# United States Patent

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[54] **WASTE COMPACTING DEVICE**
**13 Claims, 6 Drawing Figs.**


[52] **U.S. Cl.** ..... **100/48,** 21/58, 21/61, 53/124, 100/71, 100/98, 100/99, 100/100, 100/179, 100/215, 100/229, 100/289, 100/295, 141/73, 141/194, 141/357
[51] **Int. Cl.** ..... **B30b 15/14**
[50] **Field of Search** ..... 100/98, 99, 214, 229, 53, 289, 48, 74, 100, 295, 179, 215, 71; 53/67, 124, 122; 141/71, 73, 255, 249, 193, 194, 195, 264, 276; 107/14; 21/58, 61



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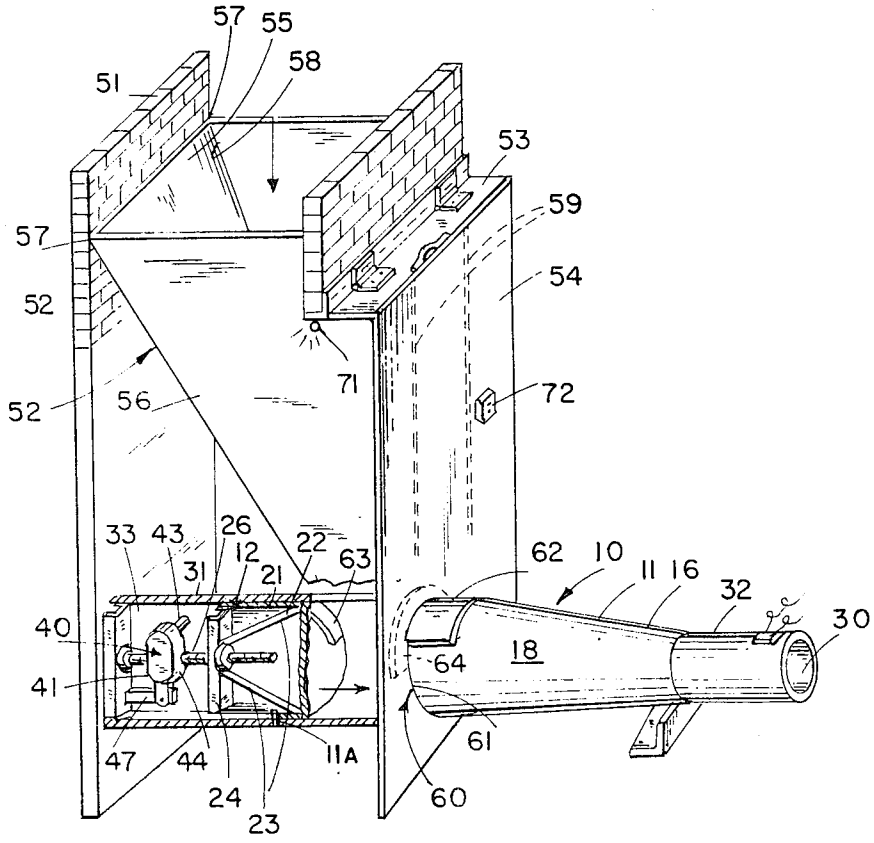
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**ABSTRACT:** A waste compacting assembly comprising an elongated circular housing, a movable compactor of annular shape slidably mounted therein, said housing being adapted to receive waste to be compacted therein, said housing being partially in the shape of a funnel, and said compactor being forcibly reciprocable toward and away from said funnel to compact waste into said funnel.

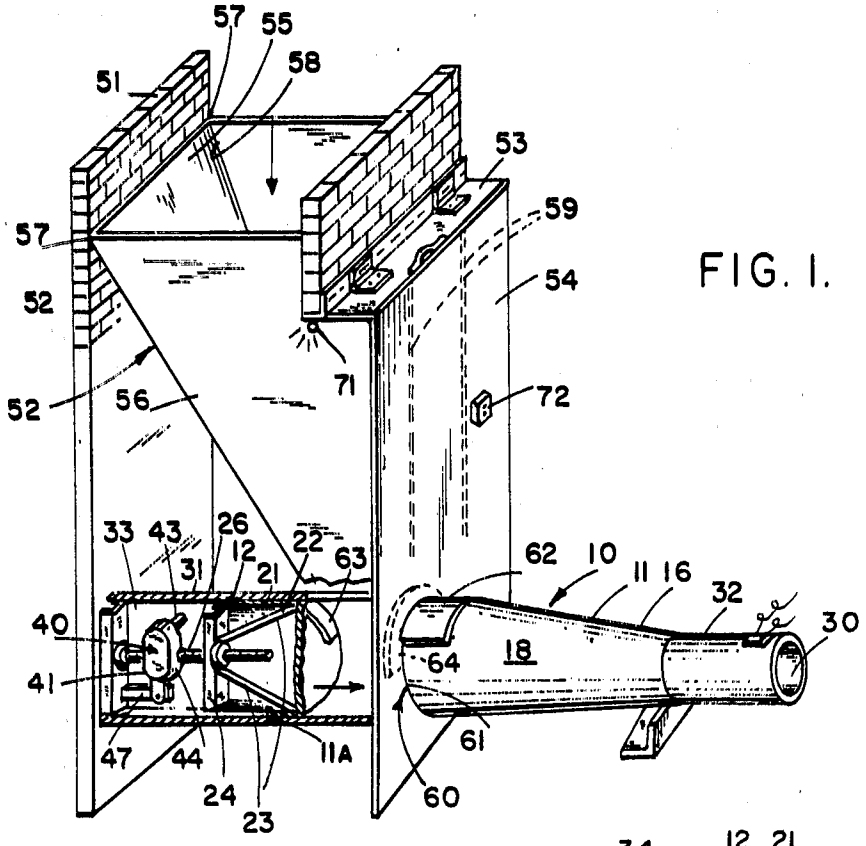



FIG. 1.

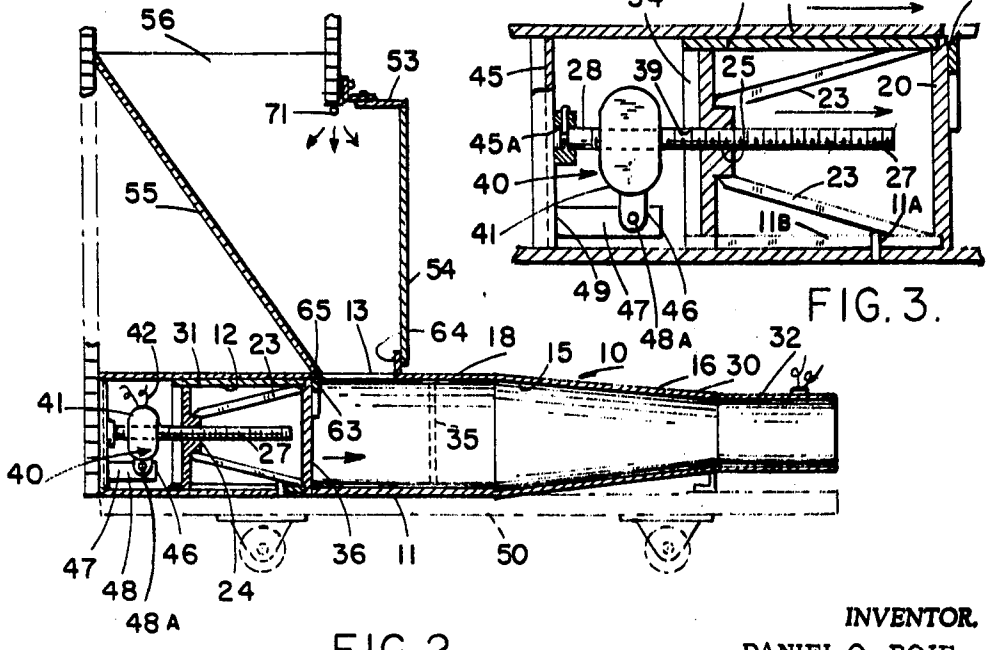



FIG. 2.

FIG. 3.

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FIG. 4.

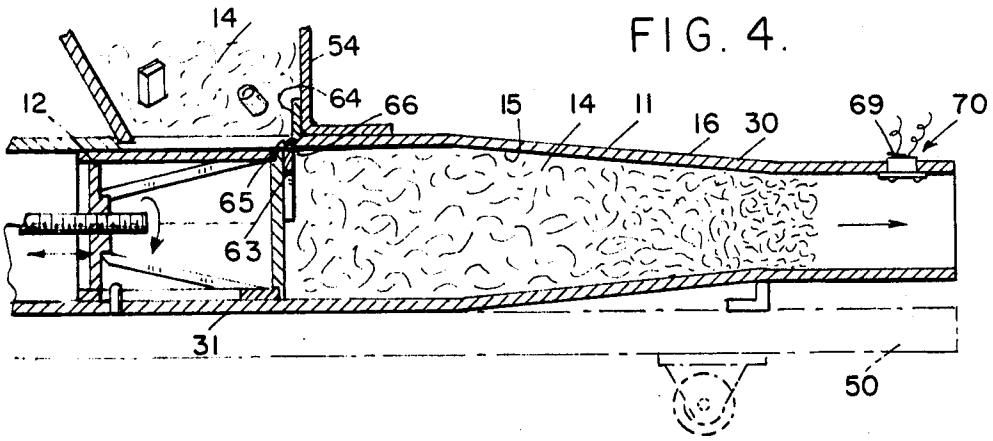
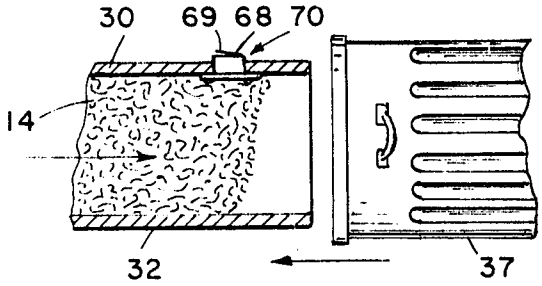



FIG. 5.



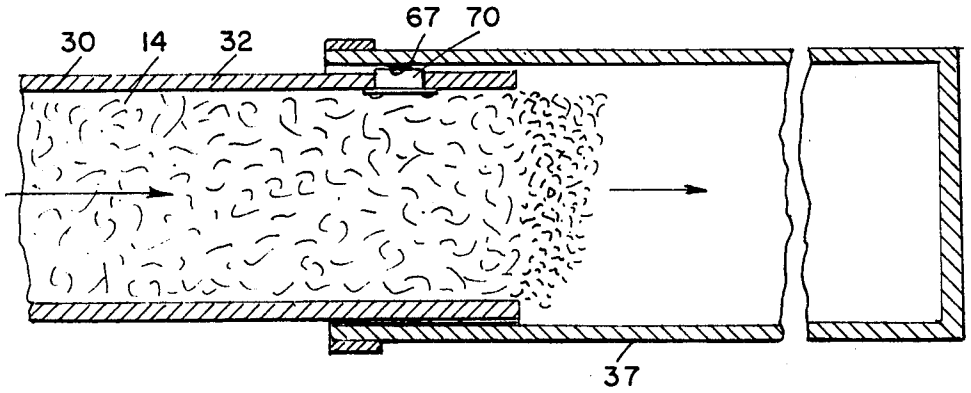




FIG. 6.

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# WASTE COMPACTING DEVICE

## CROSS-REFERENCE TO RELATED APPLICATIONS

The present application is a continuation of copending U.S. application, Ser. No. 588,050, filed Oct. 20, 1966.

## BACKGROUND OF THE INVENTION

### Field of the Invention

The present invention relates to a waste compacting device.

## SUMMARY OF THE INVENTION

An object of the present invention is to provide a waste compacting device and, more particularly, a transportable waste compacting device adaptable to fixed installations.

In accord with the invention, there is now provided a waste compacting assembly comprising an elongated housing comprised of a continuous wall of generally circular cross section having an inner surface, a movable compactor of circular cross section slidably mounted within said housing, said housing having an opening defined therein through which waste may be loaded for compaction therein, a portion of said housing being constructed in the form of a funnel, said compactor being forcibly reciprocable toward and away from said funnel to compact waste loaded into said housing against the inner surface of said funnel as said waste is moved therethrough by said compactor, shearing means acting in association with said compactor to prevent immobilization thereof by jamming of said waste.

## BRIEF DESCRIPTION OF THE DRAWING

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same become better understood by reference to the following detailed description when considered in connection with the accompanying drawings, in which like reference numerals designate like parts throughout the Figures thereof, and wherein:

FIG. 1 is a perspective view of the inventive device;

FIG. 2 is a sectional view of the inventive device shown in FIG. 1;

FIG. 3 is an enlarged cross-sectional view of the compactor;

FIG. 4 is an enlarged cross-sectional view of the housing;

FIG. 5 is an enlarged cross-sectional view of the right end of the inventive device; and

FIG. 6 is an enlarged cross-sectional view similar to FIG. 5 showing the waste being loaded into a container.

## DESCRIPTION OF THE SPECIFIC EMBODIMENTS

Referring now to the drawings, wherein like reference characters designate like or corresponding parts throughout the several views, there is shown in FIGS. 1 and 2 a waste compacting assembly 10 which includes an elongated housing 11 having an inner surface 15 and a movable compactor 12 slidably mounted within the housing. The housing 11 is provided with an opening 13 defined therein through which waste 14 may be loaded for compaction therein. A portion of the housing, generally indicated by the numeral 16, is seen to be constructed in the form of a funnel having its longitudinal axis oriented in the direction of motion of the compactor 12. The compactor is forcibly reciprocable toward and away from the funnel to compact waste loaded into the housing against the inner surface 15 of the funnel. The waste is compacted as it is moved through the housing 11 by the action of the compactor.

As shown in FIGS. 1 and 2, the movable compactor 12 is preferably an annular member which is advantageously of circular cross section constructed in a pistonlike form. The compactor comprises a headwall 20, a skirt wall 21, and a carrying means 22. The skirt wall is integrally connected to the headwall and extends horizontally therefrom and substantially normal thereto. It is seen that the skirt wall 21 is an annular extension of the peripheral configuration of the headwall 20. The



carrying means 22 may be a single elongated annular member having an internally threaded channel formed in one end thereof to threadably receive a drive shaft, and having the other end thereof integrally connected to the headwall, skirt wall, or both. The carrying means 22 is advantageously a plurality of elongated annular members 23, each having one end thereof integrally connected to the junction between the headwall 20 and skirt wall 21, and having the other ends thereof terminated together in a collar 24 having an internally threaded bore 25 formed therein to threadably receive a drive shaft 26.

As shown in FIGS. 1, 2 and 4, the elongated housing 11 is an annular conduit which is advantageously constructed from a rigid material. The housing is preferably a generally circular enclosure comprising a wall 30 having an inner surface 15 and an outer surface 18. The preferred embodiment of the enclosure includes a left end section 31, a right end section 32 of lesser diameter than the left, an an open-ended funnel-shaped section 16 extending intermediate the end sections and merging thereinto to form a reducing conduit section which brings the right end section into waste flow relation with the left. The longitudinal axis of the housing is preferably oriented horizontally, as shown in FIGS. 1, 2, and 4. The opening 13 for the ingress of waste is preferably formed in the left end section 31 of the enclosure wall 30. It should be understood that it is a feature of the invention to use a simple construction of generally circular cross section easily orientable so that the opening is positionable for side loading as well as top loading by rolling the housing over to the extent circumstances dictate. In the preferred embodiment, the opening 13 is shown vertically oriented since the majority of users are expected to so use the device. The compactor 12, as hereinbefore described, may be conveniently slidably mounted within the left end section 31 of the housing, as shown in FIGS. 1 and 2. In operation, the headwall of the compactor 12 reciprocates between a forward position 35 and a rearward position 36, said positions defining the length of travel of the compactor. It is a feature of the invention to provide a compactor skirt wall 21 which extends horizontally from the headwall a distance substantially equal to or greater than the maximum horizontal dimension of the opening 13. This feature prevents inadvertently loading waste into the end of the left end section remote from the headwall when the compactor is projected to the forward position thereof. The right end 32 of the compactor serves as a discharge conduit and supporting means for removable waste containers generally represented by the container 37. It is a feature of the invention to dimension the right end or discharge end 32 of the conduit to allow standard sizes of waste containers well known in the art to be slidably mounted thereon as shown in FIG. 5. It is a further feature to provide disposable bags to be used in place of standard-sized waste containers.

The container 37 is mounted on the outer surface of the housing and held in place by its inherent weight. Waste 14, forcibly moved through the funnel 16 and progressively compacted therein and thereby as it is forcibly moved therethrough, contacts the inner bottom surface of the container and forcibly moves the container from the housing as the container is simultaneously progressively filled with compacted waste. When a container becomes full it will fall of its own weight from the discharge end of the funnel, whereupon an attendant may replace said container with another empty container by slidably mounting it on the discharge mouth 32.

It should be understood that the compactor 12 is adaptable to be cyclically moved from the rearward position 36 thereof to the forward position 35 thereof and returned therefrom to the rearward position 36 thereof by driving means 40 associated with the housing that are well known in the art. The driving means may include hydraulic driving means having a smooth-surfaced drive shaft associated therewith instead of the threaded drive shaft 26 and carrying means 22 herein before described, the smooth-surfaced drive shaft being a piston rod directly connected to the headwall 20. Applicant's

preferred embodiment includes a reversible gear motor **41** having electrical terminals **42** adapted to be energized by a source of current. The motor **41** includes a controlling means **43** for stopping, starting and automatically reversing the motor and a power takeoff adapter **44** operably associated with the motor gearing. The drive shaft **26** is operably connected to the power takeoff adapter to rotate said shaft in place.

One end of the drive shaft **26** has a threaded body portion **27** which threadably engages the internally threaded collar **24** of the compactor **12**. The opposite end thereof is a smooth-surfaced body portion **28** endwise supported for rotation in place. A supporting member **45** having a bored collar **45A** connected thereto is provided to support the opposite end **28** of the shaft. It is to be understood hat the shaft is journaled for rotation in the bored collar **45A** and endwise anchored therein for rotation in place by means well known in the art. The supporting member **45** may be conveniently mounted within the left end section **31** of the housing to give a finished appearance to the inventive device by means well known in the art. To support the motor **41** in place, mounting means are provided which preferably comprise a bracket **46** and a supporting arm **47**. The bracket **46** is integrally connected to the motor **41** forming a platform therefor. One end **48** of the supporting arm is pivoted to the bracket **46** by means of a pivot pin **48***a* and the other end **49** thereof is anchored to the supporting member **45** by means well known in the art. The housing **11** is advantageously provided with a guide pin **11A** connected thereto which slidably engages a keyway channel **11B** formed in the compactor skirt wall **21**. The pin **11A** cooperates with the sides of the keyway **11B** to constrain the compactor from rotation in place when torque is imposed thereon by the rotating drive shaft.

A feature of the invention is to provide venting means shown in the drawing as an opening **33** in the left end section of the housing. It is understood of course that a vented cover may otherwise be provided at an additional expense. In any event, an opening **33** is provided to avoid air compression and airlock problems which might otherwise occur during operation of the compactor if the left end of the housing were to be enclosed without providing a vent therefor. As shown by the dashed-line depiction of a transporter **50** it is a feature of the invention to provide a transportable waste compactor assembly adaptable for various fixed installation schemes.

As shown in FIGS. **1** and **2** the waste compactor **10** assembly is adaptable for fixed installation at the bottom of an incinerator chute **51**. It is a feature of the invention to provide an adapter **52** intermediate the bottom of the incinerator chute **51** and the loading opening **13** in the compactor housing. Waste loaded into the incinerator chute through a plurality of loading openings generally represented by the covered opening **53** falls by force of gravity into the adapter **52** and is guided thereby from the incinerator chute **51** to the compactor opening **13** and therethrough into the housing **11**. As shown in FIGS. **1** and **2** the adapter **52** is a hopper comprising an elongated funnel of substantially rectangular cross section. The hopper is endwise vertically oriented to form a continuation of the incinerator chute. The hopper **52** advantageously comprises a substantially vertical front wall **54**, a slanted rear wall **55**, and slanted opposing sidewalls **56**. All of the walls **54**, **55**, and **56** are constructed from sheet material. The slanted walls **55** and **56** are connected together to form a waste guide chute. The opposing upwardly oriented edges **57** o the rear wall **55** are connected to the rearward upwardly oriented edges **58** of the opposing sidewalls **56** by means well known in the art. The forward vertically oriented sidewall edge surfaces **59** remote from the rear wall **55** are connected to the front wall **54** throughout the lower portions thereof by means well known in the art. The upper portions of these sidewall edges **59** abut against the incinerator brick work intermediate the front wall and the upper edges.

In the preferred embodiment, the front wall **54** extends around the compactor housing **11** to support the housing in place. Hence, as shown in FIGS. **1** and **2**, the front wall is provided with a cutout **60** for insertion of the compactor housing therethrough. The edge **61** formed by the cutout **60** upwardly supports the housing in place. An adapter plate **62** connected to both the front wall **54** and housing **11** is advantageously provided to anchor the waste compactor in place.

It is a feature of the invention to provide shearing means comprising a pair of arcuate plates **63** and **64** edgewise orientable with respect to each other to define an arcuate shearing plane substantially equal to the width of the housing cutout **13** as measured along the circumference of the housing. The plates **63** and **64** shear refuse deposited partially within and without the waste compactor housing to prevent the waste from jamming between the compactor and housing when the compactor is moved to the forward position **35** thereof. The shearing means includes a first plate **63** connected to the compactor head **20** and a second plate **64** connected to the front wall of the hopper **52**. In operation, the compactor moves one of the arcuate edge surfaces **65** of the first plate **63** slidably within one of the arcuate edge surfaces **66** of the second plate **64** to shear waste therebetween, thereby preventing immobilization of the compactor by jamming. The arcuate edge surfaces **65**, **66** are brought into shearing relation with respect to each other when the compactor-carried plate **63** is moved into cooperating relationship with the front-wall-carried plate **64**.

A feature of the invention is to provide a reinforcing strut **34** endwise connected to the skirt wall by means well know in the art. The strut comprises a channel member having an orifice **39** bored through the center thereof. The centrally located aperture **39** is assembled in register with the internally threaded collar **24**. As shown in the Figures, the drive shaft **26** is insertable therethrough when it is threadably engaged with the collar. The strut is connected to the collar by means well known in the art.

Referring now to FIGS. **4**, **5** and **6**, it is seen that a switching means **70** may advantageously be provided to signal the motor-controlling means **43** to stop and start the motor **41** depending upon whether or not a container **37** is or is not mounted on the discharge end of the housing. The controlling means **43** may advantageously comprise a microswitch having a closed position **67** which corresponds to start signalling and an open position **68** which corresponds to stop signalling. The microswitch may advantageously have a lever arm **69** pivoted thereto to contact the inner surface of the container when it is mounted on the housing. The lever **69** is so positioned with respect to the microswitch that when a container is mounted on the funnel the lever is depressed by the container. In turn, the lever closes the switch, thereby signalling the motor to start cyclically compacting the waste. The lever is released when the container falls off or is otherwise removed from the housing. Thereupon the switch opens, thereby signalling the motor to stop cyclically compacting the waste.

Disinfectant dispensing means **71** may be conveniently located within the hopper to dispense disinfectant therein.

A warning alarm means **72** may be conveniently locate, as shown in FIG. **1**, to respond to the stimulus of fire due to combustion within the hopper and/or basement area and emit a warning signal to the occupants of the house wherein the compactor is disposed.

What is claim is:

**1.** A waste compacting assembly comprising an elongated hollow housing having three integral sections, the first and third sections being of constant dimension throughout their lengths, the second section tapering downwardly toward the third section so that said third section has a smaller dimension than the first section, an opening in said first section through which waste may enter, a movable compactor of cross section complimentary to said first section of the hollow housing, said compactor being slidably mounted in said first section, means in said first section to reciprocate said compactor, shearing means on said compactor and said first housing section to prevent immobilization of said compactor, the third section of

said housing being adapted to have a waste receptacle mounted thereon, switch means on said housing third section interrelated with said means to reciprocate said compactor and which switch means functions to start the reciprocating movement of said compactor when the switch means is actuated by a waste receptacle being placed thereon.

2. The device according to claim 1, wherein said housing is cylindrical with said second section being of funnel shape.

3. the device according to claim 1, said compactor comprising a headwall, a skirt wall extending from said headwall, and a carrying means extending from said headwall.

4. The device according to claim 3, said carrying means comprising an elongated member having an internally threaded bore formed in the end thereof remote from the headwall.

5. The device according to claim 4, wherein said means to reciprocate said compactor includes a drive shaft having a threaded body portion which threadably engages the internally threaded bore formed in the carrying member for forcibly slidably moving the compactor cyclically within the housing.

6. The device according to claim 5, including a reversible gear motor adapted to rotate the drive shaft in place.

7. The device according to claim 6, including a controlling means associated with the motor for starting, stopping and reversing the motor, said switch means remotely signalling said controlling means.

8. The device according to claim 3, said carrying means comprising an elongated member having a bore formed in the end thereof remote from the headwall, and said means to reciprocate said compactor including a drive shaft associated with hydraulic driving means, said drive shaft having a body portion which engages said bore and is directly connected to said headwall for forcibly slidably moving the compactor cyclically within the housing.

9. The device according to claim 1, including a hopper adapted to said first section opening.

10. The device according to claim 9 wherein disinfectant dispensing means are provided in said hopper to disinfect said waste being loaded into said housing.

11. The device according to claim 1, wherein said waste receptacle which actuates said switch means is a generally cylindrically shaped container.

12. The device according to claim 1, wherein said waste receptacle which actuates said switch means is a disposable bag.

13. The device according to claim 1 wherein said switch means comprises a microswitch having a closeable position correspondable to start signalling and an openable position correspondable to stop signalling, said microswitch having a lever arm pivoted thereto contactable on the outside of said housing third section for opening and closing the switch means.