

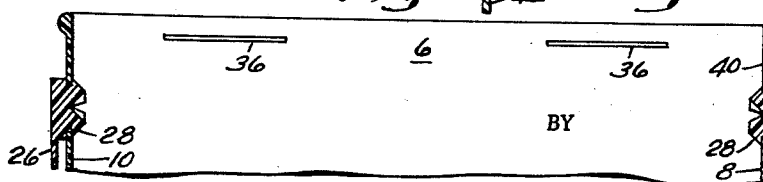
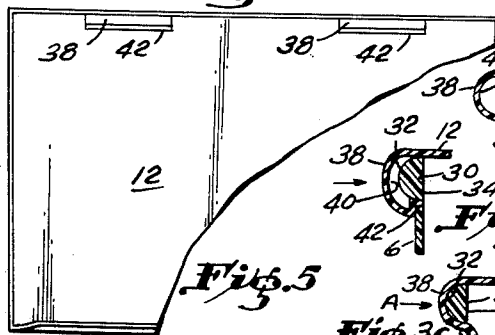
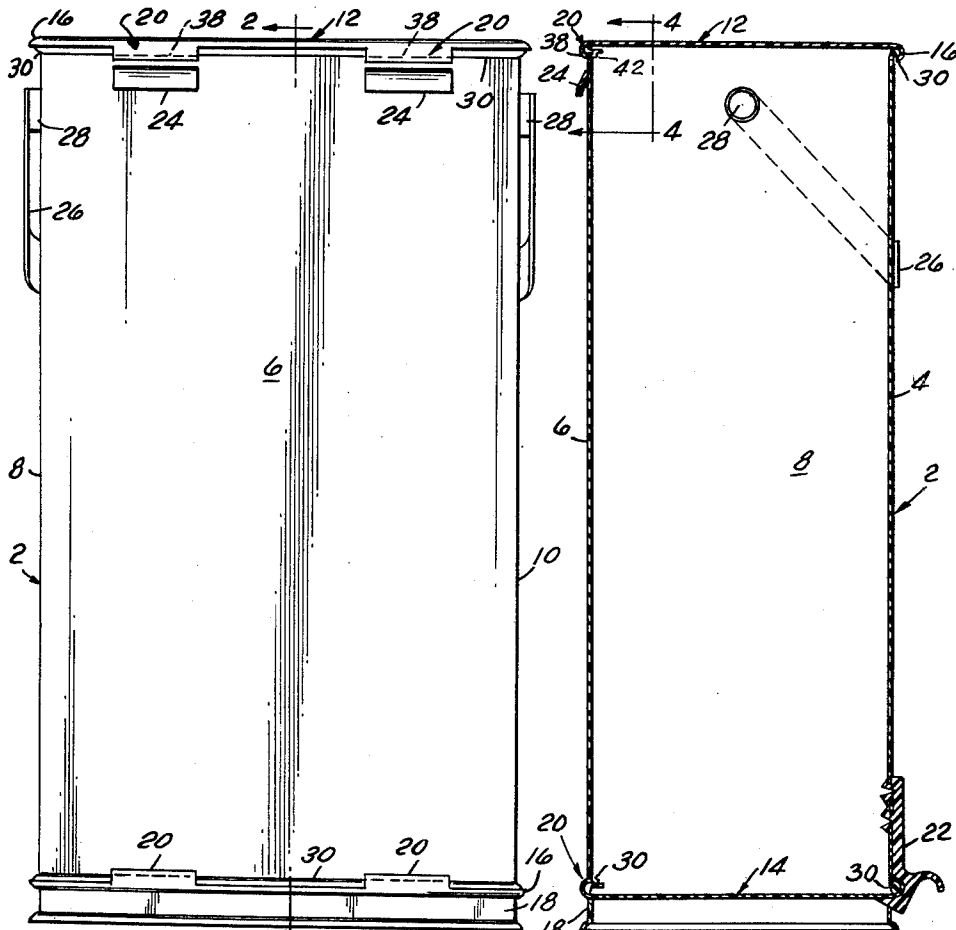
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END STRUCTURE AND HINGE FOR PLASTIC CONTAINERS

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END STRUCTURE AND HINGE FOR PLASTIC CONTAINERS

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This invention relates to end structure and closure mountings for containers and, more particularly, to a combined reinforcing bead and hinge pintle, and a closure hinged thereon.

Although the invention has general application to many sorts of containers having hinged closures at one end or the other, or at both ends, the environment of the concept is in tubular wall refuse cans having pivoted closures for its top and bottom ends, it being contemplated that the wall and end closures be formed of relatively thin and somewhat flexible material such as polyvinyl resin and that the other elements, such as the catch, handle and handle mountings be formed of polyvinyl resin or the like plastic with sufficient elasticity so that they may be distorted for purposes of assembly, but which will resume their original shapes so as to hold themselves in place. The primary objects of the invention are to provide for the reinforcement or stiffening of the wall of the container at its ends and to provide for very simple mountings for the end closures, the intended end results being a sturdy container which can be constructed with the minimum of material and elements, and which can be quickly assembled with unskilled labor.

These and other objects will be apparent from the following specification and drawings, in which:

FIG. 1 is a rear elevation of a bottom opening refuse can embodying the invention;

FIG. 2 is a vertical cross-section along the line 2—2 of FIG. 1, looking in the direction of the arrows;

FIG. 3 is a fragmentary cross-section illustrating the hinge action when a closure, such as the top of the container, is pivoted open;

FIG. 3A is a view similar to FIG. 3, but illustrating the hinge immediately before being forced into place;

FIG. 3B shows the second step in forcing the hinge into place;

FIG. 3C shows the final push, just before the hinge snaps into place;

FIG. 4 is a broken off view approximately on the line 4—4 of FIG. 2 illustrating the hinge slots in the upper rear wall of the container prior to mounting of the container top; and,

FIG. 5 is a broken-off bottom plan view of the container top prior to mounting on the container.

Referring now to the drawings, in which like reference numerals denote similar elements, the refuse container 2 in which the invention is embodied has a tubular body of rectangular section with a front wall 4, rear wall 6 and opposite side walls 8 and 10 preferably formed of thin, tough plastic, such as polyvinyl resin, with sufficient stiffness to retain its shape under all normal conditions of use to which a domestic refuse container is liable to be subjected, but nevertheless being capable of elastic distortion by manual pressure for purposes of assembly. Polyvinyl resin also has a somewhat "greasy" feel, a surface characteristic which enhances its slidability. Such materials are currently used to form "squeeze bottles" for medicines and cosmetics, for food containers, and for household wastebaskets. The top and bottom 12 and 14 are of thin, tough plastic, similar to that referred to immediately above and are each formed with a peripheral lip 16, the bottom having a base band 18. Both the top and bottom are

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pivotally connected to the ends of the body by hinges 20 detailed hereinbelow. Bottom 14 is releasably fastened by a catch 22 affixed on the lower portion of front wall 4. By pulling on the catch handle forwardly, the bottom is released and it pivots open downwardly and thereby dumps the contents of the container. The details of catch 22 are described more completely in our copending application entitled Catch Mechanism filed concurrently herewith. Clips 24 are provided on rear wall 6 for hanging the container on a suitable supporting bracket, and a handle 26 is pivoted on mountings 28 to the side walls. The details of the manners in which catch 22 and handle mountings 28 are affixed to the container walls are covered in our copending application entitled Plastic Deformable Mountings filed concurrently herewith. This invention is concerned with the container end structure, consisting of a reinforcing bead 30 at each end and hinges 20. Since the critical structure and principles of operation at each end are the same, only the structure at the top of the container will be detailed.

Referring particularly to FIG. 3 bead 30, which extends completely around the outer sides of the container, has a half-round exterior 32. Assuming the container walls to be of polyvinyl, bead 30 should also be of the same material and suitably bonded or fused onto the wall material at each end. If the container walls are formed in a mold, bead 30 would also be molded as a part thereof. However formed, bead 30 is effectively integral with the container wall material which, on the inner side, behind the bead, is flat, as indicated at 34. Beneath bead 30 are slots 36.

The lip 16 of top 12 is extended at two locations to provide a pair of hook-shape hinge shells 38 which have cylindrical inner sides 40 with angle-flanges 42 along their free edges.

Each end closure, for example, the top 12, is mounted by resting it on the beaded end of the body with the free edges of the angle flanges 42 resting against the half round exterior 32 of the bead, as in FIG. 3A. Then, by forcing top 12 forwardly, the edges of angle flanges 42 are first cammed downwardly, as shown in FIG. 3B, so as to spread hinge shells 38 open until the edge of the angle flanges enter slots and then, by pushing on the exterior of hinge shell as denoted by arrow A in FIG. 3C, angle flange 42 distorts sufficiently (with the lower edges of slots 36 giving slightly also) for the angle flange to snap in through slots 36 to the final condition shown in FIG. 2. Once the hinge shells are snapped into place, considerably more force than is applied in normal usage of the container is required to back them out of slots 36.

At shown in FIG. 3, top 12 may then be pivoted open until the angle flanges 42 engage against the flat surfaces 34 to that, in the FIG. 3 condition, the angle flanges and the adjacent material of hinge shells 38 constitute resilient stops to limit the extent to which top 12 can be swung open.

Beads 30, in addition to their functionings to stiffen the ends of the container body, also constitute hinge pintles about which the cylindrical inner sides 40 of hinge shells 38 slide during opening and closing of top 12.

The invention is not limited to the refuse can environment, it being apparent that the hinge and end structure may be applicable by mere mechanical skill to many different kinds of plastic container.

I claim:

1. In a container, a body having a generally tubular side wall of thin sheet material, an outwardly convex half-round reinforcing bead integral with said body and extending along the edge at one end thereof, slot means extending through said side wall parallel to and immediately adjacent said bead on the side thereof opposite said edge, a container closure disposed across said end

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and overlying said bead, a hinge shell comprising a concavo-convex semi-cylindrical projection integral with said closure and extending beyond one edge thereof, the semi-cylindrical portion of said hinge shell slidably engaging around said bead and having a free end portion extending through said slot means, and stop means on the free end portion of said hinge shell for preventing outward withdrawal of said free end portion through the slot means, said hinge shell being of manually bendable and somewhat flexible plastic material.

2. The combination claimed in claim 1, said container side wall also being of manually bendable and somewhat springy sheet plastic material, said stop means comprising a generally right angular bend having one arm extending radially inward from said free end portion and a contiguous arm extending outwardly from said one arm in the direction away from said semi-cylindrical portion.

3. The combination claimed in claim 1, said container

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being generally rectangular in cross-section, said slot means comprising a spaced pair of axially aligned slots, there being two of said hinge shells, one for each slot.

4. The combination claimed in claim 3, said closure having a curved concavo-convex lip extending therearound and being integral continuations of ends of the semi-cylindrical projection portions of said hinge shells, said lip engaging over said bead.

References Cited in the file of this patent

UNITED STATES PATENTS

1,164,913	Bicker	Dec. 21, 1915
1,308,935	Cook	July 8, 1919
2,746,081	Gershen	May 22, 1956
3,029,855	Telford	Apr. 17, 1962

FOREIGN PATENTS

25,125	Holland	Apr. 15, 1931
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