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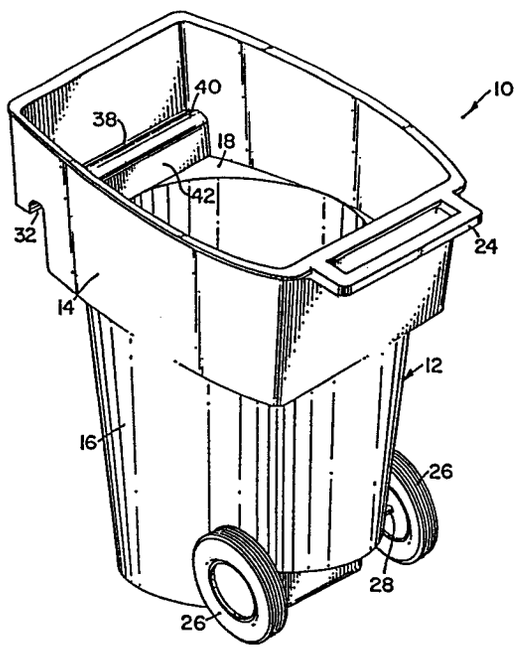
(54) Rectangular/cylindrical container.

(57) A refuse container is disclosed. The refuse container includes a housing (12) having an upper portion (14) with a generally rectangular cross-section and a lower portion (16) with a generally cylindrical cross-section. The upper portion (14) has a generally larger cross-section than the lower portion (16) so as to form a horizontally extending flange portion (18) generally about the circumference of the housing (12). The housing (12) includes a cover (20). The upper portion (14) includes a horizontally projecting portion (34) generally along the front side thereof, the horizontally projecting portion (34) defining a generally downwardly opening channel (32). The channel (32) providing a lift cavity whereby the container may be lifted by a mechanized lift arm. Furthermore, the cylindrical lower portion (16) enables the container to be lifted by engaging the side walls thereof.



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RECTANGULAR/CYLINDRICAL CONTAINER

Background of the Invention

The present invention relates to a refuse container. More particularly, the present invention relates to a refuse container having a cylindrical lower portion and a generally rectangular upper portion, the configuration of the refuse container enabling the container to be lifted and emptied by various mechanized methods.

Currently, there are various types of refuse containers available on the market. However, most of these refuse containers are rather bulky and not very portable.

Those refuse containers which are portable, typically must be manually unloaded. Various containers having a cylindrical configuration are adaptable to mechanized unloading methods. In these methods, typically two lift arms or mechanical grippers having arcuately shaped engagement pads, are forced together so as to clamp or grip the container therebetween. The lift arms are then raised and the container emptied.

Unfortunately, many refuse trucks do not have this type of unloading mechanism. Additionally, many containers are not properly configured for this type of mechanized unloading, whereby the lift arms may cause damage to the container or be damaged themselves if a properly sized and configured container is not utilized.

The most popular unloading method is the semi-mechanized "lift bar" method wherein a lift bar is utilized to engage a lift cavity of the container and thereby unload the container. However, this semi-mechanized method requires additional personnel to position the container on the lift bar. Futhermore, these containers are not typically configured for use with mechanical grippers.

In addition, many so called portable containers must be manually lifted or dragged to the garbage pick-up

site. Often, this is difficult to accomplish due to the relatively heavy weight of the container.

In addition, many refuse containers are relatively expensive, thereby prohibiting the mass marketing of the containers to individual residential households. Furthermore, many of these containers are not aesthetically pleasing so as to find widespread use in residential neighborhoods.

The present invention solves these and many other problems associated with currently available refuse containers.

Summary of the Invention

The present invention relates to a refuse container including a housing defining a recepticle for receipt of refuse, the housing including an upper portion having a generally rectangular cross section and a lower portion having a generally annular cross section. The upper portion has a larger cross section than the lower portion such that a hortizontally projecting flange is defined generally about at least a portion of the circumference of the container at the intersection of the upper and lower portions. A pair of wheels are mounted at the ends of an axle retained by the lower portion of the housing so as to enable the container to be rolled from one location to another. The container further includes a horizontally extending, downwardly opening, relatively straight channel proximate one side of the container, the channel providing a lift cavity for engagement by a lift apparatus of a refuse truck or the like.

The present invention is particularly advantageous in that it provides a portable refuse container ideal for residential use. In addition the present invention may be utilized with manual, semi-mechanized, and fully mechanized lift apparatus. Accordingly, the present invention may be utilized with existing garbage trucks, thereby enabling a community or particular company to gradually switch over from manual or semi-mechanized methods to fully mechanized

methods.

Furthermore, the present apparatus is relatively inexpensive to manufacture and has a long useful life.

In one embodiment of the present invention, the housing of the container is made from an industrial grade polyethylene by a plastic molding process. This provides for a very rugged container and one which will withstand the elements.

The present invention is readily adaptable to individual family use wherein it has a reduced capacity to aid in portability and also to commercial or group use wherein it has a larger capacity.

These and various other advantages and features of novelty which characterize the invention are pointed out with particularity in the claims annexed hereto and forming a part hereof. However, for a better understanding of the invention, its advantages, and objects attained by its use, reference should be had to the drawings which form a further part hereof, and to the accompanying descriptive matter, in which there is illustrated and described a preferred embodiment of the invention.

Brief Description of the Drawings

In the drawings, in which like reference numerals and letter indicate corresponding parts throughout the several views,

FIGURE 1 is a prespective view of a preferred embodiment of the present invention with the cover portion removed;

FIGURE 2 is a top plan view of the embodiment shown in FIGURE 1;

FIGURE 3 is a side elevational view of the embodiment shown in FIGURE 1;

FIGURE 4 is a bottom plan view of the emobodiment shown in FIGURE 1;

FIGURE 5 is a front side elevational view of the embodiment shown in FIGURE 1;

FIGURE 6 is a back side elevational view of the embodiment shown in FIGURE 1;

FIGURE 7 is a partial enlarged sectional view generally along the line 7-7 in FIGURE 6;

FIGURE 8 is a view similar to FIGURE 1 of an alternate embodiment; and

FIGURE 9 is a view similar to FIGURE 1 of yet another embodiment.

Detailed Description of a Preferred Embodiment

Referring now to the drawings, there is shown in FIGS. 1 through 7 a preferred embodiment of the present invention generally referred to by the reference numeral 10. As is illustrated, the preferred embodiment of the present invention includes a housing 12 having an upper portion 14 with a generally rectangular cross section, and a lower portion 16 with a generally circular cross section. Accordingly, the lower portion 16 may be gripped from varying angles by mechanized gripper apparatus which are commonly used in fully mechanized methods. In the preferred embodiment, the upper portion 14 has a larger cross section than the lower portion 16 so as to form a horizontally projecting flange portion 18 generally about at least a portion of the circumference of the housing 12 at the intersection of the upper and lower portions 14, 16. The flange portion 18 aids in preventing the container from slipping out of the grasp of the mechanized gripper apparatus. Furthermore, the preferred embodiment includes a cover 20, which may be of varying configurations, hingedly attached at 22 to the top of the upper portion 14. A handle 24, which also may be of varying configurations, is further suitably attached to the top portion of the container. In addition, a pair of wheels 26 are mounted at the ends of an axle 28 retained in a cavity or channel 30 defined in the lower portion 16 of the

housing 12. The wheel assembly enables the container to be readily wheeled from one location to another.

The upper portion 14 includes proximate the front side of the container, a horizontally extending, downwardly opening channel or cavity 32 defined by a horizontally projecting portion 34 of the upper portion 14. The channel 32 provides a lift cavity for engagement by a lift bar apparatus of a garbage truck or the like such that the container may be emptied by a semi-mechanized or mechanized lift apparatus using a lift bar apparatus.

More particularly, as illustrated in FIGS. 1 through 6, the lower portion 16 of the preferred embodiment has a generally truncated, inverted conical configuration with curvilinear side walls generally diverging outwardly from the bottom to the top. Similarly, the side walls of the upper portion 14 also diverge generally outwardly. Accordingly, the downwardly opening channel 32 overhangs the front side wall portion of the lower portion 16 such that there is unobstructed access to the channel 32 from the outside of the container and such that the channel 32 does not interfere with the unloading of garbage or the like on the inside of the container. The outwardly projecting portion 34 defines a lip portion 38 which provides one of the generally downwardly projecting walls of the channel 32. The lip portion 38 functions to retain the mechanized lift apparatus in the channel 32 during the unloading process.

It will be appreciated that although the side walls diverge generally outward in the preferred embodiment to facilitate nesting or stacking of the containers during shipment and also not interfere with the garbage during the unloading process; and although the upper portion 14 is larger than the lower portion 16, the side walls might also be relatively straight.

The channel 32 has a curvilinear upper portion 40 with generally straight side wall portions 42 and 44, the inside side wall 42 generally being in alignment with the

side wall of the rectangular upper portion 14 and the lower portion 16 directly therebelow. Preferably the channel 32 will have a depth at least the diameter of the lift bar of the lift apparatus to assure that the lift bar does not slip out of the channel 32 during the lifting process. It will be appreciated that the lip portion 38 might extend further downward so as to provide the channel 32 with even greater depth. In the preferred embodiment, the channel 32 extends generally parallel to the side wall of the rectangular upper portion 14. Furthermore, the channel 32 preferably extends substantially the entire width of the front side of the housing 12 to increase the stability of the container on the lift bar. However, the channel 32 might extend across only a portion of the front side, which for example would be the case if the outwardly projecting portion 34 did not extend along the entire width of the front side.

Additionally, it will be appreciated that the channel or cavity 32 might be formed by attaching a bracket apparatus to the side of the container whereby the bracket in cooperation with the container would form the channel 32.

As previously mentioned, and as illustrated in FIGS. 3 through 6, hingedly attached at 22 is the cover 20 providing for ready access to the container. In addition, the handle 24 is suitably attached to the top of the container such that the container may be readily pivoted about the axle 28 and wheeled from one location to another. It will be appreciated that the container of the present invention may be used with or without a handle and/or wheels as generally illustrated in FIG. 8. This will typically be the case in commercial applications where the container will be of relatively large size. Also, as illustrated in FIG. 8, the container in certain applications might only include a retangular portion 14' and no cylindrical portion 16.

Illustrated in FIG. 9 is yet another embodiment of the present invention which is made by a structural foam molding process to form a one piece integral container. As illustrated, the structural foam molding process enables the

corners to be squared off as compared to the radiused corners of the blow molding process as illustrated in the other embodiments.

As illustrated in FIGS. 1 through 6, and more particularly in FIG. 7, the axle 28 is slideably retained within the cavity 30 near the bottom of the container. The cavity 30 is formed by an arcuate, concave portion 48 interconnecting a horizontal wall 50 and a vertical wall portion 52 of the lower portion 16. As illustrated the vertical wall portion 52 includes a wall portion 52a extending directly below the axle 28 and a wall portion 52b offset inwardly from the wall 52a, the walls 52a, b being interconnected by an oblique, slanted wall portion 52c. This is a preferred wall configuration as it facilitates nesting of the containers during shipment. When nested, the wall 52b of an inside container nests inside the wall 52a of the outside container. In one application the wall 52a has a length approximately one-third that of the walls 52a, b combined, the inside wall 52b being offset by approximately one -half inch. The preferred embodiment includes a bracket 33 near a midportion of the cavity which assists in retaining the axle 28 in the cavity 30. The horizontal and vertical walls 50, 52a, b, c form an indentation in the lower portion 16 across the back side of the container thereby enabling the container to be pivoted about the horizontally extending axle 28 such that the bottom back side of the lower portion 16 does not engage the surface of the ground so as to interfere with such pivotal motion. As further illustrated in the drawings, the preferred embodiment of the present invention has a bottom wall 21 which is slightly radiussed or concave to provide for a more ruggedized structure. In the preferred embodiment, the bottom wall 21 is displaced near a center portion thereof from the horizontal plane extending through the edges of the bottom wall 21 by roughly the thickness of the bottom wall 21. Preferably the wall thicknesses of the present invention are 1/4" to 3/8".

The housing 12 of the preferred embodiment is made as a one piece, integral unit by a blow molding process. This reduces costs and enables relatively quick assembly and manufacture. Furthermore, the container is made from an industrial grade polyethylene material which has good weathering properties. Additionally, the present invention might also be made by a rotational molding process or a structural foam molding process or other suitable plastic molding processes.

It will be appreciated that while rotational molding is probably the least costly to initiate, the blow molding and structural foam molding processes are less labor intensive and therefore save in daily operational costs. Of course, the container might also be made of other materials such as metal or the like.

Typically, the containers might be sent to customers in a nested configuration without the axle 28, the cover 20, and/or the handle 24 attached. The customer will then assemble the containers after receipt thereof.

As previously indicated, the present invention provides a portable refuse container which is easily wheeled from one location to another and which enables use with various types of manual, semi-mechanized, and mechanized lift apparatus. Additionally, the container may be dimensional to readily fit through fence gates, doors, etc. thereby being readily adaptable for residential use. For example; in residential use the continer might have a ninety gallon capacity and in commercial or multiple family residential use it might have a three hundred gallon capacity. Furthermore, the present invention is relatively inexpensive to manufacture and lends itself to both residential and commercial use.

It is to be understood, however, that even though numerous advantages and characteristics of the invention have been set forth in the foregoing description, together with details of the structure and function of the invention,

the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size and arrangement of parts within the principal of the invention, to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

WHAT IS CLAIMED IS:

1. A refuse container, comprising:

(a) a housing defining a recepticle for refuse, the housing including an upper portion having a generally rectangular cross section and a lower portion having a generally annular cross section, the upper portion having a generally larger cross section than said lower portion, a horizontally projecting flange being defined generally about at least a portion of the circumference of the container at the intersection of said upper and lower portions;

(b) a pair of wheels mounted at the ends of an axle, said axle suitably secured to said lower portion of the housing, said wheels enabling the container to be rolled from one location to another; and,

(c) a horizontally extending, downwardly opening, relatively straight channel positioned proximate one side of the container, said channel providing a lift cavity for engagement by a lift apparatus of a garbage truck or the like.

2. A refuse container in accordance with claim 1, wherein said channel includes first and second sides and an arcuate portion interconnecting said first and second sides, said first side being spaced inwardly from said second side, said first side being spaced generally further outwardly than the side wall portions of said lower portion directly below said first side so as to provide an unobstructed entrance into said channel.

3. A refuse container in accordance with claim 1, wherein said upper and lower portions are generally tapered outwardly from the bottom to the top.

4. A refuse container in accordance with claim 1, wherein said axle is retained in an arcuate channel defining

an opening of less diameter than said axle, along a major portion thereof the walls of said channel engaging said axle to retain the same in position.

5. A refuse container in accordance with claim 1, wherein the container upper and lower portions are made as a one-piece, integral unit by a molding process.

6. A refuse container, comprising:

(a) a housing defining a receptacle for refuse, said housing including an upper portion and a lower portion, said upper portion having a larger horizontal cross section than said lower portion, said lower portion having arcuately configured walls about at least a portion thereof, a horizontally extending flange portion being defined about at least a portion of the circumference of the container on the outside of the container at the junction of the upper and lower portions; and

(b) a horizontally extending, downwardly opening, relatively straight channel extending proximate at least a portion of one side of the container, said downwardly opening channel including first and second sides interconnected by an arcuate portion, the arcuate portion being displaced outwardly from the walls of the lower portion directly below, to provide an unobstructed entrance into said channel, said downwardly opening channel adapted for receipt of a lift apparatus whereby the container may be lifted either by a lift apparatus engaging said downwardly opening channel or by a lift apparatus clamping onto the lower portion.

7. A refuse container in accordance with claim 6, wherein said upper and lower portions are formed as a integal unit by a molding process.

8. A refuse container in accordance with claim 6, wherein said axle channel is positioned at the junction of a relatively horizontal wall and a relatively vertical wall of the lower portion, said horizontal and vertical walls being interconnected by an arcuate portion defining said axle channel.

9. A refuse container, comprising a housing defining a receptacle for refuse, the housing including an upper portion and a lower portion, said upper portion defining a lift cavity, said lower portion including an arcuately shaped outer wall portion adapted for being gripped by a gripping device.

10. A refuse container in accordance with claim 9, said container further including a horizontally extending member projecting outwardly from the outer wall of said container.

11. A refuse container in accordance with claim 10, wherein said horizontally projecting member is positioned at the intersection of said upper and lower portions and forms a flanged portion about a major portion of the circumference of the container.

12. A refuse container in accordance with claim 9, wherein said upper portion has a larger horizontal cross section than said lower portion.

13. A refuse container in accordance with claim 12, wherein the outer walls of said upper and lower portions diverge generally outwardly from the bottom to the top.

14. A refuse container in accordance with claim 9, wherein said housing is made from a plastic material as an integral one-piece unit.

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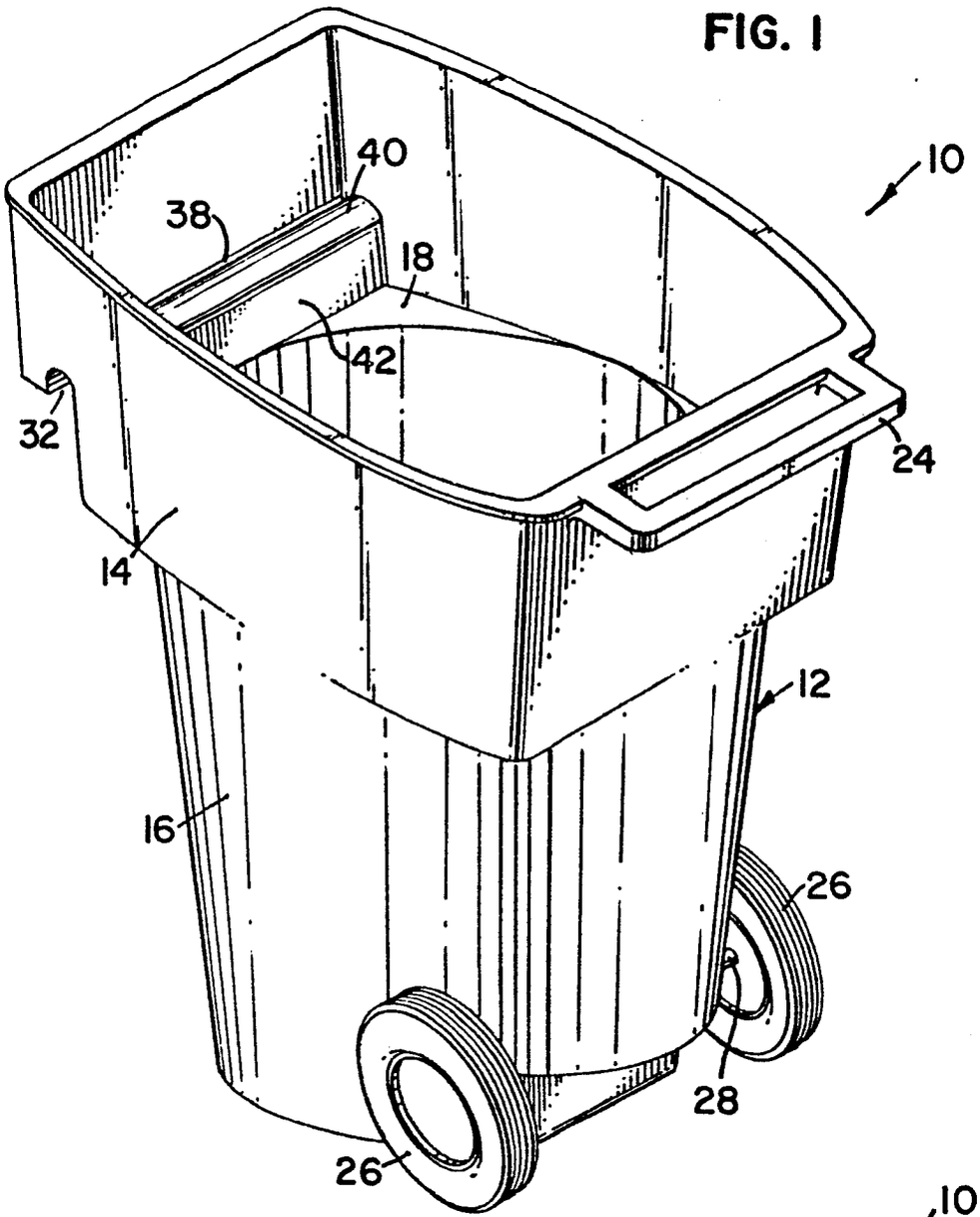
FIG. 1



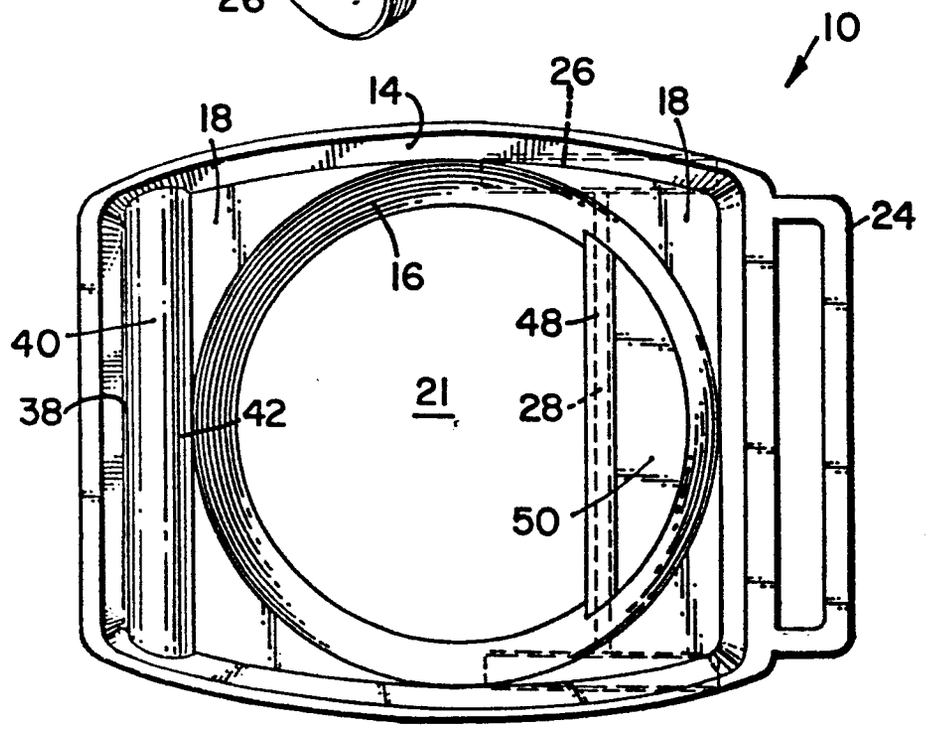


FIG. 2

FIG. 3

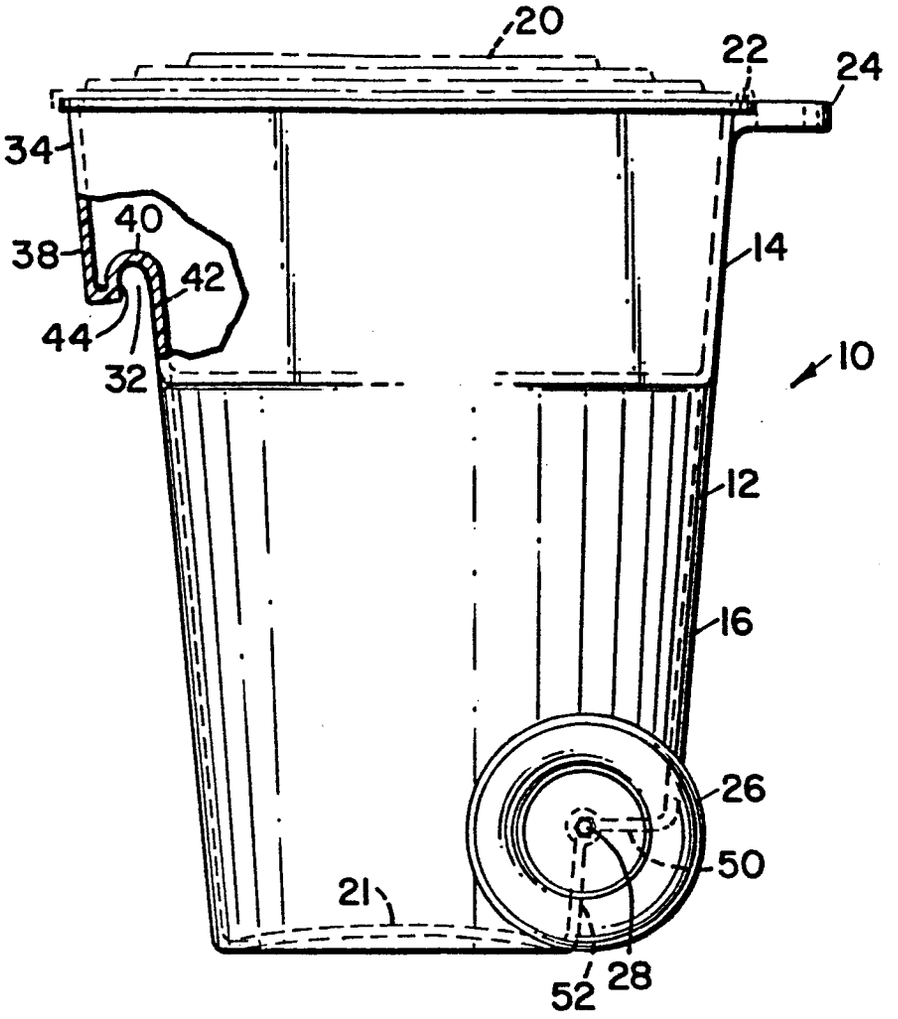

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FIG. 4

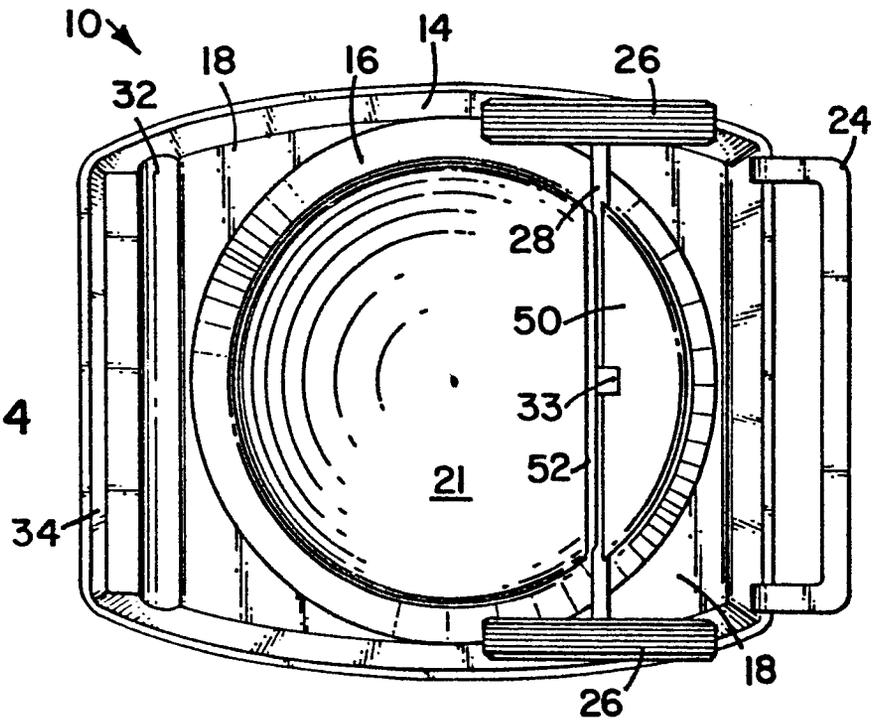
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FIG. 5

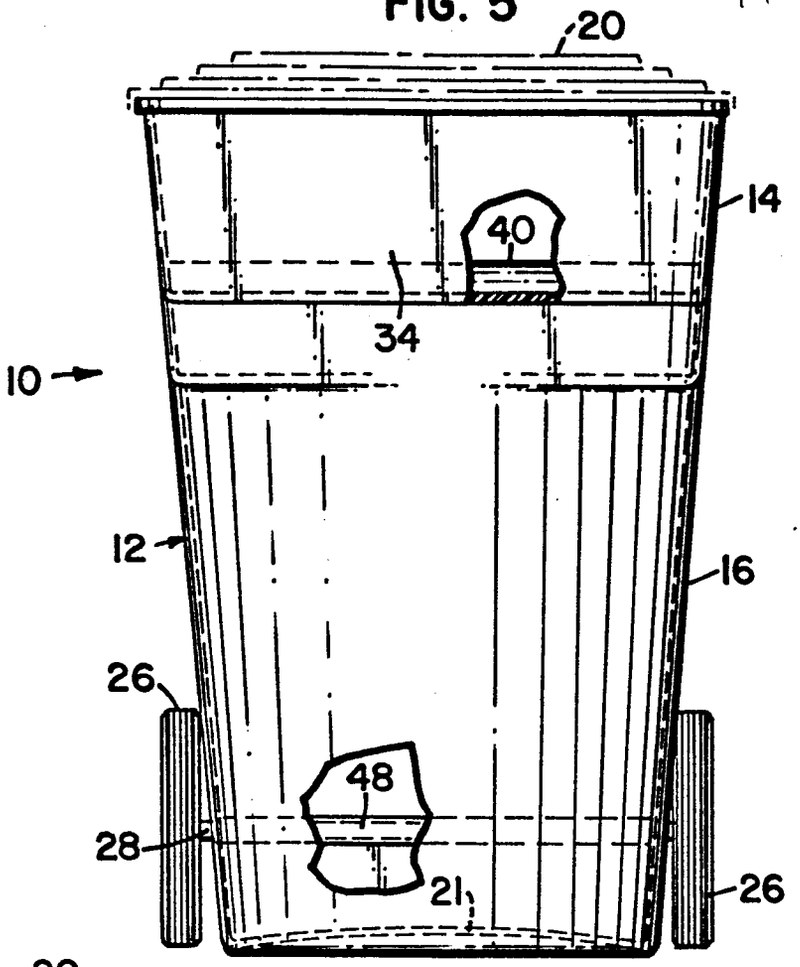
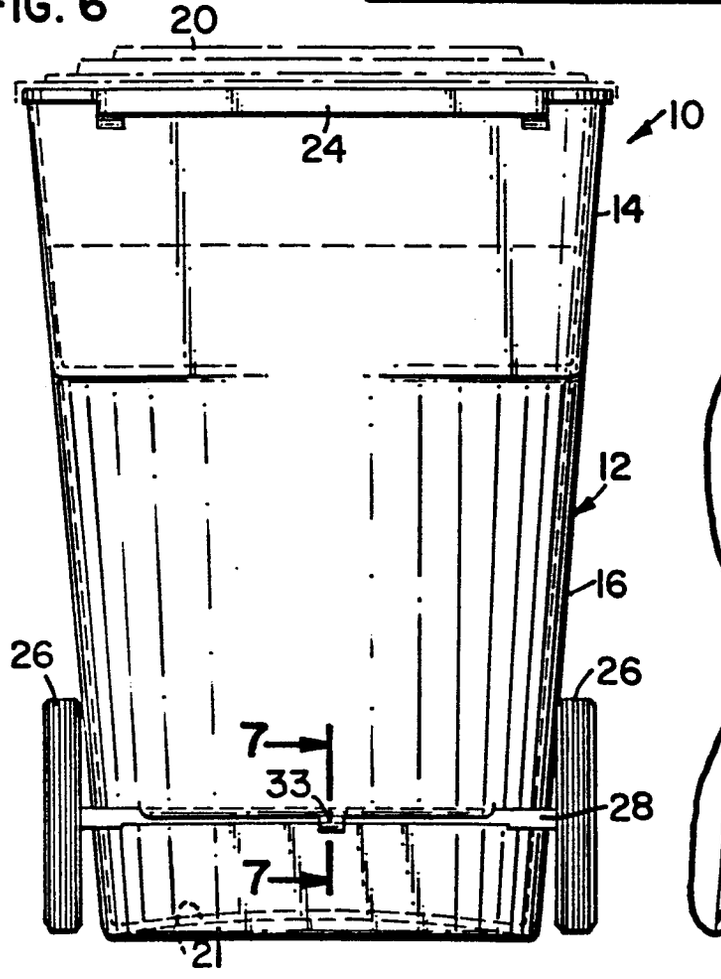


FIG. 6



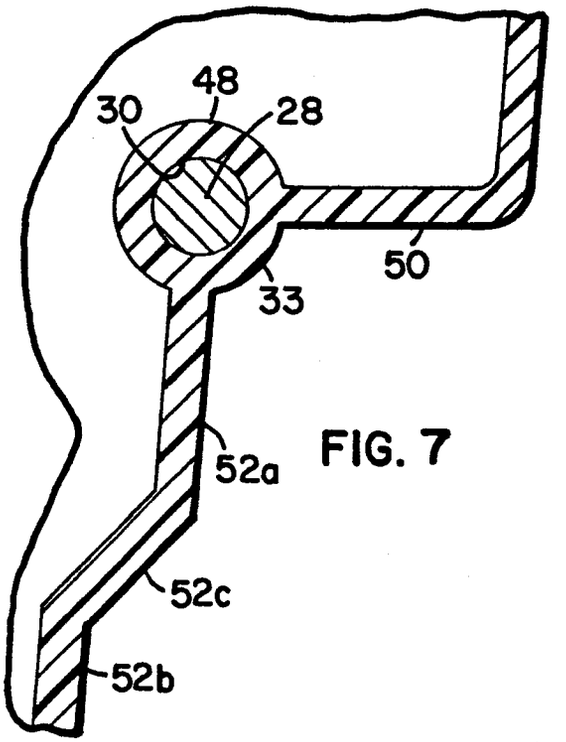


FIG. 7

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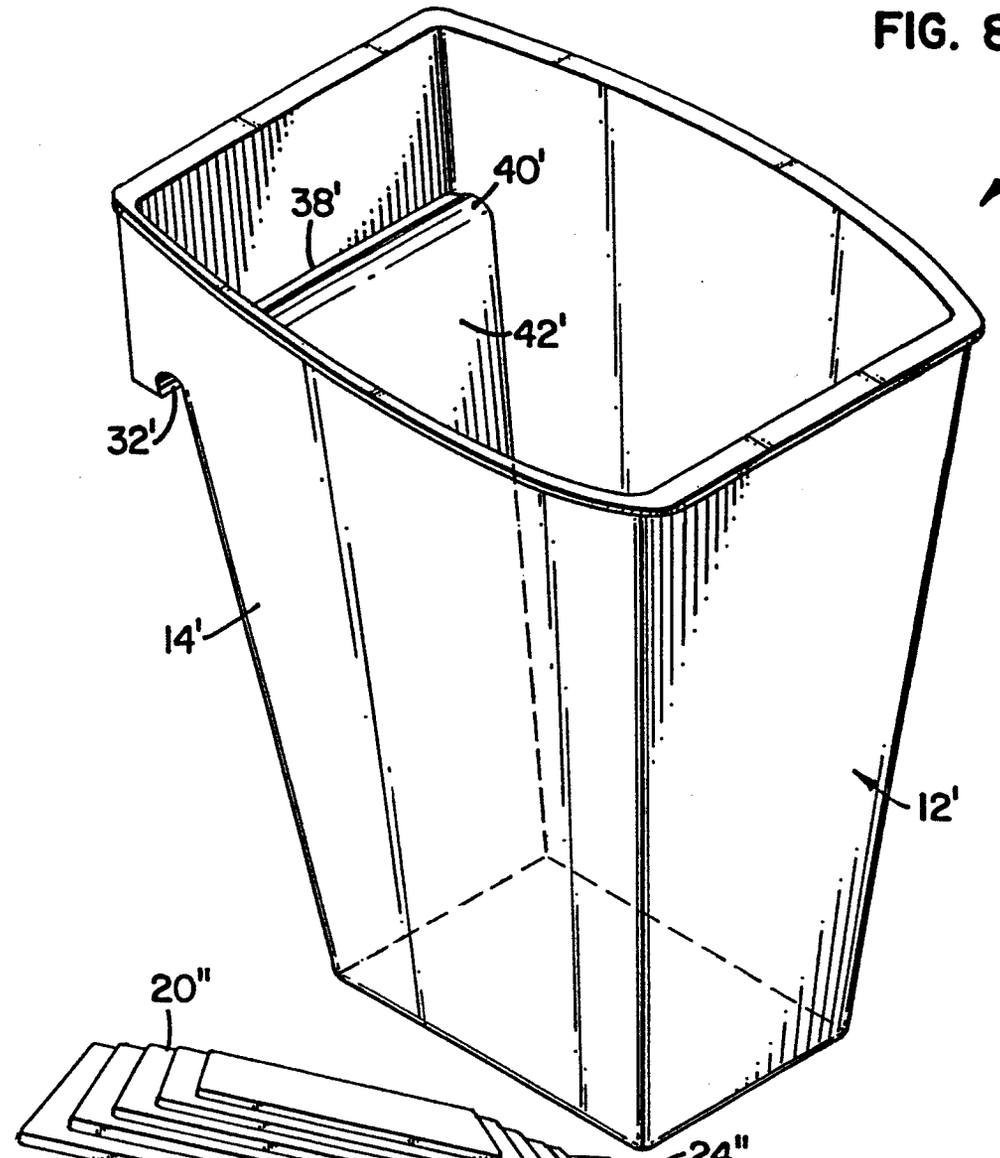
FIG. 8



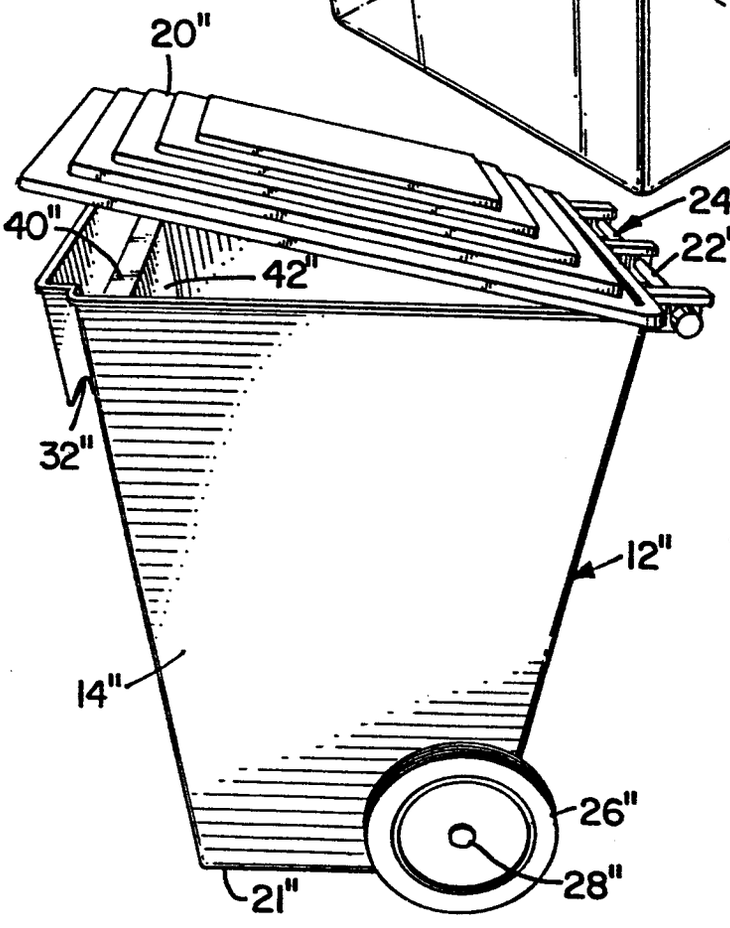


FIG. 9