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Merkin

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[54] **PROTECTIVE SLEEVE FOR REFUSE HANDLING APPARATUS**

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[73] Assignee: **The Union Corporation,** Verona, Pa.

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[52] **U.S. Cl.** ..... **100/229 A;** 100/275; 100/252; 141/316; 141/390; 220/63

[51] **Int. Cl.** **B30b 15/06**

[58] **Field of Search** ..... 100/229 A, 229 R, 215, 100/246, 252; 220/1 T, 65, 63 R; 141/316, 141/390; 53/124 B; 248/99

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Attorney, Agent, or Firm—Fleit & Jacobson

[57] **ABSTRACT**

A positive sleeve for refuse-handling adapted for use with a refuse compaction machine of the type using a reciprocating ram to compress the refuse into packages, such as flexible bags. The sleeve is resiliently expandable and is positioned in the compaction zone of the machine so that the reciprocating ram compacts the refuse into the sleeve. When the sleeve is substantially filled with compacted refuse the sleeve is moved from the compaction machine, and then removed from the compacted refuse leaving the refuse in a packaging container.

23 Claims, 10 Drawing Figures

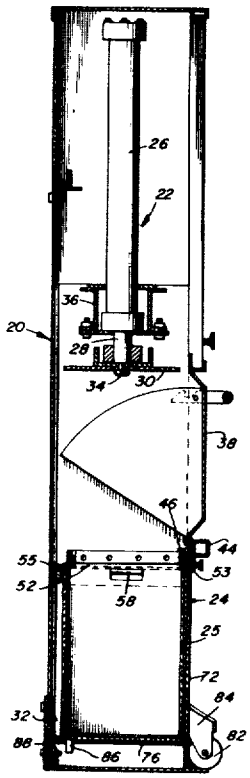


Fig. 1

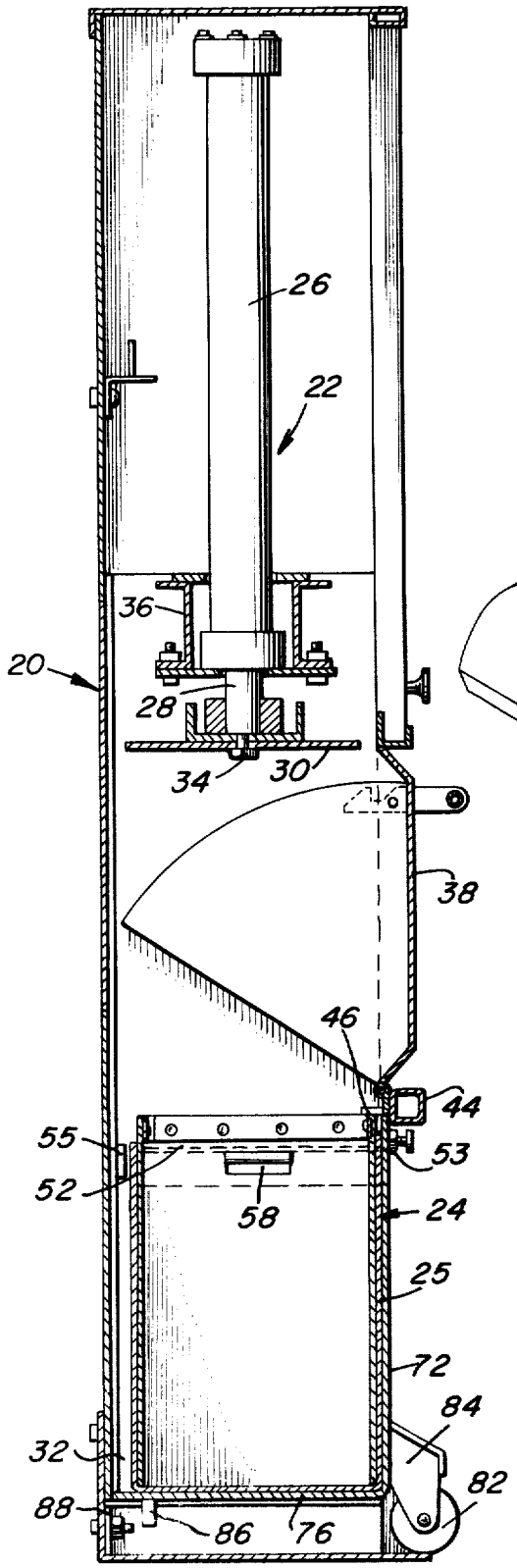

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Fig. 2

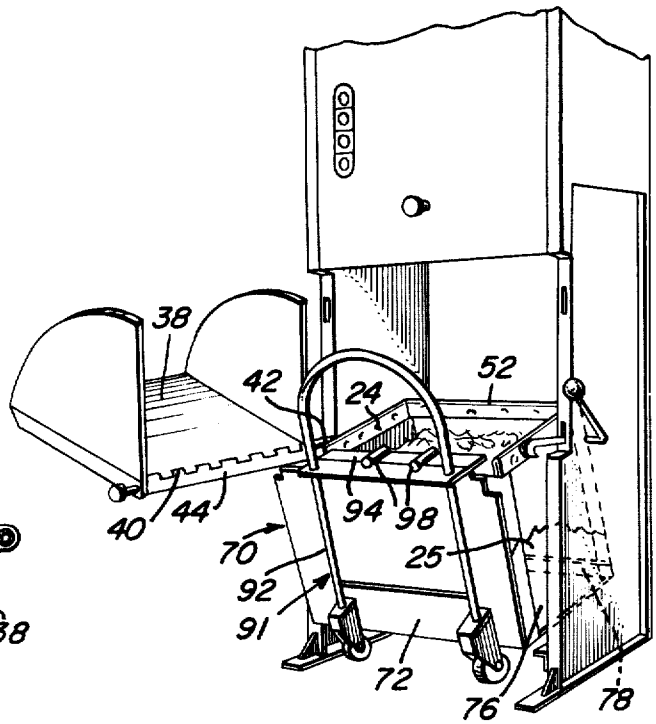

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Fig. 3

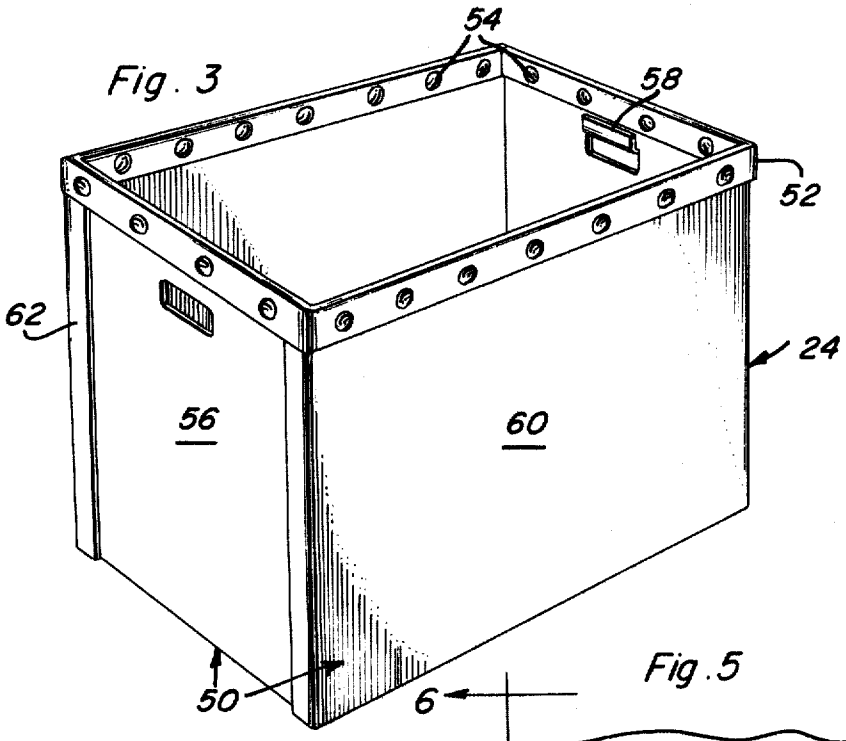


Fig. 5

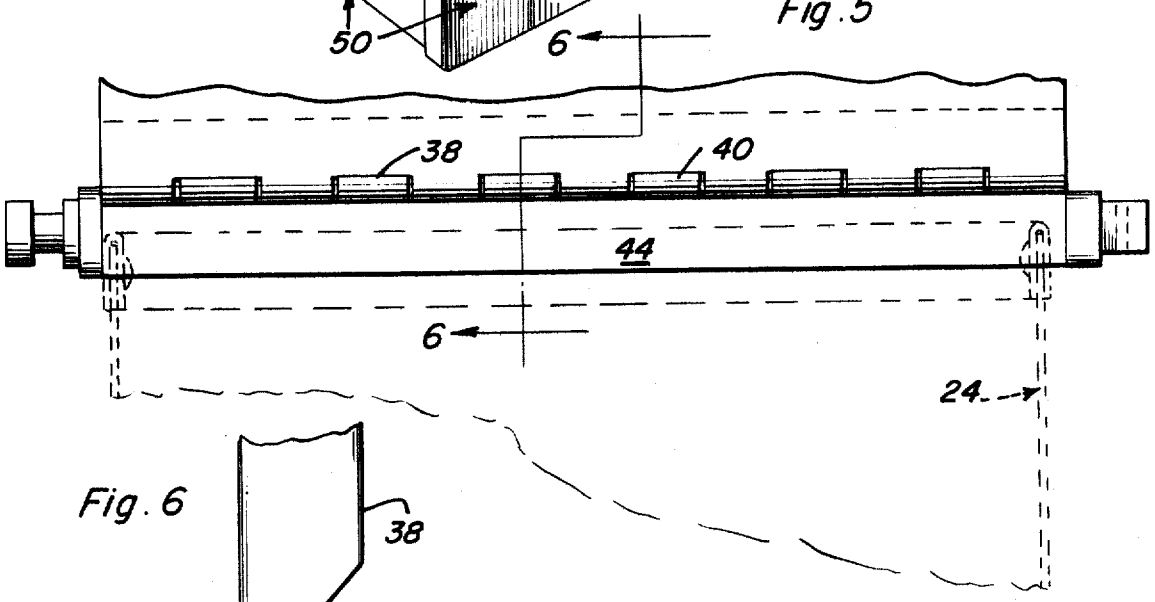


Fig. 6

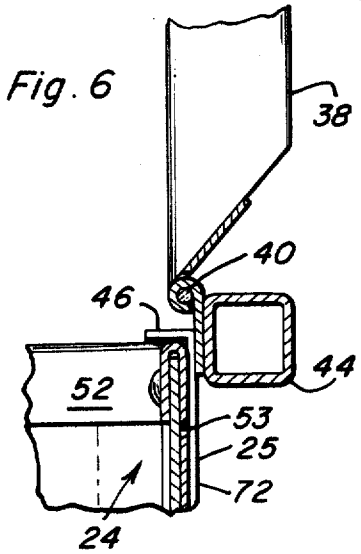


Fig. 4

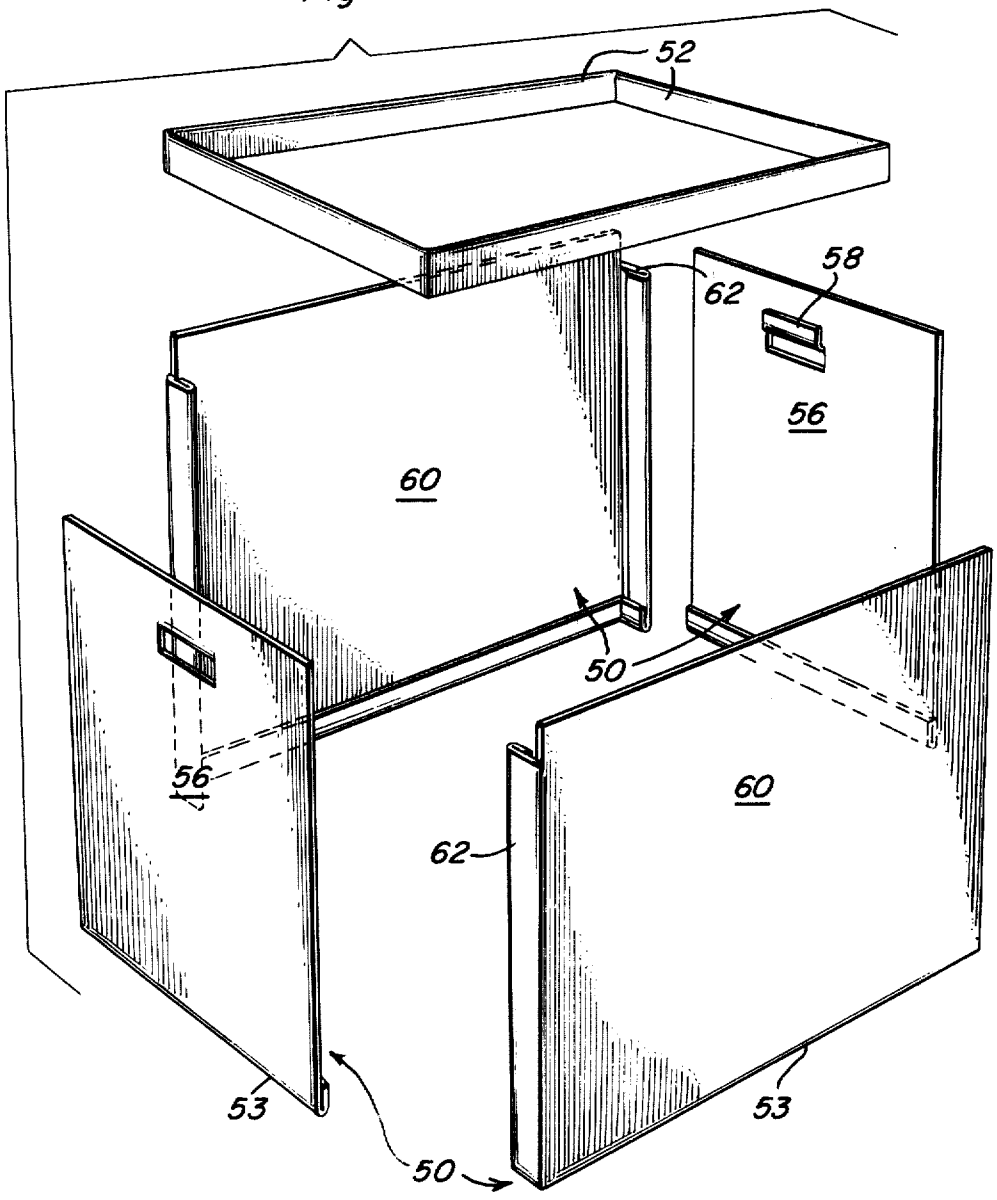


Fig. 7

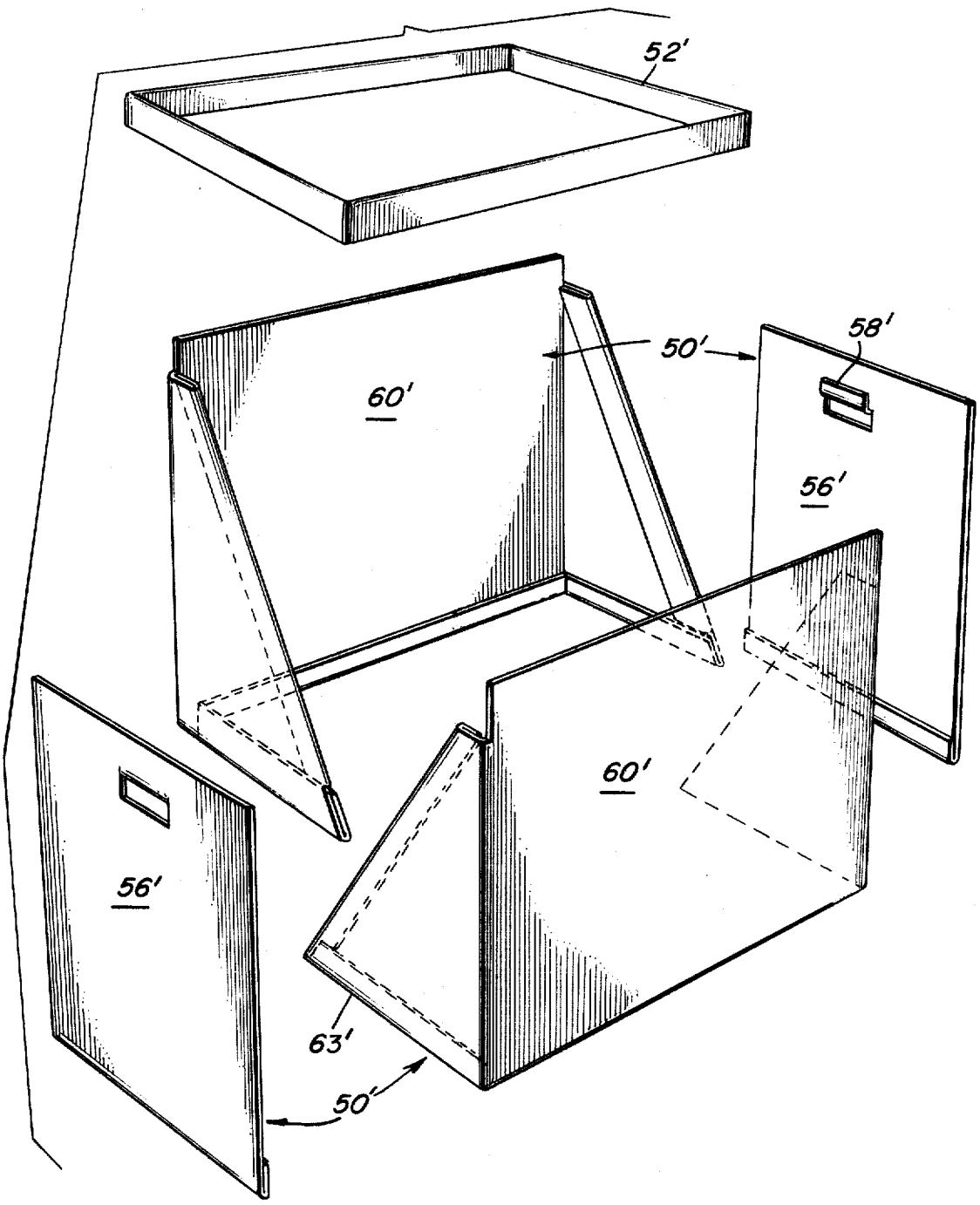


Fig. 8

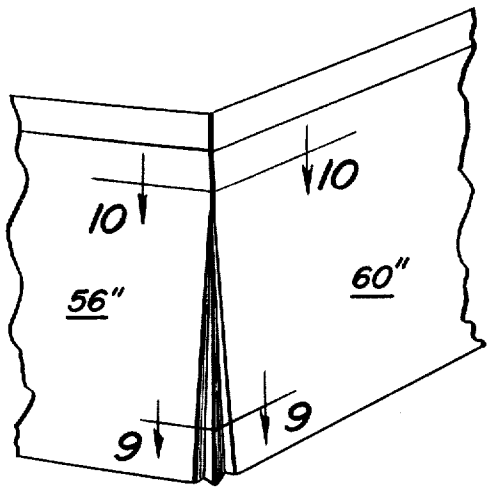


Fig. 9

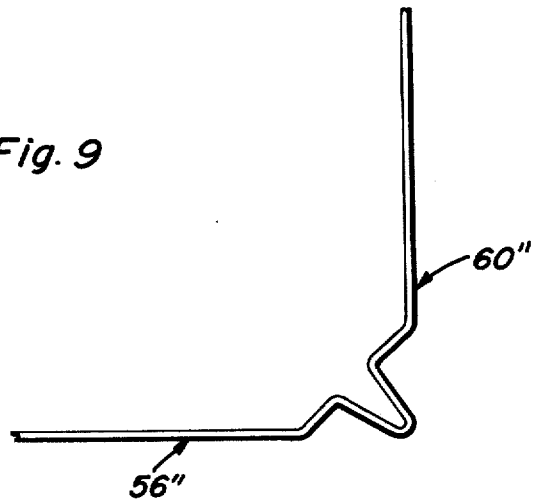
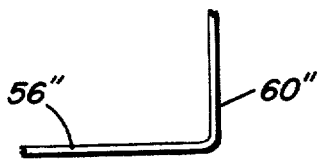


Fig. 10



PROTECTIVE SLEEVE FOR REFUSE HANDLING APPARATUS

The present invention generally comprises a refuse-handling system which is adapted to dispose of refuse from multi-story or single-story buildings, such as apartment houses, office buildings, residential dwellings and similar structures.

More specifically, the invention relates to a refuse-handling system which is adapted to be used with refuse-compacting apparatus of the type using a reciprocating ram to compact the refuse into a specific size and volume. The invention can be adapted for use with either a horizontal-type compacting ram or a vertical-type compacting ram, such as the type disclosed in U.S. Pat. No. 3,424,078 and U.S. Pat. No. 3,741,107. In particular, the present invention involves a modification of and an improvement in the subject matter disclosed in the previously identified application when used to compact the refuse into a container or flexible package within the compacting zone of the machine.

BACKGROUND OF THE INVENTION

Refuse-compacting equipment is increasingly being utilized to condense compressible solid and semi-solid materials to reduced-volume packages. These reduced-volume packages serve to facilitate and expedite the handling of refuse from its source to its final destination by reducing its bulk. Refuse-compacting equipment has previously been used for large commercial buildings, but it is now available for single family type buildings and smaller commercial establishments. In conjunction with the transportation of refuse, it has become desirable to have the refuse packaged in a container or package. Flexible plastic bags or other thin, flexible containers are conventionally used for this purpose.

Previously, compacted refuse was placed into a package or container, such as a flexible plastic bag. The packaging of the compacted refuse constituted an arduous, time-consuming and sometimes impossible task since small pieces from the compacted refuse always fell away before the compacted refuse could be inserted into the bag. In order to overcome this problem and eliminate the necessity for packaging the refuse after it has been compacted, the present invention contemplates compacting and packaging the refuse at the same time by placing an open ended package or container in the compacting zone of the compacting machine and having the refuse compacted into the package or container itself. In order to accomplish simultaneous compacting and packaging in conventional flexible plastic bags or other thin packaging material or containers, it has been found essential to protect the inside of the bag or package from being torn, cut, split, etc., during the compaction gy glass, metal and other sharp rigid objects in the refuse being compacted.

Accordingly, it is a primary object of this invention to simultaneously compact and package conventional type refuse into packaging materials or containers.

It is another primary object of this invention to reduce bulk refuse with a ram-type compacting machine into a flexible plastic bag or other conventional refuse container or package.

It is a further object of this invention to accomplish such compaction inside the refuse container, without cutting, tearing, splitting, etc. the container during the compaction.

It is a still further object of this invention to accomplish the desired compaction and packaging by economical and inexpensive equipment which is easy to operate.

SUMMARY OF INVENTION

The foregoing objects and advantages are obtained according to the present invention by a resiliently expandable sleeve having size dimensions approximating, but slightly smaller than, the dimensions of the compacting zone of the compaction machine. The resilient sleeve is inserted into the flexible plastic bag or other package or container, and then the bag or package containing the sleeve is placed into the compacting zone to receive bulk refuse to be compacted. The side walls of the compacting zone which surround the outside surface of the flexible bag or package are rigid and preferably smooth to prevent cutting or tearing of the bag during compaction. The compacting ram is shaped to compact the bulk refuse within the sleeve, and the sleeve is designed to resiliently expand against the rigid walls of the compacting zone under the force of the compaction. As a result, the sleeve and surrounding package are pressed against the side walls of the compacting zone.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a cross-sectional view of a preferred refuse-handling apparatus utilizing the protective sleeve.

FIG. **2** is a partial perspective view of the preferred refuse-handling apparatus showing the dolly assembly with protective sleeve disengaged from the apparatus housing and the flexible plastic bag broken away.

FIG. **3** is a perspective view of the protective sleeve of this invention.

FIG. **4** is an enlarged exploded perspective view of the protective sleeve shown in FIG. **3.**

FIG. **5** is an enlarged partial front view of the horizontal hinge assembly of the refuse-handling apparatus.

FIG. **6** is a cross-sectional view of FIG. **5** taken along lines **6—6.**

FIG. **7** is an enlarged exploded perspective view of another embodiment of the protective sleeve.

FIG. **8** is a partial perspective view of another embodiment of the protective sleeve.

FIG. **9** is a cross-section view of FIG. **8** taken abong line **9—9.**

FIG. **10** is a cross-sectional view of FIG. **8** taken along line **10—10.**

DETAILED DESCRIPTION OF THE DRAWINGS

The invention as shown in the figures comprises a modification and improvement of the refuse compacting apparatus and system disclosed in U.S. Pat. No. 3,741,107.

As shown in FIGS. **1** and **2,** housing **20** has compacting means **22** mounted therein which is adapted to compact refuse in sleeve **24** placed within the housing. The basic function of the sleeve **24** is to provide protection for a flexible plastic bag **25,** or other package constructed of suitable material, against cutting, tearing and abrasion caused by loading refuse containing glass, metal and other sharp, rigid matter into the refuse compactor for bulk reduction. This protection for bag **25** is achieved by inserting the sleeve **24** into the bag so that the inside vertical surfaces of the bag are fully pro-

tected by the sleeve during the compacting of the refuse.

The walls of housing **20** form an internal compacting chamber or zone **32** into which the sleeve **24** and bag **25** are placed. The walls are preferably smooth so that the bag **25** will not be torn or cut when in the compacting chamber **32** and sandwiched between the sleeve **24** and the walls of the compacting chamber **32.**

The compacting means **22** as shown in FIG. **1** includes a cylinder **26** having a piston movably mounted therein, which is not shown. The piston carries an elongated piston rod **28,** which has a suitable compressing ram or plate **30** secured thereto. The compacting plate **30** is preferably of the same cross-sectional configuration as, but slightly smaller than, the interior of sleeve **24** and is mounted to the piston rod **28** by suitable securing means such as bolt **34.** It should be noted that the cylinder **26** is held in position and the piston rod **28** is guided by a mounting and guide block assembly **36.** The mounting and guide block assembly **36** is suitably secured to the housing **20** or to bracket or mounting means extending inwardly from the housing walls. The compacting means **22** is preferably driven by hydraulic fluid pumped from a pump means not shown. One such compacting means including the drive mechanism is disclosed in U.S. Pat. No. 3,424,078. The compacting means **22** can use a single-acting hydraulic circuit or double-acting hydraulic circuit or any such hydraulic or pneumatic circuit which will allow the apparatus to operate efficiently. The housing **20** has a loading door **38,** which is double hinged at **40** and **42** so that the door can be opened vertically from the housing for refuse-feeding and swung horizontally from the housing for refuse removal.

Door hinge **40** is preferably secured to a horizontal arm **44** allowing the loading door **38** to travel vertically approximately 60° for refuse loading.

The horizontal arm **44** is preferably pivotally mounted to the housing **20** so that it can be positioned adjacent the upper edge of a front plate **72** of a dolly assembly **70** when the dolly assembly is mounted in the housing. The horizontal arm **44** is a structural member preferably spanning the width of the compacting machine and is mounted to the compacting machine by means of a vertically disposed hinge **42** at one extremity and a latch means at the other extremity. In the latched position, the horizontal arm **44** provides distributed load restraints to the upper boundary or edge of the dolly assembly front plate **72** against the lateral forces induced by the compression loading. For refuse removal, the latch means is released and the horizontal arm **44** is rotated 90° or more about its hinge line, so that the dolly assembly **70** carrying the compacted refuse within the sleeve **24** and bag **25** can be withdrawn for disposal.

The sleeve **24** comprises a plurality of panels **50** and a continuous upper reinforcing rim **52** which is secured to the upper surface of each panel **50** by a preferred dimple construction **54** as shown in FIG. **3.** The preferred dimple construction provides compression strength and rigidity to the upper perimeter of the panels **50** of the sleeve. The panels **50** are not interconnected to each other except through their individual interconnection to the continuous reinforcing rim **52.** As such, the panels **50** when subjected to a force normal to their surface, such as when refuse within the sleeve **24** is being compacted, can expand outwardly along their bottom edge about an axis defined by the continuous reinforcing rim **52.** By designing the sleeve **24** to approximate the dimensions of the compacting chamber or zone **32,** the panels **50** can expand during compaction to thereby clamp the walls of the bag **25** against the rigid walls of the chamber permitting the walls of the chamber to act as the principal surfaces for the resisting of the outward movement of the refuse under the force of the ram **22.**

The height of the plastic bag **25** is preferably maintained just below the rim **52.** The bag is maintained in position by an elastic restraining strap or band **53** placed over the plastic bag holding it against sleeve **24.** If desired, any portion of the plastic bag which would otherwise extend upward past the restraining band **53** can be doubled back over or under the restraining band.

Two of the panels **50,** designated as panels **56,** have handles **58** formed therein which are used to remove the sleeve **24** from the compacted refuse and the bag **25** after the package has been removed from the housing **20.** The ability of the sleeve **24** to resiliently expand along its length facilitates removal of the sleeve from around the compacted refuse since the panels **50** can expand to accommodate removal of the sleeve. This expansion significantly reduces the friction forces which must be overcome to remove the sleeve from around the compacted refuse.

In addition, the other panels **50,** designated as panels **60,** have brace flanges **62** along their side edges which overlap the side edge of the adjacent panels **56.** This arrangement assists in avoiding tearing of the bag **25** resulting from the side edges of adjacent panels pinching.

Another embodiment of the sleeve is shown in FIG. **7.** In this embodiment, the flanges **63'** of the panels **60'** are preferably trapezodial in configuration and overlap a significantly larger portion of the adjacent panel **56'** than the previous flange **62.**

This second embodiment further reduces the probability of tearing and snagging of the plastic bag at the lower corners. Additional tearing of the plastic bag is minimized by providing the wider continuous flanges **63'** of each panel **60'** so that the compacted refuse package can easily be extracted from the compactor compression chamber. When the dolly assembly with compacted refuse filled sleeve **24** and plastic bag **25** are being extracted there is a tendency for the panels to spread apart at their lower extremity causing snagging of the bag. With the wider flange **63'** this tendency of snagging is greatly minimized.

The dimples construction **54** which secures the rim **52** to the panels and the handles **58** preferably project inwardly into the interior of the sleeve so that only the substantially flat outer surface of the sleeve contacts the inner surface of the bag.

The combination rim and panel construction serves to achieve strength against localized and distributed loading on the rim similar to a beam on an elastic foundation wherein the rim acts like a beam and the panels like an elastic foundation. The reinforcing rim **52** also prevents tearing and destruction of the upper panel edges of the sleeve, and the individual panel compressive strength and stability is increased by the normal to panel pressure induced by the compaction loading, where each panel is sandwiched between the compression chamber walls of the compactor and the refuse be-

cause of the lateral loading generated on the refuse being compacted.

The dolly assembly **70** as shown in FIG. **2** serves to provide the transportation means for removing the compacted refuse within the packaging bag and sleeve. The dolly assembly **70** comprises a wheeled dolly body with removable handle means **91.** The dolly body can be integrally constructed but preferably comprises a base plate **76,** which can optionally include a flange **78** and a vertical front plate **72** secured to the base plate.

The base plate **76** is located at or near the bottom of the compression chamber **32** when the dolly assembly is placed in housing **20** in a vertical compression stroke compacting machine. The base plate **76** may serve as, but is not restricted to, the structural component and lower boundary of the compression chamber in the lower plane as well as the member holding sleeve **24.** When the base plate **76** serves as the bottom structural element, it has a greater thickness than when the base plate is backed up by an additional plate which is rigidly secured to the compacting machine to form a portion of the housing **20.** If desired, the base plate can rest on brackets which provide structural support for the base plate. The base plate **76** also serves as the lower boundary and support for the dolly assembly **70** when the refuse compacted in the sleeve is to be moved from the compactor.

If desired, the base plate **76** can have dowels **86** protruding from its bottom surface which serve to index and guide the dolly assembly **70** into its proper location in the compression chamber **32** for the compacting mode of operation. The dowels **86** can be positioned in corresponding apertures, slots or notches **88** located in brackets secured to the housing walls or in a base forming the bottom of the compression chamber.

The dolly base plate **76** has a vertical front plate **72** secured thereto by suitable fastening means such as fasteners or welding. As previously mentioned, the base plate and front plate can be integrally constructed, if desired. The height of the front plate is such that it fits in the housing to provide a substantially closed side of the compression chamber.

A flange **46** is preferably integrally constructed with the vertical front plate **72** and extends inward into the compression chamber. The flange **46** bears down on the top of rim **52** of sleeve **24** to restrict the sleeve from shifting or rising up during refuse compacting as the compacted refuse tends to expand vertically when the cylinder plate load is removed from contact with the refuse during the several cycles of compacting and filling the compactor with refuse. The construction of flange **46** allows horizontal arm **44** to be swung open about the vertical hinge line shown on the right side of FIG. **5** even when a fully compacted refuse load has not been reached. At the same time, the tendency of the sleeve to rise above its normally installed height is prevented. Thus, the refuse can be compacted within the compactor at any level up to an elevation level preferably below that of the upper reinforcing rim **52.**

In an alternate embodiment of the invention, dowel pins can be inserted through the horizontal arm **44** and secured thereto, to restrict the movement of sleeve **24.** The dowel pins take the place of flange **46** and bear down on the rim **52** of the sleeve **24** to restrict the sleeve from shifting or rising up during refuse compacting.

Dolly wheels **82** are rotatably mounted to the plate **72** by suitable means such as wheel brackets **84.** The dolly wheels **82** and their respective brackets **84** are preferably attached to the lower outboard face of the front plate **72** to provide rolling action and pivot means for the dolly assembly **70** when the dolly is tilted out of the compacting machine and moved away carrying the sleeve package from the compaction machine. A female socket is preferably provided in each dolly wheel bracket **84,** or in separate brackets, to position and hold the handle means **91** at its lower extremity. Means are provided relative to the floor or bottom of the compacting machine to unload the wheels during the compacting mode. If desired, the wheels can alternately be mounted to the base plate **76** to provide rolling action for the dolly assembly.

The removable dolly handle means **91** has a frame **92,** which is preferably U-shaped and can be fabricated of pipe, tubing, or other suitable structural shape to enable the dolly to be tilted, manipulated, pushed or pulled, in and out of the compaction apparatus. The handle frame **92** is removed from the dolly during the compaction mode and may be clipped to the apparatus or to a wall of the room in which the compaction apparatus is located for storage purposes. The handle frame **92** preferably has horizontal braces in at least two locations and latch means **98** adapted to hold sleeve **24.** The upper brace **94** serves as a structural brace for the handle and can support the latch means **98** which engages the sleeve **24.** Alternately, the latch means **98** may be secured to the front plate **72** to hold sleeve **24** when the dolly assembly is tilted and removed from the compaction chamber **32.**

As shown in FIG. **2,** the refuse has been compacted into the sleeve and bag and the refuse removal process begun. The door latch has been released and the door pivoted, causing the door to swing downward approximately 60°. The horizontal arm latch means has been operated to release the horizontal arm **44** so that the loading door can swing about pivot **42,** freeing the front plate **72** of the dolly assembly.

After the loading door has been swung away, the handle frame **92** is mounted into the wheel brackets and the latch means **98** on the handle frame or front panel is engaged to the sleeve **24.** The handle frame **92** is pulled causing the dolly assembly **70** to pivot and disengage from the housing **20** so that the refuse package and sleeve carried by the dolly assembly can be pulled or pushed to the desired discharge station, the sleeve removed and the refuse package disposed of.

A new bag is then placed around the sleeve **24** and the bag and sleeve are positioned on empty dolly **70.** The dolly is then placed into the housing to form the compaction chamber **32** with the bag **25** and sleeve **24** positioned to receive bulk refuse for compaction therein through loading door **38.** Thus, the operation cycle repeats.

The upper rim **52** of the sleeve **24** is preferably fabricated of steel, with the sleeve panels **50** fabricated of aluminum. However, the sleeve assembly can be fabricated from other materials, such as plastic and metals, for example, aluminum or a combination of plastic and metals including for example singularly or in combination, metal rims; rigid plastic panels; rigid plastic reinforced rims; rigid plastic panels; semi-rigid plastic reinforced rims; semi-rigid plastic panels.

The use of a semi-rigid plastic sleeve material will minimize the possibility of tearing of the flexible bag being protected by the sleeve. An accordion-type joint between adjacent panels **50** would afford sufficient joint expansion to facilitate removal of the sleeve FIGS. **8–10** disclose this accordion-type joint between panels **56''** and **60''**. In addition to the accordion joint, the choice of semi-rigid plastic material for the sleeve will minimize the possibility of tearing of the flexible bag by virtue of smoother, less abrasive edges of the sleeve coming into contact with the bag being protected. The specific region or zone improved by the use of semi-rigid plastic material for the sleeve is at the bottom edge or lower extremity of the sleeve assembly, where the sleeve panels rest on the bottom plane of the dolly assembly forming the compactor compression chamber.

This difference in panel construction in the lower contact area is analogous to the shearing action of a metal edge on the flexible plastic bag bearing on the bottom plane for the metal sleeve panel construction, in contrast with the reduced shearing action of a semi-rigid plastic edge on the same flexible plastic bag bearing on the bottom plate for the semi-rigid plastic sleeve panel construction.

The size and shape of the compaction chamber or zone **32** and sleeve **24** is not critical so long as they are both generally the same and the sleeve is able to resiliently expand into contact with the walls of the chamber enabling the large lateral forces encountered during the compaction to be absorbed by the walls of the compaction chamber and not the sleeve. This permits a design and construction for the sleeve which is lightweight and easily removable from around the compacted refuse.

Supporting elements or shear pads **55** can additionally be affixed in a suitable combination with the compression chamber side frames, rear panel and dolly front plate to minimize the compression loading near the top edge of the sleeve panels. It is not necessary that the shear pads be affixed to each of the two side frames, the rear panel and the front plate of the dolly, and the addition of these supporting elements or shear pads does not hinder the extraction of the dolly as the dolly assembly is easily tilted even in the presence of the shear pads.

While preferred embodiments of the invention have been disclosed, numerous modifications will occur to those skilled in the art without departing from the inventive concept. Accordingly, it is intended and understood that the invention not be limited to the precise embodiments as disclosed but only as defined by the appended claims.

What is claimed is:

1. Refuse-compaction and transportation apparatus comprising a housing, said housing defining a portion of the side walls of a compaction chamber, compaction means mounted in said housing, portable transportation apparatus removably mounted in said housing, said portable transportation apparatus comprising at least a base plate and a front plate secured to said base plate, said front plate defining a portion of the side walls of the compaction chamber, a sleeve positioned on said base plate and within said compaction chamber, said sleeve comprising a rigid reinforcement member at the upper end thereof and a plurality of panels mounted on and extending downwardly from said reinforcement member, at least one of said panels being capable of flexing, at least at the lower region thereof, in a manner substantially independent of adjacent panels, said compaction means being adapted to compact refuse in said sleeve and against the side walls of said compaction chamber upon flexure of one or more of said panels.

2. Apparatus as claimed in claim **1** including bag means fitted outside and under said sleeve.

3. Apparatus as claimed in claim **1** wherein said front plate has means to restrict said sleeve from movement.

4. Apparatus as claimed in claim **3** wherein said sleeve movement restriction means is a flange secured to said front plate.

5. Apparatus as claimed in claim **1** wherein said sleeve comprises a plurality of plastic panels.

6. Refuse-handling and transportation apparatus comprising a housing, said housing defining a portion of the walls of a compression chamber, sleeve means positioned in said compression chamber and comprising a substantially continuous reinforcing rim at the top thereof and a plurality of panels mounted on and extending downwardly from said reinforcing rim, at least one of said panels being capable of flexing, at least at the bottom portion thereof, in a manner substantially independent of adjacent panels, compaction means mounted in said housing, said compaction means being adapted to reciprocate into said sleeve means to compact refuse placed therein, means to restrict said sleeve means from vertical movement as the compacted refuse expands against the walls of said compression chamber, a dolly apparatus adapted to be positioned in said housing and defining a portion of the walls of said compression chamber, said dolly apparatus comprising at least a base plate holding said sleeve means, said base plate serving to define the base of said compression chamber and said sleeve means, and means to engage said sleeve when said dolly apparatus is removed from said housing.

7. Apparatus as claimed in claim **6,** wherein said sleeve means is constructed of semi-rigid plastic material.

8. Apparatus as claimed in claim **6,** and further comprising handle means adapted to be removably connected to said dolly apparatus and comprising a substantially U-shaped frame, a lower brace secured to the legs of said U-shaped frame, an upper brace connecting the legs of said U-shaped frame at a position closer to the web of said U-shaped frame than said lower brace and sleeve restricting means comprising latches secured to said upper brace and adapted to engage said sleeve.

9. Apparatus as claimed in claim **6** wherein said sleeve means comprises two end panels and two side panels.

10. Apparatus as claimed in claim **9** wherein two of said panels have trapezodial shaped side flanges adapted to engage each adjacent panel.

11. Refuse handling apparatus comprising a compaction chamber defined by a plurality of side walls and a bottom, a flexible bag disposed in said chamber, a removable sleeve having a substantially continuous and rigid reinforcing member and a plurality of flexible panels mounted on and extending downwardly from said reinforcing member, at least one of said panels being capable of flexing, at least at the lower region thereof, substantially independent of adjacent panels, said sleeve being fitted within said bag and adapted to

expand under pressure against the side walls of the compaction chamber, and a vertically reciprocating ram cooperating with said sleeve to compact refuse within said sleeve and said bag.

12. Apparatus as claimed in claim **11,** wherein said substantially rigid reinforcing member is made of steel and said flexible panels are made of sheet metal.

13. Apparatus as claimed in claim **11,** wherein said sleeve comprises two end panels and two side panels.

14. Apparatus as claimed in claim **13,** wherein said side panels have a flange along each side edge thereof which overlaps the side edge of the adjacent end panel thereby defining a continuous form when said panels are in repose.

15. Apparatus as claimed in claim **14** wherein the flanges are trapezodial in shape.

16. For use in a vertical refuse-compaction machine of the type employing a vertically reciprocating ram in a compaction chamber to compress refuse housed therein, a protective sleeve for protecting fragile containers, said sleeve comprising: a substantially continuous mounting rim at the upper portion thereof; and a plurality of independent panels mounted on and extending from said mounting rim to define the lower portion of said sleeve; said mounting rim and said panels being associated so that when the reciprocating ram compresses refuse in the compaction chamber, said panels expand into contact with the side walls of the compaction chamber, and so that when the fragile container is filled with compacted refuse, said panels can expand to enable said sleeve to be removed from the fragile container, said panels being capable of flexing, at least at the bottom portions thereof, in a manner independent of adjacent panels.

17. The sleeve of claim **16,** wherein at least two of said panels are provided with flanges for overlapping adjacent panels, to thereby define a continuous form when said panels are in repose.

18. A vertical refuse-compaction and transportation apparatus comprising: a housing defining the rear and side walls of a compaction chamber; a compaction ram mounted for vertical movement in said housing and adapted to compact refuse in said compaction chamber; a dolly removably mounted in association with said housing and defining the bottom and rear wall of said compaction chamber; and a sleeve in said compaction chamber for protecting fragile containers against rupture during compaction of refuse in said compaction chamber, said sleeve comprising an upper reinforcing rim at the top thereof and a plurality of panels flexibly mounted thereto and extending downwardly therefrom, at least the lower regions of said panels flexing against the front, rear and side walls of the compaction chamber, substantially independent of adjacent panels, during the compaction of refuse in said compaction chamber, and flexing against an associated fragile container after the compaction of refuse and the removal of said dolly, to facilitate the removal of the sleeve from the container once filled with compacted refuse.

19. The apparatus of claim **18,** wherein at least two of said panels are provided with flanges for overlapping adjacent panels, to thereby define a continuous form when said panels are in repose.

20. A vertical refuse compactor adapted for use with fragile refuse-receiving containers comprising: a frame having two side walls and a rear wall; a compaction chamber defined, in part, by the lower regions of said side and rear walls; a ram mounted on said frame and adapted to move downwardly in said compaction chamber to compact refuse which has been placed therein; a dolly removably mounted to said frame and defining the bottom and rear wall of said compaction chamber; a sleeve removably carried by said dolly for insertion into said fragile container, said sleeve comprising a substantially continuous mounting rim at the upper portion thereof, and a plurality of panels flexibly mounted on and extending downwardly from said mounting rim, for flexing against said fragile container and the front, rear and side walls of said compaction chamber during the compaction of refuse therein, and for expanding against said fragile container after removal of the dolly from said frame to facilitate the removal of said sleeve from said fragile container once filled with compacted refuse, at least one of said panels being capable of flexing, at least at the lower region thereof, in a manner independent of adjacent panels.

21. The compactor of claim **20,** wherein at least two of said panels are provided with flanges for overlapping adjacent panels, to thereby define a continuous form when said panels are in repose.

22. Refuse-compaction and transportation apparatus comprising a housing, said housing defining a portion of the side walls of a compaction chamber, compaction means mounted in said housing, portable transportation apparatus removably mounted in said housing, said portable transportation apparatus comprising at least a base plate and a front plate secured to said base plate, said front plate defining a portion of the side walls of the compaction chamber, a sleeve positioned on said base plate and within said compaction chamber, said sleeve comprising a rigid reinforcement member at the upper end thereof and a plurality of panels mounted on and extending downwardly from said reinforcement member, said compaction means being adapted to compact refuse in said sleeve and against the side walls of said compaction chamber, wherein said front plate has means in the form of a flange secured thereto for restricting said sleeve from movement.

23. Refuse-handling and transportation apparatus comprising a housing, said housing defining a portion of the walls of a compression chamber, sleeve means positioned in said compression chamber and comprising a substantially continuous reinforcing rim at the top thereof and a plurality of panels mounted on and extending downwardly from said reinforcing rim, compaction means mounted in said housing, said compaction means being adapted to reciprocate into said sleeve means to compact refuse placed therein, means to restrict said sleeve means from vertical movement as the compacted refuse expands against the walls of said compression chamber, a dolly apparatus adapted to be positioned in said housing and defining a portion of the walls of said compression chamber, said dolly apparatus comprising at least a base plate holding said sleeve means, said base plate serving to define the base of said compression chamber and said sleeve means, and means to engage said sleeve when said dolly apparatus is removed from said housing, wherein said sleeve means comprises two ends panels and two side panels, and wherein two of said panels have trapezodial shaped side flanges adapted to engage each adjacent panel.

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