United States Patent [19]

Delmar

[11] **3,785,406**

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[54] **CARTRIDGE PACK FOR TRASH COMPACTION MACHINE**

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[73] Assignee: **Crystal-X Corporation,** Darby, Pa.

[*] Notice: The portion of the term of this patent subsequent to Mar. 21, 1989, has been disclaimed.

[22] Filed: **Dec. 29, 1971**

[21] Appl. No.: **213,694**

Related U.S. Application Data

[62] Division of Ser. No. 61,693, Aug. 6, 1970, Pat. No. 3,650,298.

[52] **U.S. Cl.** **138/103,** 206/46

[51] **Int. Cl.** **F16l 55/00**

[58] **Field of Search** ..... 206/46, DIG. 18; 229/62, DIG. 3; 138/103

[56] **References Cited**

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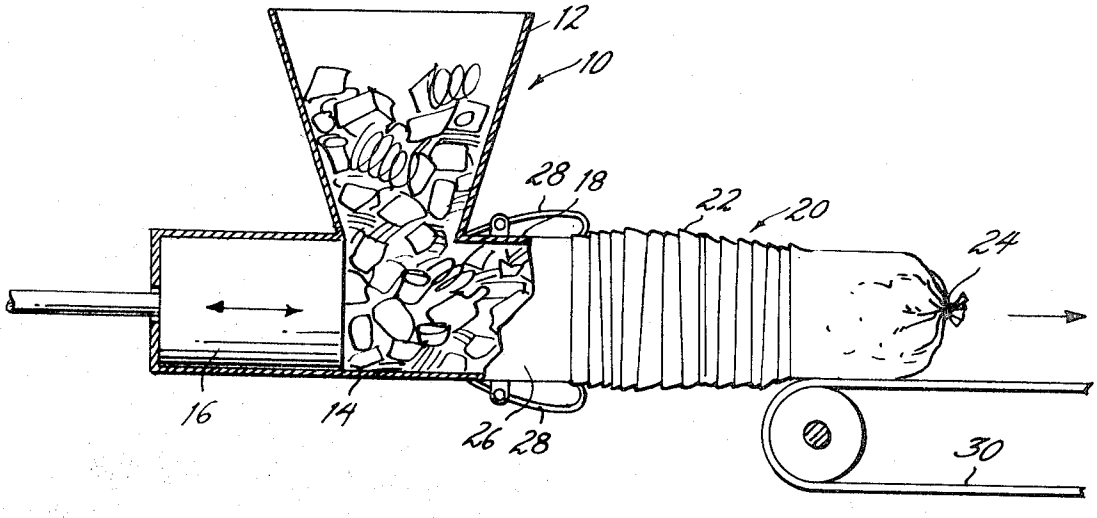
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Attorney—Max R. Millman

[57] **ABSTRACT**

A cartridge comprising a compressed plastic tube for mounting on the tapered end of a hollow cylindrical member into which solid waste or refuse is rammed so that the tube can subsequently be tied and cut into relatively small units containing slugs of compacted refuse. The plastic tube comprises elongated sections, generally about 2 ft. in length, interconnected by adhesively retained external folds, so that after a length of tube, such for example as 32 ft., is filled with slugs of compacted refuse, the folds can be readily pulled open, tied, and severed between the ties to form 2 ft. plastic containers of compacted refuse.

2 Claims, 10 Drawing Figures



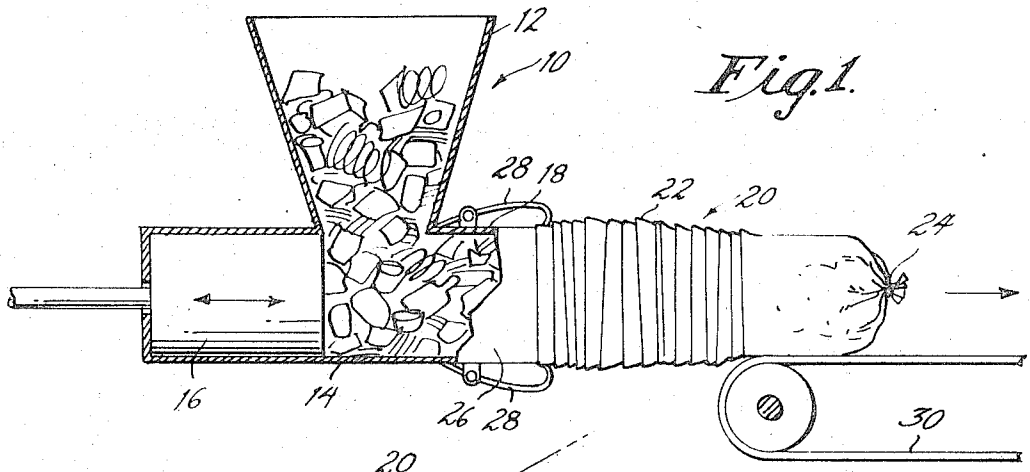


Fig. 1.

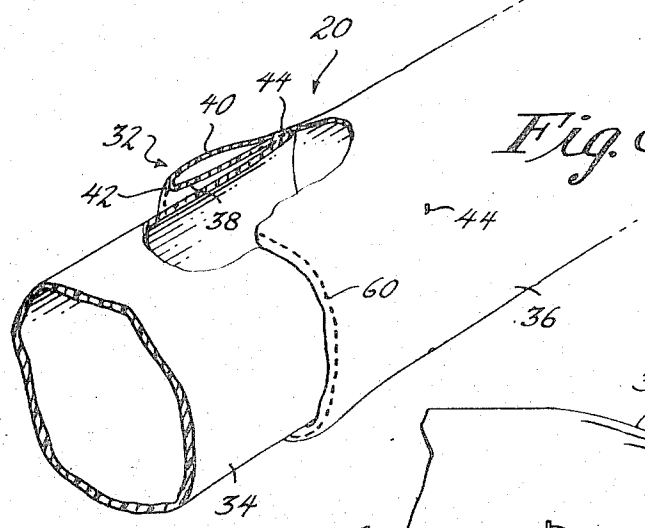


Fig. 8.

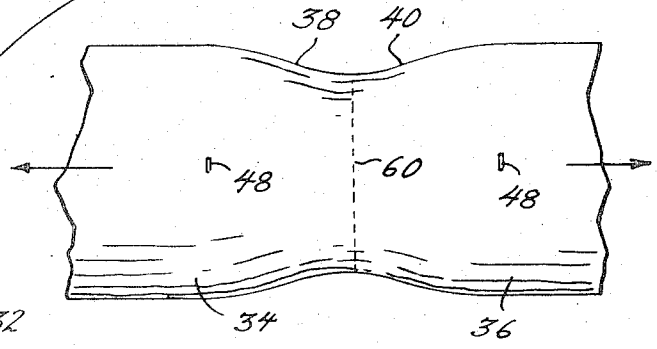


Fig. 9.

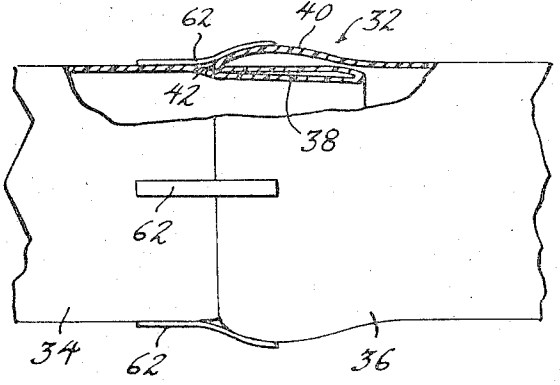


Fig. 10.

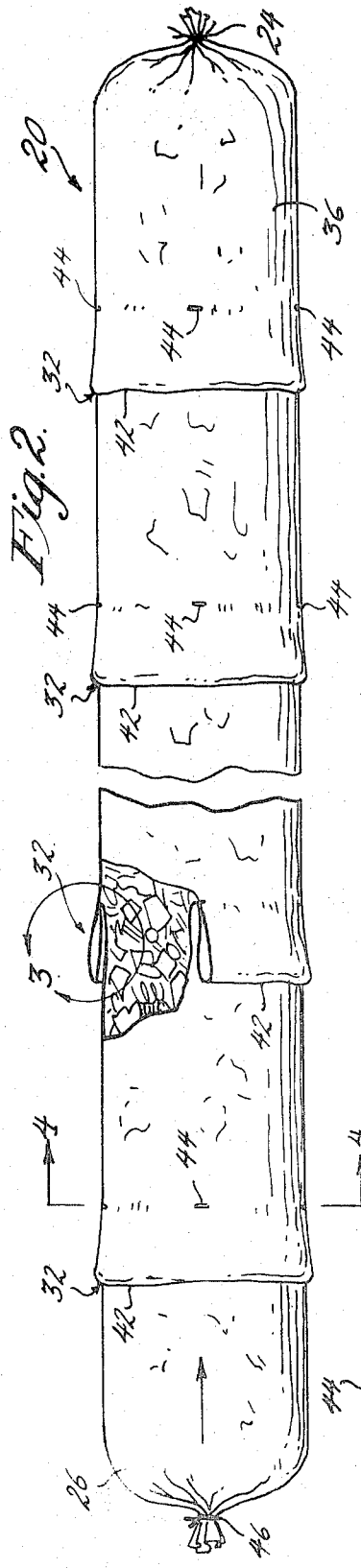


Fig. 2.

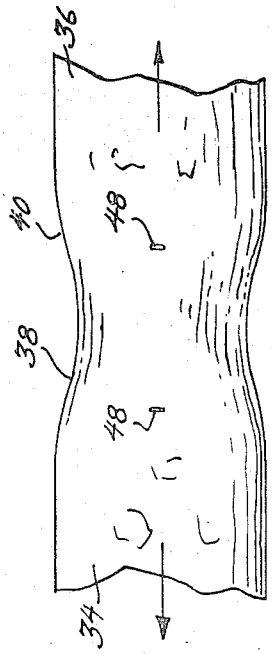


Fig. 5.

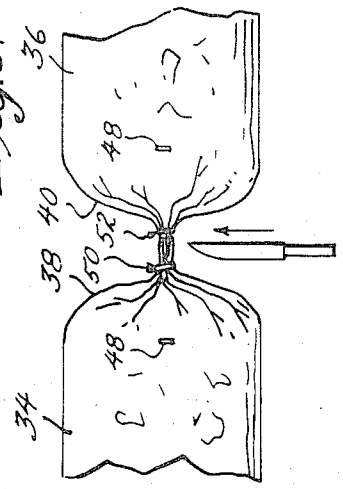


Fig. 6.

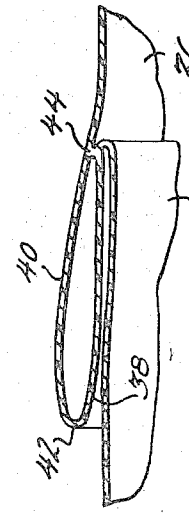


Fig. 3.

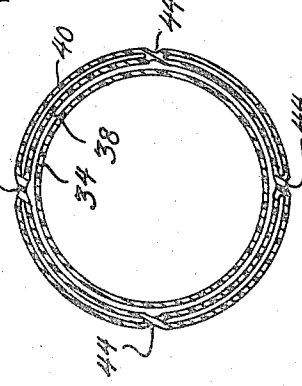


Fig. 4.

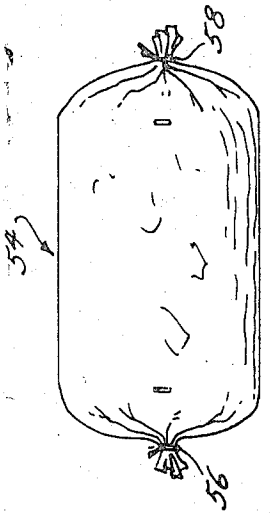


Fig. 7.

CARTRIDGE PACK FOR TRASH COMPACTION MACHINE

This invention relates to trash compaction and more specifically to a plastic tubular member into which the compacted trash is packed for subsequent disposal in units of predetermined size and constitutes a division of my copending application Ser. No. 61,693 filed Aug. 6, 1970, Now U.S. Pat. No. 3,650,298.

There are presently in use a number of different machines which operate on the principle of feeding refuse or solid waste from a hopper into a tube whose delivery end is tapered and forcing the refuse preferably by hydraulic rams through the delivery end where it is compressed or compacted as slugs into containers. In one such machine an extendable plastic tube is mounted on the delivery end of the compactor tube into which the slugs are forced and then the tube is severed and tied into predetermined lengths for disposal.

The primary object of the invention is to provide a plastic tube for mounting on the end of a refuse compactor tube having spaced portions which are not extendable during compaction but are manually or mechanically extendable thereafter so that the areas are made readily available for efficient severing and tieing of the tube into units of desired length.

Another object of the invention is to provide a plastic tube of the character described in which the spaced areas which are not extendable during compaction are provided with separable means for readily and easily extending said areas manually or mechanically by the use of a relatively low pulling force which acts to rupture said separable means but minimize rupture of the plastic tube at said areas.

Another object of the invention is to provide a plastic tube for mounting upon the end of a refuse compaction tube having spaced folded portions in which the folds are retained as such by heat sealing means which are readily separable by the exertion of a pulling force which does not rupture the body of the plastic tube and makes available areas which can be readily tied and severed to provide plastic containers of predetermined size filled with compacted refuse slugs.

Another object of the invention is to provide a plastic tube for mounting upon the end of a refuse compaction tube having spaced folded portions which are separably joined and a weakened area in each folded portion so that when the folded portions are unfolded by the exertion of a pulling force thereon, the unfolded area can be tied on opposite sides of the weakened area and the latter severed to close off the adjacent plastic containers having the compacted refuse therein.

These and other objects of the invention will become more apparent as the following description proceeds in conjunction with the accompanying drawings, wherein:

FIG. 1 is a diagrammatic view of a refuse compaction machine with the plastic tube of the instant invention shown mounted thereon and partly filled;

FIG. 2 is a side elevation of the plastic tube completely filled with compacted refuse, partly broken away and partly in section;

FIG. 3 is an enlarged view of the area shown as numeral 3 on FIG. 2;

FIG. 4 is a sectional view taken on the line 4—4 of FIG. 2;

FIG. 5 is an elevational view of a portion of the filled plastic tube showing the fold seal broken;

FIG. 6 is a view similar to FIG. 5 showing the unfilled areas between the broken seals tied;

FIG. 7 is a side elevation of a single filled refuse container or package tied at its ends;

FIG. 8 is an enlarged fragmentary perspective view of the plastic tube showing a modified form of the invention;

FIG. 9 is an elevation of a portion of the plastic tube and similar to FIG. 5 as applied to the modification of FIG. 8; and

FIG. 10 is a fragmentary side elevation of another modification of the invention, parts being broken away and shown in section.

Specific reference is now made to the drawings in which similar reference characters are used for corresponding elements throughout.

Indicated at 10 and shown in generalized diagrammatic form is a solid waste or refuse compaction machine comprising a hopper into which the refuse is fed, a tube or cylindrical member 14 communicative therewith, a compaction ram 16 slidable therein to push the refuse through the delivery end 18 thereof which is inwardly tapered (not shown) to provide the compaction. While a horizontal compaction tube is shown, it will be understood that the same may also be vertically disposed. The ram is preferably hydraulically operated by controls (not shown) which may synchronize the ram operation and the supply of refuse in the hopper.

The plastic tube of the instant invention is shown at 20 which in the form of overlapped folds 22 forms a cartridge unit of relatively short over-all length. The cartridge is slipped over the tapered delivery end 18 of the compaction tube. The outer end of the plastic tube 20 is tied as by a wire as at 24 whereas the inner end 26 is removably held on the compaction tube 14 by suitable means, such as pivoted spring fingers 28. As the solid waste or refuse is compacted at the tapered end 18 of the tube 14 and pushed into the plastic tube 20, the latter will extend to its full length, there being a suitable support, such as a conveyor 30 to support the outer end portion of the plastic tube.

After the plastic tube is filled with compacted slugs of waste or refuse, which can vary in length and is generally about 30–40 ft. long when extended and about 18 in. in diameter, it becomes necessary to cut and tie the tube into predetermined lengths, such as 2 ft.

To the end that the plastic tube 20 can be readily and easily severed and tied at the desired lengths with minimal possibility of injury to the filled tube, the tube is constructed with folds or tucks which can be unfolded manually or mechanically with relatively small pulling force after the compacted slugs of waste or refuse have filled the tube.

Coming now to the form of the invention shown in FIGS. 2–6, the tube 20 which is made of a suitable plastic and may be of any desired cross-section but preferably circular, is provided at spaced intervals, say 2 ft. apart, with external folds or tucks 32 extending in the same direction from the outer end 24 to the end 26 which is mounted on the compaction tube 14. Each fold is formed by tucking the main body portion of one section 34 under the main body portion of the adjacent section 36 to provide a fold having two circumferentially extending portions 38 and 40 joined by a web 42. Adjacent their bases, i.e. where they extend from the main body portions of the adjacent sections 34 and 36, the portions 38 and 40 are heat sealed as at 44 at cir-

cumferentially spaced points, there being preferably four such seals, each ⅜ × 1/16 inches, about 90° apart, although two seals about 180° apart may also be employed. While the over-all length of the fold **32** may vary, a length of 2 ft. is preferred, each fold portion **38** and **40** being, therefore, about 12 in. long.

When the entire length of the plastic tube **20** is compressed, preferably by folding one portion over the next, it occupies a relatively small length and becomes a cartridge which is readily slipped onto the delivery end **18** of the compaction tube **14**, there to be held by the pivoted spring fingers **28**, while the outer end **24** is tied by a wire to close it off. As the slugs of compacted refuse are forced into the plastic tube **20** by the ram, the plastic tube fills up and extends its full length. However, because the folds **32** are sealed at their bases and they extend in the direction of the inner end **26** of the plastic tube, the plastic tube fills and unfolds smoothly, the folds **32** remaining attached to the main body portions of the tube by the seals **44**.

The end **26** which remained on the delivery end or nozzle **26** of the compaction tube is then removed and closed off by a suitable wire **46**. Thereafter, at each of the adjacent sections **34** and **36**, a pull is exerted, in the order of magnitude of 5–10 pounds, which breaks the seals **44**, as shown at **48**, to unfold the fold **32**, as seen in FIG. **5**. The portion **38** is then tied by a wire **50** and the adjacent portion **40** by a wire **52** and the area between the ties **50** and **52** is then cut. Repeating this procedure for the full length of the plastic tube **20** will produce a plurality of plastic containers **54**, see FIG. **7**, filled with slugs of compacted solid waste or trash and tied at their ends as at **56** and **58**.

In the form of the invention shown in FIGS. **8** and **9**, the same folded construction as that heretofore described is used except that a circumferentially extending perforated or weakened area or line **60** is provided in either the portion **38** or **40** of the fold **32** adjacent the web **42** so that when the seals **44** are broken, as shown at **48**, the perforated or weakened area **60** will extend between the broken seals, and when the ends **38** and **40** are tied, as previously described with reference to FIG. **6**, the adjacent tied units can then be pulled apart at the perforated or weakened area, rather than cut.

In the form of the invention shown in FIG. **10**, the adjacent main body sections **34** and **36** are each separated by the same fold **32** previously described which consists of inner and outer portions **38** and **40** joined by a web **42**. However, the bases of the portions **38** and **40** are not heat sealed. Rather, the fold is retained in an unfolding position during the filling of the tube with compacted slugs of refuse by tapes **62** each having a pressure sensitive adhesive surface which engages the outer surface of one section **34**, bridges the web portion **42** of the fold and engages the outer surface of the outer fold portion **40**, there being preferably four such tapes spaced about 90° apart.

While any plastic may be used to make the tube of the instant invention, a preferred plastic is polybutylene which has a high tensile strength, high dart drop strength, high tear strength and exceptional resistance to environmental stress cracking. Also, while the preferred embodiment therein is the one in which the bases of the folds **32** are heat sealed or bonded at circumferentially spaced areas, the bases of the folds can also be separably secured by a suitable cement or adhesive for the plastic from which the tube is made.

While preferred embodiments of the invention have here been shown and described, it will be understood that minor variations may be made without departing from the spirit of the invention.

What is claimed is:

1. For use with a refuse compaction machine and adapted to be mounted as a cartridge on the delivery end of a hollow cylindrical compaction member; a plastic tube having elongated sections and external spaced folds connecting adjacent sections and extending in the same direction towards one end of said tube, each fold including an outer portion continuous with one section of said tube, an inner portion adjacent to the outer portion of an adjacent section and continuous therewith and a web connecting said inner and outer fold portions, and separable adhesive means engaging the outer surface of one section and the outer surface of the outer portion of said fold for retaining the webs of spaced folds against the outer portions of adjacent sections to that said folds remain in the folded position until a pull is exerted on the plastic tube to sever the adhesive means only.

2. The plastic tube of claim **1** wherein said separable adhesive means includes circumferentially spaced adhesive strips engaging one section, bridging the web of said fold and engaging the outer portion of the adjacent section.

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