United States Patent [19]

Coop

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[54] **TEAR-OFF CAP CLOSURE**

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[21] Appl. No.: **390,095**

[52] **U.S. Cl.** **215/253,** 215/256, 215/324

[51] **Int. Cl.** **B65d 41/32,** B65d 41/10

[58] **Field of Search** ..... 215/253, 254, 256, 324, 215/327; 220/94 A

[56] **References Cited**

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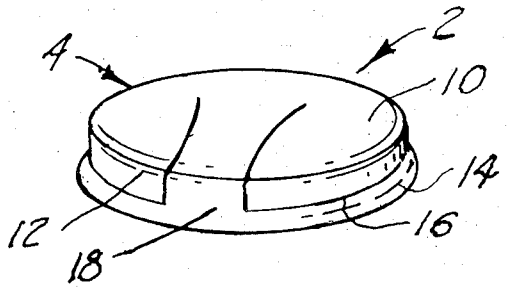
[57] **ABSTRACT**

A tear-off cap closure for a container including a cap body having a cap top and an integral skirted cap wall. The cap wall depends from the periphery of the cap top for attachment to the container, and terminates in a peripherally extending bead. A deformable bridge portion integrally connects a minor portion of the bead with the cap body. A sever line extends around the cap wall from one side of the bridge portion to the opposite side of the bridge portion to enable severing of a major portion of the bead from the cap wall during application of the cap closure to the container and forms a pull-ring for pulling the cap from the container when access to the contents of the container is desired.

6 Claims, 8 Drawing Figures



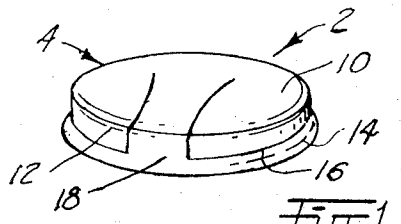


Fig. 1

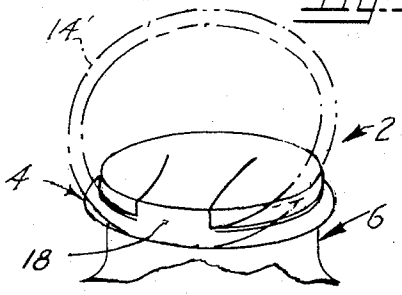


Fig. 2

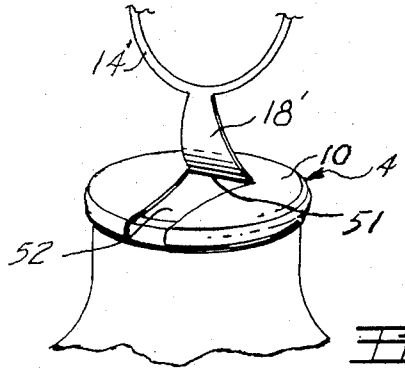


Fig. 3

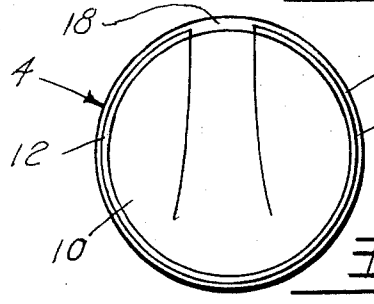


Fig. 4

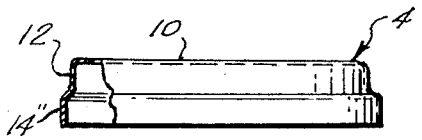


Fig. 5

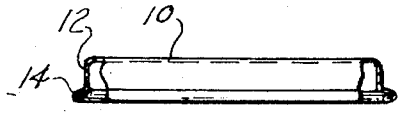


Fig. 6

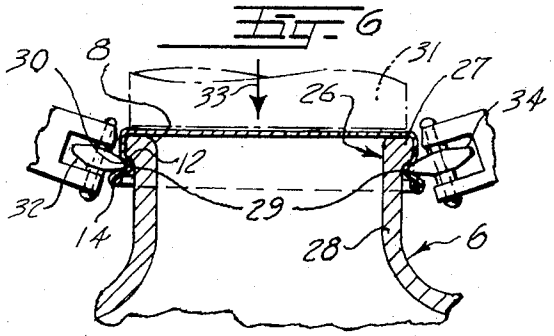


Fig. 7

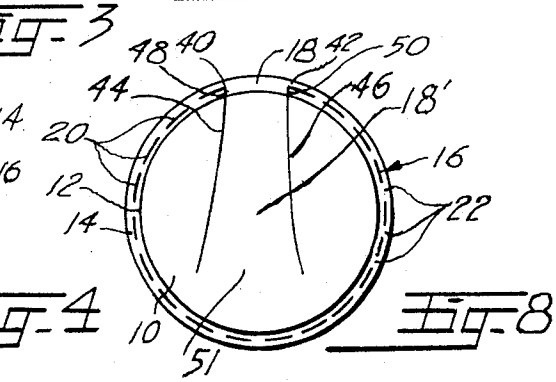


Fig. 8

TEAR-OFF CAP CLOSURE

BACKGROUND OF THE INVENTION

The present invention relates to a closure for a container, and more particularly to an improved tear-off cap closure having an integral, concentric pull ring for removing the cap closure from the container.

Heretofore, it has been known to form a cap closure with a cap body having a concentrically disposed pull ring which has been integrally connected to the cap body, such as is disclosed in U.S. Pat. Nos. 2,443,185 and 2,490,791. In the construction of such prior cap closure, the pull-ring has been disposed around the cap body and has been attached to the cap body by a narrow bridge portion, and the remainder of the pull-ring has been separated from the cap body prior to attachment of the cap closure to the container.

In addition to the apparent fragile nature of such closures, the prior structure was such as would lead to problems in hoppering and handling at the capping machine.

SUMMARY OF THE INVENTION

The present invention contemplates providing an improved tear-off cap closure for a container, and includes a cap body having a cap top and an integral, skirted cap wall which depends from the periphery of the cap top for attachment over the open end of a container. The cap wall terminates in a peripherally extending bead, and a deformable bridge portion integrally connects a minor portion of the bead with the cap body. A sever line extends generally around the cap wall from one side of the bridge portion to the opposite side of the bridge portion to enable severing of a major portion of the bead from the cap body during application of the cap closure to a container to form a pull-ring for pulling the cap closure from the container. More specifically, after application the pull-ring extends around a major portion of the cap wall and is on the side of the cap wall which is opposite to the bridge portion. With this arrangement, the bead remains intact with the cap body until the cap is applied to the container. In applying the cap closure to the container, the capping machine includes rollers for deforming the cap walls about the open end of the container to secure the closure on the container. According to the invention, such rollers are so positioned with respect to the cap wall and container as to separate the bead from the cap wall during deformation thereof to form the pull-ring concurrently and simultaneously with securing the closure on the container. Subsequently, when it is desired to open the container, the pull-ring is merely lifted upwardly to pull the cap closure from the container. As can be seen, this arrangement does not have the disadvantage of having the pull ring separated or spaced from the cap body until the cap closure is applied to the container to eliminate obvious problems resulting in storage of the parts, and more importantly, handling the parts from storage until they are applied to the container at the capping machine.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the cap closure of the present invention prior to its application to the container;

FIG. 2 is a perspective view of the cap closure of the present invention as applied to the container showing the pull-ring in the lifted position in phantom lines;

FIG. 3 is a perspective view of the cap closure of the present invention showing the opening of the cap of FIGS. 1 and 2;

FIG. 4 is a top plan view of the cap closure of the present invention;

FIG. 5 is an elevation view, partially in section of the cap closure of the present invention prior to the formation of the bead;

FIG. 6 is an elevation view, partially in section, of the cap closure of the present invention shown after the formation of the bead;

FIG. 7 is an end elevation, transverse sectional view of the cap closure of the present invention being applied to a container; and

FIG. 8 is a top plan view of an alternate embodiment of the cap closure of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring again to FIGS. 1 and 2, the cap closure of the present invention is illustrated, generally at 2, and includes a cap body 4 which is adapted for attachment to a container 6 for sealing the open end, such as at 8 FIG. 7), of the container 6.

Referring now to FIGS. 4 and 6, the cap body is of a generally cup-like shape being generally circular in configuration, when viewed in top plan. The cap body 4 includes a generally flat cap top 10 and an annular cap wall 12 which is formed integrally with the cap top 10. As shown, the cap wall 12 depends downwardly from the periphery of the cap top 10 and terminates in an annular bead 14 along the edge remote from the cap top 10.

Referring now to FIG. 5, the cap body 4 is formed from a blank (not shown) of generally thin, flat material, such as aluminum or the like. The blank is then drawn in a die to form a lower wall section 14'' which has a diameter greater than the diameter of the cap wall 12. As shown, the lower wall section 14'' is formed integrally with the cap wall 12 and depends downwardly therefrom. As shown in FIG. 6, the lower wall section 14'' is subjected to a further forming operation, such as a curling operation, for curling the lower wall section 14'' radially inwardly to form the bead 14. The cap closure is stored in this condition to await application to the container 6 at a subsequent time.

Referring particularly to FIG. 4, a sever line 16 is formed in the cap body 4 adjacent the juncture between the cap wall 12 and the bead 14 to enable separation of the bead 14 from the cap wall 12. By this arrangement, severing of the bead 14 results in the formation of a pull-ring 14' (FIG. 2) which is integrally connected to a minor portion of the cap wall 12 by the bridge portion 18.

In the invention, the sever line 16 may be made by cutting the cap body material to a depth of preferably at least one half of the metal thickness, leaving a residual of less than half of the metal thickness. Scoring to this depth should leave sufficient strength to allow the lower wall section 14'' to be curled to form the bead 14 and still allow the formed bead 14 to be separated from the cap wall 12 to form the pull-ring 14'. In the alternative and referring to FIG. 8, the sever line 16 may also be formed by scoring or piercing the material

of the cap body, such as by slitting the material of the cap body 4 to form a plurality of slits 20 along spaced intervals adjacent the juncture of the bead 14 with the cap wall 12 to form a plurality of small bridges, such as at 22, around the periphery of the cap wall 12 adjacent to the bead 14. By this arrangement, the material of the cap body 4 will be weakened to enable the bead 14 to be broken away from the cap wall 12 by rupturing the bridges to form the pull-ring 14'. By forming the sever line in either of the above ways, sharp edges are avoided on the inside of the pull-ring 14' which could possibly result in the cutting of the fingers of the user, such as may be experienced should the sever line be formed by pinch trimming or the like.

Referring now to FIG. 7, the container 6 is provided in the form of a bottle having a conventional finish 26 adjacent its open end. The finish includes an annular rim 27 which projects radially outwardly from the neck 28 of the bottle 6 defining an annular recess 30 immediately below the rim 27. In applying the cap closure 2 to the container 6, the cap closure 2 is placed over the open mouth 8 such that the cap top 10 rests on the rim 27. The side wall 12 extends downwardly beyond the rim 27 to position the bead 14 adjacent the neck 28. When the cap wall 12 is in this position on the bottle, a holder 31 which is part of the capping machine, is moved downwardly, as indicated by the arrow 33, into contact with the cap top 10 to clamp the cap closure 2 in position on the bottle 6. The bottle 6 and the cap closure 2 are then moved together relative to disc-like rollers 32 and 34 of a capping machine (not shown). The peripheral edges 29 of the rollers 32 and 34 positioned with respect to the bottle 6 to engage the cap wall 12 adjacent the recess 30 for deforming the cap wall 12 inwardly around the rim 27 and into engagement with the neck 28. Prior to engagement of the rollers with the cap wall 12, the cap wall 12 is spaced outwardly from the neck 28, and the sever line 16 is positioned outwardly of and adjacent to the recess 30. The rollers 32 and 34 may be resiliently biased to apply a radially inward force on the cap wall 12 adjacent the sever line 16. Such force may have a slightly downward component causing the rollers 32 and 34 to separate or sever the bead 14 from the cap wall 12 as the cap wall 12 is deformed inwardly into engagement with the neck 26. It is to be understood that the rollers 32 and 34 may be arranged to force the cap wall 12 into engagement about the entire periphery of the neck 28 by rotating the bottle about its central axis or by rotating the rollers around the neck 28. Thus, the entire periphery of the cap wall 12 is formed around the rim 28 and into engagement with the neck 26. By this arrangement, the bead 14' will be severed from the cap wall 12 along the sever line 16 to form the pull-ring 14' which will be separated from the cap wall 12 along a major portion thereof. The bridge portion 18 will maintain the pull-ring 14' connected to the cap wall 12 along a minor portion thereof.

After the capping operation, the bottle is removed from the capping machine for packaging. When it is desired to obtain access to the contents of the bottle 6, the pull-ring 14' is lifted up over the cap wall, as shown in FIG. 2, and then by continuing to pull upwardly on the pull ring 14', the cap 10 is severed to form a partially split cap which can be easily separated from the bottle 6 by continued pulling of the pull ring 14'.

Another embodiment of the cap closure 2 of the present invention is illustrated in FIG. 8. In this form, the sever line 16 is extended at its opposite ends, such as at 40 and 42, adjacent the opposite sides of the bridge portion 18 to form extended sever line portions 44 and 46. The extended sever line portions 44 and 46, like the sever line 16, may be formed by a continuous score line, by intermittent spaced score lines or by piercing, such as slitting, the cap body. The extended sever line portions 44 and 46 extend upwardly along the cap wall 12, such as at 48 and 50, and then continue beyond the cap wall 12 into the cap top 10. The extended sever line portions 44 and 46 continue in spaced relation from one another along the cap top 10 to form a tab or bridge extension 18' which terminates adjacent the rim of the cap top 10. As shown, in FIG. 8, the extended sever line portion 44 and 46 may diverge outwardly away from one another such that the width of the tab or bridge extension 18' is wider at its junction such as at 51, with the cap top 10, than the width of the bridge portion 18 adjacent the bead 14. In this arrangement when the pull-ring 14' (FIG. 3) is pulled upwardly, the bridge extension 18' will be severed from the cap top 10 forming an opening 52 in the cap body 4 to enable the contents of the bottle 6 to be poured outwardly therefrom, or to enable the insertion of an article, such as a straw or the like, into the interior of the bottle 6 or to facilitate removal of the cap from the bottle. The juncture 51 between the bridge extension 18' and the cap top 10 may be positioned closer to the periphery of the cap top 10 remote from the bridge portion 18 to facilitate complete removal of the cap closure 2 from the bottle 6.

The scores 40 and 42 in the side wall and 44 and 46 in the body of the cap may be formed either in the exterior or interior surface of the cap and are preferably formed in the flat blank before drawing the blank into the cap shape. The score 16 between the ring 14 and the side wall is preferably formed at the end of the drawing stroke which forms the cup illustrated in FIG. 5.

Although a preferred embodiment of this invention has been illustrated and described, it will be apparent to those skilled in the art that numerous modifications can be made therein without departing from the invention or the scope of the appended claims. For example, a closure of the invention could be applied to a container by a collet closing or crimping operation in which fingers are closed against the side wall of the cap to secure it to a container and concurrently separate the bead from the side wall of the cap. A closure of the invention may also be formed from a plastic resin which is molded into a closure having the structure of that illustrated and described for a metal closure.

I claim:

1. A tear-off closure for a container comprising,

a cap body having a top and an integral, skirted cap wall depending from the periphery of the cap top for attachment to the container,

said cap wall terminating in a peripherally extending bead,

a deformable bridge portion connects a minor portion of said bead with said cap,

a sever line extending generally around said cap wall from one side of said bridge portion to the opposite side of said bridge portion to enable severing of a major portion of said bead from said cap to form

a pull-ring for pulling said cap from said container.

2. A closure in accordance with claim 1, wherein said pull-ring extends around the major portion of the cap wall and is formed integrally with the bridge portion, and wherein said pull-ring is in close proximity to the major portion of said cap wall.

3. A closure in accordance with claim 1, wherein said sever line comprises a score line adjacent the bead along which the bead is severable from the cap wall to form the pull-ring.

4. A closure in accordance with claim 3, wherein the score line is continuous from one side of the bridge portion to the other side thereof.

5. A closure in accordance with claim 3, wherein the score line comprises slits which extend intermittently from one side of the bridge portion to the other side thereof.

6. A closure in accordance with claim 1, wherein said cap top has spaced score lines extending transversely thereof to form a tab, said score lines extend beyond the periphery of said cap top and along said cap wall terminating at said sever line adjacent said bead.

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