

Jan. 11, 1966

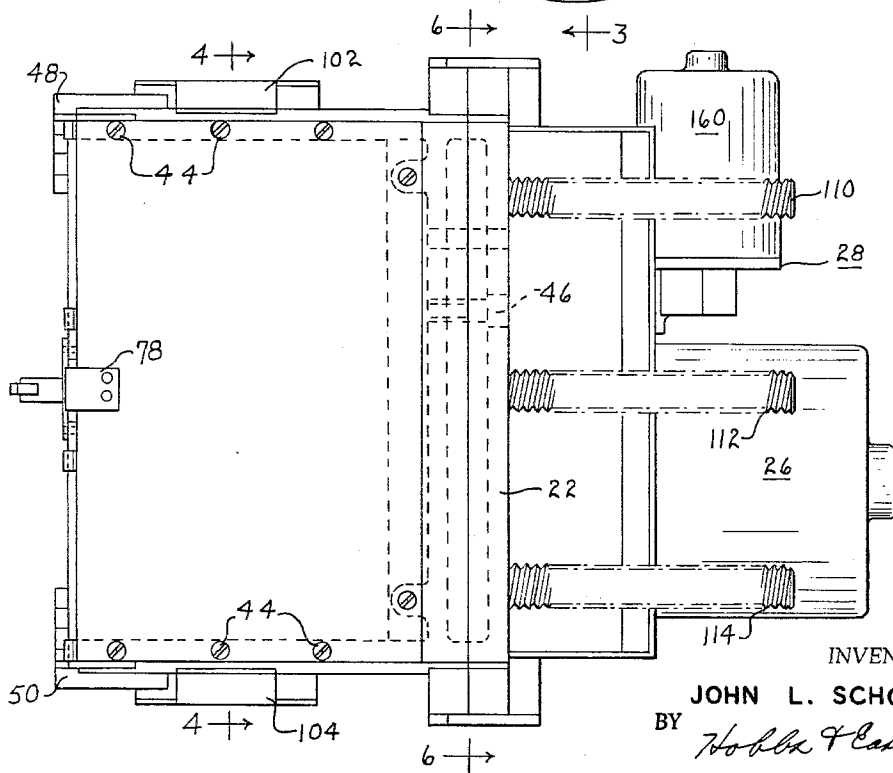
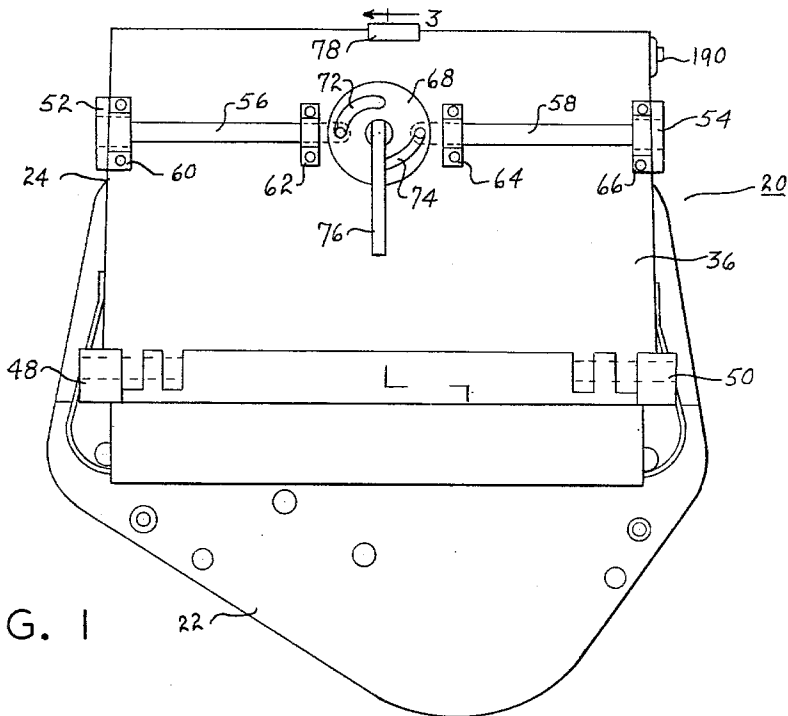
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3,228,323

GARBAGE COMPRESSOR AND COMPACTOR DEVICE

Filed Oct. 14, 1963

5 Sheets-Sheet 1



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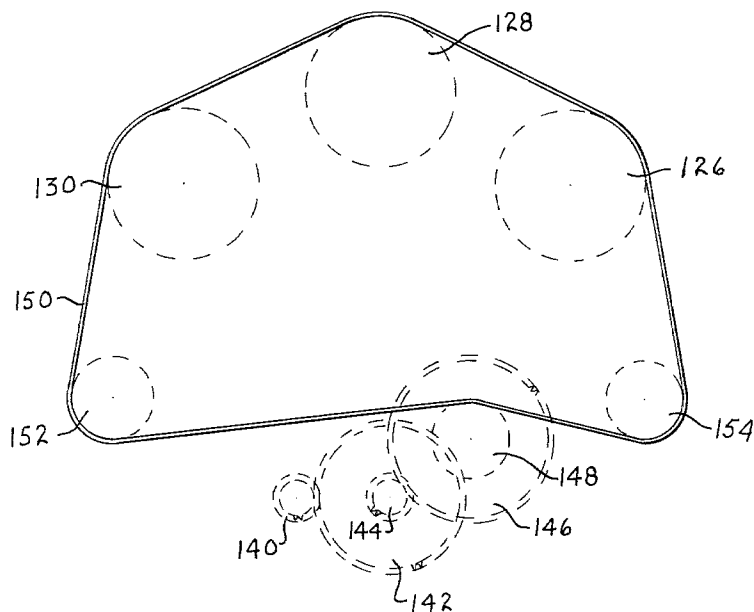
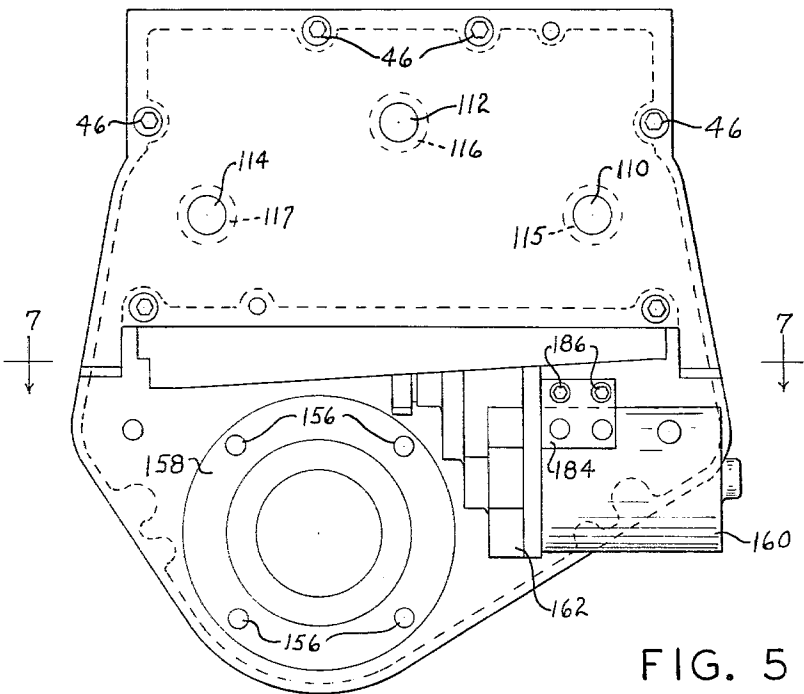
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5 Sheets-Sheet 3



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GARBAGE COMPRESSOR AND COMPACTOR DEVICE

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5 Sheets-Sheet 4

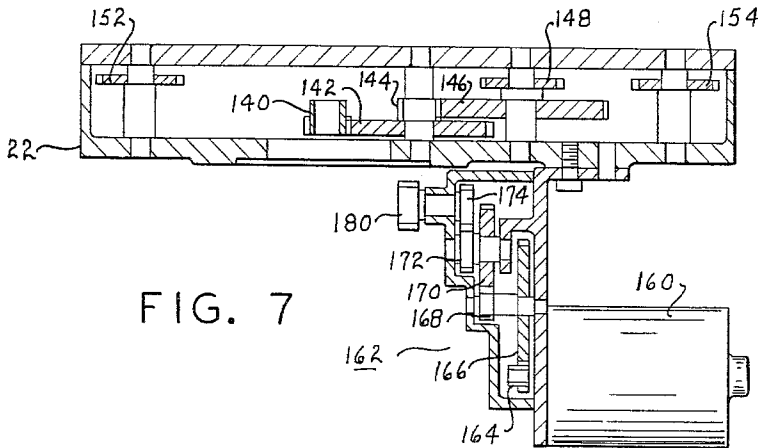


FIG. 7

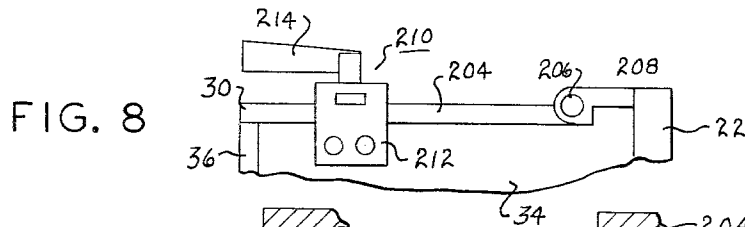


FIG. 8

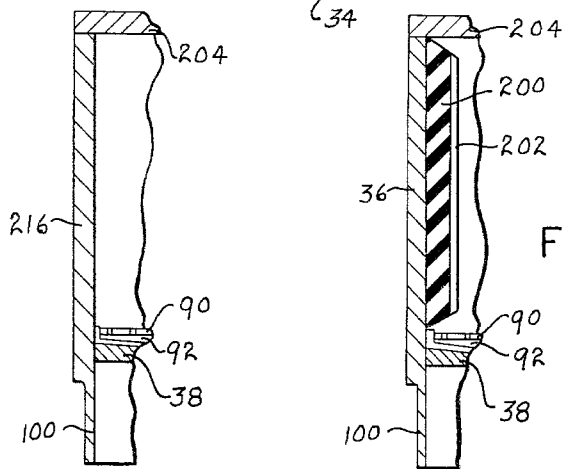


FIG. 9

FIG. 10

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GARBAGE COMPRESSOR AND COMPACTOR DEVICE

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5 Sheets-Sheet 5

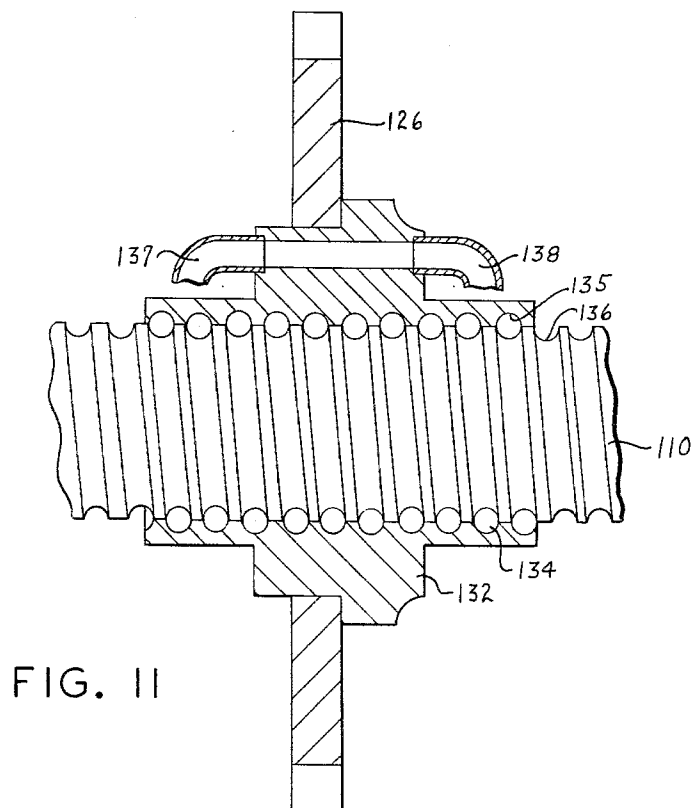


FIG. 11

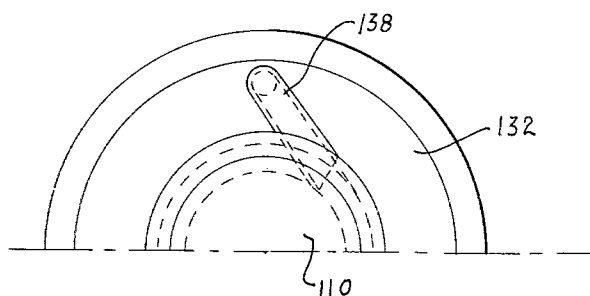


FIG. 12

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**GARBAGE COMPRESSOR AND COMPACTOR
DEVICE**

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6 Claims. (Cl. 100-126)

The present invention relates to a garbage compressor and more particularly to a device which removes the water from and compresses and compacts the volume of a quantity of garbage to permit easier disposal thereof.

The disposal of garbage and other household waste is usually handled either by garbage collection, by burning in a home or apartment incinerator, or in part by a drain disposal unit. With the former, the garbage is generally placed in a can, sack, or other similar container in the kitchen and periodically taken outside to be placed in a larger can or container, which is then in turn emptied during the regular collection of garbage. This system, however, makes it necessary for the container in the kitchen to be emptied frequently, often an inconvenience because of rain, snow or otherwise unfavorable weather. Further, the container in the kitchen often fills up quickly, and many times a housewife will wish to dispose of garbage in an already full container. This makes necessary the pushing down of garbage in the sack and compressing it, or else allowing the garbage in the container to accumulate above the rim of the container, thereby making the container unsightly, odoriferous, and inconvenient to carry. Also, the neighborhood collection of garbage is sometimes irregular, and garbage accumulates in the outside container, causing difficulty in disposing of garbage in the container in the kitchen, making it necessary to push the garbage in the outside container down, or again resulting in unsightly and odoriferous exposure of garbage above the rim of the outside container.

There have been such partial solutions to these problems as the drain type of garbage disposal unit. This type, however, has been unsatisfactory in several respects. First, these units are often difficult to install and are not capable of handling such things as glass, broken china, metals, clam shells, cloth, string, tin foil, rubber, wire or paper in quantity, and, when these materials are accidentally introduced into the disposal unit, they may become wedged and jam the elements of the disposal unit, thereby resulting in damage to the unit or ineffective operation thereof. Furthermore, many disposal units are suitable only for certain types of drainage pipes and systems, and many times an element will become jammed if the unit is stopped before the grinding operation is completed. Water leaks sometimes occur as a result of improper mounting or worn parts, causing serious damage to various parts of the disposal unit and to the surrounding building structure. Further, drain stoppage is often likely to result when insufficient water is used, or from improper plumbing conditions or plumbing conditions which do not conform to the specifications of the unit or improperly cleaned plumbing lines resulting from disposal of fats and grease through the system, or when improper grinding or ineffective operation of the disposal unit allows large particles to enter the drain. Also, the operation to the disposal unit is sometimes very noisy, especially when bones, fruit pits or similar hard materials are being ground. It is therefore one of the principal objects of the present invention to provide a device for disposing of garbage and other household waste, in which the garbage and waste are compressed into a compact form with

2

the water or other fluids thereof being removed therefrom, and which places the compacted garbage in a package which can be easily handled, carried, stored and disposed of either by garbage collection or by an incinerator.

Another object of the present invention is to provide a compact garbage compressor and compactor which can readily be installed in a kitchen, as for example beneath the sink, and easily operated for receiving garbage and other household waste and conveniently operated to release the compressed and compacted liquidized garbage and waste, and which is suitable for use in conjunction with all types of drainage pipes and systems.

Another object of the invention is to provide a garbage compressor and compactor which can be used in conjunction with the kitchen sink, but which does not require a connection with the water outlets or with the drain, and which can be operated as a portable unit, readily movable from one convenient operating position to another.

A further object of the present invention is to provide a garbage compressor which will not be harmed by glass, metals, string, cloth or other materials that generally damage a conventional disposal unit, and which will not cause drain stoppage.

Still another object of the present invention is to provide a garbage compressor of the aforesaid type which is relatively simple to install and easy to operate.

Additional objects and advantages of the present garbage compressor will become apparent in the following specification and accompanying drawings, wherein:

FIGURE 1 is a front elevational view of the present garbage compressor and compactor device;

FIGURE 2 is a top plan view of the present device;

FIGURE 3 is a cross sectional view of the device taken on line 3-3 in FIGURE 1;

FIGURE 4 is a cross sectional view of the device taken along line 4-4 in FIGURE 2;

FIGURE 5 is a rear elevational view of the present device;

FIGURE 6 is a schematic cross sectional view taken along line 6-6 in FIGURE 2 showing the sprocket mechanism and roller chain for driving the present device;

FIGURE 7 is a cross sectional view of the sprocket mechanism taken along the line 7-7 in FIGURE 5;

FIGURE 8 is a fragmentary side elevational view of the top door of the present invention showing a modification in the device;

FIGURE 9 is a fragmentary cross sectional view of the front of a modified form of the present invention;

FIGURE 10 is a fragmentary cross sectional view of the front of the present invention showing a further modified form;

FIGURE 11 is a fragmentary side elevational view of one of the screw shafts and cross section of a sprocket and bearing for operating the present device; and

FIGURE 12 is an end elevational view of the screw shaft, sprocket and bearing illustrated in FIGURE 11.

Referring more specifically to the drawings and to FIGURE 1 in particular, numeral 20 designates generally the present garbage and waste compressing and compacting device, consisting generally of a body 22 having mounted on one side thereof a garbage receiving housing 24 and on the opposite side thereof main drive motor 26 and door operating motor and gear reduction assembly 28. The present garbage and waste compressing and compacting device is adapted to be installed in the compartment beneath the kitchen sink or any other suitable place.

The device shown in the drawings does not have the fixtures, such as mounting brackets or legs for installing the unit; however, these may be specially made and adapted for any particular installation. The unit can readily be made into a portable type having a stand or carriage which can be used to transport the unit and to hold the unit while it is being operated at any convenient location, such as beside a dishwasher, dish receiving table or kitchen sink. The only requirement for operating the portable unit is a suitable electrical outlet for an extension cord or other wiring (not shown).

Housing 24 consists of a top 30, opposed side walls 32 and 34, front door 36 and bottom or discharge door 38, the two side walls, top and bottom doors forming a garbage compressor and compactor chamber 40 in which a plunger 42 reciprocates from the position shown in FIGURE 3 on the right side of the chamber to an intermediate position in the chamber depending upon the amount of garbage or other waste in chamber 40. The two sides and top are preferably constructed of steel or aluminum paneling and are joined together by a plurality of screws 44 extending downwardly through the top panel 30 into the upper edges of side panels 32 and 34; however, any other suitable joining means may be used to secure the top and two side panels together. The housing is mounted on the front side of body 22 by a plurality of screws or bolts, one of which is shown at numeral 46 extending through the body into the housing. The front door 36 closes the entrance to chamber 40 and is pivoted to the lower portion of the housing by hinges 48 and 50 on opposite sides of the housing at the lower edge of the door.

The door, which opens from the top forwardly and downwardly, is held in closed position by a latch mechanism consisting of lugs 52 and 54 secured to the external surface of panels 32 and 34, respectively, and projecting outwardly beyond the forward edge of said panels, and reciprocating bars 56 and 58 supported on the front panel by brackets 60 and 62 for bar 56 and brackets 64 and 66 for bar 58. The bars are reciprocated into and out of engagement with lugs 52 and 54 by a disc 68 pivotally secured to the front of door 36 by bearing 70, and having cam slots 72 and 74 connected to the ends of bars 56 and 58, respectively, for moving the bars inwardly and outwardly as disc 68 is rotated by handle 76. A clip 78 for releasably holding door 36 in closed position without the use of the lock mechanism is preferably provided and consists of a release spring member having a downwardly extending portion 80 and being secured to the upper surface of the top 30.

The discharge door 38 consists of a reciprocable panel supported at its two lateral edges in grooves 82 and 84 in side walls 32 and 34, respectively, the discharge panel being adapted to reciprocate in the two grooves and to move from the position shown in FIGURE 3 to a fully retracted position extending outwardly from the right side of body 22. Since much of the garbage contains water which will be removed upon the compressing and compacting of the garbage, a drain is provided consisting of a perforated plate 90 supported on the upper surface of the main part of the discharge door 38 in which there is a series of channels 92 sloping rearwardly and draining into a collecting channel 94 at the rear of the door, the collecting channel preferably being connected to a drain pipe, sump, or other container by a hose or flexible tube.

An extension 100 is provided at the bottom of housing 24 for receiving and supporting a bag or sack into which the compressed and compacted garbage is discharged when door 38 is retracted. The bag has substantially the same cross sectional size as the lower end of extension 100 and is slipped over the external side walls of the extension and held in place by opposed clamps 102 and 104 secured to side panels 32 and 34, respectively,

Plunger 42, which consists of a rectangular plate forming a full side of chamber 40 and constructed of iron or aluminum plate material, is driven by three screws 110, 112 and 114 extending through body 22 and journaled therein in bearings 115, 116, and 117, respectively, each consisting of parts 118 and 119, mounted in side walls 120 and 122, respectively, of the body. The three screws are secured to the inner side of plunger 42 and are held in nonrotatable portion by screws 123, 124 and 125 extending through the plunger into the ends of the screws. The screws 110, 112 and 114 are driven by sprockets 126, 128 and 130, rotatably mounted on the three screws, respectively, and disposed in housing 22. A suitable type of bearing for rotation of the sprockets on the screws consists of the circulating ball construction as shown in FIGURES 11 and 12, the housing of the sprocket bearing being designated by numeral 132 and the balls in said sprocket bearing 134, the bearings being disposed in spiral grooves 135 and 136 of the bearing and screw and lubricated through tubes 137 and 138.

The three sprockets are driven by motor 26 through intermeshing gears 140, 142, 144, and 146, sprocket 148 and roller chain 150 extending around guide sprockets 152 and 154, and over sprockets 126, 128 and 130. The motor is the conventional reversible drive type and is mounted on the rear side of body 22 by bolts 156 extending through flange 158 on the motor and into the body. When the motor is operated in one direction, sprockets 126, 128 and 130 rotate to advance screws 110, 112 and 114 and thereby move plunger 42 forwardly, i.e. to the left as shown in FIGURE 3, to compress and compact the garbage and other waste, and when the motor is reversed, the sprocket is likewise reversed, thus withdrawing the screws and the plunger to the initial starting position shown in FIGURE 3.

The discharge door 38 is opened by drive assembly 28 consisting of a motor 160 and gear reduction unit 162 secured to body 22 and consisting of intermeshing gears 164, 166, 168, 170, 172, 174 and pinion 180, the pinion intermeshing with rack 182 secured to the underside of discharge door 38. Motor 160 is of the conventional reversible type and when the motor is driven in one direction, the pinion 180 is rotated on rack 182 to withdraw the discharge door from the position shown in FIGURE 3 to its fully retracted position to the left, thus opening the door fully and permitting the compressed and compacted garbage and waste to fall into a bag secured to extension 100. Upon the reversal of motor 160, the pinion is rotated in the opposite direction to move the door from its retracted position to its closed position, as shown in FIGURE 3. The motor 160 and gear reduction unit 162 are secured to the body by a bracket 184 and screws 186, extending through the bracket into the body.

The electrical mechanism, including the switches and wiring, are not shown; however, in the construction and operation of the device just described, switches are connected to lugs 52 and 54 to prevent either motor 26 or 160 from operating whenever the door is not fully locked. When the door is fully locked, the pressing of control button 190 first actuates motor 26 to advance the plunger, and thereafter, as the pressure of the plunger increases to a predetermined point, a pressure sensitive switch reverses the motor and withdraws the plunger to its original position. Preferably, however, a second compressing step is included in the cycle to effectively compact the material before the plunger is fully withdrawn. After the plunger has been withdrawn to its initial position, a further step is included in the cycle which actuates motor 160 for opening door 38 to discharge the compressed and compacted material into a bag suspended on extension 100.

In the operation of the present garbage and waste compressing and compacting device, starting with plunger 42 fully withdrawn to the position shown in FIGURE 3

5

and with a bag clamped onto the extension 100, door 36 is opened by rotating handle 76 counterclockwise, thereby withdrawing bars 56 and 58 from lugs 52 and 54, thus permitting the door to open forwardly and downwardly. Garbage and other waste are then placed in chamber 40 and door 36 is closed and locked, and control switch 190 is closed. Thereupon, motor 26 is actuated to rotate sprockets 126, 128 and 130 to drive screws 110, 112 and 114 forwardly, thus forcing plunger 42 to the left, as shown in FIGURE 3, thereby compacting the garbage and waste in chamber 40. After the plunger has been fully withdrawn, the motor 160 is actuated to drive pinion 180 and open the discharge door 38 to permit the compressed and compacted garbage and waste to drop into the bag suspended on extension 100. Most of the water contained in the garbage and waste is removed during the compressing and compacting operation and the water drains through the perforated plate 90 into channels 92 and into collector channel 94. After the bag has been filled by successive compressing and compacting operations, it is removed from extension 100 and disposed of by any suitable method.

In order to assist in dislodging the compressed and compacted material after plunger 42 has been withdrawn, a resilient pad 200 of rubber or rubber-like material may be secured to the inner side of door 36, which in effect performs a kicking action to dislodge the compacted and compressed material when door 38 is opened to permit it to fall unobstructed into the bag. Also, this resilient pad, which preferably is provided with a reinforcing plate 202, tends to deaden the sound created by breakage of glass and other frangible materials placed in the chamber 40.

FIGURE 8 illustrates a further modification in the device in which top panel 30 is in the form of a door consisting of a panel 204 pivoted by hinge 206 on member 208 secured to body 22. A latch mechanism 210 of a construction similar to the latch mechanism used in conjunction with front door 36 is used to lock the door in closed position. This lock consists of lugs 212 secured to opposite side wall panels and an operating handle 214. This top door permits easy access to chamber 40, whether front door 36 is open or not. A control switch is also used with lock 210 to prevent operation of motor 160 except when the lock is fully latched, holding panel 204 in fully closed position. In a further modified form, door 36 may be eliminated, as illustrated in FIGURE 9, and a rigid front panel 216 used in its place. The construction and operation of the top door are the same as previously described.

While only one embodiment of the present invention has been described in detail herein, various changes may be made to satisfy requirements, including the use of different types of drive mechanisms and different arrangements of the doors and door mechanisms, without departing from the scope of the present invention.

I claim:

1. A garbage and waste compressing and compacting device, comprising a housing defining a rectangularly-shaped chamber and having a front door hinged at the bottom, a top door, a bottom door slidable rearwardly from closed to open position, a lock for holding said front door closed, a lock for holding said top door closed, said bottom door having a perforated plate and drain channels beneath said plate for receiving water removed from the garbage and waste, an extension on the bottom of said housing opening downwardly, means for retaining a bag on said extension beneath said bottom door, a horizontally movable reciprocable plunger in said chamber movable toward and away from said front door, a resilient kicker member on said front door opposite said plunger, a plurality of screws connected to said plunger and extending from said chamber, a rotatable nut held against axial movement on said screws, a sprocket on said nuts, a chain on said sprockets, a motor means having a gear reduction unit connecting said motor with said

6

chain, a means for opening said bottom door including a rack and pinion, and a motor means having a gear reduction unit connecting said second motor to said pinion.

2. A garbage and waste compressing and compacting device, comprising a housing defining a chamber and having a front door hinged at the bottom, a bottom door slidable rearwardly from closed to open position, a lock for holding said front door closed, said bottom door having a perforated plate and drain channels beneath said plate for receiving water removed from the garbage and waste, an extension on the bottom of said housing opening downwardly, means for retaining a bag on said extension beneath said bottom door, a horizontally movable reciprocable plunger in said chamber movable toward and away from said front door, a plurality of screws connected to said plunger and extending from said chamber, a rotatable nut held against axial movement on said screws, a sprocket on said nuts, a chain on said sprockets, a motor means having a gear reduction unit connecting said motor with said chain, a means for opening said bottom door including a rack and pinion, and a motor means having a gear reduction unit connecting said second motor to said pinion.

3. A garbage and waste compressing and compacting device, comprising a housing defining a chamber and having a front door hinged at the bottom, a bottom door slidable rearwardly from closed to open position, a lock for holding said front door closed, said bottom door having a perforated plate and drain channels beneath said plate for receiving water removed from the garbage and waste, a means for retaining a bag on said housing beneath said bottom door, a horizontally movable reciprocable plunger in said chamber movable toward and away from said front door, a screw connected to said plunger and extending from said chamber, a rotatable nut held against axial movement on said screw, a power means for rotating said nut, and a power means for opening said bottom door including a rack and pinion.

4. A garbage and waste compressing and compacting device, comprising a housing defining a chamber and having a front door hinged at the bottom, a bottom door slidable rearwardly from closed to open position, a lock for holding said front door closed, said bottom door having a perforated plate and drain channels beneath said plate for receiving water removed from the garbage and waste, a means for retaining a bag on said housing beneath said bottom door, a plunger in said chamber movable toward and away from said front door, a power means for moving said plunger toward and away from said front door to compress and compact the garbage and waste in said chamber, and a power means for opening said bottom door.

5. A garbage and waste compressing and compacting device, comprising a housing defining a chamber having a door for receiving the garbage and waste and having a bottom door horizontally slidable from closed to open position for discharging the compressed and compacted material, said bottom door having a perforated plate and drain channels beneath said plate movable with the bottom door for receiving water removed from the garbage and waste, a horizontally movable plunger in said chamber, and a power means for moving said plunger to compress and compact the garbage and waste in said chamber.

6. A garbage and waste compressing and compacting device, comprising a housing defining a rectangularly-shaped chamber and having a top door hinged at the rear, a bottom door slidable from closed to open position, said bottom door having a perforated plate and drain channels beneath said plate for receiving water removed from the garbage and waste, a horizontally movable reciprocable plunger, a plurality of screws connected to said plunger and extending from said chamber, a rotatable nut held against axial movement on said screws, a sprocket on said nuts, a chain on said sprockets, a motor means including a gear reduction unit connecting

7

said motor with said chain, a means for opening said bottom door including a rack and pinion, and a motor means including a gear reduction unit connecting said second motor to said pinion.

8

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