

[54] TRASH COMPACTOR APPARATUS

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[51] Int. Cl..... B30b 1/32

[58] Field of Search..... 100/53, 295, 266, 100/269 A, 229 A; 29/454; 92/34, 37, 47, 40

[57] ABSTRACT

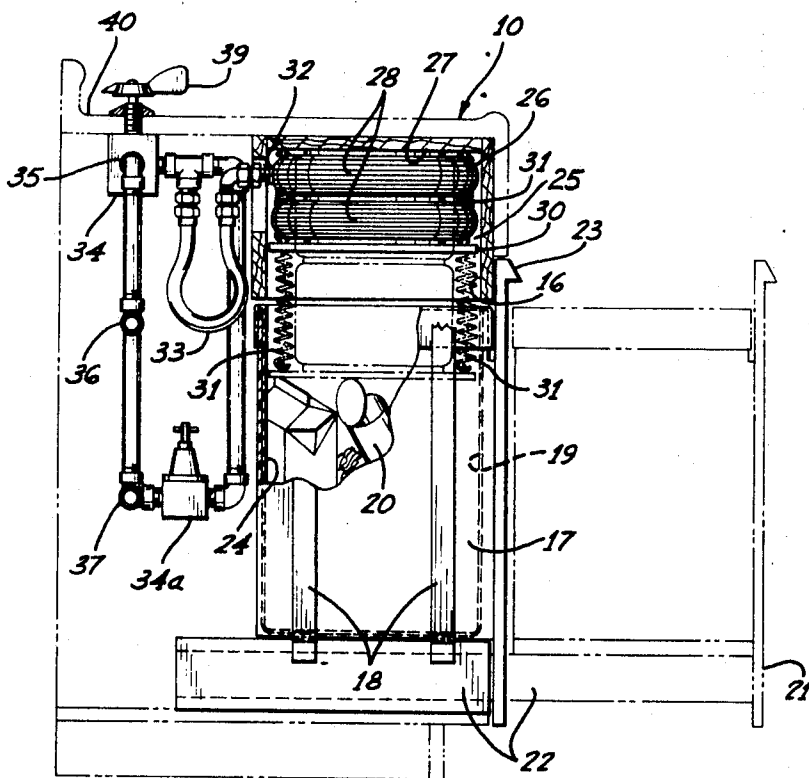
A household trash compactor operable by means of household water supply and pressure.

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1 Claim, 8 Drawing Figures



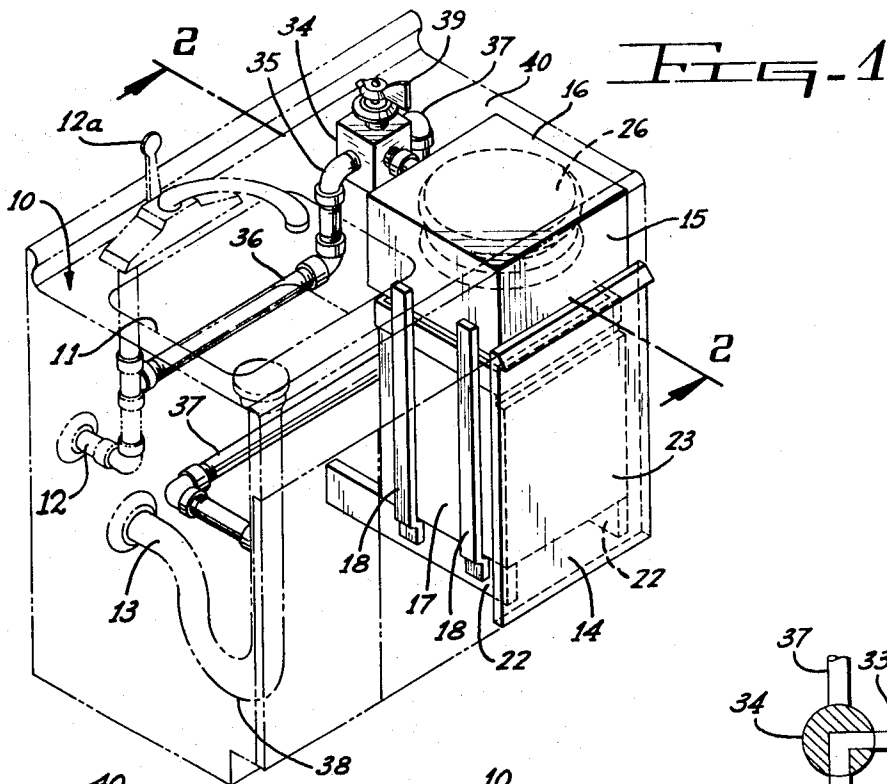


Fig. 1

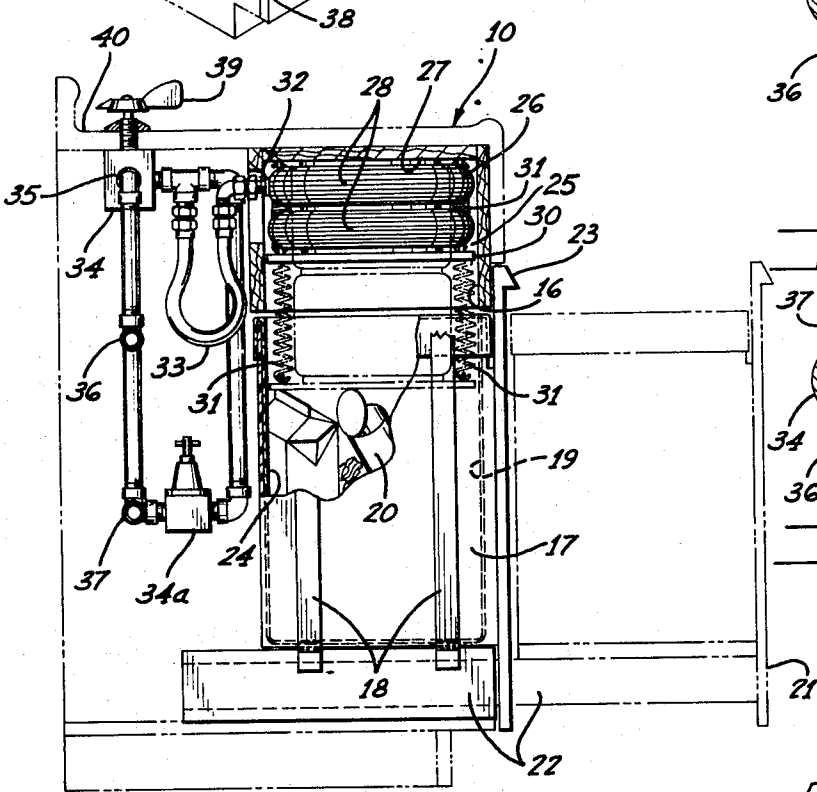


Fig. 2

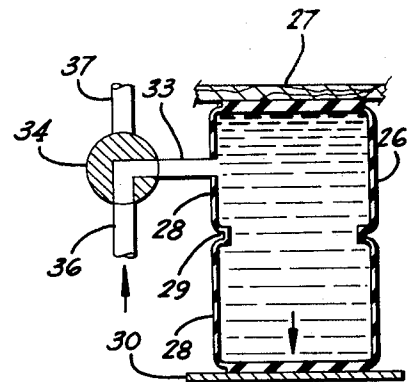


Fig. 3b

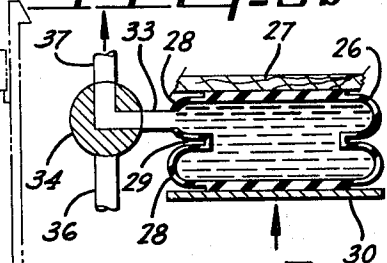


Fig. 3a

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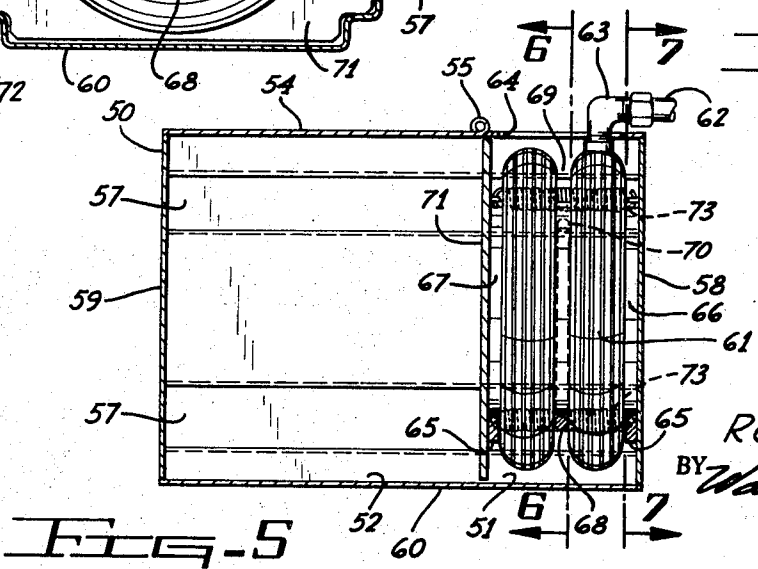
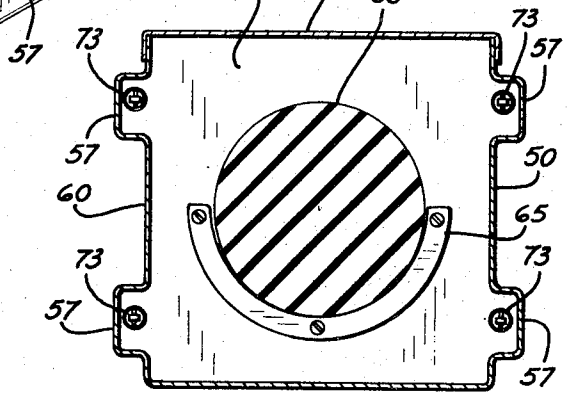
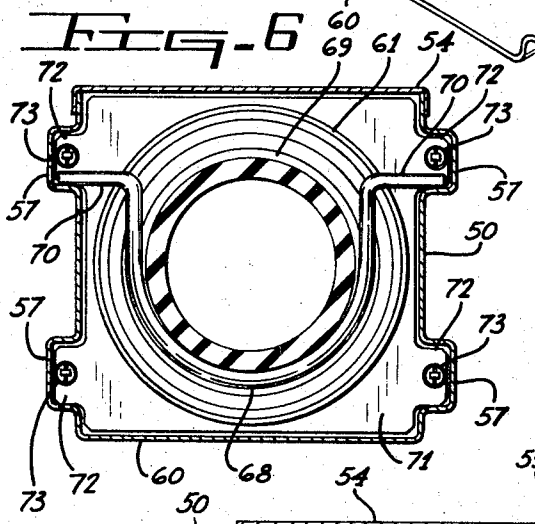
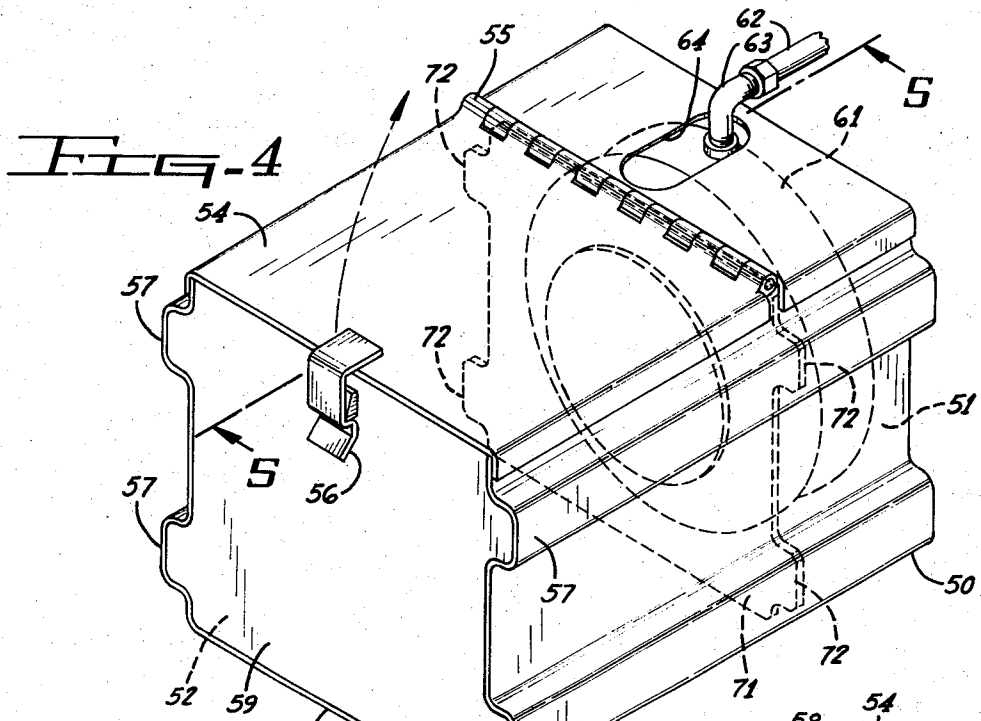


FIG-7

FIG-5

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TRASH COMPACTOR APPARATUS**BACKGROUND OF THE INVENTION**

This invention relates to a household trash compactor which utilizes household water supply and pressure to move and supply compressive pressure to a pressure plate to compress trash in a compression chamber which forms a part of the apparatus.

1. Field of the Invention

This invention is particularly directed to a trash compactor employing an expansive flexible bellows which is simply constructed and easily operated to provide a trash compactor which may be manufactured and sold relatively inexpensively and which will be acceptable to housewives who will normally operate the device.

2. Description of the Prior Art

There have been many trash compactors invented and patented; however, none of these has gained very wide acceptance by the public. For the most part, prior trash compactors have been expensive to manufacture and could not be marketed at a price which householders could afford or were willing to pay. In addition, the prior devices had operating and control systems which were complicated and therefore difficult to operate, service and/or repair.

SUMMARY OF THE INVENTION

In accordance with the invention claimed, the trash compactor disclosed is designed to be manufactured at relatively low cost so it may be sold at a price householders are willing to pay; and also, it is designed to be operated from the standard household water supply and drain system in any home. Also, the apparatus, is designed to be easily operated and serviced when necessary.

It is therefore one of the principal objects of this invention to provide a trash compactor which is simple in design and may therefore be manufactured and sold at relatively low cost.

Another object is to provide such a device which has relatively few working parts, which parts are simple to operate, and simple to maintain or replace when necessary.

Another object is to provide such a device which may be installed in any household and which may be connected to the household water supply and drain system for operation without complicated installation procedures.

Another object is to provide a trash compactor which is simple to operate.

Another object is to provide a trash compactor which has great compressive capabilities so it will be able to compress and compact any refuse, cans, bottles, and the like which are inserted in the compression chamber.

A more specific object is to provide a trash compactor which employs an expandable bellows connected by a single control valve to the water supply system and the drain system of a home, wherein water from the supply system may be directed into the bellows to fill and expand it to move a pressure plate into the compression chamber to cause refuse therein to be compacted.

Another specific object of the invention is to provide an apparatus as described above wherein the operation

of the control valve will permit the water within the bellows to be drained into the household drain system.

Another object is to provide a positive bias means to cause the expanded bellows to be contracted and force the water therefrom into the drain system when the control valve is in a position to direct water into the drain.

These and other objects and advantages of this invention will become more apparent as the description proceeds, and the features of novelty which characterize this invention will be pointed out with particularity in the claims annexed to and forming part of this specification.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention may be more readily described by reference to the accompanying drawing, in which:

FIG. 1 is a perspective view of a household kitchen cabinet sink showing my invention installed.

FIG. 2 is a vertical sectional view on the line 2—2 of FIG. 1.

FIG. 3a is a central sectional view showing the bellows in contracted condition and showing the two-way valve in position to drain water therefrom.

FIG. 3b is similar view of the bellows in expanded position and showing the two-way valve in position to close the drain and permit water from the water supply line to fill and expand the bellows.

FIG. 4 is a perspective view of a modified form of my invention wherein the compressive pressure is applied horizontally rather than vertically as in FIG. 1.

FIG. 5 is a vertical section view on the line 5—5 of FIG. 4.

FIG. 6 is a sectional view on the line 6—6 of FIG. 5.

FIG. 7 is a sectional view on the line 7—7 of FIG. 5.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring more particularly to the drawing by characters of reference, reference numeral 10 indicates a cabinet having a sink 11 which has a water supply line 12 to the faucet 12', and a water drain line 13 from the sink to a sewer.

The number 14 indicates, generally, my trash compactor which is installed in the cabinet 10 adjacent to the sink 11, water supply 12 and drain 13 for convenience in making the necessary connections thereto.

The trash compactor comprises a housing 15 having an operating mechanism section 16 and a trash compressing section 17 which are of any suitable shape and size and which are connected by suitable stress members 18—18 as shown. It is deemed apparent that the housing 15 could be an integral unit, such as is shown in FIGS. 4—7, without departing from the spirit of the invention.

The trash compressing section 17, as shown in FIGS. 1 and 2, is the lower section, and comprises a container or chamber 19 into which trash 20 is placed to be compressed, and thus the container becomes a compression chamber. The container 19 is preferably a drawer-type structure, as shown, and is capable of being moved inwardly to a close position and outwardly to an open position, as shown at 21, by means of drawer slides or guides 22. As is deemed apparent, the front 23 of the drawer may be of suitable design of the cabinet 10.

It is preferred that the container section be so constructed that a trash bag 24 may be installed as a liner

for the container and also serves as the means to remove and hold the compressed trash for disposal. The use of such trash bags is conventional in the art.

The apparatus section of my device comprises a chamber 25 in which an expandable bellows member 26 is carried, the bellows having one end engaged against the end 27 of the housing 15, as shown.

The bellows member 26 is comprised of a plurality of stacked expandable disc sections 28—28 joined by a narrow neck 29 to permit the bellows to be expanded and contracted as shown particularly in FIGS. 3a and 3b. The bellows may be made of any suitable material such as rubber, plastic or the like.

The opposite end of the bellows 26 is supported on a pressure plate 30. The pressure plate 30 is carried by a plurality of tension springs 31—31 which has the pressure plate 30 toward the end 27 of the housing and tends to keep the bellows 26 in contracted position, the purpose of which will become apparent.

The pressure plate 30 is of suitable size and shape to fit freely in the trash container chamber 19 and can be moved into the chamber to compress trash therein and can be retracted from the chamber to permit trash to be inserted into the chamber.

The bellows 26 has a water connection 32 to which a flexible water supply and drain line or hose 33 is attached at one end. The opposite end of the water supply and drain line is connected to a suitable two-way control valve 34. The control valve 34 has a connection 35 to permit a water supply line 36 to be connected from the household water supply line 12 so that water from the supply line 12 may be introduced into the bellows 26 when the valve 34 is in the position shown in FIG. 3b. As shown in this figure, the introduction of water into the bellows forces the bellows to expand, moving the pressure plate against the tension of springs 31—31 away from the end 27 of the housing and into the trash container chamber 19 shown in dotted lines in FIG. 2. The pressure of the water in the household supply line connected with the bellows applies compressive pressure to the pressure plate, as is deemed apparent. The relatively large area of the bellows which is under pressure and engaged against the pressure plate assures that a very substantial pressure will be applied to compress trash within the chamber 19, as the average household water pressure would be in the neighborhood of 65—100 pounds per square inch.

In order to protect the compressors shown in the drawings against excessive pressures, a safety valve 34a is provided between line 33 and drain lines 37—13. If pressure becomes excessive in line 33 or in the bellows, the safety valve connects the pressure line through valve 34a to drain lines 37—13 in a manner well known in the art.

It is deemed apparent that the compressive pressure desired to compress trash may be readily controlled by proper sizing of the diameter of the bellows. It is even possible to supply special larger diameter bellows for areas where household water pressure is normally lower than average, and also to supply special smaller diameter bellows for areas where household water pressures are higher than average. One can also be assured, with my bellows apparatus, that adequate compressive pressure may be obtained to suit any requirements which may be encountered in trash compression.

As shown, the two-way valve 34 has a drain line 37 connected thereto which connects with the household

drain line 13 at any suitable location, preferably above the trap 38. With the valve 34 in the position shown in FIG. 3a, the bellows is connected to the drain line 37 and water is shut off from the supply line 36. Thus, the tension springs 31—31 begin immediately to contract the bellows 26 and thereby water is forced from the bellows into the drain lines 37—13 and the pressure plate 30 is retracted from the container or chamber 19 into the apparatus section of the housing. This permits the container section to be opened to receive more trash for compaction, or to remove the bagged trash for disposal as desired.

The two-way valve 34 has an operating handle 39 which preferably extends above the countertop 40 of the cabinet 10 in a suitable location, preferably near the rear wall of the cabinet, where it is handy to reach yet out of the way from interfering with normal use of the countertop. The valve handle may have its two positions suitably marked, of course, such as "compress" and "release" or other suitable wording, as desired.

FIGS. 4 through 7 show a modified form of my invention which may be installed and operated in horizontal position rather than in vertical position. This modified form of my invention is intended for use in areas where space is not available for a vertical installation which would normally require an area of the front face of a cabinet. My modified form of the invention may be installed in the open cabinet area under a sink, for example, where access is easy through the conventional doors under a cabinet sink, or any other suitable location. This form of the invention requires much less installation time and cost, and is very handy as many households now have their trash container in this space under the sink.

As shown in FIGS. 4 through 7 the modified form of the invention includes a housing 50 having an apparatus section 51 and a trash container section 52 similar to their counterparts in the invention shown in FIGS. 1 through 4. The housing 50 has a lid 54 on its top portion which is connected to the housing near the apparatus section 51 by means of a hinge 55. A closure latch or catch 56 is provided to permit locking the lid closed during the compression cycle of the device.

The housing may be made of formed metal to facilitate the provision of a plurality of pressure plate guides 57—57. The ends 58 and 59 of the housing are securely fastened as by welding to the body portion 60 of the housing to withstand the compressive stresses present during the trash compression cycle of operation.

Within the apparatus section, a bellows 61 similar to the bellows 26 is carried, and has a water supply and drain line 62 connected thereto by connector 63. The line 62 connects to the two way valve 34 in the same manner and with the same function as previously described for the line 33 and valve 34, and therefore it is deemed unnecessary to again describe the connection and operation features. As shown clearly in FIG. 4, the housing 50 has a slot 64 through which the connector 63 extends to permit the movement of the bellows 61 in the apparatus section.

The bellows 61 is supported at each end in the apparatus section 51 by means of a U-shaped support member 65, one of which is fastened to the wall 58 and one to the pressure plate 71 to engage and support the opposite ends 66 and 67 of the bellows.

The bellows 61 is supported intermediate of its ends by means of a U-shaped sliding support or guide 68

which embraces the lower half of the bellows at the reduced portion or neck 69 thereof. The guide 68 has laterally extending ends 70 which extend into the pressure plate guides 57, as shown, whereby the sliding support may move with the bellows as the latter is extended and retracted.

As shown in FIG. 4, the pressure plate has dogs or ear-like projections 72-72 which extend into the pressure plate guide slots or grooves 57 to insure proper guiding of the reciprocable movement of the pressure plate during operation.

Tension springs 73-73 are provided between the pressure plate 71 and the end wall 58 of the housing to bias the bellows to contracted position as previously described.

In operation of the modified form of the invention the latch 56 is released so the lid 54 may be raised to permit trash to be inserted into the compression section 52 of the compactor, the lid is then closed and latched and the valve 34 may be moved into the "compress" position to direct water under pressure into the bellows 61 to cause it to extend or expand to force the pressure plate 71 into the compression section to compact trash contained therein.

It will be apparent to those skilled in the art that changes and other modifications may be made to the trash compactor shown and described herein without departing from the spirit of the invention or from the scope of the appended claims.

What is claimed is:

- 1. A trash compactor for connection to and operation with household water supply and drain lines comprising:
 - a housing having an apparatus section at one end thereof and a trash compaction section at the opposite end thereof,
 - a wall at each end of said housing,
 - opening means associated with said trash compaction section to permit access to said compaction section to deposit trash therein and to permit closing said trash section,
 - an expandable closed-ended, bi-sectional bellows

member carried in said apparatus section and having one end thereof engaged against said end wall of said apparatus section,

said bellows formed of a resilient material and when expanded forming two cylindrical sections each having the same diameter at any point along their lengths,

a pressure plate engaged against the opposite end of said bellows and being movable from said apparatus section into said compaction section by said bellows when the latter is in expanded condition, tension spring means having one end thereof connected to said end wall of said apparatus section and the opposite end thereof connected to said pressure plate to bias said plate toward said end wall of said apparatus section and thereby tend to maintain said bellows in its contracted position,

a water control valve having water line connecting means to permit a connection to said household water supply and having drain line connecting means to permit a connection to said household drain line, and

a water supply and drain line connected between said valve and the side wall of one of said cylindrical sections of said bellows,

said valve having two positions, one of said positions permitting water to flow from said water supply line to said bellows to fill and expand said bellows to cause said pressure plate to move into said compaction section to compact trash contained therein and the other of said positions serving to shut off said water in said water supply line and to open said drain line to cause water in said bellows to be discharged into said household drain line by said action of said tension springs contracting said bellows,

said housing being disposed in a vertical position with said apparatus section located above said trash section,

said opening means including a drawer-like mounting of said compaction section.

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