United States Patent [19]

Miller

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[54] PORTABLE WASTE DISPOSAL UNIT

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[73] Assignee: **Mileahead Industries Incorporated**, Greenwich, Conn.

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[52] **U.S. Cl.** **4/142**, 4/111

[51] **Int. Cl.** **A47k 11/02**

[58] **Field of Search** 4/141, 142, 111, 143, 138, 4/121, 115, 131, 116

[56] **References Cited**

UNITED STATES PATENTS

2,671,906	3/1954	Potts	4/142 UX
2,794,989	6/1957	Pellerito et al.	4/111
3,401,409	9/1968	Ekrut	4/142
3,452,368	7/1969	Couper	4/142
3,619,822	11/1971	Carmichael	4/142
3,648,302	3/1972	Winters	4/142
3,665,522	5/1972	Backlund et al.	4/142

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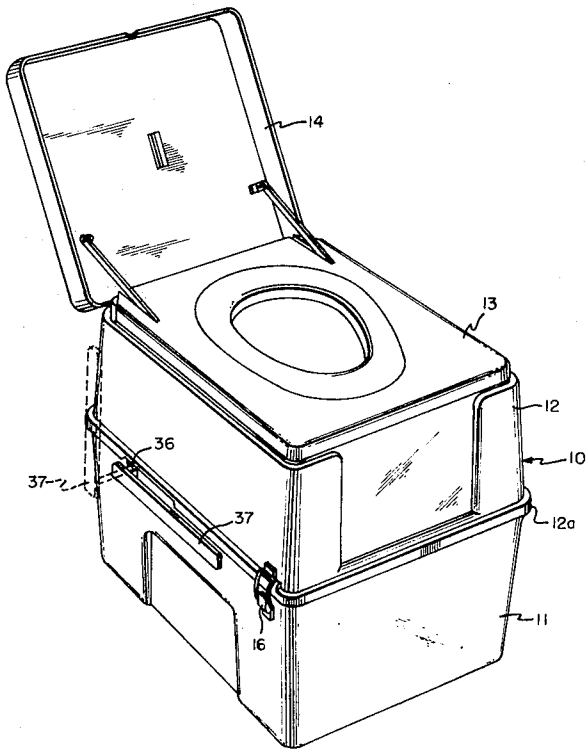
Attorney—Dean S. Edmonds et al.

[57] **ABSTRACT**

There is disclosed a portable unit for the reception of human waste having interrelated self-synchronizing equilateral polygon cage means for the sequential sealing and disposition in the unit of increments of plastic tube material containing waste.

8 Claims, 8 Drawing Figures



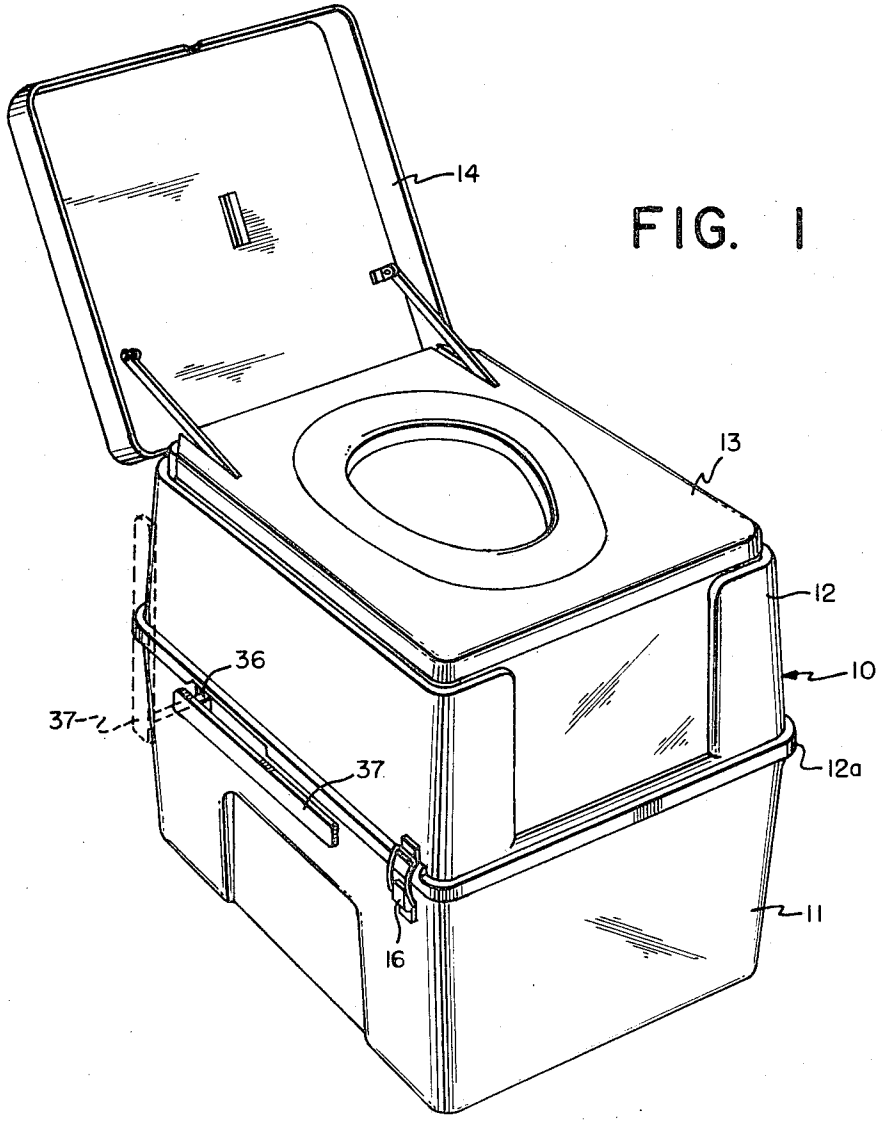


FIG. 1

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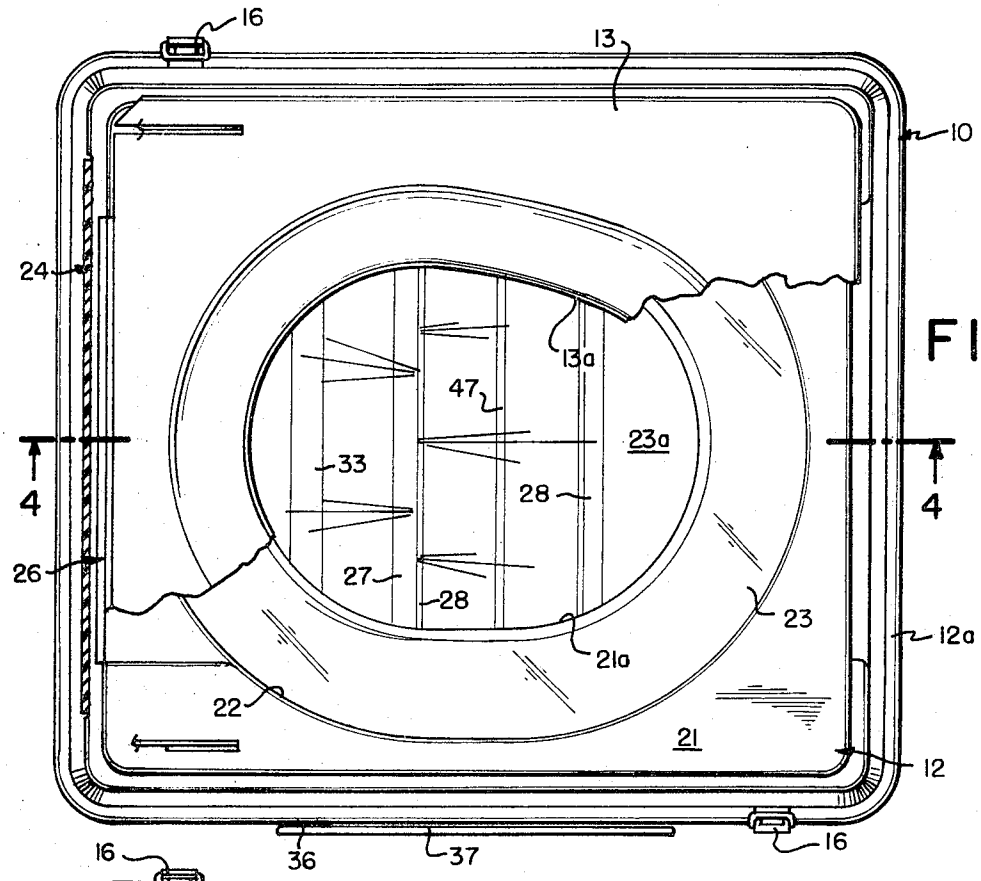
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13
10
24
13a
47
23a
33
28
4
4
26
27
28
23
21a
12a
22
21
12
36
37
16

FIG. 2

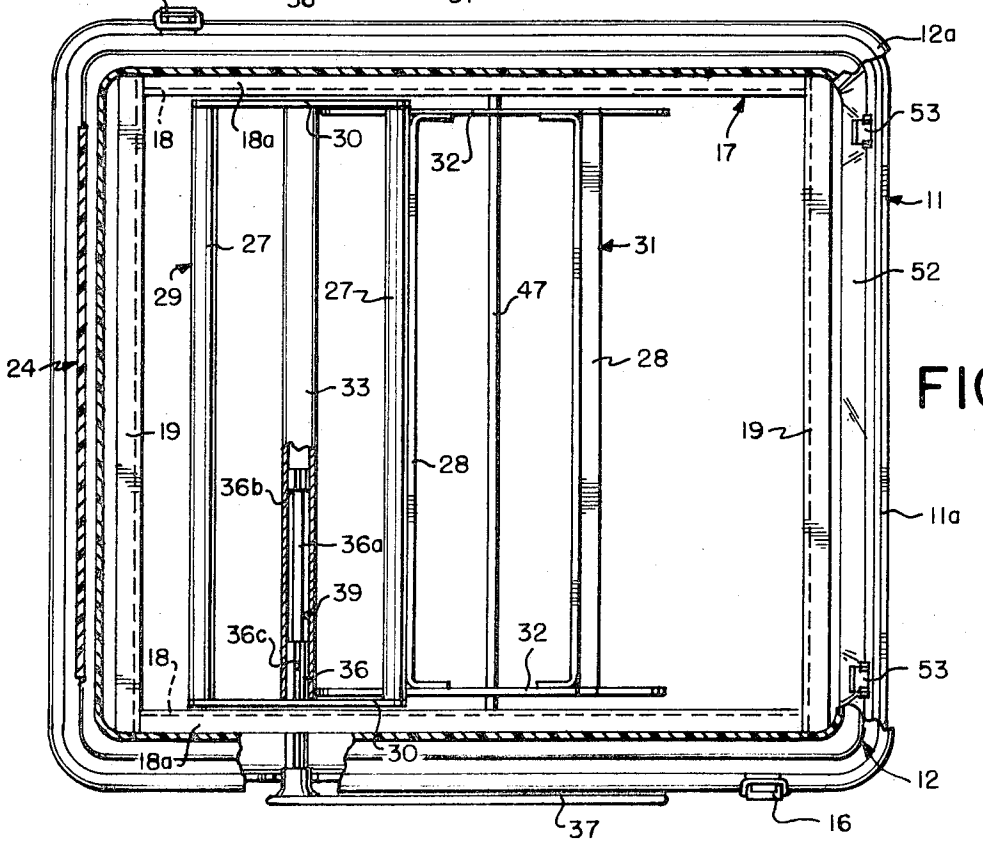
16
12a
53
18
18a
30
32
17
11
27
31
29
27
47
52
24
28
33
19
19
28
36b
11a
36a
39
36c
32
18
53
36
18a
30
12
37
16

FIG. 3

FIG. 4

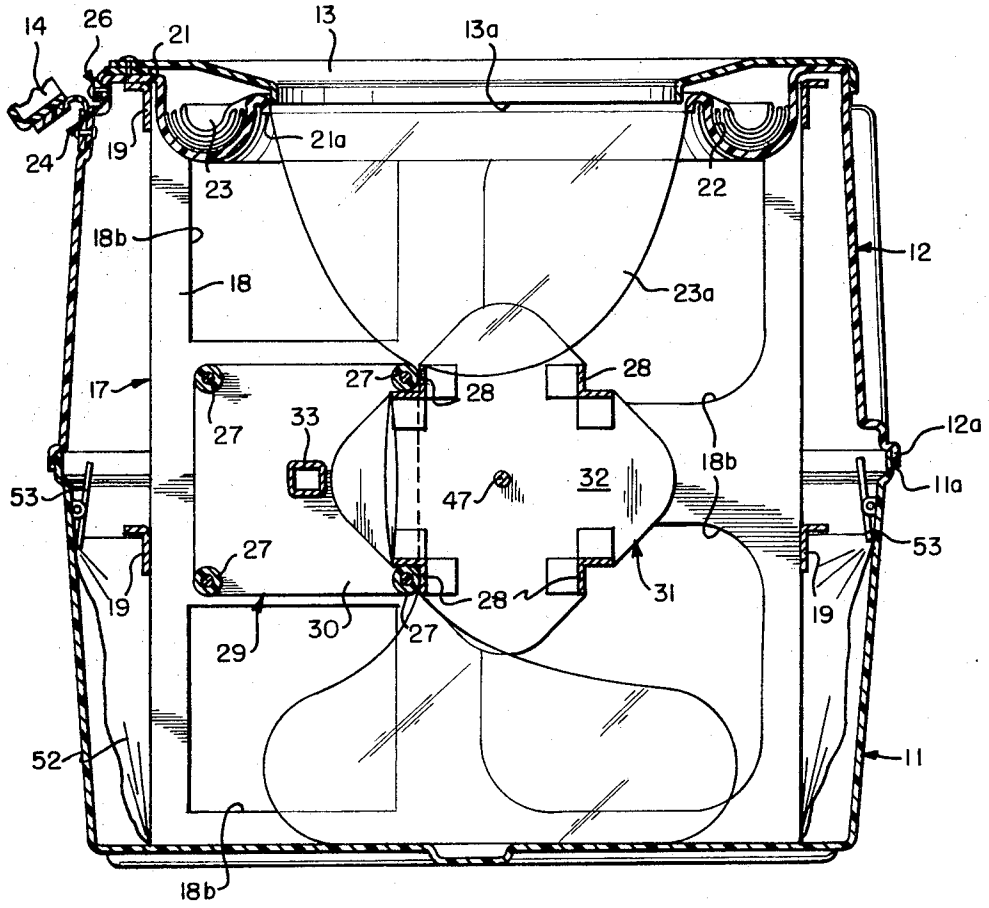

FIG. 5

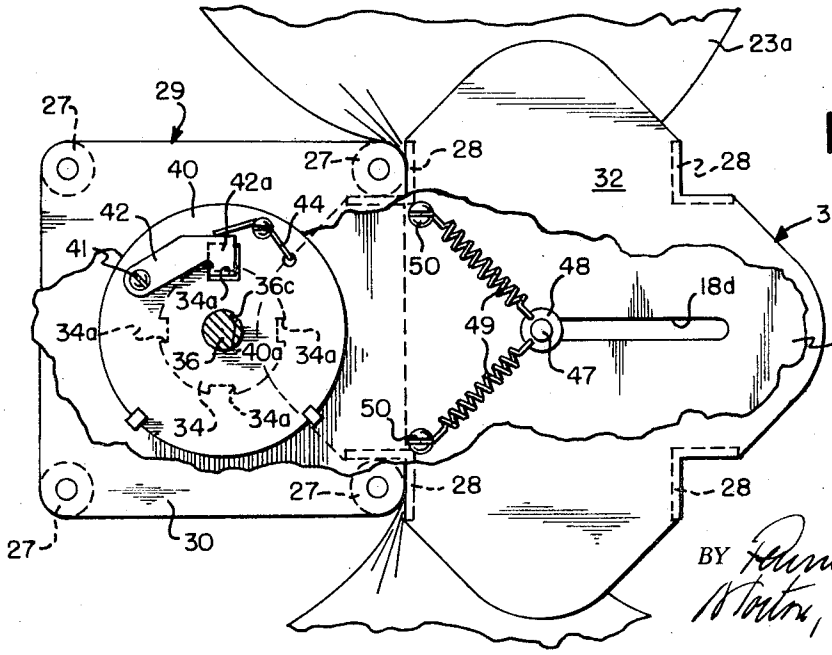

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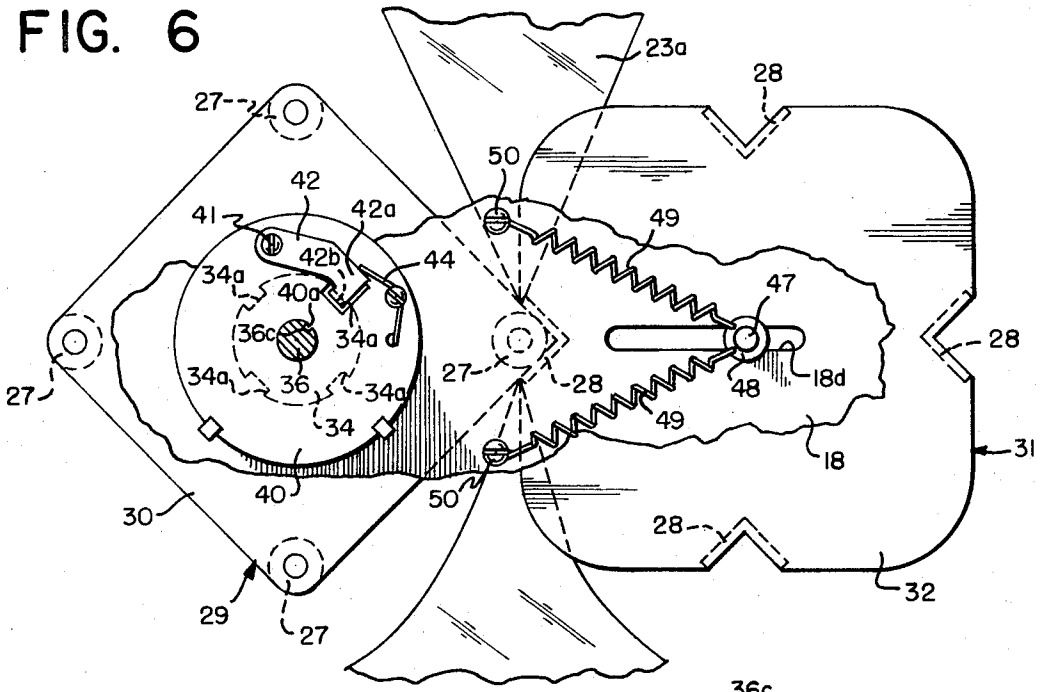
FIG. 6



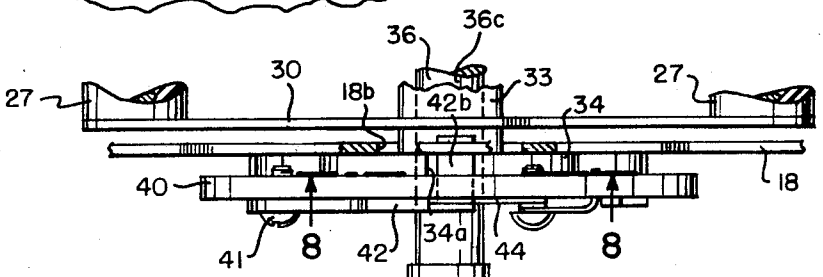
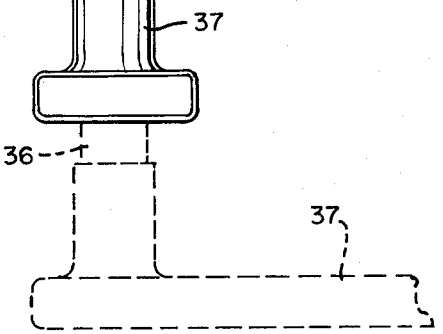


FIG. 7



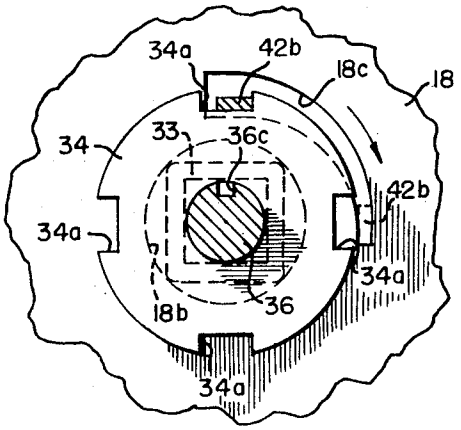


FIG. 8

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PORTABLE WASTE DISPOSAL UNIT

BACKGROUND OF THE INVENTION

Portable dry flush waste disposal units are known which utilize a closed cabinet and means for sequentially encapsulating waste for deposit in the base of the unit. Such disposal units are shown for example in U.S. Pat. Nos. 3,401,409; 3,452,368; 3,473,779 and 2,671,906. However, the units disclosed in these patents frequently lack simplicity of operation or fail to maintain adequate sealing or provide ease of handling waste deposited therein.

SUMMARY OF THE INVENTION

It is the purpose of the present invention to avoid the difficulties experienced with prior devices of this type. More particularly, the disposal unit according to the present invention provides a closed outer casing supported upon a rigid internal frame. Tubular plastic material is stored in folds in a groove immediately adjacent to the seat and can be freely withdrawn downwardly to "flush" the unit when desired. During such movement of the plastic tube, it is restrained slightly by passing between the edge of the groove and the edge of the seat.

A unique tube sealing and withdrawing mechanism is provided in the form of two counter-rotating self-synchronizing equilateral polygon cages, each having opposing pairs of sealing elements between which the tube must pass. One of the cages rotates about a fixed axis while the other, spring-urged toward the first, is permitted freedom to rotate while moving horizontally. At all times at least one pair of sealing elements is maintained in contact with the tube as it passes through and is pulled downwardly by the cages. Furthermore, at the beginning and end of each 90° of rotation, two pairs of sealing elements are in contact with the tube for double protection.

According to the invention increments of tube with waste encapsulated therein pass into the base of the unit for storage within a plastic liner. The liner is removable upon separation of the outer casing by lifting the upper portion and frame clear of the lower section of casing which is devoid of sharp edges which might tear the liner.

These and other aspects of the invention will be seen upon examination of the following detailed specification and accompanying drawing of a particular embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a three-quarter perspective view of the disposal unit of the present invention;

FIG. 2 is a top view of the unit of FIG. 1 with parts broken away;

FIG. 3 is a horizontal section taken generally through the center of the waste disposal unit;

FIG. 4 is a vertical section taken in the direction of arrows 4—4 of FIG. 2;

FIG. 5 is an enlarged fragmentary view of portions of FIG. 4 showing additional parts;

FIG. 6 is a view similar to that of FIG. 5 with the parts thereof shown in a sequential position;

FIG. 7 is a partial top view of handle actuating portions of the disposal unit; and

FIG. 8 is a section taken in the direction of arrows 8—8 of FIG. 7.

DESCRIPTION OF A PREFERRED EMBODIMENT

Referring to the drawing and initially to FIG. 1 thereof, a waste disposal unit **10** constructed according to the present invention has been illustrated. Unit **10** is a portable dry flush sanitary disposal unit for the receipt of waste, having lower and upper casings **11** and **12** of a suitable plastic material, a plastic seat **13** and cover **14**. As seen in FIGS. **1** and **4**, the upper casing **12** has an outer peripheral flange **12***a* which is closely fitted over and rests upon an inner peripheral flange **11***a* of the lower casing **11**. Releasable clasps **16** secure the casings together.

Within the casings **11** and **12** is a frame **17** having vertical side walls **18** of sheet steel having outer peripheral flanges **18***a*. Side walls **18** have cutouts **18***b* therein to lighten the structure (see FIGS. **3** and **4**). Side walls **18** are connected further and run by horizontal cross members **19**. The frame **17** is secured to the casing **12** by suitable mechanical fastening means interconnecting casing **12** with flanges **18***a*. The casing **12** includes a top portion **21** having an annular groove **22** therein for the reception of folded layers of plastic tube **23**. The cover **14** is secured to the casing **12** at **24** as is the seat **13** at **26**. The top portion **21** of the casing **12** and the seat **13** therefore structurally rest upon the upper end of the frame **17** and the casings **11** and **12** are therefore not required to provide structural support.

As best seen initially in FIG. **4**, tubular plastic material **23** can be withdrawn from groove **22** by an advancing means to be described.

Passing downwardly into the disposal unit **10**, the tube **23** will pass between the inner annular edge **21***a* and a depending lip **13***a* of the seat **13**. The spacing between the members **21***a* and **13***a* is such that tube **23** will be restricted somewhat from being freely withdrawn from the groove **22**.

Immediately beneath the seat opening, tube **23** forms a closed receptacle **23***a* for waste, the lower end of the tube being sealed by passing between a roller **27** which is maintained in close contact against a mating L-shaped member **28**, except for the interposition of the tube **23**. Rollers **27** define the corners of a rectangular cage **29** having sheet metal ends **30** rigidly secured to the rollers. L-shaped members **28** (four in number) similarly form a part of a second cage **31** whose ends are sheet metal plates **32**. The relationship between cages **29** and **31** provides for the sequential mating of rollers **27** in contact with L-shaped members **28** to provide a sealing pressure against the tube **23** as it passes between the respective cages **29** and **31**.

Referring to FIGS. **5–8**, it will be seen that plates **30** are supported upon a rectangular shaft **33** extending therebetween. Shaft **33** passes through plates **30** and is rotatably supported within each side wall **18** passing through openings **18***b* (see FIGS. **7** and **8**). Shaft **33** is welded on one side externally of the adjacent wall **18** to an actuating plate **34** having in its periphery four rectangular slots **34***a* spaced at 90° intervals. Shaft **33** receives in telescoping relation a second, round shaft **36** attached to handle **37**. Shaft **36** has a reduced diameter portion **36***a* (FIG. **3**) whose inner end forms

with the enlarged portion of shaft **36** a shoulder **36***b*. A stop pin **39** connected internally to rectangular shaft **33** therefore permits relative rotation between portion **36***a* and member **33** but prevents the withdrawal of shaft **36** in an outward direction beyond the outward travel of shoulder **36***b*.

Shaft **36** furthermore defines a slot **36***c* which is keyed to a pawl bearing plate **40** by key **40***a*. A pawl **42** is pivotally attached by pin **41** to the plate **40**. The pawl's actuating end **42***a* is received within each of the slots **34***a* of plate **34**. The pawl **42** furthermore has a tab **42***b* extending through plate **40** which passes through slot **18***c* in the side wall **18**. The bottom portion of slot **18***c* is shaped as a cam surface whose function will be described. The actuating end **42***a* of the pawl is urged toward plate **34** by means of a spring **44** attached to plate **40**.

As a consequence of the interconnections just described, when shaft **36** is rotated, pawl bearing plate **40** will be rotated and the actuating end **42***a* in a slot **34***a* will effect rotation of actuating plate **34** in the direction of the arrow shown in FIG. **8**. FIGS. **5** and **6** illustrate the result of the foregoing actuation of plate **34** through an initial phase of 45°. It will be seen that as plate **34** rotates it carries with it cage **29** and an upper roller **27** engaging against an upper L-shaped member **28** of cage **31**, thereby effecting a counter-rotation of cage **31** which causes pulling downward of the tube **23** trapped therebetween. Cage **31** is supported for rotation about a central shaft **47** which passes through side walls **18** at opposite ends thereof. Side walls **18** define a horizontal slot **18***d* therein permitting for lateral travel of shaft **47** and, thus, cage **31**. Shaft **47** is held at its ends within collars **48**, which are connected to springs **49** fastened by screws **50** to side walls **18**. Thus, shaft **47** is urged constantly toward cage **29** but is resiliently free to move within slot **18***d*, during the relative rotation between the cages and as required by the geometric relationship between rollers **27** and L-shaped members **28**.

Referring to FIG. **6**, cage **29** has completed approximately 45° of downward rotation. As cage **31** continues to rotate in a clockwise direction beyond the position of FIG. **6**, springs **49** cause the final 45° of rotation to take place without further actuation by the shaft **36**. It will be observed, furthermore, that immediately prior to actuation of cage **29**, there is contact between two opposing rollers **27** and members **28** to effect a double seal. During actuation of the cages **29** and **31**, sealing is maintained by one of the rollers **27** against a member **28** which is assisted by the spring pressure of springs **49**. As the final 90° movement of the cage takes place, double sealing again takes effect.

During the final 45° rotation of cages **29** and **31** which, as mentioned, is effected by springs **49**, tab **42***b* will contact and ride outwardly upon the cam surface of **18***c* to lift the pawl end **42***b* from engagement in a slot **34***a*. The final position of tab **42***b* is shown in dotted FIG. **8**. This allows the handle **37** and shaft **36** to be then rotated in a reverse direction for a subsequent engagement of the pawl and actuating plate and subsequent 90° rotation of cages **29** and **31**.

Referring again to FIG. **4**, it can be seen that a plastic liner **52** is secured within the lower casing **11** by clips **53**. When cage **29** rotates relative to cage **31** beginning with the position shown in FIG. **5**, a section of tube **23** containing waste will be drawn downwardly (see FIG. **6**) until the next roller **27** in rotation again contacts the tube **23** (FIG. **5**), after 90° of rotation of the respective cages. In this position waste is sealed in the tube **23** between upper and lower rollers **27** and L-shaped members **28**. A second 90° rotation of cages **29** and **31** will cause the further progress of encapsulated waste to be deposited in the liner **52**. When the entire length of tube **23** has passed into this liner, the clasps **16** are opened to release the upper casing **12** from the lower casing **11**, whereupon the upper casing and frame **17** can be removed to expose the liner **52** which is sealed in a suitable manner prior to removal. It will be noted that when the frame **17** and casing **12** are removed, there are no sharp edges to tear or snag the liner **52** as it is removed.

From the foregoing it can be seen that cage **29** drives cage **31** through an initial 45° of rotation, cage **31** driving cage **29** from 45°–90° of rotation. This driving of the cages is accomplished without complicated gearing. At the same time, at all times during the driving of cages **29** and **31** there is at least one pair of sealing elements in contact with the tube **23** and at the end of each 90° of rotation two pairs of sealing elements provide double protection. Should the rotation of cages **29** and **31** get out of synchronization, plates **32** are so shaped in relation to the position of rollers **27** and members **28** that the rollers will automatically be brought back into paired positioning with members **28**.

It will be understood that the foregoing description has related to a particular embodiment of the invention and is therefore representative. In order to appreciate the scope of the invention, reference should be made to the appended claims.

It is claimed:

1. In a waste disposal unit of the type including a closed portable closet for the reception of waste sealed and contained in a continuous tube of plastic sheet material, said unit having a seat and an annular receptacle area for holding a quantity of said plastic material beneath an opening in said seat means for successively withdrawing increments of said plastic material downwardly into said unit and means for sealing waste in said increments and depositing same in said unit for storage and subsequent removal, the improvement comprising, a first equilateral polygon cage rotatable about a fixed horizontal axis, a second equilateral polygon cage rotatable about a horizontal axis movable in a horizontal direction toward and away from said first cage, a first set of spaced, horizontal sealing elements on said first cage, a second set of horizontal mating sealing elements on said second cage contacting said first set of elements lengthwise in sequence, the contact between said elements being sufficient to grip said plastic material and seal a flattened widthwise strip of said material when passed therebetween, means for counter-rotating said cages to draw said plastic material downwardly into said unit, and means for maintaining contact during counter-rotation at all times between at least one pair or mating rollers and grooved members.

2. The waste disposal unit according to claim **1** wherein said unit includes a rigid frame, an outer casing enclosing said frame means for supporting said first

cage in said frame for rotation about a fixed axis, means for supporting said second cage for rotation in said frame about a second horizontally movable axis, and spring means urging said second cage into contact with said first cage.

3. The disposal unit of claim 2 in which said first cage comprises two generally square end plates connected at each corner by one of said sealing elements, the sealing elements of said first cage consisting of rollers and the sealing elements of the second cage consisting of L-shaped members whose open sides receive said rollers. Said second cage comprises two generally square end plates notched intermediate each side thereof to receive said L-shaped members which join said end plates, the relation between the square shaped ends of the second cage and the rollers of the first cage causing automatic centering of said rollers in said L-shaped members to maintain said cage automatically in synchronization.

4. The disposal unit according to claim 3 wherein one pair of sealing elements is in contact at all times during rotation of said cages and two pairs of sealing elements are in contact when said fixed and movable axes are at their closest and at rest position.

5. The disposal unit according to claim 4 wherein said first cage rotates upon a shaft, an actuating plate attached to said shaft defining in its periphery actuating notches, a second shaft telescopically received within said cage shaft and freely rotatable with respect thereto, a pawl bearing plate connected to said second shaft, a pawl pivotally mounted to said pawl bearing shaft, spring means urging the end of said pawl toward the periphery of said actuating plate and said notches, a pawl tab and cam means for causing said tab to lift said pawl clear of each notch upon rotation of said pawl bearing plate in one direction and handle means for rotating said second shaft and pawl bearing plate to drive said actuating plate and cage.

6. The disposal unit of claim 5 wherein said second cage drives said first cage through 45° of rotation and said second cage drives said first cage during 45°–90° of rotation and said pawl tab lifts the pawl from an actuating notch during approximately 45°–90° of rotation.

7. The disposal unit of claim 2 wherein said frame is enclosed within an upper and lower outer casing, means for securing said upper casing to said frame, said groove containing plastic tube material is in said upper casing, the inner edge portion of said seat opening and the inner edge of said groove being closely spaced to restrict flow of tube material.

8. The disposal unit of claim 6 wherein a plastic liner is provided within said lower casing to receive increments of plastic tube encapsulating waste therein and said lower casing is free of sharp edges to tear or snag said liner.

* * * * *