United States Patent

Harris

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[54] **WASTE COMPRESSOR**

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[52] **U.S. Cl.**.....**100/53,** 100/DIG. 15, 100/245, 100/251, 100/256, 100/269 R, 100/295

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

[58] **Field of Search**....100/53, 269, 295, 229, 229 A, 100/245, 249, 250, 251, 256

[56] **References Cited**

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[57] **ABSTRACT**

This application relates to a waste compressor particularly adapted for household or domestic usage which is powered by water pressure from a conventional water supply. The compressor incorporates a basket type frame in which a waste material carrying basket is slidably mounted, the basket forming the movable element for the compression motor and defining with the base of the casing, the expansion chamber for the compressor. A stationary die element removably connected to the top of the casing forms the cover such that as the basket is moved toward the die element waste material therebetween and in the basket is compressed.

13 Claims, 3 Drawing Figures

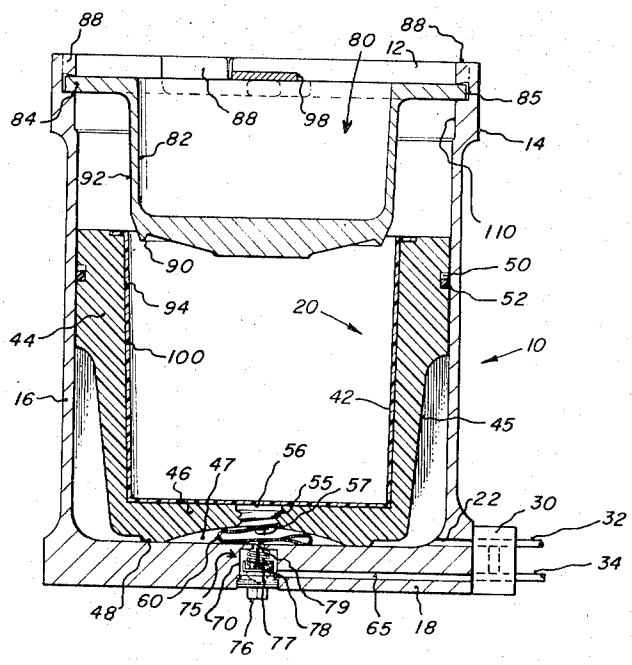


FIG. 2.

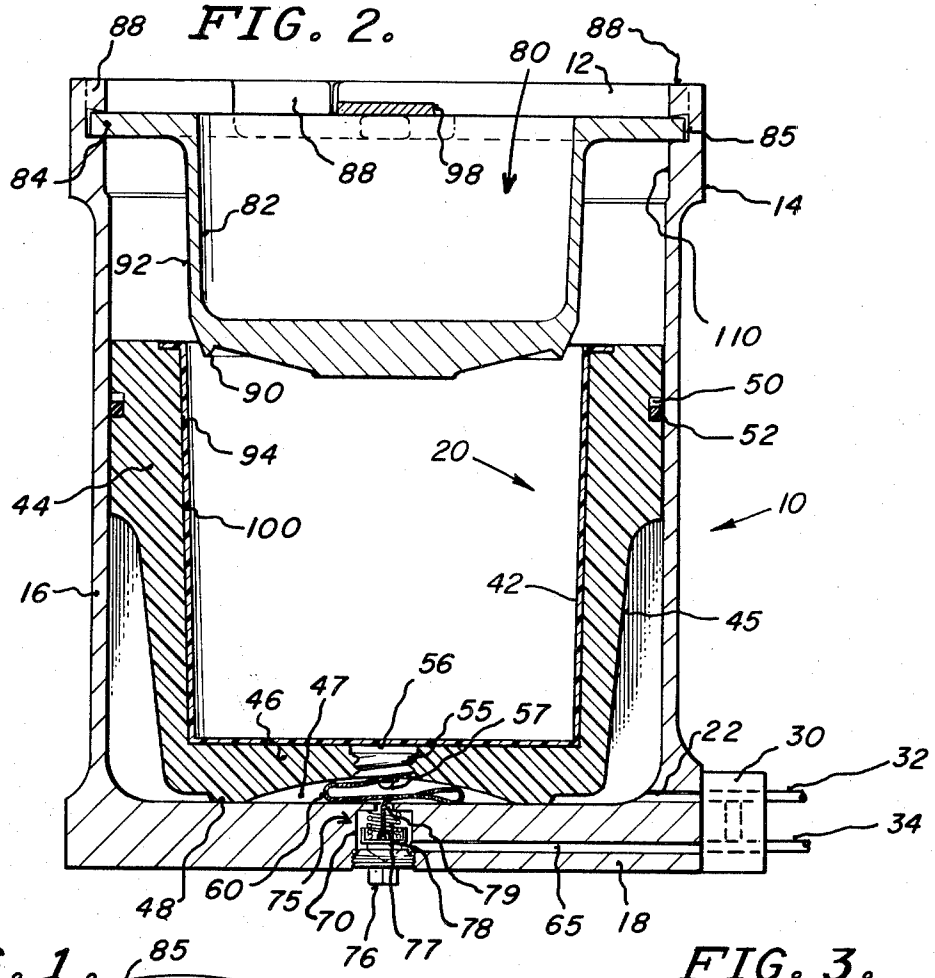


FIG. 1.

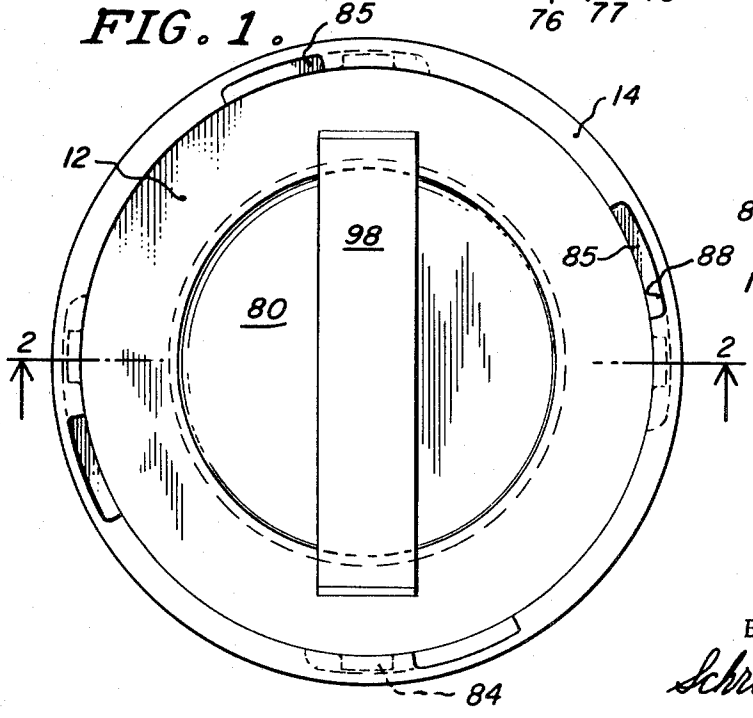
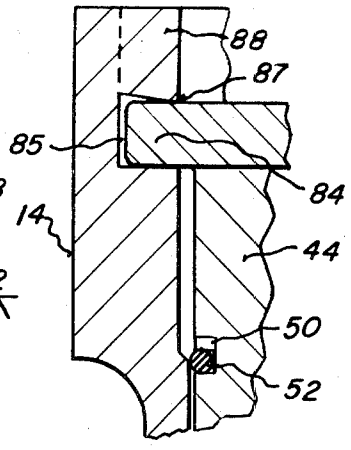


FIG. 3.



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WASTE COMPRESSOR

My invention relates to compressors for compressing waste material and particularly to an improved compressor adapted for domestic and utility use in which municipal water supply is used as a motivating source for the compressor.

Waste compressors are known and in use. In general, such compressors require special motive means for moving a piston or a ram into a basket to perform the compressing operation. Certain versions of this apparatus include in addition a motorized pump or special actuators for moving the piston. Such structures have heretofore been of such size and complexity as to prohibit application thereto to normal household usage.

The present invention is directed to an improved waste compressor which is simple in design and is operated by water pressure from a conventional water supply eliminating the need for special actuators. It employs a ram section which is also the compressing basket and which cooperates with a die section to compress material in a simplified operation. Control of the compressor is effected by a simplified valve arrangement which permits connection of the compressor to a household or municipal water supply and with a drain therefrom to evacuate water after compression. The improved structure includes a die section which is removable in the casing of the same to permit filling of waste material in the compressor and removal of material from the compressor to provide a simplicity in design which is relatively low in cost and easy to use. Such structure eliminates moving parts, except for the ram, and simplifies maintenance relative thereto.

Therefore it is the principal object of this invention to provide an improved waste compressor.

Another object of this invention is to provide a waste compressor of this type which is powered by pressure from a conventional water supply.

A further object of this invention is to provide a simplified compressor of this type which is easy to use and maintain and is relatively low in cost.

These and other objects of this invention will become apparent from the reading of the attached description wherein:

FIG. 1 is a plan view of the waste compressor,

FIG. 2 is a sectional view of the compressor taken along the lines 2—2 in FIG. 1, and

FIG. 3 is an enlarged view of a portion of the wall of the compressor showing a safety release feature therein.

My invention in a waste compressor is principally directed for household or domestic type usage. It is powered by a conventional water supply, such as a household water supply and provides a simplified combination of a ram basket which acts as the piston for the compressor motor. Thus, in the drawings of FIG. 1 and 2 the compressor will be seen as incorporating a generally cylindrically shaped outer frame or casing indicated generally at **10**. This casing, which is shown herein as circular in cross section in its preferred form, may be curved and eliptical in cross section, if desired. It has has an open top extremity **12** with a thickened or enlarged flange portion **14** at the upper or open end of the same, a thin straight or vertical wall portion **16** along the major extent or height of the same with an enlarged base portion **18** which closes the lower or bottom end of the casing to define a general cup shaped configuration. The casing may be made of a metal or plastic material and may be machined or molded. We have preferably found that a molded fiberglass casing is suitable and economical for this purpose. At the base of the casing and extending from one edge thereof is an inlet passage **22** communicating with an inlet valve, indicated generally in block at **30**, at the lower edge of the casing, the valve having an inlet passage **32** on the exposed surface of the same with a drain passage **34** also exposed and adapted to be connected to a drain.

Positioned within the casing **10** is a compressor basket, indicated generally at **20**, which basket is generally cup shaped in form having a centrally located recess or basket area **42** which is generally circular in cross section and with the upper edge of the basket portion having an enlarged flange section **44** with an outer circular cross section or dimension which mates with the circular inner cross-sectional surface or wall surface of the casing to slidably mount the basket therein. The lower or remaining portion of the basket is recessed or inwardly tapered along its sides, as at **45**, with the closed bottom section **46** having a concave recess surface **47** therein and foot portions **48** distributed along the bottom thereof to provide for flow passages beneath the basket. The flange section **44** has a groove **50** therein in which is positioned a circular or O-ring type seal **52** which seals the basket to the wall portion on a dynamic or sliding liquid tight seal. Beneath the basket and within the casing is an expansion chamber to which the inlet passage **22** communicates. The closed bottom portion **46** of the basket has a tapped aperture **55** therethrough in which is positioned a screw type plug **56** having a flange extremity **57** thereon. This terminates in the recessed portion **47** of the bottom of the basket and, as will be later noted, provides a surface which a chain **60** is connected and will be stored when the basket is in its lowermost position.

The base **18** of the casing has an additional drain passage **65** therein which connects with the drain passage **34** from the valve to provide an alternate drain from the expansion chamber. Located centrally within the bottom base of the casing is an aperture **70** in which is positioned a check valve, indicated generally at **75**, the check valve being formed by a valve seat member **76** threaded into the passage or aperture **70** and cooperating with a floating valve closure member **77**, the latter being urged into contact with the valve seat by means of a spring **78** positioned above the same. The passage **70** is reduced as at **79** to provide a shoulder surface against which the one end of the spring **78** will bear for biasing the check valve closed. The chain **60** connects to the valve closure member and in a certain point in the upward movement of the basket within the casing, the chain will cause the valve closure member **77** to be unseated from the seat **76** allowing escape of fluid from the expansion chamber through the drain passage **65** as a safety device.

Positioned above the basket **20** in the casing is a top closure and die member, indicated generally at **80**. This closure member includes a cup shaped die section **82** with diametrically opposed flange sections **84** extending therefrom, the flange sections fitting into a plurality of grooves **85** included on the inner surface of the en-

larged flange section **14** of the casing. Such grooves **85** are arcuate and as will be seen in FIGS. **1** and **3** have a tapered upper surface, as at **87**, for purposes to be later noted. Vertically extending slots **88** communicating with the arcuate slots **85** in the casing permit the entrance and removal of the flange sections **84** of the closure member to remove or position the closure member in the upper end of the casing. The depending die section has an annular pointed surface **90** along the edge of the same and the outer walls of the same are inclined or inwardly tapered, as at **92**, to correspond with a similar taper **94** in the recess portion **42** of the basket. A handle **98** is positioned across the flange sections permitting twisting and maneuvering of the top closure member or die section in the upper portion of the casing. The basket **40** also includes a liner as indicated at **100**. The top closure member is a machined or stamped item preferably made of metal, such as aluminum, and the basket may be made of a metal or plastic, similar to the casing.

As indicated in the enlarged sectional view in FIG. **3**, an alternate safety provision or structure may be utilized in place of the check valve or may be added as a secondary safety device in the waste compressor. This will be seen as a grooved or recessed surface **110** in the upper inner wall of the casing which when the flanged extremity **44** of the basket is raised beyond the same will allow escape of liquid or the motive source from the expansion chamber to prevent damage to the compressor.

In operation, my improved waste compressor will be loaded by removal of the top closure and die member **80** by turning of the handle allowing the flange portions **84** to mate with the vertical slots **88** such that the same may be lifted out from the casing. This will facilitate loading of the basket portion with waste to be compressed. The top closure member is then reinserted into the casing by moving or positioning the flange portions **84** through the slots **88** and twisting the same such that the flange members will move in the slots **85** arcuately to be displaced from the slots **88** so that the top closure member will be rigidly held in the casing by the tapered or knife edge surfaces **87** when the casing is loaded and compressed. At this point the control valve **30**, which is a conventional three-way valve, will be operated to permit the entrance of water under pressure from the water supply having a pressure from 30 – 70 psi through the inlet passage **32** and the valve to the passage **22** and into the expansion chamber in the lower portion of the casing beneath the basket. The dynamic seal or O-ring **52** will permit movement of the basket with an increase of the fluid under pressure in the expansion chamber and sufficient surface area is provided on the undersurface of the basket to provide a force to compress material in the recess or basket area **42** of the basket as the same is engaged by the stationary die or portion **82** of the closure member. The amount of material within the basket will determine the length of the upward stroke and in the event that it goes beyond a predetermined or safe position, the safety check valve will be unseated allowing escape of the fluid under pressures to the drain causing the basket to oscilate about a predetermined position until the valve **30** is closed or moved to a drain position. Once sufficient material is compacted within the basket, the valve is reversed allowing the fluid therein to drain through the passage **22**, valve **30** and drain passage **34**, the fluid being forced under the influence of gravity and the weight of the basket with the compressed waste therein. With the water drained, the handle or top closure member will be removed and the liner section taken out permit removal of the compressed waste from the compressor. The alternate safety feature prevents an abnormal operating condition in which the basket would go beyond a desired height allowing escape of fluid past the O-ring seal due to the enlarged section or recess section **110** in the casing wall.

The improved waste compressor operates with the basket as the only moving part and without any special motive source other than conventional water supply which will provide sufficient compacting force in a compressor to provide normal household compaction of waste materials. The improved structure provides a simplified arrangement of parts with suitable safety interlocks. The tapered surfaces **87** on the recess or notches **85** prevent sticking of the handle section or the flange sections in the notches for ease in removal of the same.

In considering this invention it should be remembered that the present disclosure is illustrative only and the scope of the invention should be determined by the appended claims.

What is claimed is:

1. A waste compressor comprising, an outer frame member having a thin curved upstanding wall section with a closed bottom section and an open top extremity with a uniform wall thickness and constant cross section intermediate the extent of the wall section, a basket member positioned in the outer frame member having a generally cup shaped configuration with an upper flange portion symmetrical with the inner cross section of the wall section of the frame member and with the remainder of the basket member having a reduced cross section from that of the upper flange portion thereof, said basket member having a recess open to the upper flange section with the basket member being slidably mounted in the outside frame member and defining an expansion chamber between the bottom of the basket member and the closed bottom section of the outside frame, seal means positioned on the upper flange portion of the basket member and bearing against the inner wall of the outer frame to provide a dynamic seal therebetween, a stationary die and cover member having a centrally located depending cup shaped die portion with a cross section symmetrical with the recess of the basket member, said stationary die and cover member having radially extending flange members adapted to fit into grooves in the upper edge of the outside frame member in suitable slots therein to secure the stationary die and cover member in said outside frame member and permit removal of the same, passage means positioned in the bottom of the outside frame and including valve means in the passage means, said passage means being adapted to be connected to a source of fluid under pressure with the valve means controlling flow of the fluid selectively into the expansion chamber to move said basket member within said outer frame member in a direction toward said stationary die and cover member to compact material positioned in the recess of the basket

member, said valve means including means for providing a flow of fluid from said expansion chamber to an outside drain to permit the return of the basket member to a position in contact with the bottom section of the outside frame member.

2. The waste compressor of claim 1 in which the curved wall section of the outside frame member and the upper flange portion of the basket member are annular in cross section and the outside frame has a generally cylindrical configuration.

3. The waste compressor of claim 2 in which the valve means is a three-way valve having an input passage adapted to be connected to a source of water under pressure and an outlet passage adapted to be connected to a drain.

4. The waste compressor of claim 3 in which the seal means positioned on the upper flange member of the basket is an O-ring positioned in a groove therein and bearing against the inner wall surface of the outside frame member to seal therebetween.

5. The waste compressor of claim 1 in which the outside frame member and the basket member are made of a fiberglass material.

6. The waste compressor of claim 5 in which the recess in the basket member and a cup shaped depending portion of the stationary die and cover member are generally circular in cross section and inwardly tapered from top to bottom respectively to mate when the basket member is extended in the outer cylindrical frame upwardly in near contacting relationship with the stationary die and cover member.

7. The waste compressor of claim 7 in which the stationary die and cover member includes handle means extending between flange members on the exposed surface of the same.

8. The waste compressor of claim 7 and including an additional passage in the bottom section of the outer frame member communicating with the expansion chamber and including a check valve means which is spring-biased to a closed position, said check valve means having a flexible connection to a movable element of the check valve means connected to the bottom of the basket member to open the check valve means as the basket member extends in the outside frame member to a predetermined upward position, said additional passage being connected through said valve means to the drain thereof.

9. The waste compressor of claim 8 and including plastic liner means positioned in the recess of the basket member.

10. The waste compressor of claim 9 in which the inner circular surface of the outer frame member adjacent the upper extremity thereof is recessed to permit escape of fluid from the expansion chamber with movement of the basket member into near contacting relationship with the flange members of the stationary die and cover member.

11. A waste compressor comprising, an outer cylindrical casing having a thin wall portion of uniform interior cross section and a closed bottom portion with an open top, a ram bucket positioned in the casing and having a guide flange near the open extremity of the same having a cross section similar to the interior cross section of the cylindrical casing to slidably mount the ram bucket therein and with a cylindrical recess extending from top to a closed bottom portion of the bucket, said flange section forming with the closed bottom portion of the casing an expansion chamber for moving the ram bucket, a cover and die section removably positioned in the upper portion of the casing and having a depending portion symmetrical with the recess in the ram bucket to compress material positioned in the ram bucket as the ram bucket moves upwardly in the casing, and a fluid inlet passage into the casing communicating with the expansion chamber and adapted to transmit expansion fluid thereto.

12. The waste compressor of claim 11 and including valve control means communicating with the inlet passage in the casing and adapted to valve expansion fluid into and out of said casing selectively.

13. The waste compressor of claim 12 and including additional passage means in said casing communicating with the expansion chamber and including a check valve means selectively operable with movement of the ram bucket, said additional passage means being connected to the outside of said casing.

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