July 20, 1965 B. L. LARSEN ETAL 3,195,448

PACKING AND COMPACTING APPARATUS

Filed Dec. 21, 1962 3 Sheets-Sheet 1

Fig. 1

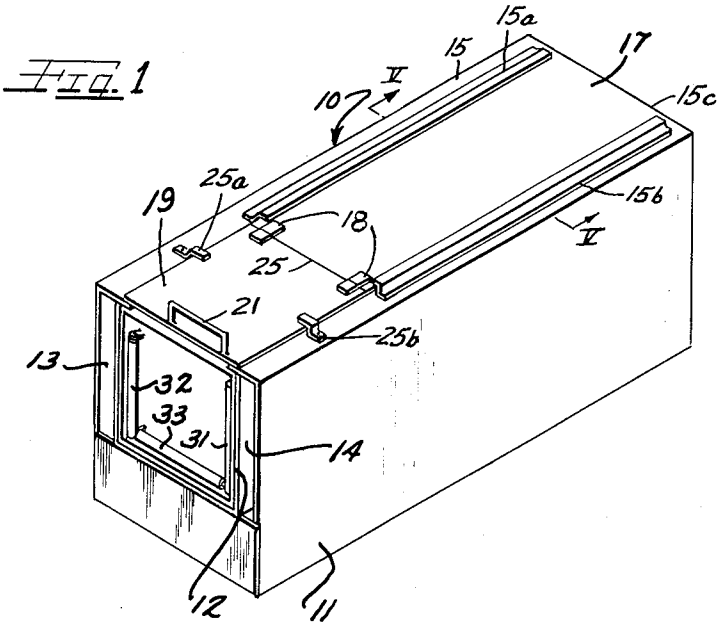
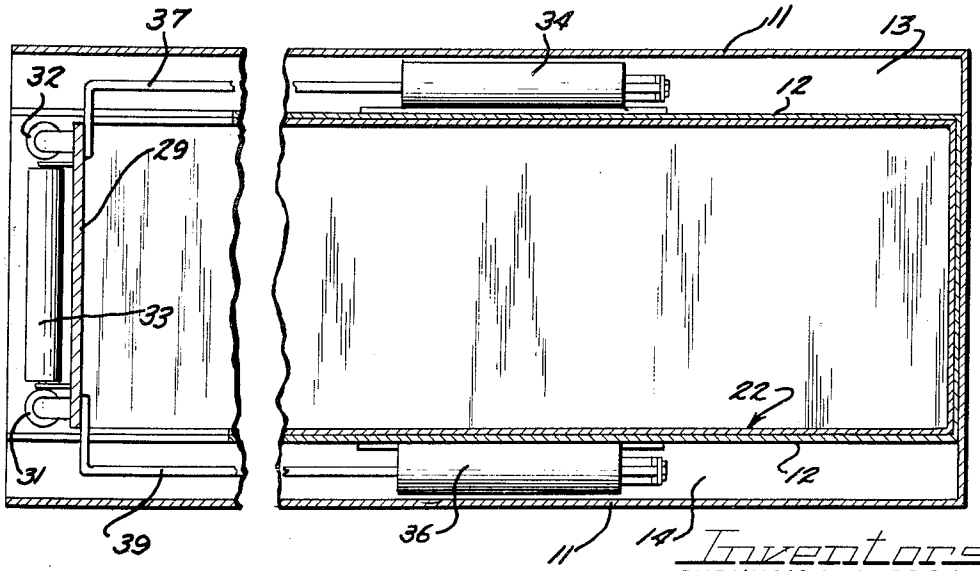


Fig. 2



Inventors
BURNHAM L. LARSEN
BERNARD J. LARSEN

By Hill, Sherman, Meroni, Gross & Simpson Attys

July 20, 1965 B. L. LARSEN ETAL 3,195,448

PACKING AND COMPACTING APPARATUS

Filed Dec. 21, 1962 3 Sheets-Sheet 2

Fig. 3

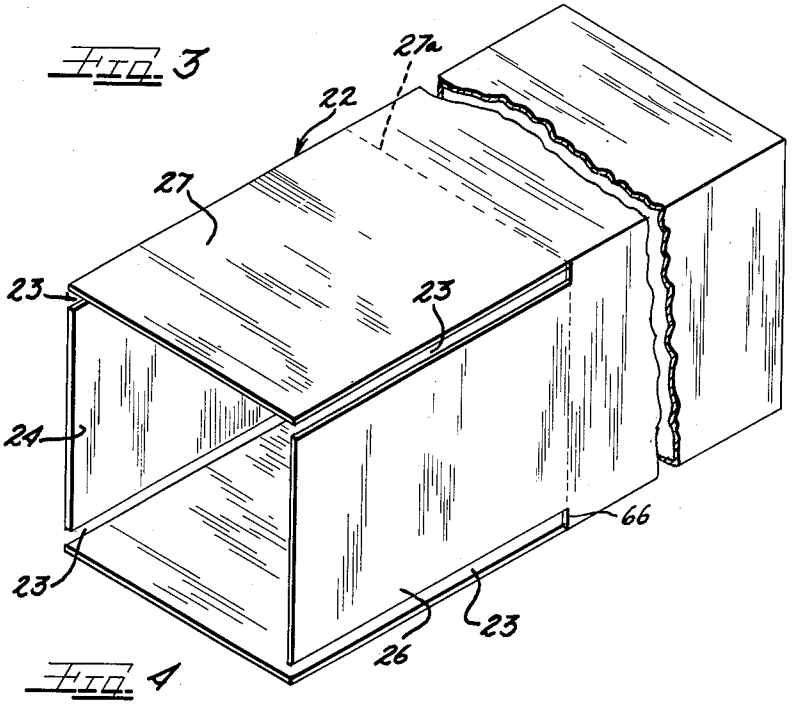
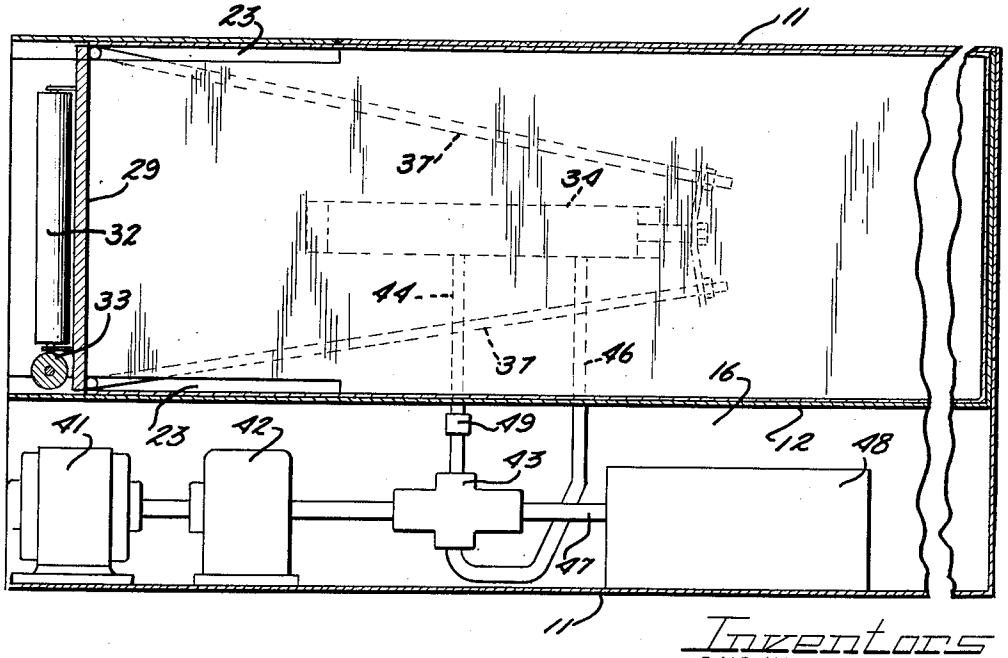


Fig. 4



Inventors
BURNHAM L. LARSEN
BERNARD J. LARSEN

By Hill, Sherman, Meroni, Gross & Simpson Attys

July 20, 1965 B. L. LARSEN ETAL 3,195,448

PACKING AND COMPACTING APPARATUS

Filed Dec. 21, 1962 3 Sheets-Sheet 3

FIG. 5

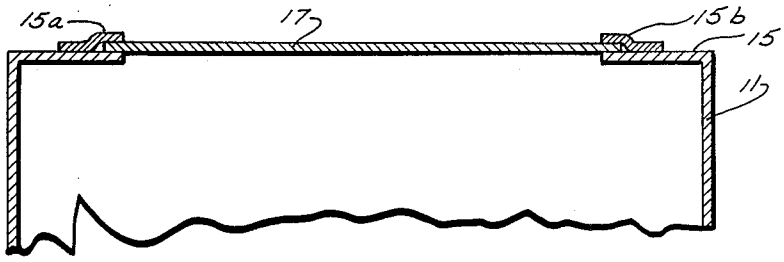


FIG. 6

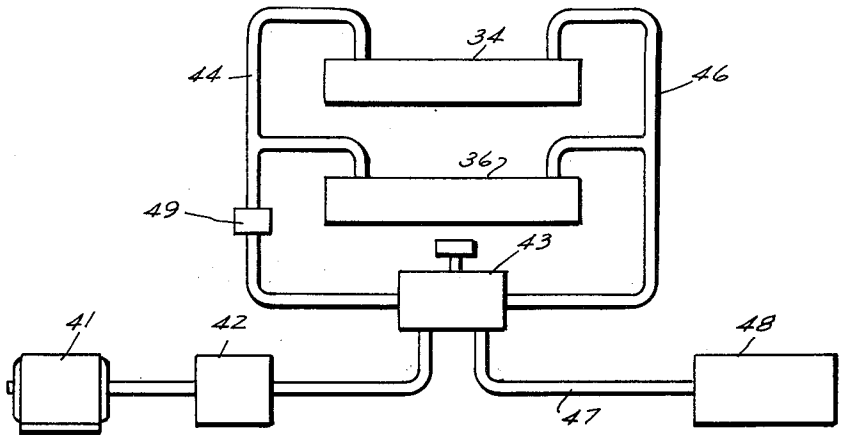
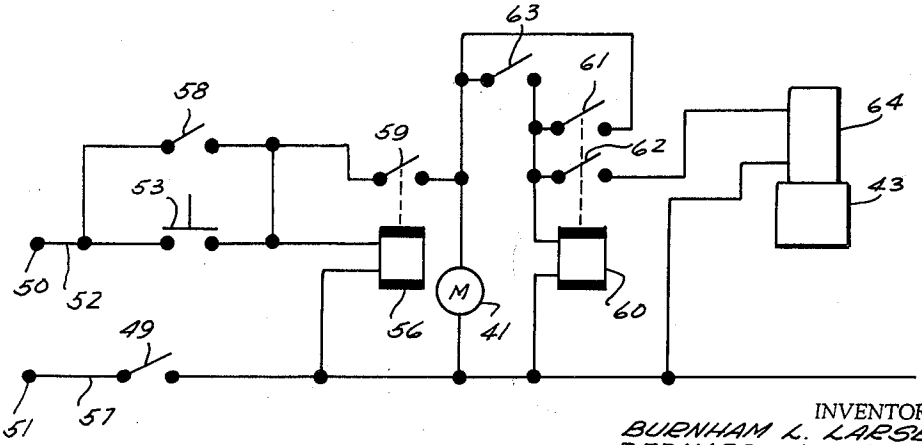


FIG. 7



INVENTOR.
BURNHAM L. LARSEN
BERNARD J. LARSEN
BY

Hill, Sherman, Meroni, Gross & Simpson

ATTORNEYS

United States Patent Office 3,195,448 Patented July 20, 1965

3,195,448

PACKING AND COMPACTING APPARATUS

Burnham L. Larsen and Bernard J. Larsen, Cedar Falls, Iowa, assignors to Curbmaster of America, Inc., Cedar Falls, Iowa, a corporation of Iowa

Filed Dec. 21, 1962, Ser. No. 246,581
1 Claim. (Cl. 100—245)

This invention deals with an improved packing and compacting apparatus particularly intended for home use and providing a convenient means for storing and disposing of waste material such as paper, cans and the like from the kitchen.

The apparatus of the present invention provides, in a simple and compact unit, means for accommodating a substantial quantity of the waste material and for compressing the waste material into a readily disposable, compact package. For this purpose, means are also provided in the assembly for the rapid and convenient removal of the compressed package.

An object of the present invention is to provide a compact, readily accessible assembly for packaging and compacting waste products such as paper, cans, and the like.

A further object of the invention is to provide a packaging and compacting assembly which can be readily accommodated in a very small space, making it available for use in the kitchen where space is frequently at a premium.

Another object of the invention is to provide an improved compacting assembly including a disposable container which provides a convenient means for removing the compacted waste material from the assembly and for disposing of it afterwards.

Other objects and features of the present invention will be apparent to those skilled in the art from the following description of the attached sheets of drawings which, by way of preferred embodiment only, illustrate a specific form of the invention.

In the drawings:

FIGURE 1 is a view in perspective of the compacting apparatus in its fully assembled condition;

FIGURE 2 is a plan view, partly in cross-section, and partly broken away to illustrate the interior of the apparatus;

FIGURE 3 is a view in perspective of the disposable container which is preferably employed in conjunction with the apparatus;

FIGURE 4 is a view with parts in elevation, and partly in cross-section, illustrating the control mechanism employed in the assembly of the present invention.

FIGURE 5 is a fragmentary sectional view of the top wall and top panel of the compacting apparatus taken substantially along lines V—V of FIGURE 1.

FIGURE 6 is a schematic plumbing diagram of the hydraulic system of the compacting apparatus; and

FIGURE 7 is a schematic wiring diagram of the control system of the apparatus.

As shown in the drawings:

As seen in FIGURE 1, reference numeral 10 indicates generally a compacting apparatus embodying the principles of the present invention, the apparatus 10 being generally rectangular in configuration and of a size sufficiently small to be received under a kitchen sink or within a kitchen counter.

The apparatus 10 preferably includes an outer rectangular housing 11 and an inner housing 12 received therein and fastened thereto. As best seen in FIGURES 2 and 4, the inner housing 12 is spaced from the outer housing 11 along three of its four walls, with spaces 13 and 14 being provided between the side walls of the inner housing 12 and the outer housing 11, and a relatively large space 16 being provided between the base of the inner housing 12 and the outer housing 11.

The upper wall of the inner housing 12 consists of a slidable or otherwise removable panel 17 which can be detached to permit removal of the compacted material, the panel 17 being hingedly secured by means of a pair of hinges 18 to an access door 19. The latter has a handle 21 provided therein so that the access door 19 can be opened to permit introduction of the waste material within the compacting portion of the apparatus. As illustrated in FIGURES 1 and 5, a top wall 15 of the outer housing 11 comprises a pair of flange type guide members 15*a* and 15*b*. Members 15*a* and 15*b* are adapted to slidably receive the removable panel 17 which is carried on the top wall 15. In order to permit opening of the door 19, members 15*a* and 15*b* extend only from a rear wall 15*c* to a rear edge 25 of the door 19, and a pair of wing fasteners 25*a* and 25*b* are pivotally mounted on the top wall 15 adjacent either side of the door 19 to overlie and lock the door after waste material has been loaded therethrough.

Tightly received within the inner container 12 is a closely conforming, flexible container 22 which is best illustrated in FIGURE 3 of the drawings. The container 22 may be composed of material such as paper, paper board, or the like. As seen in FIGURE 3, the container 22 is provided with a series of slots 23 at each of the four corners thereof to provide flaps 24, 25, 26 and 27 which can be folded down to make a compact, neat package when the compressed waste material is being removed.

Slidably received within the container 22 is a pressure plate 29 which applies the compacting pressure to the material disposed within the container 22. The pressure plate 29 carries a pair of guide rollers 31 and 32 and a base roller 33 which engage the inner walls of the container 22 and provide for sliding movement of the pressure plate 29 therein.

The pressure plate 29 is moved inwardly by a hydraulic system which includes a pair of hydraulic cylinders 34 and 36 secured to the outer wall of the inner housing 12 in the spaces 13 and 14, respectively. A pair of angularly disposed rods 37 and 39 connect the pistons contained in the cylinder 34 and 36 to the inner surface of the pressure plate 29. The slots 23 formed in the container 22 accommodate movement of the rods 37 and 39 horizontally during compression of the waste material contained within the container 22.

Referring to FIGURES 4 and 6, the hydraulic control system for actuating the cylinders 34 and 36 is contained within the space 16 existing between the base of the inner housing 12 and the outer housing 11. This system may include, for example, a motor 41 fixedly secured to the outer housing 11, the motor 41 being arranged to drive a pump 42 which supplies the hydraulic fluid in the forward stroke through a solenoid operated two-way valve 43 to a conduit 44 and then into the cylinders 34 and 36. A return line 46 is provided to return the hydraulic fluid, or to deliver the hydraulic fluid to the opposite end of the cylinder in the case of the return stroke. The two-way

valve 43 is also connected by means of a line 47 to a hydraulic fluid reservoir 48, all of the last named units being located in the space 16 between the inner housing 12 and the outer housing 11. In this position, the units are not visible from the outside of the assembly but are still readily accessible in the event of repair or replacement.

The line 44 also includes a pressure cut-off switch 49 which may be set to a predetermined maximum pressure level and operates to cut-off the energization of the motor 41 in the event that the pressure in the line 44 builds up to too high a value due to some overload condition existing.

Referring to FIGURE 7, terminals 50 and 51 are adapted to be connected to a suitable source of electric power, such as 110 v. alternating current. In one leg 52, a push button switch for energizing the system is shown at 53, one contact of which is connected to terminal 50 and the other contact of which is connected to one contact of a relay 56. The second contact of the relay 56 is connected to a second leg 57. Connected to the leg 52 in parallel with the push button switch 53 is a limit switch 58, one contact of which is connected to one contact of a switch 59 operated by the relay 56. The second contact of switch 59 is connected to one terminal of the motor 41, the other terminal of which is connected to the leg 57.

One terminal of a second relay 60 is also connected to the leg 57. The relay 60 operates in unison a pair of switches 61 and 62, one contact of both of which is connected in series with the second terminal of the relay 60 and with the switch 59 through a second limit switch 63. The second contact of switch 51 is also connected to switch 59, and the second contact of switch 62 is connected to the leg 57 through the solenoid 63 of the solenoid operated two-way valve 43.

The limit switch 58 is situated adjacent the pressure plate 29 when the plate is in its retracted position, as illustrated in FIGURE 1. Limit switch 63 is situated adjacent an inner edge 66 of one of the slots 23, which is adjacent the pressure plate 29 when the plate is moved inwardly to its compressed position. The control system of FIGURE 7 is operated by depressing the push button switch 53 which energizes the relay 56, closes the switch 59 and thereby energizes the motor 41 to operate the hydraulic pump 42. The solenoid operated two-way valve 43 is deenergized to deliver pressurized fluid to one end of the cylinders 34 and 36 to begin moving the pressure plate inwardly to a compressed position. As soon as the pressure plate 29 begins moving inwardly, and before the push button switch 53 is released, the limit switch is closed by the movement of the pressure plate 29 so that after the push button switch 53 is released, the relay 56 and the motor 41 remain energized. After the pressure plate 29 moves to its compressed position, that is, adjacent the inner edge 66 of the slot 23, the limit switch 63 is closed by the pressure plate, thereby energizing the relay 60. Switches 61 and 62 are closed by the energized relay 60, and closing of switch 62 energizes the coil 64 of the two-way valve 43 to change the delivery of the pressurized fluid to the opposite ends of cylinders 34 and 36. The pressure plate 29 is thereby moved backward toward its retracted position, but as the limit switch 63 is opened by backward movement of the pressure plate, the switch 61, which is now in a closed position, continues to energize the coil 64 of the two-way valve 43. After the pressure plate 29 moves backwardly to its retracted position as illustrated in FIGURE 1, the limit switch 58 is thereby opened, and the entire control system is thereby deenergized.

The operation of the device is as follows. When the access door 19 is opened, the waste material may be introduced directly into the container 22. The top flap 27 of the container 22 may be raised along a score line 27*a* to accommodate filling the container.

Once the access door 19 is replaced, the motor 41 may be energized to thereby pump the hydraulic fluid into the cylinders 34 and 36 in such a manner that the pistons included within the hydraulic assemblies are moved to the right, thereby urging the pressure plate 29 inwardly.

Initially, the movement of the pressure plate will merely force the waste material to build up in the rear end of the container 22. When sufficient material has been accumulated, the pressure plate will commence exerting a substantial compacting pressure on the material, to form a coherent package or bale of the waste material. Generally, sufficient pressure should be exerted by the pressure plate 29 to crush tin cans and similar materials.

When the pressure plate 29 reaches the limit of its stroke, the limit switch 63 operates the two-way valve 43 in a manner such that the hydraulic fluid is introduced into the line 46, and is drained from the line 44. In this condition of the control system, the hydraulic cylinders operate to force the pressure plate 29 to the left as viewed in FIGURE 4. A second limit switch 58 is engaged by the pressure plate 29 as the latter completes its return stroke to deenergize the motor, thereby completing the cycle of operation.

When sufficient material has been compacted to form a relatively dense package, the package may be removed by removing the panel 17 together with the door 19 from the outer housing, 11 and lifting the package which is confined within the container 22 from the machine. The flaps 24 through 27 are then folded down upon each other to form a top closure for the package and the latter can then be conveniently discarded.

From the foregoing, it will be apparent that the compacting apparatus of the present invention provides a convenient means for accumulating and for compacting waste materials. It will also be evident that the unit is simple in construction, and can be conveniently stored in a minimum amount of space, making it acceptable for use in the kitchen.

It should be further evident that various modifications can be made to the described embodiment without departing from the scope of the present invention.

We claim as our invention:

A compacting apparatus for waste material comprising,

a rectangularly shaped outer housing having a pair of flat parallel spaced side walls, flat parallel spaced top and bottom walls and an end wall,

a rectangularly shaped inner housing situated within said outer housing and having a top wall thereof formed by the top wall of said outer housing and having side walls and a bottom wall in spaced parallel relation to corresponding side walls and the bottom wall of said outer housing,

said top wall being releasably secured to said outer housing and having an access opening formed therein,

the inner housing of said apparatus being adapted to receive a disposable container therein for receiving waste material,

said container being of the type having a closed end adapted to abut the end wall of said outer housing and being adapted to conform closely to the inner surfaces of the walls of said inner housing,

a pressure plate in said inner housing having a pressure bearing surface extending perpendicularly to the walls of said inner housing and movable toward and away from said end wall,

said plate being dimensioned to fit within the confines of said inner housing,

a plurality of roller members affixed to said pressure plate and being spaced inwardly from the walls of said inner housing,

two pairs of actuating arms firmly affixed to said pressure plate and extending respectively from either end of said plate,

each of said pairs having one of said arms extending through corresponding side walls of said

inner housing at the upper edge thereof and having the other of said arms extending through the corresponding side walls at the lower edge thereof,

a pair of pressurized hydraulic cylinders situated exteriorly of said inner housing adjacent the side walls thereof and operatively connected respectively to a pair of corresponding actuating arms for moving said arms and said pressure plate toward and away from the end wall, and means defining a pair of corresponding slots on each side wall of said inner housing for receiving and for accommodating movement of said arms.

References Cited by the Examiner

UNITED STATES PATENTS

282,046	7/83	Bower	53—124
291,683	1/84	Chapman	53—124
1,088,435	2/14	Matthews	100—179
1,119,353	12/14	Jackson.	
1,503,183	7/24	Bailey	53—124
2,387,532	10/45	Schenk.	
2,508,877	5/50	Walker et al.	
2,718,992	9/55	Baker et al.	53—124
2,763,202	9/56	Gramelspacher	100—52
2,813,569	11/57	Nelson	100—53
2,817,290	12/57	Parker et al.	100—256 X
2,919,528	1/60	White	53—124
3,035,750	5/62	Kauffeld	229—37
3,049,281	8/62	Vines	229—37
3,062,130	11/62	Huber et al.	100—216

FOREIGN PATENTS

341,865	7/36	Italy.

WALTER A. SCHEEL, *Primary Examiner.*

ABRAHAM G. STONE, CHARLES A. WILLMUTH, *Examiners.*