The present invention relates to a trash compactor and particularly to an apparatus for volumetrically reducing trash to facilitate the storage, handling and disposal thereof.

One of the most bothersome tasks which must be performed in homes and business establishments alike is the removal of trash. Normally, trash material is accumulated in baskets that are periodically emptied into larger containers which store the trash until it can be removed to a ground fill or other disposal location. In performing these tasks and handling the operations, the most disturbing aspects are the frequency with which the accumulating baskets must be emptied, and the volume of trash which must be handled and transported.

The trash from a home or other establishment usually consists largely of boxes, bottles, metal cans, and other empty containers. Therefore, flattening or compacting these containers substantially reduces the volume of the trash to minimize the problems of storing and handling trash. As a result, a need exists for an economical, trouble-free, compact apparatus for reducing trash as by smashing and flattening various containers.

In general, the present invention comprises a trash compactor including an open housing having a plunger movably-mounted therein. The plunger is coupled to a driving means which urges the plunger through power and return strokes. Trash placed in the housing is compacted during the power stroke. The housing also includes an exit closure which supports trash until it is compacted. However, the exit closure is not complete, therefore, after the trash has been compacted it may fall from the compactor. The apparatus may further include an entry closure in the form of a cover which incorporates control means and other objects and advantages when the plunger is in motion, and to also render the plunger inoperative when the lid is open. A further feature of the present invention resides in providing a driving unit for the plunger which may be hydraulically operated as from an ordinary source of city water.

An object of the present invention is to provide an improved trash compactor.

Another object of the present invention is to provide an economical trash compactor which may be inexpensively manufactured and operated with minimal maintenance.

A further object of the present invention is to provide a trash compactor which is safe for home use.

A still further object of the present invention is to provide a trash compactor apparatus incorporating a hydraulic drive unit and so constructed as to provide for automatic discharge of compacted trash.

One further object of the present invention is to provide a trash compactor unit incorporating control means whereby the apparatus may be safely operated by inexperienced persons, and perform various operations in accordance with the type of trash being handled.

These and other advantages will become apparent from a consideration of the following description taken in conjunction with the drawings, wherein:

FIGURE 1 is a sectionalized plan and diagrammatic view of an apparatus constructed in accordance with the present invention;

FIGURE 2 is a perspective view of a portion of the apparatus of FIGURE 1; and

FIGURE 3 is a diagrammatic representation of an electrical circuit incorporated in the system of FIGURE 1.

Referring initially to FIGURE 1, there is shown a housing H which is adapted to receive cans, bottles, containers, and other trash. A plate P comprising a plunger is mounted in the housing H whereby to be moved through a horizontal power stroke to the left and a return stroke to the right. In the operation of the apparatus, trash is placed inside the housing H and the plate P moves to the left compressing the trash so that the trash may fall through an opening O in the bottom closure of the housing H. Of course, the compacted trash which falls from the apparatus is considerably easier to store and handle after having been volumetrically reduced. The apparatus will now be considered in greater detail with reference to FIGURES 1 and 2.

The housing H generally comprises four walls (which may be of steel) joined to form a generally-rectangular configuration. The side walls 12 and 14 have horizontal elongate slots 16 and 18 respectively formed therein which slots are parallel to the direction of movement of the plate P. The plate P carries transversely-extending pins 20 and 22 threadably-affixed to extend from the sides of the plate into the slots 16 and 18 respectively.

In this manner, the plate P is movably supported in the housing H and may be moved from right to left and vice-versa, in the housing H.

The rear surface of the plate P (surface remote from the wall 24) carries a coupling ring 26 which threadably receives a tube 28 comprising a connecting rod. The end of the tube 28, which is remote from the plate P, is connected to a concentric piston 30 by a thread seal incorporating an O-ring 32. The annular edge of the piston 32 contains an arcuate groove, and carries an O-ring 34 whereby to form a fluid-tight seal between the piston O and a closed cylinder 36.

The cylinder 36 may be formed of steel and affixed to the rear wall 38 of the housing H as by a weld.

The wall 38 in the housing contains a bore coinciding to the inside diameter of the cylinder 36 through which the tube 28 may freely pass.

The closed end 40 of the cylinder 36 contains a threaded plug 42 having an integrally-formed bracket 44 to engage one end of a coil spring 46 lying in the tube 28. The other end of the coil spring 46 is held adjacent the plate P by a pin 48 which extends transversely through the tube 28.

The flow of fluid into and out of the cylinder 36 is controlled by a three-port two-position electro-crank-trolled relay and valve 50. One port of the valve 50 is connected through a line 52 to the interior of the cylinder 36, while the other two ports are connected respectively to a source of fluid under pressure, and to a fluid discharge passage. Specifically, one of the ports in the valve 50 is connected through a passage 54 to a source of fluid under pressure (not shown) which may comprise ordinary city water in a typical installation of the present apparatus. Another port of the valve 50 is connected through a discharge passage 56 to a fluid-discharge line which may comprise the sewer line in a typical installation of the apparatus. The quiescent or unenergized state of the valve 50 results in the interconnection of the interior of the cylinder 36 with the discharge passage 56; however, the valve, upon being energized, connects the interior of the cylinder 36 to the pressure passage 54.

The housing H is covered by a hinged cover 58. Lips 60 and 62 (FIGURE 2) are formed in the cover 58 which extend inwards to engage the plate P by entering cuts 64 and 66 in the plate P when the plate is displaced from a position adjacent the rear wall 38.

The cover 58 also carries an extension 68 (FIGURE 2) extending outwardly from the cover 58 to close a switch 70 when the cover is closed. The switch 70 functions in conjunction with a switch 72 (mounted at the forward end of the slot 18) to control the valve
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50 and prevents energization of the valve 50 to move the plate P while the cover 58 is open, as will be herein-described with respect to FIGURE 3.

The bottom of the housing H is closed by a hinge- mounted cover plate 74 which is urged to a closed position by a spring incorporated in a solenoid 76 which is indicated to be mechanically coupled to the plate 74 by a dash line 78. The solenoid 76 functions to open the bottom of the housing H by displacing the bottom plate 74 upon energization. The solenoid 76 is energized by closing a switch 80 that is connected in series with the solenoid and the source of electrical energy.

In manufacturing the apparatus as shown in FIGURE 1, the cylinder 36 may have the piston 30 mounted thereon then be integrally formed as shown with the housing H. Next, the tube 28 is inserted through the bore in the wall 38 and threaded into the piston 30 with the spring 46 affixed therein. Thereafter, the plate P is lowered into position and the tube 28 threaded into the collar 26 which may be affixed on the plate P by a weld. It is to be noted, that the threads at opposite ends of the tube 28 may be in opposite directions so that the entire piston 30 is turned as the tube 28 is revolved to mate with the collar 26.

The pins 20 and 22 are next affixed in the plate P, as by threading, and the plug 42 is inserted with the spring 46 in position. Thereafter, the cover 58 and the plate 74 are hinged mounted and the valve 50 is installed.

In using the apparatus, the plate P normally lies adjacent the rear wall 38 of the housing H. With the plate P in that position, the cover 58 may be pivotally raised to insert trash in the housing H. Trash, as a tin can, is then inserted in the housing H. Thereafter, a switch 52 (FIGURE 3) is depressed, and if the cover 58 is closed, the switch 70 is also closed and therefore a relay coil 50a is energized through the normally-closed switch 72, from a source of electrical energy coupled across terminals 81. The switch 52 also energizes the solenoid valve 50e. Energization of the coil 50a closes the contact 50b to maintain the valve 50e energized connecting the pressure passage 54 to the cylinder 36. This connection permits fluid to flow into the cylinder 36 moving the piston 30 and the plate P through a compacting power stroke to smash the trash contained in the housing H. It is to be noted that upon displacement of the plate P from its quiescent position, the lips 60 and 62 engage the plate P and prevent lifting of the lid 58.

At the end of the compacting stroke, the pin 22 closes the switch 72 (FIGURE 3) thereby de-energizing the coil 50a to open the contacts 50b, and de-energize the valve 50e returning it to its quiescent state wherein the interior of the cylinder 36 is connected to the discharge passage 56. As a result, the spring 46 returns the plate P and the piston 30 through a return stroke to normal positions. It is to be noted that during the return stroke the cover 58 remains engaged with the plate P, locking the cover in a closed position. Thus, as a result the above safety feature, and the feature of the switch 70 opening when the cover 58 is open to thereby prevent the coil 50a from being energized to operate the valve 50; the unit is completely safe to be operated by inexperienced persons.

As a result of the above described compacting operation, the can or other trash placed in the housing H is flattened and falls through the opening O to a storage container (not shown). Of course, the apparatus would function in a similar manner to smash a bottle or other container formed of rigid material.

Paper cartons, boxes, or other similar material placed in the housing H, may be reducible to a size while with the opening O. In such instances, the button 89 is depressed energizing the solenoid 76 whereby to swing open the bottom plate 74 of the housing H and allow the trash to fall therefrom into the storage container.
receiving section and thereby clear said trash-receiving section.

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