# United States Patent

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[54] **EASY OPENING CONTAINER**
**7 Claims, 4 Drawing Figs.**


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229/7, 220/24, 220/90.2
[51] **Int. Cl.** ..... **B65d 17/20,**
B65d 17/24, B65d 39/00
[50] **Field of Search** ..... 220/53, 54,
24, 90.2; 229/7; 222/541; 215/46



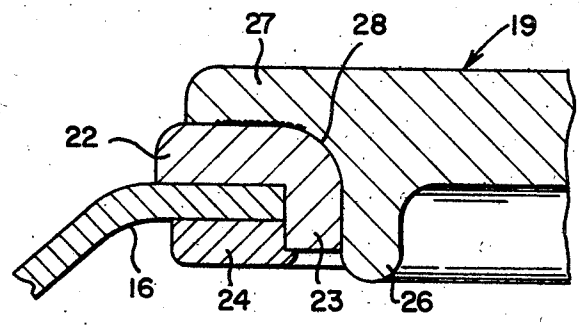
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**ABSTRACT:** A three component easy opening ends structure for a metal container. The easy opening structure comprises a two-piece bonded lip bounding an opening formed in the container. A closure member is releasably bonded to the lip and separable therefrom upon the application of a pulling force.

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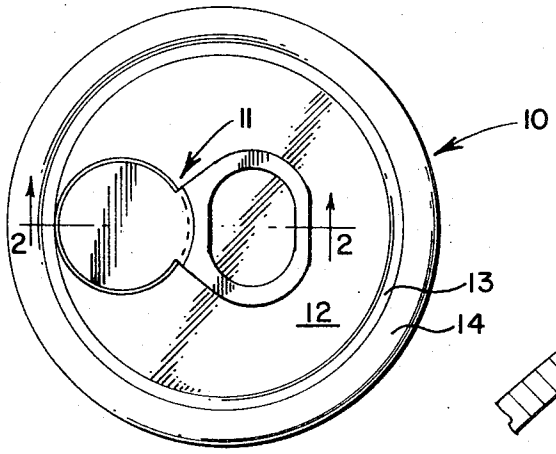



FIG. 1

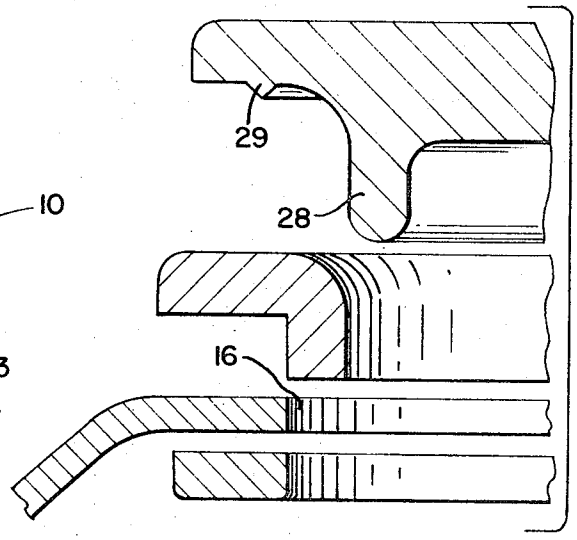



FIG. 4

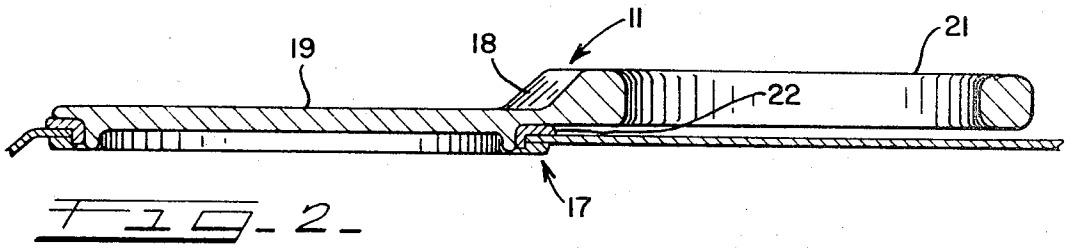



FIG. 2

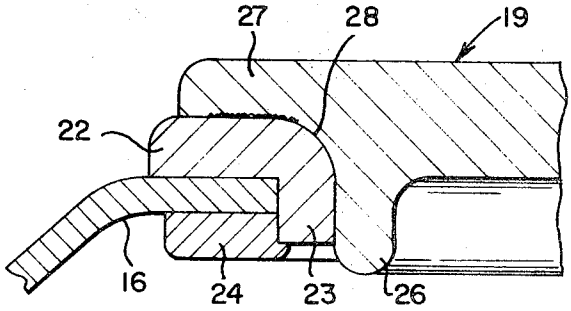



FIG. 3

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# EASY OPENING CONTAINER

## BACKGROUND OF THE INVENTION

Easy opening containers of the type to which the present invention relates are generally formed of metal and provided with a pour opening. The pour opening generally occupies only a portion of the end panel of the container. Heretofore, the pour opening has generally been formed by scoring to define a tear strip. A pull tab is attached to the tear strip and upon the application of a force the pull tab is operative to separate the tear strip along the weakening line from the panel.

Frequently the contents of the container are directly consumed therefrom by placing the lips over the pour opening. This is somewhat unsanitary because of the dirt and the like which may be exposed about the surface of the opening. Moreover, under some circumstances, the edge of the opening may have exposed sharp edges which may cut the lips.

## SUMMARY OF THE PRESENT INVENTION

By the present invention, it is proposed to provide a new and improved easy opening structure for a container which is constructed and arranged to provide a smooth protective surface about the opening when the closure is removed.

This is accomplished generally by the provision of a plastic ring which is constructed and arranged so as to provide a lip which bounds the pour opening and protects the latter. The lip is formed in two pieces and bonded to the marginal edge portion above the opening of the container. Bonded to the lip is a releasable closure member having formed integrally therewith a pull tab which is grasped by the fingers for applying a force for separating the closure member from the lip.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plane view of the container having the easy opening structure of the present invention incorporated therein.

FIG. 2 is an enlarged cross-sectional view taken generally along the lines 2–2 of FIG. 1.

FIG. 3 is an enlarged fragmentary view of the easy opening structure at the left end of FIG. 2 showing the tear strip secured to the lip.

FIG. 4 is a fragmentary end view similar to FIG. 3, but showing the components in an explored position.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, and in particular FIG. 1, there is shown a container top end closure 10 of a container having an easy opening structure 11 of the present invention incorporated therein. The end closure 10 is made of metal such as tin plate, tin free steel or aluminum end. The end closure 10 comprises a central panel 12 having a bead formed adjacent the outer periphery from which there depends a peripheral flange 14. The peripheral flange 14 is curled and doubled seamed with an outwardly flap flange at the upper end of a container body in the usual manner.

The panel 12 in the embodiment is shown with a circular pour opening 16 through which the contents of the container are poured. The opening 16 may be formed by blanking or the like. It is to be understood that the opening 16 may assume any configuration as for example, the conventional tear drop design now commonly used in easy opening container structures.

The opening 16 is closed or sealed by the easy opening structure 11, which is preferably made from a thermoplastic material such as polypropylene, polyethylene or the like. The easy opening structure 11 comprises generally a lip assembly 17 attached about the outer periphery or edge of the opening 16. Detachably and sealably secured to the lip assembly 17 is a closure member 18 having a sealing flap 19 for closing the opening. Integrally extending from the sealing flap is a pull tab portion 21.



The ring or lip assembly 17 includes an upper annular ring 22 having a downwardly depending flange or collar 23 along the inner edge thereof. The depending flange 23 terminates below the inner face or surface of the panel 12. A lower or attachment ring 24 of greater thickness than the distance which the flange 23 depends below panel 12 is attached to the under side of the latter. The inner periphery of the ring 24 snuggly embraces the depending end of the flange 23.

The upper annular ring 22 and the lower attachment ring 24 are fixed to the marginal edge portion of the panel 12 above the opening 16 by bonding with a suitable pressure or heat sensitive adhesive. Container end panels used for beverages and the like are usually coated with an enamel comprising essentially a carboxylated polyethylene. The enamel provides a suitable heat sensitive adhesive for bonding the annular ring 24 to the container panel 12. The heat to achieve bonding may be applied as by induction or RF heating of the metal. Preferably RF heating is used so as to localize the heat in the bounding marginal edge portion of the opening 16, thereby to minimize the buckling of the relatively thin metal from which the end 10 is made. In this manner, the sealing ring assembly 17 is firmly fixed about the marginal edge portion of the opening 16 and remains adhered thereto.

At the same time as the rings 22 and 24 are bonded to the metal container end 10, the heat at the free edge of the opening 16 is conducted to the contacting surfaces of the collar 23 and the inner circumference of the attachment ring 24, thereby to fuse the surfaces as shown.

The sealing or closure member 19 is formed or made from a plastic material which may be of the same chemical class or a different chemical class from that of the plastic material from which the lip assembly 17 is made. The closure member 19 includes the closure flap 19 and a downwardly depending continuous flange 26 which fits snuggly and conforms to the downwardly depending flange 23 of the rim assembly 17. A horizontal ledge 27 overlies the horizontal surface of the upper rim or ring 22 of the rim assembly 17. As shown the horizontal ledge 27 and the downwardly depending flange 26 merge along a radius 28 which conforms to curvature of the downwardly depending flange 23 of the rim assembly 17.

The closure flap 17 may be suitably releasably bonded to the lip or rim 22 to form a seal capable of maintaining the integrity of the product within the container. The bond is preferably formed by ultrasonics. To this end, there is formed on the under side of the horizontal ledge 27 a projecting annular triangular rib 29. The annular triangular rib 29 serves as an energy director which melts and merges with the upper surface of the ring portion 20 of the lip 22 upon the application of an ultrasonic tool to the upper surface of the ledge 27.

The closure member is initially seated within the lip 17 so that the primary director is supposed over the annular portion. Thereafter an ultrasonic instrument may be applied to the upper face of the ledge 27 so as to impart sufficient energy to the inner face of the overlying marginal portion 27 and the upper surface of the lip assembly 22, thereby to create heat which forms a bond with the primary director 29 which emerges and solidifies with the rim 22.

While the bonding of the closure strip to the rim 17 is preferably formed by ultrasonic means, it is readily apparent that other bonding means may be used. For example, any suitable pressure or heat sensitive adhesive may be used to attach the closure to the rim.

The bond is formed in a manner so that the closure member or flap may be separated by the application of a pulling force at the pull ring portion 21. Preferably the pull ring portion 21 is formed with an opening sized to receive the finger of a user.

From the foregoing it should be readily apparent that there has been provided an easy opening structure 11 in which ring pull or closure member is formed so that it is internally removable from the opening 16 and separable from the rim assembly 17. The pull tab which is made from a plastic may be readily discarded without creating a hazard such as by cutting or the like when it is disposed on the public premises.

Moreover, the rim assembly remains adhered to the metallic member completely incompositing the sharp edge about the opening 16. In this manner, the rim assembly 17 serves to eliminate the sharp edges and permits the direct application of the lips to the opening so that the contents of the container may be directly consumed therefrom.

I claim:

1. An easy opening container including an end panel having an opening, a lip assembly fixed about said opening, said lip assembly including a first ring having a collar formed along the inner periphery and extending through said opening and an attachment ring embracing said collar and disposed on the face opposite the one on which said first ring is disposed, and a closure member releasably bonded to said first ring.

2. The invention as defined in claim 1, wherein said end panel is made from metal, and said lip assembly and said closure member are made from a thermoplastic material.



3. The invention as defined in claim 2, wherein said end panel includes an enamel coating and said first ring and said attachment ring are bonded to said enamel.

4. The invention as defined in claim 3, wherein the inner circumference of said attachment ring is bonded to said collar.

5. The invention as defined in claim 4, wherein said closure member includes a pull tab formed integral therewith.

6. The invention as defined in claim 5, wherein said pull tab is in the form of a ring.

7. The invention as defined in claim 3, wherein said closure member is releasably bonded to said first ring by ultrasonic means.