. 14, 1957.

Garbage is disaggregated and homogenized in dry form in a rotary drum; then it is placed in an airtight silo, which, if necessary, is heated to 30 C during fermentation. When the gas has escaped, the fermented composition is removed and the residue is worked up into a fertilizer. The yield of methane is increased by passing in coal gas, etc. The cost of the process is less than the value of the gas obtained. (Text in Danish)

INT-0727

Fattinger, H., and E. Pfauth. Animal fodder. Austria 190,785; filed Sept. 3 1955; issued July 25, 1957.

An enriched animal fodder consists of industrial plant wastes, e.g. brewery, oil, or sugar refinery wastes, mixed with urea and saturated sludge from sugar manufacturing. Preferably, a warm emulsion consisting of urea and the saturation sludge with the optional addition of molasses is used. Other ingredients, e.g. mineral substances and/or phosphorus compounds, can also be used. (Text in German)

INT-0728

Bate, S. C. and F. G. Peach (British Celanese Limited). Improvements in the production of cellulose from lignocellulosic materials. Great Britain 784,873; filed Feb. 10, 1955; issued Oct. 16, 1957.

Wood chips or sawdust are pretreated by boiling with water at 150 C for 2 hr and then with 1 percent sodium hydroxide solution under atmospheric pressure for 1 hr, washing, and cooling by the soda, sulfate, chlorine, or nitric acid processes. This leads to a reduction in the amount of chemicals consumed. Sycamore chips, spruce chips, and oak sawdust, with and without pretreatment, are treated with nitric acid at 60 to 70 C for 4 to 6 hr, drained, heated with water at 95 C for 1 hr, washed, and heated with 1 percent sodium hydroxide solution at 100 C for 1 hr. The amount of nitric acid consumed is considerably less when the wood has been given the two-stage pretreatment. The wood, which has been given the pretreatment, gives a crude cellulose of lower pentosan content than the untreated wood. Similar improvements are obtained after pretreatment followed by chlorination pulping of ash and oak chips in 5 percent hydrochloric acid and 2 percent available chlorine. These chemicals are added in increments as long as chlorine is absorbed; then wood pulp is filtered out, washed, and treated with 8 percent sodium hydroxide in solution.

INT-0729

Lesniak, A., K. Durski, W. Kwiecien, and W. Szmeja (Centralny Zarzad Przemysly Metali Niezelaznych). Recovery of metals. Poland 40,626; filed Apr. 20, 1957; issued Jan. 27, 1958.

A byproduct of the production of bearing alloys containing oxides of copper, tin, antimony, lead, zinc, cadmium, and nickel can be converted on reduction to a product containing 20 to 40 percent copper, 20 to 40 percent tin, 10 to 30 percent antimony, 2 to 20 percent lead, and small amounts of zinc, cadmium, and nickel. The product is ground and oxidized in a revolving furnace at 500 to 800 C, and extracted with an ammonium carbonate solution containing ammonium hydroxide. Copper, tin, and nickel-amino compounds are dissolved, the extraction is heated, and the black copper oxide precipitate is separated. Nonsoluble oxides are reduced with hydrogen or carbon monoxide, and a tin-antimony-lead alloy is obtained. (Text in Polish)

INT-0730

Schlecht, L., G. Trageser, and R. Staeger (Badische Anilin- and Soda-Fabrik Aktiengesellschaft). Purification of scrap metals. Germany 1,030,034; filed July 7, 1953; issued May 14, 1958.

A procedure for the purificiation of metal scraps which, in addition to ferrous metals, contains a mixture of other metals or alloys, is carried out with the metals in the molten state during or following oxidation. Sulfides or sulfide-forming substances such as ferrous sulfide or sulfur are added, and the sulfide-containing portion is separated from the rest of the components. Quantities of sulfides used are such as to convert most of the metals of the iron group into sulfides, and the cobalt content of the metallic substance is converted to a sulfide. (Text in German)

INT-0731

(Society Francaise du Xylon). Cellulose pulps. France 1,156,492; filed Dec. 16, 1957; issued May 16, 1958.

Heterogeneous cellulose paper pulps from hemp bagasse, flax, sorghum, etc., are frequently overcooked, giving poor yields; if they are undercooked, bleaching difficulties result. These difficulties are avoided by cooking only sufficiently to delignify the least lignified fibers, and then subjecting the mixture to a mechanical treatment, and separating the fibers obtained by passing the mixture over a screen, or by decantation into a delignified chemical pulp and nonchemical pulp. The different pulps are then subjected to treatments appropriate to their nature and their proposed usage. (Text in French)

INT-0732

Huebner, G. (Deutsche Supraton (G.m.b.H.) Processing of waste paper. Germany 1,030,670; filed May 31, 1952; issued May 22, 1958.

Wastepaper is shredded to size, and then transferred to a centrifuge in a concentration of 5 to 6 percent in a mixture of acids, bases, or solvents. The diluent can consist of an added alkali amounting to about 3 percent of the total water content, and it is further heated to about 70 to 80 C. The addition of this alkali serves the purpose of dissolving the ink, the dyestuff and the bitumen in the fibers. When centrifugation is complete, the supernatant layer containing the colored material can be removed. The centrifuge features a multichamber throttling zone, and works with less than 200,000 Hz and in the upper regions of audibility. (Text in German)

INT-0733

Gaertner, W. (Deutsche Gold- und Silber-Scheideanstalt, formerly Roessler). Regeneration of waste paper. Germany 969,809; filed Feb. 10, 1952; issued July 17, 1958.

Wastepaper is regenerated with an aqueous alkaline solution containing an alkali metal silicate, at least one oxygen-furnishing compound, one protecting colloid containing at least one nitrogen atom in an amide or sulfonamide bond, and at least one wetting or washing agent free from nitrogen. For example, 100 kg of newspaper is mixed in a spherical boiler at a stock dilution of 5 percent with 4 percent sodium silicate, 2 percent sodium hydroxide, 2.5 percent sodium peroxide, 0.5 percent sodium alkylbenzene-sulfonate (12 to 18 carbon atoms) and 0.5 percent sodium oleate. This mixture is treated at 80 F for 2 hr, and the material is washed and manufactured into paper. The untreated material has a white content of 52 percent, while the treated material has 73 percent. (Text in German)

INT-0734

Young, R. A. G. A method of treating residual liquor obtained by the distillation of alcohol from mash. Great Britain 800,935; filed Jan. 11, 1955; issued Sept. 3, 1958.

Products suitable for use as animal feed or fertilizer are made from the solids in distillery still-bottoms. The solids-containing liquor is concentrated by evaporation, settling, or filtering. Acid that may have formed is neutralized with an alkali. The liquor is dried by baking, spray drying, rolling, kiln drying, rotary drying, oven drying, or sun drying. To improve the product, prevent stickiness, and prevent hygroscopicity, a dry powder (less than 20-percent moisture content) is added during drying. If the final product will be feed, this powder is a food substance. If the product will be a fertilizer, an artificial fertilizer such as bone flour should be used. Other suitable materials include powdered chalk, calcium salts, peat, moss, shoddy, or seaweed.

INT-0735

Michaud, R. A. Hydraulic cements from fly ash from lignite from Provence. France 1,162,673; filed Oct. 12, 1956; issued Sept. 16, 1958.

The calcium oxide content of the ash is slaked during extension, preferably with heating, by slaking the ash from the hopper. The resulting shattering of the ash grains renders further grinding unnecessary. Mixing this material with pozzolans or pozzolanic ash gives a variety of hydraulic cements. They have unusual stability in corrosive liquids or sea water. (Text in French)

INT-0736

Archibald, W. A. (The British Iron and Steel Research Association). Improvements in or relating to the treatment of slags. Great Britain 801,883; filed July 21, 1955; issued Sept. 24, 1958.

The porosity of slags such as those from iron blast and open-hearth furnaces is controlled to produce either a lightweight or dense material by promoting oxidation of the sulfur compounds in the slag at either a low or high temperature. Sulfur dioxide or other gas evolution in viscous slag causes porosity, and evolution in fluid slag allows a dense solid to form on cooling. To produce lightweight material, the slag is poured into thin, water-cooled, closed molds for about 2 minutes, and at 1,250 to 1,400 C, poured into open molds about 6 in. deep, with an oxidizer such as ferric oxide. The oxidation of the sulfides causing gas evolution swells the slag from 3 to 6 in. thickness in 1.5 minutes. Pressed blocks or a sized aggregate can then be made. To produce dense material, the slag is first blown with an oxidizer with air, oxygen, or steam for a few minutes at a high temperature. After effervescence has ceased, the slag is cast in molds and cooled quickly.

INT-0737

(Rudolph Koepp and Company, Chemische Fabrik A.G.). Process for the production of foamed materials, using polyurethane foam waste. Great Britain 805,561; filed Feb. 29, 1956; issued Dec. 10, 1958.

A process for the production of polyurethane foam is carried out by reacting a polyester with a diisocyanate, water, and an activator. Before the reaction, scraps of polyurethane foam are heated with the polyester and/or the diisocyanate to form a homogeneous solution. In heating the scraps of foam with the polyester component, the temperature is between 130 and 350 C.

INT-0738

Mankowich, I., and F. P. Chiaretta (Dominion Rubber Company, Ltd.). One-step process for making sealants from vulcanized butyl rubber scrap and asphalt. Canada 571,671; filed Aug. 13, 1955; issued Mar. 3, 1959.

This process of making thermoplastic compositions from asphalt and reclaimed, vulcanized, butyl rubber is quicker and more uniform than previous methods. The method comprises heating a mixture of 50 to 80 percent asphalt by weight, 20 to 40 percent of vulcanized butyl rubber scrap by weight, and zero to 10 percent of a hydrocarbon oil by weight (this lowers the melting point of the final product) for 2 to 4 hr at 425 to 550 F. Simultaneous reclaiming and solvating of the rubber is effected. A wide variety of physical properties can be achieved by varying the grade of asphalt. A higher melting point asphalt will produce a higher melting point end-product. The product can be used in sealing expansion joints in highways and runways, and in sealing the spaces in masonry structures.

INT-0739

Magnaghi, F., and L. Savoia. Regenerating polyamide-resin waste. Italy 590,032; filed Sept. 5, 1957; issued Mar. 23, 1959.

The polymer is recovered as a white powder by dissolving the raw material in an organic acid at 50 C and atmospheric pressure, decolorizing by charcoal, cooling by a solvent miscible with the organic acid used, and then

crystallizing. For example, 10 kg of 85- to 90-percent formic acid is introduced into a 15-liter flask; then 1 kg of poly(hexamethylenediamine adipate) in the form of waste is added and mixed, and the mixture is heated to 50 C. After decolorizing and filtering, the formic acid is distilled in vacuo. The residue is treated with 1 kg of formamide. By centrifuging, a formic acid formamide mixture is recovered, which is then vacuum-dried to a moisture content of 0.2 percent. The product is used in extruders or injection presses. (Text in Italian)

INT-0740

Neimeyer, W. F. F., and J. W. Busker. Granulated abrasive. Netherlands 90,761; filed Dec. 18, 1956; issued Apr. 15, 1959.

Granulated iron slag is used as a substitute for sand in the sandblasting process. To prevent the dusting of slag pulverized in the process, mineral oil is added in amounts of 0.6 to 2 liters per cu m. (Text in Dutch)

INT-0741

Tamada, K. (Tagi Seihijo Company). A manufacturing method for fertilizers containing organic phosphoric acid. Japan 34-4,777; filed May 30, 1956; issued June 9, 1959.

Five kg of scraps of animal skin or fur are treated with 12 kg of sulfuric acid at a specific gravity of 50 Baume. The resulting amino acid solution is mixed with 10 kg of phosphate rock powder and enough ammonium hydroxide to bring the pH to 6. Ten kg of vegetable manure and 15 g of rapeseed cake are then added. Water is added until the moisture content reaches 40 to 50 percent. The mixture is kept at 30 to 35 C for 1 week, after which it is cooled to 3 C and dried to reduce the water content to less than 10 percent. (Text in Japanese)

INT-0742

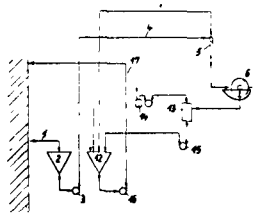
Mueller, H. Animal fodder. Austria 203,837; filed Aug. 10, 1954; issued June 10, 1959.

The fodder consists of extracted sugar beet pulp, saturated sludge, molasses (optionally), and water- or citrate-solution phosphoric anhydride compounds, preferably triple phosphate, in amounts up to 1 percent. Preferably, the calcium carbonate-to-phosphoric anhydride ratio is approximately 4 to 1. In the preparation of the fodder, an emulsion is made from saturated sludge, phosphorus compounds and molasses. Dried beet pulp lumps are soaked in this emulsion and pressed. (Text in German)

INT-0743

Herbeck, R. (Maschinenfabrik Buckau R. Wolf A.G.). Process for the utilisation of the sludge-containing wash water and dry dust occurring in coal (e.g. brown coal) briquette works. Australia 222,572; filed Mar. 13, 1958; issued July 6, 1959.

Sludge from wet dust removal is concentrated in a hydrocyclone and vacuum filter. The separated water is reused for wet dust removal. The concentrated sludge is mixed with dust from dry separators in a ratio of 1 to 4. The mixture is homogenized in a hammermill or beater mill, and is used as an additive in briquetting coal.



INT-0744

Lebedev, V. N., V. B. Levinson, and V. K. Buslov. Heat-insulating building materials from sawdust. U.S.S.R. 121,065; filed Nov. 4, 1958; issued July 6, 1959.

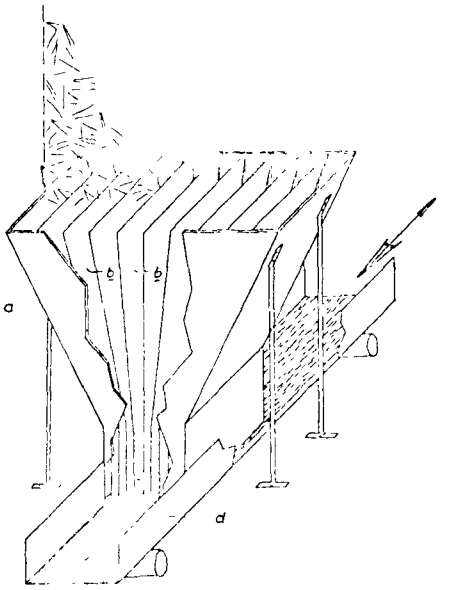
From 70 to 80 percent of the sawdust is mixed with 20 to 30 percent by volume of a mixture containing: 50 percent powdered, unslaked lime; 47 percent slag, cinders, and similar materials; and approximately 3 percent gypsum. The mix is combined with water to obtain the desired consistency, and then it is pressed into blocks, sheets, etc., which are kept for 5 to 7 days at 15 to 20 C. To the mix, 10 percent of superphosphate is added to increase the fire resistance of the product. (Text in Russian)

INT-0745

Gewecke, H. Manufacture of constructional materials from wood chips. Great Britain 816,285; filed Jan. 2, 1958; issued July 8, 1959.

Wood chips are cut to a predetermined size, glued, and projected into a tapered box, which is subdivided into orienting compartments which arrange the chips with their longitudinal axes more or less parallel. The ends of the tapering compartments are open

to allow the oriented chips to fall into a sheet metal-lined box mold, which moves longitudinally, arranging the chips in layers. The operation is repeated until the required thickness is achieved. The mold is then removed and the material is condensed in a heated, hydraulic press. The ratio of longitudinal to transverse strength of the product can be varied by altering the orienting arrangement.



INT-0746

(American Smelting and Refining Company). Recovery of selenium from scrap selenium rectifiers. Great Britain 816,989; filed Oct. 11, 1956; issued July 22, 1959.

Elemental selenium contained in scrap from rectifiers having an aluminum metal base is recovered by exposing the scrap to a molten alkali metal hydroxide. This incorporates the elemental selenium into molten hydroxide. The scrap is immersed in a pool of molten sodium hydroxide, forming selenium hydroxide. The aluminum base, which also contains elemental bismuth and cadmium, collects as a pool beneath the molten hydroxide from which it is separated.

INT-0747

Hurrey, R. C., and C. L. Hurrey. Method of reclaiming waste forest products. Canada 582,264; filed May 14, 1956; issued Sept. 1, 1959.

For the useful disposition of the trim ordinarily wasted in logging operations, a portable hog is provided in the forest adjacent to the tree-felling site. The trim from the felled trees is fed into the hog to produce chips. The chips are loaded and moved to a predetermined operating location. There, the chips are screened to a desired size. The acceptable chips are mixed with a thermosetting binder chosen from the group of melamine formaldehyde, urea formaldehyde, and phenol formaldehyde. The mixture is then subjected to heat and pressure, the binder is cured and the chips are formed into a rigid, coherent mass of predetermined form.

INT-0748

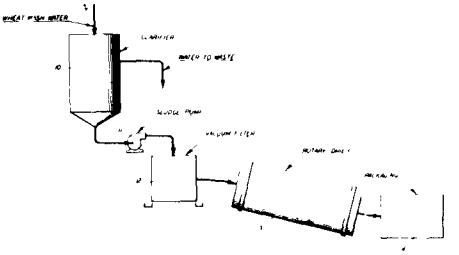
Fombonne, G. (Houilleres du Bassin de la Loire). Cements. France 1,204,335; filed Dec. 16, 1957; issued Sept. 10, 1959.

Materials with good strength properties are obtained from mixtures containing 70 percent fly ash and 30 percent portland cement clinker. Thus, a mixture containing 29 percent clinker, 70 percent fly ash, and 1 percent calcium chloride gives a product with a strength (after 7 days) of 240 kg per sq cm, and 396 kg per sq cm after 28 days. (Text in French)

INT-0749

Ofner, F. R. (Industrial Processes, Inc.). Recovery of flour mill wastes. Canada 587,323; filed Jan. 30, 1958; issued Nov. 17, 1959.

Flour mill wastes are high in food value, containing wheat heart and hulls which are fairly high in protein and fat. If the recovery process is started from 16 to 24 hr after their production, the dissipation of the proteins and fats into the waste water is not enough to render the wastes valueless as animal feed, and the formation of a paste-



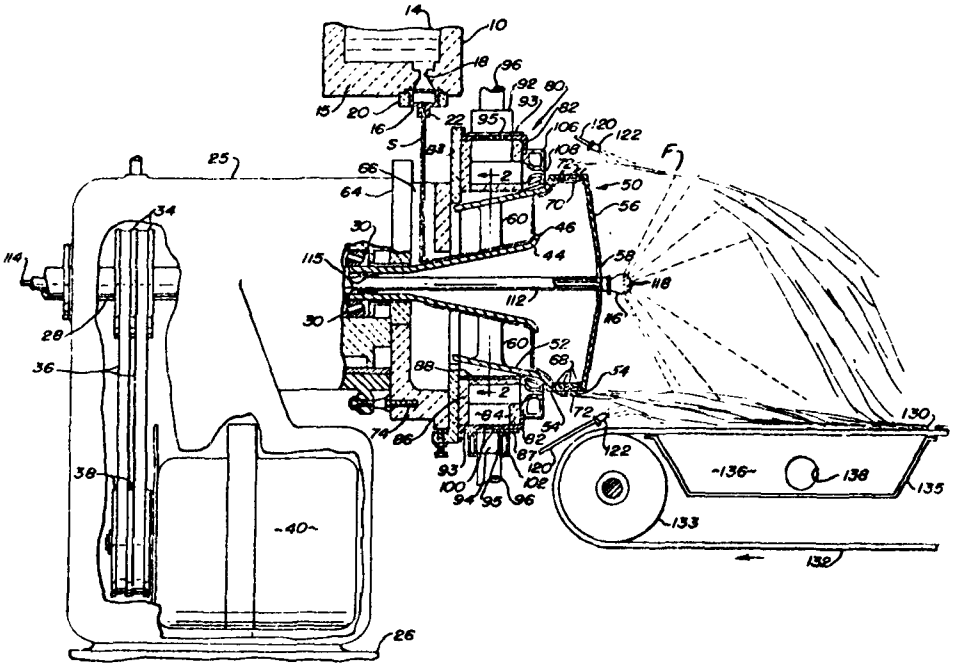
like mass within the wastes is not yet far advanced. The wastes are retained in a clarifier for 10 to 30 minutes, after which the water is drawn off and discharged, and the thickened material is pumped through a sludge pump to a filter. The moisture content is reduced by the filter to 65 percent, and the

products are transferred to a dryer, where moisture is further reduced to 10 to 15 percent. The solids are packaged, and are immediately usable and salable as a dry feed with high protein and fat content.

INT-0750

(Owens-Corning Fiberglas Corporation). A method and apparatus for forming fibres from a heat softenable mineral material. Great Britain 824,493; filed Oct. 11, 1956; issued Dec. 2, 1959.

A supply of molten mineral material (such as glass, slag, or fusible rock) is delivered onto an elongated, rotating, flared surface. The surface is rotated to advance the material to a discharging zone. The molten material is discharged outwardly from the zone by centrifugal forces in a number of elongated devices. The devices are engaged by a high-velocity gaseous blast, in front of the point of delivery to the flared surface.



INT-0751

Majewski, J. (Centralne Laboratorium Przemyslu Rybnego). Liquid feed concentrate from fishes and fish wastes. Poland 42,729; filed Feb. 14, 1959; issued Dec. 28, 1959.

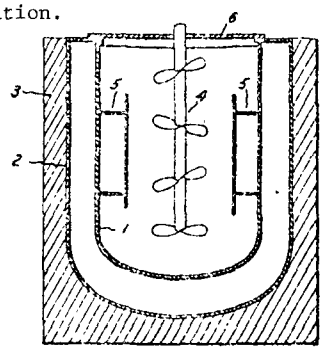
A liquid feed concentrate, stable for at least 1 year, is prepared by successive treatment of powdered fish material with hydrochloric acid to pH 6.5, sulfuric acid to pH 5, and formic acid to pH 4. The mixture is kept at 35 C for 24 to 48 hr, stirred occasionally, and formic acid is added to the semiliquid product to bring its total concentration to 2 percent and the mixture is heated to more than 40 C. The fat-free product is treated with formic acid to pH 3 to 4. (Text in Polish)

INT-0752

Krodel, W. J., and N. Hackerman. Process for de-inking printed waste paper. Great Britain 827,503; filed Feb. 6, 1956; issued Feb. 3, 1960.

An improved process is presented for decolorizing waste newspaper stock to produce a product suitable for purposes requiring a clean cellulose pulp. Paper is first shredded, then mixed and purified with water, to yield a stock consisting of not less than 1.5 percent by weight. After settling and thickening, this stock is fed into a reactor chamber. Ink particles are loosened and emulsified by a detergent. A suitable salt is added, causing the ink and cellulose particles to become differentially charged. Ink particles are

separated from cellulose fibers by heating with agitation; the former remains in the water, apart from the fibers. Further separation, if necessary, is achieved by an impressed voltage supplied by electrodes immersed in the reaction chamber, which causes coagulation of the neutralized particles. The ink-containing water is then drained off from the pulp, which is then washed with water and dilute acid until completely free of ink. The apparatus comprises a steam-heated jacket about a reaction receptacle, within which is a rotary stirrer for agitation.



INT-0753

Giampietro, F. Very fine polyethylene powder and aqueous dispersions from coarse polyethylene granules and refuse. Italy 602,169; filed Oct. 30, 1958; issued Feb. 22, 1960.

Polyethylene is dissolved at 80 C in a suitable solvent to a concentration of 7 to 30 percent. The solution enters an externally cooled vessel with a powerful mixer, such as a colloid mill. Water at 20 C is added before starting the mixer (optimum ratio 1 to 2, to 1 to 3). Mixing is performed with simultaneous cooling in order that the solution not exceed 20 to 30 C. A wetting agent (0.1 to 10 percent) and a stabilizer may be added. Solvent is slowly evaporated in an airstream aided by an exhaustor. After 5 to 30 minutes it is eliminated completely, and a uniform, aqueous polyethylene dispersion is obtained. The dispersion is thickened on a filter or centrifuge, and then it is dried. Solvent is recovered. The method can be applied to mixtures of polyethylene and polyisobutylene. (Text in Italian)

INT-0754

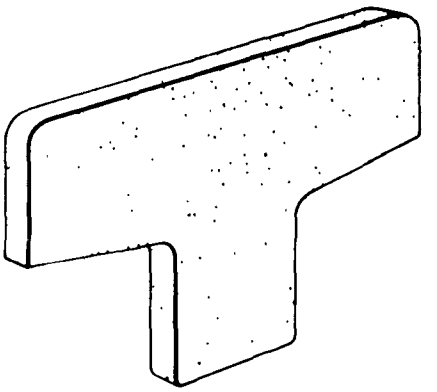
(Societe Anonyme Immobiliere Canadienne Francaise). Methane production by fermentation of organic wastes. France 1,213,721; filed Oct. 20, 1958; issued Apr. 4, 1960.

Liquids containing organic material, e.g. dairy residues, are fermented after adding 0.05 N sodium bicarbonate or ammonium bicarbonate to buffer the pH at about 7.5. Portions of spent liquid are removed at intervals and replaced with fresh liquid, which must contain at least 30 to 40 g per liter of organic matter, and 0.7 g per liter of nitrogen so that the buffer capacity is maintained by the production of organic bases. About 4.7 kg of organic matter can be fermented daily to give 1.8 cu m of methane from one charge of 100 liters in a reaction mixture of 2 cu m. A higher turnover can be achieved by adding an inert porous material, e.g. coke or flax fibers, by more frequent replacement of spent liquid, or by mechanical stirring or recycling. (Text in French)

INT-0755

Jones, J. D. (Ontario Research Foundation). Porous media. Canada 596,788; filed Jan. 6, 1953; issued Apr. 26, 1960.

The process produces a molded mass composed mainly of rice hull ash particles of irregular shape with surface irregularities and in random orientation to one another, which controls the size of the capillary passages. The bodies are suitable for humidifier plates, filters, and sound-absorptive media. A humidifier plate is formed by a dry mixture consisting mainly of rice hull ash, 15 percent ball clay, 7 percent hydrated lime as a flux for the clay, and an agglutinant if necessary. Water up to 60 percent of the weight of the rice hull ash is added, and the whole is thoroughly mixed. The mixture is molded under a pressure of 400 lb per sq in., and fired after drying at a temperature of 1,800 to 2,350 F. The shape may be chosen to fit the individual application. An alternative method substitutes 20 percent clay without lime for the clay and lime, and an agglutinant is not required. However, the use of a flux increases the strength of the body.



INT-0756

Kagaya, B. Wet method for treatment of slags from non-ferrous smelting operations. Australia, 229,723; filed Dec. 24, 1957; issued July 21, 1960.

The method comprises crushing the slag from non-ferrous smelting operations into small grains. They are then treated with dilute sulphuric acid of 2 to 50 percent. Four percent nitric acid is added with or without an oxidizing agent; 4 percent of another acid with an oxidizing agent may be added instead. The grains are treated with this mixture at 40 to 100 C to leach the metals within.

INT-0757

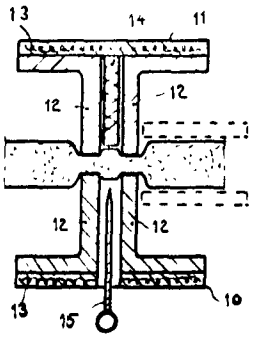
Hinrichs, D. D., F. L. Schmidt, and J. D. Wiethern (Hawaiian Development Company, Ltd., and Crown Zellerbach Corporation). Improvements in or relating to paper-making pulp. Great Britain 846,232; filed Jan. 13, 1959; issued Aug. 31, 1960.

Papermaking pulp is made from nonwoody lignocellulose. Comminuted, depithed sugarcane bagasse or straw is mixed with an aqueous alkaline liquor containing sodium hydroxide, and having a pH of at least 12. The liquor-lignocellulose ratio ranges between 2 to 1 and 100 to 1. The mixture is maintained at a temperature of between 50 and 250 F until the lignocellulose has consumed from 1 to 7 percent of its own dry weight of the hydroxide. The lignocellulose is softened without being delignified. The pulp is bleached by the addition of sodium hydrosulfite (or zinc hydrosulfite); a portion of this chemical is added during softening, and a portion in the postdefibering stage. The softened lignocellulose is mechanically defibered to form a physical papermaking pulp. The pulp can be mixed with chemical pulp, and run into paper.

INT-0758

Schulpen, K. H. N. Molding articles from waste foam material. Canada 604,506; filed Jan. 19, 1956; issued Sept. 6, 1960.

Objects can be manufactured from thermoplastic artificial materials which, upon being foamed up, form a closed surface layer or skin having an irregular, unpleasing appearance. The method comprises compressing at least the marginal portions of at least one piece of such material to place the skin under tension and to compress the sides of the piece whereby the skin assumes a regular and pleasing appearance. The compressed marginal portions are fixed in the compressed state. Before the material is compressed, at least one piece of multicellular artificial material is placed upon another piece of the material having the irregular skin.



INT-0759

Torrim, H., and J. B. Nobert (Building Products Limited). Production of adhesives from waste sulfite liquor. Canada 604,590; filed June 23, 1953; issued Sept. 6, 1960.

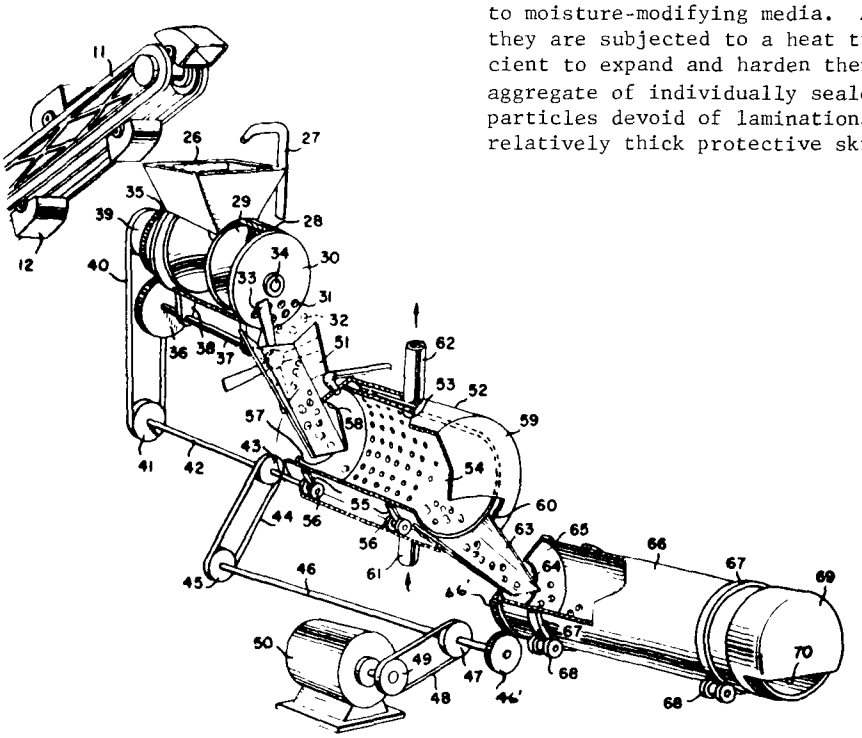
A method for manufacturing adhesive from sulfite waste liquors comprises heating about 61.44 to 100 parts by weight of the liquor at a temperature between 109 and 210 F in admixture with 10 to 25 parts aluminum sulfate powder, 1.16 to 10 parts sulfuric acid, 20.4 to 100 parts filler, 6 to 30 parts 50 percent resin solution, and 31.82 to 50 parts water by weight. The filler is selected from the group consisting of China clay and pulverized stone, and the resin is selected from the group consisting of formaldehyde and blown tall oil. The mixture is maintained at the elevated temperature until the required viscosity is obtained; then it is neutralized by the addition of from 1 to 10 parts by weight of lime. This adhesive can be used for cementing together the component plies of laminated material.

INT-0760

Old, A. [illegible] tweight Aggregate Corporation). Lightweight aggregate from dust and method of producing same. Canada 606,543; filed Apr. 21, 1955; issued Oct. 11, 1960.

A method of producing a lightweight aggregate from waste, dust, or other fine material includes treating emission gases by wetting and directing the air against a series of baffles to remove the dust. Some of the

material is compressed to remove some of the water. Portions of the material are detached to provide smaller independent units. These units are then tumbled, and subjected to moisture-modifying media. After this, they are subjected to a heat treatment sufficient to expand and harden them. A lightweight aggregate of individually sealed and sized particles devoid of laminations and with a relatively thick protective skin is produced.



INT-0761

Kozlenko, D. S., E. V. Funk, and G. A. Pominalnik. Utilization of the wastes from antibiotic production. U.S.S.R. 133,333; filed Nov. 16, 1959; issued Nov. 10, 1960.

The waste materials, e.g. mycelium mass or culture liquids, are mixed with a hygroscopic filler, e.g., calcium carbonate or sodium phosphate, and are dried in vacuo while being mixed. The dried product is then passed through a mill, and used as an additive for livestock feeds. (Text in Russian)

INT-0762

Vilpert, E., and Y. M. Thiebaud. Low-density blast-furnace slag for insulation and construction. France 1,235,403; filed Apr. 10, 1959; issued Nov. 21, 1960.

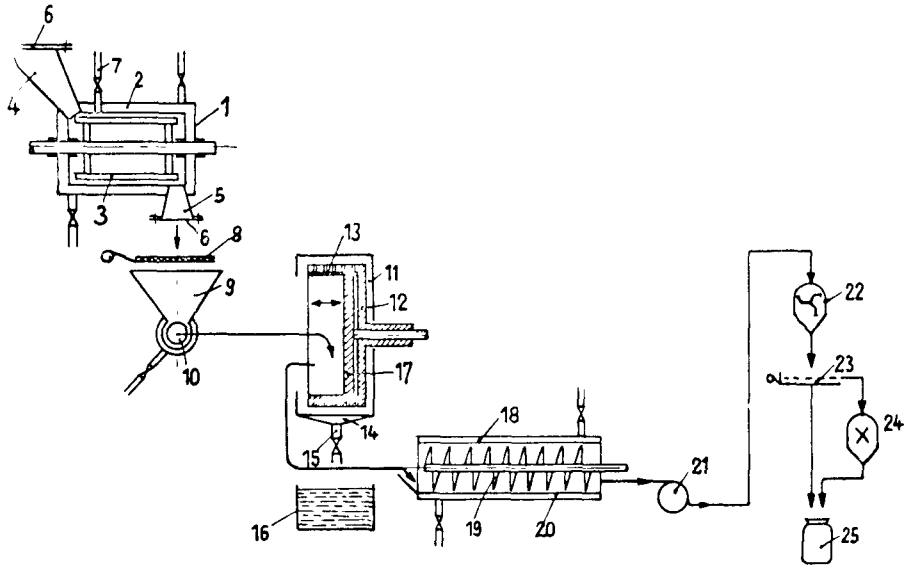
The slag is obtained by screening, crushing, and granulating low-density, spongy, porous slag from the hydraulic action of a special device on cast iron. The material at 80 to 350 kg per cu m has excellent heat and sound insulating properties, and is a good moisture absorber. It may be used as is or admixed to other binding materials. (Text in French)

INT-0763

Berndt, F., and W. Huhn (Krauss-Maffei Aktiengesellschaft. Fats and feed from animal carcasses and slaughterhouse waste. Germany 1,094,082; filed Aug. 5, 1959; issued Dec. 1, 1960.

To increase the yield of fats and the nutrients in feed, the broth containing meat and bones is concentrated to a moisture content of from 7 to 9 percent; then the remaining bones and horns are removed. Subsequently, the mash is kept hot at the melting point of the fat which is then continuously removed in a centrifuge. The defatted remainder is cooled to room temperature and milled. Thus, no hardening of protein takes place, and the feed is easily digestible. The feed contains 8.9

percent fat, 6.3 percent water, and 63.8 percent crude protein. Eighty-eight percent of the crude protein is digestible. (Text in German)



INT-0764

Cousin, J. M. H. Fertilizer by dewatering of fermentation residues. France 1,240,451; filed Nov. 17, 1959; issued Dec. 14, 1960.

The fermentation residues from winemaking processes are treated with hot phosphoric acid to fix the methylamines, to decompose betaine, and to combine part of the glycerol. The treated residues are mixed with peat previously heated in a potassium hydroxide (or ammonium hydroxide) bath. The product is dried in an oven at 300 C. (Text in French)

INT-0765

Pleva, M., B. Cibulka, and Z. Mikula. Method for producing a lightweight building material. Czechoslovakia 98,561; filed Oct. 5, 1959; issued Feb. 15, 1961.

A lightweight building material can be produced from power plant ashes or quartz sand, lime, and water to which (for activation of silica) are added: hydrogen chloride, calcium chloride, sodium hydroxide, potassium hydroxide, or compounds which, reacting with calcium hydroxide, liberate 0.5 to 5 percent sodium hydroxide or potassium hydroxide. The mixture is poured into molds, and after 7 days in air is immersed in water for 28 days, or subjected to autoclave treatment and steaming. For example: 50 kg of power plant ashes are ground together with 50 kg of calcium oxide; 25 kg of this powder are mixed with 75 kg unground ashes; the mixture is treated with 50 liters of water containing 4 kg of 37 percent hydrochloric acid, poured into molds, and after solidification, subjected to steaming or autoclave treatment. (Text in Czechoslovakian)

INT-0766

Fleischmann, H. (VEB Spezialpapierfabrik Niederschlag). Procedure for processing waste products from synthetic textiles with a cellulose base and of waste from synthetic fibers with a polyamide base, particularly in the production of highly absorbent matter and for purposes of filtration, by the application of paper, cartons and cardboard. Germany 1,102,547; filed Nov. 22, 1958; issued Mar. 16, 1961.

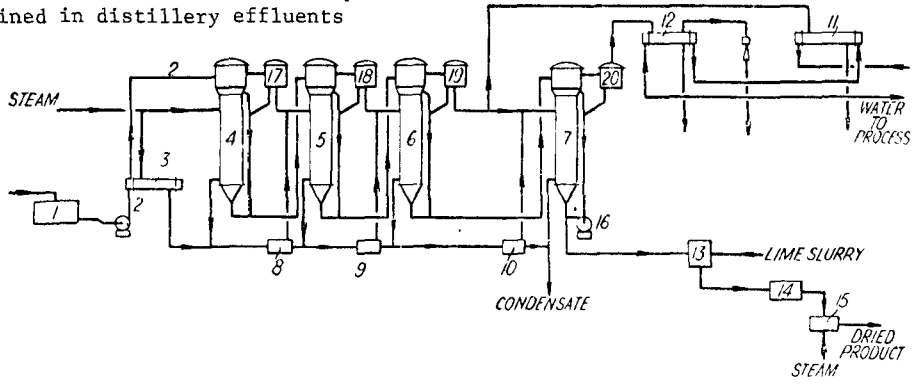
This procedure is used for processing wastes from the production of synthetic textiles with a cellulose base as well as synthetic fibers of a polyamide base. These wastes can be utilized in the production of highly absorbent material, or for purposes of producing filters from paper, cartons, and cardboard. The ground fibers are treated with hypochlorite at a high temperature and are matted by this process. They are further treated with bleached sulfite cellulose under pressure. For the production of filter paper, the bleached and ground sulfite cellulose is further mixed with 70 parts cellulose to 30 parts synthetic fibers. The preparation of

pulp from synthetic fiber textiles with a cellulose base is effected by means of steeping the pulp for 24 hrs, grinding it for 30 to 45 minutes, and subjecting it to treatment with calcium or sodium hypochlorite at a temperature of 35 to 40 C and a pH of 4 to 4.5. (Text in German)

INT-0767

Webb, W. H. A., D. Spencer, and D. A. Jones (A.P.V. Company Limited). The treatment of distillery wastes. Great Britain 869,059; filed Apr. 11, 1956; issued May 25, 1961.

A process is presented for economic recovery of solids contained in distillery effluents in a form suitable for animal feed or fertilizer. Effluents are concentrated by evaporation in a multistage evaporator. Tank-stored feed is preheated to boiling in a preheater and passes to the first of seven stages. This process is repeated serially through the seven stages; the steam vapor is successively reused from one stage to the next. Concentrate from the evaporator is continuously removed and pumped into a tank where a lime/water slurry is continuously injected for partial neutralization. After this, the material is dried under reduced pressure and rolled for use in animal feed.



INT-0768

Sauer, L., and O. Reimann. Spongy insulating materials based on polyamides. Germany 1,109.880; filed May 12, 1958; issued June 29, 1961.

Waste polyamide materials are dissolved by strong acids, for example hydrochloric acid, with or without the application of heat. The resulting solutions are allowed to stand, with or without cooling, to cause gelation. When treated with alkali carbonates at the surfaces of the gels, foams are obtained that are continuously stripped off to give continuous spongy materials. The structure of these materials varies according to the conditions of the reaction. Raising the temperature up to 40 C gives more compact materials; raising the rate of stripping of the formed foams yields products of a more loose structure. The materials need no further posttreatment, but washing and drying are desired so the materials are ready for use. (See also Great Britain 775,514) (Text in German)

INT-0769

(Societa Italiana Leucite per Azioni). A process for the production of a fertilizer compound. Great Britain 875,543; filed Oct. 7, 1959; issued Aug. 23, 1961.

Waste leather, hide, or wool is subjected to the effect of steam at a pressure of between 8 and 15 atm and a temperature of 200 C for 30 minutes to 6 hr, depending on the material. The resulting liquid is concentrated by evaporation until the water content is 2 to 10 percent. The material is solidified by cooling and crushed to a soluble powder, or made into tablets suitable for use as a fertilizer.

INT-0770

(Grubbens and Company, Aktiebolag). A basic blast-furnace slag/gypsum mixture for use in the manufacture of plastic boards. Great Britain 880,229; filed Sept. 16, 1959; issued Oct. 18, 1961.

In the manufacture of plastic boards, it is possible to produce a product having superior properties, such as increased strength and resistance to fire, by utilizing a mixture of blast-furnace slag and gypsum in which particular attention is paid to the particle-size distribution of the slag component. In the slag, 10 to 50 percent can have a particle size greater than 72 mesh BSS, and 0 to 40 percent can have a particle size less than 72 mesh BSS or greater than 170 mesh BSS, and 10 to 50 percent can have a particle size less than 170 mesh BSS. In the preferred mixture, the slag is free of particles having a size greater than 8 mesh BSS, which can be screened off. Slag that possesses the requisite degree of fineness can then be obtained by grinding. It should have a hydraulic modulus of between 1 and 2.4 in order to utilize the hydraulic properties of the slag for binding an aqueous pouring mass, from which the boards are formed. Further, the particles in the slag must be of a size sufficient to act as reinforcement in the formed boards. The mixture of slag and gypsum should contain a minimum of 20 percent by weight, and a maximum of 70 percent by weight of the slag.

INT-0771

Engelhart, L. Dust-free commercial fertilizers from organic and mineral fertilizers. Germany 1,116,244; filed June 22, 1959; issued Nov. 2, 1961.

Meal from horns and bones, to which other organic waste products may be added, is made into a paste with the addition of slaughterhouse blood. The mixture is piled and subjected to anaerobic fermentation at 70 C or less. A crumbly mass is obtained; this material can be placed into bags before fermentation is complete. Prior to the addition of blood or thereafter, inorganic nitrogen and/or potassium fertilizers may be added if desired. (Text in German)

INT-0772

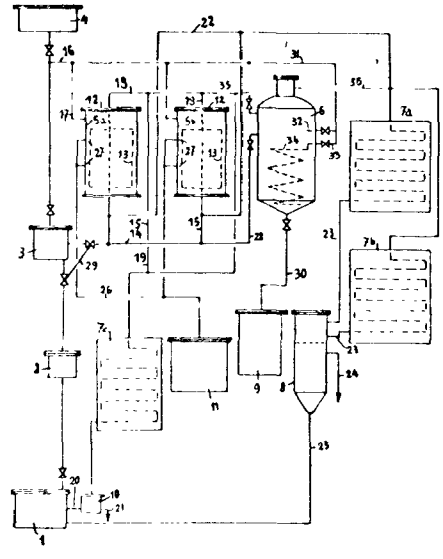
Yanov, V. V., N. V. Mironov, A. V. Chuyko, and Y. S. Chuyko. Method of manufacture of a colored wood plastic from sawdust without a binder. U.S.S.R. 142,016; filed Mar. 30, 1961; issued Nov. 15, 1961.

Evergreen and deciduous sawdust having a particle size between 0.25 and 1.0 mm and a moisture content between 18 and 20 percent is hydrolyzed by mixing it with a 5 percent aqueous solution of aniline hydrochloride and letting the mixture stand for 20 to 24 hr. The resulting mass has a yellow-green ink color and is dried at 60 C until the residual moisture is reduced to 5 to 6 percent. The dried mass, which has a yellow color, is subjected during the molding process to hot pressing at 140 to 150 C, at a pressure between 100 and 250 kg per sq cm. The finish-pressed plastic has a hard smooth water-repellent surface of yellow-brown color. The specific weight of this wood plastic is 1,350 kg per cu m, its compressive strength is between 500 and 800 kg per sq cm, and its coefficient of thermal conductivity is between 0.258 and 0.267 kcal per m per degrees C per hr. The material produced can be used as a substitute for hardwood flooring and as lining for interior walls of buildings. (Text in Russian)

INT-0773

Bocci, A. Method and apparatus for cleaning wastepaper which has been coated, impregnated, or otherwise treated with synthetic polymeric or polycondensation resins in order to recover the cellulosic fibers for the preparation of papermaking pulp. Italy 624,421; filed Jan. 4, 1960; issued Dec. 4, 1961.

Resin-treated wastepaper is compressed and placed in a container, through which a solvent is passed to remove the resinous material with which the paper has been treated. The solvent is heated to a temperature at which it will dissolve the resin in the paper; the solvent-resin solution, so prepared, is fed into a refrigerator where, due to the low temperature, the solution separates into solvent and resin. Then the solution is passed through a filter which retains the viscous resin. The paper remaining in the container is treated

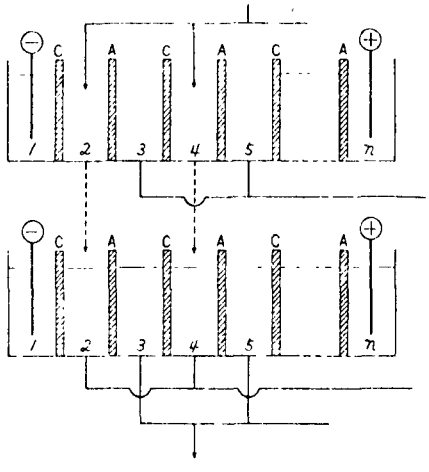


with superheated steam to recover the remaining solvent. The steam is then removed by a pump; the clean paper is dried. Any small residues of resin in the recovered solvent are removed by evaporating the solvent under heat. (Text in Italian)

INT-0774

(Ajinomoto Company, Inc.). Process for purifying beet sugar waste. Great Britain 883,922; filed Sept. 17, 1959; issued Dec. 6, 1961.

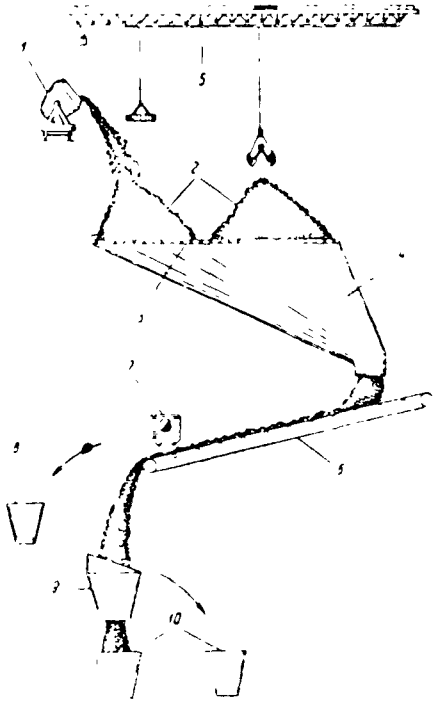
A process for purifying sugar beet waste solution comprises concentrating the waste solution to obtain a pyroglutamic acid concentration of greater than 3 percent by weight, and subjecting the solution to electrodialysis through an anion exchange membrane. The resulting unmigrated pyroglutamic acid solution is then diluted to a pyroglutamic acid concentration of less than 3 percent by weight. After this, the pH is adjusted to between 3 and 7, and the solution is electrophorized through an anion-exchange membrane. A modification of this process can include diluting the sugar beet waste solution to a pyroglutamic acid concentration of less than 3 percent by weight, then adjusting the pH to between 3 and 7, electrodialysing the solution, concentrating the resulting migrated acid solution to more than 3 percent by weight of pyroglutamic acid, and subjecting this solution to electrodialysis through an anion-exchange membrane.



INT-0775

Fefer, A. S. (Invention and Discoveries Committee, Council of Ministers U.S.S.R.). Crystallochemical procedure for preparation of slag powder from primary open-hearth slags. U.S.S.R. 142,560; filed Apr. 10, 1961; issued Dec. 14, 1961.

Open-hearth slag melts are treated with 1 to 5 percent (by weight) of dolomite powder (below 2 mm in particle size) in order to generate crystallization of the silicate. The slag bar is then thrown on a metallic, 10-mm-mesh grill and left to cool for 18 to 24 hr. Spontaneous crushing of the silica slag occurs at approximately 300 C. About 85 to 90 percent of the slag powder passes through the grill into a receiving bunker and is then transferred onto a carrier where it is subjected to magnetic segregation for metal extraction. The segregated slag powder undergoes sifting and separation according to particle size. The slag powder with a particle size below 1 mm, may be used as a binder for building materials; the powder with a particle size above 1 mm can be useful as an agricultural fertilizer. (Text in Russian)



INT-0776

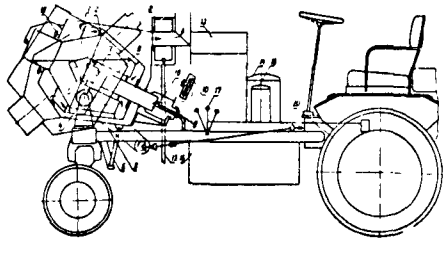
Finkener, F., J. Krug, and H. Loges (Th. Goldschmidt A.G.). Process of detinning lacquered tin scrap derived from tin sheet metal. Germany 1,109,376; filed Apr. 4, 1959; issued Jan. 4, 1962.

A method of detinning lacquered tin scrap is characterized by thermal treatment of the scrap at a temperature between 240 and 350 C. Thermal treatment is achieved through heating with hot air or hot inert gases, and should last no longer than 15 minutes. Tin sheet scrap with 2.4 percent tin coating covered on two sides with lacquer was detinned in sodium lye without preliminary thermal treatment. The residual tin content after completion of the treatment was 0.39 percent. With prior thermal treatment it was only 0.046 percent. Lacquered tin cans are shredded first. The scrap can then be thermally treated with low-oxygen gas such as flue gas. Thermal treatment can also be achieved with pressurized water or water vapor, preferably at 160 to 180 C. Alkaline substances or sodium lye, potassium lye or amines are added to the hot water. To the water vapor, ammonia or ketones, and cyclohexanone can be added. (Text in German)

INT-0777

Kontush, K. V., V. V. Shchegol'kov, and V. P. Chagayey (Invention and Discoveries Committee, Council of Ministers U.S.S.R.). A mixer for the processing of refuse asphalts and briquets. U.S.S.R. 143,834; filed May 29, 1961; issued Jan. 27, 1962.

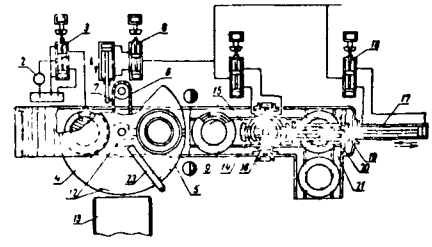
This mixer is designed to provide better heating conditions for the processed materials. It includes a loading and unloading device assembled on the bottoms of a specially designed drum. In order to provide better heating conditions, the drum is provided with a gas circulating jack covering the cylindrical, lined furnace and is installed in a stationary structure that allows rotation along its horizontal axis. The drum carries a smoke funnel and is barrel-shaped. (Text in Russian)



INT-0778

Kalmykov, P. P. (Invention and Discoveries Committee, Council of Ministers). Device for pressing wood waste into chair parts. U.S.S.R. 144, 597; filed Apr. 8, 1960; issued Feb. 15, 1962.

This device for pressing chair frames, including the plywood seat, consists of a rotating desk with two loading and pressing molds that interact alternatively with a hydraulic press. It is provided with demountable ring-shaped matrixes with interchangeable punches for each compression. The release of the processed molds occurs through a mobile frame provided with two arched lifters and two pairs of clamps. One of these clamps loosens the inner ring of the matrix, while the other detaches the punch. The performance of these clamps is synchronized. (Text in Russian)



INT-0779

Jodet, A., and P. Rene. Fertilizer from animal wastes. France 1,276,179; filed Oct. 8, 1960; issued Feb. 28, 1962.

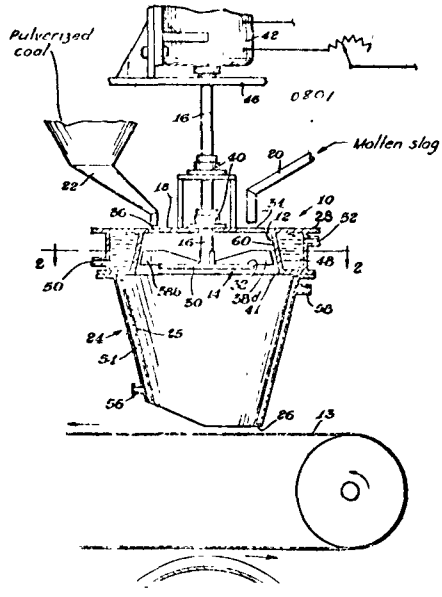
Meat and fish scraps are digested with phosphoric acid, neutralized with ammonium hydroxide, and composted with vegetable matter to give a fertilizer. Thus, 1,000 kg of chopped fish scrap is digested with 110 kg of phosphoric acid (46 to 48 percent phosphoric anhydride) at 90 to 110 C for 90 minutes, neutralized with ammonium hydroxide, and composted with 40 kg of vegetable matter, such as seeds and corn stalks. (Text in French)

INT-0780

McNally, H. L. (The Dow Chemical Company). Method and apparatus for making light weight aggregate. Great Britain 891,503; filed Sept. 24, 1959; issued Mar. 14, 1962.

Expanded, lightweight aggregates are produced from silicate or molten iron aluminum silicate type slag. A particulate, gas-liberating, carbonaceous material is dispersed and intimately mixed with the molten ashes. The

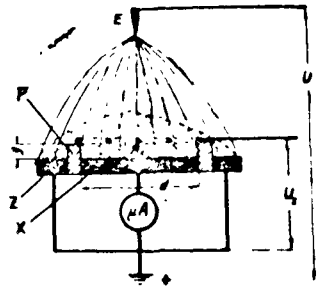
carbonaceous material can be bituminous coal, sodium carbonate, or sodium bicarbonate. The mixture is then cooled. The apparatus for carrying out the process includes an inverted frusto-conical, cup-shaped mixing chamber with an open lower end, a closed top, and downwardly diverging sidewalls. A rotatable agitator for mixing the materials has an axis of rotation, and a number of blade-like elements in symmetrical array about the axis. A mechanism for cooling the sidewalls and one for directing the molten slag onto the blade-like elements are included.



INT-0781

Dzierzawski, J., A. Filipkowski, and Z. Wielgosz. Regeneration of thermoplastic cellulose acetate wastes. Poland 45,556; filed July 5, 1960; issued Apr. 19, 1962.

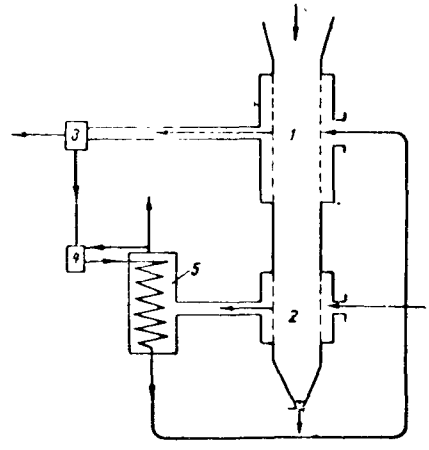
Cellulose acetate wastes, in the amount of 100 parts, are treated with an epoxy resin in 0.01 to 5 parts. Cellulose 2,5-diacetate, obtained by hydrolysis of photographic films, can also be treated with an aqueous emulsion of the epoxy resin. Thus, 100 kg cellulose acetate wastes were mixed for 10 minutes with 2 kg melted epoxy resin, and then rolled at 140 to 150 C. The resulting material was crushed, ground, and granulated by extrusion and cutting. Also, 100 parts cellulose 2,5-diacetate, obtained by hydrolysis of photographic films, and 1,200 parts water were mixed at 35 C. A mixture of 25 parts di-methyl phthalate and 2 parts epoxy resin (Epidian) was separately prepared and poured into the hydrolyzate. After 0.5-hr stirring, the plasticized material was centrifuged, seasoned for 48 hr, gelled on hot friction rolls, and granulated by extrusion and cutting. (Text in Polish)



INT-0782

Yantovskii, I. A., N. I. Bereznitskaya, and P. P. Levenets. Fertilizer. U.S.S.R. 146,320; filed Apr. 22, 1961; issued Apr. 23, 1962.

To make it possible to use wastes from the coal enriching process, or to use shaft rock as a fertilizer, the shaft rock or the wastes are subjected to stepwise calcination or gasification to eliminate the organic and sulfurous components. Wastes are charged into a vertical hopper to undergo stepwise gasification and cooling. (Text in Russian)



INT-0783

Duchange, G. Manufacture of white pulp from old printed papers. France 1,299,675; filed June 15, 1961; issued June 18, 1962.

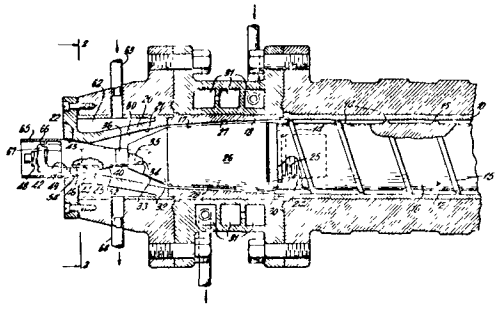
The process for the manufacture of white pulp from old printed paper calls for shredding the paper, suspending it in an aqueous solution of borax, defibrinating it, and bleaching it with a solution of lime

chloride and phosphoric acid. It is then washed thoroughly and hung up to dry. This entire operation can be conducted under atmospheric pressure at a temperature of 12 to 37 C and with slight agitation. (Text in French)

INT-0784

(U.S. Rubber Reclaiming Company, Inc.). Rubber reclaiming apparatus. Great Britain 902,943; filed Apr. 14, 1961; issued Aug. 9, 1962.

Within a stationary hollow cylindrical casing is a rotatable screw for reclaiming rubber and moving it forwardly through a chamber. A gradually decreasing-diameter conical element is mounted on the front end of the screw and is rotatable with it. A stationary wall serves as a continuation of the casing and defines a restricted annular channel between it and the conical element. A reducing-diameter element extends forward from the conical element. An additional exterior stationary wall forms an annular chamber outside the reducing-diameter element. An increasing-diameter conical element is fitted on the shaft for rotation with it. A further stationary wall defines a restricted annular channel about this conical element.



INT-0785

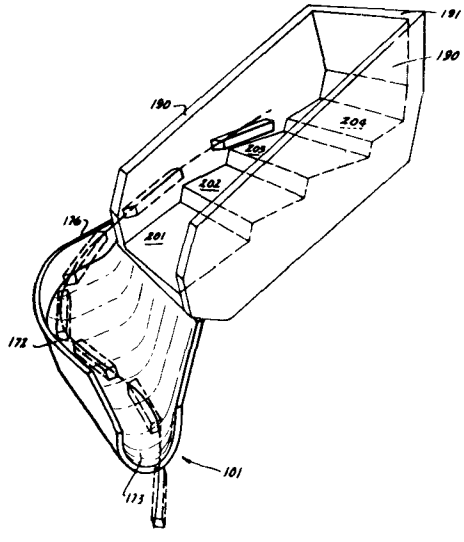
(Kodak Limited). Recovery of scrap polyesters. Great Britain 905,562; filed Apr. 23, 1959; issued Sept. 12, 1962.

A process for the preparation of linear condensation polymers of glycols and aromatic dicarboxylic acids comprises three primary steps. Scrap polymer can be mixed with a lower dialkyl ester of the aromatic dicarboxylic acid originally used in preparing the polymer. This mixture is carried out under an inert atmosphere at a temperature in the range of from 25 C less than the boiling point up to 50 C more than the boiling point of the admixed glycol, under conditions whereby all of the scrap polymer is dissolved and all of the monohydric alcohol is removed. This forms a monomer composed of bis-glycol esters of aromatic dicarboxylic acid and low polymers thereof, having an average degree of polymerization of less than about 10. The monomer is heated under conditions which completely remove that portion of the glycol which can be vaporized, while forming an active prepolymer with a molecular weight of from 2,500 to 12,000. This heating is performed under an inert atmosphere with at least the latter part under a vacuum. The solid particles of the prepolymer are heated with agitation in an inert atmosphere under conditions that keep the particles substantially free-flowing; the temperature is kept at about 10 to 90 C below the crystalline melting point of the prepolymer, until a molecular weight in the range of 14,000 to 50,000 is achieved. The particles are of such a size that they completely pass through a 20-mesh screen.

INT-0786

Calderon, A. (Calderon Automation, Inc.) Method of and apparatus for charging scrap. Canada 649,375; filed Dec. 5, 1960; issued Sept. 25, 1962.

This method of rapidly feeding scrap through a charging aperture into a steelmaking furnace includes intermittently feeding scrap onto a chute with sufficient momentum to establish and maintain a flow of scrap through the chute. The direction of flow of the scrap through the chute is drastically altered to interfere with the free gravitational flow of the scrap. This causes the scrap to turn and tumble on the chute. The scrap flows and



handles like a fluid; while in the chute, it is always in a dynamic state. Elongated pieces of scrap are oriented into longitudinal alignment with the chute exit portion and the charging aperture, thereby making possible the feeding of scrap of any practical size or shape encountered in normal steelmaking operations.

INT-0787

Becker, F., I. G. G. Kulcsar, L. Palotai, and F. Reviczky (Nikex Nehezipari Kulkereskedelmi Vallalat). Improvements in or relating to the utilization of waste material. Great Britain 913,177; filed Jan. 9, 1961; issued Dec. 19, 1962.

Coal-containing waste material from coal mine waste heaps is processed to yield fuel, coal-rich waste, or bricks and concrete additives from the coal-poor material produced. Fractionation into coal-rich and coal-poor portions is achieved by suspending crushed material of optimal grain size in water and passing this through a hydrocyclone. Waste material is first screened to segregate large and small components; these can then be ground to appropriate grain size.

INT-0788

(Gesellschaft Der Ludw. Von Roll'schen Eisenwerke A.G.). Improvements in or relating to blasting agents. Great Britain 914,337; filed Sept. 4, 1959; issued Jan. 2, 1963.

Efficient airblasting abrasives are obtained from granulated iron blast-furnace slag containing 25 to 45 percent silicon dioxide, 35 to 60 percent calcium oxide and magnesium oxide, and 8 to 25 percent aluminum oxide. The slag is heated at 920 to 970 C for 5 to 60 minutes to fuse only the surfaces of the particles and heal quenching cracks, without coagulation. Slag containing 33.8 percent silicon dioxide, 43.6 percent calcium oxide, 3.1 percent magnesium oxide, and 16.5 percent aluminum oxide was heat treated in this way. The particles 1 to 1.5 mm in diameter were blasted onto sheet iron 9 times, and a 6-mm diameter nozzle was held 5 cm from the iron. About 55.7 percent of the abrasive was no finer than before use. With untreated slag used in the same way, this figure was 3.8 percent, with quartz 17.5 percent, and with corundum 55.6 percent.

INT-0789

Agarwal, R. K. Refractory materials. India 74,582; filed Dec. 19, 1960; issued Jan. 19, 1963.

Rice-husk ash in the amount of 100 parts, and 2 to 16 parts lime were milled together; 1 to 5 parts sodium silicate were added as a 1 to 5 percent aqueous solution, and the wet mix was molded, dried, and fired at 1,250 C to give refractory blocks. The fired material can be powdered and used in mortars.

INT-0790

Caspari, F., and H. Meyer. Biologically active soil-improving material. Germany 1,145,646; filed July 25, 1961; issued Mar. 21, 1963.

A storable, odorless, and biologically active soil-improving material is manufactured by compressing rasped garbage and sewage sludge into bricks, and air-drying them. Varying amounts of other biologically active and/or nutritive materials can be added to the mixture before compressing. Thus, a mixture of 716 cu m of garbage and 84 cu m of sludge was compressed to 300 cu m of dry bricks without any weight loss. (Text in German)

INT-0791

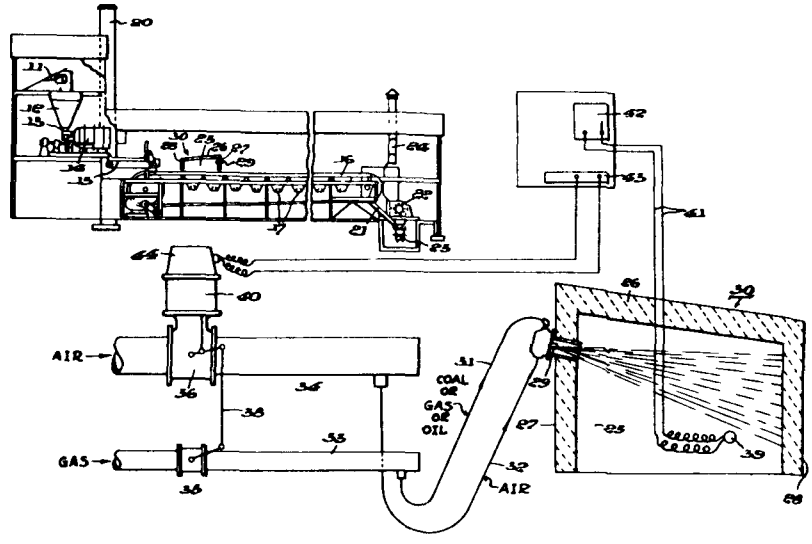
Wilson, H. W. (F. G. Woodside, and T. McGee). Acidic fertilizer containing slag. Canada 662,222; filed Dec. 31, 1959; issued Apr. 30, 1963.

A newly developed fertilizer has a high acidity, so that it will not decompose immediately, but will release its nutrients at a slow rate. It is nontoxic, easily applied, and will neutralize alkaline soils. The cost is low because the manufacturing process is based on the utilization of waste products. The necessary components of the fertilizer are slag with a high iron content, inorganic acids in water, and a few trace elements. One part by weight of an acid such as 90 percent sulfuric acid or 70 percent phosphoric acid is added to 2 parts by weight of water that contains 1 part by weight of pulverized slag. These are mixed and, following the exothermic chemical reaction, a gelatinous product is achieved. This gel contains the salts of the acids that were used in the reaction, and the absorption products of the metallic slag. The product has an acid content of 32 to 34 percent and contains metal absorbates to the extent of 10 percent.

INT-0792

Stirling, H. T. (Koppers Company, Inc.). Method of sintering fly ash into lightweight aggregate. Canada 668,732; filed Oct. 24, 1961; issued Aug. 13, 1963.

A method of sintering fly ash residue from waste gases of combustion of coal to form a lightweight concrete aggregate comprises depositing pellets of fly ash, bound together with no binder other than water, in a layer upon the upper surface of a moving grate. The top of the layer is ignited and heated transversely across the line of movement of the grate, by combustion of fuel and air from above the layer. Air is drawn downward through the layer and the grate to heat the pellets to a temperature at which they sinter, and, after the grate has passed from the region of ignition and heating, to cool the sinter. The sinter is then discharged from the grate and crushed to form a lightweight aggregate component. The supply of fuel and air for the ignition and heating is determined by the increase or decrease in the temperature of the ignited and heated sinter from a predetermined constant temperature.



INT-0793

(Earbwerke Hoechst Aktiengesellschaft, formerly Meister Lucius and Bruening). Process for regenerating waste paper. Great Britain 1,062,182; filed Apr. 16, 1960; issued Aug. 15, 1963.

A suspension of cellulose pulp is treated in an aqueous bath softened by addition of an alkali metal silicate and an oxygen-yielding substance, and containing as detergent a primary and/or secondary alkyl sulfonate with a hydrophobic hydrocarbon radical in the side chain. Then the water hardness is adjusted to at least 10 degrees German hardness. This is followed by the flotation of the liquor, which is charged with the pigment particles, for subsequent removal. Water glass is used as the water softener and sodium peroxide as the oxygen source. The sulfonates are generally used in proportions ranging from 0.1 percent to 2 percent. The regeneration process is carried out by adding the indicated chemicals to the waste paper during bleaching and comminuting the waste in the pulper; the concentration of fibrous material is generally 4 percent, and the temperature at which the process is conducted ranges from 40 to 60 C.

INT-0794

Honda, M. (Yahata Kagaku Kogyo K.K.). Slag for cement. Japan 38-17,829; filed Apr. 26, 1961; issued Sept. 11, 1963.

Slag, obtained by quenching the molten slag discharged from melting furnaces with large quantities of water, contains about 35 percent water, thus incurring drying costs. According to this method, the molten slag is blown by pressurized air, steam, or both, or dropped onto a revolving disc for quenching and vitrifying. This hardened slag is then crushed and used as the additive in manufacturing portland cement. This slag gives about the same degree of vitrification as the conventional water-granulated slag. It contains far less water and retains alumina, silica, lime alkali, and sulfides which are usually dissolved out. A comparison between portland cement manufactured using this slag, and that manufactured using the conventional water-granulated slag, indicated that the new cement has remarkably greater strength than the conventionally manufactured cement. (Text in Japanese)

INT-0795

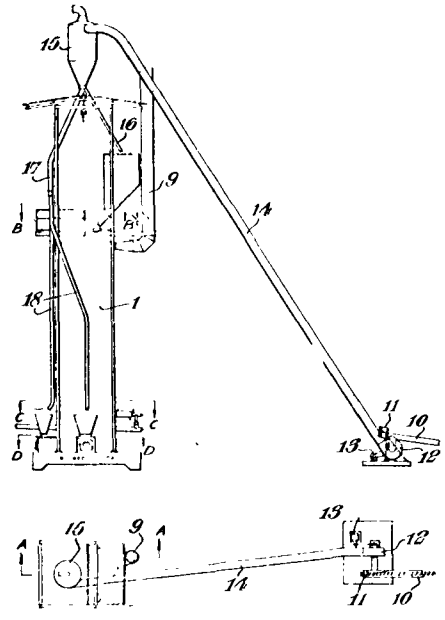
Hossain, S. U., and A. A. Pataki (Albitibi Power and Paper Company, Ltd.). Deinking of waste paper. Canada 694,471; filed Sept. 11, 1962; issued Sept. 15, 1963.

Waste papers are de-inked by pulping them in a solution containing a soluble alkaline de-inking agent and a soluble polymer, selected from a group of proteins and polymers having a lactam or a substituted lactam structure. The most suitable alkali system was found to be a combination of sodium sulfite with a small amount of sodium tripolyphosphate. The de-inking system can be used for de-inking waste paper aged for a considerable period of time. The amount of sodium sulfite or other de-inking agent may be widely varied. Quantities in the range of 1 to 10 percent can be used, but the preferred range is between 3 and 5 percent. Surfactants such as soap, or chelating agents such as the pentasodium salt of diethylenetriaminepentaacetic acid, are compatible with soluble polymers such as proteins or polyvinyl pyrrolidone. The addition of the soluble polymers may be added in the flotation cell rather than in the pulper. Pulping temperature may be widely varied. It appears that the de-inking treatment enhances the reflectance in the blue region at the expense of the reflectance in the yellow-red region. Thus, the de-inked pulp obtains pleasing blue-white shade, rather than merely retaining the yellow-white of the original stock. (See also Canada 719,622)

INT-0796

Schmidt, W. K. Process for producing charcoal. Great Britain 936,963; filed Dec. 1, 1959; issued Sept. 18, 1963.

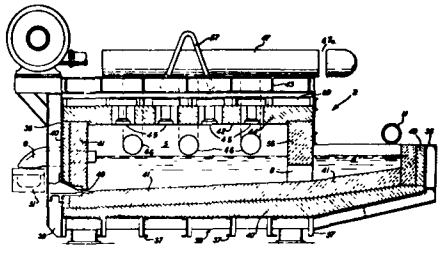
Charcoal is made from a particulate carbonaceous material, such as sawdust, which is introduced into the upper portion of an externally heated reaction zone. The horizontal cross section of the zone has one dimension much greater than the dimension at right angles to it. The reaction zone is substantially unobstructed in a vertical direction and has its shortest dimension extending between two substantially parallel planar boundaries of the reaction zone. This effects controlled passage of the material down through the reaction zone under the influence of gravity, while heat is supplied externally. Thus, progressive carbonization of the material is achieved, and charcoal is formed. The charcoal moves countercurrently to upwardly flowing volatile products of carbonization. The volatile content of charcoal formed is controlled by adjustment of the temperature of the hottest part of the reaction zone, and continuous withdrawal of substantially uniformly carbonized charcoal from the lower portion of the reaction zone. The temperature of the hottest part of the reaction zone is between 720 and 1,000 F.



INT-0797

Foster, T. W. F., and W. E. Stephens (Kaiser Aluminum and Chemical Corporation). Recovery of aluminum from aluminum scrap. Australia 247,077; filed May 19, 1959; issued Sept. 24, 1963.

This method of recovering aluminum from aluminum scrap uses fused salt having a density less than that of aluminum and at least one alkali metal halide. A small but effective amount of fluoride is present in the fused salt to strip the oxide coating from the aluminum scrap. The fused salt is continuously introduced into a mixing chamber at a velocity sufficient to create agitation, whereby it is mixed with the aluminum scrap. A mixture of fused salt and aluminum is withdrawn from below the surface of the fused



salt and passed below another fused salt surface in a settling chamber. Molten aluminum settles beneath the fused salt and is recovered. The preferred salt composition employs the eutectic mixture comprising 44 percent by weight of sodium chloride and 56 percent by weight of potassium chloride. The salt should be maintained at a temperature not less than 1,300 F. Cryolite, in concentrations of 2.5 to 5 percent by weight of total flux produced, is an effective fluoride constituent.

INT-0798

Chumburidze, P. I., and M. I. Zautashvili. Preparation of tartaric acid. U.S.S.R. 157,952; filed Dec. 16, 1960; issued Oct. 18, 1963.

Tartaric acid is prepared from winemaking wastes and other raw material by ion-exchange techniques, concentration in vacuo, and crystallization. To simplify the process and increase the yield of the product, the raw material is first treated with sodium carbonate; the resulting solution of tartrates is passed through an anion-exchange column. The tartaric acid adsorbed is eluted with sodium hydroxide, and the tartrate solution is finally passed through a cation-exchange column. (Text in Russian)

INT-0799

Tanaka, H. Method of producing shock-absorbing and heat-insulating materials from trash. Japan 38-22,246; filed Aug. 2, 1961; issued Oct. 21, 1963.

Useful materials such as shock-absorbing fillers for packing use and heat-insulating or acoustic pressed boards for construction use are produced from reclaimed trash using this method. Urban solid wastes should be separated into earth and sand, glass, kitchen garbage, etc. by means of a vibrating strainer or screen net (mesh is about 2 to 5 cm). Bulky trash, such as cardboard boxes and wooden boards or cases, are crushed, and empty bottles and cans, wornout shoes, etc., are removed by hand. The solid wastes so selected are put into a cyclone or a wind-force duct separator to complete the removal of earth and sand, nails, glass fragments, and the like. The remaining solid wastes, now completely without mineral materials, are classified into light, medium, and heavy by their specific gravity. Each group may then be selectively used as a material to produce a desired product's weight and strength requirements. The wastes and large quantities of water are processed by a heater and reduced to pulp. Antiseptics, such as creosote and casein, may be added when necessary. The pulped material is then press-molded by a patented textile machine, and dried by a patented drier which is similar to a hot press. (Text in Japanese)

INT-0800

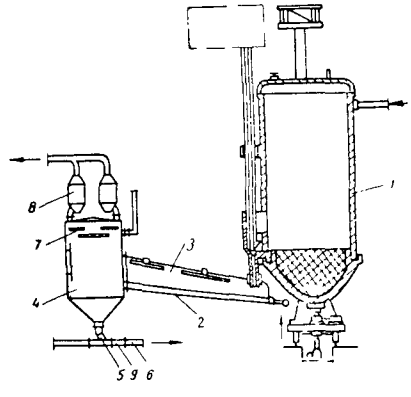
Kubicki, T. (Slaska Fabryka Mydla). Preparation of a fertilizer from animal waste materials. Poland 47,848; filed Nov. 24, 1962; issued Dec. 30, 1963.

A multicomponent fertilizer containing some protein substances was obtained from the residue of animal waste materials after acid or basic hydrolysis. The insoluble residue, after hydrolysis of horns and hoofs, was dried at 100 to 130 C to obtain a maximum water content of 10 percent. The dry residue was mixed with an equal amount of powdered bone meal (the gelatinous substances were removed beforehand from the bone meal), and a fertilizer was obtained which contained 9.88 percent moisture, 14.43 percent phosphoric anhydride, 4.67 percent nitrogen, 8.06 percent calcium oxide, and traces of potassium oxide. The fertilizer may be stored without decomposition; it decomposes gradually on the soil without losses. (Text in Polish)

INT-0801

Bolotin, A. Y., L. Y. Yerikhemzon-Logvinskiy, N. K. Leonidov, A. V. Markov, and M. V. Rutus. Device for continuous ladle-less removal of slag from a blast furnace and production of granulated slag. U.S.S.R. 159,871; filed Apr. 3, 1962; issued Jan. 14, 1964.

A sealed container connected by a granulating chute has a sealed steam collector with a



receiving chamber for separating pulp from steam. The lower part of the receiving chamber is connected by a T-pipe with the slag conduit. Its upper part contains a separator, and above it filters for purification of the steam are located. In operation, slag is pressed by means of steam from the container into the granulating chute, in which it is subjected to the action of strong water jets; it becomes granular, and enters in the form of pulp into the receiving chamber, from where the pulp is discharged through a hydroelevator into the slag conduit. Steam formed during granulation is collected in the receiving chamber, and is fed continuously through the separator and the filters to the consumer installations. (Text in Russian)

INT-0802

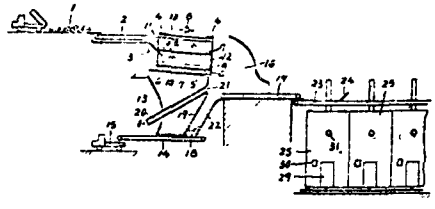
Vom Ende, H. (Mannesmann A. G.). Blast furnace slag of low porosity for road building. Germany 1,170,302; filed Jan. 17, 1963; issued May 14, 1964.

A procedure is provided for preparing slag for road building which meets the qualification requirements of German Industrial Standards No. 4301. Aluminum or a silicon-manganese mixture is added to liquid slag outside of the blast furnace. A slag with porosity of 37 percent and a density of 1.90 kg per cu dm was treated with 0.5 percent aluminum in the form of small ingots. After hardening, this produced a slag with a porosity of 5 percent and a density of 2.85 kg per cu dm. This process is applicable to road building material using other slags. (Text in German)

INT-0803

Itano, A., and I. Tawa. Treatment of garbage to produce carbon fertilizer. Japan 39-13,031; filed Aug. 16, 1961; issued July 8, 1964.

To carbonize garbage, thereby reducing it to a useful fertilizer that is more conducive to soil quality improvement than to direct fertilization, garbage is first manually sorted to remove bulky rubbish such as wooden boxes, straw bags, etc. It is then fed into an inclined rotary screening device to separate out sand and earth. A conveyor removes the dirt. Fragments of stone, metals, and similar solids are screened by means of pneumatic and electromagnetic separators. Impurities still remaining in the garbage are removed by hand. The garbage is then charred in the carbonization furnace. After one more screening, the garbage is used as a carbon fertilizer. The number of carbonization or combustion furnaces necessary can be determined according to the quantity of garbage to be handled. Two or more of them can be combined to increase the capacity of this sytem. The tubular or rectangular furnace has a cone-shaped ignition chamber in the center of the bottom. Vents are provided on side walls of the ignition chamber. Connected to the top of the conical chamber is a stack that sticks out of the furnace top. Installed inside of the chamber is a gas burner connected to a gas pipe and an air intake pipe, both of which are equipped with control valves to adjust the combustion. The feed-in port is in the top and the discharge port is in the lower front. The inspection window and a thermometer are also provided in the front side. (Text in Japanese)



INT-0804

Filin, N. A., B. P. Derevenskiy, A. I. Trepalin, Z. I. Vaysgant, and S. G. Smirnov. Method of reprocessing scrapped storage-battery plates. U.S.S.R. 164,122; filed July 8, 1963; issued July 30, 1964.

The plates are subjected to the single operation of reduction smelting in a steel kettle at 650 to 700 C under a layer of molten flux, formed of a 1 to 1 mixture of potassium chloride and sodium carbonate, using granulated charcoal as a reducing agent. The flux is first melted in the kettle, then small batches of scrapped plates and charcoal of a grain size not exceeding 15 to 20 mm are alternately charged under the flux layer in a weight ratio between 12.5 to 1 and 20 to 1, respectively. The lead oxides are reduced by solid carbon or by gaseous carbon monoxide. The molten flux removes films of oxides forming on the surface of metal reguli obtained by the reduction process, thereby facilitating their coalescence to progressively larger reguli, and its layer on the surface of the molten metal bath

prevents oxidation of the latter by the oxygen in the air. The weight of flux required for this process varies between 1 and 2 percent of that of the scrapped plates, the yield of lead being between 85 and 90 percent. (Text in Russian)

INT-0805

(Elektrokemisk A/S). Recovering fluorine, sodium, and aluminum compounds from furnace wastes. Norway 104,495; filed Oct. 11, 1962; issued Aug. 17, 1964.

Waste material from the electrolytic manufacture of aluminum is leached with an alkaline solution, and cryolite is precipitated by a two-stage process. Thus, 1,055 kg furnace bottom material is powdered and treated with 12.85 cu m of a solution containing 20 kg sodium fluoride. This solution is the recirculated mother liquor of the second stage with the addition of 0.151 cu m of 40 percent sodium hydroxide. After filtration, 13 cu m of a solution containing 90.3 kg fluoride, 21.3 kg aluminum, and 155.5 kg sodium remained. Then 2.91 cu m of tower acid from the gas washing plant, containing 3 percent hydrogen fluoride, was added at pH 10 to 11. The second precipitation was carried out at pH 4 to 5 with 2.56 cu m aluminum fluoride solution, prepared by dissolving approximately 100 kg alumina trihydrate in 2.56 cu m tower acid. In all, 470 kg cryolite, corresponding to 68 percent of the total fluoride present in the furnace wastes, was obtained. The process eliminates time-consuming analysis work and the need for a large storage area. The yield of the valuable components is almost quantitative, and the product has good filtering and settling properties. (Text in Norwegian)

INT-0806

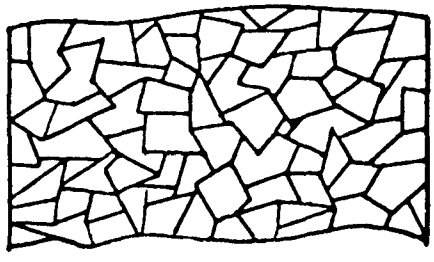
Carr, G., and B. Englund (Svenska Taendsticks A.B.). Production of paper, cardboard, and other fiber products from raw materials consisting completely or partly of waste paper containing printer's ink. Sweden 191,144; filed Mar. 1, 1960; issued Aug. 25, 1964.

A whiter product is obtained by removing most of the ink from paper according to this procedure. After pulping in alkali, the wastepaper is washed and then treated with a foaming agent in a flotation system. Here, the ink and ink-coated fibers rise to the surface attached to bubbles, while the clean fibers fall to the bottom and are ready for dewatering and papermaking. The remaining pulp in the flotation scum is treated to break down the foam, and the remaining gas is dissolved in the liquid by centrifugation under pressure. The suspended liquid is recycled to the pulping step, and the impurities are concentrated for disposal. (Text in Swedish)

INT-0807

Kreker, H., G. Neuendorf, W. Reil, and W. Roemer (Habrawerk Wilhelm F. Ott). Bodies formed from thermoplastics coated paper scraps. Great Britain 973,203; filed Feb. 11, 1963; issued Oct. 21, 1964.

A process for the utilization of wastepaper coated with thermoplastic materials, such as polyolefins or vinyl polymers of copolymers, begins with the material in comminuted form. Further comminuted scraps may be added without paper backing. The materials are shaped into panels or plates by pressing under pressure and heat.

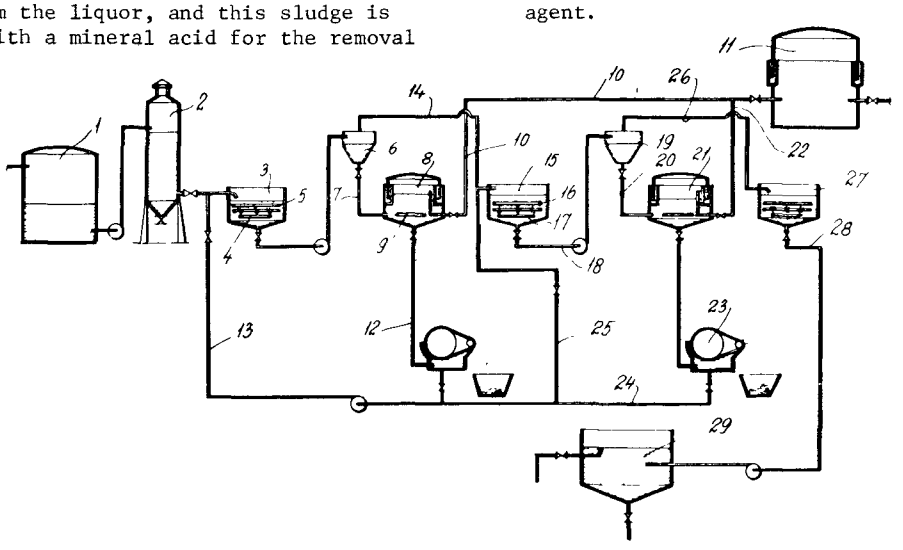


INT-0808

Bystroem, S. G. Fermentation of waste sulphite liquors for fertilizers. Canada 696,556; filed Mar. 28, 1963; issued Oct. 27, 1964.

A method for producing fertilizer or a soil improvement agent from sulfite waste liquor by fermentation also recovers acids and combustible gases formed in the process. The pH of the sulfite waste liquor is raised by the addition of an alkali. The liquor is then inoculated with a bacteria-bearing putrefied sludge. Under aeration, the inoculated liquor thus obtained is subjected first to a submersed aerobic fermentation, and then to an anaerobic fermentation. Gases developed in the course of the anaerobic fermentation are collected. This is carried out in an open fermentation basin until approximately 30 percent of the sulfite waste liquor's content of putrescible organic

matter has been broken down. The putrefied sludge formed in the fermentation is separated from the liquor, and this sludge is treated with a mineral acid for the removal of acetic acid. It is then recovered to be used as a fertilizer or soil conditioning agent.



INT-0809

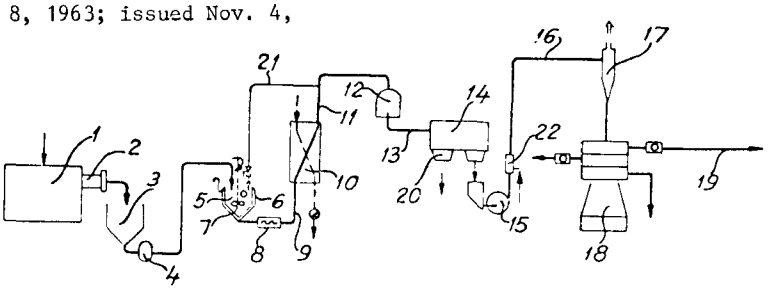
Pillorget, P. (Produits Chimiques de Sainte-Colombe). Utilization of vegetable waste material in the manufacture of wood panels. France 1,381,209; filed Nov. 17, 1960; issued Nov. 2, 1964.

A procedure is provided to utilize sawdust and the furfural produced as a byproduct in the acid hydrolysis of cellulosic waste material. After humidification at 70 C, the cellulose-containing material is treated with acid to form furfural. A 9 percent furfural yield is obtained, e.g. from beechwood. This treatment results in rapid polymerization without a loss of the material's qualities through degradation; the material can thus be used immediately for the manufacture of panels. (Text in French)

INT-0810

(Aktiebolaget Separator). Method for the recovery of edible proteins from abattoir waste and plant therefor. Great Britain 974,154; filed Jan. 8, 1963; issued Nov. 4, 1964.

A method for recovering edible proteins from fatty tissues, such as meat trimmings containing fat and proteins, is carried out by the rendering of fat out of the fatty tissue. The rendered fat is separated from the proteins, and recovery occurs continuously. After the fatty tissues have been reduced into particles, they are indirectly heated in a first heating stage to a temperature at which the fat contained in the tissue starts melting. A molten mass is achieved, and then there is a second heating stage, where the mass is heated up to a point slightly below the temperature at which the proteins start to denature. After this, the fatty tissue thus treated is stirred, while being partially further disintegrated at a temperature which does not exceed the temperature reached in the second heating stage. Finally, the fatty tissue is separated into its components: melted fat and undenatured proteins. A pump is the device used to deliver the mass from the first to the second heating stage. The second heating stage takes place in a tube heat exchanger; the stirring and partial

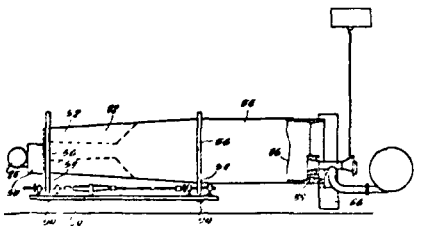


further disintegration after the second heating stage is carried out in a disintegrator. The final separation is carried out in a centrifugal separator from which fat and proteins are discharged separately. The first heating stage is carried out at approximately 40 C, the second heating stage at about 49 C, and the third stage at about 49 C.

INT-0811

Wright, J. W. R. Improvements in or relating to the manufacture of synthetic aggregates. Great Britain 974,240; filed Dec. 1, 1960; issued Nov. 4, 1964.

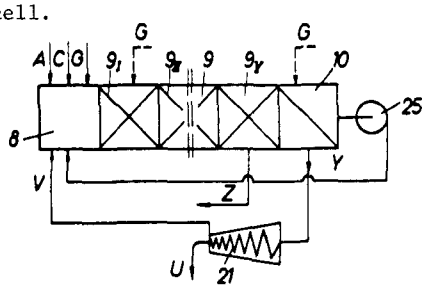
Waste slag, shale, or ash is used to make aggregate for use in the building trade. The process consists of the following steps: removing any granules smaller than 80 mesh or larger than the desired ultimate size; feeding the selected granular material to a kiln; drying the granules; progressing the granules through the kiln in the presence of an oxidizing agent; and sintering the granules. The apparatus in which the aggregate is made consists of a cylindrically shaped rotary kiln, divided axially at the inlet end into tubular passages for drying. Weirs, angle of repose, and rotational speed of the kiln control the progress of the aggregate material through the kiln. Combustion of fuel gas or oil in the kiln supplies the heat for the sintering of the aggregate. Control of the combustion gases by air circulators or exhaust fans maintains the required temperature in the kiln.



INT-0812

Ortner, H., and H. Nisser (J. M. Voith G.m.b.H.). Process and apparatus for removing ink from printed waste paper. Canada 699,582; filed May 17, 1962; issued Dec. 8, 1964.

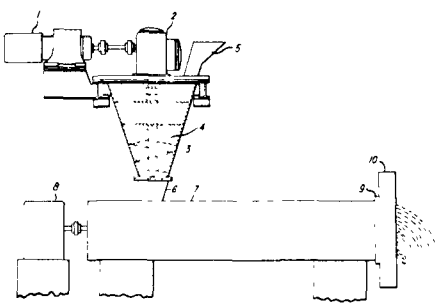
Printed materials consisting of fibers and a filler are purified. The process involves subjecting the printed material to a flotation process in a mixture of water, printed material, and a saponaceous flotation agent. Through this mixture a gas is passed; the ink particles adhere to the gas bubbles rising to the top of the mixture. The froth is sprayed with water to form a turbid liquid; this liquid is separated into cleaned water and a thick substance, consisting essentially of 30 to 40 percent of solid matter which includes the ink particles. The apparatus includes a number of series-connected flotation cells for subjecting the liquid mixture to a flotation process. A worm centrifuge is connected in series with the last cell.



INT-0813

(E. I. DuPont de Nemours and Company). Recovery of synthetic resin scrap. Great Britain 977,955; filed Aug. 1, 1963; issued Dec. 16, 1964.

Thermoplastic synthetic resin scrap of variable and relatively low bulk density is converted into material of uniform and higher bulk density. This is done by continuously passing the particulate thermoplastic synthetic resin scrap into a tapered screw compactor, which is driven at a controlled torque, so as to cause the particulate resin to issue from the compactor under a constant pressure of from 75 lb per sq in. to just below the pressure at which the compacted resin would be converted into melt form. The compacted resin is continuously passed from the compactor directly into a melt screw extruder, which continuously emits



the molten synthetic resin. The extrudate can subsequently be cut into particles or pellets of uniform size. A wide variety of thermoplastic material such as polyolefins, polyesters, polyamides and polyethers, as well as nonthermoplastic material such as asbestos, hemp, and various inorganic fillers that can be incorporated with the thermoplastic material, can be conditioned for reclamation by this process.

INT-0814

Wihsmann, F. G., and W. Hinz. Electric insulation from copper slag. East Germany 35,718; filed Mar. 18, 1961; issued Jan. 15, 1965.

The fusible slag from copper smelting is cast at 1,250 C into metal molds preheated to 450 to 830 C, followed by cooling to room temperature in 5 hr. The product has a direct current resistance at room temperature of greater than 10 to the 16th ohm cm, a dielectric contant of 8.0 to 7.5 at 50 cycles to 30 megacycles, dielectric loss factor of 4 to 1 times 10 to the third, a breakdown strength of 30 kb, and excellent creep resistance. (Text in German)

INT-0815

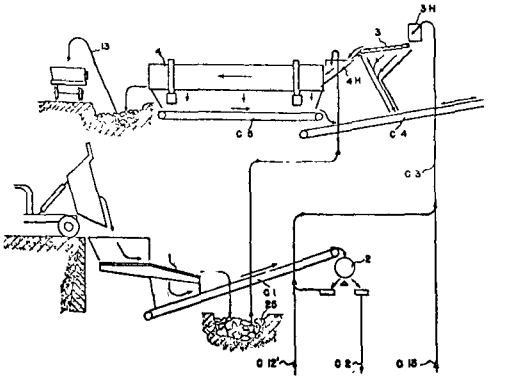
Rozlovskiy, A. A., and V. V. Pokrovskiy. Method of recovery of tin from sheet iron scrap. U.S.S.R. 169,255; filed Oct. 15, 1963; issued Mar. 11, 1965.

Nondegreased sheet iron scrap is kept immersed for 20 to 30 minutes in a 100- to 200-g per liter solution of sodium disulfide maintained at a temperature of 90 to 100 C. In this process, the sodium disulfide solution breaks down the grease film, and almost all of the tin passes into solution in the form of sodium thiostannate. Metallic tin is recovered from this solution electrolytically, or by some other known method. The electrolyte, stripped of tin, can be reused in the described scrap treatment process many times until an unduly high accumulation of organic solutes necessitates its replacement by a freshly-made one. The proposed method of recovery lowers the net cost of secondary tin by reducing the number of separate operations required. (Text in Russian)

INT-0816

Haussig, H. G. (Harsco Corporation). Method and apparatus for processing ferrous slag. *Australia* 283,811; filed Oct. 4, 1963; issued Apr. 8, 1965.

An installation for processing slag and other solid refuse resulting from iron or steelmaking operations recovers metal scrap and produces sized structural aggregate, free from iron and steel inclusions. The apparatus comprises a separating station to remove free iron and steel pieces from the incoming raw material. The iron and steel pieces are cleaned and separated into size classifications by the mechanism provided. A primary crushing station receives the predominantly nonmagnetic fraction form the first separating station; here all pieces of the fraction are reduced to a predetermined size to liberate further magnetic pieces and to provide materials for an agggegate cleaning and sizing station. There is a second separation station which receives the output of the primary crushing station and removes the released magnetic pieces in the output. The aggregate cleaning and sizing station also has a sizing feature to reject all pieces passing through the crushing station which are beyond a predetermined particle size. The secondary crushing station has a receiver for the oversized rejects from the sizing device. The output of the secondary crushing station is conveyed to the second separation station. The sizing device has a pair of parallel paths, one of which produces an end-product of clean aggregate having one range of particle size, while the other path produces an end-product of clean aggregate having a second range of particle size. There is a controlled conveyor for directing the oversized particles from the sizing mechanism into the secondary crushing station.



INT-0817

Drobchenko, A. T., P. I. Dochello, L. M. Kabanov, V. N. Mazanik, B. N. Ranskiy, and V. A. Kharaim. Method of reprocessing liquid waste slag. U.S.S.R. 171,117; filed Oct. 19, 1962; issued May 11, 1965.

The molten waste slag is treated in an electric arc furnace by blowing a carbon-air mixture through it, and by depositing additions of lime and a solid reducing agent on its surface. The carbon-air mixture is passed through the metal bath forming under the slag layer to maintain its carbon content between 2.5 and 4 percent. The metal oxides present in the waste slag are reduced by the simultaneous action of calcium carbide, iron carbide forming under the action of the carbon-air mixture, metallic iron, and products of dissociation of the carbon-air mixture which have not reacted with the metal bath. The carburization of the metal bath enables the temperature of the recovered metal to be lowered from 1,500 to 1,200 C while it remains in the liquid state. Slag, from which the metals have been removed in this process, is used as raw material for the production of building materials, such as road-paving blocks. (Text in Russian)

INT-0818

Borggreen, G. Production of fuel gas from garbage. France 1,399,544; filed Sept. 30, 1963; issued May 14, 1965.

Household garbage, dried sewage, and similar organic wastes can be converted to fuel gas by partial oxidation in a producer unit at 700 to 900 C. Thus, 0.7 to 0.8 cu m of gas containing 12 percent carbon dioxide, 4.8 percent carbon monoxide, 14.1 percent methane, 69.1 percent nitrogen, and no detectable higher hydrocarbons, oxygen, carbon dioxide, or hydrogen, with 1,495 kcal per cu m higher and 1,450 lower heating value, and 0.9797 specific gravity (relative to air) was produced from 1 kg of garbage. This gas has low toxicity, and this, and its low oxygen content, make it especially suitable as a diluent for adjustment of the heat content of town gas. Thus, a mixture of this gas with 25.8 percent hexane had a higher heating value of 7,000 kcal per cu m, and a mixture containing 13.1 percent hexane had 4,200 kcal per cu m. Similar results were obtained from other types of household and garden refuse, and from dried sewage. Purification of the product gas from solids and condensable tars is described. (Text in French)

INT-0819

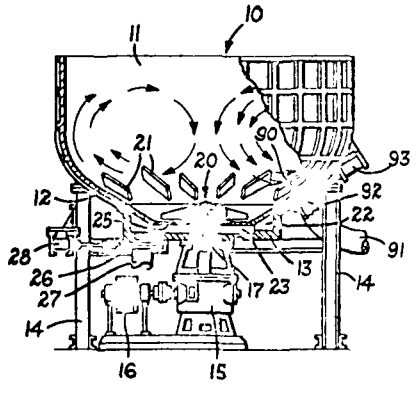
Michkareva, V. I. Method of production of ash concretes. U.S.S.R. 172,215; filed July 20, 1958; issued June 22, 1965.

The ash is thoroughly mixed, first with a small amount of a mineral binder, then with a cement solution of paste. Finally, the resulting mass is formed into spherical granules in a granulator. Preliminary granulation of the ash predetermines a coarsely porous structure of the concrete, thereby lowering its specific weight and simultaneously improving its physicomechanical properties. In coarsely porous or dense, light concrete, the setting of the granules can be allowed to take place simultaneously with that of the cement matrix. In such cases, they are transferred from the granulator directly to the concrete mixer, and they are set with the matrix. By the use of preliminary ash granulation, new porous fillers can be produced whose properties are suited for the production of dense, light concretes having a compressive strength of 65, 79, and 106 kg per sq cm at a specific weight (dry) of 1.18, 1.22, and 1.24 kg per cu cm, respectively. (Text in Russian)

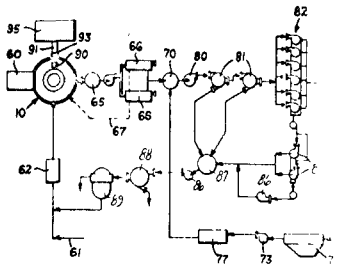
INT-0820

Mennell, G. G. Method of and substance for constructing flexible pavement. Great Britain 996,214; filed May 5, 1961; issued June 23, 1965.

Fly ash, with a residual moisture content of 18 percent, is mixed 30 percent by weight with 4 percent calcium hydrate, 1 percent portland cement, and 1 percent sodium carbonate. To this is added 64 percent by weight of aggregate, such as soil, slag, broken stone, or clinker, all of uniform size. The mixture is dumped, spread conventionally, and finally consolidated



by rolling or mechanical vibratory means. The base, which has heat-resistant properties, may then be covered with a suitable material.



INT-0821

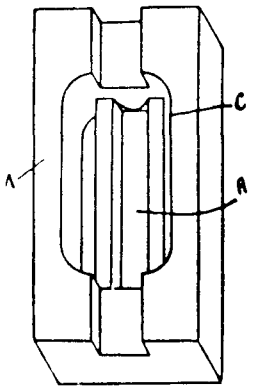
(Centre de Recherches de Pont-a-Mousson). Production of molded articles using portland cement. Belgium 662,590; filed June 8, 1964; issued Aug. 2, 1965.

A mixture of portland cement, asbestos fiber, and an amount of fly ash at least equal in weight to the cement is molded and hardened by exposure to water vapor greater than atmospheric pressure, but not exceeding 2 atm. The mixture may contain 55 to 75 percent fly ash for 45 to 25 percent portland cement, and may be hardened by exposure to water vapor to 0.1 bar (about 0.1 kg per sq cm). (Text in French)

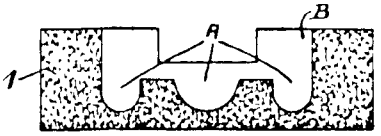
INT-0822

Donati, A. Thermal and acoustical insulation. France 1,409,794; filed July 8, 1964; issued Sept. 3, 1965.

Steam boilers and pipes are insulated with a compound based on waste newsprint. To 8 kg of shredded newsprint are added 2 kg of caustic soda and 30 liters of water. The mixture is steeped for 8 days, with mechanical agitation every 48 hr. Then the pulp is diluted with 10 liters of water and



allowed to stand for 4 days. Finally, 2 kg of quicklime is gradually added over 2 days. Surplus water is eliminated by pouring the product through a sieve and then adding 2 kg of water glass. The plastic mass obtained is cast in the desired shape and dried. During the drying, the shapes are sprinkled with an equal mixture of calcium silicate and water. (Text in French)



INT-0823

Michalski, J., S. Kijak, Z. Kowalski, T. Idzikowski, W. Grajek, S. Chrzanowski, H. Kukla, and B. Laskawiec (Huta Szczecin). Lime-sand bricks. Poland 50,063; filed Dec. 21, 1962; issued Sept. 30, 1965.

Powdered slag was used instead of lime for the production of bricks having a compressive strength greater than 100 kg per sq cm, and a porosity of about 11 to 12 percent. The slag should have a density of 2.92 g per sq cm, and a particle size distribution such that the residue on a 10-micron mesh screen is 0.8 percent, on 20-micron, 0.3 percent, on 40-micron, 0.4 percent, on 50-micron, 1.7 percent, on 80-micron, 12.7 percent, on 100-micron, 8.1 percent, and on 200-micron, 23.7 percent. (Text in Polish)

INT-0824

Caussanel, A. Fertilizer from winemaking and distillation residues. France 1,426,053; filed Jan. 29, 1959; issued Dec. 20, 1965.

A procedure is provided whereby residues from winemaking and distillation can be utilized as fertilizer. After clearing away the skins, stalks and pits, the residues are pressed to remove excess water; to this, complementary fertilizer substances can be added as required. The final pH must be less than 6.5, and the mixture must not contain more than 1.5 percent sulfuric acid. The mixture is then rapidly dried to an optimal humidity of 5 percent, and sifted to the required size of granules. The finished product is a fertilizer having the following composition: organic nitrogen, 4.25 percent; phosphoric anhydride, 1 percent; and potassium oxide, 2 percent. (Text in French)

INT-0825

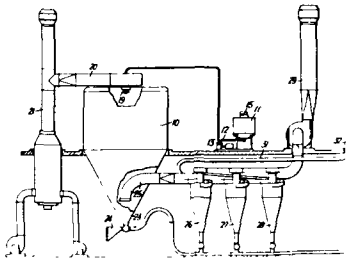
(Fisons Fertilizers Limited). Basic slag fertilizer. Belgium 666,451; filed July 14, 1964; issued Jan. 6, 1966.

Basic slag discharged from a furnace is cooled slowly for 1.5 hr from 1,500 to 500 C, without the use of water or air, then it is cooled to 500 to 150 C and ground so that 60 percent passes through a 0.152-mm mesh sieve. By screening or by air separation, particles 0.15 to 0.80 mm are recovered. This slowly cooled slag, containing appreciable quantities of silicocarnotite, is more easily crushed and is more effective in pot experiments growing rye grass in pH 4.4 soils than is more rapidly cooled slag. (Text in French)

INT-0826

Martin, R. K., and J. C. Stothard (George Scott and Sons, Ltd.). Process and apparatus for treatment of distillery waste material. Great Britain 1,018,606; filed Apr. 9, 1963; issued Jan. 26, 1966.

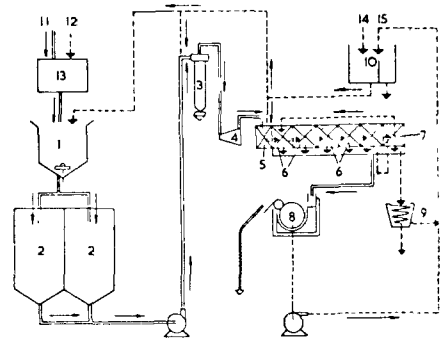
This process converts distillery wastes to a fibrous material suitable for use as animal fodder. Draff and spent wash, which has been treated so it has a solids content of between 15 and 70 percent by weight, are mixed in a vessel to form a substantially homogeneous substance. After being atomized, the waste is dried with heated air to form a granular, fibrous material. Preferably, the heated air is at a temperature between 300 and 600 F.



INT-0827

(Deutsche Gold- und Silber-Scheideanstalt, formerly Roessler). De-inking of waste paper. Netherlands 6,509,829; filed July 29, 1965; issued Jan. 31, 1966.

The chemical treatment in the first step of the flotation process of ink removal is improved. Besides the usual sodium peroxide and water glass, aliphatic carboxylic acid emulsifiers are added. To 1,000 kg of wastepaper are added 18 cu m of water, 20 kg of sodium peroxide, 50 kg of water glass, and 10 kg of the following mixture: 55 percent oleic acid, 23 percent ricinoleic acid, 9 percent stearic acid, 10 percent palmitic acid, and 3 percent abietic acid. The paper is repulped 20 minutes at 35 C, then beaten 2 hr, and the impurities are removed by flotation after dilution to 1 percent. The brightness of the paper is 60 to 62 as compared to 58 to 60 in the old process, when soft soap or polyglycol ethers of fatty alcohols are used. (Text in Dutch)



INT-0828

Ottenholm, T. A. I. Treating bark and wood waste for use as concrete fillers, and structural elements of concrete containing bark and wood waste thus treated. Sweden 201,851; filed July 13, 1962; issued Feb. 8, 1966.

Structural plates are manufactured by applying powdered, crude portland cement to moistened bark and drying. For example, clean bark of spruce or pine is comminuted to pieces 12 to 25 mm in size, centrifuged to 35 percent water content, mixed with a rapidly setting cement in a rotating drum, and dried in a heating and/or ventilating device. Then, 40 parts of the glazed bark, containing 35 percent moisture, is mixed with 60 parts mortar, made of cement, water, sand and/or ground slag. The mass is cast under vigorous vibration, the mold is opened after 2 days, and the plates obtained are stored 30 days out of doors before use. (Text in Swedish)

INT-0829

(The Black-Clawson Company). Method and apparatus for treating plastic coated waste paper material to recover fibrous material therefrom. Great Britain 1,020,003; filed Oct. 24, 1962; issued Feb. 16, 1966.

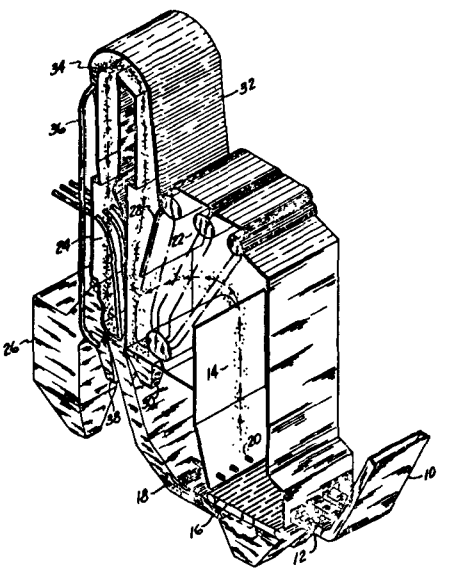
This method comprises charging a tub with a mixture of the waste material and water.

The mixture is then agitated in the tub, under conditions creating intense hydraulic shear with minimum mechanical action, until at least the major portion of the fibrous material has been separated from the plastic. Then the liquid and the major portion of the separated fibrous material are removed by passing them through a screen having perforations, while retained in the tub is all of the waste material too large to pass through the perforations. The retained material is removed separately. The apparatus for treating the plastic-coated wastepaper material comprises the tub, the perforated screen, a rotor mounted about a central axis within the tub, and vanes extending outward from the hub and overlying the screen. Each of the vanes has a leading surface portion of substantial area to subject the mixture to hydraulic shear. This causes separation of the fibers from the plastic coating, and reduces the fibers to particle size small enough to pass through the screen.

INT-0830

Stoertz, R. W., and W. B. Goodwin (West Virginia Pulp and Paper Company). Active carbon, production and use thereof. Great Britain 1,020,189; filed Aug. 28, 1964; issued Feb. 16, 1966.

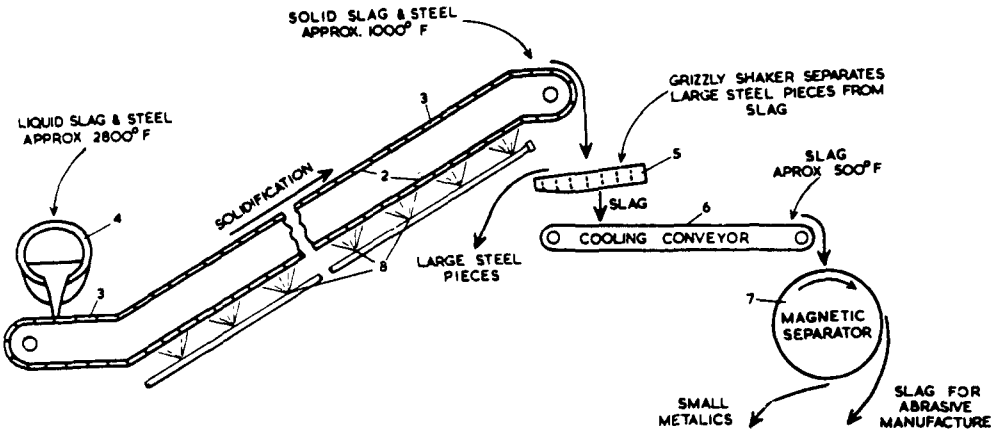
Activated carbon is obtained from fly ash by burning pine bark or waste with excess air in a steam boiler. Optimum results are obtained with dry bark (1/8 to 1/4 in. in diameter), air preheated to over 200 F, and combustion at more than 1,600 C. Decreased yields and/or less active, but still satisfactory material, are obtained with wet bark, a mixture of soft and hardwood barks, larger bark pieces, and cold air. The product has superior handling properties to existing types. All particles are equally active, regardless of size. Coal, wood peat, and bagasse do not produce fly ash with the high adsorptive properties of bark fly ash at the same yield. The activated carbon can be used to remove taste, odor, or color from a liquid.



INT-0831

Webster, G. A. (Dominion Foundries and Steel Limited). Process for production of abrasive grit from furnace slags. Canada 729,559; filed May 31, 1963; issued Mar. 8, 1966.

This process is for the removal of metal and production of abrasive grit from slag from a steel bath in a slag pot. The steel in the slag is permitted to settle to the bottom of the pot. The slag and



the steel are emptied, by pouring the slag and then the steel into cooled containers. These containers have thick heat-absorbing metal walls to freeze the slag under rapid transfer of heat. The frozen slag is ejected into a device which separates metallics, and crushes the slag into abrasive grit. The containers, subsequent to the ejection of slag from them, are subjected to coolant action for the dissipation of heat absorbed by the containers from the slag.

INT-0832

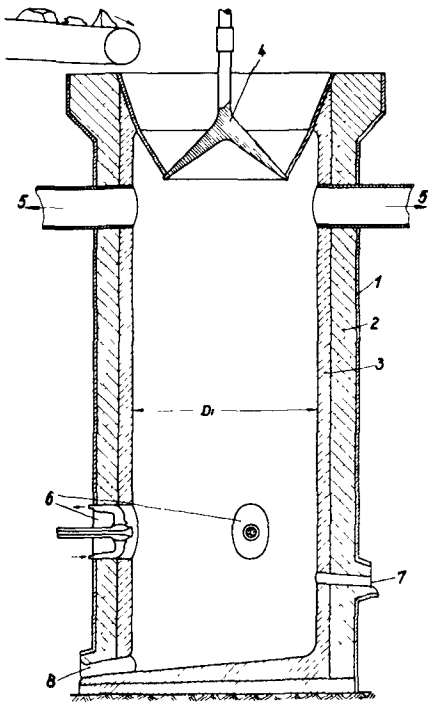
Wihsmann, F. G., and W. Hinz. Homogenous shaped bodies from crude copper slags. East Germany 45,563; filed Oct. 25, 1962; issued Apr. 15, 1966.

In a process for the manufacture of finely crystalized homogenous-shaped bodies from crude copper slag, remelted vitreous and/or crystalized slag is cast into preheated molds, and the solidified casts are heat-treated. Then, 0.1 to 5 percent of a chromium compound is added to the slag to support the crystallization of foreign crystal seeds contained therein. The chromium compound may be replaced by 4 percent carbon or carbonaceous compounds in fine or coarse dispersion. Alternately, mixtures of carbonaceous and chromium compounds may be used, and the slag is tempered 0.5 to 5 hr at 800 to 1,200 C under oxidizing conditions before adding the mixture. It is then cooled at a rate of (preferably) 30 degrees per minute to room temperature. Instead of preheated metal molds, molds of quartz sand with oil binder may be used, preheated to less than or equal to 300 C. (Text in German)

INT-0833

Balster, H. W. (Rheinstahl Huettenwerke A.G.). Shaft furnace and method for scrap melting. Germany 1,216,902; filed Dec. 3, 1960; issued May 18, 1966.

A shaft furnace for melting scrap has a cylindrical cross section. It is tightly sealed against the entrance of air. Oxygen/gas or oxygen/oil nozzles, which rotate about an axis, are the sole heat suppliers. It is preferable to install several tiers of nozzles. The nozzles of the lowest tier can be tilted directly toward the metal layer at the bottom. No other fuel enters the furnace with the scrap. The steel is continuously cast into the extrusion plant. The scrap is charged from above, and it is heated by countercurrents to the melting point. The liquid steel is gathered in the bottom of the furnace. With the scrap, either calcium carbonate, calcium oxide, or calcium fluoride is added for slag formation. The liquid slag settles above the steel, because it has a lower specific weight. (Text in German)



INT-0834

Fieffe, C. F. A protein food from wastes. France 1,439,936; filed Mar. 8, 1965; issued May 27, 1966.

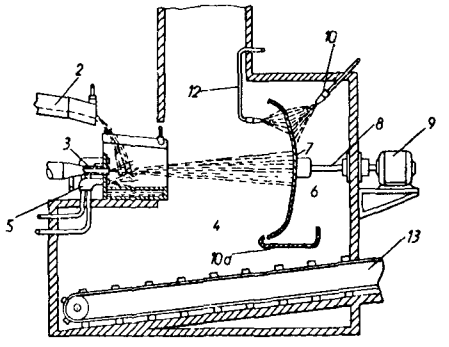
A powdered nonhygroscopic protein food for cattle is prepared from slaughterhouse and fishery offal, yeasts, oil cakes, plankton, and other protein-containing material. This is done by partial hydrolysis with enzymes (especially papain), elimination of non-protein components, and evaporation of the hydrolyzate to dryness. Thus, 800 kg of a crushed mixture containing 30 percent fish and fishery offal with 70 percent water, is heated and stirred in a closed enameled boiler at a pressure permitting a slow distillation of water. After 10 minutes at 70 C, 250 g of enzyme and 1 g cysteine are added, the temperature is raised in 15 minutes to 85 C, and the pressure is adjusted so the water is distilled at a rate of 1 to 2 liters per minute. When the protein material is entirely dissolved, it is heated at 105 C for 5 minutes to inactivate the enzyme. It is then filtered, centrifugated, and dried on rollers, giving 180 kg of a non-hygroscopic powder, containing 2 percent

moisture and 2 percent lipid, easily soluble in water. It contains 13.6 percent total nitrogen, and 2.8 percent nitrogen of free ammonia groups. (Text in French)

INT-0835

Osborne, F. Method of and apparatus for processing molten slag and the like. Great Britain 1,032,608; filed Apr. 11, 1963; issued June 15, 1966.

A falling stream of molten slag is broken into pellets by a stream of steam or air, which propels them into an expansion chamber. There, the pellets collide with drops of atomized water, insufficient to quench the slag to a point where it ceases to be plastic, but which produces a controlled expansion of the pellets. The pellets then fall into the central area of a revolving concave metal disk, and are caused to roll on the disk surface toward the periphery. This rolling tends to impart a generally spherical shape to the pellets, whose texture is smoothed and appears to become slightly glazed. Heat is conducted from the pellets through the disk by water sprays striking the rear surface of the disk. The cooled pellets are then discharged by gravity and centrifugal force into a pit, where they do not fuse or sinter together to any appreciable extent. Each pellet is not precisely spherical, but resembles gravel taken from riverbeds or gravel deposits. The glazed surface of the slag pellets makes them desirable for use as aggregate in concrete blocks.



INT-0836

(Zavod 'Avtosteklo'). Glass based on metallurgical slag. France 1,447,653; filed Sept. 22, 1965; issued June 20, 1966.

Prior art crystal glass based on metallurgical slag showed a black or dark brown tint due to ferrous sulfide or manganese sulfate, which also limited the molding capacity of the glass. Crystal glass with light tints (e.g. white or light blue) is produced by introducing zinc oxide and sodium fluorosilicate into the charge. This results in the formation of zinc sulfide in place of ferric sulfide and manganese sulfate, which, together with sodium fluorosilicate, acts as a catalyst to lower the the crystallization point. A molded glass is cooled to 700 to 750 C, maintained at that temperature for 30 to 60 minutes, then gradually heated over 3 hr to 950 to 1,000 C, at which temperature it is held for 1 hr at most, then cooled to ambient temperature. Thus, from a mixture of 54 percent (by weight) slag, 33 percent sand, 11 percent sodium fluorosilicate, and 2 percent zinc oxide, a glass is formed having: 57.3 percent silica; 6 percent aluminum oxide; 0.2 percent ferric oxide; 26.1 percent calcium oxide; 0.8 percent magnesium oxide; 1.1 percent manganese oxide; 2 percent zinc oxide; 2.2 percent sodium oxide; 0.6 percent sulfur; and 3.7 percent iron, by weight. (Text in French)

INT-0837

Motz, G., E. Schulze, H. Rau, K. Raschke, W. Wille, and H. Schade. Covering material from bitumen and filter ash. East Germany 49,235; filed Oct. 23, 1965; issued July 20, 1966.

A covering material for roofs is prepared by the addition of 0.36 part of electrofilter ash, a waste product from power stations, to 1 part of bitumen at 150 C, with stirring. (Text in German)

INT-0838

Szewczyk, S., Z. Pliszynski, and W. Skawinski (Zaklady Miesne Lublin). Silage for pig breeding. Poland 51,418; filed Oct. 31, 1964; issued July 20, 1966.

Slaughterhouse wastes, used for the production of silage, are mixed with molasses (containing a minimum of 50 percent sugar) in amounts of 10 percent. The mixture is kneaded in a pit, and after 4 to 6 weeks, given to pigs. The silage may be stored for a long time. (Text in Polish)

INT-0839

Sippel, A., and P. Vollmer (Deutsche Rhodiaceta A.G.). Recovery of fibrous and filament wastes from fusible polymers. Germany 1,221,440; filed Dec. 2, 1958; issued July 21, 1966.

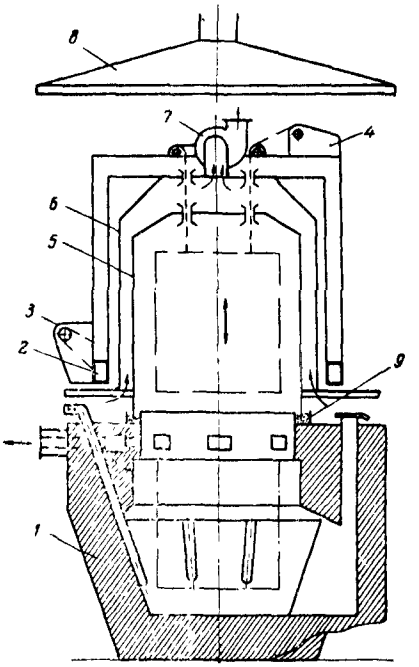
Shredded or torn fibrous waste from condensed polyhexamethyleneadipamide is carried counter-

currently above a 330 F superheated steam stream. The melted mass formed is drained underneath, and immediately formed into endless bands. The material obtained for melting shows no discoloration. The substance has a dry point of 72, and a relative viscosity of 37, as compared with the melting material with a dry point of 82 and a relative viscosity of 48. The relative viscosity is a ratio of the viscosity of an 8.4-percent solution of the polyhexamethyleneadipamide in 90 percent formic acid, to the viscosity of 90 percent formic acid. Similar results are obtained with polycaprolactam, polyurethane, polyethylene terephthalate, polyethylene, polypropylene, and polybutylene. (Text in German)

INT-0840

Borisov, S. M., B. P. Velichko, N. V. Didrikh, S. P. Kosarev, A. N. Tatakin, V. G. Raskatov, and A. Y. Tayts (All-Union Scientific-Research and Planning Institute of the Aluminum, Magnesium and Electrode Industry). Salt bath for melting of magnesium wastes and scrap. U.S.S.R. 185,061; filed Feb. 25, 1965; issued July 30, 1966.

A salt bath furnace, which is heated by the passage of electric current through the molten salt, is used for remelting magnesium wastes and scrap. A basket containing the wastes is loaded into the salt bath through an unsealed top-loading hatch by the use of an overhead crane. To reduce health hazards



to operating personnel, the design incorporates a gas seal consisting of a self-propelled platform travelling on the level of the loading hatch of the furnace. The platform includes: a drive for raising and lowering the charge basket; a movable inner bonnet; a fixed outer bonnet acting as a heat shield; and a fan. As the charge basket is being lowered, the inner bonnet descends with it until its bottom edge seats on the sand seal, thereby closing the loading hatch and sealing off the working space of the salt bath furnace. Lowering of the basket continues until the charge is completely immersed in the molten salt. Most gases liberated in the operation are drawn off through wall openings which ring the throat of the furnace, into the furnace flue. (Text in Russian)

INT-0841

Grondstof, N. V. E. Recovery of waterproof waste paper. Netherlands 6,502,643; filed Mar. 2, 1965; issued Sept. 5, 1966.

Waterproof wastepaper impregnated with urea- or melamine-formaldehyde resins is treated by acid hydrolysis with o-sulfanilic acid. The acid is not corrosive, hence corrosion inhibitors need not be added. In this process, 10 kg crude sulfanilic acid is dissolved in 1,500 liters water, 1,350 kg urea-formaldehyde resin-impregnated paper labels are put into the solution, another 1,500 liters water are added, and the mass is hydrolyzed for 1.5 hr at 120 to 130 C. A paper free of spots can be made from the hydrolyzed paper. Phototype paper can be treated similarly. (Text in Dutch)

INT-0842

Leroy, J. Agglomerate of sawdust and products obtained from it. France 1,453,809; filed Apr. 27, 1964; issued Aug. 22, 1966.

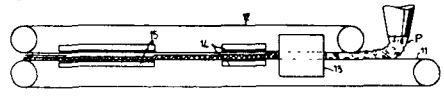
A mixture of 100 g sieved sawdust and 50 g clay (preferably kaolin) was stirred for 15 to 20 minutes in a blender with 150 ml of a 38 C Baume sodium silicate solution. Silica (20 g) and sodium silicate powder (20 g) could be added to decrease shrinking during drying, and to obtain a very fine grain. The resulting mass was introduced into molds and pressed to produce tubes or special shapes. The objects removed from the molds were slowly dried at room temperature for 3 to 6 days. Shrinking was less than 40 mm per m. The objects were painted, varnished, or coated, preferably with polyester. Sawdust of different kinds and different grain could be mixed in the same blend. The

agglomerate is light (density of 1.3), thermally insulating, and incombustible; it is proposed as a substitute for wood, e.g. in parts of furniture, toys, and handles for pans. (Text in French)

INT-0843

Schueler, G. B. E. Improvements in or relating to the utilisation of natural fibrous materials. Great Britain 1,046,246; filed May 29, 1962; issued Oct. 19, 1966.

Natural fibrous materials such as wood waste can be used in the manufacture of particleboard or molded articles of a substantially rigid nature. Five parts by weight of chlorinated polyphenyl are prepared in an emulsion, and to this are added 150 parts styrene-butadiene latex with a solids content of 25 percent. This mixture is added to 400 parts wood waste which has been ground into particles, and then mixed for 15 minutes in a rotary mixer. Then, 9 parts urea-formaldehyde hardener is added to the mix, followed by 30 parts urea-formaldehyde resin, both in powdered form. Fibrous molding material is also produced from wood waste and various resins. Novalak (17 parts), coumarone resin (5 parts), and bitumen emulsion (1 part), are prepared as a suspension in water with a wetting agent (1 part), and added to preground 5-mesh wood waste (75 parts) in a rotary-blade mixer. Water (35 parts) is added to 100 parts of the dry resin-wood mix during mixing. The final mix is then dried to less than 5 percent moisture content, ground, and molded at 120 to 180 C and 2.5 tons per sq in. pressure into dimensionally stable and waterproof articles, such as window frames.



INT-0844

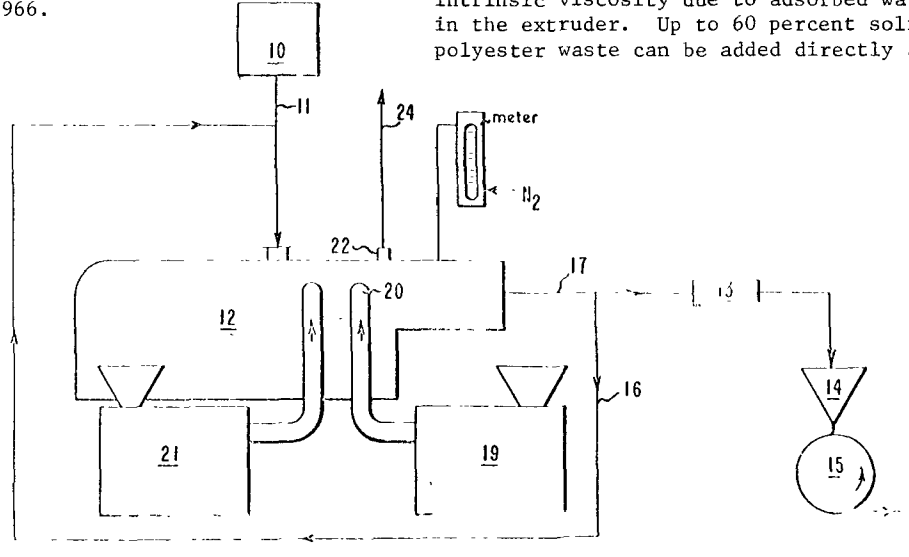
Biryukova, L. V., R. A. Sandler, and V. V. Sergeyev. Method of reprocessing wastes of titanium and its alloys. U.S.S.R. 188,674; filed Mar. 4, 1958; issued Nov. 1, 1966.

Wastes, such as sponge, shavings, or powder, of titanium and/or titanium-base alloys are mixed with solid chlorides of an alkali or alkali earth metal. This charge is chlorinated with titanium tetrachloride at a temperature between 600 and 650 C. The molten complex salts of bi- and trivalent titanium are then heated to a temperature between 750 and 800 C, and kept in contact with the unreacted residual charge for 2 to 3 hr. They are then poured through a stainless-steel sieve into a reactor for reduction of the titanium di- and trichlorides to metallic titanium with magnesium or with sodium. Metallic titanium is separated from the product of magnesiothermal reduction by a combined method, and from that of the sodiothermal reduction by a hydrometallurgical one. (Text in Russian)

INT-0845

(E. I. DuPont de Nemours and Company). Use of polyethylene terephthalate waste. Netherlands 6,606,342; filed May 10, 1965; issued Nov. 11, 1966.

If solid polyester waste is reused, it has to be pretreated to prevent hydrolytic and oxidative breakdown and a decrease in intrinsic viscosity due to adsorbed water in the extruder. Up to 60 percent solid polyester waste can be added directly and



continuously to fresh material, if part of the extruder material is fed back into the extruder through an oxygen-free atmosphere. If the intrinsic viscosity of the product is lower than that of the fresh material, the polyester is kept circulating through the extruder until no difference in viscosity is observed. Thus, polyethylene terephthalate is fed into an extruder directly from the last polymerization vessel. At 280 C the material is circulated through an extruder for 15 minutes in a nitrogen atmosphere at a rate of 90 kg per hr; simultaneously, the addition of liquid from the vessel is stopped slowly, and 45 kg of the product per hr is fed back into the extruder. After 1 hr at 280 C, the intrinsic viscosity of the product from the extruder is 0.53. (Text in Dutch)

INT-0846

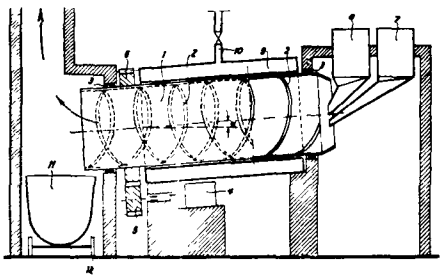
Anikeyev, K. M., A. K. Bayev, I. D. Zobolotskiy, and A. Y. Kipnis. Method of reprocessing products containing nickel, cobalt, and iron. U.S.S.R. 189,144; filed June 22, 1964; issued Nov. 17, 1966.

An amount of sulfur is added to the charge of the original product in sufficient quantity to bind the amount of cobalt present in the form of cobalt sulfide. The modified product is carbonylized with carbon monoxide containing about 0.2 to 0.3 percent oxygen. Up to between 96 and 99 percent of the nickel and iron present in the product pass into the gaseous phase, while between 95 and 99 percent of the cobalt remains in the solid residue. The solid residue is roasted and reduced a second time, and, finally, treated with carbon monoxide. In the case that nickel, iron, and cobalt are present in the original product in metallic form, the roasting and reducing treatments are not prerequisite. If the material contains copper, the amount of sulfur in the charge to be carbonylized with carbon monoxide should be not less than one-half the amount of copper. (Text in Russian)

INT-0847

Tubis, R., and M. Wilgocki (Huta Szkla Technicznego). A solid fuel from solid and liquid organic wastes, especially from phenolic wastes and coal tar. Poland 52,173; filed Aug. 17, 1965; issued Dec. 15, 1966.

Phenolic wastes and coal tar obtained as waste products in gas generators can be absorbed at a temperature of over 100 C on fine brown coal used in the ratio from 1 to 2, to 1 to 4. The fuel obtained is plastic, and its heating value is higher by 30 percent than that of brown coal. A device for the process is diagrammed. (Text in Polish)



INT-0848

Fischer, S., and H. J. Krausse. Liquid protein feed from leather scraps and other industrial wastes. East Germany 53,549; filed May 12, 1965; issued Jan. 20, 1967.

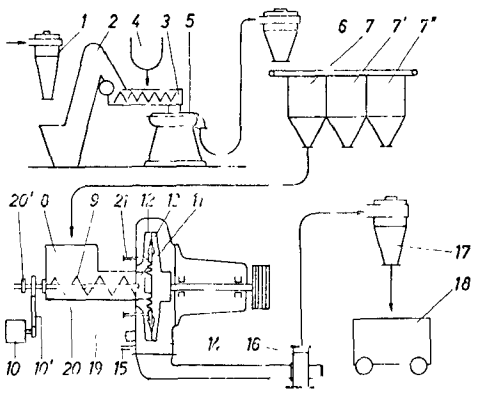
Hairy leather scraps are dehaired chemically. The dehaired scraps and lime-treated leather scraps are thoroughly washed mechanically. Mechanically treated leather scraps, that were not limed, are not sprayed. The total scraps are disintegrated by a machine to particles capable of being pumped. Fish and fish byproducts are likewise ground to a pumpable mass. The shredded leather scraps, that may contain anthrax spores, are sterilized for at least 30 minutes at 130 C. Some of the other raw materials, e.g., fish wastes and blood for feed use, are heated to only 100 C for 20 to 40 minutes. Beer yeast and antibiotic mycelium require no heat treatment. The sterilization is performed in a directly heated autoclave that also dehydrates the material. The raw materials are kept in separate containers, and those that require heat treatment are separately introduced into the autoclave by vacuum through pipes. The fat and oils can be separated by draining. The sterilized materials are conveyed to a feed mixer in a separate conduit. All portions of the fluid protein feed materials are mixed, and sulfuric acid is added to reduce the pH to 3.5. (Text in German)

INT-0849

(Ultrex-Chemie G.m.b.H.). Continuous regeneration of vulcanized scrap rubber particles. Netherlands 6,609,488; filed July 6, 1966; issued Jan. 23. 1967.

A device and process are provided to subject scrap rubber particles, mixed

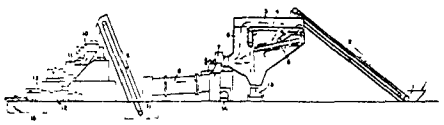
with additives, to heat and to centrifugal force in order to obtain regenerated rubber. Thus, 100 parts rubber scrap from vulcanized rubber mixtures is reduced to particles of 0.4 to 0.6 mm; 2 to 3 parts zinc pentachlorothionate, 3 to 4 parts softener, 3 to 4 parts pine wood tar, and 20 parts regeneration oil is added. The composition is mixed, and the mixture kept until regeneration is complete. Then it is subjected to a continuous mechanical action at a peripheral velocity of 100 to 150 kg per hr, and a capacity of 20 to 25 kw. A similar process was carried out with scrap rubber and buna-S, but with the introduction of steam at 120 to 130 C during the mechanical treatment, and also with scrap of synthetic rubber. Homogeneous well-plasticized regenerates were obtained with good mechanical properties and good processibility. (Text in Dutch)



INT-0850

Kobayashi, K. Garbage treatment and charcoal manufacturing machine. Japan 42-4,070; filed May 28, 1959; issued Feb. 20, 1967.

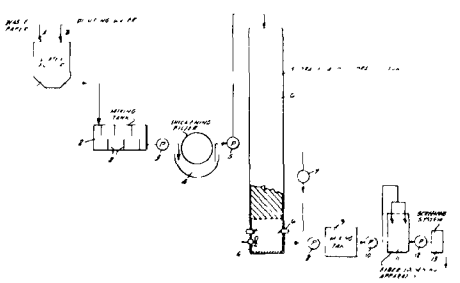
A machine to manufacture charcoal consists of an upwardly inclined belt for garbage transport; a rotating, horizontal screen which receives the garbage from the belt; an iron scrap recovery device; below, a downwardly inclined vibrating shifter which separates the inflammable, light scrap from the inflammable, heavy scrap; a belt leading downward from the horizontal screen to the vibrating shifter; and a blower which draws in the flammable light scrap. The first heating furnace heats inflammable scrap for the first time. The first and second crushers follow. A molder and compressor unit compresses and dehydrates the crushed scrap while it is heated in the second heating furnace. The final product is molded charcoal. The heat in the second heating furnace should be sufficient to plasticize the lignin in the scrap. Drilling bars can be installed in the molder to mold the briquette into a form that it is easy to ignite and burn. (Text in Japanese)



INT-0851

Pav, J., V. Hnetkovsky, K. Drda, and Z. Libnar. Method and apparatus for loosening the fibers of waste. Canada 756,346; filed Oct. 5, 1964; issued Apr. 11, 1967.

This method of loosening fibers of waste paper comprises mixing waste paper and water and subjecting the mixture to a coarse pulping operation. The pulp thus obtained is thickened, and subsequently fed into a storage tank. There it is subjected to swelling and hydration. The pulp is discharged from the tank as it is diluted to a smaller density. The diluted pulp is then subject to mechanical vibrations at high frequencies for loosening the fibers. Finally, the pulp is screened. The apparatus includes a chamber and a nozzle with an outlet communicating with the interior of the chamber for directing a pressurized stream of pulp into the chamber. A vibrator is axially aligned with the nozzle adjacent to the outlet end and it vibrates at high frequency to subject the stream to mechanical vibrations



INT-0852

Belen'kiy, S. I., N. S. Maksimenko, B. A. Glazman, T. V. Per'kova, and A. G. Savinykh (All-Union Scientific Research Institute of Biosynthesis of Albumins). Method of percolation hydrolysis of wood wastes. U.S.S.R. 195,310; filed Sept. 1, 1965; issued Apr. 12, 1967.

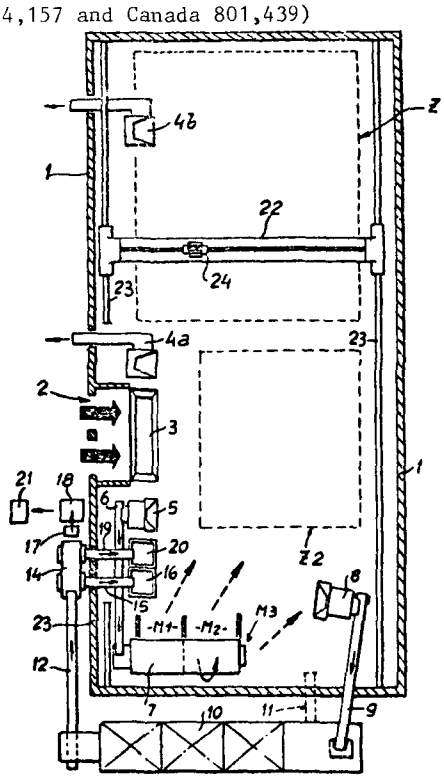
The proposed method is a modified version of an existing method of percolation

hydrolysis of wood-processing wastes and agricultural wastes by exposing them to the action of a boiling acid introduced at various rates into the reactor. The boiling acid is introduced, first at a volume rate of flow between 8 and 15 cu m per hr, and then at a rate between 15 and 35 cu m per hr. The usual total duration of the reaction is practically unaffected by the proposed modification, whereas the yield of sugar from the wastes as well as the biological quality of the obtained solutions is substantially raised. (Text in Russian)

INT-0853

Matteini, S. A process for the treatment of municipal refuse. Great Britain 1,066,166; filed Aug. 10, 1965; issued Apr. 19, 1967.

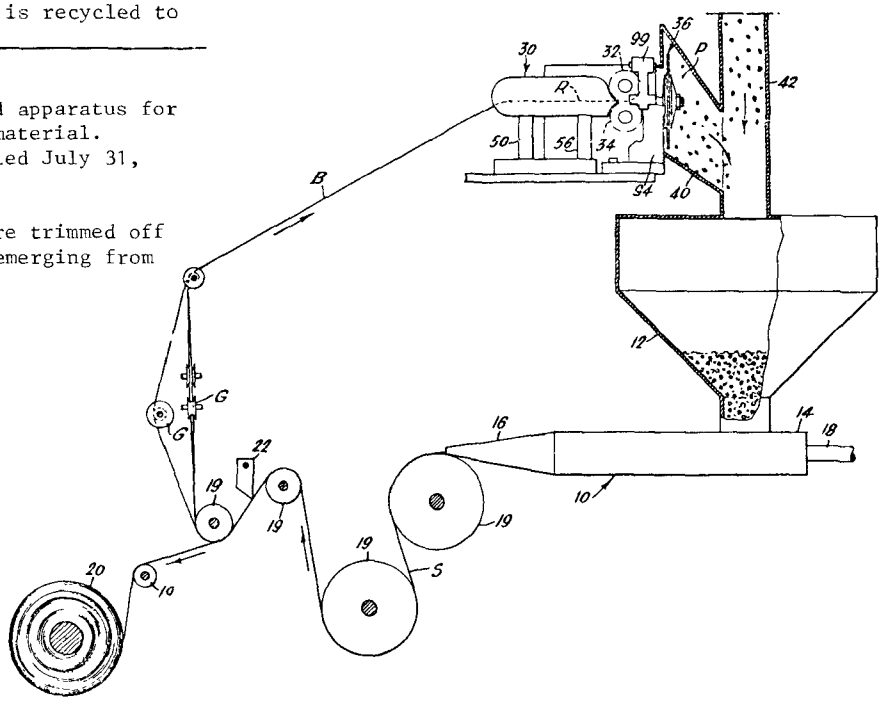
A process for the treatment of municipal refuse comprises screening the refuse to separate out small-sized, readily-fermentable, entirely organic material; larger-sized, partially organic material that is capable of enough fermentation to produce the disintegration of the material; and substantially nonfermentable material. The incinerated material is separated into component portions, including ferrous residues, nonmagnetic nonash residues, and ashes capable of being introduced into a fermented material for the production of a fertilizer. The small-sized material is fermented, and the larger-sized material, after partial fermentation, is recycled to the screening step. The steps of screening the refuse and effecting fermentation are carried out in a closed, externally-operated plant. (See also Great Britain 1,128,083 and 1,154,157 and Canada 801,439)



INT-0854

Van Riper, A. H. Method and apparatus for reprocessing plastic waste material. Great Britain 1,066,379; filed July 31, 1964; issued Apr. 26, 1967.

Two or more selvage bands are trimmed off the plastic sheet material emerging from



an apparatus usually used for making plastic sheet goods. The bands are formed into an integrated strip, which passes through a pair of crimping gears to yield a unitary, corrugated ribbon. This is fed through a cutter which reduces the ribbon to a number of pellet-sized segments of uniform size and shape, substantially the same as that of the new pellets used in the sheet-molding apparatus. The segments are directed through a funnel which communicates with the main pellet supply tube, so the recovery process operates simultaneously with the sheetmaking procedure.

INT-0855

(Ferentzi and Kessler). Recovery of wool. Germany 1,240,621; filed Oct. 24, 1963; issued May 18, 1967.

The recovery of wool from raw pelt waste, and especially raw lamb and sheepskin waste, comprises: softening the waste material in water until the skin is in a similar condition when it is removed from the animal; spreading out the waste material; and spraying it with water to prevent it from drying out. Flies lay their eggs on this waste, and the skin is consumed by their maggots, thus leaving the wool. (Text in German)

INT-0856

Krasbuchenka, L. V., N. I. Cherkesov, and M. G. Ross (Institute of Agricultural Machine Construction). Method of processing wastes of ferrous and nonferrous metals and of their alloys. U.S.S.R. 197,644; filed Oct. 29, 1966; issued June 9, 1967.

To obtain metal powders with superior mechanical properties, it is proposed that the original wastes be treated with a solution of caustic soda and sodium carbonate, and then reduced with solid carbon at a temperature between 930 and 950 C. The product of reduction, a spongy mass of metallic particles and abrasive grains, is ground to a fine powder, from which the metal powder is removed by subjecting the mixture to magnetic separation. The alloy-steel powder obtained by this method can be used to produce, by powder-metallurgical methods, various structural and antifrictional parts with superior mechanical properties. (Text in Russian)

INT-0857

Olesov, Y. G., A. B. Suchkov, and A. N. Rubtsov (Dnieper Titanium-Magnesium Plant). Method of preparation of anode material from wastes of high-melting metals and their alloys for electrolytic refining. U.S.S.R. 200,765; filed Dec. 7, 1964; issued Aug. 15, 1967.

Wastes such as sponge, cuttings, shavings, and the like are placed in a container and annealed in a vacuum or in an inert-gas atmosphere, at a temperature between 800 and 1,000 C for 2 to 6 hr, depending upon the fineness of the material and the thickness of the surface film. During this treatment, oxygen, nitrogen, and hydrogen, present in the surface film in the form of titanium compounds, diffuse into and become uniformly distributed throughout the interior of the waste-metal pieces, while the surface film gradually disappears. In the subsequent electrolytic refining process, the absence of the surface film permits a lower anode polarization, resulting in lower impurity contents in the product, as well as in a lower specific energy expenditure. (Text in Russian)

INT-0858

Bulmer, L. New or improved concrete and a process for the manufacture thereof. Great Britain 1,080,004; filed Nov. 17, 1964; issued Aug. 23, 1967.

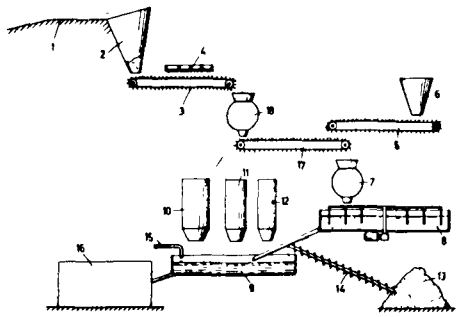
A homogeneous mixture of fly ash (or gravel), cement, and sand is wetted, agitated, allowed to partially dry, and broken into irregular pieces. The conglomerate is then placed to the desired depth (as on a roadway), or into molds, rolled or tamped, and levelled, resulting in a homogeneous honeycombed concrete. The addition of potash, soda, or other alkali would improve the waterproof and crackproof properties of the concrete. A typical example of the constituents of the mixture would be 85 percent lagoon ash, 7.5 percent alkali, and 7.5 percent sand. Synthetic resin and/or lime may be added to the mixture.

INT-0859

Henrion, A. Construction blocks from garbage. France 1,501,664; filed Dec. 3, 1965, issued Oct. 2, 1967.

Domestic garbage is ground and mixed with metallic slag, cement, calcium chloride,

ferric sulfate, and water to yield an agglomerate suitable for the fabrication of construction blocks. Thus, an agglomerate containing approximately 425 liters ground garbage, 6.75 liters of slag, 320 liters of cement, 10 kg calcium

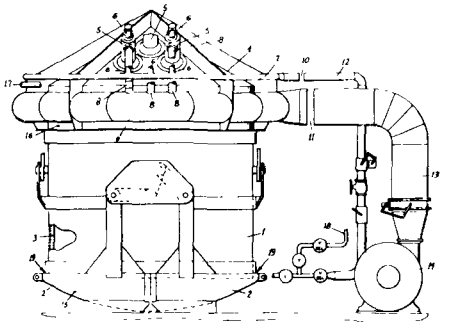


chloride, 1,250 kg ferric sulfate, and water, yields concrete blocks with a density of 1,600 kg per cu m, and a 28-day compression strength of 30 to 50 kg per sq cm. The blocks show no sign of molding, have remarkable properties of acoustical and thermal insulation, and can be sawed like wood. (Text in French)

INT-0860

Jensen, R. F., and P. E. Phillips (Armco Steel Corporation). Preheating scrap with controlled oxidation. Canada 772,561; filed Nov. 2, 1965; issued Nov. 28, 1967.

A process of preheating scrap metal for use in electric furnaces, basic oxygen furnaces, and the like includes charging the scrap into a refractory lined vessel and heating it by means of flames from burners extending through a refractory-lined top closure of the vessel. Orifices in the bottom area of the vessel ensure positive pressure so that the hot products of combustion will pass downward through the scrap and out the orifices. Oxidation of the scrap is controlled by employing air in quantities less than stoichiometric



proportions, recirculating the exhaust gases, or placing a layer of coal or other solid fuel at or near the top of the scrap mass. The heated scrap is discharged directly into a furnace of the type previously mentioned.

INT-0861

Meloyan, R. G., M. V. Darbinyan, and B. V. Lebed (Ural Scientific-Research and Planning Institute of the Copper Industry and the Erevan State University). Method of reprocessing of slags. U.S.S.R. 206,082; filed Aug. 1, 1966; issued Dec. 2, 1967.

Cooled slag is pulverized to minus 80 to 100 mesh and mixed with 80 to 90 percent of calcined soda and 7 to 8 percent of carbon, by weight. The charge is thoroughly mixed and reduced in a tubular furnace at 850 to 1,000 C for 2.5 to 3 hr. Iron silicates and oxidized copper compounds are reduced while zinc and other volatile metals are sublimated. The resulting agglomerate is wetground in a ball mill. The sediment is separated from water-soluble silicates by decanting and rinsing, and its ferrous fraction is removed by wet magnetic separation. The ferrous sediment is washed with a weak solution of hydrochloric acid and dried at 100 to 150 C. The magnetic fraction containing a large share of the iron oxides is additionally reduced by hydrogen at 700 to 750 C to obtain a commercial iron-copper alloy with 90 to 95 percent iron and 1 to 4 percent copper. From the nonmagnetic fraction, copper and noble metals are recovered by existing methods, in which iron powder is produced as a by-product used in the manufacture of metalloceramic products. (Text in Russian)

INT-0862

Jones, J. C., and J. N. Firth (Midland Silicones Limited). Treatment of fly ash. Great Britain 1,093,896; filed May 3, 1966; issued Dec. 6, 1967.

This process renders fly ash hydrophobic through treatment with an organosilicon compound. Any of the wide variety of monomeric or polymeric organosilicon materials, such as the organosilanes, the organopolysiloxanes, and silazanes, are suitable for imparting water repellency to the fly ash particles. A particularly acceptable source for the organosilicon compounds comprises the material

obtained as a by-product of the direct process reaction for making chlorosilanes, wherein an alkyl chloride is reacted with silicon. These by-products constitute a mixture of distillable organosilicon compounds of many different structures and types, including halosilanes, silcarbanes, polysiloxanes, and polysilanes. Any number of possible techniques may be employed to place the pulverized fuel ash in contact with the compound. It may be applied as a solution, or, through the use of a fluidized bed, as a vapor. The solution should contain from 0.1 to 5 percent by weight of the compound. As a vapor, an exposure time of several seconds to several minutes is adequate. The treated ash is suitable for use in the preparation of building materials such as water repellent cement or concrete.

INT-0863

Rudolf, F., and M. Laufer (Vereinigung Volkseigener Betriebe Beton). Process for the production of steam hardened cemented products from waste products of the soda industry. Great Britain 1,099,773; filed Mar. 26, 1965; issued Jan. 17, 1968.

This process is for the manufacture of steam-hardened, cemented products utilizing mixtures of waste products of the soda industry. These products are the lime granules or nonslakable constituents which occur in the slaking of burnt lime. These contain calcium carbonate, 'free lime,' di- and tri-calcium silicates and aluminates, and the solid constituents from the distillation sludge from the soda industry, which also contains calcium carbonate and 'free lime', and from which calcium chloride has been removed. This process consists of working the waste products with a material of high silicic acid content and with water, and casting and subsequently steam-hardening the mixture in molds, autoclaves, or similar devices.

INT-0864

Holden, H., and M. Leedham (British Copper Refiners Limited). Improvements in or relating to the treatment of scrap copper. Great Britain 1,100,858; filed Jan. 13, 1967; issued Jan. 24, 1968.

When scrap copper is recovered in a refining furnace, the patina that often covers it gives off noxious odors and gasses such as hydrogen chloride and sulphurous gasses. If the wire is chopped to small pieces before refining, the patina can be removed mechanically. Solid, brittle inorganic compounds, such as the mineral-insulating material used in some cables, can be similarly disposed. The chopper should be equipped with a dust extractor.

INT-0865

Ashworth, D. R. (British Glues and Chemicals Limited). Degreasing animal bones and other animal by-products. Canada 777,167; filed May 30, 1966; issued Jan. 30, 1968.

A simplified method of degreasing animal bones and other animal by-products produces a bone which is sufficiently fat-free to be used for glue or gelatine, for animal feed, or as a fertilizer and a salable fat product. The broken material is heated, with or without additional water, to a temperature not higher than 100 C. The heated material is passed through a continuous centrifuge from which the treated material can be removed continuously. Defatted, protein-containing material is separated from a mixture of fat and water, from which the fat may be separated by conventional means.

INT-0866

Kaganskiy, I. M., M. P. Mazhara, V. V. Kharlamov, and S. A. Sapotnitskiy (Northern-Donets Branch of the State Scientific-Research and Development Institute of the Nitrogen Industry and of Products of Organic Synthesis). Method of production of nitrogen from wastes of the cellulose industry. U.S.S.R. 213,902; filed Jan. 25, 1966; issued Mar. 20, 1968.

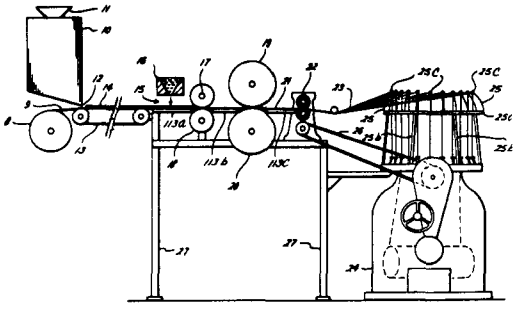
Sulfite liquor, a waste product of the cellulose industry, is first ammoniated, then oxidized in the presency of excess ammonia and catalysts such as iron oxide. This is followed by neutralization of the residual ammonia by acids to a pH value of 7 to 9. For example, sulfite liquor saturated with ammonia gas and preheated to 150 C is fed to a reactor filled with excess ammonia and air at a pressure of 10 atm, and containing 0.1 percent iron oxide. After a 3-hr reaction, the mixture is cooled, decompressed to atmospheric pressure, and neutralized to pH 7 with phosphoric acid. The solution is then concentrated by evaporation and dried in an atomizer. The complex organomineral fertilizer contains more than 22 percent

of total nitrogen, 70 percent of which is slowly assimilable. (Text in Russian)

INT-0867

Marks, R. H. Method of waste fiber utilization. Great Britain 1,107,394; filed May 24, 1965; issued Mar. 27, 1968.

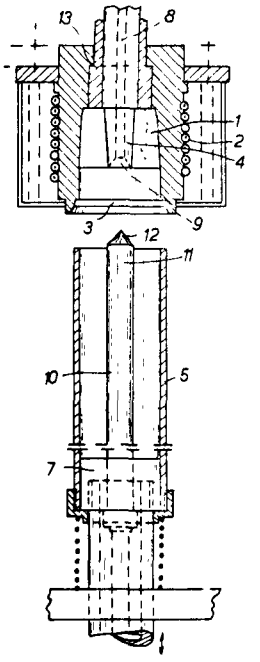
This method of knitting a yarn formed of substandard fibers comprises feeding the yarn and a strip material to a knitting machine, and guiding the strip and yarn in contiguous relationship to the needles of the machine. This positions a portion of the strip between the needles and the yarn. Thus the engagement and pulling of the needles deforms the strip into at least partial engagement with the yarn, to form a core yarn during the knitting operation. The term 'substandard fibers' means fibers which in the past have not been readily used in normal production of a fabric by knitting.



INT-0868

Winsnes, P. O. Arrangement for the production of moulded objects of fibre material, wood chips or sawdust. Great Britain 1,108,998; filed Nov. 25, 1965; issued Apr. 10, 1968.

The proposed arrangement provides a simple means for the escape of steam and/or gas from the mold assembly during compression and heating in the molding operation. Molding material is forced from below into the mold by a piston fitted into a cylinder which contains a predetermined amount of material. Heating is provided by an electrical element wound around the mold. A central mandrel, having a channeled conical end, is affixed to the compression piston and fits into a conical end recess of a central core tube in the mold when the piston is introduced. Vapors arising during the molding process escape via these channels.



INT-0869

Pietraszkieaicz, Z., S. Neubart, J. Kubiak, and H. Piasecki (Lodzkie Przedsiebiorstwo Surowcow Wtornych). Board from bituminized paper waste. Poland 55,177; filed July 28, 1966; issued Apr. 12, 1968.

Bituminous paper waste (1 part) is comminuted with 0.5 to 1.5 parts of wood chips in the presence of water to obtain a homogenous suspension. Excess water is removed, and the pulp is pressed for at least 10 minutes under a pressure of 12 to 60 kg per sq cm at 150 to 200 C. Physical and chemical processes which accompany such treatment, involving the formation of phenol-formaldehyde resins, convert the pulp into a uniform web, which is resistant to water and has considerable mechanical strength. The board may be used as insulating material, especially in the building [illegible] in Polish)

INT-0870

Bauer, E., and W. Auhorn (Badische Anilin- and Soda-Fabrik A. G.). Improved papers having high mechanical strength and their production. Great Britain 1,110,004; filed July 27, 1965; issued Apr. 18, 1968.

Papers are prepared with the usual papermaking apparatus, but have 15 to 25

percent greater strength than paper prepared without the addition of polyethylenimine. The paper is useful for preparing corrugated cardboard, punchcards for data processing, and other papers which are subjected to high mechanical stress. Degraded cornstarch (2 percent), CM-cellulose; (0.5 percent), and polyethylenimine (viscosity in 1 percent solution at 20 C of 5 centipoises) (0.1 percent), all in an aqueous solution of 0.5 percent, were added in the beater to a suspension (5 percent solids content) of fibrous material comprising waste corrugated board (60 percent), mixed wastepaper (25 percent), and periodicals (15 percent). The mixture was made into a paper having density of 140 g per sq m, and a Concora Medium Text (CMT) value of 2.2. A paper prepared without polyethylenimine had a CMT value which was 25 percent lower, and it had corresponding decreases in tensile strength, bursting strength, and folding endurance. The solids content of the water in the wire section was approximately 60 percent higher and the maximum approximate speed for equally good sheet formation was approximately 10 percent slower without polyethylenimine in the fibrous material.

INT-0872

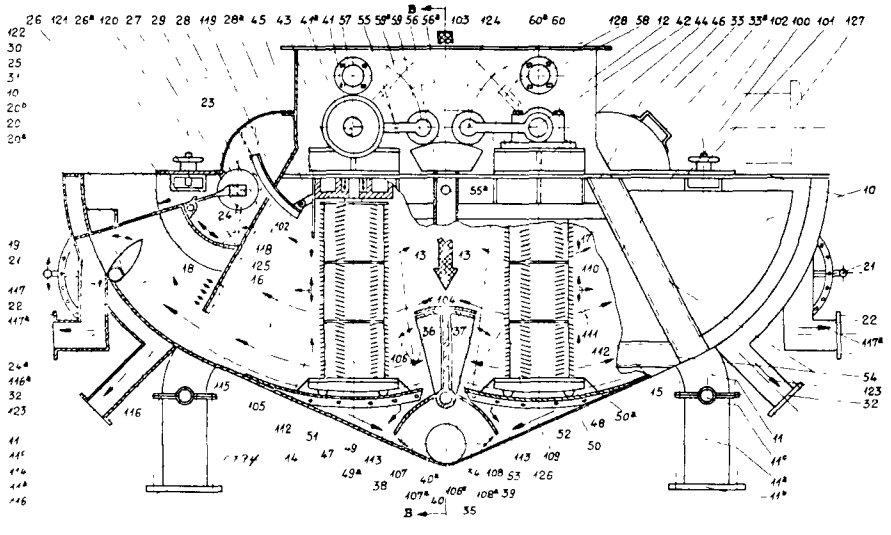
Von der Ohe, E. Method and equipment for maceration of raw and semi-finished materials, particularly of waste paper for the manufacture of paper, paperboards and similar products. Switzerland 457,122; filed Oct. 10, 1966; issued May 31, 1968.

Fibrous organic materials such as wastepaper are macerated to form a liquid pulp. The raw material is introduced into a wet-processing vat in which liquid is maintained in laminar flow by the use of a low velocity pressure and surface pressure. A rotor with longitudinal vortex segments receives the material and sets of angular knives move back and forth through a guide. The material is continuously fed, macerated, cleansed, and finely ground in a vortex zone, lying parallel to the axis of rotation, in order to be suspended in the surrounding vortex-free liquid. The suspension reaches the outlet after separation of its floating and heavy constituents. (Text in German)

INT-0871

Goeser, P. A. (Draiswerke G.m.b.H.). Waste synthetic plastic material. Germany 1,268,813; filed Apr. 15, 1961; issued May 22, 1968.

A machine renders waste synthetic plastic material suitable for reuse. The machine comprises a mixing trough or drum for the material and mixing tools for causing frictional heating of the material. A comminuter for the material is mounted on the machine ahead of the mixing tools with respect to the feeding of the material to the machine. The mixing trough or drum may have opposite end walls rotatably supporting a mixing tool shaft between them. The comminuter may include at least one cutting blade mounted on the mixing tool shaft near one of the end walls, which can rotate with the shaft. (Text in German)



INT-0873

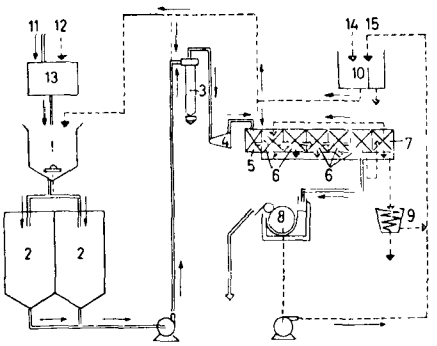
Thatcher, K. F. J. (Fisons Fertilizers Limited). Treated slag and the process for the production thereof. Great Britain 1,119,345; filed Jan. 5, 1966; issued July 10, 1968.

This process renders basic blast furnace slag and steelmaking slag suitable for commercial use. Once the slag has been cooled by conventional means, it is crushed into small particles, none larger than 0.5 mm in diameter, and none with a specific surface area of less than 500 sq cm per g. These small particles are treated with a water-repellent substance which may be a long-chain fatty acid, a water-insoluble fatty acid salt, or a silicone. The acid may be stearic acid, palmitic acid, lauric acid, or oleic acid; the salts may include calcium, aluminum, magnesium, and zinc stearates, calcium and zinc palmitates, aluminum recinoleate, and aluminum oleate. Alkyl silicones, such as methyltrichlorosilane, may be used as the silicone. The slag may be combined with small amounts of the water-repellant substance in a number of ways. For instance, the substance may be sprayed onto the particles as a solution or as a suspension in a volatile organic solvent, which is subsequently evaporated off and recovered. A fatty acid may be ground with the slag at a temperature between 60 and 100 C. The fatty acid salts are mixed with the slag after being ground to a size having a specific surface area of from 20,000 to 150,000 sq cm per g. Rotary mixers, screw mixers, ribbon mixers, ball mills, and tube mills are all suitable grinding machines. Once the slag has been treated, it can be used to protect underground pipes, or blended with potassium chloride for use as a fertilizer. The slag can be stored outside in heaps and still remain freeflowing because of its water-repellent covering.

INT-0874

Berndt, W. (Deutsche Gold- und Silber-Scheideanstalt). Method of waste paper recovery. Switzerland 459,739; filed June 30, 1965; issued July 15, 1968.

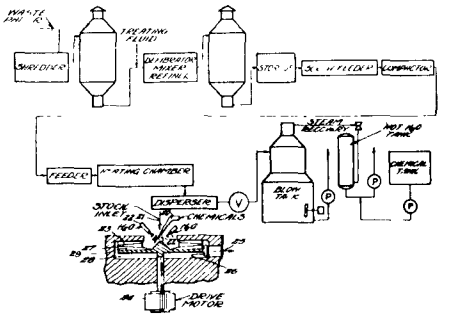
Wastepaper is de-inked by a bleaching solution in the first stage of a process based on the flotation principle. The flotation agent contains, in addition to sodium peroxide and water glass (or in addition to sodium hydroxide), at least one aliphatic monocarboxylic acid. The amount of monocarboxylic acid added is not sufficient to bind the sodium peroxide or sodium hydroxide present. Particularly effective is a mixture of: 55 percent oleic acid, by weight; 23 percent ricinoleic acid, 9 percent stearic acid, 10 percent palmitic acid; and 3 percent percent abietic acid. (Text in German)



INT-0875

Ayers, J. R., H. J. Eklund, and E. D. Wood (Beloit Corporation). Semi-wet waste paper recovery system. Canada 790,321; filed Aug. 12, 1966; issued July 23, 1968.

This machine converts wastepaper, including high wet-strength wastepaper and like fibrous materials, into paper stock for a pulp digestor. The dry wastepaper is first shredded into particulate size, then conveyed to a cycloning device for fluffing the material. A treating fluid consisting of water and/or chemicals is added before the material enters a defibering device to render the consistency of the defibered material in the range of 30 to 70 percent. Air is removed from the defibered, moistened material by a second cycloning device. The material, which is now stock, then enters a storage chamber. From there it is conveyed to a compactor, and then to a screw feeder, which sends it to a heating chamber. The temperature of the stock is raised above the melting temperature of its contaminants. A disperser receives the stock from the heating chamber and disperses the contaminants to microscopic size. The



dispersed stock is transported by a feeding device to a digestor.

INT-0876

Turulov, A. V., A. S. Sadykov, E. P. Buzitskova, and A. I. Ismailov. Production of edible acids. U.S.S.R. 227,960; filed June 19, 1967; issued Oct. 8, 1968.

Food acids, such as citric and malic, are obtained from cotton leaves and other wastes from cotton gins by extraction. The extract is removed and neutralized, and the acids are separated as calcium salts. A precipitate (oil cake) is separated from the remaining extract and from the calcium salts. From the preparation of nutrient yeasts together with the food acids, as well as for the more complete use of the raw material, and to increase the yield of yeasts, the precipitate undergoes hydrolysis, followed by separation of the hydrolyzate from the precipitate, as by filtration. The hydrolyzate is mixed with wash water and neutralized with calcium hydroxide. The filtrate remaining after the preparation of the acids is added to the hydrolyzate. The required mineral salts are then added to the resulting mixture, which is used as a culture medium for growing the nutrient yeasts. (Text in Russian)

INT-0877

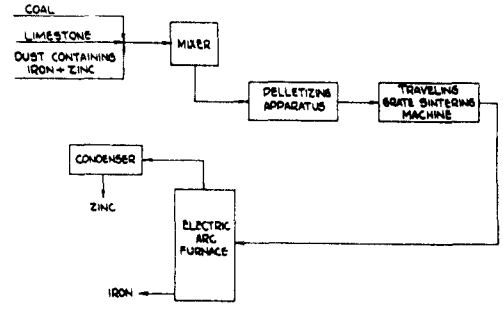
Jantzen, L. (Aktieselskabet Christiania Portland Cementfabrik). Proteinous cattle food. Australia 287,740; filed Dec. 1, 1964; issued Dec. 16, 1968.

Proteins extracted from waste water are used as an additive to cattle food. The waste water may be: stickwater from the herring oil industry or whale oil production; potato juice from potato flour factories; whey from dairies; blood and blood-containing water from slaughterhouses; and water expelled from cattle food silos. Proteins are recovered from the waste water in the form of lignoprotein by using sulfite waste liquor or lignosulfonic acid as a precipitating agent. The sulfite waste liquor can be used without any prior treatment, such as being drawn from the digestors in the ordinary sulfite cellulose cooking process. The lignoprotein is used in a quantity so as to limit the content of lignosulfonic acid to 3 percent (by weight) of the cattle food.

INT-0878

Ban, T. E. (McDowell-Wellman Engineering Company). Recovery of steel and zinc from waste materials. Canada 802,134; filed July 4, 1966; issued Dec. 24, 1968.

A process for recovering iron and zinc from waste material containing ferric oxide and zinc from steelmaking operations involves mixing the waste material with coal and limestone and adjusting the water content of the resulting mixture to within the range of 12 to 16 percent. The mixture is then formed into green pellets. These are carbonized so as to char-bond the pellets, while simultaneously calcinating the limestone and partially reducing the ferric oxide. The char-bonded pellets are fed to an electric-arc furnace and subjected to ironmaking conditions. Zinc is recovered as an overhead vapor, and iron is recovered as a liquid.



INT-0879

(Strategic Patents Limited). Process for the treatment of finely divided metalliferous material. Great Britain 1,138,695; filed July 13, 1966; issued Jan. 1, 1969.

A process is described for the treatment and recovery of finely divided material such as blast furnace and steel plant dust, fumes, and mill scale. The waste material is passed to a rotating kiln and mixed with a carbonaceous reductant. A reducing atmosphere is maintained within the kiln within the range of 800 to 1,050 C. The wall temperature of the kiln is maintained at about 600 C. The material is recovered in a nonoxidizing atmosphere after discharge from the kiln. The material discharged from the kiln may be briquetted at a temperature of approximately 800 to 1,000 C.

INT-0880

Sagi, G. S. Leather regenerating process. Canada 803,418; filed Aug. 26, 1966; issued Jan. 7, 1969.

This regeneration process begins with the mechanical grinding, shredding, and tearing of the leather material into a uniform stock of small leather pieces. The stock is treated with an alkaline substance to bring the pH to between 7 and 12. A wet sheet-forming process prepares the leather for further treatment as rubber particles are deposited on the surface of the stock. This wet, weakly bound, reclaimed leather sheet is pressed, dried, and then coated with finishes. The whole process makes it economically feasible for local processors of leather waste to manufacture good-quality leather from waste material.

INT-0881

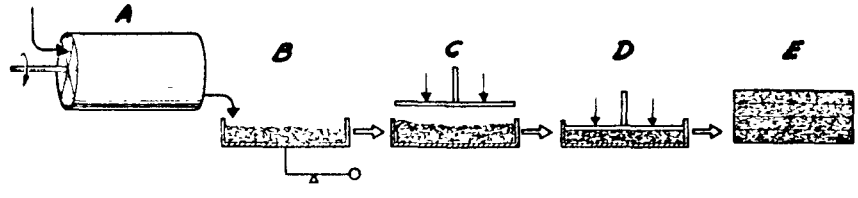
Brill, H. C. (E. I. DuPont de Nemours and Company). Paper manufacture from waste paper. Canada 806,074; filed Apr. 6, 1966; issued Feb. 11, 1969.

This process converts de-inked wastepaper into quality paper which won't form scales or specks due to the presence of contaminating agents. The coagulation of resinous adhesives is lessened, and a high brightness pigmented paper is the result. Following the pulp preparation and the addition of filler, the pulp, consisting of about 99 percent water, flows on an endless wire belt. The water is removed by gravity and suction until the paper is rolled; then the paper is heated until it is dry. The coagulation of resinous adhesives is reduced when a fibrous pigmentary alkali metal titanate is incorporated as an essential component of the paper.

INT-0882

Harris, F. B. Instant carton pulp. France 1,559,917; filed Mar. 10, 1967; issued Feb. 3, 1969.

Instant cardboard pulp, easy to store and transport, is prepared by mixing milled newspaper and magazine paper with starch and molding plaster, and then compressing this into solid blocks. Thus, a mixture of 32 parts milled magazine paper, 148 parts waste newsprint, 100 parts degelatinized starch, 5.5 parts sodium benzoate, 55 parts molding plaster, and 25 parts perlite is compressed at at least 7 kg per sq cm pressure to solid blocks, which, on treatment with water, are converted to workable plastic materials. Other additives used are borated dextrin and carboxymethylcellulose. (Text in French)



INT-0883

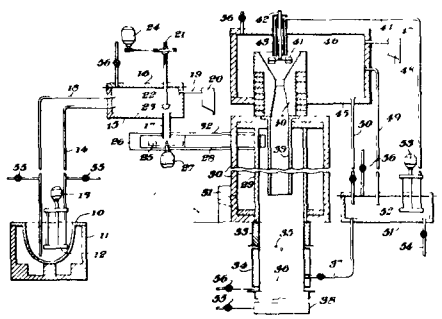
Ovchinkin, N. N., Y. M. Kislitsin, V. I. Kozlov, T. F. Likhacheva, and T. A. Kaygorodova (Chelyabinsk State Institute of Planning of Metallurgical Plants). Method of reprocessing of steel-smelting slags. U.S.S.R. 237,668; filed Oct. 2, 1967; issued Feb. 12, 1969.

This method of reprocessing of steel-smelting slags yields stable slag gravel which can be used in the production of building materials. This stability is attained by increasing the intensity of the process of dissociation of the silicates of the slag by dumping the slag in a pit, coarsely crusting it by any known method, recovering the large metallic inclusions, and then keeping the slag in the pit in a moist condition by periodic watering for 3 to 5 days. At the end of this period, the treated slag is charged into a drum crusher and then into a magnetic separator, and finally onto gravel grading screens. Several slag treatment pits may be used to insure continuity of processing. While the slag is being watered in one of the pits, it is being coarsely crushed in another and is being charged into a third. (Text in Russian)

INT-0884

Stewart, L. Distillation of zinc from zinc scrap materials. Canada 812,720; filed Apr. 30, 1966; issued May 13, 1969.

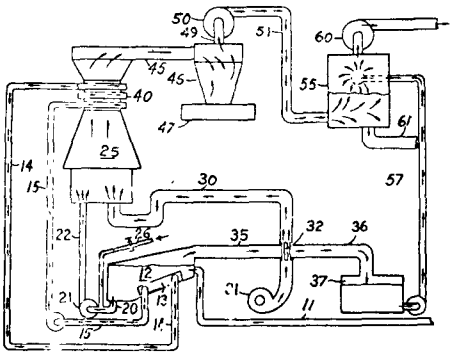
This invention recovers high purity zinc from drosses or ashes from baths of molten zinc employed in galvanizing iron, or from other zinc scrap materials. Rapid distillation occurs at high temperatures which may be just above the boiling point of zinc. A film of molten impure zinc is projected onto a face of a refractory distillation tube fast enough to produce distillation. The zinc vapor is placed in contact with molten pure zinc, where it remains for a period of time. Any lead present as a dilute solution in the original zinc scrap is forced to condense, leaving a high purity zinc.



INT-0885

Brophy, J. W. (Prenco Manufacturing Company). Procedure for recovery of sulfuric acid and iron in the form of oxide from a residual aqueous cleaning liquid with a sulfuric acid base containing iron sulfate and free sulfuric acid. Switzerland 471,905; filed Mar. 7, 1967; issued June 13, 1969.

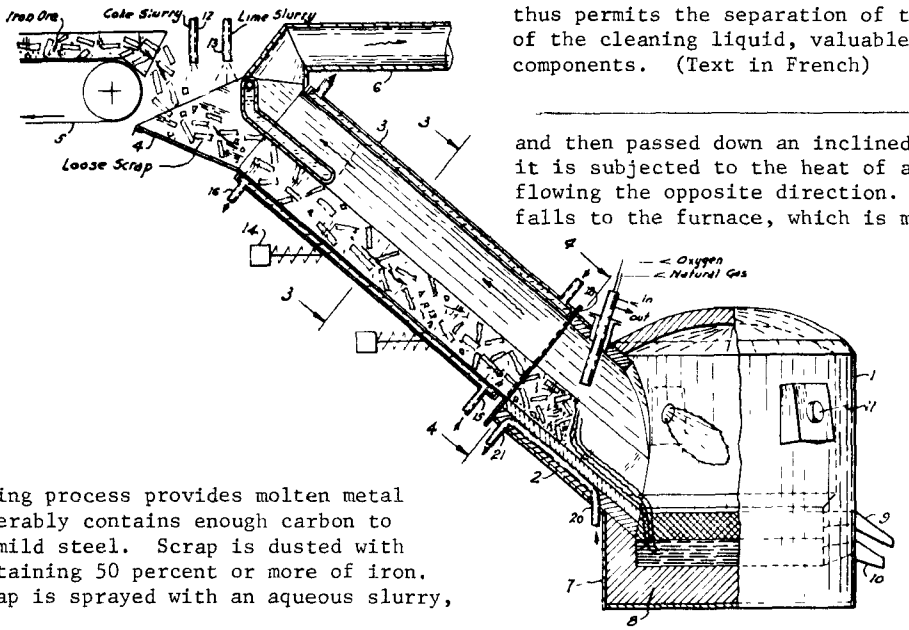
This procedure for recovery of sulfuric acid and iron eliminates the water contained in the cleaning liquid by evaporating it to a concentrate. The concentrate is atomized through pyro-decomposition by being heated in an



oxidizing atmosphere to approximately 1,650 C. The sulfuric acid in the concentrate is decomposed into sulfurous anhydride and water vapor, and the ferrous sulfate of the concentrate is decomposed into gaseous sulfuric anhydride, solid particles of iron oxide, and water vapor. The sulfuric anhydride is separated and made to react with the water in order to form sulfuric acid. The procedure thus permits the separation of the constituents of the cleaning liquid, valuable chemical components. (Text in French)

INT-0886

Mahony, H. A. Apparatus and process for high speed scrap smelting. Canada 815,463; filed Feb. 1, 1966; issued June 17, 1969.



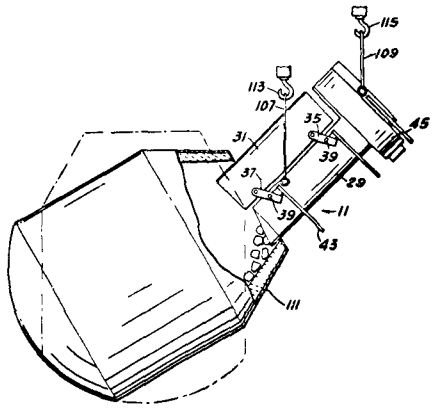
This smelting process provides molten metal which preferably contains enough carbon to produce a mild steel. Scrap is dusted with an ore containing 50 percent or more of iron. Dusted scrap is sprayed with an aqueous slurry, and then passed down an inclined stack, where it is subjected to the heat of a gas stream flowing the opposite direction. Treated scrap falls to the furnace, which is maintained at

a temperature of from 3,200 to 3,500 F; in the furnace, oxygen is applied to melt the metal. Simultaneously, hydrocarbon gases reduce any iron oxide that is present. Means are available for separately removing the slag and molten metal from the furnace. This process, which rapidly smelts scrap, supplies steel containing up to 1 percent carbon.

INT-0887

Richards, E. R. (Koppers Company, Inc.). Method and apparatus for preheating scrap metal. Canada 817,343; filed June 7, 1966; issued July 8, 1969.

This device preheats the scrap metal charge before it is inserted into the basic oxygen furnace. Scrap metal includes the following: scrap steel, alloys and ferroalloys, additives



such as lime and fluorspar, and fuels such as coke. Scrap is removed from the usual storage area and placed in a preheater. This preheater is connected to an exhaust hood and a combustion chamber. Heat enters the unit to heat the scrap from the unit via the hood. After a soaking period, the preheater is transported to where the oxygen furnace is located, and the preheated scrap is dumped. Preheated scrap reduces the proportion of molten pig iron which is required for each heat of steel.

INT-0888

Hammerschmidt, P. Improvements in or relating to processes of utilizing fish flesh waste. Great Britain 1,157,517; filed Sept. 30, 1966; issued July 9, 1969.

A process is described of utilizing fish flesh waste obtained during the processing of frozen fish flesh. This waste is substantially comminuted mechanically without temperature rise, so that the waste is converted into an amorphous, homogeneous state, and liquid and salt are added to this composition. The mixture is then shaped into bodies appropriate for final use, for example as patties, fillets or pieces for frying. Milk may be used as the liquid. The shaped bodies are subjected to a preserving process such as freezing or sterilization.

INT-0889

Kondratyev, S. F., Y. I. Krasnikov, A. P. Lebedeva, V. F. Semenov, V. Y. Masumyan, and S. K. Potemkina (Scientific-Research and Design-Technological Institute of City Management and the D. K. Zabolotnyy Institute of Microbiology and Virology). Method of disinfection and conversion of municipal domestic refuse into a fertilizer. U.S.S.R. 238,562; filed Mar. 10, 1969; issued July 17, 1969.

Fresh municipal refuse is delivered to the refuse processing plant where mechanical admixtures and secondary raw materials are removed from the refuse. The refuse is then conveyed to a receiving tank in the hydrolysis shop, where it is charged into autoclaves, acidified with sulfuric acid, and treated with steam at 120 to 130 C at a pressure of 2 to 3 atm for 1½ hr. The resulting pulp is discharged into vats for steeping, completion of hydrolysis, clarification and subsequent decantation. The decanted hydrolysate is sent to the appropriate shop or plant of the microbiological industry. The remaining sludge is conveyed to an area for the production of organic fertilizers. This hydrolytic method more completely utilizes the complex organic compounds found in refuse, such as albumens, fats, carbohydrates, and organic acids. Full sterilization of the refuse is achieved in a shorter processing time than with previous methods. (See also U.S.S.R. 227,337) (Text in Russian)

INT-0890

Hirano, K., G. Aramaki, and T. Sejima (Kyowa Hakko Company). Method of manufacturing organic chemical fertilizer. Japan 44-16,332; filed Jan. 11, 1965; issued July 19, 1969.

Organic chemical fertilizer can be manufactured from the waste fluid from fermentation. The fermentation waste fluid is condensed to 40 to 50 percent solid content. A mineral acid, such as sulfuric acid, hydrochloric acid, or phosphoric acid, is added to this fluid. The temperature for the reaction should be less

than 200 C. A second reaction is induced when alkali fertilizer and phosphoric acid fertilizer, or phosphorus ore is added. Neutralization with ammonia and drying follows. The waste fluid from amino acid fermentation, alcohol fermentation, or organic acid fermentation is recovered by the ion resin exchange method, or by evaporation. If it is condensed to 20 percent solid content, it loses its viscosity and its practical value. The treated fluid is low in viscosity and it can be condensed and dried quickly. The fertilizer produced contains about 50 percent partially oxidized acids and proteins. (Text in Japanese)

INT-0891

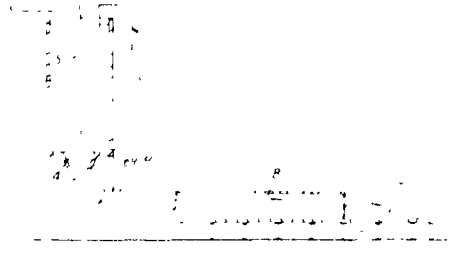
Trautvetter, R., and J. Schwinghammer. Preparation of forest waste for construction materials. East Germany 68,070; filed Sept. 22, 1967; issued July 20, 1969.

Forest wastes containing cellulosic materials are composted to remove decaying elements, and are then used as construction materials. Thus, pine bark and needles containing 30 percent moisture are pulverized and screened into 3 fractions of 3 to 7 mm, 7 to 20 mm, and 20 to 200 mm. The fractions are composted in piles 12 m high and 12 m wide. After 8 months, the piles are taken up and neutralized. The residue is used in insulating construction materials. (Text in German)

INT-0892

Evans, W. D. Aggregate for concrete. France 1,581;089; filed July 17, 1968; issued Aug. 4, 1969.

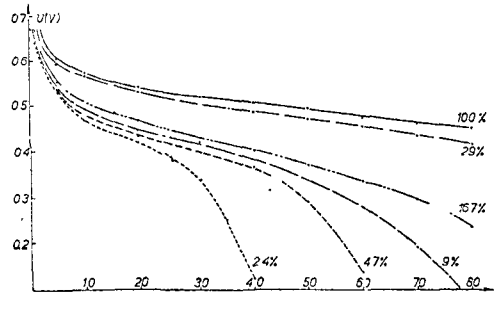
Artificial aggregates are produced from cinders, ash, or other such waste for use in cement or concrete. Fine furnace ash is mixed with 0.5 to 10 percent water containing 0.2 to 2 percent organic binder, such as sewage, and pressed at 0.79 to 15.75 kg per sq cm. The green molding so obtained is fired at 900 to 1,500 C for at least 2 minutes, and a solid product results from a reaction or sintering. Generally, an initial pressure of more than 1.58 kg per sq cm is used, and the firing temperature is 1,000 to 1,350 C. A process is envisaged in which material is fed from a hopper into a press, from where moldings 3.17 to 76.2 mm across are ejected onto a moving belt, taking them through the furnace. Thus, an artificial gravel may be prepared from fly ash with less than 10 percent water, and 2 percent starch, dextrin, or sewage. The green moldings are fired at 1,150 to 1,350 C for at least 2 minutes. When made up into blocks with sand and cement, the artificial gravel compared reasonably well with natural gravels in similar blocks. (Text in French)



INT-0893

Wiesener, K., G. Angers, and K. Schwabe (Deutsche Akademie der Wissenschaftan zu Berlin). Process and device for the production of electrical energy from solid and gaseous industrial waste products. Great Britain 1,161,495; filed Sept. 6, 1966; issued Aug. 13, 1969.

Sulfur dioxide-containing waste gases are supplied to the anode of the galvanic cell for oxidation and/or nitrogen oxide-containing waste gases are supplied to the cathode of the galvanic cell for reduction. The chemical energy of the process is converted into electrical energy which is taken from the anode and cathode of the galvanic cell. Scrap iron may be used in the galvanic cell as the anode, a porous carbon electrode as the cathode and a magnesium chloride solution, which has been obtained as a waste product, as the electrolyte. In this way, gaseous waste products are used in an economic manner to produce electrical energy.



INT-0894

Mueller, F. Building materials from ashes. East Germany 68,852; filed June 14, 1968; issued Sept. 5, 1969.

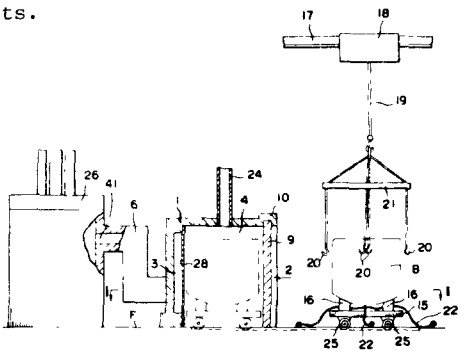
For lightweight materials, 80 percent ashes, slags, or any compound, is mixed with

20 percent cement and made into a damp mortar with a calcium chloride solution of density 1.08, saturated with hydrated lime to a pH of 11 to 12, and cast in molds. Addition of 15 to 20 g aqueous aluminum paste supplies thermal insulating properties. For high early strength, the cast building units may be treated with saturated steam at 70 to 80 C. They are dimensionally stable, fireproof, can be sawed, drilled, or nailed, and their strength gradually increases owing to pozzolanic hardening. (Text in German)

INT-0895

Tezuka, K. (Tezuka Kosan K.K.). Melting device for the regeneration of iron scraps. Canada 823,127; filed Aug. 31, 1966; issued Sept. 16, 1969.

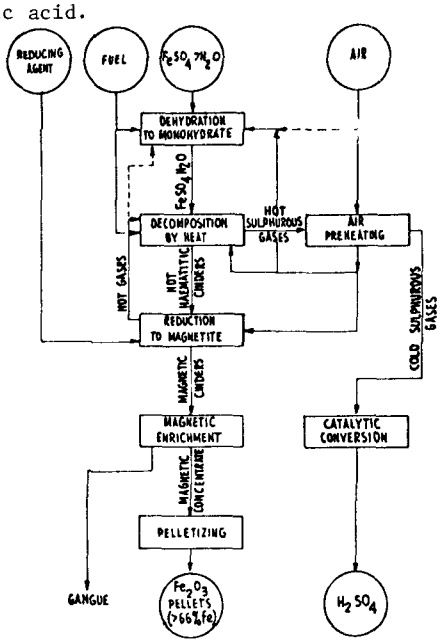
This melting device recovers scrap which may be covered with moisture, oily matter such as paint, machine oil and the like, rubber synthetic resin, or nonferrous matter such as aluminum, zinc and the like. An overhead travelling crane lifts iron scrap blocks into a trolley which is mounted on rails leading to the preheating chamber. A preheating casing, which is heated by the exhaust gases from the melting furnace, receives the scrap. The temperature in the casing can reach 600 to 800 C when the heating temperature in the electric furnace is 1,600 C. The device can prepare scrap for melting in order to economize thermal energy and thereby lower operational costs.



INT-0896

(Montecatini Edison S.p.A.). Utilization of waste ferrous sulphate. Great Britain 1,165,056; filed June 28, 1967; issued Sept. 24, 1969.

A process for utilizing waste ferrous sulfate comprises dehydration of crude ferrous sulfate to the monohydrate, decomposition of the monohydrate by heating in a fluidized bed to yield hematite ash and sulfurous gases, reduction of the hematite ashes in a fluidized bed or in a rotary furnace to magnetite or sponge iron, and magnetic upgrading. The dehydration, decomposition and/or air preheating stages are almost identical, whether the reduction stage is to be carried out to yield magnetite or sponge iron. If sponge iron is produced, a considerable amount of high-pressure steam is recoverable. The magnetite concentrate obtained can be pelletized at a temperature of 1,200 C. The resulting pellets can be fed to a blast furnace. The sponge iron can be briquetted and used for steel production in an electric furnace. The sulfurous gases produced can be catalytically converted into sulfuric acid.



INT-0897

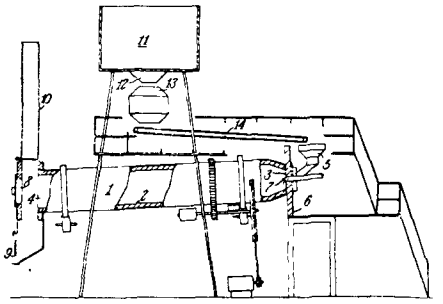
Gfeller, G. Method of transformation of sawdust into a culture substrate by fermentation. Switzerland 478,727; filed Feb. 1, 1967; issued Sept. 30, 1969.

A universally applicable culture substrate for growing plants is prepared by mixing sawdust with 10 to 40 percent (preferably 25 percent) by volume of 'cotton dust', which is a waste product of raw cotton processing. A 1 m thick layer of the mixture ferments for 6 to 8 weeks. The fermentation product is hygienically unobjectionable and provides the required humus in bacteriologically active form. It is permeable to water and air, thus providing a substrate well suited for development of an extensive root system by cultivated plants. In its original form, it makes a good planting soil for growing seeds and seedling transplants. When used as potting soil, it is mixed with a fertilizer. (Text in German)

INT-0898

McHenry, J. Pellet-hardening method. Great Britain 1,165,897; filed Oct. 4, 1966; issued Oct. 1, 1969.

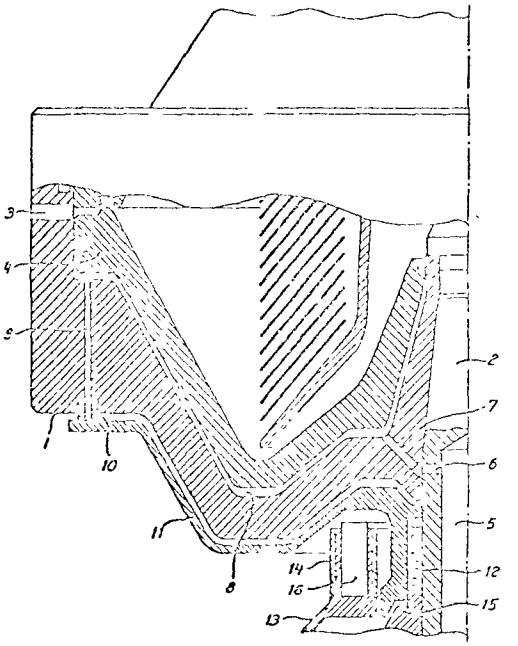
Pellets produced from fine powders, such as fly ash, are hardened in a kiln at 800 to 1,200 C with a binder such as tar or aqueous solutions of sulfite, lye, or sugar. The residence time of the pellets in the kiln having a new burner arrangement is 8 to 23 minutes. The kiln has a length to diameter ratio of 5 to 1. The discharged product can be rapidly cooled at the base of the stack where cold air can be drawn over it. Fly ash pellets containing 12 to 14 percent water and 1 to 1.5 percent calcium lignosulfate were calcined for 20 minutes at 1,200 C in a kiln containing 2 to 3 percent carbon monoxide and rotating at 1 rpm. The nonsintered pellets lost 20 percent of their weight by baking. Their bulk density decreased from 60 lb per cu ft to 42 to 45 lb per cu ft.



INT-0899

(Industrilaboratoriet Aktiebolag). Improvements in or relating to the utilization of tobacco waste. Great Britain 1,166,576; filed Mar. 15, 1968; issued Oct. 8, 1969.

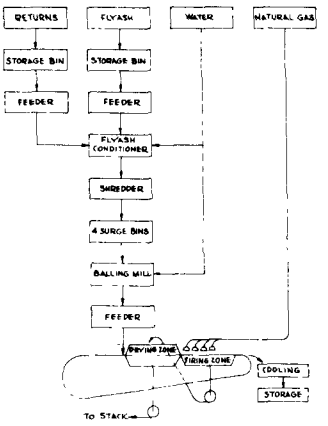
Tobacco which is disintegrated and treated in a suitable way can be dissolved in water, or a liquid principally comprising water, to form an adhesive or a binder. Tobacco waste, mixed with liquid, is subjected, preferably in a closed container, to a mechanical treatment in the form of blows, pressure or shock impulses of a high repetition frequency. The weight proportions of tobacco to liquid are preferably 1 to 3. The treatment is continued until water-soluble lumps are formed. The water-soluble parts of these lumps are subsequently dissolved in a liquid which principally comprises water, and separated from the principal portion of the tobacco material which is insoluble in water. The tobacco solution has a strongly adhesive or binding effect, and it may be utilized in several ways. The solution may, by means of molding, casting, pressing, or extrusion, be formed into one or several filamentary band-shaped webs. The solution may be sprayed, dropped, or poured onto uncut leaves to strengthen the leaves and reduce the amount of waste.



INT-0900

Ban, T. E. (McDowell-Wellman Engineering Company). Method for making light-weight aggregate from fly ash. Canada 826,172; filed Apr. 28, 1967; issued Oct. 28, 1969.

This process transforms fly ash into a light-weight aggregate material for use in concrete



mixes, cinder blocks, etc. Fly ash, which contains from about 5 percent to about 10 percent by weight of free carbon and at least 2 percent by weight of iron, is formed into discrete green pellets. Gases dry the pellets at a temperature of 550 to 900 F. The dried pellets are burned at a temperature of 1,800 to 2,400 F, which yields gaseous carbon oxides and a hardened product. This product is cooled, either spontaneously or by forced air draft cooling. The cooled product, in turn, is crushed and heated at a temperature of 1,000 to 2,000 F. After a second cooling process has been accomplished, the product is ready for use as a lightweight components in concrete aggregate compositions.

INT-0901

Coman, C. (Romania Institute for Drilling and Extraction Research). Cement paste with reduced specific gravity. Romania 52,051; filed Feb. 13, 1968; issued Nov. 6, 1969.

Cement pastes which have a specific gravity of 1.2 to 1.35 kg per cu dm and are used for water-tightening of oil wells to eliminate drilling fluid losses are prepared by mixing 40 to 50 percent ash from thermal power stations with cement. To keep the particles in suspension and to confer better rheological and physicomechanical properties, 12 percent hydrated tufa gel with a viscosity of 14 cp was added. Thus, the hydrated tufa was prepared by mixing, for 5 minutes, 10 percent tufa with the corresponding amount of water needed for the cement paste, and keeping the mixture at rest for 8 hr at 25 C. To this was added the remaining water and a mixture of 50 to 60 percent cement containing 40 to 50 percent ash. After mixing 5 minutes, the paste can be poured. (Text in Romanian)

INT-0902

Arentz, T., and E. Tonseth (Aktieselskapet Apothekernes Laboratorium for Specialpraeparater). Recovery of proteins from effluents. Norway 117,339; filed Mar. 10, 1966; issued Nov. 8, 1969.

Many industries have effluents with a high protein content which is usable if an extraction is possible. Extraction is done by precipitation with surface-active agents such as sulfonates or sulfates of fatty alcohols or acids. In an example, 100 liters of effluent from a slaughterhouse were adjusted to pH 3.5 with sulfuric acid, and treated with 40 g of lauryl sulfate. Analysis of treated and untreated effluent indicated a reduction of proteins from 2,000 to 5 ppm, and a reduction of BOD from 1,850 to 120. (Text in Norwegian)

INT-0903

Pielichowski, J. (Instytut Ciezkiej Syntezy Organicznej). Vulcanization of waste ethylene-propylene-diene terpolymers. Poland 58,306; filed Apr. 4, 1968; issued Nov. 15, 1969.

The use of 0.5 part dicumyl peroxide per 100 parts waste rubber gave, after 0.5 m vulcanization at 160 C, rubber having good properties. The elastomer was composed of 100 parts rubber, 50 parts carbon black, 2 parts sulfur, 5 parts zinc oxide, 1 part stearin, 5 parts napthalene, 4 parts accelerator, and 0.5 parts dicumyl peroxide. (Text in Polish)

INT-0904

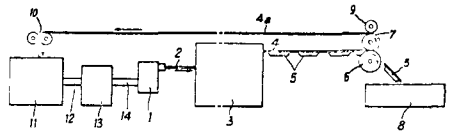
(Houilleres Du Bassin Du Nord et Du Pas-De-Calais). Improvements in or relating to the manufacture of expanded nodules. Great Britain 1,173,054; filed Apr. 14, 1967; issued Dec. 3, 1969.

This process converts fly ash and roasted floating shales into cellular nodules which may be used for the production of light concrete. Either of the above waste products can be blended into a mixture which is 5 percent slaked lime. This powder mixture is granulated in the presence of water. The granules, the cohesion of which is strengthened by the silicocalcareous reactivity of the substances involved, are dried. Then the granules are heated to a temperature of 350 C by gases which utilize the waste heat produced during subsequent heating steps. After being heated, the granules are transferred into a slowly rotating tube in which a flow of counterstreaming gases is maintained. Once the granules pass from the tube, they are allowed to fall through a heating chamber where they rapidly expand. The extent to which the granules expand is determined by three factors: the rate at which the granules fall through the chamber; the distance traveled through the chamber; and the temperature of the gases in the chamber. When the granules are clear of the heating zone, they are cooled abruptly; this causes them to solidify into cellular nodules. Sodium silicate may be used to lower the heat requirements of the expansion process.

INT-0905

Winstead, T. W. Process for utilizing expanded thermoplastic sheet waste. France 2,005,614; filed Apr. 2, 1969; issued Dec. 12, 1969.

The waste thermoplastic polystyrene sheet is first compressed to increase its density, then granulated. The compression is preferably carried out between rollers at a pressure of 4 to 10 kg per sq cm. The granulated waste is sieved before mixing it with fresh granulated plastic. The sieve mesh is between 1.6 and 4.8 mm. Subsidiary claims provide for a method of continuously extruding an expanded thermoplastic sheet and for molding and cutting articles such as plates and cups from the sheet. (Text in French)



INT-0906

Blickensderfer, P. S., A. E. Weinberg, W. F. Oliver, and R. J. Perez (Plywood-Champion Papers, Inc.). Bark resins and method of forming same. Canada 829,982; filed Nov. 24, 1967; issued Dec. 16, 1969.

This process transforms tree bark into a resinous material that is commercially useful. After the bark is reduced to fine particles, the fibrous particles of the bark are separated from the nonfibrous particles. An aqueous alkali metal hydroxide is added to the nonfibrous particles to form a mixture. This mixture is heated in a substantially oxygen-free atmosphere; at temperatures from 200 to 260 C a dry alkali bark is formed. A slurry is prepared from the alkali bark which is acidified to form a formaldehyde-reactive acid bark. The formaldehyde-reactive acid bark and a phenol can be reacted to form heat-curing resinous materials. Such materials can be used for various purposes, such as molding materials, laminating resins, and plywood adhesives.

INT-0907

Anderson, K. E., and J. L. Waber (National Gypsum Company). Method of treating asphalt contaminated waste paper. Canada 830,887; filed Nov. 23, 1967; issued Dec. 30, 1969.

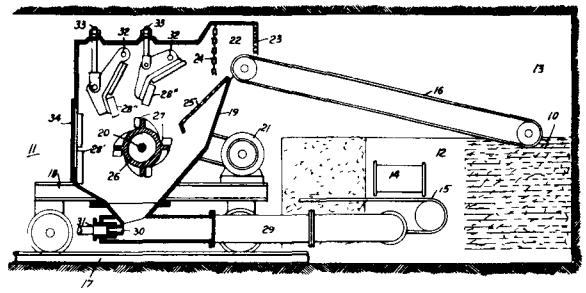
This process disperses asphalt particles throughout a paper sheet during a paper-making operation. A slurry of the asphalt containing wastepaper is formed by repulping the paper in water; then a chemical additive is introduced into the slurry. The additive consists of a major proportion of a water-immiscible solvent for the asphalt, and a minor proportion of a surfactant capable of forming a stable emulsion of the solvent in water. After the slurry is agitated for a controlled period of time, it is processed according to conventional papermaking techniques. Suitable solvents include aromatic hydrocarbons and their derivatives, such as xylene, toluene, mineral spirits, and the like, which have a boiling point above 185 F. It has been found that amounts as low as 0.1 percent by volume of the slurry, of the chemical additive are effective in dispersing asphalt contaminants.

SANITARY LANDFILL

INT-0908

(Hartzekleinerungs und Zementmaschinenbaugesellschaft). Method and apparatus for the preparation and stowing of mine waste. Australia 167,176; filed Dec. 17, 1953; issued Mar. 7, 1956.

The method consists of working a seam from a bay branching from a gallery, while leaving a recess in the gallery for the waste or rubble. The rubble is pulverized as it is extracted from the material mined on a site adjacent to the extraction plate, and is returned by pneumatic or hydraulic power through pipelines to the bay from which it originated. The apparatus consists of: a mobile pulverizing machine comprising a casing having a shaft rotated by a motor; a rotor on the shaft with juxtaposed impact blades; impact plates mounted in the casing; a rubble conveyor having its delivery in the inlet; a fabric curtain over the inlet, and a chain curtain in the casing; a screen in the casing adapted to pass fines and to direct rubble to the impact blades; a funnel outlet in the bottom of the casing connecting to a



pipeline; and a nozzle in the pipeline connected to a pressure supply. The exhaust of the internal combustion motor forces the pulverized rubble through the pipeline.

INT-0909

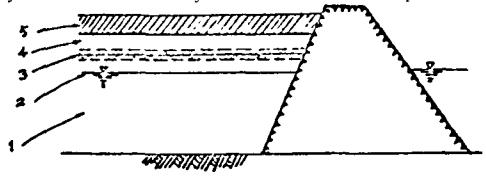
Titze, R. Conversion of waste land. Germany 1,137,051; filed Nov. 18, 1958; issued Sept. 27, 1962.

Conversion of wasteland into humus or workable soil is achieved in a relatively short time (1 to 2 years) by stacking locally collected animal and vegetable wastes (industrial waste, domestic waste, garden rubbish, weeds, etc.) in a layer of 30 to 50 cm deep on the land. This waste is then pressed down by rolling, and allowed to rot. Optionally, bacterial cultures and inorganic foods for these may be added. The layers may periodically be pressed or rolled again to maintain a higher rotting temperature and to exclude air. (Text in German)

INT-0910

Amiboshi, T. Promotion of the surface drying of landfill by the use of layers that prevent capillary rise of water. Japan 39-10,483; filed Feb. 6, 1962; issued June 12, 1964.

Surface drying of landfills is quickened when a layer of plastics or sand is placed above the ground water zone. Fine-grained earth like clay, that usually forms underground water zones, allows the capillary rise of water to as high as several meters; sand layers, which have a larger grain size, result in a rise of only about 7 cm. In the case of reclaimed land where the underground water level is comparatively high, it takes months for the landfill to dry, since the capillary rise of water keeps moistening it from beneath. Plastic (vinyl, polyethylene or the like) films or sand layers can prevent this. For example, land reclaimed from the sea is filled with landfill material to a height several dozen cm short of the final height. Sheets of vinyl film or a layer of sand are spread.

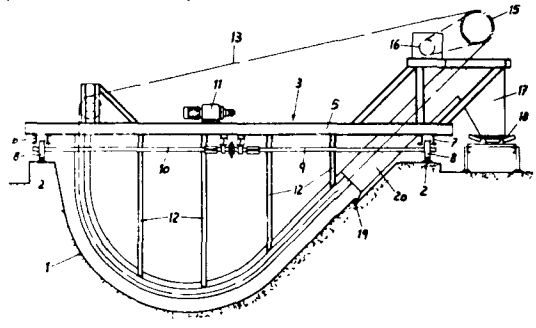


The filling is then continued until the final height is obtained. When the landfill has sufficiently dried, good surface soil is spread over it as thickly as desired. In one project where the underground water level was about 1 m below the ground surface, it took only 90 days for the surface layer (up to 50 cm deep) to dry, when the layer for blocking capillary rise of water was used; it took 10 months to dry without the layer. (Text in Japanese)

INT-0911

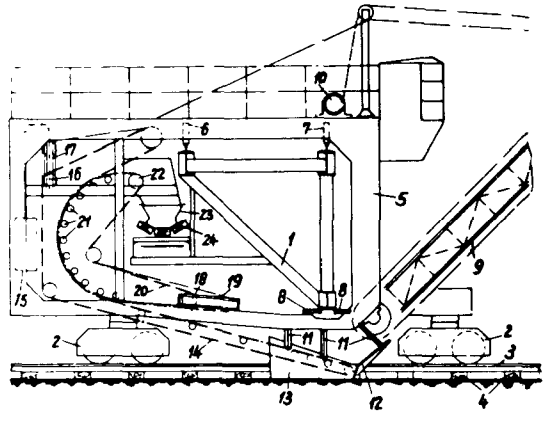
Hennecke, H. (Deutshce Babcock and Wilcox-Dampfkessel-Werke A.G.). Refuse dump removal device. Germany 1,261,446; filed Nov. 28, 1963; issued Feb. 15, 1968.

A refuse dump removal device comprises a carriage running on rails across the dump and it has an endless band which empties onto a sideways arranged conveyor belt. The endless band revolves around the dump. (Text in German)



INT-0912

Sukurs, R. (Beteiligungs- und Patentverwaltungs G. m. b. H.). Dump clearing device. Germany 1,262,164; filed July 4, 1966; issued Feb. 29, 1968.

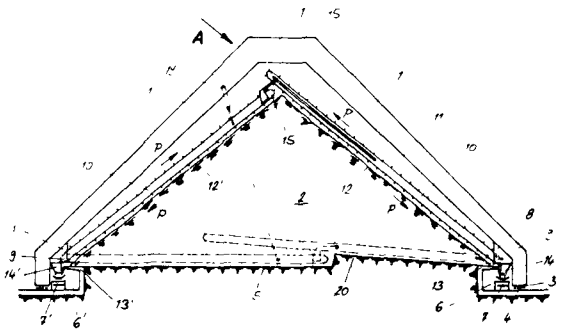


A dump-clearing device has a carriage traversable on rails laid on the dump, and an endless conveyor belt formed by two superposed runs. This forms a pocket in which the loose dump goods are delivered upward to an endless discharge conveyor, carried by a platform, which moves along the dump with the carriage. (Text in German)

INT-0913

Stroecker, G. (Firma Gustav Schade, Maschinenfabrik). Dump clearing scraper. Germany 1,284,899; filed Feb. 12, 1968; issued Dec. 5, 1968.

A dump-clearing scraper has a gantry spanning and traversing the dump. Its opposite feet have scraper booms pivoting in a common vertical plane and overlapping, with their free ends in partially or fully lowered positions. (Text in German)

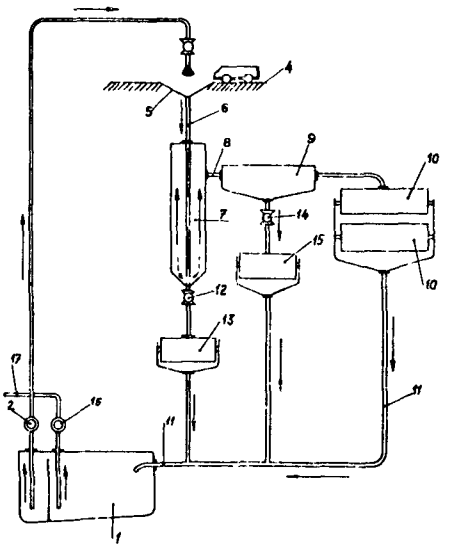


SEPARATION

INT-0914

Marcovigi, V. Method for separation and removal of various types of inert material from solid communal refuse. Switzerland 243,267; filed Aug. 16, 1943; issued July 15, 1946.

Glass, slag, sand, gravel, nails, needles, razor blades, and other inert materials are separated from organic matter in communal refuse by flushing all the refuse down a funnel which goes through a separator. First, the refuse is thoroughly mixed with water from a container. The shape and capacity of the separator are such that the water carries along only refuse matter whose specific weight is equal to or less than water. Heavy material remains on the bottom of the separator. The water, carrying primarily organic matter, passes through a sand collector, which is an expanded cross section of the water duct. The flow is then slowed to permit sedimentation of the sand; the organic matter continues. A series of differently sized sieves collects the organic matter. The water is returned to the container, and is recycled. (Text in German)



INT-0915

Knoll, M. (Alpine A.G. Eisengiesserei und Maschinenfabrik). Preparation of refuse. Germany 811,821; filed Apr. 7, 1950; issued Aug. 23, 1951.

A method has been devised for separating inorganic components from refuse destined for composting. The unwanted inorganic components are much heavier than that of the organic substances, whose specific weight is about 1. The inorganic components are separated in a carrier liquid whose specific weight is between that of inorganic and organic substances. If water is used as a carrier, the organic components are kept in suspension by motion or by addition of chemicals. The organic refuse can then be further treated in the water, or it can be first dehydrated in a centrifuge. In this separation process, coarse refuse remains as long as it is organic. (Text in German)

INT-0916

Harris, E. P., and F. J. Trostler. Improvements relating to the recovery of lead alloy from scrap accumulator plates. Great Britain 658,568; filed Apr. 14, 1949; issued Oct. 10, 1951.

Scrap accumulator plates are subjected to

sustained structural disruption, and to simultaneous heat treatment under controlled conditions, so that there is no substantial oxidation of the antimonial lead component. The process is carried out in an inclined open-ended rotary driver or furnace, heated either directly or indirectly to 500 to 600 C. The continuous tumbling of the plates causes their disruption, and advances them to the lower end of the drum. Molten alloy tends to separate, and can be selectively withdrawn, leaving a mixture of dross and non-metallic components with appreciable amounts of antimonial lead pellets which can be separated for further treatment by mechanical screening.

INT-0917

Straetling, W. (W. Straetling, and Westfalia Dinnendahl Goeppel A.G.). Method for the treatment of fly ash from power plants and similar combustion plants. Germany 890,032; filed May 6, 1943; issued Sept. 17, 1953.

The fly ash from power plants or other combustion processes contains quantities of unburned coal, which is more or less coked. The unburned coal can be recycled if it is separated from the carbon-poor fraction. The separation may be carried out by several methods, e.g. a vibrating table, electrostatic separation, or froth flotation. The latter method is particularly suitable since an extremely fine coal dust is obtained, which can be used as fuel again after drying. The carbon-poor fraction may be used as additive to construction material. If 100 kg fly ash are separated on a vibrating table whose inclination is 4 to 5 degrees, 23.5 percent of coke product is obtained and 48.5 percent ash. The process may be repeated for more efficient separation. If 1,000 kg fly ash with 36 percent combustible material is subjected to froth flotation, 440 kg of coke with an ash content of 19 percent (78% carbon content, heating value 6,400 cal), and 560 kg of low-coal product, with an ash content of 97 percent, are obtained. (Text in German)

INT-0918

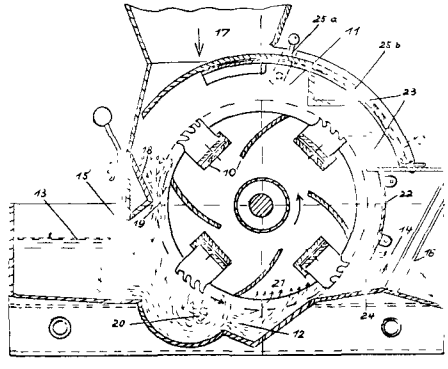
Gordon, H. E. Z. Improvements in or relating to the stripping of plastic coatings from insulated copper wires. Great Britain 730,958; filed Oct. 22, 1951; issued June 1, 1955.

Plastic coatings are removed by immersion of the coated wire into a mixture of sulfuric acid (specific gravity 1.84) and nitric acid (specific gravity 1.42) containing 1.5 to 70.5 percent nitric acid. Rapid removal of coating without damage to the copper is achieved by maintaining reaction temperatures between 50 and 120 C (60 to 90 C is sufficient in most cases). Immersion time varies inversely with temperature (11 minutes to 10 seconds for 40 to 120 C, respeccively).

INT-0919

Von der Ohe, E. Method and equipment for suspension of solid and liquid substances. Germany 933,005; filed June 28, 1951; issued Sept. 15, 1955.

The method for suspending solid and liquid substances is initiated by sending ground or crushed matter through a liquid pump. The crushing and grinding tools on a rotating structure are dipped into the liquid on the bottom at regular intervals. By this method, abattoir waste can be suspended and flushed into a waste water canal. The matter may be suspended with or without the addition of a precipitating agent. Organic domestic refuse can be suspended with waste water or waste water sludge. The equipment comprises a bucket wheel in which cutters, crushers, and grinders rotate rapidly. (Text in German)

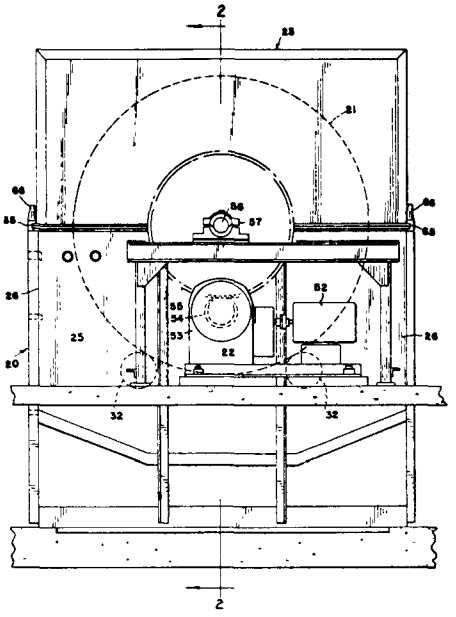


INT-0920

Klein, C. J., and W. H. Wright (National Steel Corporation). Apparatus for detinning scrap. Canada 543,993; filed May 19, 1953; issued July 23, 1957.

An apparatus for detinning scrap tinplate tumbles the material in a chemical bath which dissolves and removes the tin. A drum used to hold the scrap material is supported in a tank that holds the chemical solution. The drum is rotatable along its

longitudinal axis, and includes a cylindrical sidewall and end walls spaced apart from the tank. In one of the end walls is a circular discharge opening, having a diameter less than the diameter of the drum. A conical wall inside the drum extends from the sidewall to the periphery of the opening. Retaining devices, including a wall extending outward and upward from the lower portion of the opening, bridge the space between the end wall of the drum and the tank, and prevent material from falling out through the opening. This apparatus is not limited to tin, but may be used for treating other materials.



INT-0921

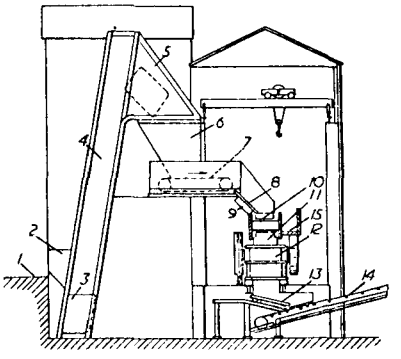
(Clevite Corporation). Electrolytically separating and recovering nonferrous alloys from ferrous materials coated therewith. Great Britain 811,442; filed Aug. 3, 1955; issued Apr. 8, 1959.

The body, made up of nonferrous lead-bearing copper base alloy affixed to ferrous material, is used as the anode in a strongly alkaline, aqueous electrolyte containing an alkali metal cyanide together with tartrate radical. An electric current maintaining 0.8 volts is passed through this anode-cathode arrangement, resulting in the separation of the copper base alloy, including the lead, from the ferrous material. The alloy is deposited on the cathode for subsequent recovery.

INT-0922

Howden, P. (Ernest Newell and Company Limited). Improvements in or relating to the separation of scrap steel from slag. Great Britain 815,619; filed July 27, 1956; issued July 1, 1959.

Raw slag is discharged into an elevator skip and carried to a hopper, then fed in a thin stream over the inclined surface of a multiple electromagnetic separator. Pieces of steel or slag (containing steel) are retained, while the remainder of the slag passes onto a reversible conveyor belt. At one end it is discharged into a jawcrusher from which it is passed to a conveyor leading to the grinding plant. After a suitable amount of slag has been processed, the conveyor belt is reversed, and the power supply to the magnets shut off to release the retained steel, which falls into a wagon for return to the steelworks. These steps are manually controlled by a surveying operator who determines the sequence and duration of the processes involved.

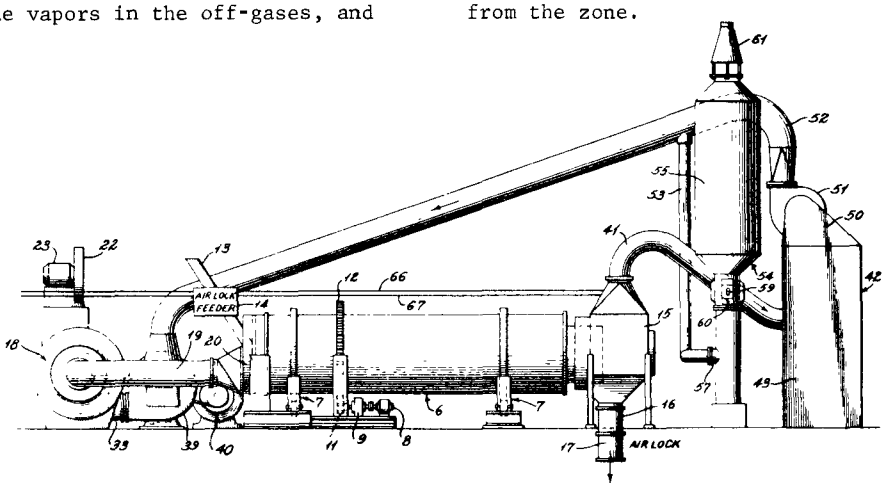


INT-0923

Davis, H. K. (Link-Belt Limited). Method for drying metal scrap. Canada 623,612; filed Oct. 21, 1957; issued July 11, 1961.

Cutting oil and the like are removed from metal scrap by wetting. A stream of gases is propelled through an enclosed path at a pressure above atmospheric, and passes through a zone in which a combustible mixture of fuel and air is burned to increase the temperature of the gases. The stream of heated gases then passes through an agitated bed of metal scrap to evaporate the wetting liquid from it, and entrain the resulting vapor in the flowing stream of gases. The gases are released from the stream at a rate which will maintain its pressure at a substantially constant value. The gases remaining in the stream are then recirculated to the zone in which the combustible mixture of fuel and air is burned. The quantity of

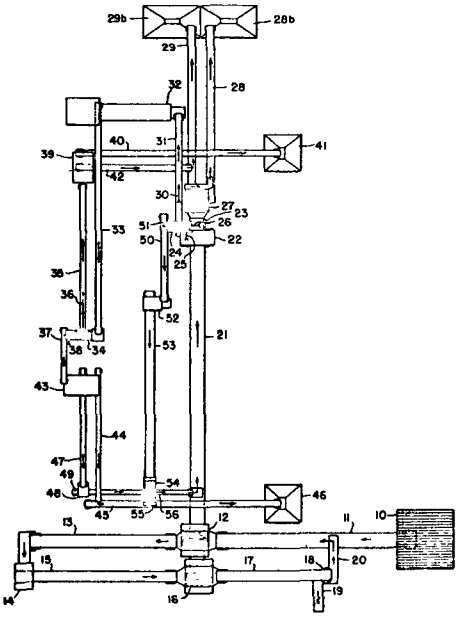
air in the combustible mixture is regulated to permit complete combustion of the fuel and the combustible vapors in the off-gases, and to prevent ignition of the combustible vapors entrained in any portion of the stream apart from the zone.



INT-0924

Rath, F. E. Recovering metal. Great Britain 905,925; filed Apr. 25, 1960; issued Sept. 12, 1962.

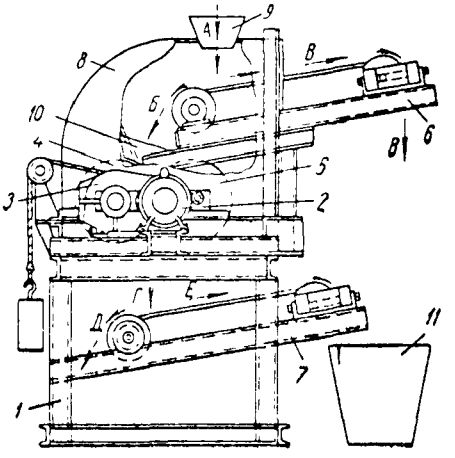
A process of magnetic separation enables clean metal pieces and magnetic oxides of a selected size range to be recovered from a mixture of materials such as are found in steel plant debris. The mixture is first screened for size on a grid, then impacted by a magnet-carrying crane. This is then fed by conveyor to another impactor and roller screen to separate the large-sized portion from the smaller portion. The larger-sized portion is collected magnetically and discharged for return to the mill; the smaller portion is recycled. Nonmagnetic material is separated by a vibrating screen.



INT-0925

Dalakishvili, L. I. Equipment for separating metal scrap from molding loam. U.S.S.R. 157,472; filed June 18, 1962; issued Oct. 5, 1963.

The equipment separates both magnetic and nonmagnetic scrap from molding loam, thus cutting substantially the metal losses in a foundry. The equipment consists of a frame on which are mounted: an electric motor, a speed reducer, a driven crushing

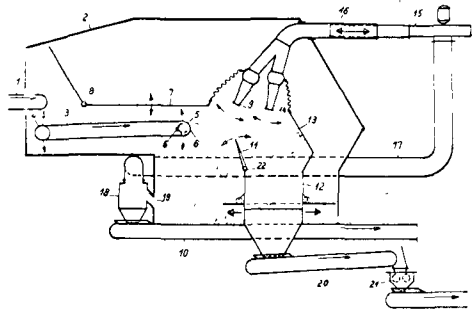


drum, an undriven crushing drum, an upper conveyor, and a lower conveyor. As the used molding loam is charged into the hopper of the machine, the loam, the cores and the scrap metal drop on the upper conveyor. The loam, cores and fine scrap are blown off by compressed air into the hopper. The coarse scrap is carried away by the upper conveyor to a scrap bin. The wastes falling into the hopper pass through the crushing drums and drop on the lower conveyor, from which the loam and the crushed cores are blown by compressed air into a hopper located above the discharge belt. The fine scrap is carried away by the lower conveyor, and discharged into the scrap bin. (Text in Russian)

INT-0926

Diefenbacher, W., and O. Herbold (Wilhelm Diefenbacher K.G.). Refuse separator. Germany 1,178,022; filed July 11, 1963; issued Sept. 17, 1964.

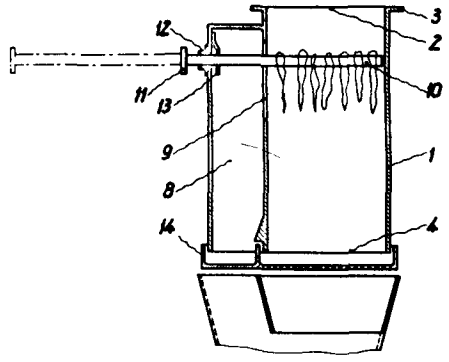
A refuse separator is designed to separate lighter and heavier items by a high-speed conveyor band which slings the lighter materials out at a nearer point, and the heavier materials at a further point. The running surface of the conveyor band carrying the materials is set into vibration in a direction which is preferably normal to the surface. The motions induced in the material on the band are limited by a plate above and approximately parallel to the band. (Text in German)



INT-0927

Meyer, L. (Hartzerkleinerungs und Zement Maschinenbau G.m.b.h.). Device for sorting waste materials. Germany 1,192,993; filed July 31, 1964; issued May 20, 1965.

A device sorts and separates waste material, particularly of a kind containing textiles whose threads tend to clog the sifting mechanism necessary in grading waste for particle size.

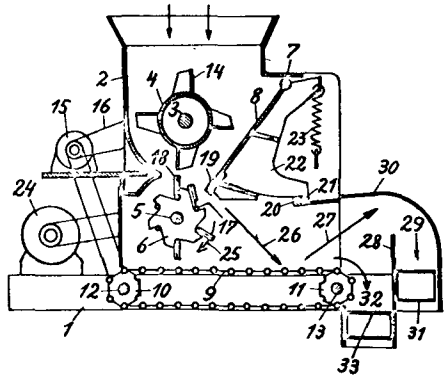


The device comprises a vertical shaft with an opening for the introduction of waste material at the top, and another at the bottom having an oscillating sieve through which the finer waste particles fall to a receiving bunker. Another shaft is attached to the first, with a connecting window between them. A rake, mounted in the upper part of the main shaft, catches and holds the unwanted textile material. It is then transferred to the second shaft, where it is detached by horizontal displacement through the connecting window, and collected at the bottom. (Text in German)

INT-0928

Treckmann, P. (Paul Treckmann and Company). Refuse preparation machine. Germany 1,192,402; filed Jan. 23, 1964; issued July 29, 1965.

A refuse preparation machine is designed for domestic and similar heterogeneous mixtures. The refuse is charged onto a conveyor belt from a fast-moving friction drum. The drum and the belt are juxtaposed so the material components are slung onto the belt surface at an angle. At the discharge

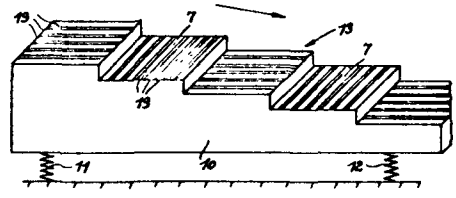


end of the belt are two partitioned receiver zones. One of these receives material which remains on the belt; the other, further from the belt, receives components which, being harder, have glanced off the belt surface. (Text in German)

INT-0929

Hartmann, H. Refuse destructor separator. Germany 1,203,194; filed Mar. 26, 1964; issued Oct. 21, 1965.

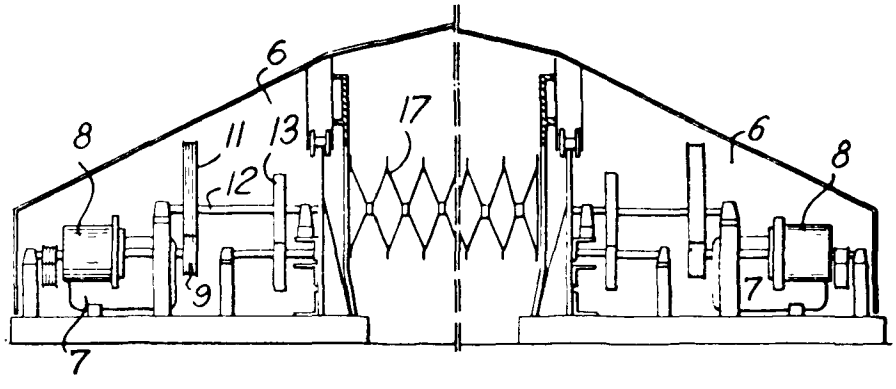
A refuse destructor/separator divides glass and ceramic pieces from crude ash by round- or square-perforated screen plates, with 6 to 8 mm perforation diameter for essentially cubic fine grains. Rod screens are used for flat pot pieces, and round- or square-perforated screen plates of approximately 25-mm perforation width are used for separating bulky pieces. (Text in German)



INT-0930

Chevallier, R. L. Refuse separator. Germany 1,215,612; filed Feb. 24, 1965; issued May 5, 1966.

A refuse separator removes compostable, fibrous, dusty components, usable as fertilizer, from domestic refuse. The device comprises interlocking disks rotating on edge, having toothed edges and tearing pegs on their flanks. Arms are suspended over the grate composed of these disks, to limit the height of the burden on them. The disks, mounted on rotating, square shafts, form a travelling grate. The refuse is charged at one end, and usable material passes over the grate to a suitable discharge. (Text in German)



INT-0931

Kozmin, Y. A., E. V. Davydov, S. T. Takezhanov, V. D. Ponomarev, L. P. Shulgin, T. K. Tserekov, I. A. Yarovoi, A. S. Kulenov, and A. V. Bratchik (All-Union Scientific-Research Mining-Metallurgy Institute of Nonferrous Metals). Treatment of dusts and dross from metallurgical plants. U.S.S.R. 186,681; filed June 21, 1965; issued Oct. 3, 1966.

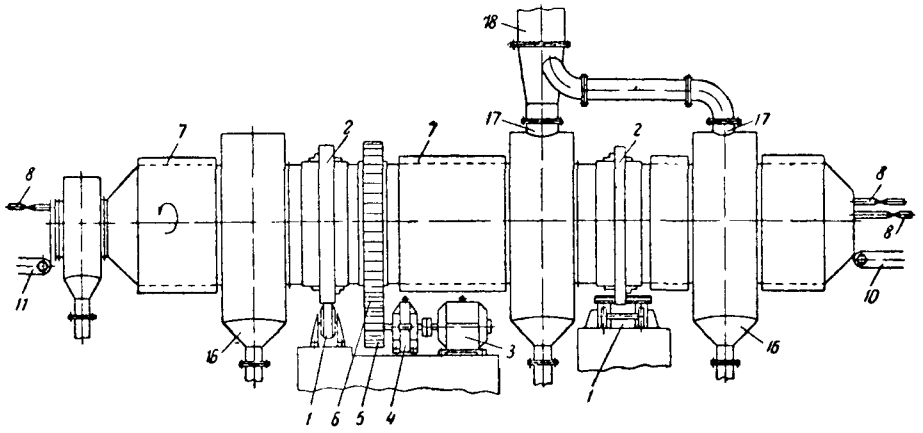
Dusts and dross from plants (e.g. lead smelting plants) are treated by alkaline leaching, and the lead is separated electrolytically from the alkaline solution as a cathode sponge. Sodium arsenate is separated from the solution by crystallization. To increase the extraction of the nonferrous and rare metals, and to simplify the technology, the alkaline leaching and the electrolytic separation of the lead are combined in a single aggregate. Selenium is precipitated from the alkaline solution after the removal of the arsenate by known methods. Zinc, cadmium, and rare metals are leached from the filtered lead sponge and the insoluble precipitate with sulfuric acid. (Text in Russian)

Separation

INT-0932

Kharlamov, F. M., K. G. Petukhov, and Y. I. Zaretskiy (Moscow Regional Administration 'Soyuztortsvetmet'). Device for continuous degreasing of tinplated scrap and washing tin off it. U.S.S.R. 195,111; filed Mar. 5, 1965; issued Apr. 12, 1967.

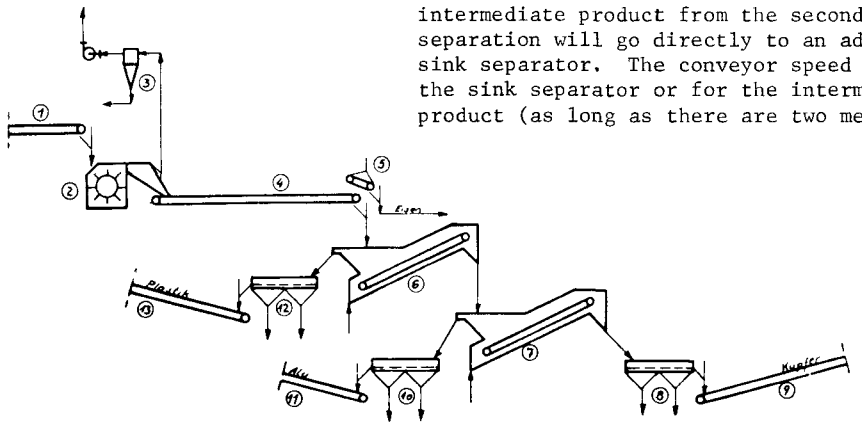
The device consists of a horizontal metal drum, supported on rollers and rotated slowly by an electric motor. Heat insulation may be applied to the outer surface of the drum. The drum is filled with various solutions by pipes provided with spray nozzles. Ribs may be attached to the interior surface of the drum to facilitate stirring of the scrap. The scrap is charged by a feed conveyor into one end of the drum, and treated scrap is discharged onto a removal conveyor from the other end. The drum is subdivided into two or more working segments with interposed pouring sections. The working segments are shielded from the pouring sections by sheet metal borders shaped like truncated cones. Drum segments, lying within the pouring sections, are perforated to support the scrap, while still allowing the liquids to flow through and down into funnels provided in the lower parts of these sections. Suction fans are provided in the upper part of these sections to remove vapors and/or gases released in the pouring sections. In operation, scrap traverses the entire length of the drum. Liquids, fed individually into the individual drum segments, are prevented by the borders from flowing from one segment to another. (Text in Russian)



INT-0933

Lenz, H., J. Mehlbeer, H. Macura, and O. Weidner (Eisen und Metall A.G.). Scrap metal recovery method. Germany 1,263,641; filed June 12, 1967; issued Mar. 21, 1968.

Scrap metal is recovered from cables by using a hammermill for comminution, followed by discharge without rehandling, into a first sink separator, with the intermediate product going directly into a second separator. If necessary, the intermediate product from the second separation will go directly to an additional sink separator. The conveyor speed through the sink separator or for the intermediate product (as long as there are two metals

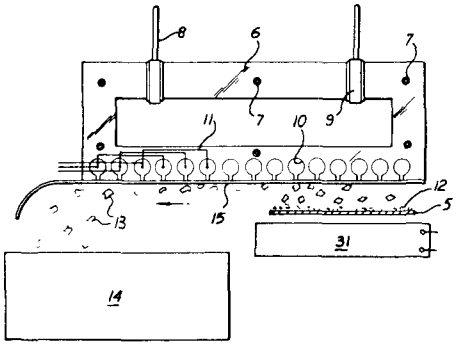


present) is adjusted so the isolation achieved in the hammermill, especially of the metal being recovered, is essentially maintained. (Text in German)

INT-0934

Lyons, W. H. Improvements in or relating to the separation of metallic bodies from bulk materials. Great Britain 1,121,451; filed Mar. 13, 1967; issued July 31, 1968.

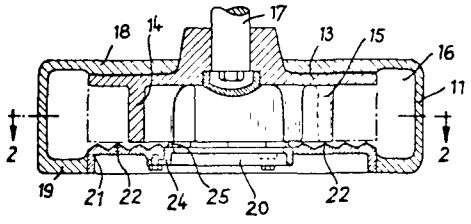
This apparatus automatically separates nonferrous metallic bodies from waste material, and it may be used in conjunction with a magnetic separator. A ferrous core, with coils spaced along its underside, is positioned above a moving belt. The coils are energized with polyphase alternating current. The resultant magnetic field is progressively intersected by the nonferrous conducting bodies in the trash. When the bodies cross the magnetic field, an electromotive force displaces them along the belt in a direction lengthwise to the core. The core is transversely disposed in relation to the belt.

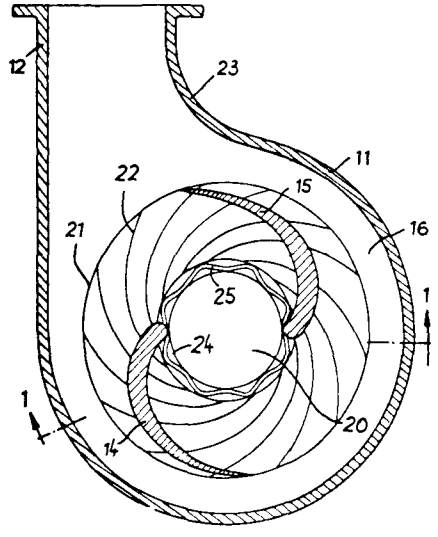


INT-0935

Blum, A. Improvements in centrifugal pumps for dirt-laden water. Great Britain 1,125,376; filed Jan. 24, 1966; issued Aug. 28, 1968.

A centrifugal pump comprises an open-channel impeller rotating in a housing. The housing facing the open channel of the impeller is provided with a conveying mechanism of at least one projection adjacent to the open side of the impeller. This projection extends from near the central inlet opening of the housing to a discharge passage in the housing around the impeller. This passage cooperates with the impeller to convey fragments of cloth or other materials in the pumped waste from the inlet opening to the discharge passage.





INT-0936

(Spectra International, Inc.). Improvements in or relating to the recovery of metals. Great Britain 1,128,367; filed Dec. 21, 1965; issued Sept. 25, 1968.

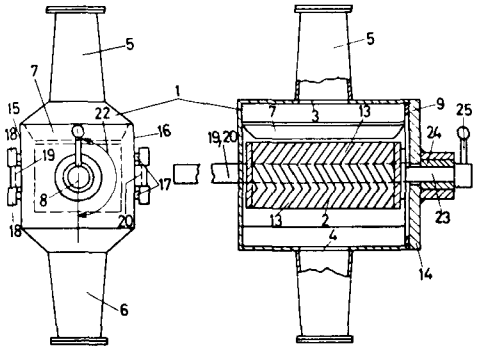
Precious metals, electroplated onto a basic metal, are recovered by contacting the electroplated base with a molten metal (a solvent for the precious metal) at a temperature below the melting points of the precious metal and the base metal. Afterward, the dissolved, electroplated precious metals are recovered from the fluid solvent.

INT-0937

Meier, J. (Georg Fischer A.G.). Device for the separation of core iron, nails, or similar components in used molding sand or similar material. Switzerland 471,614; filed Sept. 26, 1967; issued Apr. 30, 1969.

A device for the removal of iron parts and nails from used molding sand consists of at least one grate, with narrow channels and angular bends, and

at least one reserve grate. The unit also has a device for turning the grate. The grate can be removed from the casing and tilted 180 degrees for cleaning. An endless link belt, which combines the grates and which runs through the bottom and top of the casing, can be used for automatic cleaning of the grate. The casing has an inlet, and an outlet where the cleaned sand is discharged. (Text in German)



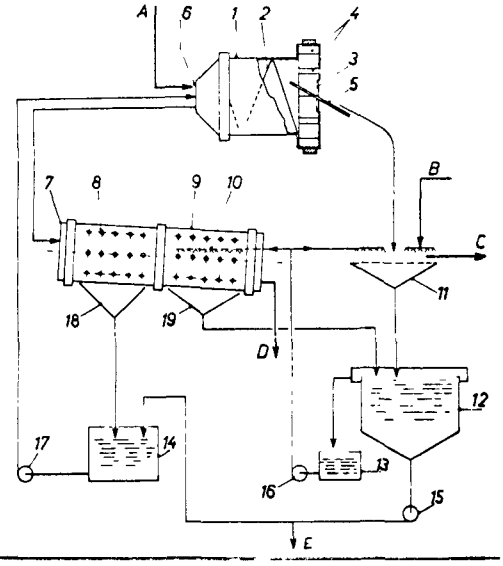
INT-0938

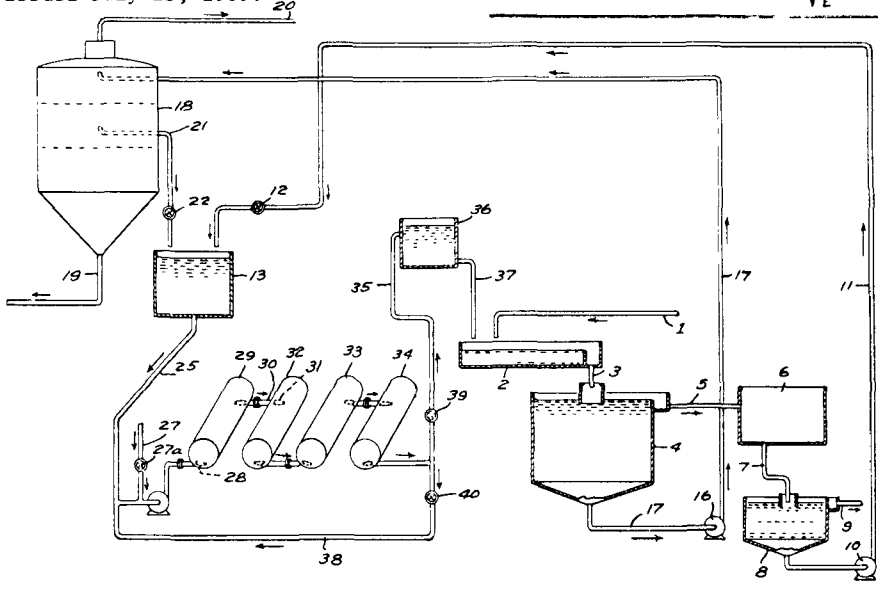
Tremolada, G. (A. Tonolli and Company. S.p.A.). Process for the separation of components of scrap storage batteries. Canada 815,369; filed Jan. 13, 1966; issued June 17, 1969.

INT-0939

Grich, E. R., and J. W. Hood (Purifax, Inc.). Procedure for the purification of waste material containing a putrescible substance. Switzerland 472,909; filed Dec. 2, 1966; issued July 15, 1969.

This separation process treats scrap storage batteries, particularly lead batteries, which are suitably crushed and devoid of active substance. The separation vessel contains an aqueous suspension of active substance to which is added the material obtained from the crushed batteries. The density of the solution is between that of its metallic components and inactive materials. Light materials are removed at the liquid surface; at the bottom of the vessel, metallic components are removed. This separation process is particularly efficient when combined with a crushing process which reduces all active ingredients in a storage battery to detached powder, or granules.



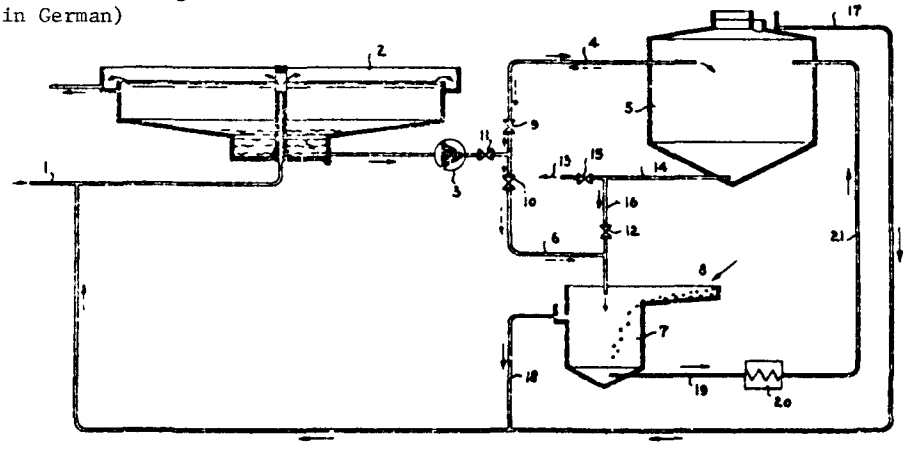


This procedure involves treatment with an oxidizing agent. The process renders the waste odorless and converts it to a flocculent form, which can be easily separated from the water mass by sedimentation or filtration. The material is put in contact with the oxidizing agent in a rapid agitation zone, and it is kept in rapid circulation to insure that the insoluble material is suspended during the time required for oxidation of the putrescible substance. Rapid circulation is continued at reduced pressure so air or gas bubbles attached to the suspended solid particles separate and reassemble. The reassembled bubbles separate easily from the waste material when they are freed in a low-pressure zone. In one installation of this process, the oxidizing agent is gaseous chlorine. It is introduced into the rapid agitation zone in which the waste is suspended in water. In this manner, the chlorine is assured access to all waste particles. The chlorine may be injected by a centrifugal pump. (Text in French)

SLUDGE

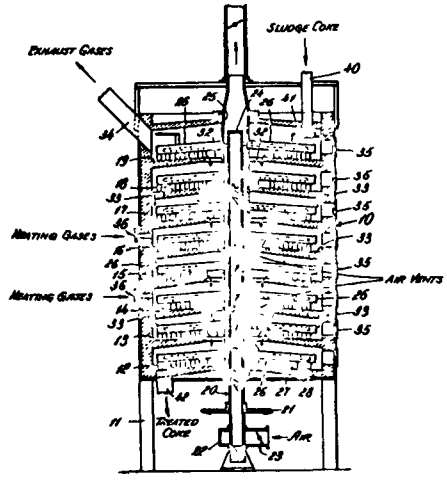
INT-0940
(Dorr-Oliver N.V.). Method and equipment for treatment of organic refuse and waste water sludge through common anaerobic decomposition. Switzerland 241,662; filed May 19, 1943; issued Mar. 31, 1946.

Organic domestic refuse and sludge from waste water purification is subjected to anaerobic decomposition in a tightly sealed, rotting tank. Before the refuse is piped to the rotting tank, it is mixed with sludge and shredded. The domestic refuse can also be wetted by sludge taken from the rotting tank, in which case no additional water is required for shredding the refuse. Smaller rotting tanks can be used. (Text in German)



INT-0941
Wickenden, L. Treatment of waste oil refinery sludge coke. Australia 123,894; filed Oct. 24, 1944; issued Mar. 24, 1947.

Sludge coke can be converted into a highly adsorptive material that is usable in the purification of water, edible oils, glycerine, and some syrups. Granules of the sludge coke are heated in a controlled oxidizing atmosphere of air and steam at a temperature sufficiently high enough (between 850 and 950 C) and for a time sufficiently long enough to burn a predetermined amount of the granules. The coke is simultaneously mixed so that the granules are exposed to substantially uniform conditions of treatment, and the heating operation is continued until the granules of sludge coke are converted. The type of furnace suitable for this process consists of a series of shelves one above the other. The raw material



is fed onto the outer edge of the first shelf and is then conveyed to the center of the shelf, at which point it drops to the next shelf. As a result, the material is thoroughly stirred, and there is intimate contact between the particles of carbon and the treating gases.

INT-0942

Stroganov, S. N. A method of utilization of activated sewage sludge as raw stuff for plastics. Great Britain 587,877; filed Mar. 26, 1941; issued May 8, 1947.

A process of producing protein plastics involves condensing a phenol-aldehyde, a polyvinyl chloride, or a Glyptal resin with bacterial protein of activated sludge, taken as a byproduct of sewage treatment plants in aeration tanks, and preferably containing up to 50 percent protein substances in dry weight. The activated sludge is preferably subjected to a preliminary treatment by an oxidizer such as hydrogen peroxide.

INT-0943

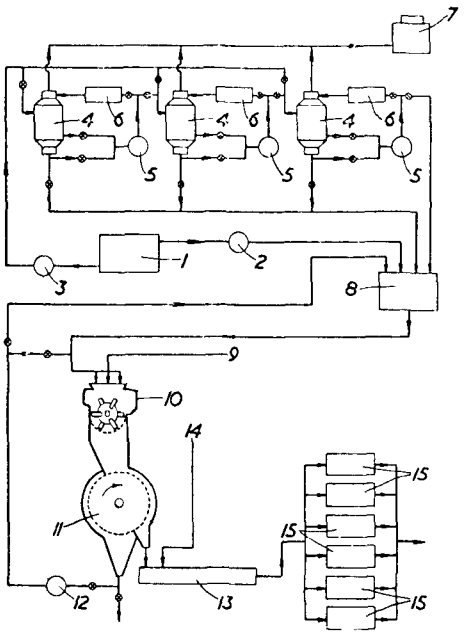
Singer, M. J. Fertilizer from harbor sludge and the like. Netherlands 77,873; filed Nov. 19, 1952; issued Apr. 15, 1955.

Harbor sludge or similar organic material which cannot be dried easily is divided into two parts. One part is formed into granules, the other part is mixed with fuel-containing waste materials, e.g. flue dust, coal sludge, or powdered lignite, in an amount greater than that necessary for baking the clay from the sludge, and then formed into granules. The latter part is burned in air, and the former part is dried with the aid of combustion gases. Both parts are then powdered and mixed. The powder may be mixed with other fertilizer. (Text in Dutch)

INT-0944

Gothard, H. A. S. (British Organic Products Limited). An improved process for the treatment of sewage or other organic liquors and domestic refuse or other organic matter. Great Britain 764,294; filed Sept. 17, 1951; issued Dec. 28, 1956.

The process for the treatment of refuse having a biochemical oxygen demand of at least 5,000 ppm, a pH of 6.5 to 7.3, and nitrogen content of at least 100 ppm, involves fermentation under anaerobic conditions to yield methane-rich gas and digested sludge. This sludge is mixed with finely divided organic matter and fermented under aerobic conditions to yield a compost fertilizer. The crude liquor is first treated by drawing off the supernatant liquid to give the liquor the requisite oxygen demand, adjusting the pH, and adding the ammonium salts for the necessary nitrogen content. The temperature of the liquor during the initial stages of its digestion is maintained between 45 and 55 C. The liquid content of the mixture is reduced by means of filtration. The organic matter is fed into a stream of the digested sludge, and the mixture is pulverized before being subjected to filtration.

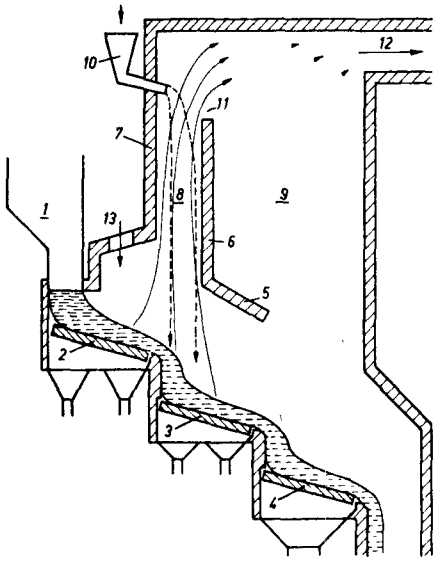


INT-0945

Wuethrich, F. (Von Roll A.G.). Procedure for the joint incineration of refuse and clear sludge, and an incinerator with grate firing for the procedure. Switzerland 434,539; filed Aug. 20, 1964; issued Oct. 14, 1967.

Refuse and clear sludge with a moisture content of 70 percent are combusted together in a common incinerator with grate firing. The filling funnel, through which the refuse is introduced, is situated over an oven containing three grates in succession. The first grate dries the refuse, the second is the main incinerator, and the third receives most of the gases of combustion. The sludge is mechanically broken up into small particles and allowed to fall through an atmosphere of heated gases

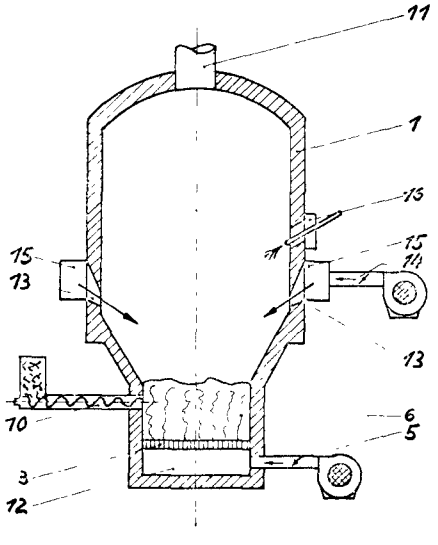
for drying, so that these can then be burned together with the other refuse. (Text in German)



INT-0946

Eberhardt, H., H. Weiand, and K. Kalmbach (Haniel and Lueg G.m.b.H.). Procedure for burning clear sludge by means of a whirlpool oven. Switzerland 440,527; filed Oct. 14, 1963; issued Dec. 29, 1967.

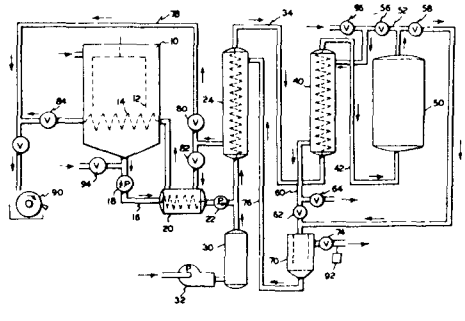
This procedure for the burning of clear sludge (oil-water emulsions, fat-water emulsions, synthetic-water mixtures) uses a whirlpool oven. The whirlpool bed below the oven requires less than half as much air flow as the oven itself. Circular air vents which are located on the oven walls provide its air supply. Thus, the air flow into the oven can be regulated. A booster oil burner located in the upper half of the structure is regulated according to the incineration temperature above the whirlpool bed. Air is led into the whirlpool bed through openings in the floor from a chamber underneath. (Text in German)



INT-0947

Gitchel, W. B., C. A. Hoffman, and E. W. Schoeffel (Sterling Drug, Inc.). Method of continuous production of a harmless, odorless, organic substance with optimal processing properties from sewage sludge. Switzerland 458,225; filed May 20, 1965; issued June 15, 1968.

A constant volume of sewage sludge is mixed continuously with a constant volume of a gas containing oxygen in such a proportion that the oxygen lowers the chemical oxygen requirement of the sewage sludge by more than 5 percent. The mixture is heated continuously until the chemical oxygen requirement of the sludge is decreased. A harmless sludge which contains fibrous substances is obtained; these substances have a lower filtration resistance and a higher sedimentation rate than the raw sludge. Insoluble fats in the treated sludge have a lower moisture retention. (See also Switzerland 473,066) (Text in German)

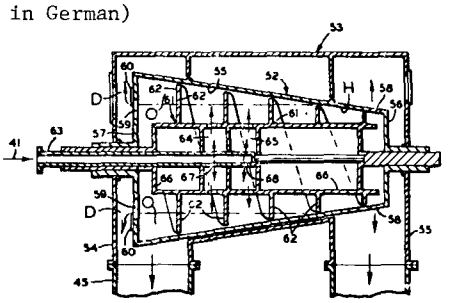


INT-0948

Albertson, O. E. (Dorr-Oliver, Inc.). Method and equipment for the treatment of putrescible sludge. Switzerland 466,820; filed Aug. 15, 1963; issued Dec. 15, 1968.

Raw sludge is subjected to an aerobic decomposition process. To the decomposing sludge, new raw sludge is added while part of the decomposing sludge is removed. This decomposed sludge is separated in a

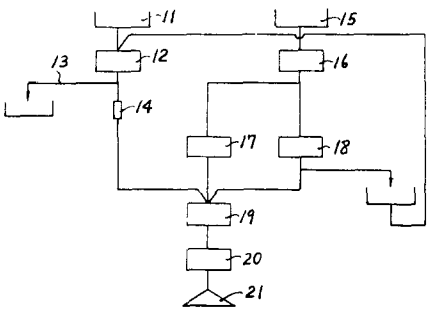
centrifuge with a screw conveyor discharge into a thin fraction containing primarily in completely decomposed substances and into a concentrated fraction of nonputrescible solids. The thin fraction is concentrated in a nozzle centrifuge. The nonputrescible fraction is incinerated in a fluidized bed furnace. (Text in German)



INT-0949

Tanaka, M. (Nagata Seisakusho). Method for disposal of fine sludge. Japan 44-652; filed Dec. 8, 1964; issued Jan. 13, 1969.

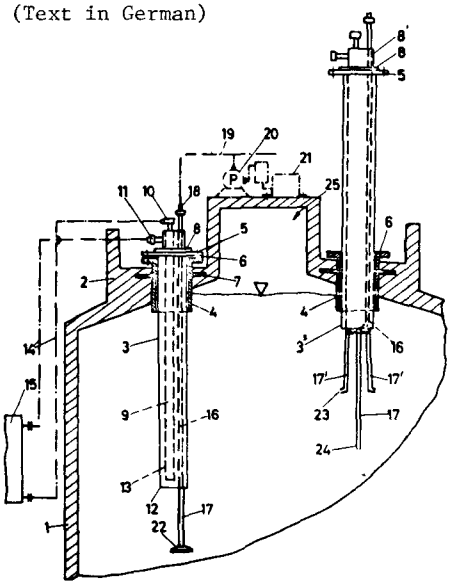
Vacuum or pressure filters are often used to dispose of wet material containing fine particulates. However, when more than 50 percent of the material measures less than 100 microns, the dehydration capacity of vacuum filters decreases rapidly, and both facilities and operations costs are high. Pressure filters cannot handle large quantities, and continuous operation is not feasible when they are used. It is unsafe to dispose of such material on waste coal and gravel piles since, as a result, they may fall. If the water containing fine sludge from coal screening is filtered to a consistency of about 300 to 600 g per liter and added to crushed gravel smaller than 25 mm, a semisolid is formed that can be disposed on the waste pile with no danger. The evenly mixed particulates form a material whose consistency approximates that of wet concrete. (Text in Japanese)



INT-0950

Roediger, W. (Roediger A.G.). Heating device for sludge digestor. Switzerland 467,220; filed Dec. 15, 1966; issued Jan. 15, 1969.

A heating device for sludge digestors consists of longitudinal bodies with circular or rectangular cross sections. The cross section is uniform over the entire length submerged in the sludge. The heating bodies are heated by hot water flowing through a pipe, which transverses the bodies from top to bottom. The heating water is returned through another pipe within the body. Another pipe may be installed likewise, crossing the heaters from top to bottom with a nozzle for injection of gas into the sludge to promote the rotting process, and to enhance the efficiency of the heating process. The heaters are installed in a sleeve. They are inserted into the sludge and removed from the top. (Text in German)

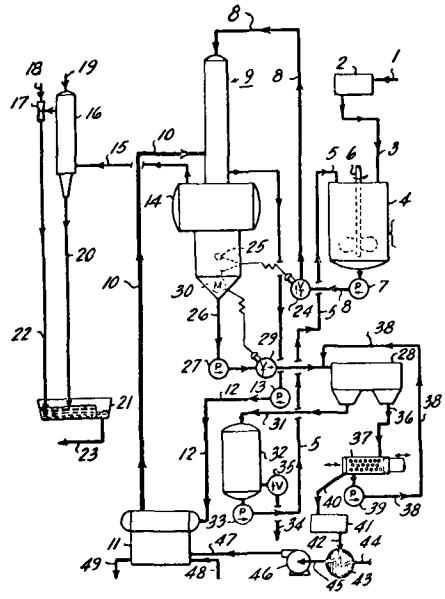


INT-0951

Greenfield, C. Apparatus and process for dehydrating waste solids concentrates. Great Britain 1,140,709; filed Dec. 14, 1966; issued Jan. 22, 1969.

An apparatus for dehydrating waste solids concentrates is characterized by a fluidizing tank in which an oil is added to the solids. There is: a single-stage evaporator; a conduit between the fluidizing tank and the evaporator through which the mixture flows to the evaporator; a heat generator supplying the heat needed for the evaporator; a pressing device in which the mixture is separated into the solid and the liquid components, a conduit leading from the evaporator to the pressing device through

which an anhydrous oil sludge flows; and a means of discharging the solids separated in the pressing device to the heat generator. The heat generator is especially suited for burning these solids. The mixture of oil and waste solids concentrates is dehydrated at a temperature of 100 to 400F.



INT-0953

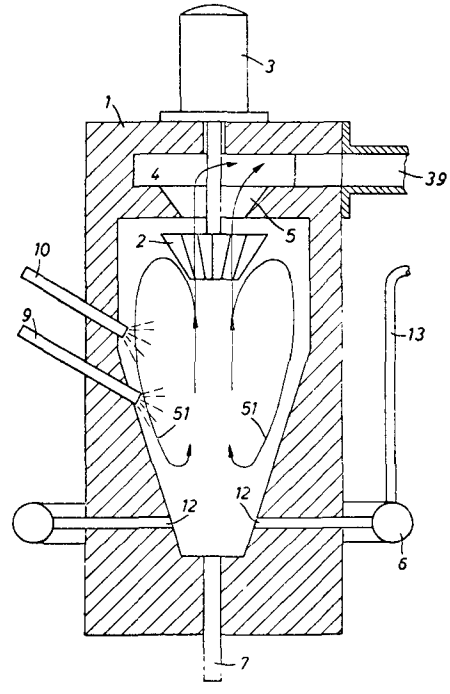
Albertson, O. E. (Dorr-Oliver Inc.). Method for incineration of organic sewage sludge as well as equipment for the process. Switzerland 469,225; filed Dec. 5, 1967; issued Feb. 28, 1969.

The dehydrated organic sewage sludge is injected into a turbulent fluidized bed. The injection is such that the sludge first contacts the wall of the reactor. The combustion chamber is shaped like a shaft. In the bottom of the reactor is an air chamber with a plate pierced by nozzles for the injection of air into the fluidized bed. At the upper end of the combustion chamber is the outlet duct for flue gases. The spray nozzle for injection of the sludge is likewise arranged in the upper section of the combustion chamber. By adjusting the injection angle of the sludge, the residence time can be prolonged or shortened. Morever, the atomization of the sludge can be regulated. The sludge particles are predried on their way into the fluidized bed where they are then incinerated. For larger particles, the underfed air is blown in at higher speeds (0.9 to 2.1 m per sec). This has two advantages: small ash particles are carried along by the rising gases and are removed from the reactor; and material flows into high-temperature one to be heated. The reactor has a cylindrical upper part and a conical lower part. Its shell is made of steel lined with fireproof

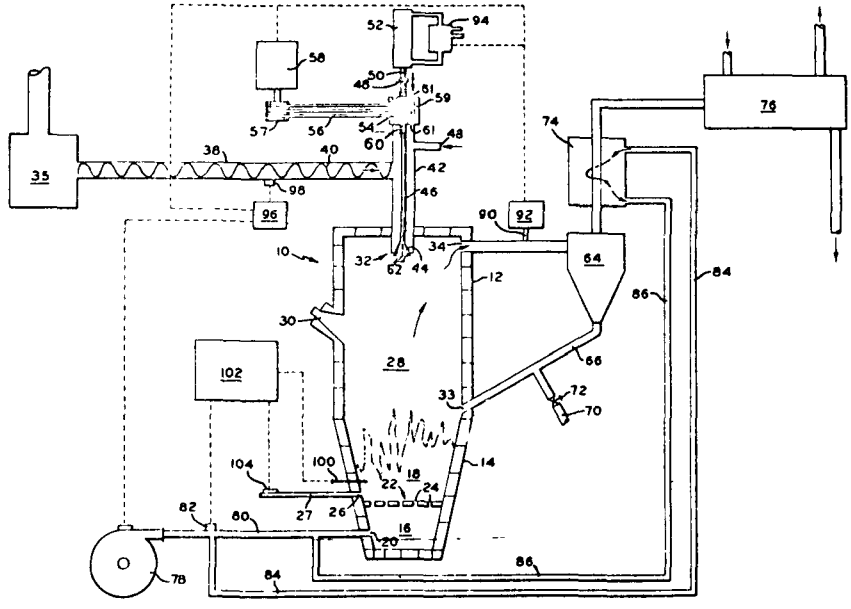
INT-0952

Hilgers, G. (Klockner-Humboldt-Deutz A.G.). Method of oxidizing organic components contained in solutions, leaches or sludges. Canada 806,244; filed Sept. 18, 1965; issued Feb. 11, 1969.

This reaction chamber burns organic compounds contained in solutions, leaches, or sludges while evaporating, at normal pressures, the water found in the liquids. A rapidly rotating vane wheel maintains a gas vortex within the chamber. Centrifugal force pushes the unburned matter against the sides of the chamber to permit the withdrawal of pure gas from the eye of the vortex. Those unburned particles, in turn, are drawn into the combustion process. Steam boilers utilizing waste heat can be employed for predrying the solution being treated.



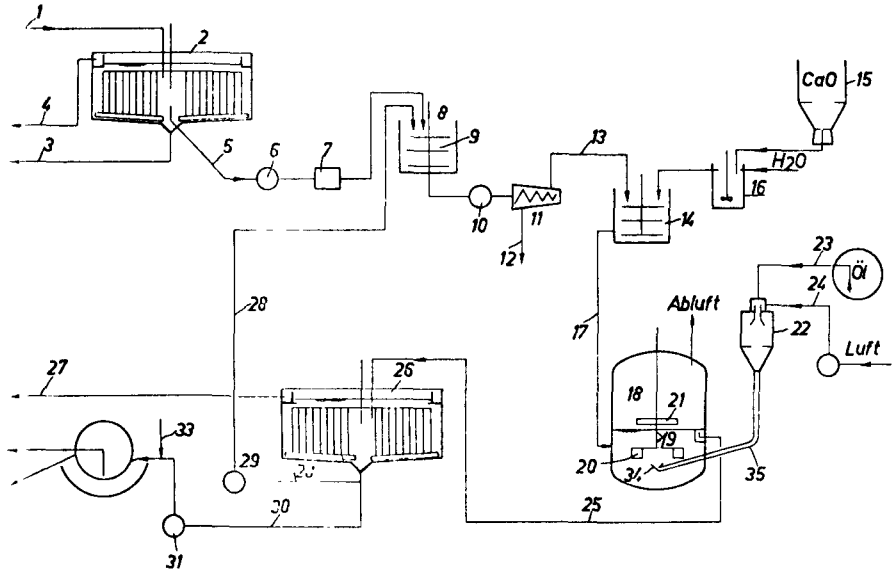
bricks. The flue gases are cleaned in a cyclone. The temperature in the fluidized bed is regulated by a thermocouple. (See also Canada 803,776 and Great Britain 1,166,70) (Text in German)



INT-0954

Sontheimer, H. (Metallgesellschaft A.G.). Method for dehydration of waste sludge. Switzerland 468,941; filed Jan. 14, 1965; issued Feb. 28, 1969.

A method for dehydrating sludges accumulating in purification plants for domestic or industrial waste water is provided. In the first stage, the sludge is concentrated in a decanting centrifuge. The centrifugate, with a water content of 40 to 60 percent, can be directly dumped or incinerated. The less dense material separated in the centrifuge is treated with lime and carbon dioxide until a pH of less than 10 is obtained. This can be further dehydrated by sedimentation or flotation. The end-product of this process is returned either entirely or in part to the decanting centrifuge. Putrid sludge, fresh sludges from communal purification plants, and industrial sludges from paper mills can be treated by this method. After treatment with carbon dioxide

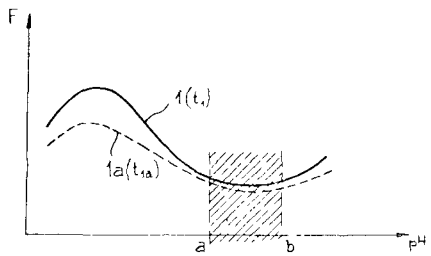


and prior to concentration of the less dense material, flocculants such as iron salts can be added. The temperature of the lime-carbon dioxide treatment and/or concentration process ranges between 60 to 80 C. The lime which is added contains ash, preferably ash from incineration of the dehydrated sludge. Three practical examples are given. In the first case, putrid sludge with a solids content of 52 g per liter was treated by this process. For concentration of the lighter material after centrifugation, 20 g per liter calcium hydroxide and 7 g carbon dioxide per cu m were needed. In the second and third cases, fresh sludge with a solids content of 60 g per liter was used. In both cases an end-product with a solids content of 45 and 35 percent was obtained. (Text in German)

INT-0955

Aeberli, H. (Von Roll A.G.). Process for dehydration of putrid and/or fresh sludge from waste water purification plants. Switzerland 469,639; filed Mar. 25, 1968; issued Mar. 15, 1969.

A dehydration method for putrid and/or fresh sludge is designed so that the sludge is heated and subsequently filtered or centrifuged. The solid substances in the sludge are left in the form of a filter cake. The filtrate and the water separated in the centrifuge are free from any suspended matter. Prior to thermal conditioning of the sludge, its pH value is brought to between 5.5 and 6.5. The temperature of the conditioning process is at least 150 C, the duration of this process, less than 1 hr. The sludge goes through the various phases of the process without interruption. (Text in German)



INT-0956

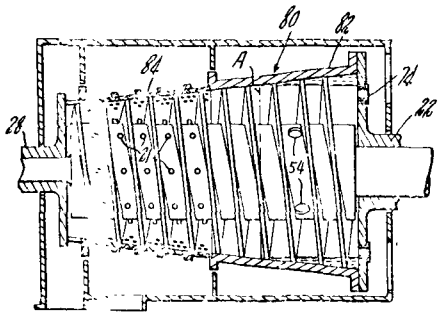
Althoff, F. W., and F. Koppernock (E. Merck A.G.). Method of treating sludges accumulating in biological waste water purification. Switzerland 469,638; filed Apr. 12, 1965; issued Mar. 15, 1969.

This method improves the dehydration ability of sludges accumulating in the biological purification of waste water. The sludge is preconcentrated and mixed with solutions containing chromium salts. Waste water from the chemical and electroplating industry is preferably used with a chromium content between 2 and 10 percent. Best results are achieved with a chromium concentration of 5 percent. This treatment can be combined with treatment using precipitants such as calcium hydroxide, iron (II) salts, aluminum salts, etc. The excess sludge from the biological purification process can be mixed with sludge from the preliminary purification process. After treatment, the sludge can be either filtered or centrifuged. If the sludge is burned, the chromium in the ash can be recovered. (Text in German)

INT-0957

Ferney, F. X. (Bird Machine Company). Centrifugal separator for separation of solid particles from the liquid part of a sludge. Switzerland 469,511; filed Apr. 13, 1966; issued Mar. 15, 1969.

A centrifugal separator consists of a rotary drum with a nonperforated, conical, inner surface. At the narrow end of the cone, it is connected with an adjoining coaxial sieve. Opposite this connection in the sieve, there is the concentrate tap-off. The wall of the sieve consists of one or several sieves which pass the fluid but retain the solid substance. The screw conveyor goes through both parts of the centrifuge. The nonperforated part has an overflow opening. When the sludge enters the drum, it is thrown toward the wall by centrifugal force. The surface of this rotating sludge ring terminates at a distance from the narrow end which is at least 15 percent of the inner diameter of the wide end of the conical drum. This guarantees smooth drain off of the fluid. The diameter of the narrow end of the conical part should be 65 to 95 percent of the diameter of the wide end. The size of the openings in the sieve section depends on the type and size of the solid particles. The inner wall of the sieve section is cylindrical. The diameter of the outlet

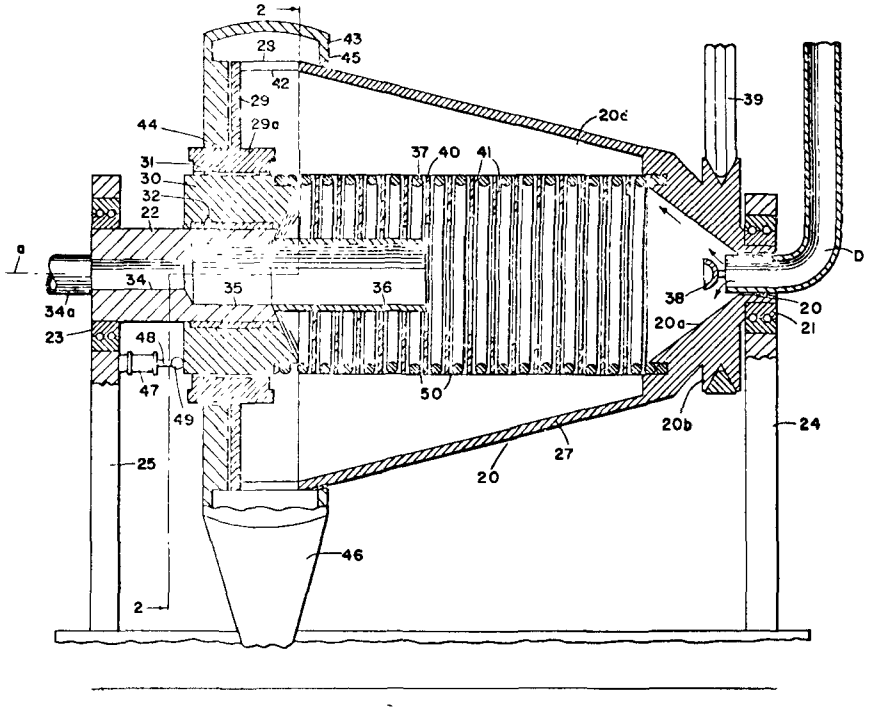


of this section is not smaller than the diameter of the inlet. The major part of the fluid is separated in the nonperforated section. (Text in German)

INT-0958

Fierstine, B. A. (Baker Perkins Incorporated). Process and equipment for concentrating thin sludge consisting of solid and liquid components. Switzerland 469,510; filed May 4, 1968; issued Mar. 15, 1969.

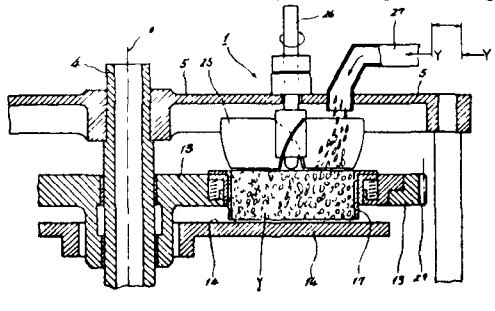
The sludge enters the interior of a container which is then set in rotational motion. The radial discharge of components is prevented so that the rotating mass consists of an outer part of solid substance and an inner part which has no solids or a low amount of solids. The radial inner part is drained off parallel to the axis of the container. The latter is formed of a spiral spring which expands and contracts. The separated sludge water flows off when the spring is contracted. The solids are thrown out when the spring expands. The spring consists of a main spring with a circular cross section, and a flat spring, which helps to seal the spring when in the contracted stage. The spring is preferably made of steel, but it can also be made of a suitable plastic material. The sludge enters the spring continuously. (Text in German)



INT-0959

Ozawa, M. Device to dehydrate and solidify sludge. Japan 44-6,358; filed Dec. 10, 1965; issued Mar. 18, 1969.

An automated continuous dehydrator-shaper-solidifier consists of a large fixed circular stand, a revolving cylinder, and three shallow cylinders placed on the cylinder. The three cylinders circle the dumping device, the dehydrating device, and the solidifier. The stand rotates at a 120 degree angle each time. Compression occurs within the cylinder, with the compression plate operating vertically. A filter board with holes dehydrates and solidifies the sludge. Latticed blades at the bottom of the cylinder divide the sludge into cakes. When the cylinder rotates, sludge is dumped into one small cylinder, dehydration and compression takes place in another, and cutting and ejecting of sludge occurs in the third. With another turn, the dumped sludge

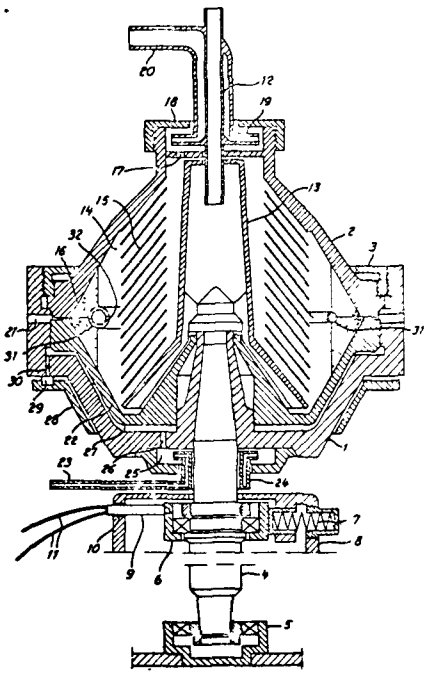


is brought to the compression-dehydration device. (Text in Japanese)

INT-0960

(Alfa-Laval Aktiebolag). Improvements in sludge centrifuges. Great Britain 1,145,698; filed Oct. 14, 1966; issued Mar. 19, 1969.

A sludge centrifuge, in which sludge discharge takes place during operation, consists of a sludge displacing body. This body is so shaped and located within the sludge space of the centrifuge rotor that the displacing volume of the body is asymmetrically disposed with respect to the axis of rotation of the centrifuge rotor. One suitable manner of designing the displacing body involves the provision of at least one hollow space in the body. In another form of the apparatus, the displacing body is a circular ring, one half of which is solid, and the other half of which is tubular.



INT-0961

Mogelnicki, S., and E. M. Gatza (Dow Chemical Company). Mixed polymers and sludge conditioning. Great Britain 1,146,384; filed June 1, 1967; issued Mar. 26, 1969.

A water-soluble flocculant composition and a process for dewatering raw sewage sludges are described. The term 'raw sewage sludge' as used here, refers to sludges produced by the primary settling of sewage and mixtures which contain at least 50 percent by weight of such sludges. The flocculant is mainly comprised of at least one resinous amino-condensation polymer having a molecular weight of 500,000 or less, and a minor proportion of at least one cationic vinyl-addition polymer having a molecular weight of at least 1,000,000. The resinous amino-condensation polymer may be a polyalkylene polyamine, the alkylene groups of which contain 2 to 3 carbon atoms. The cationic vinyl-addition polymer may contain a number of amino alkyl-N-acrylamide groups, the amino alkyl groups of which are hydrophilic. Application of the polymeric blend to sludges to be dewatered is accomplished by first preparing an applicating solution of the polymeric blend which may contain from as little as about 0.01 percent by weight up to as much as 5 percent by weight dissolved polymeric solids. The sludge is treated with a small amount of the polymer applicating solution to provide a predetermined, desired polymer dosage. The sludge is subjected to mild agitation and then to a dewatering operation which may involve compaction, filtration, flotation, or centrifugation. (See also Great Britain 1,159,819)

INT-0962

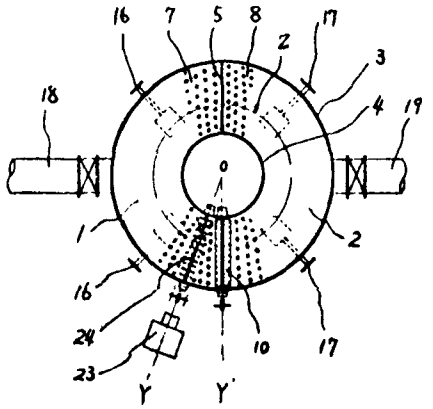
Sontheimer, H., G. Thomas, A. Fischer, and F. Knaup (Metallgesellschaft A.G.). A method of and apparatus for dewatering sludges. Great Britain 1,149,331; filed Jan. 9, 1968; issued Apr. 23, 1969.

Sewage sludge is dewatered by introducing lime into the sludge. After or during the addition of lime, and prior to the dewatering of the sludge, carbon dioxide or gases containing carbon dioxide are introduced into the sludge. The introduction of carbon dioxide is stopped while free calcium hydroxide still remains in the sludge. After the introduction of the carbon dioxide, the pH of the sludge remains above 10. The sludge is then dewatered with the aid of conventional methods. The sludge may be heated by direct heat exchange with flue gases. The apparatus for dewatering the sludge is comprised of a first vessel for receiving sludge, a second vessel, a sludge outlet from the first vessel communicating with an inlet to the second vessel, a stirring device in the second vessel, a gas admission pipe, an overflow from the second vessel for maintaining the surface of the sludge at a level below the outlet end of the pipe, means for adding lime, and dewatering means.

INT-0963

Ishigaki, E. (Ishigaki Kiko K.K.). Method of incinerating particulates containing water utilizing fluid layer and its device. Japan 44-9,155; filed Dec. 27, 1965; issued Apr. 26, 1969.

A method of drying and burning material which, like dehydrated sludge, still contains some water even after filtering, uses a fluid layer of nonflammable particulates. When air or gas of a certain velocity is sent through a porous board into the particulate mass, the particulates float evenly and fluidly. If the layer is kept at a high temperature, sludge can be incinerated. Circulation of the fluid layer between the drying chamber and the combustion chamber improves incineration. Windows utilizing the difference in air pressure between the two chambers are the means of particulate circulation. (Text in Japanese)



INT-0964

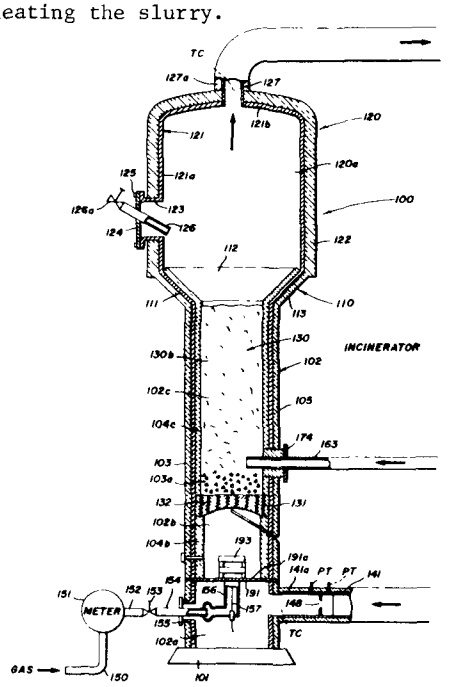
Rohrer, E. Method for the production of fodder from sewage sludge. Switzerland 471,540; filed July 25, 1968; issued Apr. 30, 1969.

Sewage sludge is mixed with refuse compost as a drying agent, and is heated to a temperature between 105 and 160 C. The mixture is then expanded until a sterile end-product is obtained. Experiments have shown that activated sludges, sludges from percolators, and putrid sludges can be used. It was also found that a 10-second expansion renders a completely inert product. It is recommended that the mixture be heated rapidly to a temperature of 110 or 120 C. To protect the equipment, temperatures of higher than 130 C are not advisable. The ratio between sludge and compost should preferably be 10 to 1. Attention must be paid to the moisture content of the mixture which may not be less than 25 percent. The nutritive value of the inert end-product can be increased by adding abattoir wastes to the mixture. Roots and tubers may also be added. The produced fodder is dried with hot air or in a familiar drying apparatus with and without a vacuum. (Text in German)

INT-0965

Metheny, D. E., and G. Gutzeit (General American Transportation Corporation). System for and method of destroying aqueous slurries containing combustible organic waste materials. Canada 813,105; filed Jan. 14, 1963; issued May 20, 1969.

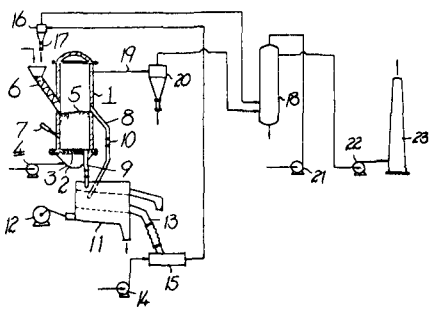
This invention destroys aqueous slurries such as sewage sludges by converting organic waste materials into inorganic ash and gases without the production of noxious gases. Aqueous slurry passes into an incinerator of the fluidized-bed type. The combustion chamber contains a mass of refractory material in the form of discrete particles fluidized by a stream of oxygen. Heat is supplied in order to maintain the chamber's operating temperature in the range of 1,300 to 1,800 F. Any water in the slurry is completely evaporated as the combustible organic materials are burned. The incinerator's upper chamber provides sufficient retention time to ensure complete burning of all combustible organic waste materials in the slurry. The exhaust gases from this process can be utilized for preheating the slurry.



INT-0966

Horikoshi, K. (Ebara Infilco Company). Combustion system with fluid layer. Japan 44-18,153; filed May 26, 1966; issued Aug. 8, 1969.

A device to burn inflammable substances in sewage or industrial sludge without producing odors uses the fluid-layer method. This kind of sludge can usually be completely burned at 350 to 600 C, but the combustion is accompanied by odors in the exhaust gas. Considerably higher temperatures are required to make it odorless. Even with the use of a fluid layer of sand or silica particulates, a minimum of 700 C is required, and the sludge has to be greatly dehydrated. The incinerator must be equipped with a heat exchanger, and must be quite large and therefore expensive. This incinerator contains activated particulates which work as catalysts. It is connected to an overflow pipe which removes excess particulates from the top fluid layer. The bottom discharge pipe is connected with a selector device which selects activated particulates from inorganics. The steel cylinder is lined with fireproof cement, and in the lower part contains a board with many holes, below which is an air chamber connected with the fan. On top of the perforated board, catalyst particulates of cobalt-manganese or copper-chrome fill the container to a

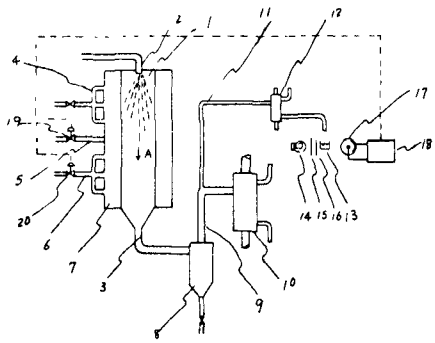


certain height and are made fluid by the air flowing in through the air board. A screw feeder feeds in the waste to be burned and the catalyst particulates. A burner is attached to the sidewall of the incinerator. The discharge pipe is connected with a multistage vibrating sift. The catalyst particulates are sent back to the hopper by an ejector and separating cyclone. The top of the separating cyclone is connected with the bottom of the scrubber. Malodorous gases are oxidized by the catalyst particulate and discharged through the exhaust pipe with the ash. (Text in Japanese)

INT-0967

Hitomi, O., and M. Yamada (Hitachi, Ltd.). Sludge incinerating device. Japan 44-19,597; filed May 17, 1965; issued Aug. 25, 1969.

A sludge burning device can dispose of large quantities of material without being restricted by site size or weather variables. A pipe at the top of the reactor sends sludge into the reactor; one at the bottom of the reactor discharges the burned remnants. Several burners are arranged outside of the reactor. A separator separates out the residual solids after combustion. A photocell controls the burners and gas supply valve, so that sludge can be almost completely combusted and pollution from incinerator output minimized to below the standards. The photocell operates by detecting and analyzing by color the water condensation from the exhaust gas. It consists of a slit, which adjusts to the amount of light emitted by the source, a filter, a photocell, and an amplifier. When sludge burns from its own heat, the burners are automatically extinguished; they are relit when the temperature falls below a predetermined level. (See also Japanese 44-19,237 and 44-2,155) (Text in Japanese)



INT-0968

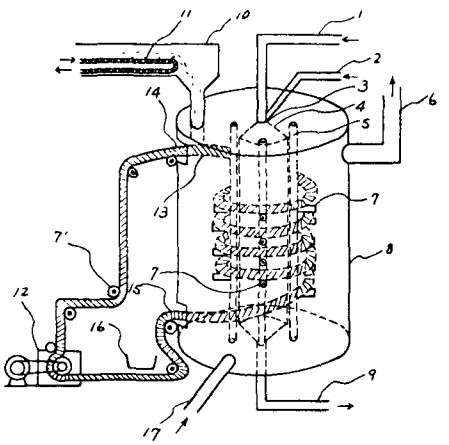
Querio, C. W., R. C. Hultin, W. C. Bauman, and J. L. Teal (Dow Chemical Company). Method for disposal of waste solids. Great Britain 1,163,494; filed June 22, 1967; issued Sept. 4, 1969.

Biologi[illegible]idge solids produced by the treatment of sewage are disposed of in subsurface formations. The sludge is made into a slurry in proportions of 1 to 25 percent by weight and pumped to a well. The slurry is transported to a permeable underground formation having a 5 percent porosity and a minimum permeability of about 10 millidarcies per ft. The slurry is pressure injected at a temperature which will not cause a fracture of the formation.

INT-0969

Yamada, M., and O. Hitomi (Hitachi, Ltd.). Incinerator. Japan 44-20,586; filed July 28, 1964; issued Sept. 4, 1969.

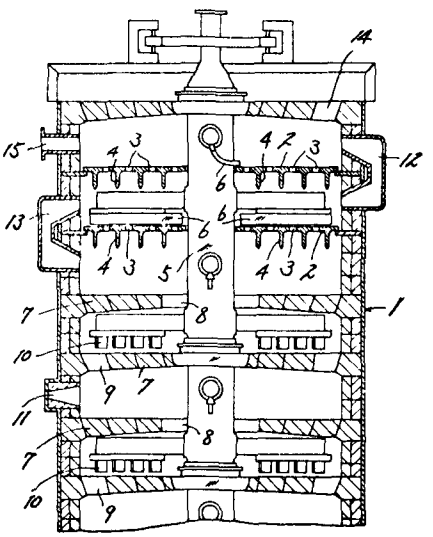
An incinerator is designed to use the heat generated by the burning of garbage to prepare sludge for combustion. Garbage from a hopper is transferred to a stoker on which the garbage is incinerated. The stoker moves spirally around the sludge incinerator. When the sludge incinerator has been sufficiently heated by the hot air rising from the garbage incinerator, sludge is sprayed into the sludge incinerator. When the preheated sludge enters the combustion chamber, it is quickly dried and burned. To prevent the temperature in the chamber from becoming too high, the stoker's speed can be reduced. (See also Japan 44-20-949) (Text in Japanese)



INT-0970

Ozawa, T. (Nihon Gaishi Company). Multi-step incinerator. Japan 44-22,713; filed Nov. 15, 1965; issued Sept. 29, 1969.

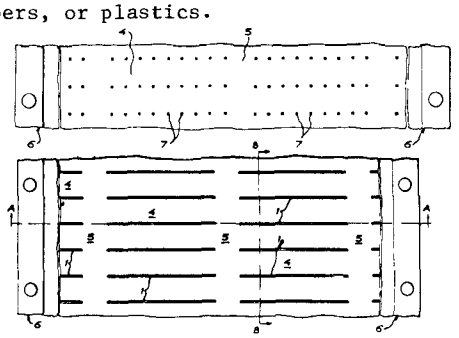
A multistep incinerator can heat, dry, and burn high water content waste such as sludge. When the heavy oil burner is ignited, the garbage is dumped into the incinerator. Bent wings attached to the rotating axis in the center of the incinerator push the sludge through the holes in the top metal grid. Since the conductivity of metal is high, the grid reaches a high temperature, and can evaporate most of the approximately 70 percent water content of the sludge. As the garbage falls through the holes to the second and then to the other grids it is further dried and combusted. These grids are lined with fireproof bricks. The flame gas that heats the sludge passes above the grids before it is discharged from the top exhaust outlet. For a traditional incinererator, the temperature of the exhaust gas is 260 to 300 C, and the fuel used per ton is 70 liters; in this model, the gas temperature is between 240 and 250 C, and the fuel used per ton is about 54 liters. (Text in Japanese)



INT-0971

(Trelleborgs Gummifabriks Aktiebolag). Improvements in or relating to screens for removal of liquid from sludge materials or the like. Great Britain 1,166,940; filed Jan. 6, 1967; issued Oct. 15, 1969.

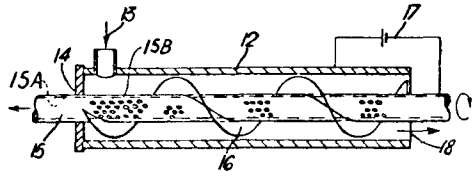
A screen assembly for the removal of liquids from sludge materials comprises a frame, at least two webs of resilient material, and a means of defining slits in the webs. One of webs, in relation to the other web, is prestressed in the direction of the slits. The webs are: superimposed, one upon the other; interconnected over their entire surface with the slits opposite each other; and connected with the frame. The screen may be formed of natural rubbers, synthetic rubbers, or plastics.



INT-0972

Coackley, P. (Motherwell Bridge and Engineering Company, Ltd.) Improvements in or relating to apparatus for use in de-watering sludge. Great Britain 1,170,413; filed Oct. 8, 1965; issued Nov. 12, 1969.

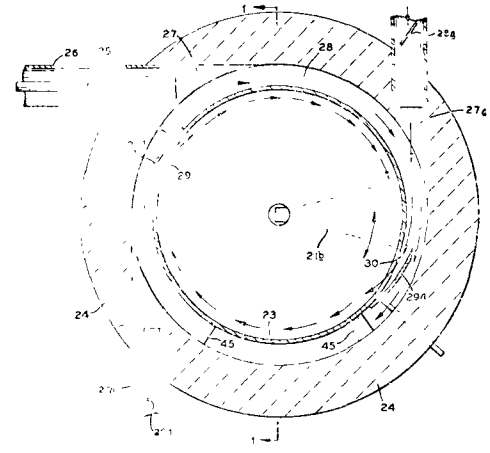
This dewatering apparatus rapidly dries relatively large quantities of sludge. An elongated electrode device is positioned within a hollow electrode device. The tubes comprise a through passage for sludge. A rotary blade system forces sludge through the passage, and the ducting consists of the tube bore and perforations in the tube wall. The electrodes respectively serve as anode and cathode to cause an electro-osmotic flow of water from the sludge.



INT-0973

(Dorr-Oliver, Inc.). Refuse incinerator. Great Britain 1,172,571; filed Jan. 19, 1967; issued Dec. 3, 1969.

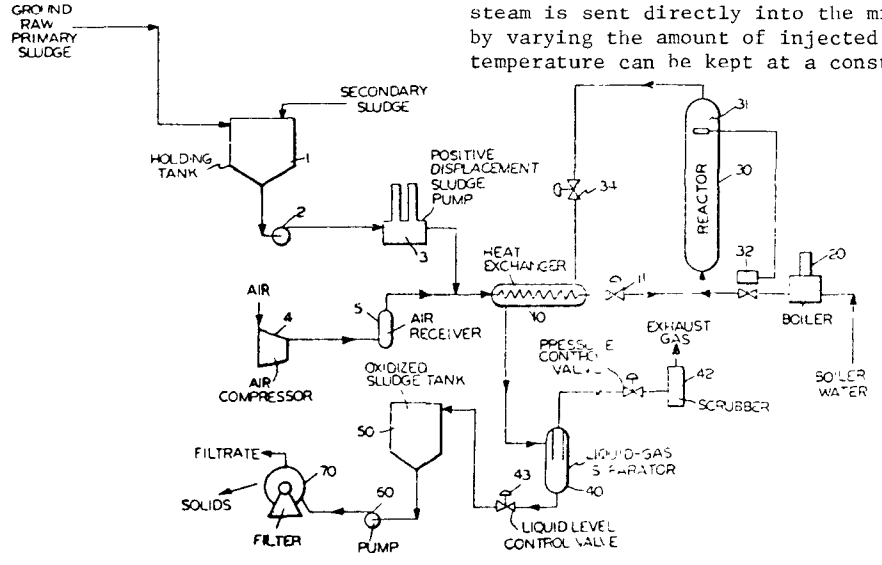
This sewage sludge incinerator is suited to the needs of small communities requiring an inexpensive means of burning sewage sludge. A cylindrical combustion chamber is positioned within a housing. Hot gases, under pressure, are directed into the space between the chamber and the housing. A movable sprayer feeds organic material into the combustion chamber, where hot combustion gases effect burning of the feed material. The sprayer repetitively traverses the combustion chamber to prevent any buildup of unburned waste material in the combustion chamber.



INT-0974

(Sterling Drug, Inc.). Partial wet air oxidation of sewage sludge. Great Britain 1,173,654; filed Feb. 23, 1967; issued Dec. 10, 1969.

This partial wet air oxidation process is conducted under nonautogenic conditions. The reaction temperature is maintained at a constant level by preheating the sludge to a temperature not exceeding 150 C. Next, steam is sent directly into the mixture, and, by varying the amount of injected steam, the temperature can be kept at a constant level

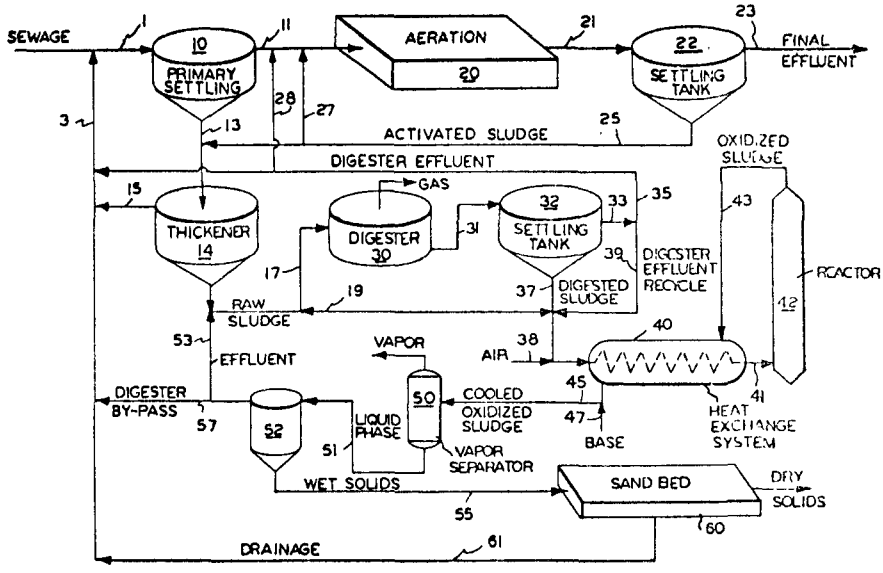


of from 160 to 185 C. This process reduces the COD of the sludge by 5 to 45 percent. There is always sufficient air present to maintain gaseous oxygen in the oxidized mixture. This process provides trouble-free operation, with minimum supervision, and low-cost equipment.

INT-0975

Teletzke, G. H., and E. M. Pogainio (Sterling Drug, Inc.). Sewage treatment process. Australia 400,186; filed May 11, 1965; issued Dec. 17, 1969.

A sewage treatment plant employing a gas anaerobic digester and a wet air oxidation system can effectively utilize the effluent from the wet oxidation process. The plant can also recycle the effluent to the digestor as an acceptable nutrient for the digestor organisms, if the oxidizing is carried out in a way that reduces the COD of the sludge by less than 55 percent. To do this, the sludge is subjected to wet air oxidation at a temperature of at least 120 C under pressure and in the presence of excess oxygen. The process separates the resulting liquid effluent and the undissolved solids, and cools at least a portion of the effluent to a temperature between 75 and 108 C; after this the cooled portion is returned to the digestor. Not only the amount of cooling is regulated, so as to maintain the digestor at a constant temperature between 30 and 60 C, but also the amount of ammoniacal nitrogen that is returned to the digestor by the effluent is regulated so as to maintain the ammoniacal nitrogen content of the digestor below 1.0 g per liter. In a variation of the process, the ammoniacal nitrogen may be separated from the effluent by evaporation, and a nonvolatile base may be added to the effluent prior to evaporation. Residual solids are concentrated and dried by filtration.



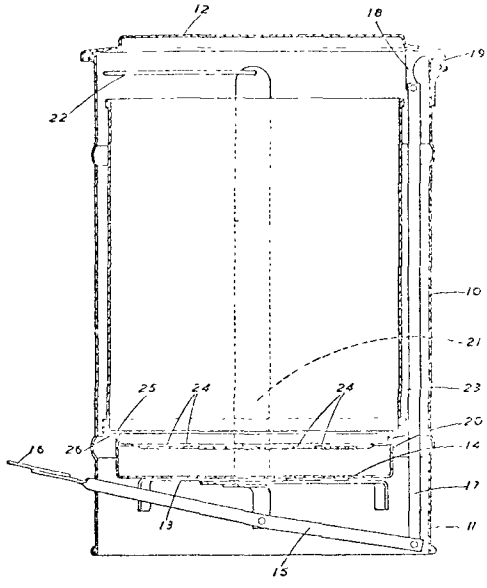
STORAGE

INT-0976

MacKenzie, A. K. (Amac Refinements Limited). Improvements in or relating to refuse bins. Great Britain 618,756; filed Dec. 3, 1946; issued Feb. 25, 1949.

This refuse bin has an external casing with a removable lining. The bottom of the liner is perforated, and a drip tray is provided beneath it with a handle extending above the level of the top of the liner. The drip tray and liner may be removed as a unit from the external casing. The bottom of the liner and the wall of the drip tray have complementary conformations, so the bottom of the liner fits in the

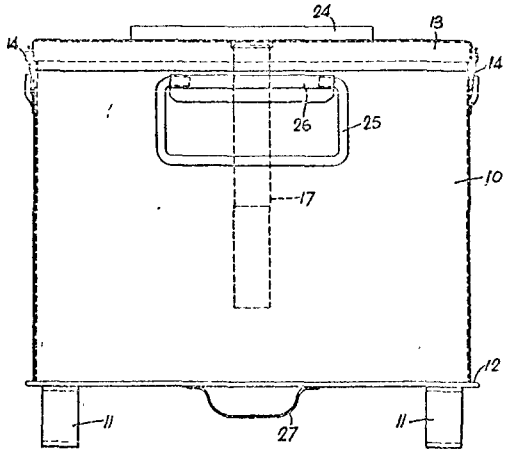
drip tray and is retained against accidental displacement.



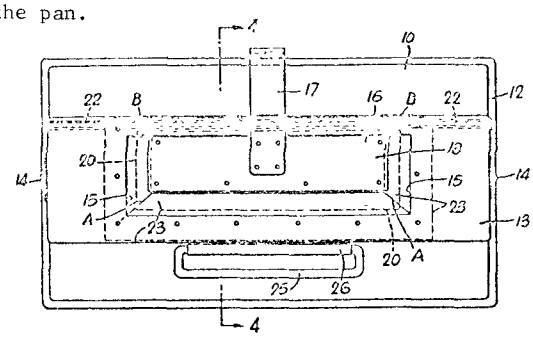
INT-0977

Northover, G. H. Improvements in or relating to receptacles for ash or other waste matter. Australia 133,823; filed Apr. 11, 1947; issued Aug. 11, 1949.

The container, which is tapered to the top, is adapted to receive and hold ash or other waste introduced through an inlet. The aperture is closed by a hinged flap that will open to admit the ash pan through the flexible sealing means (such as strips of felt, or asbestos) which are around its edges, and seal it when the flap is closed. The whole lid of the container, which has the aperture



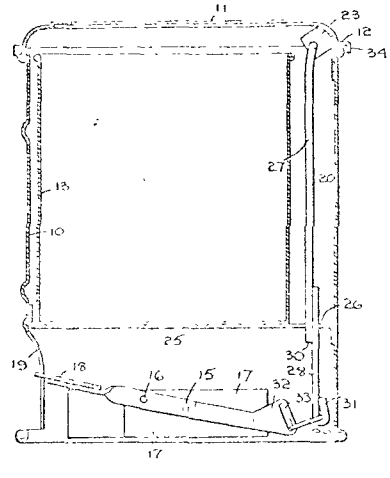
within it, is removable. The container is supported on runners that facilitate tilting from vertical to horizontal position. The device has a bucket-type carrying handle, and a handle on the bottom to facilitate emptying. To empty an ash pan, the container is tilted to a horizontal position, and the pan is inserted in the aperture. When lifted to a vertical position, the ash slides out of the pan into the container. Also, as the container is lifted to the vertical position, the flap closes, preventing the escape of the ash. The sealing strips sweep the ash from the pan.



INT-0978

Neale, W. Improvements relating to refuse bins. Great Britain 634,061; filed Mar. 24, 1949; issued Mar. 15, 1950.

The improvement applies to a bin with a removable container and hinged lid attached to the body. It provides several designs whereby a pedal opens the lid until a second operation causes it to close. This is due to a pivotal link connection which passes over a center point when the pedal is depressed. Pressing the lever again moves the rod upward, returning the lid over the center and allowing it to close by gravity. Alternatively, the lid

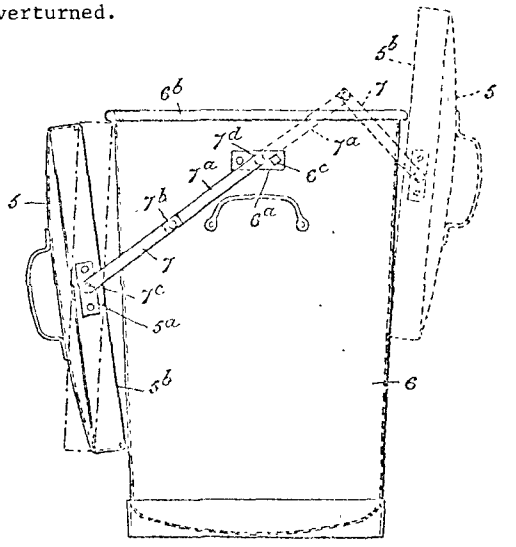


may be opened by means of a tension, compression or torsion spring. These operations can be effected by means of a cam plate interposed between the pedal and the lid. Its rotation causes the lid to assume the 'opening' or 'closing' position. The link on the bin may alternately support the lid in the two open positions, when the pedal is pressed a second time.

INT-0979

Treece, J. W. Improvements relating to refuse collecting bins. Great Britain 634,021; filed Mar. 4, 1949; issued Mar. 15, 1950.

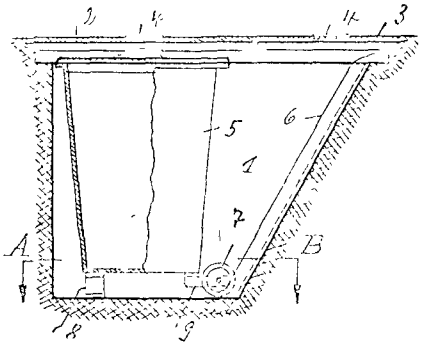
An improved lid is attached to the refuse bin to prevent complete detachment from the bin, while allowing for the uncovering requisite for emptying. A pair of foldable linkages are attached diametrically opposite. One is on each side of the bin comprising two parts whose ends are pivoted to the rim of the bin and the lid, and sufficiently long to allow raising the lid for the introduction of refuse. The lid can also be moved laterally to the side of the bin during emptying. The lid will remain closed even if the bin is inadvertently overturned.



INT-0980

Jakob, F. Storage method for garbage cans. Germany 838,266; filed Dec. 8, 1950; issued May 8, 1952.

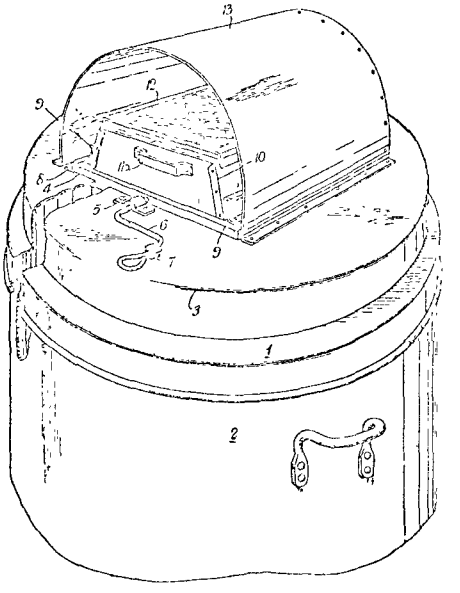
A storage method has been devised in the form of a coverable shaft for garbage cans equipped with rollers which run on a rail. The shaft is under the ground and covered by two lids. To empty the garbage can, it is taken by its two handles, removed from the worm screw spindle with which it is fastened to the shaft neck, and rolled out. By this method of storage, the garbage cans are not immediately visible and require no space above ground. The shaft wall on the side of the rail is slightly inclined for simpler removal. (Text in German)



INT-0981

Moon, P. H., H. Hindson, and H. C. H. Archer. Garbage containers. Great Britain 717,839; filed Nov. 24, 1952; issued Nov. 3, 1954.

Introduction of garbage into a container is achieved by means of a flat-topped, circular, detachable lid with an aperture, fitted on the upper rim of the container. Fitted within



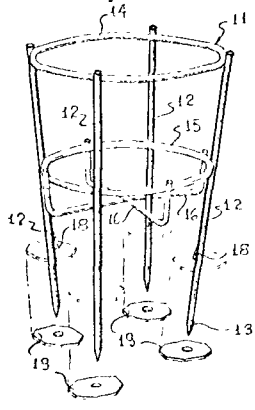
the aperture is a platform which can rotate 180 degrees about a horizontal pivot bar, the end of which is bent to form a crank. A rectangular receptacle with converging walls is

fitted onto the platform, so that it can be removed by sliding along two guiding flanges. The top of the receptacle has a sliding, removable sieve. The entire superstructure is covered by a protecting hood. Garbage and other refuse is placed into the receptacle, which is then emptied by rotating about the pivot with or without the sieve cover (which separates ashes from cinders) in place. Rubber gaskets may be fitted around the edges of the platform to better seal the aperture edges.

INT-0982

Kilian, C. Garbage can stand. Canada 507,888; filed Jan. 28, 1954; issued Dec. 7, 1954.

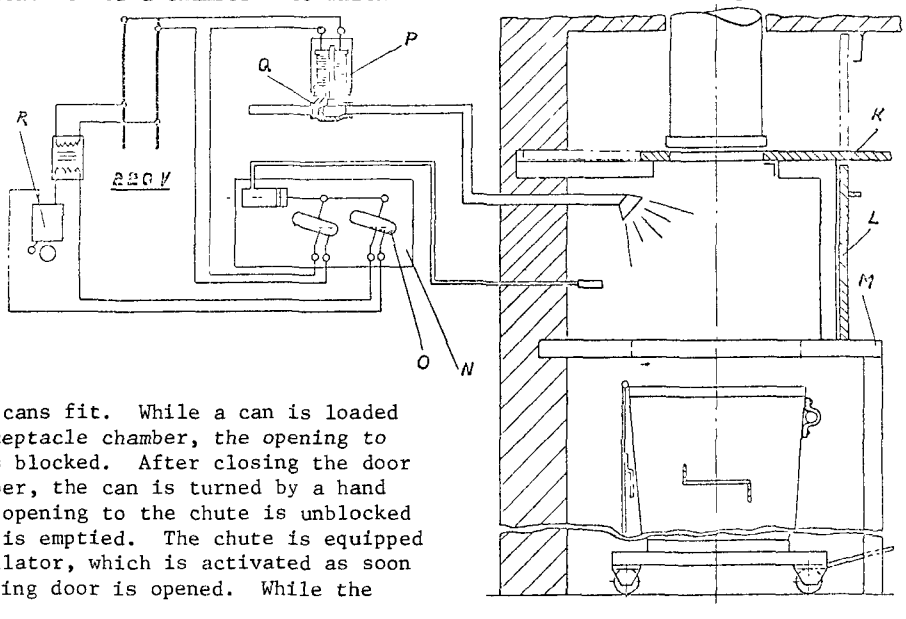
A support for an outdoor garbage can or similar receptacle comprises two horizontal rings with a number of legs arranged about the exterior of the rings so one ring is near the upper end of the legs, and the other is near the middle. The lower end of each leg is provided with a point for penetration into the ground. A pair of crisscrossed bars are positioned among the legs and below the lower ring. Between the pointed lower ends of the legs and the lower ring, fixed, horizontal lugs project. When apertured stop plates are slid onto the legs and engaged with the lugs, the penetration of the pointed ends of the legs into the ground is limited. The garbage can rests on the crisscrossed bars and cannot be accidentally toppled by winds or by animals.



INT-0983

Moers, W. Domestic refuse storage system. Germany 923,331; filed Nov. 13, 1951; issued Feb. 10, 1955.

A storage system for refuse in apartment houses consists of a rotary receptacle for garbage cans, a chute, and a pipe leading to a container or storage bunker. The drum-shaped receptacle consists of a chamber into which the garbage cans fit. While a can is loaded into the receptacle chamber, the opening to the chute is blocked. After closing the door to the chamber, the can is turned by a hand wheel. The opening to the chute is unblocked and the can is emptied. The chute is equipped with a ventilator, which is activated as soon as the charging door is opened. While the garbage can is emptied, the chute is flushed with water. The end of the chute is equipped with a grate which catches the falling refuse. The door to the storage bunker can be opened only when the end of the chute is closed. A heat sensor in the refuse storage bunker initiates a fire extinguisher and an acoustic alarm at the outbreak of a fire. The extinguisher is automatically shut off after the fire has been extinguished. (Text in German)

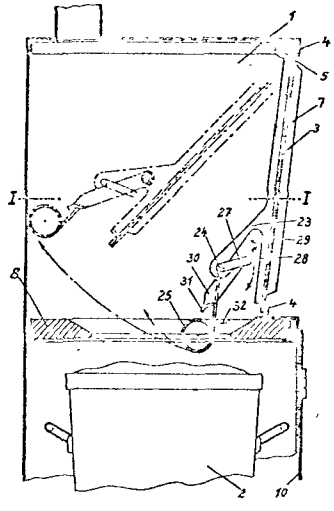


Storage

INT-0984

Gutmann, M., and G. Zeune. Closure and locking device for waste receptacles. Germany 1,024,010; filed May 9, 1956; issued Feb. 6, 1958.

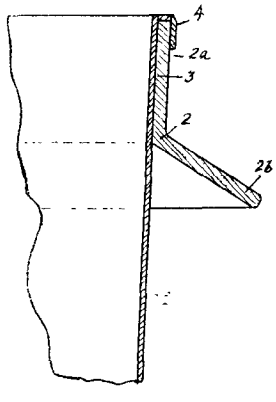
The device closes a receptacle when filling is completed. It consists of a rectangular frame with removable walls which enclose the waste receptacle. The receptacle is equipped with a door and a funnel-like device to guide the incoming waste, which closes and locks automatically when the level of material reaches the top. The inner side of the closure door is equipped with arms which can be swiveled horizontally, engaging hooks which are in turn attached to the guide. (Text in German)



INT-0985

Linde, H. Garbage can. Switzerland 334,545; filed Jun. 8, 1955; issued Dec. 15, 1958.

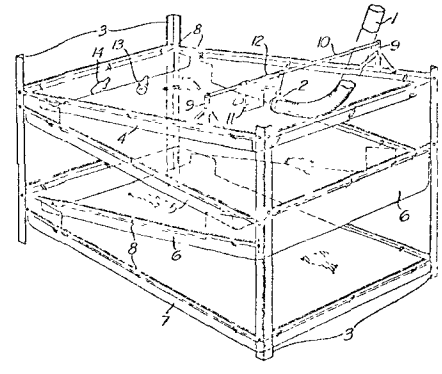
The garbage can consists of galvanized sheet steel with a fortification ring around its opening. A flange is attached to the ring at a 120-degree angle. The ring, which is made of angle iron, protects the can against the strain of automatic emptying devices. Prior to galvanization, the can is dipped into a pickling bath. The fortification ring and can are welded together in the outside angle between flange and can. (See also Germany 1,073,942) (Text in German)



INT-0986

Shimeild, G. R., and J. K. Shimeild (George Shimeild and Sons). Article disposal means. Great Britain 809,223; filed Feb. 20, 1957; issued Feb. 18, 1959.

The invention provides a disposal unit to collect empty bottles discarded from a bar. Empty bottles are thrown into a chute which projects into a rectangular framework in which a number of supporting wire mesh shelves are positioned. The shelves are arranged alternately in zig-zag fashion to extend from one end of the container to the other, downwardly inclined to form a guideway, so the articles drop to the bottom for further disposal.



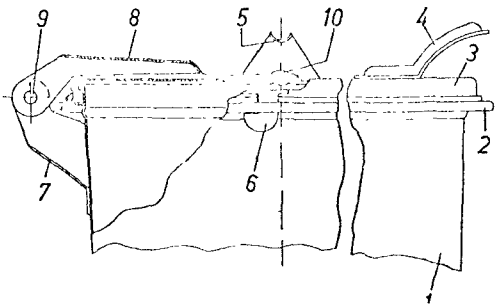
Spring mountings assist the descending movement of bottles. The end of the chute is provided with a pivotally mounted flap, against spring bias, as a shock absorber against the impact of falling articles.

INT-0987

Borchard, F., and E. Goetz (Eisenwerk Streuber and Lohmann G.m.b.H.). Locking device for garbage can covers. Germany 1,065,323; filed Jan. 9, 1958; issued Sept. 10, 1959.

The garbage can is provided with a rim lip, a cover with a carrying handle, a spout, and hooks. The cover is attached to the lower part of the can by a rivet and hinge. In the center of the cover a stopcock connects (by turning) with the hooks in the under part of the cover. These hooks connect with bolts in slits which limit the rotation of the

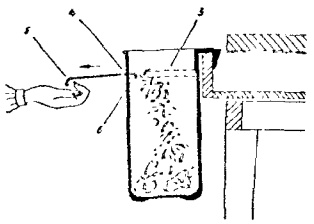
cover. In the locked position, the cover is provided with an eccentric device with connections to the hinge of the cover. (Text in German)



INT-0988

Lerch, I. R. Box-shaped garbage receptacle. Germany 1,095,740; filed Oct. 14, 1959; issued Dec. 22, 1960.

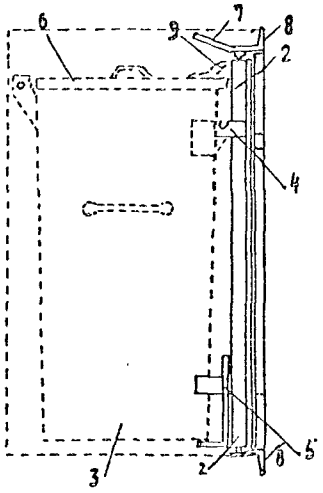
The receptacle is made of plastic or stainless metal. Garbage is thrown into the top of the open container, which is separated from the bottom by a movable cover. This newly introduced garbage can be transferred to the bottom portion by sliding the movable cover outward. The cover is prevented from sliding out entirely by the angle provided at the pertinent end. However, this safeguard is only applicable to the horizontal position; the cover may be removed entirely by turning it downward through an angle of 90 degrees. The receptacle is also provided with an outwardly projecting U-shaped device for hanging the receptacle on a cupboard door. (Text in German)



INT-0989

Brandhoff, H. (Firma Heinrich Brandhoff). A device for holding down the cover of a refuse container provided with doors. Germany 1,098,444; filed Mar. 31, 1959; issued Jan. 26, 1961;

The door of the container is fastened to a column so that it can be swung. In the interior of this container, the refuse barrel is inserted and secured by holders. The cover is held on top of the barrel by a piece of sheet metal projecting from a metal device built over the column. It is located at an angle, so in case refuse forces the cover open, pressure is exerted by this device to

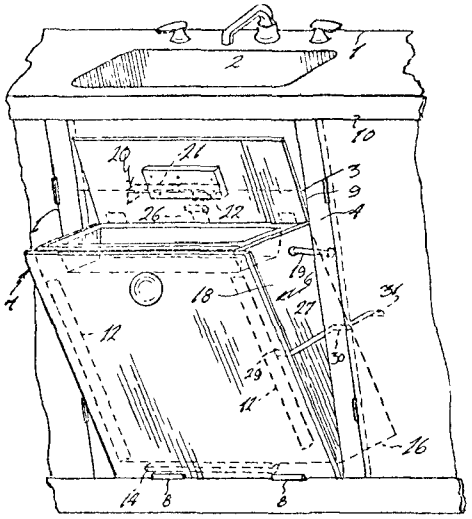


press the lid downward. (See also Germany 1,049,772 and 1,072,188) (Text in German)

INT-0990

Goodchild, T. A. Removable bin for garbage disposal. Canada 613,446; filed Feb. 22, 1958; issued Jan. 31, 1961.

A garbage disposal canister is adapted for use within conventional cabinets. The unit is comprised of a bin combined with a lid, hinged to its rear edge. A support plate is hinged to the base of the associated cabinet, with guides on the inner face of the plate adapted to slidably receive and support the bin. A device is secured to at least one side of the cabinet. This is adapted to position the bin

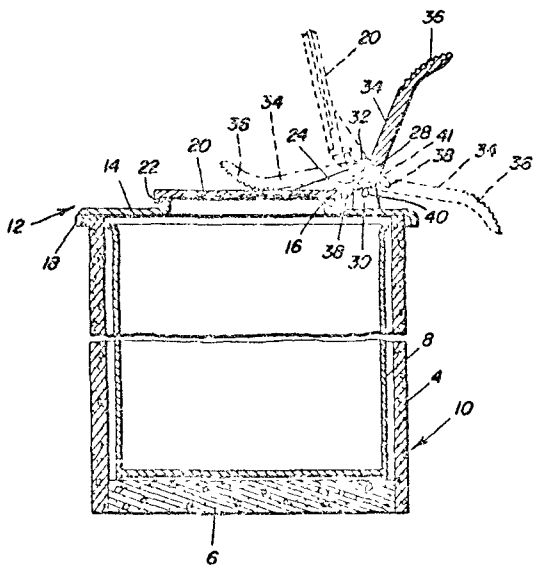


selectively in a number of open positions. There is also a device comprising a resilient bracket. This bracket is secured by one end to the inner face of one side of the plate, and a pair of detents secures the bracket in the middle and on the other end. Each of these detents engages the inner surface of the side of the cabinet when the plate is opened, and is manually disengageable, permitting the plate to open to a wider position for removal of the bin. The latch cooperates between the bin lid and the cabinet, and is adapted to open the lid when the plate and the bin are pulled open.

INT-0991

Littleton, H. R. Garbage can and cover. Canada 621,072; filed Feb. 12, 1960; issued May 30, 1961.

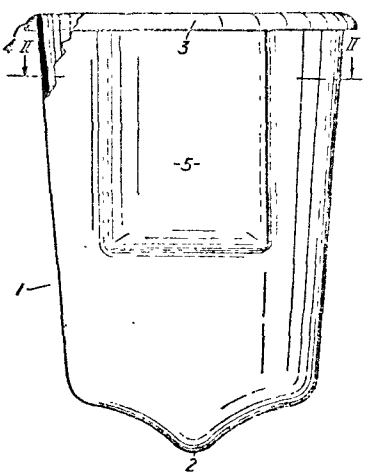
The garbage can described is suited to be used under the ground. It consists of terra cotta or concrete tile, embedded in the ground with the upper end projecting, into which an ordinary garbage can or other receptacle can be placed. The cover fits over the upper end of the tile. It can be made of aluminum, and fitted to make the container watertight. The lid forms the central part of the cover, and it rests on a raised inner lip. The pedal is on the cover, and may be used foot or hand, depending on whether the can is submerged. The lid is constructed so that it will not 'flop over' when raised.



INT-0992

Boone, J., and K. J. Foinquinos. Improved refuse and the like containers and methods of producing the same. Australia 234,840; filed Sept. 30, 1959; issued Aug. 4, 1961.

A refuse container has an inner, noncorrosive surface layer of a thermosetting resin, and an underlying layer of a fire-resisting material, integrally incorporated into the body of the container. The inner layer consists of a coating of a polyester, epoxy, or formaldehyde resin, reinforced by glass fiber. The underlying layer consists of anodized aluminum foil. The whole container is molded of a polyester resin reinforced with glass. If the contents catch fire, the inner surface coating will burn away, but the fire-resistant layer will prevent the spread of the flames. To produce this container, the mold must first be coated with a surface layer of thermosetting resin, and then a layer of fire-resistant material while the resin is still uncured. More resin is added over the fire-resistant layer, and when it is cured, the container is ready for use.

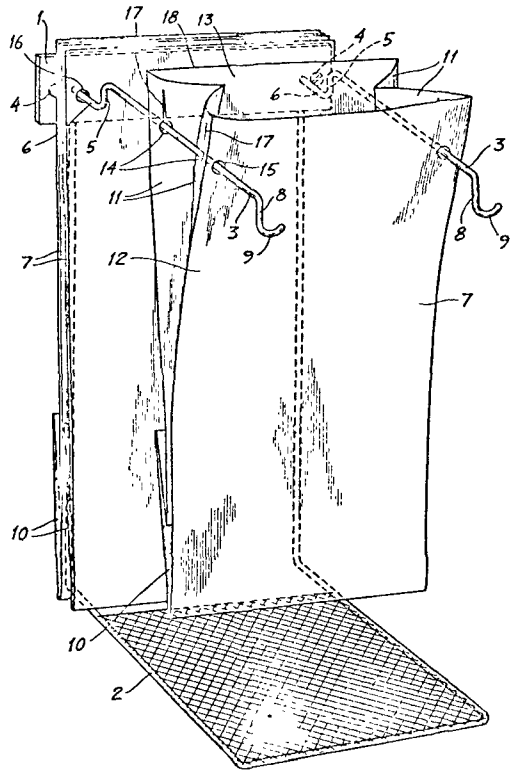


INT-0993

Franson, O. E. (Munksjo Aktie Bolag). Refuse container. Germany 1,133,667; filed Mar. 15, 1961; issued July 19, 1962.

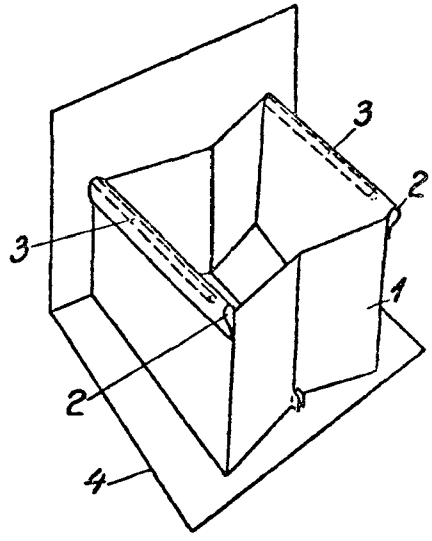
A refuse container is comprised of a bag with inwardly folded sidewalls and a flat bottom. There are openings in the front and rear walls, and in the sidewalls, for suspension from carrier rods, etc. The openings in the sidewalls are slots or oblong holes extending in

the direction of the refuse inlet. (Text in German)



INT-0994

Nissen, J. F. V. (Bates Ventil Saekke Company A/S). Waste container made of paper or similar material. Germany 1,136,268; filed May 19, 1959; issued Sept. 6, 1962.

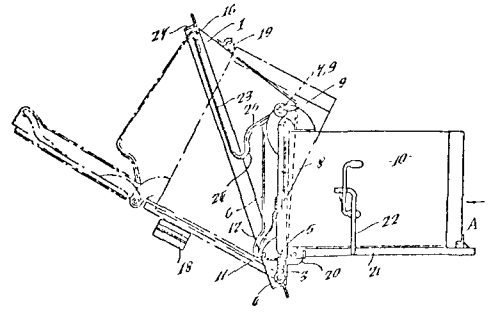


The container, when unfolded, is of rectilinear shape, closed at one end, and proportioned so that it can be used either standing on a horizontal surface, or hanging from a horizontal bar passed through one or both rolled ends of the upper lips of the bag. Alternately, the upper ends can be bent to provide a means of hanging. Reinforcement of the upper ends can be provided by tubes passed through loops attached to the top edges of the bag. (Text in German)

INT-0995

Allchurch, S. (Shefflex Limited). Improvements in or relating to apparatus for the collection of refuse from buildings. Great Britain 937,772; filed Jan. 19, 1961; issued Sept. 25, 1963.

This apparatus is for the collection of refuse from buildings having at least one upper floor. A chute has at least one refuse bin receiver for each story of the building. Each refuse bin receiver has an apertured shutter and a closure flap. The shutter is



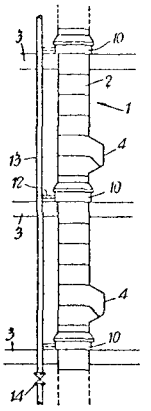
pivotally mounted in the receiver. The closure flap is mounted relative to the shutter so an inverting pivotal movement of a refuse bin, which engages with the shutter, will pivot the shutter and simultaneously open the closure flap. This puts the interior of the bin in communication with the chute. The bin receiver is composed of a closing hood with parallel sidewalls, and a rear opening. The apertured shutter is hinged at the lower edge of the opening, and extends upward from it. A movable extension is formed from the free edge of the shutter to the upper edge of the hood opening. This extends laterally between the sidewalls of the hood, to permit the shutter to be swung into the chute without dust escaping. The shutter is formed with an inlet aperture, which is closed by a flap pivoted to the upper end of the shutter. This is designed to engage with a hinged lid of a refuse bin to be emptied. When the refuse bin and its lid are engaged with the shutter

and flap, respectively, and tipped up, the shutter swings inside. The pivoted flap swings away, carrying the refuse lid with it, allowing the bin to be emptied into the chute.

INT-0996

Palmer, H. L. (True Flue Limited). Improvements in or relating to refuse chutes. Great Britain 940,638; filed July 12, 1961; issued Oct. 30, 1963.

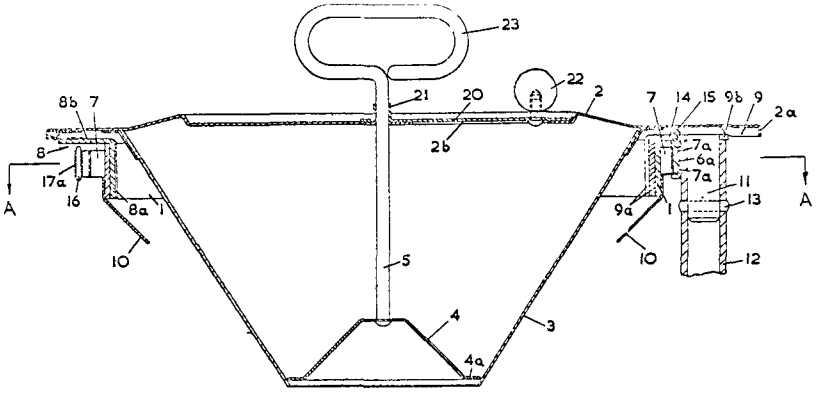
A chute supplied with a number of hoppers for refuse disposal has a number of selected zones at which one or more nozzles are situated. The nozzles are coupled to a source of water, so that water may be discharged into the interior of the chute to wash or sluice the walls. The nozzles are coupled to a common supply pipe so it is possible to adjust one valve to control the supply of water to all nozzles. The nozzles are set in from the walls, and positioned in bores. The portion of the chute immediately above the bore overhangs the nozzle disposed in the bore.



INT-0997

Wheeler, L. S. (Arthur Shaw and Company Limited). Improvements in, or relating to, refuse collectors. Great Britain 957,001; filed Jan. 22, 1963; issued Apr. 29, 1964.

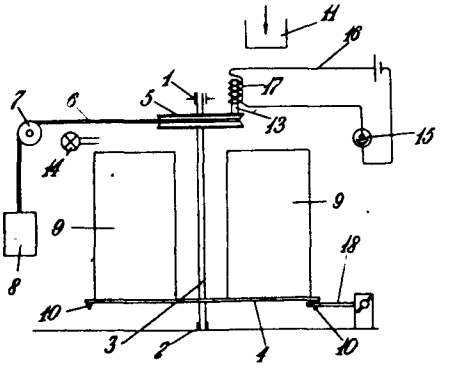
This refuse collector is composed of a lid and an internal receptacle which is made of incombustible material. It is adapted to receive and retain hot refuse temporarily while it cools. It will discharge its cooled contents into a sack detachably secured to and around the holder. The receptacle is liftable with the lid to enable unheated refuse to be deposited directly into the sack through the holder. The holder has an opening in its lower end which is controllable to enable refuse to be retained within or discharged from the receptacle, or discharged into the sack. The receptacle is an inverted frustoconical shape, placed within the holder with its larger end at the top. The lower end has a closure seated upon and around the internal surface of the receptacle. The closure is carried by a plunger which extends through the lid, and which has a handle provided above the lid. A resilient band is placed around and outside of the holder, to grip the mouth of a sack inserted between the holder and the band.



INT-0998

(Norrkoepings Stads Stiftelse Hyresbostader). Arrangement for changing refuse containers below refuse. Great Britain 959,966; filed June 15, 1962; issued June 3, 1964.

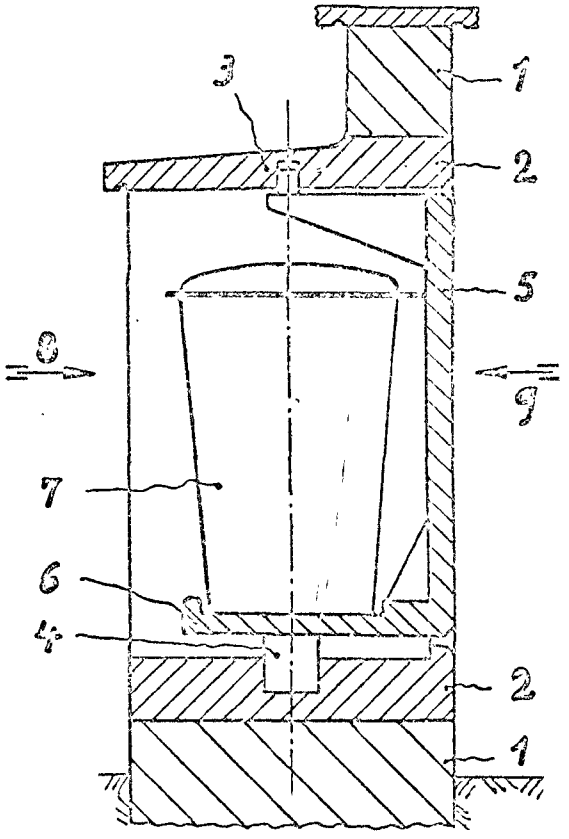
An arrangement for changing containers in a chute comprises a number of refuse containers disposed in a ring on a turntable, and arranged above its vertical axis. There is an arrangement for rotating the turntable so that the containers are brought, in turn, beneath the refuse chute. They remain there until a release mechanism initiates the rotation of the turntable. The release mechanism comprises a light beam passing over the upper edge of the container, situated in the filling position, and acting in an intrinsically known manner on an electric cell. The light beam is interrupted by refuse projecting above the edge, and initiates the rotation of the turntable so that the next container is brought beneath the refuse chute. When this container is in position, the turntable stops.



INT-0999

Kaiser, F. Refuse bin. Germany 1,204,381; filed Nov. 12, 1963; issued Nov. 4, 1965.

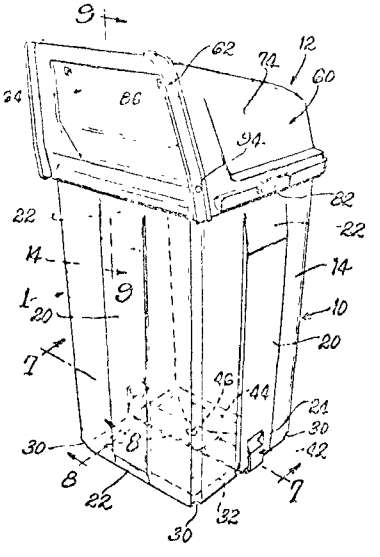
A refuse bin, built into a brick container, is reached from house or street. It has a plate swivelling around a vertical axis in the bin center so as to normally close the street-side bin opening and also close the house-side opening once swung through 180 degrees through a suitably and expressly excised sidewall of the bin. (Text in German)



INT-1000

Martino, L. J., R. E. Weimer, and W. E. Moll (McDonald's System, Inc.). Waste receptacle. Canada 745,464; filed Apr. 23, 1965; issued Nov. 1, 1966.

This waste receptacle is comprised of an upright thermoplastic container having four sides defining an open top, a bottom, and an inverted U-shaped lip circumscribing the top. A hood is releasably snap-connected

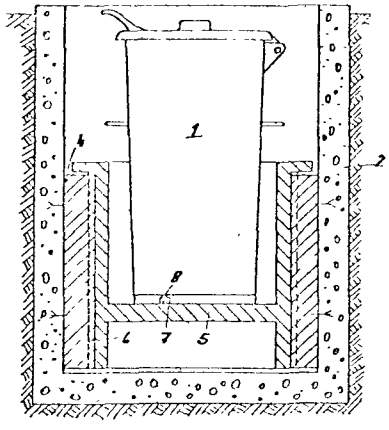


to the lip, and consists of a thermoplastic body with a top, a back, two sides, and an open front and bottom. Connected to the open front of the hood body by beads is a four-sided thermoplastic doorframe that has a central window and inclines downwardly and inwardly with respect to the body. A door normally closes the doorframe window, but it is swingable at its top so that the window may be opened to receive trash. This receptacle is light, easy to handle, and conveniently maintained and cleaned. It is appropriate for use in outdoor locations such as in the vicinity of outdoor restaurants.

INT-1001

Beckmann, D. Refuse bin enclosure. Germany 1,236,763; filed July 5, 1963; issued Mar. 16, 1967.

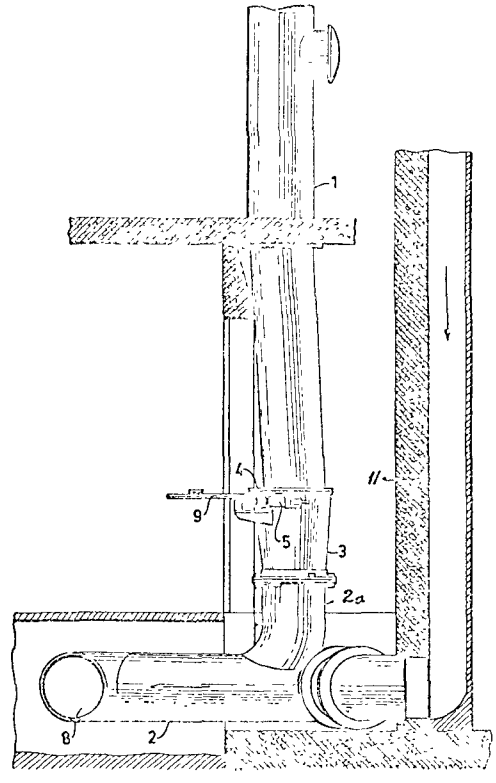
The enclosure consists of a shaft whose threaded sleeve enables a platform to travel up and down in the shaft. The platform forms an externally threaded bottom insert in a cylinder and may connect with the bin. The threaded components are made of self-lubricating plastic, or are suitably coated. (Text in German)



INT-1002

Hallstroem, O. H. Device for periodic removal of refuse. Switzerland 429,580; filed Apr. 5, 1965; issued July 31, 1967.

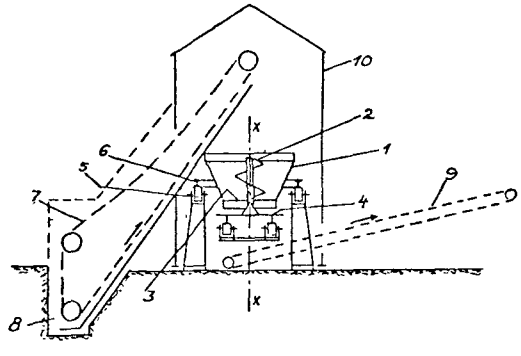
This device is comprised of a valve housing connected to the lower end of a refuse disposal chute. A sliding valve body is arranged at the upper portion of the valve housing. The cross sectional area of the upper portion of the valve housing extends outside the cross sectional flow area of the chute, and includes an air inlet slot outside the flow area. This slot is covered by the sliding valve when in a closed position, and uncovered when the sliding valve body is in an opened positions. (Text in German)



INT-1003

(Fredenhagen Kommanditgesellschaft). A refuse bunker with a stationary supply conveyor. Germany 1,246,632; filed Apr. 9, 1963; issued Aug. 10, 1967.

A refuse bunker is equipped with a stationary supply conveyor and constructed to rotate

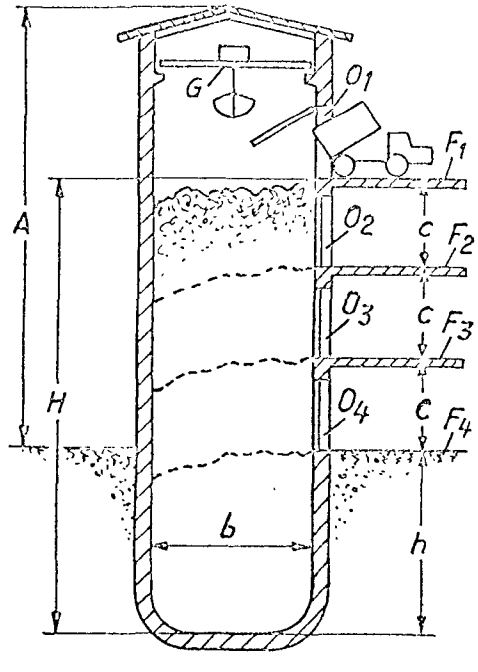


about the conveyor, or move longitudinally with respect to the conveyor. The floor of the bunker is provided with an opening for waste removal. This opening may be shut. The opening is circular, and the bunker can be revolved about a vertical axis. For emptying, this axis has a spiral conveyor installed over the opening in the bottom of the bunker, and attached to a revolving plate. Refuse is brought into the bunker by the conveyor belt, and can then be distributed evenly by means of the rotatory motion. (Text in German)

INT-1004

Hannemann, B. (Von Roll A.G.). Dumping bunker for refuse to be incinerated. Switzerland 439,684; filed Apr. 14, 1966; issued Dec. 29, 1967.

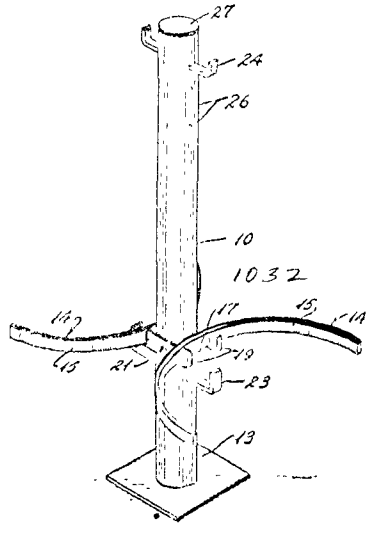
A ferroconcrete dumping bunker, for storing refuse to be incinerated at different times, is deep and rectilinear in cross section, and is provided with openings on at least one side to receive refuse at a number of levels. These openings have gates adapted to receive material from refuse trucks. For access to and from these openings, platforms that can accommodate garbage trucks and allow garbage to fall into the bunker without overflowing are provided. The ramp for the use of these trucks at the different levels must be unidirectional. The gates must be operated by the activation mechanism so that only one gate is opened for the incoming truck. (Text in German)



INT-1005

Alissandratos, T. D. (Albeni Corporation). Refuse can holder and support therefor. Canada 780,216; filed Sept. 18, 1964; issued Mar. 12, 1968.

A support for containers is made up of a bracket, mounted above and on a post supported in the ground. The bracket supports the containers vertically and laterally, and comprises radially spaced arcuate flanges connected at the bottom to define a U-shaped groove. Further support is provided by an L-shaped bracket at the top of the post, which acts as a hook. With the aid of this device, garbage cans may be supported off the ground, and yet be readily removed for transportation or emptying. (See also Great Britain 1,133,792)

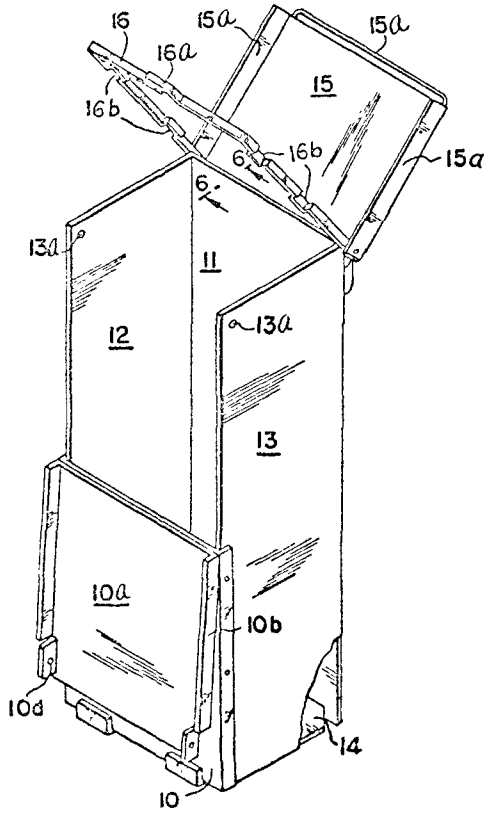


INT-1006

(International Paper Company). Improved refuse bag holder. Great Britain 1,106,673; filed Feb. 9, 1965; issued Mar. 20, 1968.

A disposable refuse bag holder comprises four connected components, disposed to define a rectangular opening. There is a movable lid disposed over the opening, and a hinge connected to one end of the lid and mounted on one of the components. A U-shaped, disposable refuse bag-clamping bar has its opposing sides and a web disposed under and against

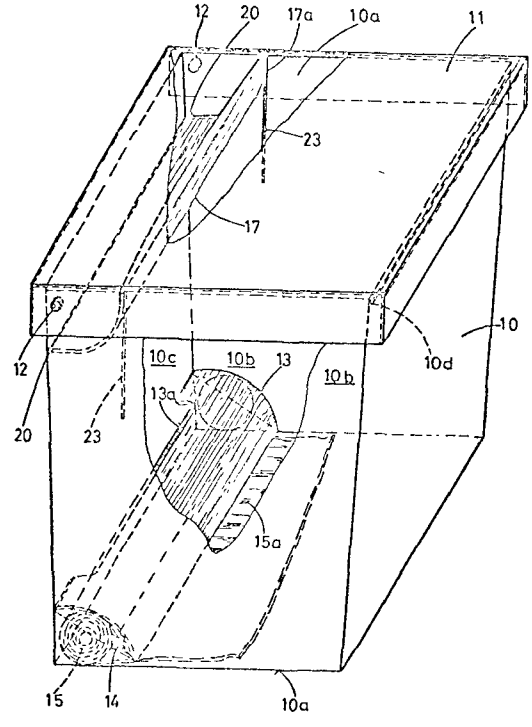
the lid, and at least one pair of opposing protuberant devices disposed on the sides.



INT-1007

Steinbach, S. (Gerdes and Company). Plastic household bin with a lid to serve as a garbage container. Switzerland 461,359; filed May 16, 1967; issued Aug. 15, 1968.

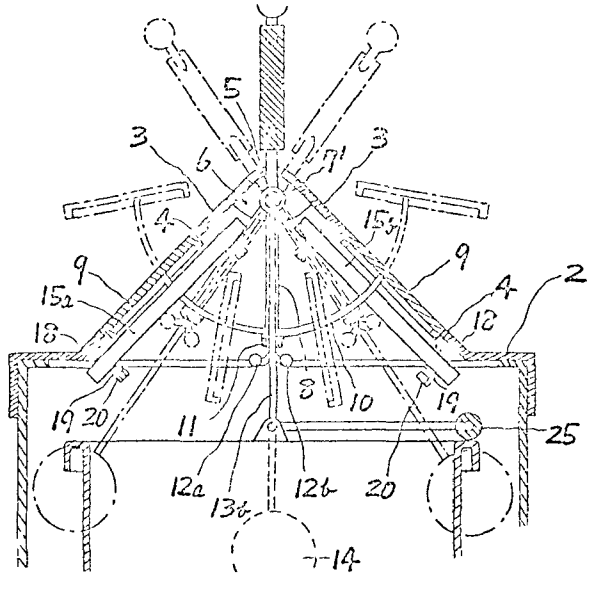
The bin is provided with a plastic bag for temporary storage of garbage. Inside, at the rear wall and the bottom of the bin, a pocket-like compartment, separated from the rest of the interior of the bin by a pivoted, curved, convex louver, holds a supply roll of individual plastic bags. The bags are joined consecutively along transverse perforation lines. The bags can be pulled out into the interior of the bin through the space between the bin's bottom and the lower edge of the louver. (Text in German)



INT-1008

Asaoka, I. Garbage box with chimes. Japan 41-2,148; filed Mar. 15, 1965; issued Jan. 29, 1969.

The garbage container has a freely movable, detachable lid. Curved, long holes, suitably spaced, are at the top of the peak-shaped lid. The slanting planes have garbage dumping holes. Bearings, fixing a rotating axis, are attached on both sides of the inner top. Supporting rods protrude through the curved, long holes. Hammers and weights hang from the axis. Opposite these are metal tubes that, when struck, produce various sounds.

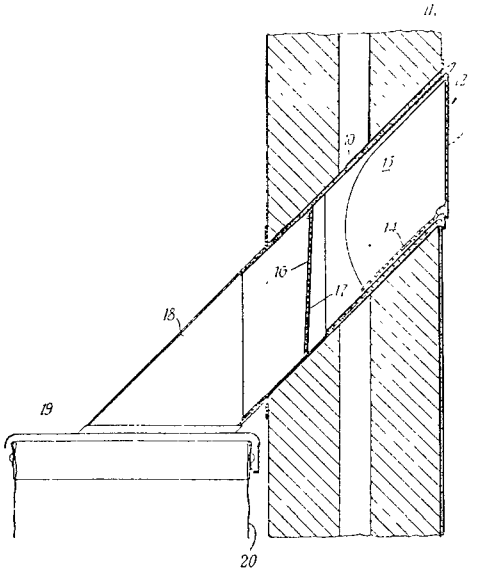


When the supporting rods are perpendicular, the dumping openings are shut. A board is placed at the end of the supporting rods. When the lid opens, the hammers and tubes collide, resulting in a pleasant chime. The empty board can be used for advertising. (Text in Japanese)

INT-1009

Palmer, H. L. (True Flue Limited). Means for facilitating the disposal of refuse. Great Britain 1,142,730; filed Sept. 15, 1966; issued Feb. 12, 1969.

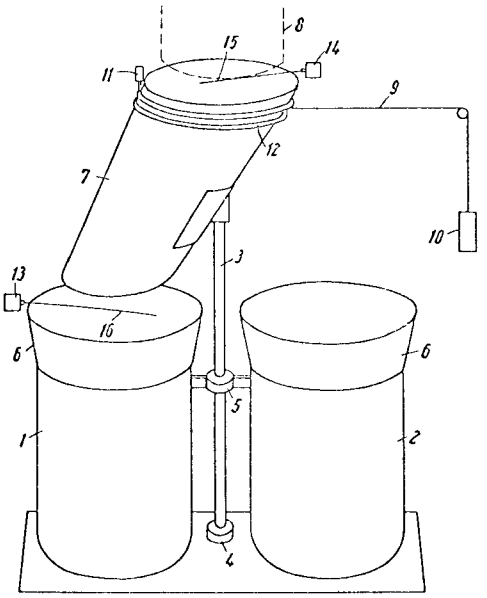
A system is provided for installation in premises where bins or expendible refuse containers are located outside of the premises, and require emptying periodically. The system consists of an inclined channel or conduit down which refuse may slide under the action of gravity through the wall of a building. A hinged closure at the upper or inner end of the channel normally closes the channel, but it is capable of opening to allow introduction of refuse. A sealing flap is located in the channel, mounted for free pivotal movement. The system is primarily intended for installation or incorporation in, for example, an external wall of the kitchen of a domestic dwelling.



INT-1010

Rey, F. Movable bin for refuse. Germany 1,289,773; filed Jan. 5, 1967; issued Feb. 20, 1969.

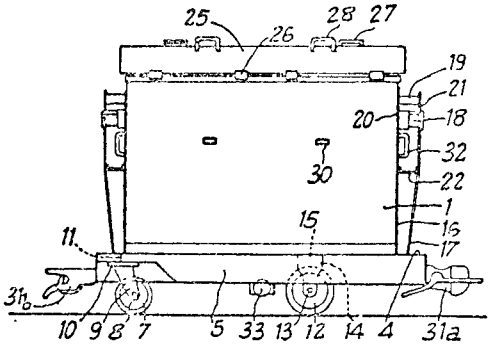
A refuse bin, for use with collective chute systems, has a container rigidly mounted on a wheeled trolley. The frame of the trolley extends beyond the bin at both ends to provide buffer beams with couplings. Attached to each end face of the bin is a framework carrying freestanding journal pins for engagement with the lifting gear on the refuse-collecting lorry. (Text in German)



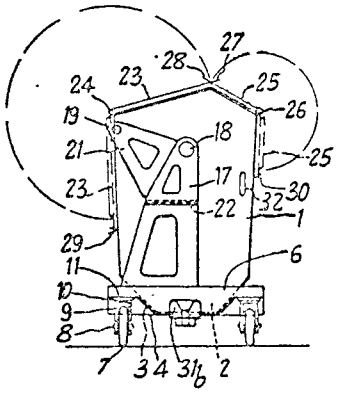
INT-1011

Smedlund, K. H. (Hygap Aktiebolag). Device for the removal of rubbish. Switzerland 468,544; filed Oct. 12, 1967; issued Mar. 31, 1969.

This device consists of at least two caissons or sacks situated underneath the rubbish ejection container. A pipe, placed below the outlet from the container and above the sacks, is able to vibrate above the sacks, which are arranged circularly, to guide waste material successively into the various sacks, until each, in turn, is filled. The apparatus replaces cumbersome waste receptacles, and



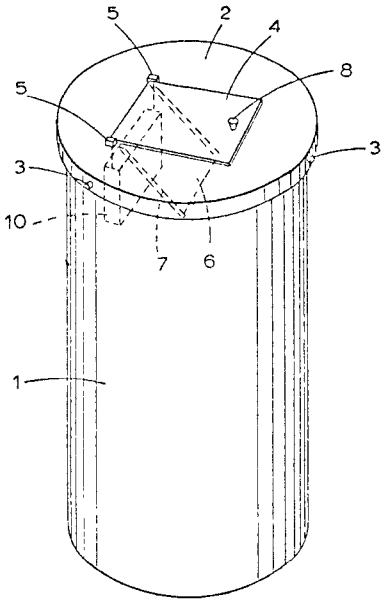
frequent manual emptying of smaller rubbish containers. The pipe rotates automatically. A cable, wound around the pipe, supports a suspended weight. The pipe is held above the sack by an electromagnet. (Text in French)



INT-1012

Saxby, D. J. (Tack Developments Limited). Improvements in or relating to refuse bins. Great Britain 1,147,733; filed Mar. 13, 1968; issued Apr. 2, 1969.

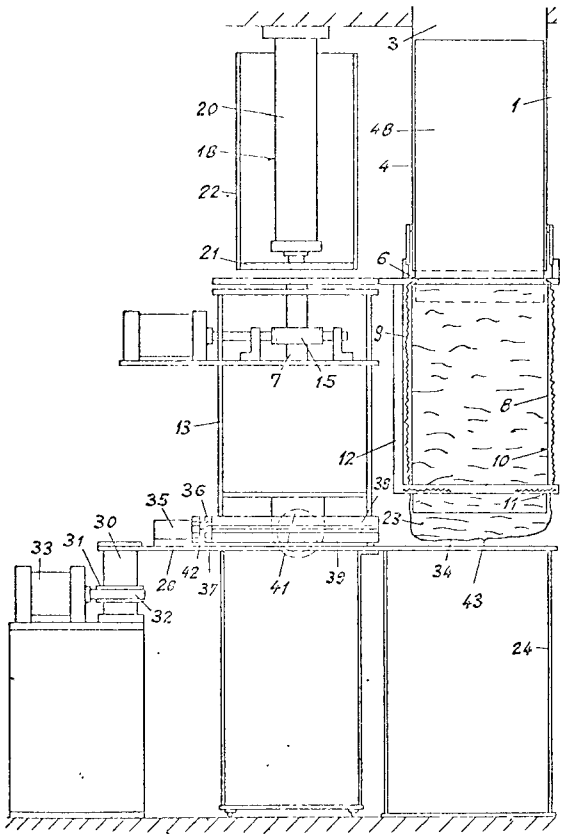
A bin for malodorous or potentially malodorous substances consists of a container having a lid with an aperture, a flap hinged to the lid capable of closing the aperture, and a waste tray attached to the flap in such a way that it is maintained at a constant angle. When the flap is open, the waste tray closes the aperture. A deodorizing substance is disposed in the bin in an air-permeable container. The deodorizing substance is preferably active carbon, but it may also be finely divided silica.



INT-1013

Ospelt, J. (MIDECO Mediterranean Industrial Development Establishment). Refuse collecting device for a refuse chute. Switzerland 477,339; filed Aug. 30, 1968; issued Aug. 31, 1969.

The chute terminates in the corner of a refuse-handling room, as required by many building codes. It occupies a small floor area, and is sanitary. In handling refuse, an upper cantilever is turned repeatedly from one extreme position to the other to collect loose refuse in a square-duct shaft, and to compact it against a supporting area of the lower cantilever by a downward motion of the compacting piston inside the shaft. Whenever the shaft is filled with compacted rubbish, the lower cantilever makes an eighth turn, moving its supporting area aside; the compacting piston pushes the refuse out of the shaft, pulling a flexible hose down past its elastic clamp. As the lower cantilever moves toward its extreme position, the

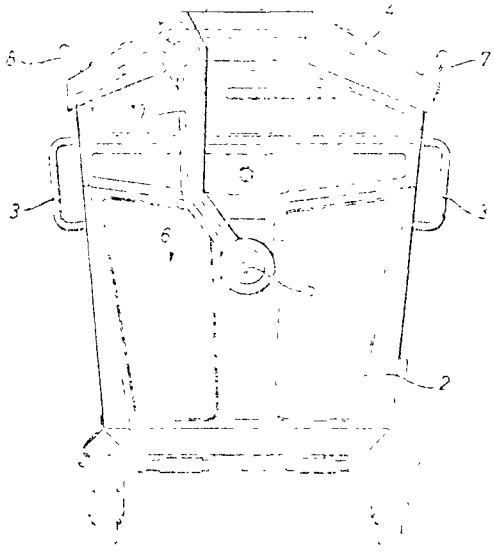


seal-and-sever unit advances toward its working position, where it is met by its counterpart, propelled toward it by a separate device. On meeting, the units clamp the intervening flexible hose, weld it in two horizontal seams, and cut it between them. The part above the cut is ready for the next collection cycle; the severed, sealed, refuse container is conveyed to the shipping platform. (Text in German)

INT-1014

Otto, W. (Gebr. Otto K.G.). Bulk refuse container. Germany 1,581,018; filed Sept. 10, 1965; issued Sept. 18, 1969.

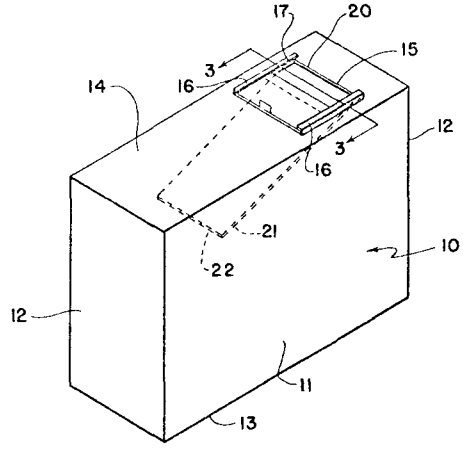
The bulk refuse container has a swing lid, held shut by springs and carried on arms which swivel around journals on the container sidewalls. A coil spring, concentric to the journal, fits into a round hole with an angled rim left in each arm around its journal. The spring is covered by a tensioning disc which swivels around the journal, is placed from the outside, and is permanently connected to the lid arm. (Text in German)



INT-1015

Martin, M. Container for disposable items. Canada 824,507; filed Dec. 18, 1967; issued Oct. 7, 1969.

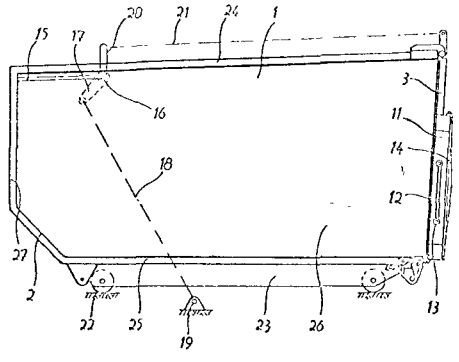
This unit disposes of sanitary napkins. The receptacle has a sliding top and a chute which guides the napkins down into the chamber. Since the container can be made from plasticized cardboard or molded plastic, it can be disposed of entirely.



INT-1016

Ries, A. (Firma Adolf Ries). Compacted-refuse container. Switzerland 480,995; filed June 26, 1968; issued Nov. 15, 1969.

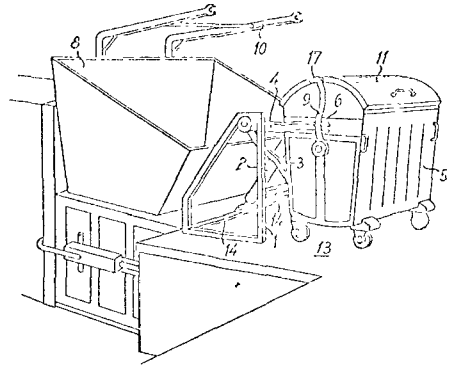
This compacted refuse container has ribs like a pressure vessel with sidewalls, as well as bottom and top walls, that diverge toward the discharge opening to enlarge the free cross sectional area. The discharge opening of the container is closed by a hinged cover, in which a pressure charge opening is provided. It can be locked by means of latches operated by a hand lever. The pressure charge opening can be closed by a grid of tubes held in a tubular frame and a solid hinged cover provided with a rubber packing ring. The container can be mounted on a carrier vehicle. Linkages fasten the container to the carrier vehicle. (Text in German)



INT-1017

Ries, A. (Firma Adolf Ries). Attachment for a refuse compaction device for emptying bulk bins. Switzerland 482,598; filed Aug. 8, 1968; issued Dec. 15, 1969.

A device is mounted on an elevated platform in front of the hopper. It consists of two side frames connected by crossties on each of which an angle lever is pivoted. The lifting arms of both angle levers are connected by a tie rod and terminate in pivoted lugs; the ends of the catching arms of both angle levers are forked. The angle levers are rotated by a hydraulic cylinder and piston assembly attached to a crosstie of the side frames and to the tie rod of the angle levers. The hydraulic cylinder is connected by a pipeline, provided with a control valve, with the hydraulic system of the refuse-compacting device. Two levers with forked ends are pivoted on both sides of the feeding hopper. They engage two catch pins of the cover of the bulk bin, and raise it during the emptying operation. (Text in German)

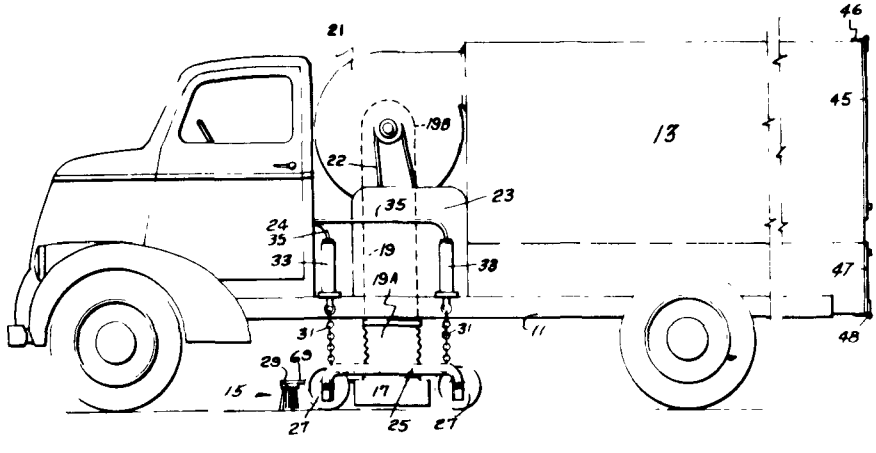


STREET CLEANING

INT-1018

Boyce, B. B., and W. B. Powell (B. B. Boyce, W. B. Powell, and C. L. Blanz). Suction street sweepers. Canada 478,407; filed Aug. 4, 1950; issued Nov. 6, 1951.

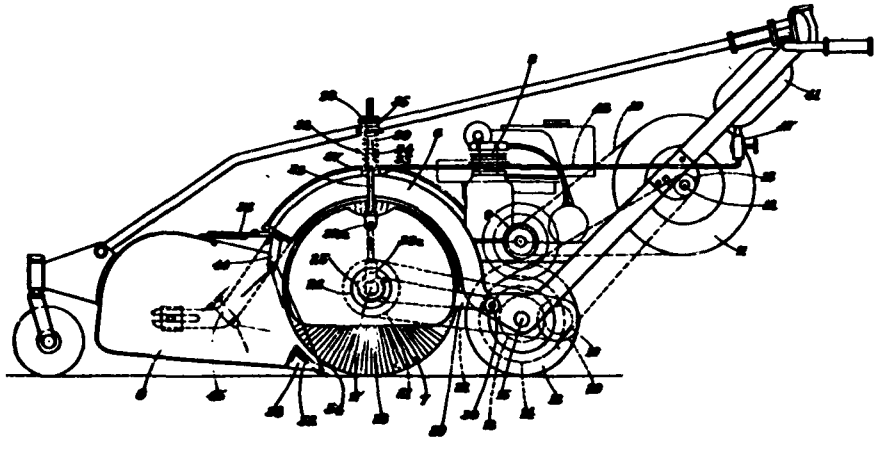
A pickup street sweeper includes a sweeper unit with a collection box and wheeled carriers supporting the box independent of the other parts of the sweeper. There is a brush in front of the box, and a pipe connecting the box with a suction fan. The top of the box is perforated except where it is connected to the pipe. Flexible curtains, weighted on their lower ends, are secured along the front and rear edges of the top. The curtains and end walls of the box are supported by the carriers so that they are near, but do not touch, the street surface. Dirt loosened by the brush and drawn in by the fan enters the box through an aperture at the right front corner where the front curtain and the right end wall do not meet.



INT-1019

Fogg, C. C., and H. P. Sinclair. Improvements in or relating to road and the like sweeping machines. Australia 147,051; filed Sept. 26, 1949; issued June 26, 1952.

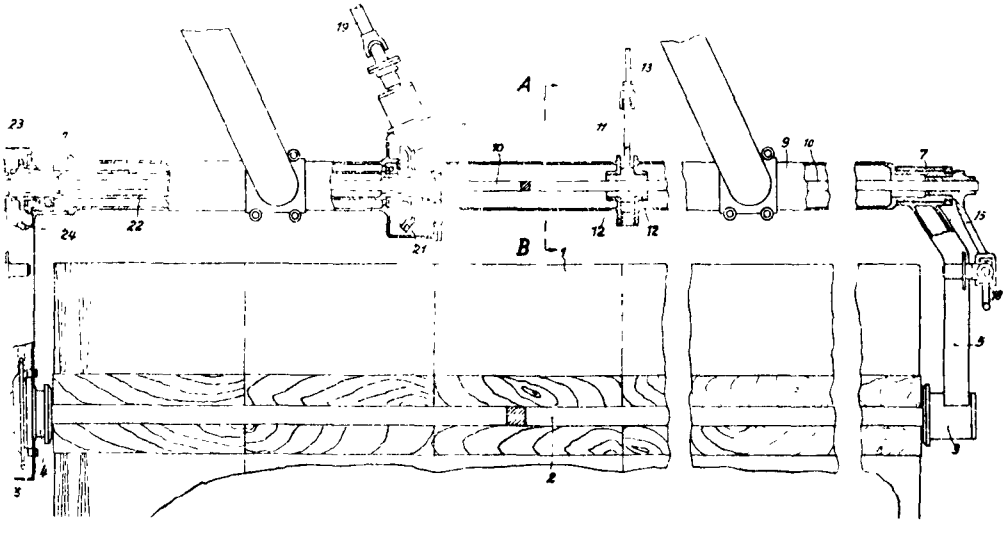
The framework of the sweeping machine supports a main rotary brush and a receptacle. An auxiliary brush is attached to the main brush, and is adapted to cooperate with it to sweep dust and debris into the receptacle. A curved parting plate prevents the entanglement of the two brushes. The auxiliary brush is secured to a stub shaft which is driven from the shaft of the main rotary brush at an angle which enables the gutters to be swept. Both brushes are supported on the framework by radial arms pivotally connected to the framework and balance gear. The vertical arms are slidably connected to the framework; they are provided with helical springs which enable one end of the main rotary brush to be applied with greater pressure than the other. A water dispensing apparatus directs a spray into the vehicle or onto the road. A disengaging device permits the brush to be raised when the machine is being wheeled from one location to the next. The receptacle has a bevelled edge both to permit sufficient clearance from the road and to prevent dust from being swept under the vehicle.



INT-1020

Baum, E. (Kloeckner-Humboldt-Deutz A.G.). Street cleansing machine with rotating roller brush or rubber roller. Germany 861,707; filed Apr. 22, 1951; issued Jan. 5, 1953.

The sweeper has a roller, suspended on levers, with torsion-bar springs. The long roller permits arrangement of a number of these springs parallel to the axis of the roller. The advantage of this suspension is that

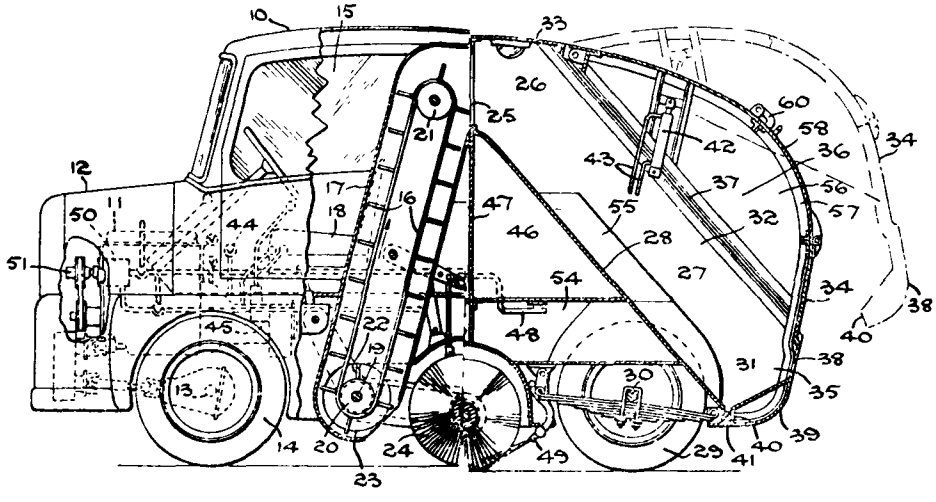


the pressure on the roller is sufficient to guarantee efficient sweeping, but not too much as to damage the brushes. The arrangement of the springs in a frame parallel to the roller is very advantageous. A lever in the center of the frame permits lifting of the roller. (Text in German)

INT-1021

Dear, A. T. C. (Lewin Road Sweepers Limited). Improvements in or relating to refuse collecting vehicles. Great Britain 685,545; filed Jan. 16, 1950; issued Jan. 7, 1953.

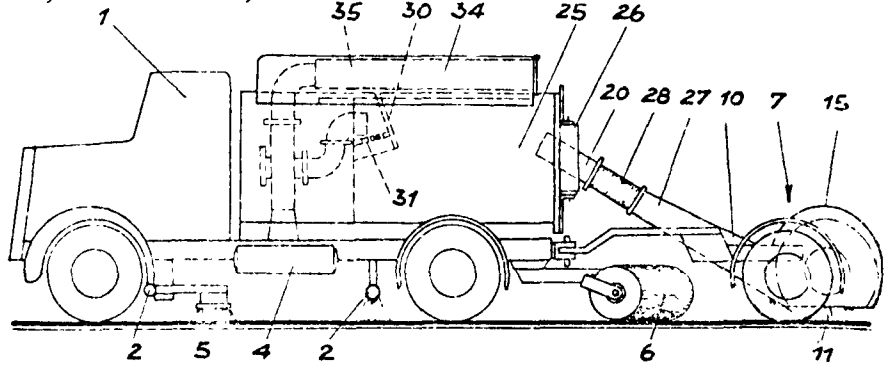
A refuse collecting vehicle with a road-sweeping brush comprises a refuse receiving compartment disposed at the rear of the vehicle, a conveyor which transports the refuse to the compartment, and a refuse discharge opening at its lower rear end. Refuse is projected forward from the underside of the rotary brush to a helical conveyor, and then to the lower end of an endless elevator belt which transports it to an opening at the upper end of the refuse receiving compartment. The floor of the latter slopes downward so the refuse falls gravitationally to the bottom rear end of the compartment while the vehicle is moving forward. A hinged door, which is separated by a pair of hydraulic arms, is located on the roof of the receiving compartment and can be opened to allow refuse to be discharged by gravity. A water tank has discharge nozzles spaced transversely behind the sweeping brush to control dust. Operating power is supplied by the engine of the vehicle, and operations are controlled from the cab compartment. (See also Great Britain 589,947 and 685,547 and Australia 153,444)



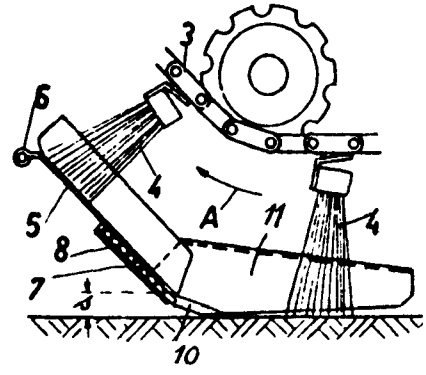
INT-1022

Heigert, J., and H. Schwarzkopt (M. Streicher). Method for automatic removal of street dirt and street cleansing vehicle. Germany 925,777; filed Sept. 26, 1952; issued Mar. 28, 1955.

Street dirt is removed by a vehicle equipped with a sprinkling system, a sweeper, an exhauster, a dirt collection container, filters, and discharging equipment. The street



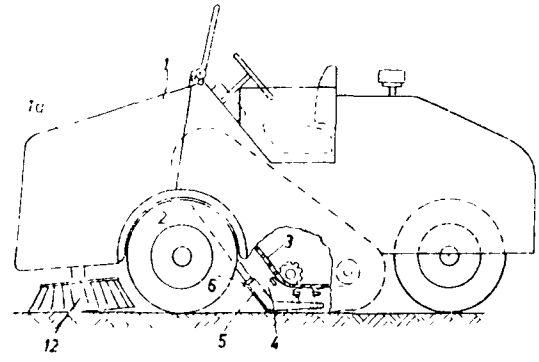
dirt is wetted, loosened from the pavement and the curb, swept into the exhauster current, and transported into the collection container. The exhauster separates the heavy, sticky particles from the lighter, coarser particles of the street dirt. The remaining dust which is not sufficiently wetted is retained in a filter and separately collected. The dust remover consists of a roller with brushes mounted on springs and is enclosed by a casing. The exhaustion funnel of this remover has a rectangular cross section. It ends in a shovel which cooperates with the brushes. The tube to the collection container is straight and has an extremely smooth surface to avoid incrustation of the wet dust and dirt. The dust remover can be lifted from the ground to drive to the discharge site. The rotating brush for cleaning the curbs is mounted in the front of the truck, and is visible to the driver. (Text in German)



INT-1023

(K. H. Schmidt). Shovel for automatic sweeper. Germany 936,045; filed Dec. 17, 1952; issued Dec. 1, 1955.

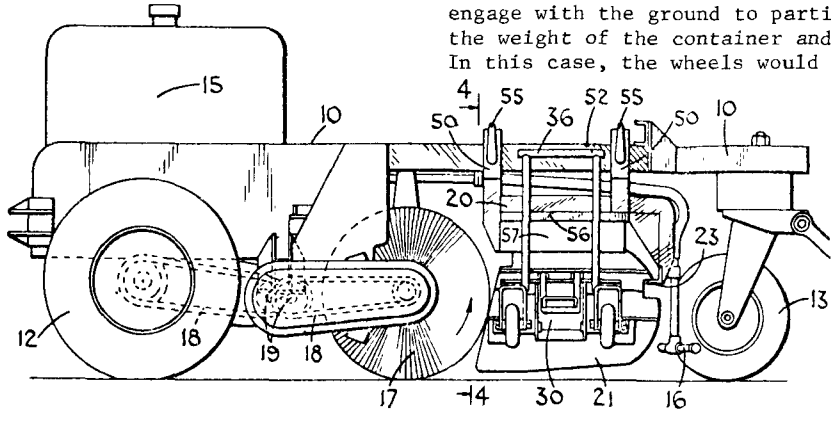
This shovel has a rubbish collecting end which can be adjusted so the distance of the shovel from the pavement is greater in the middle than on the sides. The shovel can be attached to the conveyor chute of any street sweeper. In the low position, the shovel can pick up dust; in the higher position, fallen leaves, branches, paper, etc. can be picked up. (See also Germany 1,159,484) (Text in German)



INT-1024

Holtom, O. G. (Lewin Road Sweepers Limited). Improvements in or related to sweeping machines for use in sweeping road and other surfaces. Great Britain 744,065; filed Apr. 2, 1953; issued Feb. 1, 1956.

Improvements in this sweeping machine feature a detachable refuse container. The entire weight of the container and its contents is supported by its ground-engaging wheels. In the sweeping position, these wheels are all completely clear of the ground. However, it is possible that in the sweeping position, one or more of the wheels may be arranged to engage with the ground to partially support the weight of the container and its contents. In this case, the wheels would preferably be

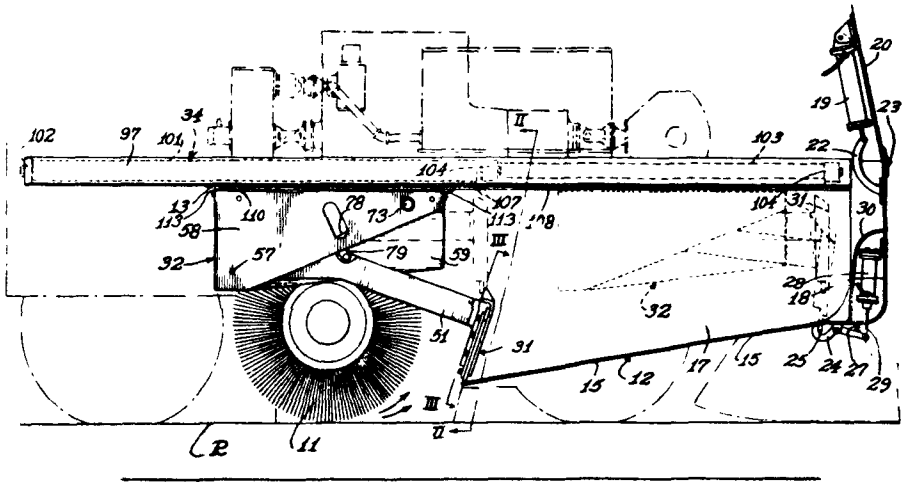


constructed as castor wheels. An arrangement is provided whereby the container can be removed from the machine by wheeling it along the ground in a direction transverse to the length of the machine.

INT-1025

Link, C. T. (Elgin Sweeper Company). Street sweeping machine. Canada 530,798; filed Sept. 21, 1951; issued Sept. 25, 1956.

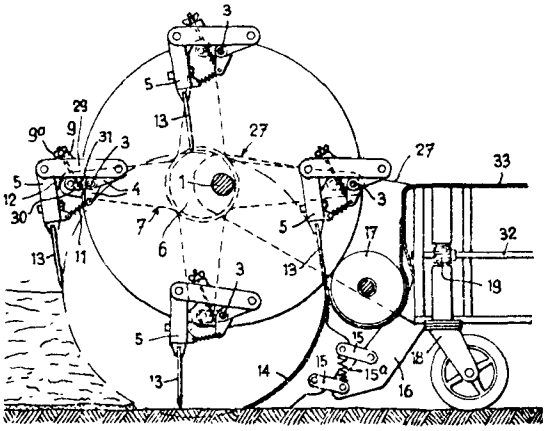
A method of compacting sweepings in the dirt box of a street sweeping machine involves periodically pushing the dirt from the mouth of the dirt box toward a remote portion of the box. A reciprocally mounted ram travels back and forth between a position at the mouth of the dirt box and a position as close to a thrust wall as the material in the chamber permits. This motion compresses the sweepings into a mass which may be discharged by the ram through a dumping door in the dirt box.



INT-1026

Von Arx, P. (Paul von Arx and Company A.G.). Street cleansing machine. Switzerland 322,914; filed Jan. 12, 1954; issued July 15, 1957.

The multipurpose street cleaning machine consists of a horizontal axis with parallel shafts. The shafts are connected to a control device which causes them to rotate about their own axis while they rotate around the horizontal axis. A shovel in the vicinity of the rotating shafts transports the material into a charging box with a screw conveyor. The horizontal axis also has two discs, one on each side, which rotate with the axis, and which are connected to each other by four shafts. The horizontal axis, lateral discs, and connecting shafts form a cage, driven by a bevel gear wheel, which combs through a spur bevel gear. The shovel can be replaced by brushes to remove fallen leaves from the street. The device can be attached to a motor vehicle, or it can be used autonomously. (Text in German)

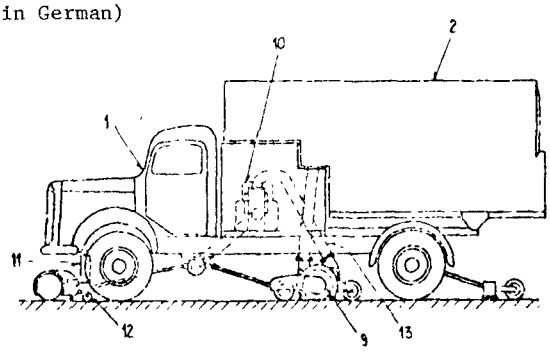


INT-1027

Horn, H. (Konrad Peter A.G.). Street sweeper. Switzerland 329,289; filed Jan. 9, 1958; issued Apr. 30, 1958.

A conventional truck with a closed dust container for rubbish is equipped with two cylindrical brushes which rotate about a horizontal axis. The brushes are broader than the front wheels that follow them. The axes are connected to a gear which is, in turn, connected to another gear by way of a Cardan shaft. The rotation of the brushes moves dust and dirt toward the center, between the two wheels, so that the wheels do not drive over it. The dirt is collected between the front and rear wheels, where there is a second

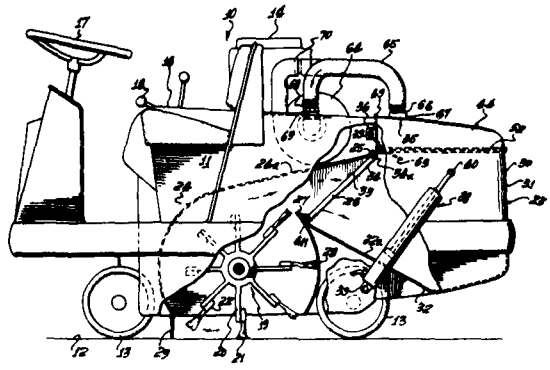
sweeper with one cylindrical brush. This brush is as broad as the vehicle and is connected with a blower, which creates a slight vacuum. The front brushes can be lifted up and down as desired; they can also be switched off. Either a vehicle engine, or a separate combustion engine, or electric motor can drive the brushes. (See also Switzerland 329,662) (Text in German)



INT-1028

Newport, J. L. (Wayne Manufacturing Company). Industrial sweeping machine. Canada 591,163; *filed Nov. 26, 1956; issued Jan. 19, 1960.*

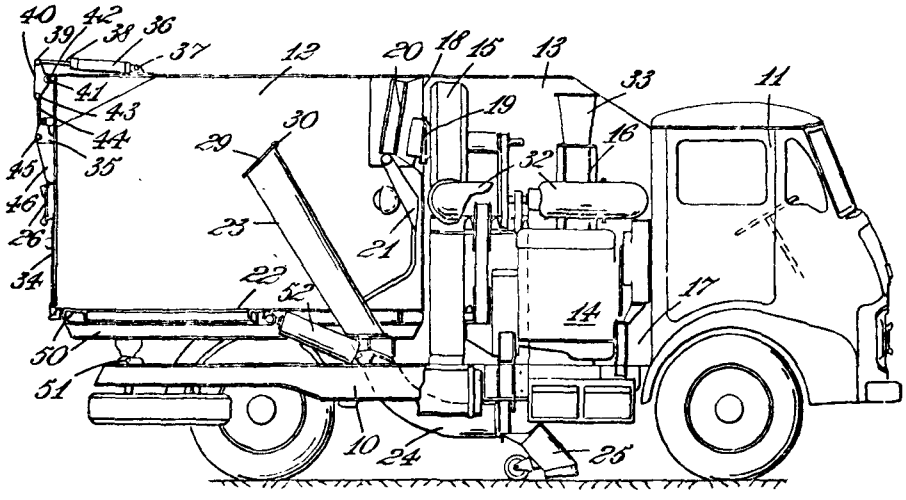
This sweeper consists of a gasoline-driven motor vehicle carrying a power-driven rotary brush to sweep up debris into a collection chamber. A hollow cover extends across the upper side of the collection chamber, and opens to provide access to the interior of the chamber. The lower portion of the cover carries a filter which extends across the major portion of the cover and separates the interior of the cover from the debris-receiving chamber. A blower exerts suction on the interior of the cover above the filter which is removable when the cover is open. The chamber and filter are mounted to swing into two positions, one for receiving debris, and one for dumping the debris. A flexible tube connects the interior of the cover to either the suction or discharge side of the blower.



INT-1029

Gray, R. F. C. (Johnston Brothers Engineering Limited). Improvements in or relating to suction refuse collecting vehicles. Great Britain 852,853; filed Mar. 27, 1958; issued Nov. 2, 1960.

This machine is designed to gather, in addition to usual debris, wet materials *such as snow,* leaves, and paper, without clogging the suction mechanism. The complete assembly comprises a sealed, low-pressure collecting chamber and a housing for the power source. Both are mounted behind the driver's cab on the chassis of a motor vehicle. A two-stage exhauster, driven by an auxiliary engine, evacuates air from the sealed collecting chamber. A filter is interposed between the exhauster and the

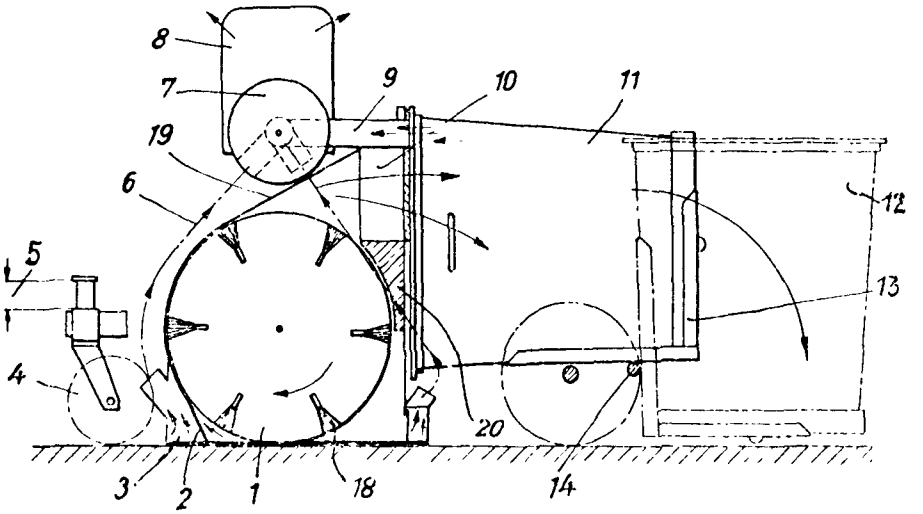


interior of the chamber. Refuse is collected through a flexible tube running from the street surface through a sealed opening into the collection chamber. Refuse may be moistened by a water spray mounted and driven as a part of the general assembly. Auxiliary suction vents can be provided at the sides of the low-pressure chamber. Sludge is collected in a separate tank at the base of the vehicle. Refuse is unloaded by tilting the chamber using hydraulic cylinders and opening a rear door. The pressure equilibration is handled by the devices provided for this purpose. (See also Great Britain 1,161,313)

INT-1030

Rausch, H. J., and W. Rausch (A. Bertsche). Mobile mini-sweeper. Switzerland 353,758; filed Oct. 14, 1957; issued Apr. 30, 1961.

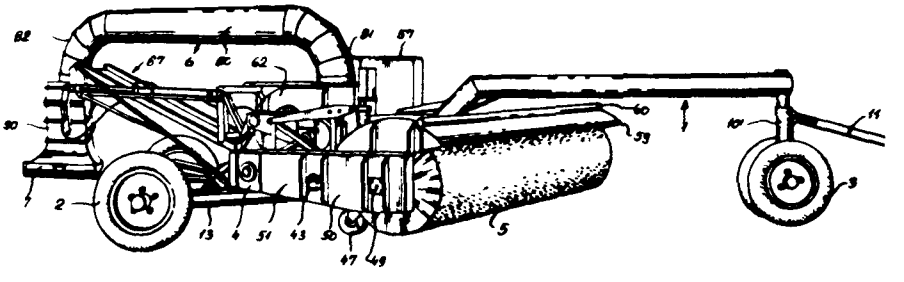
This sweeper has a roller brush which throws the dust within the casing over its top into a dust bin. Immediately ahead of the roller brush is a shaft; the dust produced by the sweeping operation is sucked in by a ventilator in the shaft. The can-shaped dust bin is arranged in a horizontal position and is tightly sealed to the inlet shaft. The dust bin is brought up to a vertical position when it is replaced by an empty bin. The sweeper is flexibly connected to a driver's seat behind which there is a rack for holding an empty dust can. (Text in German)



INT-1031

Boissonnault, R. (Sicard, Inc.). Runway sweeper. Canada 620,644; filed Oct. 5, 1957; issued May 23, 1961.

A trailer type sweeping and blowing machine simultaneously sweeps a road surface and blows loose particles from the road. The sweeper comprises an elongated wheeled frame having a longitudinal axis, and a subframe, pivoted on the wheeled frame for horizontal movement on both sides of the axis of the frame. A hydraulic mechanism is provided for pivoting the subframe. A rotary brush has an axle mounted in front of the subframe. A blower is mounted on the subframe behind the rotary brush. An air discharge duct is connected to the blower and extends to the rear of the subframe. An air discharge nozzle is carried by the duct and arranged for pivotal movement in a hori-

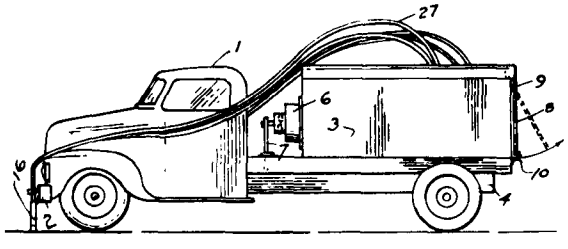


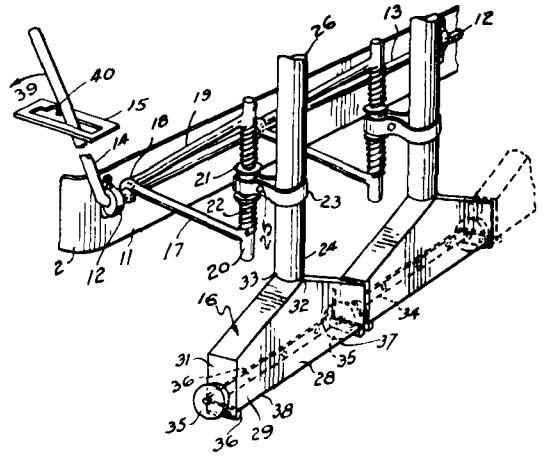
zontal plane. Its discharge opening is directed at a slightly downward angle. A second hydraulic device pivots the air discharge nozzle. An engine is mounted on the subframe for driving the blower and rotary brush, and for actuating the first and second hydraulic devices. The air discharge nozzle may direct a blast of air transversely across the entire width of the path swept by the rotary brush. The rotary brush has a predetermined range of inclinations with respect to the longitudinal axis of the wheeled frame.

INT-1032

Romaniuk, J. Vacuum type road sweeper. Canada 631,594; filed Mar. 28, 1959; issued Nov. 28, 1961.

A vacuum type road sweeper is adapted to be mounted on the bumper of a motor vehicle. The sweeper includes a source of power and a vacuum tank with a drive for the tank. Several suction, ground-engaging units are suspended from the bumper. A device is provided to raise and lower the units selectively in and out of the ground-engaging position. This device has a cross-shaft, designed to allow rotation, and bearings, secured to and extending from the cross shaft for each of the units. The sweeper also has a vertical post, a sleeve which is reciprocal on the post and secured to the units, and shock absorbing devices surrounding the post above and below the sleeve.

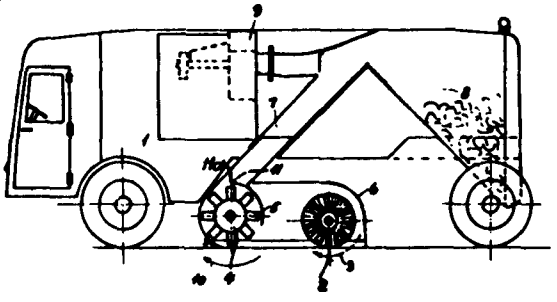


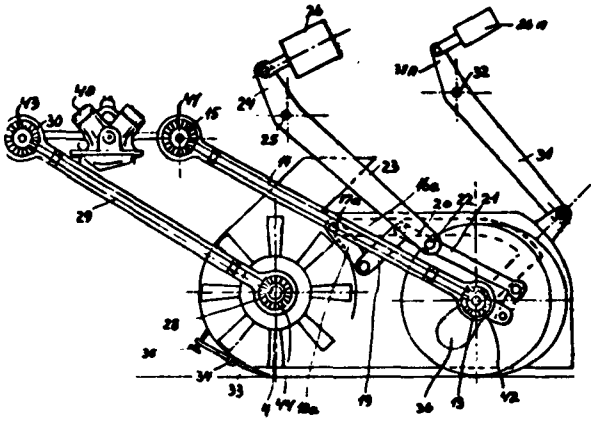


INT-1033

Gregersen, C. H. (Kastrup Maskinfabrik A/S). Street cleaning machine. Germany 1,129,979; filed Apr. 28, 1955; issued May 24, 1962.

This street cleaning machine is equipped with a system of two or more brushes rotating about horizontal axes, and coupled to one another through universal joints. The universal joints and the end bearings are interconnected through a compensation lever system. The arm lengths of this system are determined by the weight and length of the individual rotary brushes. (Text in German)



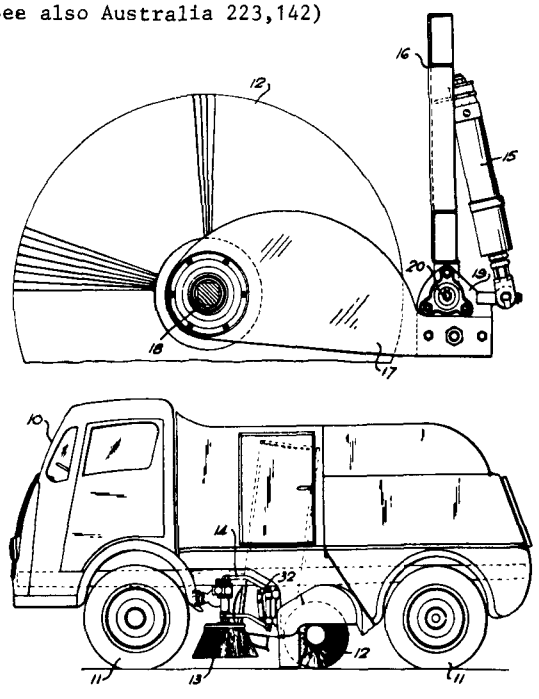


INT-1034

Dear, A. T. C., and K. L. Merther (Lewin Road Sweepers Limited). Road sweeping machines. Canada 651,451; filed Feb. 28, 1958; issued Oct. 30, 1962.

Hydraulic pressure is used to control the sweeping pressures of road sweeping brushes. A hydraulic pressure relief valve, located in the cab of the vehicle and hydraulically connected to the hydraulic pressure means, is controllable by the operator of the vehicle. This valve is capable of regulating the sweeping pressures exerted by the brushes. A vertically arranged brush, in addition to the horizontal brushes, is provided for sweeping the gutter. There are two hydraulic circuits:

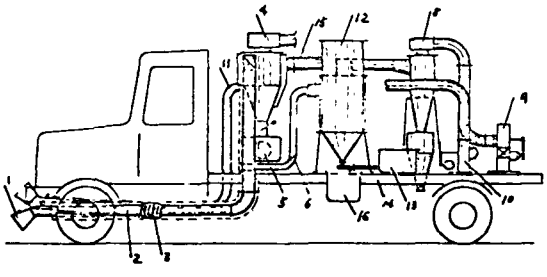
one controls the horizontal brushes and one controls the vertical gutter brush. The circuits are able to exert pressure to lift the brushes when the vehicle is not sweeping. (See also Australia 223,142)



INT-1035

Yamamoto, T. (Yokoyama Kogyo K.K.). Treatment of municipal trash by sanitation truck. Japan 39-11,123; filed Feb. 19, 1963; issued June 19, 1964.

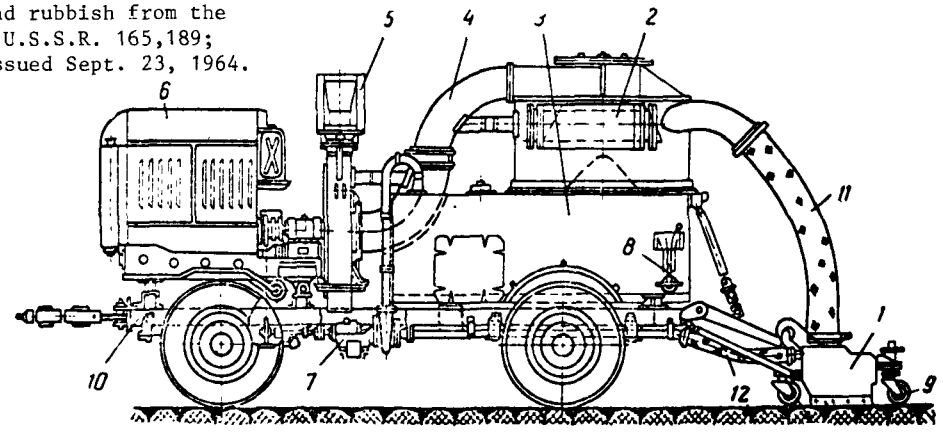
This sanitation truck automatically scavenges the streets and incinerates the collected trash while moving over its route. A trash suction pipe under the front bumper has a flexible suction port unit. The suction pipe leads to the separator where the sucked in trash and dust are collected. These are fed through the bottom of the separator into the crusher. The crushed trash is then transported by air to the incinerator. Ash produced by the incineration falls into the ash retainer tank under the truck chassis. The suction for pulling trash into the system and transporting it from the suction port to the incinerator is generated by the force of an air pump. High-temperature exhaust gas emitted from the incinerator is also drawn into the dust collector by the air pump. The separator, crusher, and suction pipe are all provided with a covering so the exhaust gas can flow through the hollow space formed between the external surface of the pipe, or through the casing and the inner surface of the covering. The exhaust gas, after leaving the dust collector, is channeled into the hot gas pipe. This pipe heats the separator, the crusher, and the suction pipe to prevent them from becoming clogged with moist dust. The final exhaust gas is collected in a wet dust collector, where it is scrubbed with water for purification. It is then discharged from the wet dust collector. (Text in Japanese)



INT-1036

Kolenda, Y. A., A. T. Drozdov, V. V. Protsenko, and A. I. Mikhaylov. Machine for removal of water and rubbish from the surface of pavements. U.S.S.R. 165,189; filed Aug. 31, 1962; issued Sept. 23, 1964.

This machine is mounted on an automobile trailer and includes: a suction nozzle; an air hose; a cyclone; a water tank; an air duct;

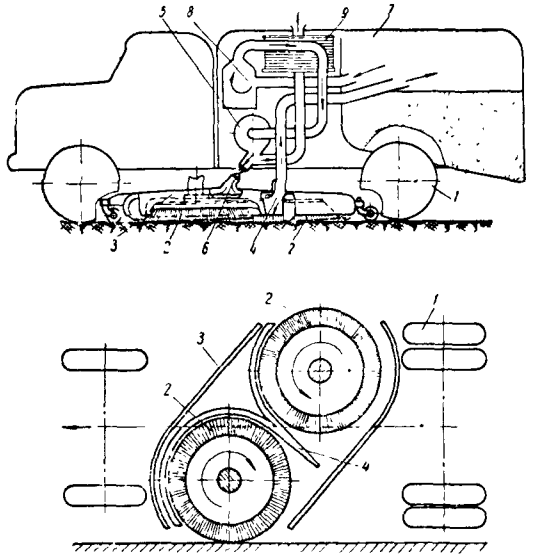


a fan; a water pump connected to the suction nozzle and to the water tank; and a power unit. In operation, the nozzle rolls on the water-covered pavement sucking in an air-water-rubbish mixture at a speed of 100 m per second. The mixture travels through the air hose to the cyclone; the dirt and debris drop into a water tank. Air flows through the air duct and the vacuum tank to the intake side of the fan. The water tank can be emptied, while it is stationary or while in motion, through the water-outlet valves. When the depth of the sediment layer reaches 10 cm, the sediment covers the outlet-valve openings and must be removed from the tank through hatches. (Text in Russian)

INT-1037

Bershteyn, M. Y., and Y. M. Bukreyev (Experimental-Design Bureau of the Welfare Administration of the City of Moscow). Machine for mechanized sweeping and cleaning of road and similar coverings. U.S.S.R. 171,879; filed Feb. 25, 1964; issued June 22, 1965.

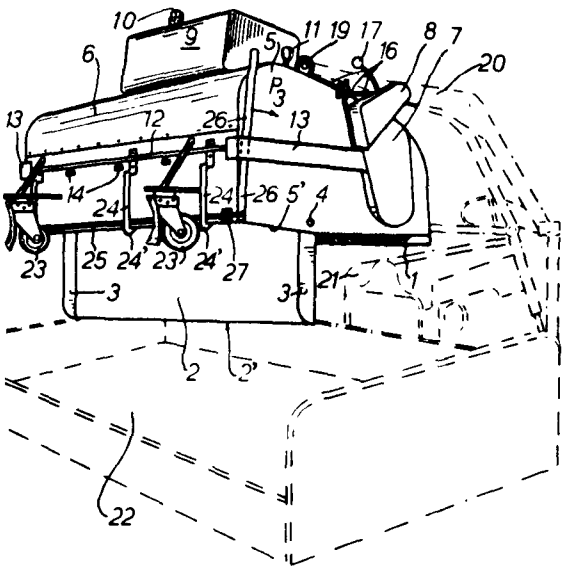
A street sweeping and cleaning machine includes: a self-propelled chassis, two rotary brushes, a double-walled brush cowling, a pressure-and-suction blower, a collecting tank, a cyclone, and an air filter. In operation, the rotating brushes direct the sweepings to the suction nozzle. These sweepings are carried by the air through the air duct into the collecting tank where they settle due to a sharp drop in air speed. Air flows to the cyclone, then enters the blower. From the blower, air is discharged into the atmosphere through the intervening air filter. A large portion of this air is directed into the working area of the brushes through the edges of the cowling. The inward blast from both edges pushes the sweepings toward the suction nozzle and creates a protective zone preventing dust from escaping from under the brush cowling. (Text in Russian)



INT-1038

Voelstad, S. Street sweeping machine. Canada 724,840; filed Oct. 12, 1962; issued Jan. 4, 1966.

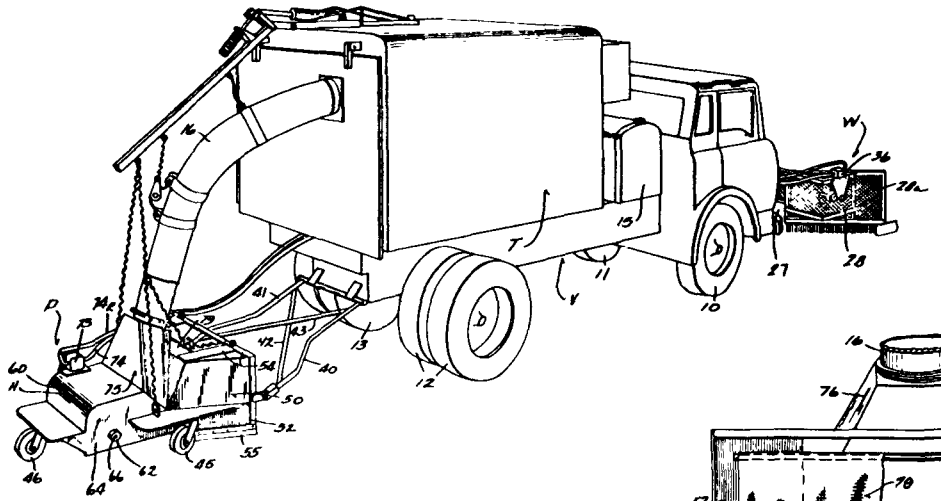
A street-sweeping machine is adapted for mounting on the lift arms of, and for propulsion by, an automotive vehicle. This vehicle has top, front, rear, and sidewalls forming a unitary, open-bottom casing. The lower edges of this casing lie in a normally horizontal plane. A rotary brush is journalled in the casing, between the sidewalls and the adjacent rear wall, for rotation about a normally horizontal axis. A pan is mounted in the casing between the sidewalls, and between the brush and front wall. This pan pivots about a second axis parallel with the first axis and adjacent plane, from one position in the plane to a second position normal to it. A latch located on the front wall can releasably hold the pan in its first position. A mechanism on the casing can release the latch from its holding position to move the pan into its second position.

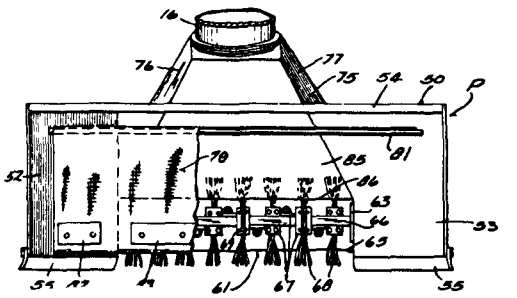


INT-1039

Daneman, B. (Central Engineering Company, Inc.). Street cleaning apparatus. Canada 758,742; filed Feb. 24, 1965; issued May 16, 1967.

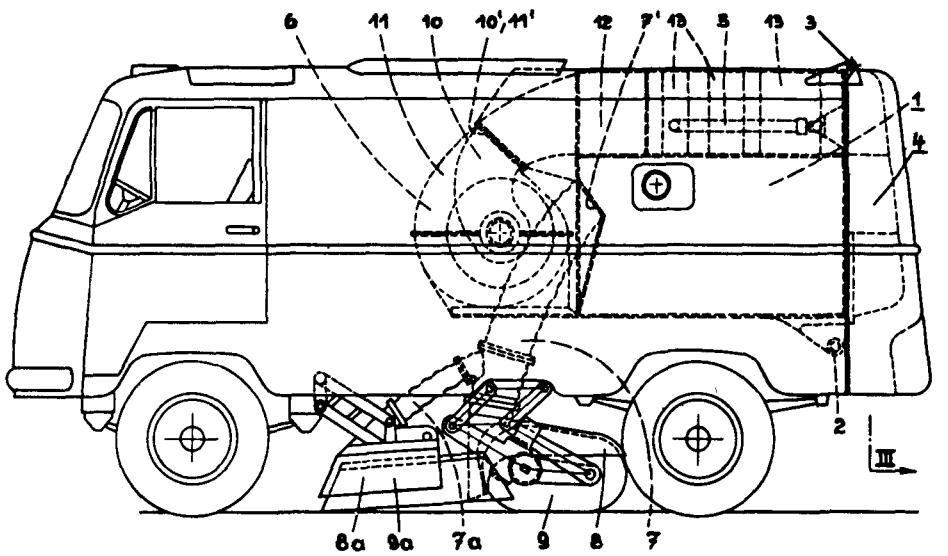
This self-propelled street cleaning vehicle includes a debris windrower whose vertical rear wall has a discharge opening in its lower portion, and a pair of vertical sidewalls which diverge forward from the rear wall. The windrower is linked with the front end of the vehicle in a way which permits its vertical movement. A device located at the lower edge of the sidewalls contacts the area being traversed. The debris in the area is formed into a windrow by the sidewalls and passes through the discharge opening at a width and height determined by the size of the opening. In front of the rear wall of the windrower and above the discharge opening is an agitator which insures the continuous discharge of the material through the opening. This vehicle sweeps the traversed area and can closely follow undulating contours of the street. The debris is picked up before it is run over by the wheels; then it is compressed.





INT-1040

Rettinger, L., and H. Hess (K. H. Schmidt). Road sweeper. Germany 1,256,242; filed July 29, 1960; issued Dec. 14, 1967.

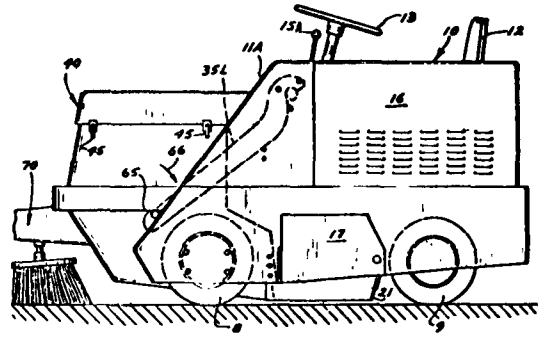


This road sweeper has a vacuum unit. The fan of this vacuum unit draws dust out of the collector vessel and conveys it to a separate light collector and dust extraction unit. The dust-containing air is sprayed with water. The light collector and dust extraction unit forms a removable rear or side cover for the main collector vessel. (See also Germany 1,256,241) (Text in German)

INT-1041

Peabody, R. C. (G.H. Tennant Company). Power sweeper. Canada 777,445; filed Aug. 27, 1962; issued Feb. 6, 1968.

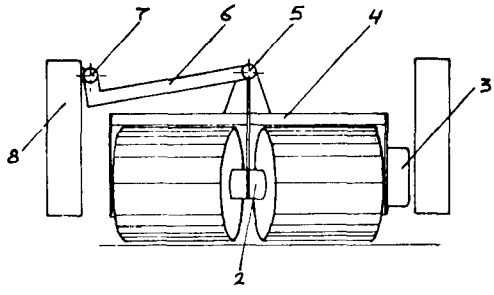
A dry-type power sweeper has provisions for controlling dust and is capable of being readily converted into a mobile vehicle of general utility. This conversion can be accomplished by removing certain components which are especially adapted for the sweeping operation. The debris and dust collection chamber can be readily detached for dumping, for substitution of additional equipment, or for servicing. The mobile, maneuverable vehicle contains a sweeping compartment which is closed except for a bottom brush, an ejection opening, a suction device, and a debris collection pan and filter.



INT-1042

Noels, K. Street sweeper. Switzerland 452,570; filed Feb. 21, 1966; issued Mar. 15, 1968.

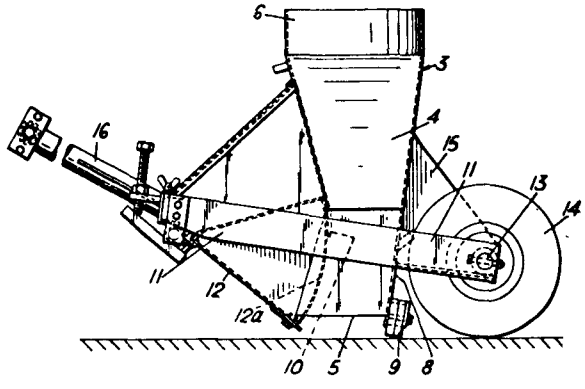
This modified version of a street sweeper incorporates a driven rotary brush, mounted in a frame transversely to the direction of motion of the vehicle. The brush consists of two roller brushes whose axes are coupled by a universal joint and form an obtuse angle with each other. In operation, both brushes sweep litter toward their common plane of symmetry. The frame carrying the brushes is joined to the main frame of the vehicle by a transverse supporting link pivoted at both ends on pins whose axes are parallel to the direction of motion of the vehicle. The roller brush assembly is capable of adapting its angular position to the slope of the street surface. (See also Switzerland 452,571) (Text in German)

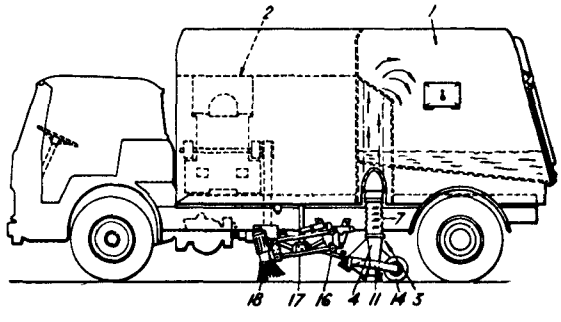


INT-1043

Lust, W. (La e Limited). Street cleaning machine. Ge.many 1,268,170; filed Dec. 5, 1962; issued May 16, 1968.

A street cleaning machine has a suction nozzle into and through which the debris is drawn.





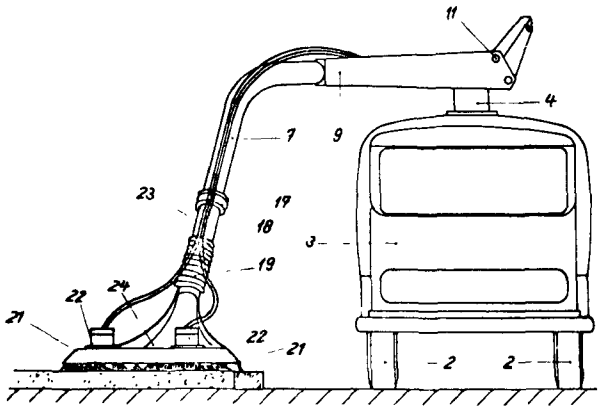
To maintain a substantially constant suction effect on the debris being picked up, the nozzle unit is provided with a forwardly extending frame. Mounted on this frame is a shutter which regulates the air drawn into

the nozzle unit inlet. The nozzle unit may be supported beneath the machine body by a linkage system, which allows the unit to be raised when not in use. (See also Great Britain 970,675) (Text in German)

INT-1044

Herrmann, R. (Keller and Knappich G.m.b.H.). Street sweeping machine. Germany 1,272,327; filed June 9, 1967; issued July 11, 1968.

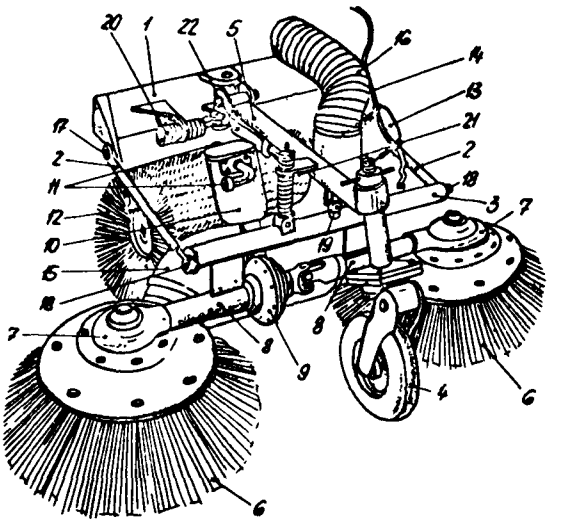
This street sweeping machine operates in a self-contained manner under reduced pressure. It has a plate-shaped broom which pivots about a perpendicular axis in the longitudinal center plane. There is a suction tube which serves as the pivot arm and holder for two counterrotating brooms, mounted on a hollow pivot connection leading to a suction chamber, and projecting from the top of this. Via a rotating attachment and drive mechanism, the suction arm can be pivoted around the vehicle front during cleaning travel. (Text in German)



INT-1045

Stephan, L. (Firma Adolf Ries). Street cleaning equipment. Germany 1,281,472; filed Apr. 11, 1964; issued Oct. 31, 1968.

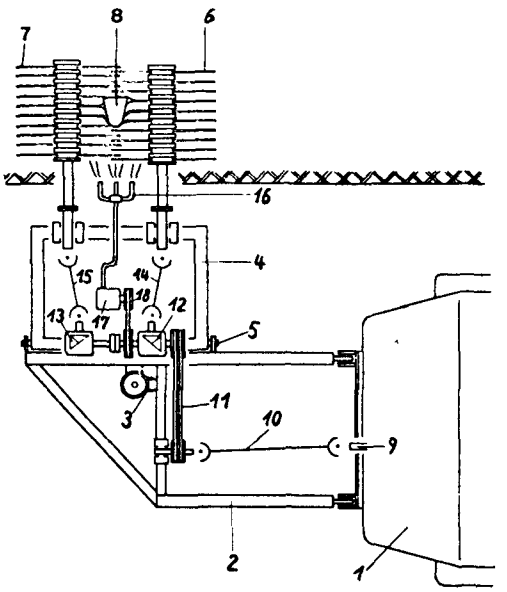
A tractor-attached street cleaning machine, designed for narrow passageways, has several brooms and a receptacle for sweepings. A support beam is attached to the front of the vehicle; this beam carries a rectangular frame composed of support bars and a front beam, capable of rising and falling. A support wheel is located at the center of the front beam and circular brooms are suspended at the front. The machine is driven hydraulically and connected by a horizontal linked shaft. Bevel gearing is between each broom and its drive. A roller broom, in the frame behind the circular broom, is driven by the same or by a separate hydraulic motor, with which is associated a suction nozzle. (Text in German)



INT-1046

Hirt, W. (A. Schmidt). Device on street cleansing trucks for cleaning the guard rails along highways. Switzerland 468,528; filed Oct. 18, 1966; issued Feb. 15, 1969.

A device, consisting of two rotatable brushes and a sprayer for the cleaning liquid, can be attached to a truck for cleaning the guard rails along highways. The brushes rotate around their longitudinal axes. The space between them is at least as long as their diam-

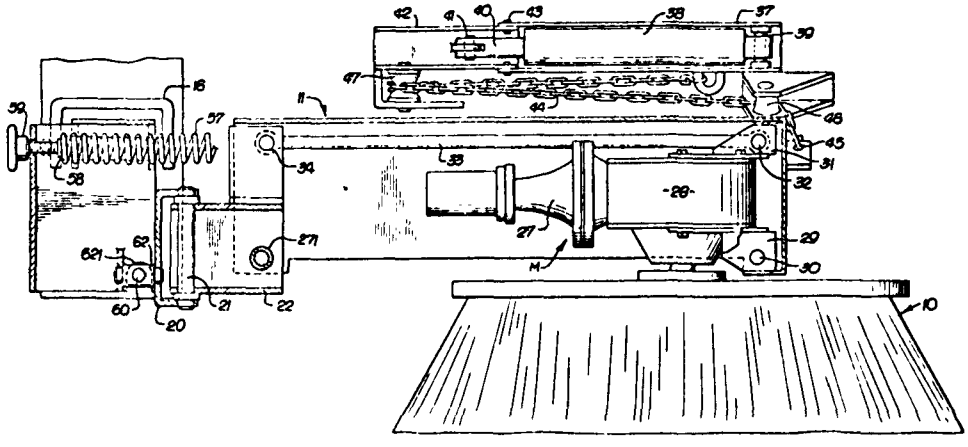


eter. The brushes can also move about their vertical axes. They sit on a transmission rope and the parallel axes can be adjusted by this rope. The spraying device is installed between the two axes and can be moved with the brushes. The brushes are rotated via the power take-off of the truck. A supporting wheel is installed. A guiding rod is used to bring the truck into proper position for the cleansing operation. (Text in German)

INT-1047

Tamny, S. (Wayne Manufacturing Company). Sweeper gutter broom suspension. Canada 807,871; filed Mar. 7, 1966; issued Mar. 11, 1969.

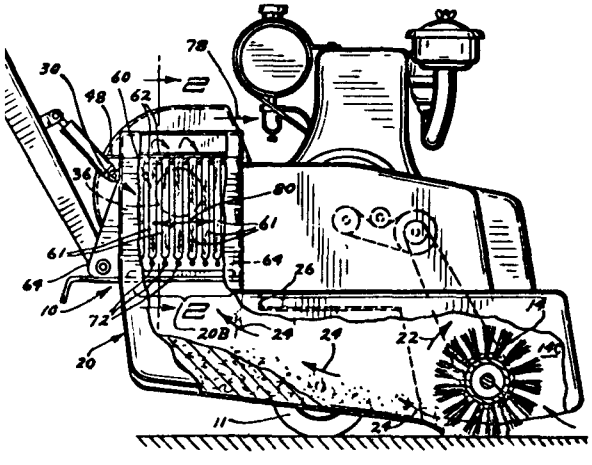
This sweeper gutter broom mounting gives the broom and its carrier arm the capability of moving downward and laterally. The mechanism, which is used to elevate the brush, has a single power unit. When the power mechanism is disengaged, the assembly is released for gravity movement to a sweeping position. A single spring applies lifting force to the carrier, and provides variable ground pressure and a flexibly restrained outer sweeping position.



INT-1048

Krier, K. N., and R. C. Peabody (G. H. Tennant Company). Sweeper with dust filters. Germany 1,292,151; filed Sept. 10, 1962; issued Apr. 10, 1969.

This moving, sweeping device sucks dust from the brush housing. Dust-laden air flows through a filter chamber which is equipped with suspended vibrating filters. The hollow open-top units of filter strand material divide the chamber. These units are spaced and suspended lateral to the direction in which the vehicle travels. (Text in German)

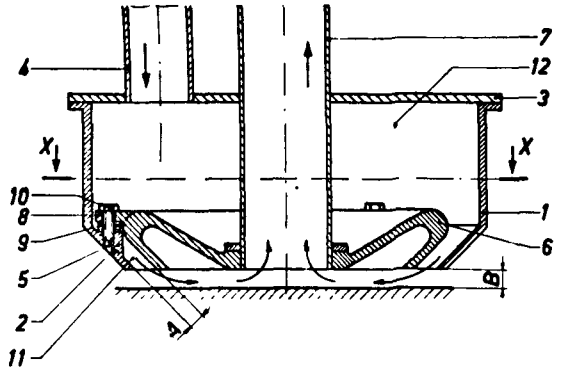


INT-1049

Trippel, W. (Rapid Maschinen und Fahrzeuge A.G.). Suction head for sucking away sweepings by means of recirculated air. Switzerland 476,167; filed May 22, 1968; issued July 31, 1969.

This device consists of a vertical suction duct, leading to the dust separator of the vehicle, and terminating in a suction orifice and plenum chamber surrounding the suction duct. The suction duct is connected by a pressure duct with the blower supplying it with the cleaned air from the dust separator. It is provided at its lower end with an annular blast aperture surrounding the suction orifice. The width

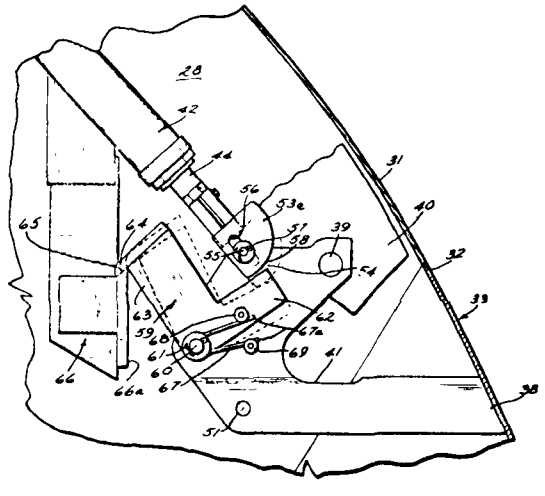
of the annular aperture can be changed and/or made to vary along its circumference. The variation of its width serves to compensate for the effect of the linear motion of the suction heat relative to the surface to be cleaned, without tilting the suction head with respect to that surface. This tilting is commonly found in existing welded monolithic designs. (See also Switzerland 476,628 and 476,128) (Text in German)



INT-1050

Prescott, E. F. (Elgin Sweeper Company). Hopper lock for a street sweeper. Canada 825,360; filed Jan. 10, 1964; issued Oct. 21, 1969.

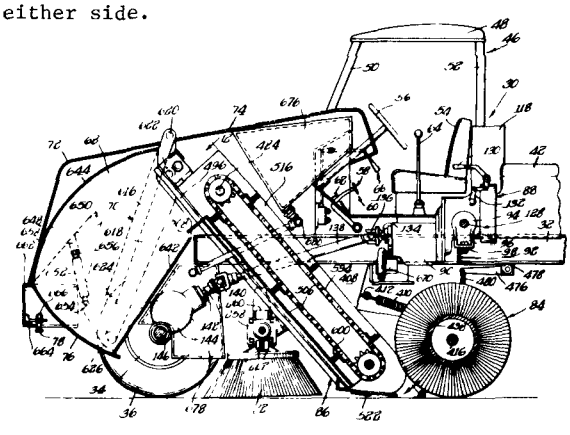
This street sweeper prevents the accidental spillage of sweepings. Within the sweeper housing there is a dirt box and a means for depositing dirt in the box. The covering on the box can be automatically opened and closed. Sweepings, therefore, are not released onto the pavement before the sweeper can be unloaded.



INT-1051

Beyerstedt, R. L. (Elgin Sweeper Company). Street sweeper. Canada 826,356; filed Apr. 26, 1965; issued Nov. 4, 1969.

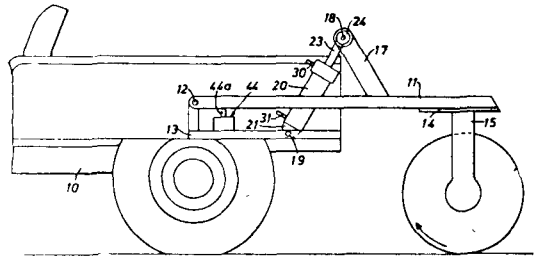
This street sweeper picks up dirt from the street rather than merely brushing the dirt aside. Dirt is gathered at street level and conveyed to a dust box located on the front portion of the vehicle body. A boom controls the movement of the dust box for collecting and dumping purposes. A split, or duplicated, elevator mechanism transports dirt to the collection box. Since the vehicle's drive shaft passes between the parts of the elevator mechanism, a conventional truck-type differential and axle drive the elevator mechanism without additional gear boxes. A single motor powers the sweeper, drives the brushes, and runs the elevator mechanism. This street sweeper may be equipped with duplicate driver's seats, steering wheels, clutch, and brake pedals for operation of the sweeper from either side.



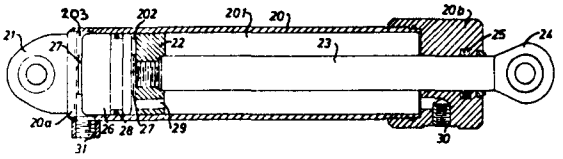
INT-1052

(Asbrink Eiker Aktiebolag). Improvements in or relating to sweeping machines. Great Britain 1,172,630; filed May 21, 1968; issued Dec. 3, 1969.

This sweeping machine has a vertically adjustable support arm for the rotatable sweeping brush. A balancing force counteracts the prevailing weight of the support assembly and



the brush. A balancing piston, which is located within a hydraulic cylinder, provides the means for automatically changing the balancing forces. The brush follows irregularities of the sweep surface, and is kept under a constant pressure. The pressure can be adjusted to the wear of the brush, with the use of simple mechanical devices.

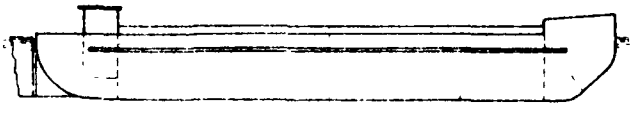


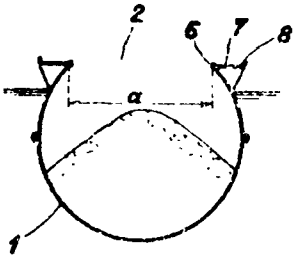
TRANSPORT

INT-1053

Westphal, E. Small water vehicle, for example, a barge for solid material. Germany 809,041; filed Aug. 14, 1949; issued July 23, 1951.

A barge for the transport of solid material, such as refuse, is shaped like a tube and is open on top. The cross section of the barge is circular or elliptical. The main feature of the barge is the smooth inside wall, designed so material can be easily unloaded by a grab crane. The navigation cabin rises just slightly above the highest point of the barge. The overhanging rim is broad enough to walk on. (Text in German)

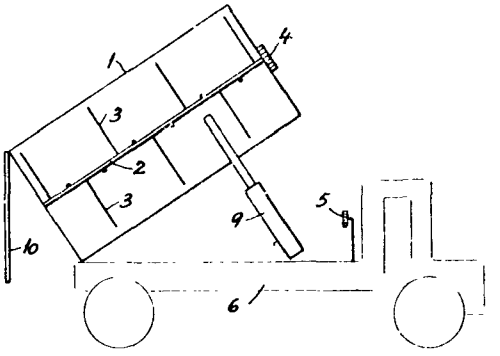




INT-1054

(G. H. P. J. Lund, and O. C. G. Galsoee). Vehicle for transportation of refuse. Switzerland 294,272; filed May 23, 1951; issued Nov. 15, 1953.

A vehicle for refuse transportation consists of a cylindrical container mounted on a chassis. In the interior, a shaft that can be rotated by power transmission crosses the container lengthwise. It can be arranged either in the center or ecentrically. Perpendicular to the shaft are blades for shredding and mixing the refuse. The container has several inlets which are closed by flaps. It can be tipped by an automatic tilting mechanism and is emptied by opening the rear wall. (Text in German)



INT-1055

Wunsch, W. (Ruhrgas Aktiengesellschaft). Procedure for the transport of solid or viscous substances by conduits. Germany 1,098,445; filed Oct. 15, 1959; issued Jan. 26, 1961.

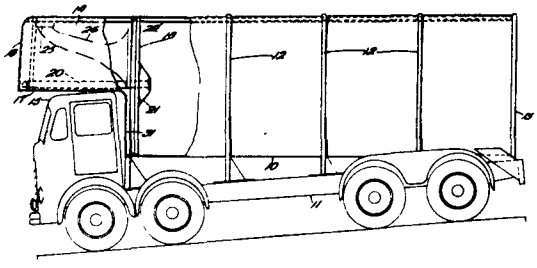
A procedure for the transport of solid or viscous substances in conduits by means of a liquid agent is provided. This agent must vaporize, at least at the end of the conduit, where it is under the influence of the temperature and pressure conditions in that part. At the beginning of the conduit, this agent may be liquefied by compression and/or can be kept liquid by compression until toward the end of the pipeline, where it is transformed into gas by means of expansion, and separated from the remaining contents. This agent is then led back into the pipeline at the beginning of a special duct for this purpose, and is converted from its gaseous form to a liquid. (Text in German)

INT-1056

Tapp, E. T. J., and D. Walker (Walkers and County Cars Limited). Improvements in or relating to vehicles for transporting refuse. Great Britain 967,172; filed Apr. 8, 1960; issued Aug. 19, 1964.

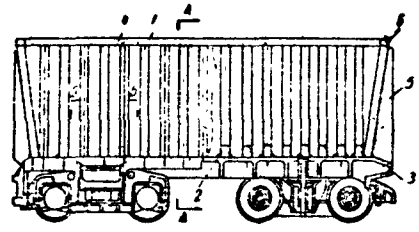
A vehicle transports refuse or other fragmentary material, which is compressed at a loading

station, and then ejected into a container on the vehicle. The compressed refuse may be discharged through the opening at the rear of the container by a piston, which is moved to the rear from a forward position by a hydraulic ram or by a cable mechanism. In order that the piston take up as little room as possible in the container, it must have a comparatively small axial thickness. However, there is a tendency for the piston to tilt while being moved. To alleviate this problem, the main piston part is provided with a supplementary portion, which lies on the side of the main piston which is nearest the front of the vehicle. The supplementary part may extend axially from the main piston part and engage a guiding surface on the container. An alternative method involves a separate guide which is slideable along the container and has a hole through which the piston rod extends. The piston rod is fixed to the main piston part to impart movement to the main part. The separate guide is retained at the front of the vehicle until the main piston part has moved a predetermined distance toward the rear of the vehicle. Then the separate guide moves with the main piston. Another arrangement involves a supplementary piston part composed of a shoe on a bracket fixed to the underside face of the piston, close to the front of the vehicle. The shoe is formed with a guide passage through which a guide rail extends from the container. The guide rail also extends through a slot in the piston.



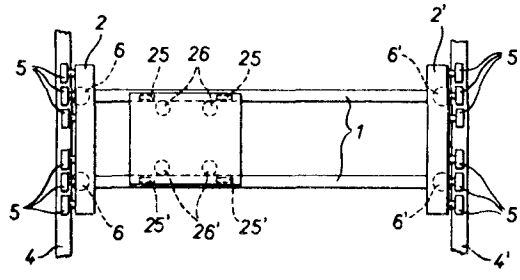
INT-1057
Mishchenko, V. I., and A. P. Likhoradov. Body of gondola for transportation of hot scrap. U.S.S.R. 147,136; filed Mar. 13, 1961; issued Sept. 14, 1967.

The gondola body consists of a framework formed from U-shaped segments and steel plates. The horizontal portions of the U-shaped segments are welded along half their length to the bottom frame of the gondola. Each of the steel plates covers two adjoining gaps between the upright channels of three consecutive U-shaped segments. The upright segment of every U-shaped frame is provided with outwards-facing stiffener ribs. The top edge of the gondola body is formed of lengths of bar stock. The design provides free thermal expansion of its structural elements. (Text in Russian)



INT-1058
Wuethrich, F. Von Roll A.G. Traveling crane, particularly for refuse incineration plants. Switzerland 463,742; filed Oct. 3, 1967; issued Oct. 15, 1968.

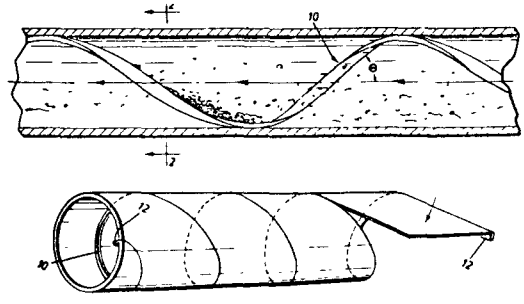
The wheels of both the crane bridge and the travelling crab are provided, on their circumference, with an elastic tire. Both crane-bridge rails are made of U-section steel beams placed sideways, with their webs facing inward. Both end trolleys of the crane bridge, as well as both sides of the travelling crab, are equipped with a pair of guide rollers rotating about vertical axes. Each guide roller has an elastic tire on its circumference. The guide rollers of the crane bridge run on the vertically inward-facing sides of the U-section webs. Also, both travelling-crab rails are made of U-section steel beams placed in the same manner as above, and the guide rollers run on these in the same manner. The elastic tires may be solid or pneumatic tires, and may be made of rubber. (Text in German)



INT-1059
Wolfe, S.E. Method and apparatus for transporting slurries. Great Britain 1,139,889; filed March 7, 1966; issued Jan. 15, 1969.

A method for the transportation of a liquid-solid slurry through a pipeline is provided.

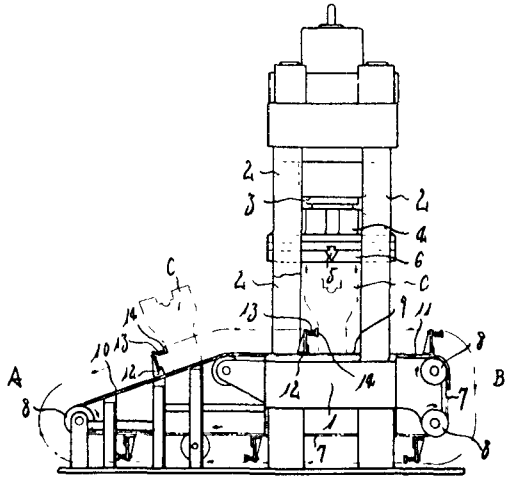
The use of helical ribs within the pipeline minimizes the disadvantages of conventional systems which require high flow velocities, and suffer from the settling of solid constituents at the bottom of the pipeline. A layer of slurry is continuously rotated by a helical rib having a linear spacing of not more than 16 cm along the pipeline and an angle 35 to 60 degrees relative to the longitudinal axis of the pipeline, and projecting inward from the wall of the pipe into the slurry at least 0.9 cm to 1.2 cm for a pipe greater than 15 cm in diameter.



INT-1060

Kitaoka, E. (Dainichi Dottesu Company). Cut iron transporting device in the iron cutting equipment. Japan 44-7,604; filed July 8, 1965; issued Apr. 10, 1969.

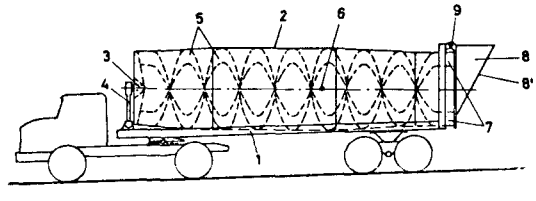
A device facilitating the supply of old iron pieces and ejection of scraps after cutting has a special steel cutting blade with a triangular column. This column operated by an oil pressure cylinder which is stabilized on a suitable anvil on top of the machine. Several sprocket wheels on the framework operate the endless chain which passes the cutting table. Two boards, one for supplying and the other for ejecting, are within the rotating range of the chain. When an old engine block to be cut is placed on the supplying board, the block glides upward; when it comes to the cutting table, the chain stops circling. The blade cuts the block, and the pieces are pushed out by the ejection board as the chain starts to circle again. If the supplying board and ejecting board are in the way when the block is being cut, the chain can be turned backward so the boards will recede from the cutting table. The cutting capacity per unit of time is greatly increased by this setup. (Text in Japanese)



INT-1061

(Keller and Knappich G.m.b.H.). A refuse transporting vehicle. Great Britain 1,151,120; filed Dec. 5, 1967; issued Apr. 30, 1969.

The refuse container of this transporting vehicle is adapted to be loaded from above. The container is a drum, rotatable about an axis extending substantially in the longitudinal direction of the vehicle. The open-end face of the drum communicates with a charging hopper mounted on the chassis. The wall of the hopper opposite the open-end face of the drum is to be discharged. The hopper is offset eccentrically to the drum axis at the side at which the drum surface rotates downward during charging. The refuse container can be loaded directly from conventional refuse collecting trucks. In this way the refuse from a number of smaller conventional refuse collection vehicles can be transported to remote tips or incinerating plants, thus preventing collection trucks from having excessive idle periods.



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PALMER, R.G.
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PALOTAI, L.
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PANASOVA, N.I.
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PAREN, E.V.A.
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PARSONS, B.
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PEREZ, R.J.
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PER'KOVA, T.V.
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PERRET-GENTIL, J.
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PERTSCH, H.
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PETERSEN, K.
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PETERSON, G.R.
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PETERSON, R.M.
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PETUKHOV, K.G.
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PFAUTH, E.
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PFIEFFER, H.
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PICTOR, J.W.D.
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PONOMAREV, V.D.
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POWELL, W.B.
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RANDACCIO, C.
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PATENT CONCORDANCE

PATENT NUMBER	CORRESPONDING PATENT		PUBLICATION NUMBER
AUSTRALIA			
150,662	GT BR	693,487*	INT-0560
160,316	CAN	537,283*	INT-0096
228,158	GER	1,135,764*	INT-0612
229,530	GER	1,178,542*	INT-0382
233,971	CAN	650,443*	INT-0313
271,057*	GT BR	1,029,174	INT-0406
277,000	GER	1,289,232*	INT-0456
279,620	CAN	693,686*	INT-0043
282,423	GER	1,263,214*	INT-0428
286,316*	GT BR	1,055,836	INT-0543
290,104*	SWIT	455,457	INT-0646
294,939*	GER	1,272,839	INT-0311
CANADA			
456,590	GT BR	621,085*	INT-0558
461,606	GT BR	604,516*	INT-0591
506,297	GT BR	680,174*	INT-0081
514,461	GT BR	693,487*	INT-0560
537,283*	AUSTR	160,316	INT-0096
606,992	GT BR	789,564*	INT-0103
650,443*	AUSTR	233,971	INT-0313
693,686*	AUSTR	279,620	INT-0043
770,512	GER	429,580*	INT-1002
801,685	GT BR	1,066,166*	INT-0853
804,876	JAPAN	44-19,143*	INT-0654
812,794	GER	1,204,604*	INT-0623
815,369*	SWIT	451,090	INT-0938
822,382	GT BR	1,167,172*	INT-0310
823,127*	US	3,476,372	INT-0895
829,035	GT BR	1,172,701*	INT-0659
FRANCE			
960,228*	GT BR	670,012	INT-0681
1,406,930	GER	1,241,933*	INT-0408
1,454,019	GT BR	1,060,166*	INT-0853
1,501,664*	GT BR	1,165,931	INT-0859
GERMAN(WEST)			
804,191*	GT BR	684,953	INT-0593
856,401	GER	363,936*	INT-0148
1,022,519*	GT BR	779,418	INT-0102
	SWIT	539,566	INT-0102
1,052,311*	SWIT	351,539	INT-0120
1,121,101	SWIT	322,914*	INT-1026
1,135,764*	AUSTR	228,158	INT-0612
	GT BR	836,550	INT-0612
1,146,440*	SWIT	401,819	INT-0157
1,154,394*	GT BR	908,070	INT-0163
1,162,302	GT BR	963,804*	INT-0260
1,175,377	GT BR	883,451*	INT-0355
1,178,542*	AUSTR	229,530	INT-0382
	GT BR	871,604	INT-0382
	SWIT	555,866	INT-0382
1,204,604*	CAN	812,794	INT-0623
1,221,587*	SWIT	403,683	INT-0628
1,226,485	GER	406,971*	INT-0181
1,241,933*	FR	1,406,930	INT-0408
1,243,813	GT BR	952,582*	INT-0367
1,246,924	SWIT	346,604*	INT-0369
1,256,870*	GT BR	909,811	INT-0634
1,263,214*	AUSTR	282,423	INT-0428
1,268,170*	GT BR	970,674	INT-1043
1,272,839	AUSTR	294,939*	INT-0311
1,289,232*	AUSTR	277,000	INT-0456
	SWIT	398,856	INT-0456
1,289,773*	GT BR	1,128,935	INT-1010
1,299,792	GT BR	1,104,605*	INT-0426
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595,947*	SWIT	241,375	INT-0521
604,516*	CAN	461,606	INT-0591
670,012	FR	960,228*	INT-0681
621,085*	CAN	456,590	INT-0558
680,174*	CAN	506,297	INT-0081
681,323*	SWIT	285,706	INT-0082
684,545	SWIT	294,272*	INT-1054
684,953	GER	804,191*	INT-0593
693,487*	AUSTR	150,662	INT-0560
	CAN	514,461	INT-0560
779,418	GER	1,022,519*	INT-0102
789,564*	CAN	606,992	INT-0103
836,550	GER	1,135,764*	INT-0612
871,604	GER	1,178,542*	INT-0382
883,451*	GER	1,175,377	INT-0355
908,070	GER	1,154,394*	INT-0163
909,811	GER	1,256,870*	INT-0634
952,582*	GER	1,243,813	INT-0367
963,804*	GER	1,162,302	INT-0260
970,674	GER	1,268,170*	INT-1043
1,018,571	GER	400,425*	INT-0391
1,027,362	NOR	104,495*	INT-0805
1,029,174	AUSTR	271,057*	INT-0406
1,054,610	GER	439,559*	INT-0418
1,055,836	AUSTR	286,316*	INT-0543
1,066,166*	CAN	801,685	INT-0853
	FR	1,454,019	INT-0853
1,091,875	GER	455,122*	INT-0432
1,104,605*	GER	1,299,792	INT-0426
1,128,935	GER	1,289,773*	INT-1010
1,157,882	GER	456,014*	INT-0433
1,165,931	FR	1,501,664*	INT-0859
1,167,172*	CAN	822,382	INT-0310
1,172,701*	CAN	829,035	INT-0659
1,173,498	GER	454,334*	INT-0430
1,174,228	GER	460,228*	INT-0440

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NORWAY			
104,495*	GT BR	1,027,362	INT-0805
SWITZERLAND			
241,375	GT BR	595,947*	INT-0321
285,706	GT BR	681,323*	INT-0082
294,272*	GT BR	684,545	INT-1054
322,914*	GER	1,121,101	INT-1026
339,566	GER	1,022,519*	INT-0102
346,604*	GER	1,246,924	INT-0369
351,539	GER	1,052,311*	INT-0120
355,886	GER	1,178,542*	INT-0382
363,936*	GER	850,401	INT-0148
398,856	GER	1,289,232*	INT-0456
400,425*	GT BR	1,018,571	INT-0391
401,819	GER	1,146,440*	INT-0157
403,683	GER	1,221,587*	INT-0628
406,971*	GER	1,226,485	INT-0181
429,580*	CAN	770,512	INT-1002
439,559*	GT BR	1,054,610	INT-0418
451,090	CAN	815,369*	INT-0938
454,334*	GT BR	1,173,498	INT-0430
455,122*	GT BR	1,091,875	INT-0432
455,457	AUSTR	290,104*	INT-0646
456,014*	GT BR	1,157,662	INT-0433
460,228*	GT BR	1,174,228	INT-0440

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140,539	INT-0665
145,047	INT-0228
147,051	INT-1019
148,646	INT-0510
152,382	INT-0328
157,868	INT-0088
159,313	INT-0330
164,464	INT-0332
164,518	INT-0231
166,055	INT-0333
166,184	INT-0719
167,176	INT-0908
167,178	INT-0335
212,100	INT-0341
213,621	INT-0107
216,044	INT-0013
218,961	INT-0598
219,596	INT-0343
222,572	INT-0743
229,723	INT-0756
234,840	INT-0992
235,441	INT-0610
237,098	INT-0312
247,041	INT-0362
247,077	INT-0797
247,215	INT-0576
248,460	INT-0529
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261,882	INT-0390
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480,398	INT-0227
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494,553	INT-0329
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604,590	INT-0759
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790,321	INT-0875
793,590	INT-0443
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805,061	INT-0546
806,072	INT-0548
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807,411	INT-0026
807,871	INT-1047
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1,112,969	INT-0721
1,156,492	INT-0731
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1,204,335	INT-0748
1,213,721	INT-0754
1,235,403	INT-0762
1,240,451	INT-0764
1,276,179	INT-0779
1,299,675	INT-0783
1,303,380	INT-0250
1,357,467	INT-0258
1,381,209	INT-0809
1,399,544	INT-0818
1,409,794	INT-0822
1,426,053	INT-0824
1,426,317	INT-0266
1,430,626	INT-0303
1,439,936	INT-0834
1,443,938	INT-0315
1,447,653	INT-0836
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1,460,727	INT-0270
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1,056,047	INT-0123
1,056,458	INT-0601
1,057,962	INT-0124
1,059,345	INT-0126
1,065,322	INT-0129
1,065,323	INT-0987
1,066,135	INT-0602
1,082,861	INT-0607
1,091,480	INT-0132
1,094,082	INT-0763
1,094,659	INT-0134
1,095,740	INT-0988
1,098,444	INT-0989
1,098,445	INT-1055
1,098,662	INT-0504
1,101,272	INT-0136
1,102,547	INT-0706
1,109,376	INT-0776
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1,126,310	INT-0143
1,126,895	INT-0248
1,127,278	INT-0144
1,128,588	INT-0566
1,128,803	INT-0145
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1,177,766	INT-0378
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1,178,165	INT-0380
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1,192,583	INT-0171
1,192,992	INT-0265
1,192,993	INT-0927
1,192,994	INT-0622
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1,201,756	INT-0176
1,203,179	INT-0177
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1,210,663	INT-0626
1,213,945	INT-0398
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1,215,612	INT-0930
1,216,902	INT-0833
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1,224,594	INT-0629
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1,227,188	INT-0405
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1,235,223	INT-0631
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1,238,841	INT-0190
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1,242,142	INT-0192
1,243,582	INT-0193
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1,246,632	INT-1003
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1,247,937	INT-0195
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1,256,870	INT-0634
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1,263,641	INT-0933
1,268,170	INT-1043
1,268,813	INT-0871
1,269,569	INT-0202
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1,270,728	INT-0435
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1,277,502	INT-0444
1,279,535	INT-0207
1,281,472	INT-1045
1,284,899	INT-0913
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1,288,277	INT-0453
1,289,232	INT-0456
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1,292,678	INT-0284
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661,659	INT-0691
662,819	INT-0594
663,402	INT-0324
667,572	INT-0325
672,071	INT-0695
680,174	INT-0081
680,238	INT-0697
681,323	INT-0082
682,876	INT-0084
685,545	INT-1021
689,421	INT-0511
693,487	INT-0560
699,303	INT-0705
701,234	INT-0229
704,403	INT-0230
707,317	INT-0086
709,867	INT-0595
711,931	INT-0583
717,136	INT-0512
717,839	INT-0981
718,397	INT-0710
719,825	INT-0089
721,069	INT-0561
721,823	INT-0711
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730,882	INT-0092
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