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Heffran

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[54] CONVENIENCE OPENING CLOSURE

[75] Inventor: **Vernon C. Heffran**, Perrysburg, Ohio

[73] Assignee: **Owens-Illinois Inc.**, Toledo, Ohio

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[52] **U.S. Cl.** ..... **215/46 A**

[51] **Int. Cl.** **B65d 43/02**

[58] **Field of Search** ..... 215/46 A; 220/54

[56] **References Cited**

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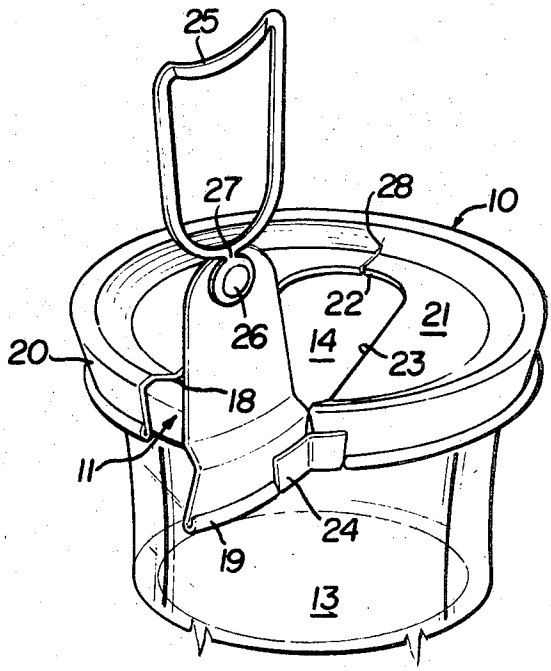
Primary Examiner—George T. Hall

Attorney—J. R. Nelson and E. J. Holler

[57] **ABSTRACT**

The invention disclosed is related to scored tear strips in convenience type ("Easy-open") bottle closures. To prevent complete tear out of the tear strip on removal of the cap, the present invention halts the tearing of one of the side scores so that the closure and tear strip remain in one piece and are removable from the container as a unit. In the path of one of the legs of the tear strip is an obstruction, i.e., a folded tab integral with the skirt, which stops the tearing action in the one leg while the other opposite leg continues to tear through the edge of the skirt.

10 Claims, 4 Drawing Figures



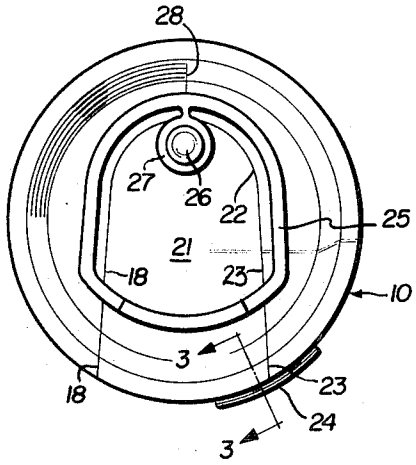


FIG. 1

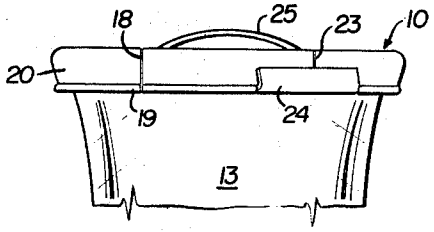


FIG. 2

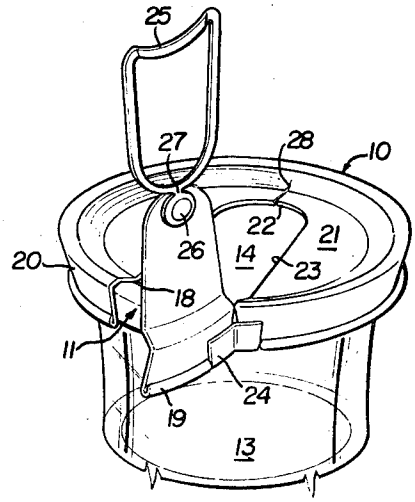


FIG. 4

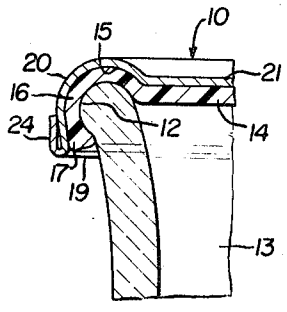


FIG. 3

INVENTOR.
VERNON C. HEFFRAN.
BY
J.R. NELSON & E.J. HOLLER.
ATT'YS.

CONVENIENCE OPENING CLOSURE

BACKGROUND OF THE INVENTION

The present invention relates to convenience opening closures for bottles or like containers having a mouth finish and which are utilized for packaging product such as beer, carbonated beverages or the like. The closure of these packages incorporates the convenience opening feature so that users may open the container without the aid of opening devices or tools of the usual sort. This is generally accomplished by a riveted pull ring attached to an integral scored tear strip on the metal cap of the closure.

By the present invention, improvements are made in the closure structure to achieve optimum results in one-piece cap removal, as hereinafter disclosed.

In the manufacture of easy-open closures for bottles, a tear strip is defined by scoring the metal in a continuous looped outline extending from a point in the skirt of the closure, over the corner radius well into the top of the closure to a reversing loop or radius, and thence outwardly in the top, over the corner radius and into the skirt. These reaches of the score line emanating from the top loop or radius (herein called legs) are spaced apart to define a strip. The attached pull ring device may be grasped by the user, lifted and pulled toward the skirt edge along the direction of the tear strip. The lift ruptures the metal at the end of the tear strip and pulling force tears the strip from the balance of the closure. If one leg of the strip tears through one edge of the skirt, the closure is released from the bottle for removal. However, if both legs of the strip tear through the skirt edge, the closure is separated into two pieces. In this case, for removal of the closure the remaining piece must be removed by the fingers, an undesirable function of the closure removal.

SUMMARY OF THE INVENTION

It is an object of the invention to provide a means in the tear strip design assuring one-piece removal of the closure and tear strip in opening the closure from the bottle.

Another object of the invention is to provide a one-piece removal closure of the type referred to that is simple, easy to manufacture, and economical.

A further object of the invention is to provide a tear strip operated closure wherein the metal is not effectively weakened at the edge of the closure skirt and the closure is more readily "capped" on the bottle with less chance of failure of the closure in use.

Various other objects and advantages of the invention will become apparent to those skilled in the art from the following disclosure and detailed description of the appended drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a convenience type bottle closure of the invention.

FIG. 2 is a side elevational view of the closure of FIG. 1 shown assembled on the neck finish of a bottle.

FIG. 3 is a fragmentary sectional elevational view taken along line 3—3 on FIG. 1.

FIG. 4 is a perspective view of the closure in FIG. 2, illustrating the one-piece removal function of the invention.

Referring to the drawings, the closure is shown as a preferred embodiment of the invention and comprises an aluminum outer cap 10 and underlying plastic liner 11. The closure is capped on a bead 12 of the neck finish of glass bottle 13 (FIGS. 2–4). Cap 10 is preferably of aluminum and is formed from sheet stock by blanking the closure metal therefrom. The blank is next scored and shaped in dies to the shape illustrated on the drawings. Liner 11 is molded from a plastic, preferably a thermoplastic such as polyethylene or polyvinyl chloride. Liner 11 (FIG. 3) has a mouth closing top 14, an annular groove 15 fitting over bead 12 and a skirt 16. Skirt 16 has a lower flange 17 compressible against the side of bead finish 12. The liner is but one example of inside construction for the closure in sealing the bottle mouth somewhere along the neck finish surfaces.

The metal cap 10 has a score line formed in blanking dies which define a configuration of a first leg 18 extending to or through the outer radial edge 19 of the skirt 20, radial of skirt 20 and well into the top portion 21 of the cap 10. Leg 18 is continuous with a looped portion 22 of score line in the top portion 21 of the cap. Continuous with the looped portion 22 of the score line is the second leg 23 which extends to the edge of top 21 and into an intermediate location radially in skirt 20. Spanning circumferentially the path of leg score 23 is a tab 24 rolled upwardly and inwardly on skirt 20 so as to lie flat along the outer surface of skirt 20 (see FIG. 3). In the form shown, tab 24 is integral with the metal of the cap blank and is rolled upwardly and inwardly in the forming of the cap.

Another form of constructing tab 24 (not shown) is to fasten, such as by fusion or other means, a strip or tab on the skirt wall of the closure to circumferentially span thereat the path of the second score leg 23.

In any event, the invention provides a physical structure as a barrier means to tearing action in the second leg 23 of the tear strip score outline. The function of the barrier means in cap operation will be presently described.

Referring to FIG. 1, the tear strip defined by the score line components 18, 22 and 23 is secured to a pull ring 25 by a rivet 26 attached to the tongue portion 27 of ring 25. The forward portion of ring 25 lies against cap top 21 outside the tear strip, i.e., radially beyond loop portion score 22. Upon lifting ring 25, this forward end serves as a lever to lift and sever the tear strip. PUlling of ring 25 radially along the tear strip shears the metal along score lines 22 and 18, 23, respectively. This shear of the metal at the score lines 18 and 23 continues relatively easily until the wire edge 19 of the skirt is reached and the barrier tab 24 is reached at the respective score legs 18 and 23. The score 23 not extending completely to tab 24 portion of the skirt will meet relatively severe resistance to further tearing of the strip. Relatively speaking, most of the pull forces on ring 25 will now be transmitted into leg 18 and since the edge or wire 19 is relatively much weaker, it will break and free the circumferential attachment of the skirt and cap about bottle 13.

As has been seen with reference to FIG. 4, after the edge 19 breaks at leg 18 the tab 24 will hinge, as does the unsevered segment of skirt 20 along line 23, and the sidewise pull on ring 25 will hinge open cap 10 along

the hinge score line **28** extending from the looped score **22** radially toward the corner radius of cap **10**. This sidewise pull on ring **25** together with an axial (upward) lift inherent in the pull movement of the user will remove cap **10** from neck finish **12** in one piece.

The liner **11**, depending upon the form of liner or gasket used in the closure, may be "thumbed" easily from the neck finish.

Having shown and described a preferred embodiment of the invention, other changes, modifications and substitutions may be made by those skilled in the art without departing from the spirit and scope of the invention as defined by the appended claims.

I claim:

1. A metal closure cap for a container having a mouth defining annular finish comprising a top portion covering said mouth and a depending peripheral skirt having a rolled outer peripheral edge, said skirt adapted to be disposed around said finish and secure said cap on said container, a tear strip integral in said cap and defined by a line of weakening, having: a first leg extending from the outer peripheral edge of said skirt and radially inwardly into said top portion, a reversing inner end portion in said top and a second leg extending from said reversing portion in said top radially outwardly of said top and into said skirt, said first and second legs being spaced apart in said cap; a barrier means in the skirt of said cap transversely in the path of said second leg in said skirt; said barrier means comprising a metal tab attached to the skirt of said cap extending transversely of the path of said second leg for said tear strip score line, said tab being an extension of a peripheral segment along said rolled edge, and means attached to said tear strip near its reversing inner end for tearing the metal of said tear strip along said line of weakening, whereby the cap with the tear strip is removable from said container finish in one piece.

2. The metal closure cap defined in claim **1**, wherein said line of weakening comprises a continuous score line formed in said metal of the cap.

3. The metal closure cap defined in claim **1** wherein the attached metal tab is disposed adjacent the skirt wall and across the terminal end of said second leg of the tear strip score line.

4. The metal closure cap defined in claim **1**, wherein said metal tab is integral with the metal of said skirt.

5. The metal closure cap defined in claim **4**, wherein said metal tab is reverse folded with said shirt edge to lie adjacent the skirt across the path of said second leg of the tear strip score line.

6. The metal closure cap defined in claim **5**, including a plastic inner cap underlying the metal cap and having a skirt for encompassing the annular finish of the container to sealingly close the mouth thereof.

7. A closure comprising a top panel and a depending integral, annular, peripheral skirt that is rolled at its lower peripheral edge, a substantially U-shaped tear strip integral with the closure and formed by a pair of score lines extending across the skirt and top panel portions and a score line at the closed end of the U-shaped strip, the latter being disposed in the top panel, and a reinforcement tab attached to the skirt and extending beyond a portion of said rolled lower edge thereat and across the path of only one of the pair of score lines in the skirt.

8. The closure defined in claim **7**, having a pull ring fastened to the tear strip adjacent said score line at said closed end of the U-shaped strip for tearing said strip along said score lines.

9. The closure defined in claim **7**, wherein said reinforcement tab is integral with the remainder of said closure and dependent from the lower rolled edge of the skirt, said tab being folded to lie adjacent said skirt.

10. The metal closure cap defined in claim **1**, wherein said barrier means in the skirt of said cap comprises two layers of metal in the lower rolled edge region of the skirt beyond the terminal end of said second leg of the score line, the one of said layers of metal being contiguous with the other layer of metal of the skirt and reversedly rolled along said skirt with said rolled outer peripheral edge, whereby tearing of the metal in said second leg of the score line beyond its terminal end meets with increased resistance to further tearing along the radial span of the aggregate of said two layers of the metal in said rolled lower edge region of the skirt.

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