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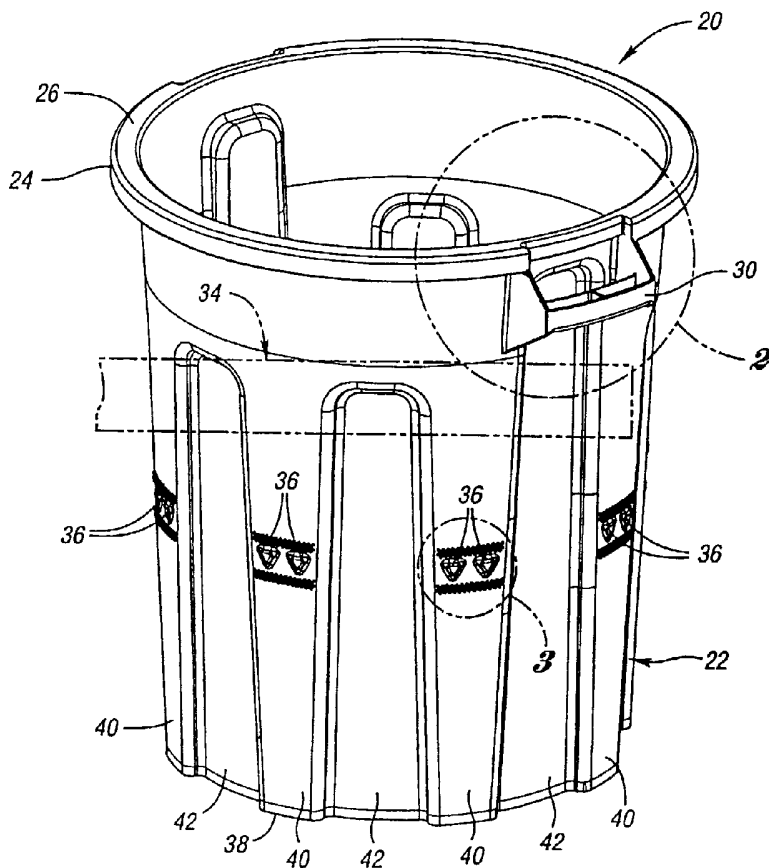
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(54) Title: WASTE CONTAINER



(57) Abstract: A waste container (20) provides at least one protrusion (36) spaced below a lip (24) extending radially outwardly from an upper edge of the waste container. The at least one protrusion is spaced below the lip to permit a gripper (34) from an automatic lifter to grasp the waste container between the at least one protrusion and the upper lip. The at least one protrusion may be a plurality of triangular shaped bosses formed midway between the upper edge and lower edge of the waste container. Alternatively, the at least one protrusion may be a base portion (76) which extends radially outwardly at a lower edge of the waste container. The at least one protrusion prevents the waste container from slipping completely through the grippers while the waste container is inverted while emptying the contents into a truck.



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WASTE CONTAINER

BACKGROUND OF THE INVENTION

The present invention relates generally to containers and more particularly to
5 a waste container for use with automated handling equipment.

Some residential waste collection services have an automatic lifter for lifting
and dumping the waste containers into the waste truck. Generally, the lifter includes
grippers which grasp the waste container. The lifter then lifts the waste container
from the ground and inverts the waste container to dump the contents into the waste
10 truck. The lifter then rotates the waste container back to an upright position and
returns the waste container to its original position on the ground.

The waste container includes a lip at an upper end of the waste container
which protrudes radially outward from an upper edge of the wall of the waste
container. The lip prevents the waste container from slipping through the grippers
15 when the lifter lifts the waste container up off the ground. However, while inverted,
the waste container may slip through the grippers and become damaged.

Some containers have wheels on their bottom for rolling the container. The
wheels also serve as stop mechanisms that stop the container from slipping through
the grippers when inverted. Some containers, particularly large containers used by
20 municipalities, are often large, rectangular containers having contoured, tapered
bodies and beveled surfaces that prevent slippage. Unfortunately, traditionally-
shaped containers without the contours, tapers or bevels and without wheels are still
subject to slippage through the grippers.

SUMMARY OF THE INVENTION

The present invention provides a waste container including at least one
protrusion extending outward from the container and spaced below the lip. The
grippers grip the waste container between the lip and at least one protrusion. If the
waste container starts to slip while inverted, the protrusions will catch the grippers,
30 thereby preventing the waste container from falling.

In one embodiment, at least one protrusion comprises a plurality of bosses integrally molded in the body wall of the waste container. The bosses may comprise inverted triangles arranged in pairs around the circumference of the waste container.

In a second embodiment, the at least one protrusion comprises a base portion
5 at a lower edge of the waste container, the waste portion extending radially outward from the waste container. The base portion may be snap-fit to a lower edge of the waste container or integrally molded with the rest of the container.

BRIEF DESCRIPTION OF THE DRAWINGS

10 Other advantages of the present invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

Figure 1 illustrates a waste container of the present invention according to a first embodiment.

15 Figure 2 is an enlarged view of the handle and upper end of the waste container of Figure 1.

Figure 3 is an enlarged view of the bosses in Figure 1.

Figure 4 is a perspective view of the bottom of the waste container of Figure 1.

20 Figure 5 is a second embodiment of a waste container according to the present invention.

Figure 6 is a disassembled bottom perspective view of the waste container of Figure 5.

25 Figure 7 is an exploded view showing assembly of the waste container of Figure 5.

Figure 8 is a sectional view of the waste container of Figure 5, showing the connection of the base to the rest of the container.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

30 Figure 1 illustrates a waste container 20 according to a first embodiment of the present invention. The waste container 20 includes a generally cylindrical body wall 22 having a lip 24 protruding radially outward about the circumference of an

upper edge 26 of the body wall 22. The waste container 20 further includes a pair of handles 30 (one shown) which also protrude radially outward from the body wall 22. The lip 24 and handles 30 are designed to be engaged by grippers 34 (one shown in phantom) of an automatic lifter on the waste collection truck. If the waste container
5 20 begins to slip through the grippers 34 while being lifted, the grippers 34 engage the lip 24 and/or handles 30, thereby preventing the waste container 20 from slipping completely through the grippers 34.

The present invention also provides a plurality of protrusions 36 formed below the area of engagement by the grippers 34. As shown in Figure 1, the
10 plurality of protrusions 36 are formed in the body wall 22, approximately midway between the upper edge 26 and a lower edge 38. The protrusions 36 are generally bosses molded in the body wall 22. For example, the protrusions 36 may be inverted triangular bosses arranged in pairs about the circumference about the waste container 20. As shown in Figure 1, the body wall 22 may comprise a plurality of
15 splines, including outer splines 40 and alternating inner splines 42. The protrusions 36 are formed on the outer splines 40.

Figure 2 is an enlarged view of the handle 30 of the waste container 20. Each handle 30 is formed adjacent the upper edge 26 and lip 24 and is positioned over one of the inner splines 42.

20 Figure 3 is an enlarged view of two of the protrusions 36 of the waste container 20 of Figure 1. As can be seen in Figure 3, the protrusions 36 comprise inverted triangular bosses, arranged side-by-side in pairs spaced circumferentially around the body wall 22 on the outer splines 40. The upper side of the triangle of the triangular bosses 36 is arranged to engage a gripper 34 (Figure 1) when the waste
25 container 20 is inverted, thereby preventing the waste container 20 from slipping through the grippers 34. As shown in Figure 3, a stripe of smaller bosses 44 is arranged above and below the pair of triangular bosses 36 to further increase the friction between the gripper 34 (Figure 1) and the waste container 20 when inverted.

Figure 4 is a bottom perspective view of the waste container 20 of the
30 present invention. As can be seen in Figure 4, the alternating inner and outer splines 42, 40 are integrally molded with a bottom wall 46 at the lower edge 38. As can

also be seen in Figure 4, the handles 30 are arranged at diametrically opposed sides of the body wall 22.

Figure 5 illustrates a waste container 60 according to a second embodiment of the present invention. The waste container 60 comprises a generally cylindrical body wall 62 having a lip 64 protruding radially outward from an upper edge 66 of the body wall 62. The waste container 60 further includes a pair of handles 70 (one shown) protruding radially outward from the upper edge 66 of the body wall 62. The body wall 62 further includes a portion 72 of increased diameter, thereby providing a circumferential ridge 74. The circumferential ridge 74, lip 64 and/or handle 70 may all engage the grippers 34 when the automatic lifter (not shown) lifts the waste container 60.

A base portion 76 protrudes radially outwardly about the circumference of the body wall 62 at a lower edge 80 of the body wall 62. The base portion 76 may be integrally molded with the body wall 62 or, as will be described below, may be snap-fit or otherwise removably or non-removably secured to the lower edge 80 of the body wall 62. In the second embodiment, if the waste container 60 begins to slip through the grippers 34 when the waste container 60 is inverted, the grippers 34 will engage the base portion 76, thereby preventing the waste container 60 from slipping completely through the grippers 34.

Figure 6 is a disassembled bottom perspective view of the waste container 60 of Figure 5. As can be seen in Figure 6, the waste container 60 includes drag ribs 81 formed at the lower edge 80 of the waste container 60 adjacent a bottom wall 82, which is recessed from the lower edge 80 of the waste container 60. Circumferentially-spaced, radial fins 83 extend downward from the bottom wall 82, for engagement with complementary slots 84 in the base portion 76, which are shown in Figure 7. Figure 7 shows the assembly of the waste container 60. As can be seen in Figure 7, the base portion 76 includes an annular recess 85 on a top surface. The lower edge 80 of the waste container 60 is received within the annular recess 85 of the base portion 76. The base portion 76 may be permanently or removably secured to the lower edge 80 of the waste container 60, or may be snap-fit together as described below.

Figure 8 is an enlarged sectioned view of the lower edge 80 of the waste container 60 connected to the base portion 76. As can be seen in Figure 8, the lower edge 80 of the body wall 62 is received in the annular recess 85. The lower edge 80 of the body wall 62 includes a plurality of apertures 86 which are snap-fit with a plurality of locking tabs 88 protruding upward from the annular recess 85 of the base portion 76. In this manner, the body wall 62 is secured to the base portion 76.

In use, the waste containers 20, 60 will be lifted by grippers 34. In case of slippage, the grippers 34 may engage one or more of the radial protrusions from the upper end 26, 66 of the waste container 20, 60, such as the upper lip 24, 64 or the handles 30, 70, or the annular ridge 74. The waste container 20, 60 is then inverted by the grippers 34 to empty the contents, at which time the grippers 34 may begin to slip along the body wall 22, 62 of the container 20, 60. In the present invention, the grippers 34 will catch on the protrusions 36, 76, thus preventing the waste container 20, 60 from falling into the truck or onto the ground, and thus preventing damage to the waste container 20, 60. Thus, the present invention may provide resistance to slippage for traditionally-shaped containers without contours, tapers or bevels and without wheels.

While embodiments of the invention have been illustrated and described, it is not intended that these embodiments illustrate and describe all possible forms of the invention. Rather, the words used in the specification are words of description rather than limitation, and it is understood that various changes may be made without departing from the spirit and scope of the invention. Although two preferred embodiments of the present invention have been illustrated and described, it should be recognized that many variations on these designs would also be within the scope of the present invention. For example, although pairs of inverted triangular bosses 36 are preferred, other shaped bosses or other protrusions molded into the body wall 22 would also be within the scope of the present invention. Further, although the bosses 36 are arranged in pairs circumferentially around the waste container 20, other arrangements or numbers of bosses or other molded protrusions would also be within the scope of the present invention. Further, as explained above, although base portion 76 is illustrated and described as a snap-fit assembly onto the body wall 62, the base portion could also be integrally molded,

heat welded, or secured by fasteners or adhesive or any other means and still be within the scope of the present invention.

CLAIMS

1. A waste container comprising
a generally cylindrical body wall;
5 a bottom wall closing a lower end of the body wall;
a lip extending radially outward from an upper end of the body wall; and
at least one protrusion extending outward from the container spaced below
the lip.
- 10 2. The waste container of claim 1 wherein the at least one protrusion comprises
a plurality of protrusions distributed about a circumference of the body wall.
3. The waste container of claim 2 wherein the plurality of protrusions comprise
a plurality of bosses.
- 15 4. The waste container of claim 3 wherein the plurality of bosses are triangular
bosses.
5. The waste container of claim 4 wherein the plurality of protrusions are
20 integrally molded with the body wall.
6. The waste container of claim 1 wherein the at least one protrusion includes a
base member extending radially outward from a lower end of the waste container.
- 25 7. The waste container of claim 6 wherein the base member is removably
secured to the lower end of the waste container.
8. The waste container of claim 7 wherein the base member is removably
secured to the bottom of the waste container.
- 30 9. The waste container of claim 8 wherein the base member is snap-fit to the
bottom wall.

10. The waste container of claim 6 wherein the base member is generally disk-shaped.
11. The waste container of claim 1 wherein the at least one protrusion is spaced
5 below the lip to define a gripping area therebetween for engagement by a gripper for lifting and inverting the waste container.
12. The waste container of claim 11 further including grippers engaging the body wall between the lip and the at least one protrusion.
- 10 13. The waste container of claim 1 wherein the at least one protrusion is integrally molded with the body wall.
14. The waste container of claim 1 wherein the waste container does not include
15 wheels.
15. The waste container of claim 1 wherein the at least one protrusion is fixed relative to the body wall.
- 20 16. The waste container of claim 1 wherein the body wall includes a plurality of inner and outer splines extending from the lip to the bottom wall.
17. A molded plastic waste container comprising
a generally cylindrical body wall;
25 a bottom wall closing a lower end of the body wall;
an upper radial protrusion extending radially outward from an upper end of the body wall; and
a plurality of bosses protruding outward from the body wall between the upper radial protrusion and the bottom wall.
- 30 18. The waste container of claim 17 wherein the upper radial protrusion comprises a lip extending circumferentially about an upper end of the body wall.

19. The waste container of claim 17 wherein the upper radial protrusion comprises a pair of handles extending from the body wall.
20. The waste container of claim 17 wherein the plurality of bosses are generally triangular.
21. The waste container of claim 17 wherein the plurality of bosses are spaced below the lip to define a gripping area therebetween for engagement by a gripper for lifting and inverting the waste container.
22. The waste container of claim 21 further including grippers engaging the body wall between the lip and the plurality of bosses.
23. A waste container comprising
a generally cylindrical body wall;
a bottom wall closing a lower end of the body wall;
a lip extending radially outward from an upper end of the body wall; and
a base member extending radially outward from a lower end of the waste container.
24. The waste container of claim 23 wherein the at least one protrusion includes a base member extending radially outward from a lower end of the waste container.
25. The waste container of claim 24 wherein the base member is removably secured to the lower end of the waste container.
26. The waste container of claim 25 wherein the base member is removably secured to the bottom of the waste container.
27. The waste container of claim 26 wherein the base member is snap-fit to the bottom wall.

28. The waste container of claim 23 wherein the base member is generally disk-shaped.

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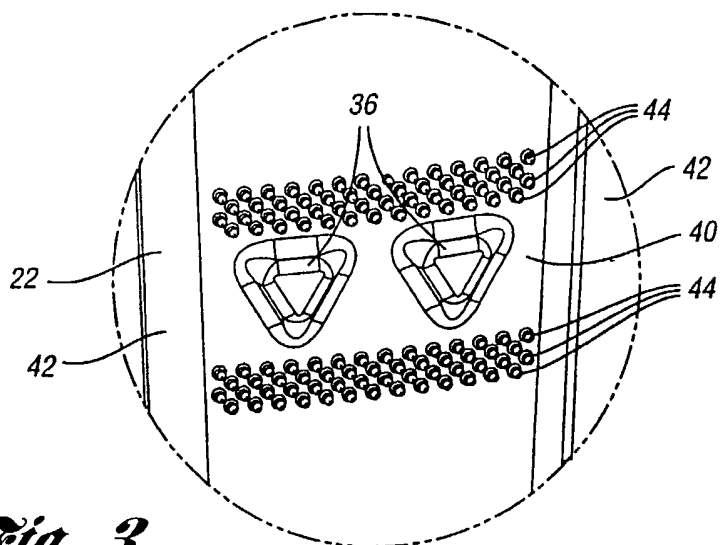


Fig. 3

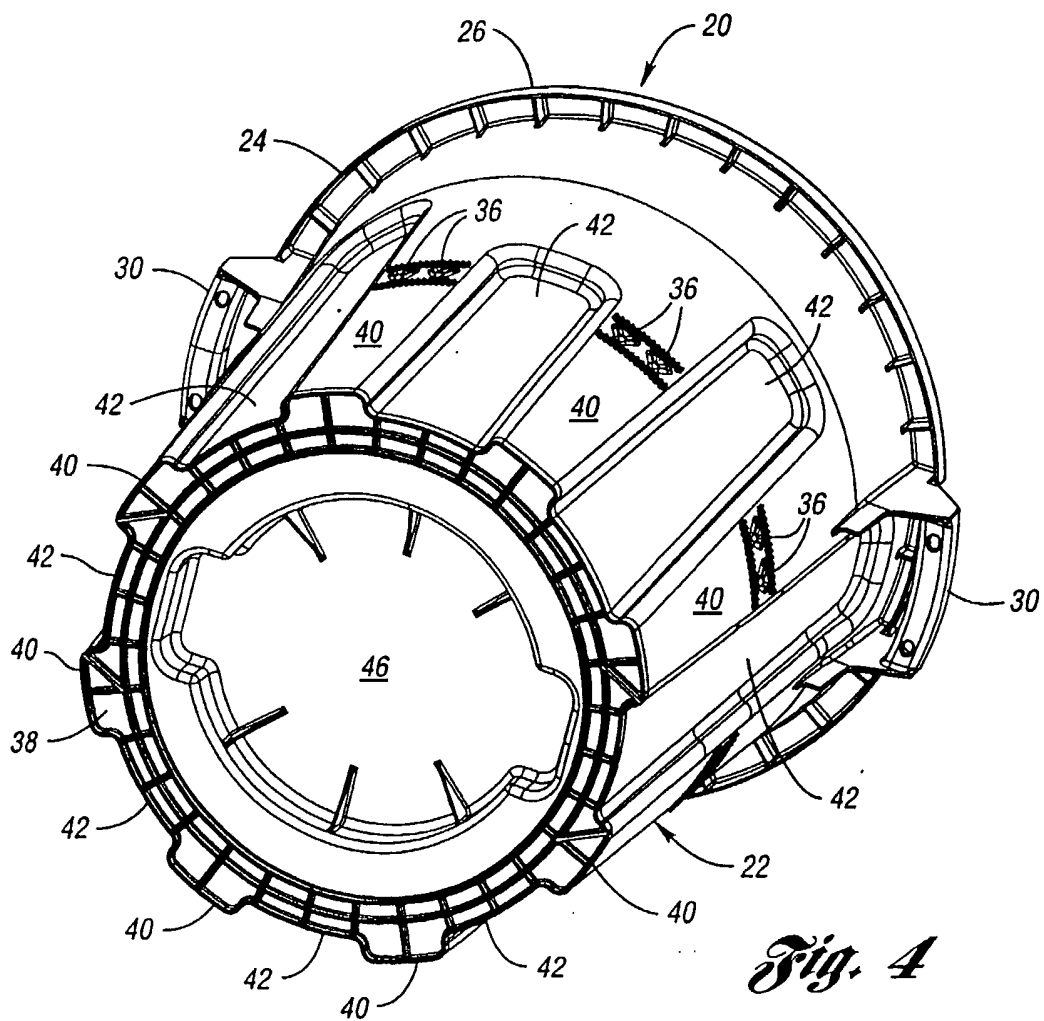
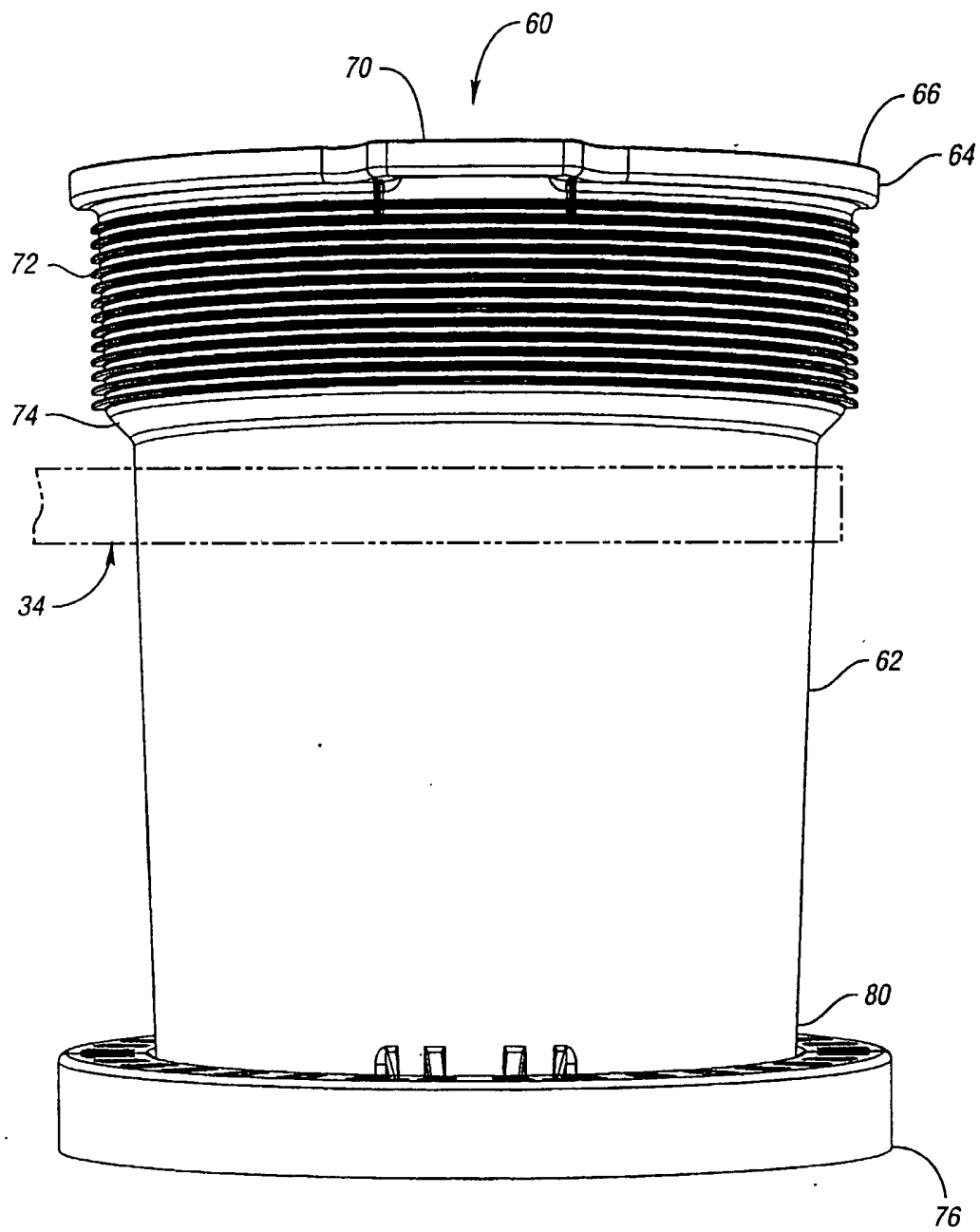
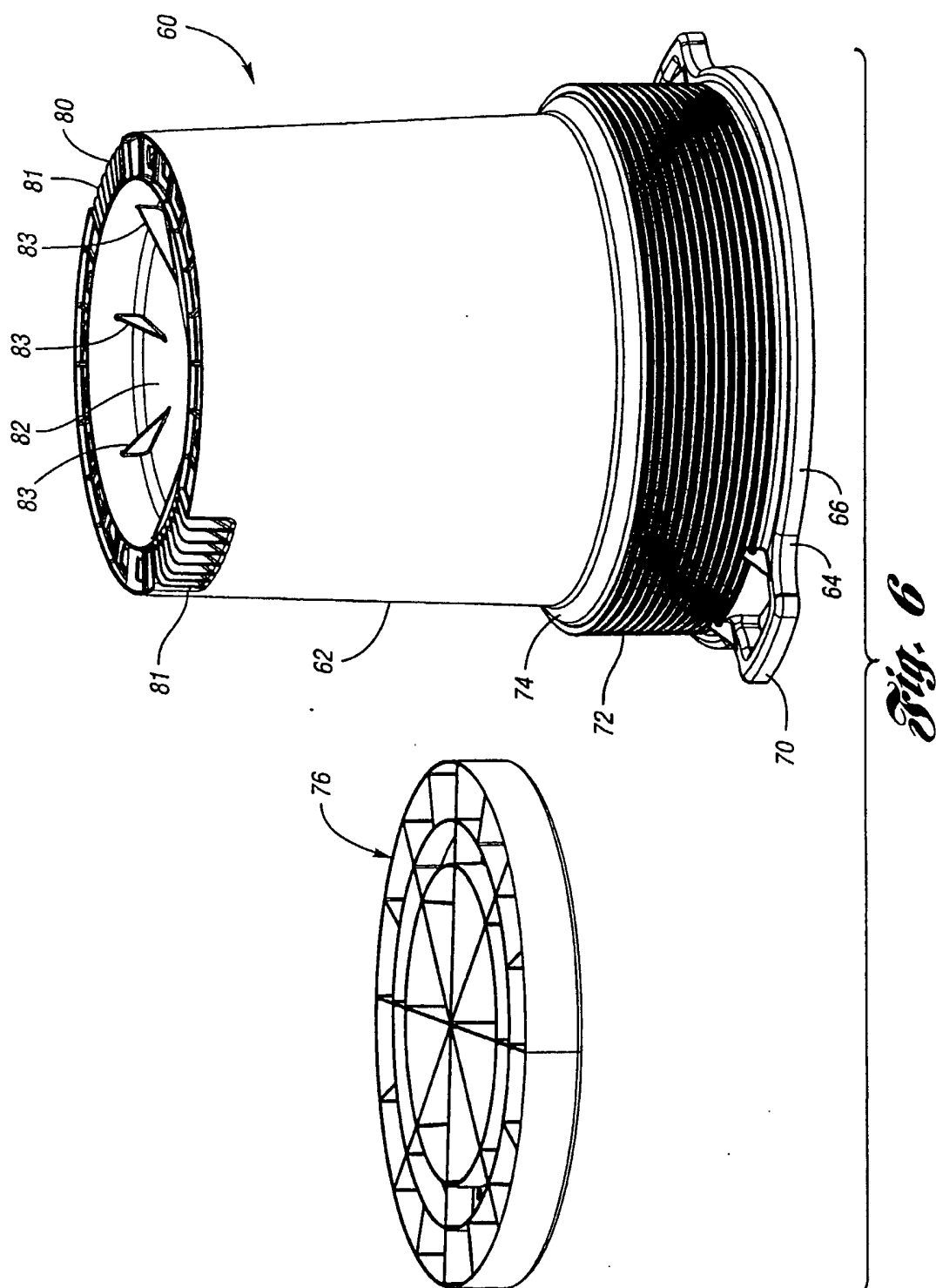


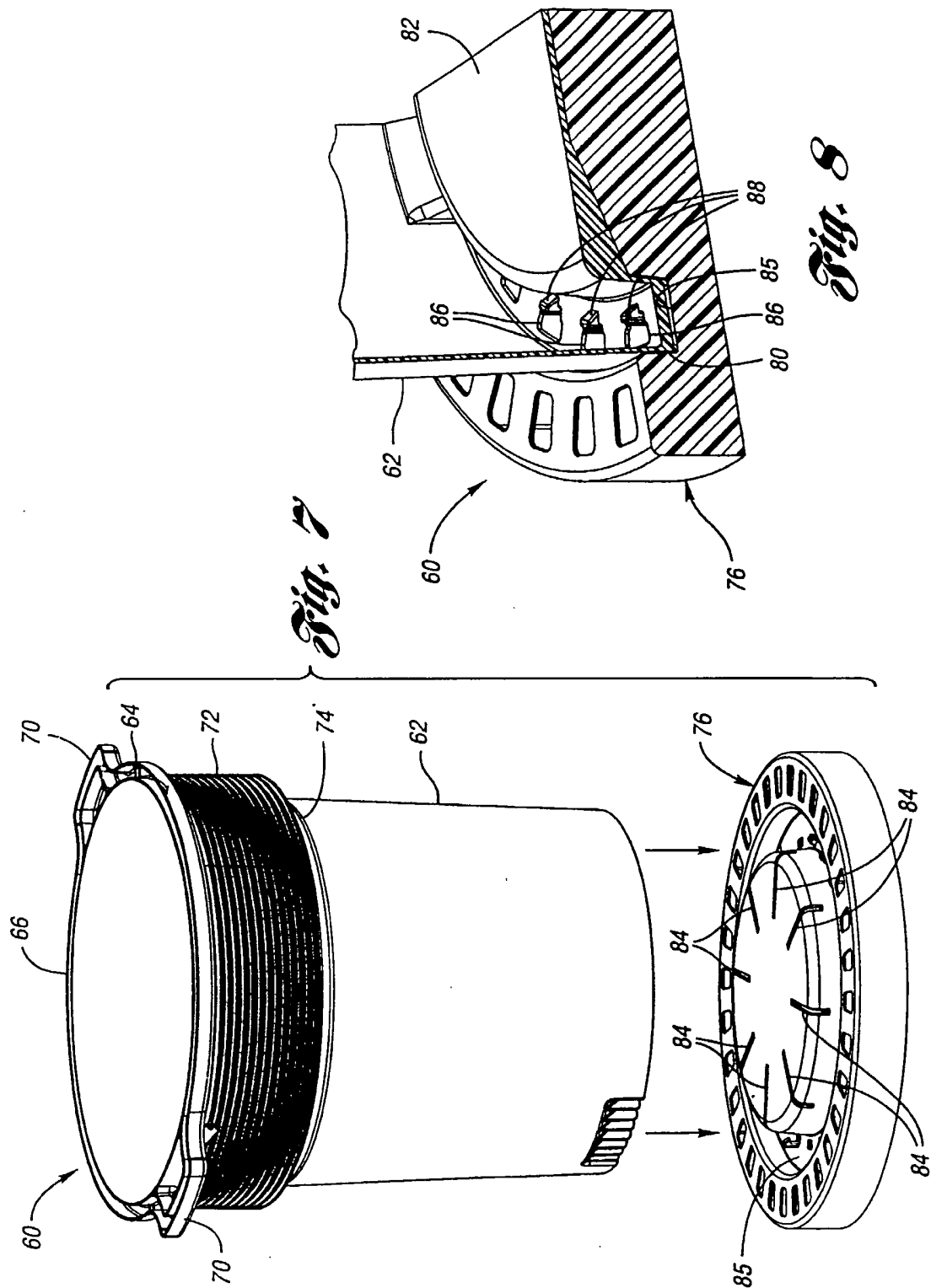
Fig. 4

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*Fig. 5*

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/27920

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B65F1/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B65F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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INTERNATIONAL SEARCH REPORT

International Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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