May 31, 1966 J. I. PORTER ET AL 3,253,537

TRASH COMPACTING APPARATUS

Filed Sept. 29, 1964

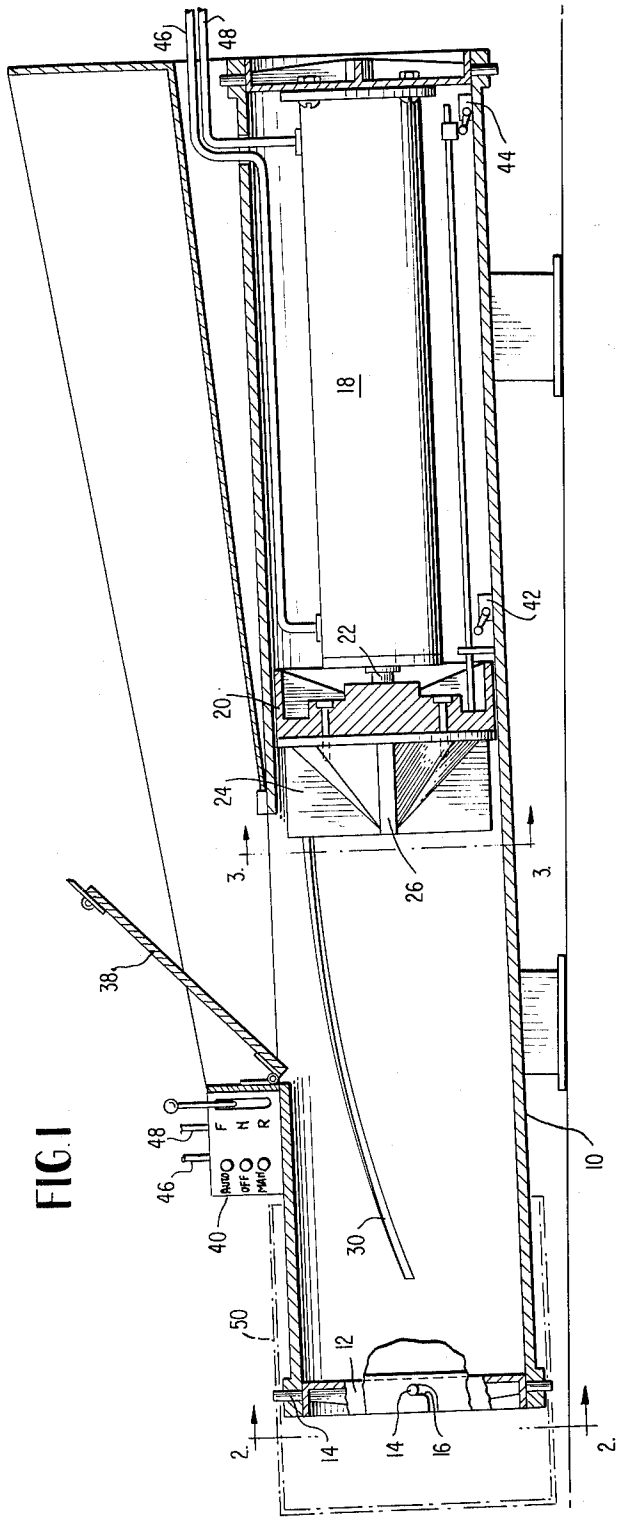


FIG. 1

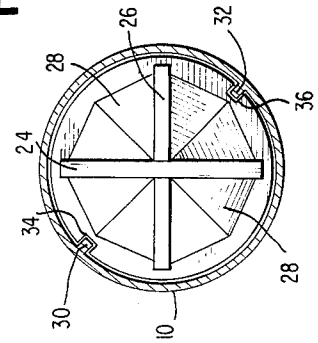


FIG. 3

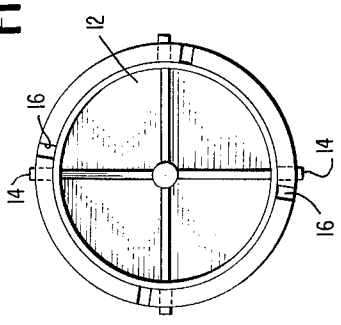


FIG. 2

INVENTORS
JAMES I. PORTER
CARL S. VOLLMER

BY Lyman, Palmer, Stewart & Estabrook
ATTORNEYS

United States Patent Office 3,253,537 Patented May 31, 1966

3,253,537

TRASH COMPACTING APPARATUS

James I. Porter, 5203 Augusta St., Washington, D.C., and Carl S. Vollmer, 625 Azalea Drive, Rockville, Md.

Filed Sept. 29, 1964, Ser. No. 400,119
2 Claims. (Cl. 100—215)

This invention relates to material handling apparatus and more particularly to apparatus for receiving uncompacted material such as trash and for compacting it into a greatly reduced volume and subsequently inserting the thus compacted material into a removable container for subsequent transportation to a point of disposal.

The problem of handling trash, particularly in structures such as modern apartment buildings, has come to be of very significant economic importance to the owners of such properties. Many buildings today are constructed with built-in incinerators but these are objectionable for a number of reasons. First of all, there is the ever present danger of fire spreading from the incinerator into the trash chutes or even into the area surrounding the incinerator proper. Operation of the incinerator requires, in accordance with local codes, some means for controlling the dispersal of ash in the surrounding atmosphere. In addition, such apparatus requires careful and constant attention to maintain it in operating condition in view of the fact that many non-combustibles find their way into incinerators and these must later be removed and separately disposed of. From the trash collection standpoint, at the present time, the trash is collected in trucks in uncompacted form and then hauled to a remote point such as a dump or large-sized, remotely located incinerator. Another solution has been to use trucks which have a trash compacting apparatus as a part thereof so that the uncompacted trash when dumped into the fill hopper of such vehicles is then compacted by the use of a hydraulically operated baffle or gate member. Such apparatus represents a substantial initial expenditure for the operator and a further maintenance expenditure. Further, the compaction apparatus of the type presently in use effects at best a compaction of approximately 3 or 3½ to 1.

Accordingly, it is the principal object of the present invention to provide a simple and fool-proof trash compacting apparatus which apparatus is sufficiently compact to be easily housed within the basement area of the average apartment building.

A further object is to provide a trash compacting apparatus of this type which will achieve compaction ratios of the order of 8 to 10 to 1.

A further object of the present invention is to provide a trash compacting apparatus which is operative once the compacting operation is complete to insert the compacted material into a disposable container for minimum volume storage prior to collection and such collection may be done in an ordinary truck without any expensive trash handling apparatus carried thereon.

Other objects of the present invention will be apparent from a consideration of the following detailed specification when read in conjunction with the attached sheet of drawings in which:

FIGURE 1 is a side elevation, partially in section, of a preferred embodiment of the present invention;

FIGURE 2 is an end view along the lines 2—2 of FIGURE 1; and

FIGURE 3 is a view on the lines 3—3 of FIGURE 1.

In general, the objects of the present invention are achieved by mounting within an elongated cylindrical housing, a head member which is mounted within the cylindrical housing for simultaneous, reciprocating and rotary movement. The power source for moving the

head member within the housing is supplied by a power cylinder which is also mounted within the same housing. The working fluid for the power cylinder may be either gas or liquid. The head member includes a trash contacting radial face having an area which is substantially less than the cross-sectional area of the housing in which the head is reciprocated. This results in higher pressures being applied to the material being compacted and the combined reciprocating and rotary motion of the head is effective to complete the compaction process in a simple and economical way. That end of the housing which is remote from the power cylinder is closed by a removable closure member so that once a predetermined amount of trash has been compacted against the closure member, the closure is removed and a disposable container is inserted over the end of the housing. Then the head is again reciprocated toward the compacted trash and is effective to load it into the disposable container and further, to push the container off the end of the apparatus.

Referring now to the drawings, the cylindrical housing is shown at **10** and the removable closure at **12**. As shown most clearly in FIGURES 1 and 2, the removable closure has a plurality of radially extending lugs **14** which engage in bayonet type slots **16** formed in the end of the housing **10**. The opposite end of the housing **10** may be closed completely or it may simply have a spider member for supporting the power cylinder **18**.

A reciprocating head member **20** which is basically cylindrical in shape and of a size to slidably fit with the cylindrical housing **10** is mounted on the end of a rod **22** which is connected to a piston within the power cylinder **18**. As shown most clearly in FIGURE 3, that side of the head member **20** which will contact the material to be compacted is not simply a plain cylindrical surface. Rather, in order to provide a surface of substantially less area than the cross-sectional area of the housing **10**, a pair of cross members **24** and **26** are mounted on the head member and the space between the cross members **24** and **26** is preferably filled out with a series of pyramidal surfaces **28** for adding support to the cross members **24** and **26** and further, to provide a desired form of compacting surface.

It has been found desirable to ensure that there is a positive rotation of the head **20** during its power or compacting stroke and for this purpose, it is proposed to utilize a pair of oppositely disposed helical members **30** and **32** mounted on the inner surface of the housing **10**. Slots **34** and **36** are formed in the outer periphery of the head **20** to mate with the members **30** and **32** so that when the head is positively driven forward by the power cylinder **18**, the head will be rotated as it contacts the material to be compacted. A corresponding rotation will also be present on the return stroke of the power cylinder **18**.

In order to load the housing **10** with material to be compacted, a door or trap member **38** is preferably provided in the upper surface of the housing **10** and positioned between the retracted position of the head **20** and the removable closure member **12**.

The foregoing describes the basic portions of the trash compacting apparatus in accordance with the present invention. The controls for operating the power cylinder **18** may be entirely conventional, but should include a means for manually controlling the power and return stroke of the head **20** as well as means for automatically reciprocating the head member. Such controls are diagrammatically illustrated on the control box **40**. It is contemplated that for the automatic reciprocation of the head **20** that limit switches **42** and **44** will be positioned to be contacted by the head at opposite ends of its stroke. Such limit switches are indicated schematically by the reference numerals **42** and **44**.

The fluid conduits **46** and **48** lead to opposite ends of

the power cylinder from an appropriate pump (not shown), and are also connected to the automatic control box **40**.

In operation, therefore, the door **38** is opened and a load of uncompacted material deposited within the housing **10** between the head **20** and the removable closure member **12**. The head is then reciprocated to compact the material within the housing and then additional material is inserted through the opening **38** and the head again reciprocated until a desired amount of compacted material is contained within the area of the housing **10** which adjoins the removable closure **12**. At this point, the head is retracted to the position shown in FIGURE 1, the removable closure member **12** removed and a disposable container **46** is then placed over the opened end of the housing **10** as indicated in FIGURE 1. Using the manual control, the head **20** is then advanced toward the compacted material with the result that the material is pushed entirely out of the housing **10** and in so doing, it is transferred from the housing **10** to the container **50** and the latter is by virtue of the same movement of the head **20** removed from the casing **10**. The apparatus is then empty and the removable closure **12** may be replaced and the operation repeated.

From the foregoing, it is submitted that those skilled in the art will readily appreciate that there is herein shown and disclosed a new and useful trash compacting apparatus which will have wide-spread application for the handling of trash and other materials. While a preferred embodiment has been herein shown and disclosed, applicants claim the benefit of a full range of equivalence within the scope of the appended claims.

We claim:

1. Trash compacting apparatus comprising in combination:

an elongated cylindrical housing having a removable closure at one end thereof and at least a pair of oppositely disposed helical ridges on the inner surface thereof;

a cylindrical head member mounted within said housing and having at least a pair of slots disposed on opposite sides of its periphery to engage with said helical ridges;

power cylinder means mounted within said housing adjacent the opposite end thereof and having a piston therein connected to said head member for causing said head member to reciprocate and rotate in said housing;

and means defining a closeable opening in said housing for insertion of material to be compacted between said head and said removable end closure.

2. Trash compacting apparatus comprising in combination:

an elongated cylindrical housing have a removable closure at one end and a pair of oppositely disposed helical means on the inner surface thereof;

a cylindrical head member mounted within said housing and having means disposed on opposite sides of its periphery to engage with said helical means for causing rotation of said head member as it is reciprocated within said housing;

power cylinder means mounted within said housing adjacent the opposite end thereof and having a piston therein connected to said head member;

and means defining a closeable opening in said housing for insertion of material to be compacted between said head and said removable end closure.

References Cited by the Examiner

UNITED STATES PATENTS

497,127	5/1893	Matthews et al.	17—32
647,490	4/1900	Heath.	
1,515,318	11/1924	Tennebaum et al.	
2,160,523	5/1939	Scurlock	146—3.9
2,428,672	10/1947	McClellan et al.	100—295 X
2,587,997	3/1952	Guettler.	
2,817,290	12/1957	Parker et al.	
3,010,665	11/1961	Smith	100—265
3,024,720	3/1962	Welsh	100—53
3,062,130	11/1962	Huber et al.	100—295 X

WALTER A. SCHEEL, *Primary Examiner.*

BILLY J. WILHITE, *Examiner.*