

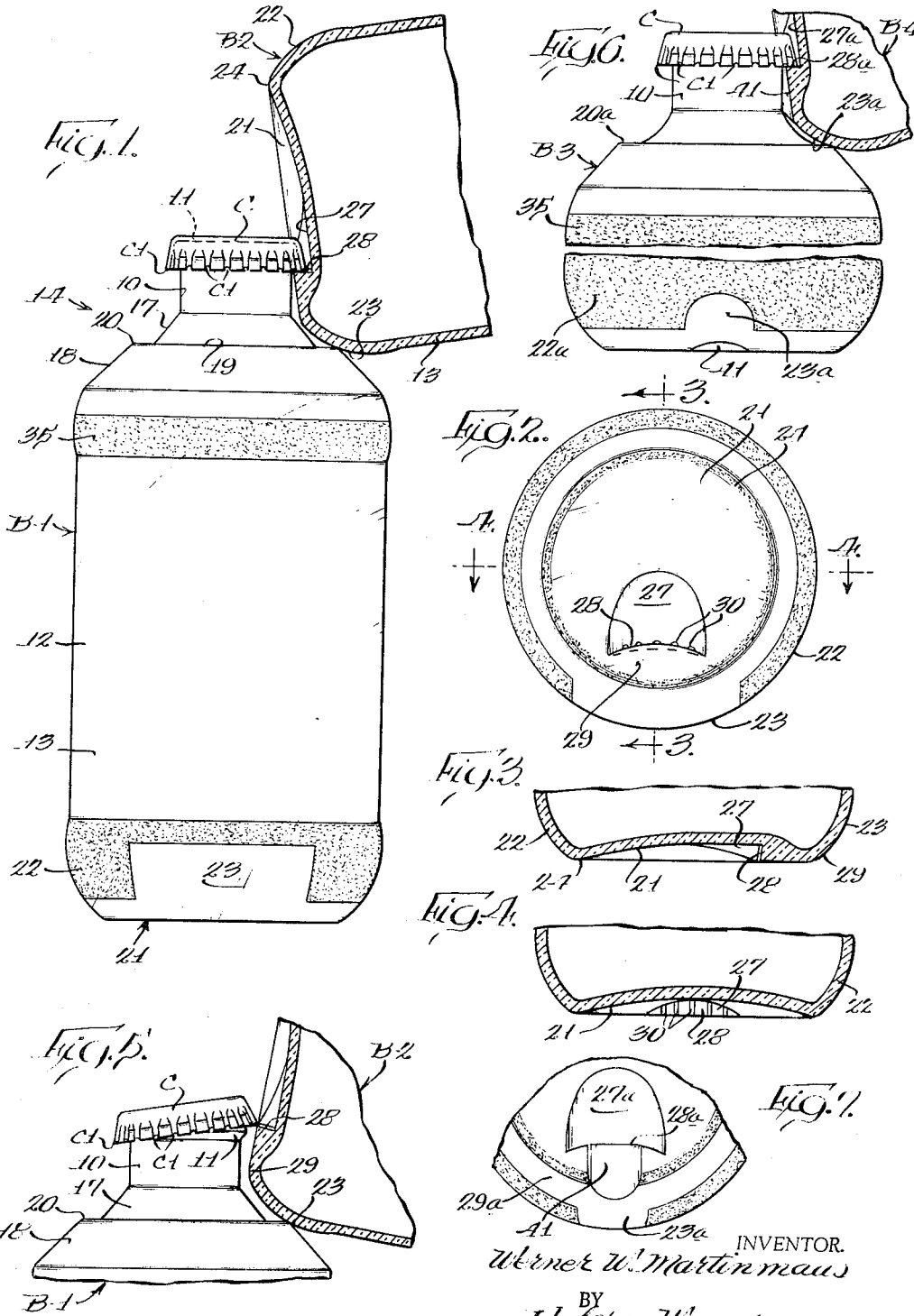
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BEVERAGE CONTAINER WITH INTEGRAL CROWN CAP REMOVER

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**3,236,126**  
**BEVERAGE CONTAINER WITH INTEGRAL**  
**CROWN CAP REMOVER**

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This invention relates to a beverage container including a built-in or integral crown cap remover for removing a crown cap from an identical or similar beverage container. More particularly, the invention relates to a container or plurality of containers having an integral improved camming system for crown cap removal. It constitutes an improvement upon the structure of my Patent 2,992,574.

In accordance with the present invention, a beverage container is provided with a bearing surface in the form of a fulcrum which is spaced a sufficient distance below the edge of a crown cap on the container to permit a cap engaging device, including a cap engaging face, integral with and recessed in the bottom face of an identical second container, to be engaged with the crown cap for removal of the crown cap. The identical second container includes a cap engaging face and a cooperating bearing surface adjacent the cap engaging face so that the second container can be used as a lever with the cap engaging face engaging a crown cap on the first container and with the cooperating bearing surface disposed upon the fulcrum surface of the first container to pry the crown cap from the first container in an upward and outward direction.

During the lever or prying action, the cap engaging face moves through a path which does not cause application of the prying or lever force to or across the neck of the bottle. The lever action is an upward action transmitting all lever force directly to the bottle cap in the upward and outward direction for effective cap removal, advantageously without application of equal downward force on any portion of the crown cap.

Features of the preferred container of the present invention include the provision of a slight undercut of the cap engaging face, the provision of smooth bearing and fulcrum surfaces which are slidable over each other during the container opening procedure, and a shoulder configuration defining a fulcrum surface. Forms of the preferred container may include gripper means on the cap engaging face to interengage the cap crimps, or a neck receiving groove adjacent the cap engaging face for effectively extending the cap engaging face circumferentially, or both. Other features of the invention will be apparent from the following description of two alternative embodiments illustrated in the drawings, in which:

FIGURE 1 illustrates a first embodiment of the present invention with a first container B-1 illustrated in elevation and an identical container, B-2, illustrated in fragmentary section engaging a crown cap on the container B-1 preparatory to opening the first container;

FIGURE 2 is a bottom plan view of either of the containers B-1 or B-2 shown in FIGURE 1;

FIGURE 3 is a fragmentary section along line 3-3 of FIGURE 2 showing the bottom portion of the container;

FIGURE 4 is a fragmentary section along line 4-4 of FIGURE 2 showing the bottom portion of the container;

FIGURE 5 is a view of the top portion of the container B-1 and bottom portion of the container B-2 as the crown cap is being removed from the container B-1;

FIGURE 6 illustrates a second embodiment of the invention with a first modified container B-3 illustrated in

fragmentary elevation and with a second identical modified container B-4, illustrated in fragmentary section, engaging a crown cap on the container B-3; and

FIGURE 7 is a fragmentary bottom plan view of the modified container of FIGURE 6.

Turning now to FIGURES 1 through 5, each of a plurality of similar or identical containers in the form of one-piece glass bottles B-1 and B-2 is provided, as shown for bottle B-1, with a neck portion 10 that has an open upper end surrounded by a bead 11 (best seen in FIGURE 5) for receiving a crown cap C. Each bottle is a one-piece structure with an extended surface defined by the surface of a body portion 12 having a continuous side wall 13, an integral bottom wall 21, and a continuous, smoothly contoured, inwardly extending shoulder area 14 which merges the body portion with the neck portion 10; and the bottles are blow-molded in the customary way. Thus, the bottles are connate in the sense that each was originally created as a unitary, or one-piece device. As used herein the term "glass" includes a number of hard, glass-like, non-metallic materials some of which are not silicates and thus are not technically glass.

The shoulder construction and length of the bottle neck must be varied to suit the bottle to use with particular bottle filling or bottle capping equipment. For use in some types of equipment, the shoulder must be slightly lower or higher than illustrated in the drawings, and in certain instances the radius of the bearing surface at the shoulder must be slightly decreased or increased.

The shoulder area 14 is preferably defined by a two stepped, generally frusto-conical surfaces 17 and 18 and a generally planar, upward facing shelf 19 therebetween. Surface 18 merges the top of the body side wall with the outer edge of shelf 19 to define a fulcrum means at the angular juncture 20 of surfaces 18 and 19. The conical surface 18 and shelf 19 cooperate to provide a bulge at their juncture 20. The conical surface 17 merges the inner edge of surface 19 with the bottle neck 10.

The bottom wall 21 of the bottle is seen in FIGURES 3 and 4 to be concave or upwardly dished, and is integrally merged with the side wall 13 through its rim 24 and through a curved stippled surface 22 that forms a slight external bulge. A smooth area 23 in the stippled surface 22 defines a bearing face in said surface. The annular bottom rim 24 may be stippled or roughened to conceal scratching or marring of the bottom wall in the event it slides on a rough surface.

Recess 27 in the bottom wall 21 defines a cap receiver that extends from approximately the center of bottom wall 21 radially to terminate in an arcuate wall that forms a cap engaging face 28 which is convex with reference to the center of bottom wall 21. As best seen in FIGURE 3, the cap engaging face 28 is slightly undercut, e.g. about 1°, from a plane parallel to the longitudinal axis of the bottle so that it extends lengthwise of the bottle and angles slightly upwardly and outwardly relative to the bottle axis. Such undercut is preferably the maximum permitted by the blow-molding equipment used in forming the bottle and functions to provide a better engagement of the cap engaging face 28 with a crown cap during the bottle opening operation.

The fulcrum surface 20 opposes the bottom edge of a crown cap C that is crimped over the bead 11 closing the container opening, and provides a bearing surface for the bearing face 23 of a second identical container during prying of the crown cap 12 from the first container with the cap engaging face 28 of the second bottle engaging the lower edge of the crown cap C.

It will be noted that the bearing face 23 is adjacent and in spaced relationship to the cap engaging face 28 near

the bottom rim 24 of the bottle so the lower margin of the bottle from face 28 through face 23 provides a hollow external lug portion 29. The cap engaging face 28 may also be provided with gripper means such as teeth 30 for engaging the crimped undulations C1 of the crown cap edge during the opening operation.

A second stippled bulge 35 is provided beneath the shoulder area 14, and bulges 35 and 22 defines the greatest diameter of the bottle, the stippling on these portions providing protection from impact with another bottle during handling and also preventing visible marring of the contacting surfaces of adjacent bottles during handling.

To remove the crown cap from a first bottle B-1, the bearing face 23 of a second identical bottle B-2 is positioned on fulcrum 20 of the bottle B-1, and the cap engaging face 28 of the bottle B-2 is engaged with the lower edge of a crown cap on the bottle B-1. The bottle B-2 is held in the hand as a lever by its body and is rocked downward from the position shown in FIGURE 1 to the position shown in FIGURE 5. Cap engaging face 28 lifts the edge of crown cap 12 upward and outward through a curved or arcuate path, prying crown cap 12 from bead 11 of bottle B-1.

The spacing of cap engaging face 28 from bearing face 23 and the spacing of fulcrum 20 from bead 11, or more correctly from the lower edge of cap C on bead 11, should be coordinated to provide proper engagement of cap engaging face 28 with cap C of an identical bottle while bearing face 23 is resting on the fulcrum 20 of the identical bottle prior to rocking to open the identical bottle. In design, increase or decrease in spacing between cap C and fulcrum 20 requires a commensurate increase or decrease in spacing between cap engaging face 28 and bearing face 23. Also, as spacing between cap engaging face 28 and bearing face 23 is increased, the radius of the curved lower bottle surface therebetween should be increased, as has been done in the illustrated bottles, or other provision should be made to assure that the margin of the bottle base is clear of the surface 17 so as not to interfere with the opening action.

Referring now especially to FIGURES 6 and 7, a modified bottle is illustrated. As seen in FIGURE 6, two identical bottles B-3 and B-4 are provided. Each of the bottles is much like the bottles B-1 and B-2 of FIGURES 1-5 except that neck 10 is merged with shelf 19 through a generally frusto-conical surface 17a which is concavely curved, rather than extending substantially straight from neck 10 to shelf 19, like surface 17, cap receiver 27a is of a deeper configuration, the bearing surface 23a is slightly different in configuration from surface 23 and bulges outward slightly beyond the stippled surface 22a, the lug portion 29a includes a neck receiving groove 41, and the cap engaging face 28a lacks any teeth such as the teeth 30.

The neck receiving groove 41 extends from face 28a through the bottom wall rim 24a to a position adjacent the bearing surface 23a, and is of concave cylindrical configuration for receiving the outer cylindrical surface of a bottle neck 10 when bottle B-4 is in position for removing a crown cap from bottle B-3 as seen in FIGURE 6. The inclusion of the groove 41 and the additional depth of cap receiver 27a causes the bearing surface 28a to be recessed deeper into the bottom of the bottle. The neck receiving groove 41 of the bottle B-4 is seen in FIGURE 6 to curve partly around the neck 10 of the bottle B-3 when the former is used to remove a cap C from the latter, and as a result the cap engaging face 28a engages much more of the circumference of a cap than does the face 28 which lacks a neck groove. If desired, of course, a neck groove 41 may be used in conjunction with a cap engaging face having teeth 30.

The bottle opening procedure using the form of bottle of FIGURES 6 and 7 is the same as that used for the device of FIGURES 1-5 except that the neck 10 of bottle B-3 is received within the groove 41 of bottle B-4 as the cap engaging face is positioned in engagement with the

crown cap. The bottle body is then pivoted downward with surface 23a rocking on the fulcrum 20a to remove or pry the crown cap from the bottle as described above.

While the double conical shoulder structure 17-18-19 is preferred, it is obvious that this specific structure is not needed provided the bottle shoulder is high enough, and thus close enough to the edge of the cap, to afford a fulcrum or abutment surface.

What is claimed is:

1. A blow molded glass beverage bottle comprising: a connate glass body with a side wall, an upwardly dished bottom wall, a neck which terminates in a bead to receive a crown cap, the body adjacent the neck having a continuous, smoothly contoured, inwardly extending shoulder portion joined to the base of the neck and defining a fulcrum surface, a cap receiving recess in the bottom wall, a wall of said recess extending generally lengthwise of the body to provide a cap engaging face, and a portion of the body side wall adjacent said cap engaging face defining a bearing face, the distance from said cap engaging face to said bearing face being only slightly less than the distance from the fulcrum surface to the lower margin of the bead, whereby a first bottle may be placed in a cap removing position on a second identical bottle with the bearing face of the first bottle on the fulcrum surface of said second bottle and with said cap engaging face of the first bottle engaged beneath the crimp of a crown cap on the bead of said second bottle, in which position the bottom of the first bottle extends above and generally longitudinally with respect to the neck of said second bottle.

2. The container of claim 1 including a neck receiving groove in the body between the cap engaging face and the bearing face for extending the cap engaging surface of said cap engaging face partially around a container neck received in said groove.

3. The container of claim 1 in which said bearing face and fulcrum surface consist of smooth glass surfaces permitting free sliding of the bearing face over the fulcrum surface.

4. The container of claim 1 in which the cap engaging face is slightly undercut so as to angle outwardly and upwardly with respect to the center of the bottom wall.

5. The glass beverage bottle of claim 1 wherein said cap engaging face is defined by a laterally concave surface portion of the wall of said recess.

6. The glass beverage bottle of claim 1 in which the shoulder portion includes lower and upper generally frusto-conical surfaces connected by a generally transverse, planar area, the shoulder portion where the lower frusto-conical surface merges with the planar area affording the fulcrum surface.

7. The glass beverage bottle of claim 6 in which the upper generally frusto-conical surface is concavely curved between the planar area and the neck.

8. The container of claim 1 in which the upper end of the side wall has an upper stippled circumferential bulge and the juncture between the lower end of the side wall and the bottom wall provides a lower stippled circumferential bulge, said bulges defining the maximum diameter of said body, and in which the bearing face comprises a smooth area in said lower stippled bulge.

9. A blow molded glass beverage bottle comprising: a connate glass body with a side wall, a bottom wall which has a peripheral rim and is upwardly dished toward its central portion, a neck which terminates in a bead to receive a crown cap, the body adjacent the neck having a continuous, smoothly contoured, inwardly extending shoulder portion joined to the base of the neck and defining a fulcrum surface, an external recessed lug in the bottom wall extending inwardly from the rim of the bottom wall and having a cap engaging face that extends generally longitudinally of the bottle body and faces inwardly toward the central portion of said bottom wall; and a rounded surface joining the bottom and side wall and defining a bearing face between the bottom wall and said fulcrum surface, the distance from said cap

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engaging face to said bearing face being only slightly less than the distance from the fulcrum surface to the lower margin of the bead, whereby a first bottle may be placed in a cap removing position on a second identical bottle with the bearing face of the first bottle on the fulcrum surface of said second bottle and with said cap engaging face of the first bottle engaged beneath the crimp of a crown cap on the bead of said second bottle, in which position the bottom of the first bottle extends above and generally longitudinally with respect to the neck of said second bottle.

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