United States Patent

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[33] **Canada**
[31] **15,690**

[54] **CONTAINER CLOSURE HAVING FRANGIBLE SKIRT PORTION**
8 Claims, 3 Drawing Figs.

[52] **U.S. Cl.** **215/42,** 215/41, 215/100.5, 220/94
[51] **Int. Cl.** **B65d 41/22,** B65d 41/20
[50] **Field of Search** ..... 215/42, 46, 41, 55, 100.5; 220/27, 54, 94 A

[56] **References Cited**

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ABSTRACT: A tamperproof, safety, plastic cap for containers comprising an end wall and cylindrical skirt adapted to tightly fit onto the neck of a container, and a ring slightly larger than the skirt hinged onto said skirt at one point and joined to the skirt at a plurality of other points by bridges such that the bridges can be ruptured by finger pressure to permit removal of the cap by use of the ring.

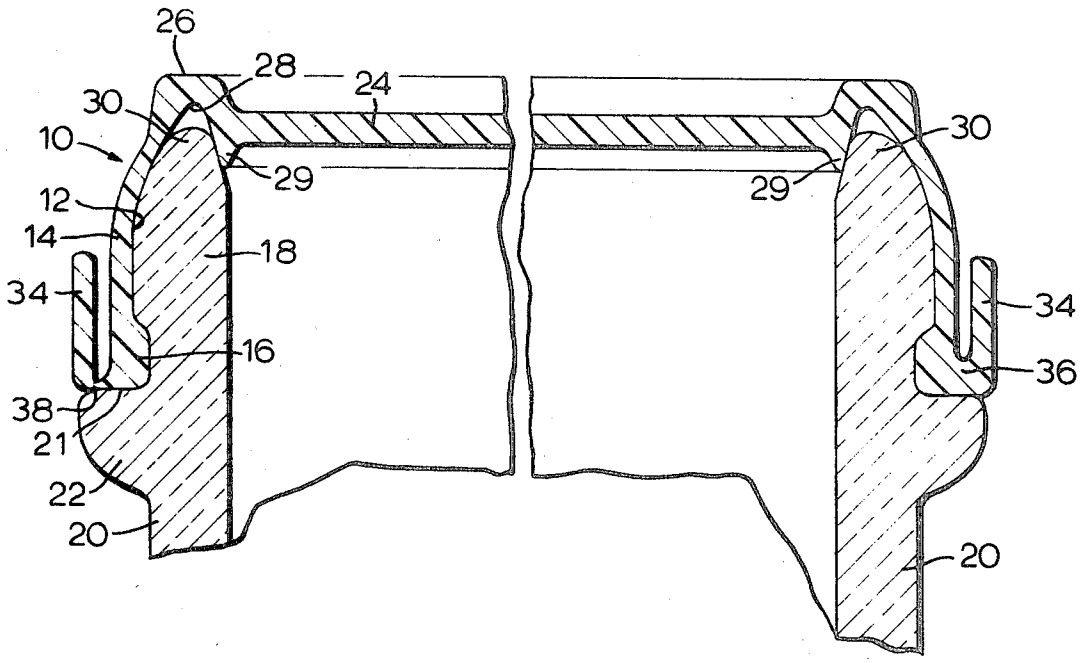
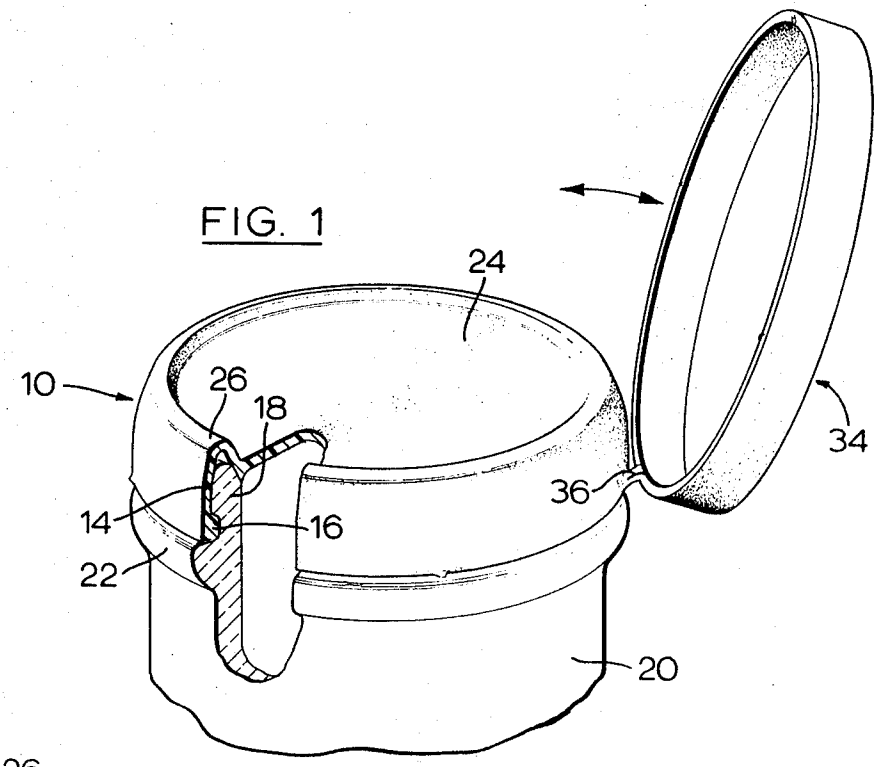


FIG. 1



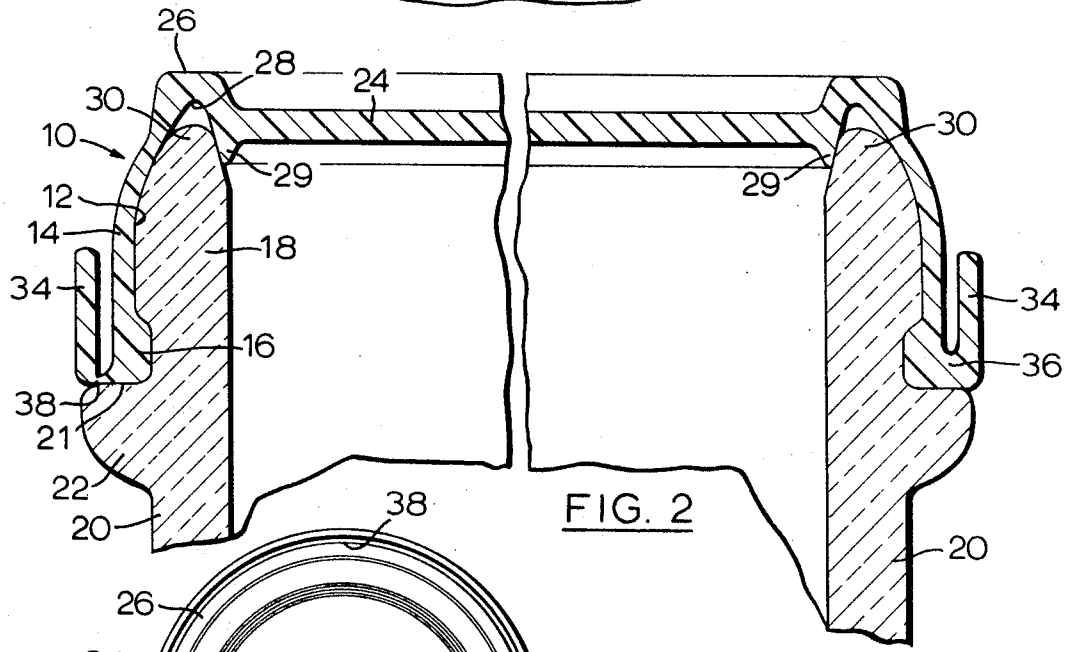


FIG. 2

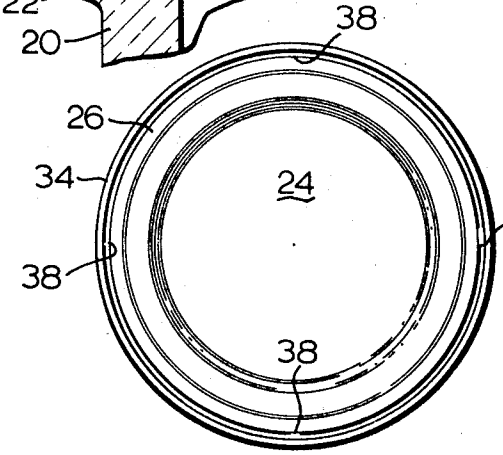


FIG. 3

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CONTAINER CLOSURE HAVING FRANGIBLE SKIRT PORTION

BACKGROUND OF THE INVENTION

This invention relates to container closures and is particularly directed to plastic caps for bottles and the like containers.

Bottles having food products offered for sale in supermarkets where the customer is free to handle the goods frequently are opened by customers for inspection of the contents of the bottle. Bottles so inspected have their vapor seals broken and, if not immediately purchased and used by a customer, will deteriorate before eventual use. Also, bottles so inspected are prone to contamination resulting in the generation of bad will towards the processor.

There is a need, therefore, for a container closure which is substantially tamperproof and which will provide indications that the closure has been removed and replaced.

Proprietary medicines and drugs which can be dangerous to the health and well-being of children when consumed in large quantities, and many hazardous and toxic substances are packaged and stored in vials and the like containers which can become accessible to children. The containers often can be opened by children resulting in injury and death. There is also a need, therefore, for a vaportight container closure which foils the efforts of a child to remove the cap in order to gain access to the container's contents.

SUMMARY OF THE INVENTION

I have discovered a novel container closure which has tamperproof and safety characteristics which substantially overcome the foregoing shortcomings common to many existing container closures. My container closure is a cap made of a material having properties of resiliency and rigidity comparable to that of polypropylene and comprises a cylindrical skirt having an annular concavity on its inner face adapted to receive a convex ridge formed about the neck of a container in tight-fitting relation therewith, a circular end wall integrally joined to an edge of said skirt defining an annular groove at the juncture of the skirt and end wall for receiving the rim of a container therein, a ring having an inside diameter greater than the outside diameter of the skirt, a plurality of bridges formed about the skirt integral with said ring and adapted to be ruptured by finger pressure for securing said ring to the skirt until broken, and hinge means integrally joining said ring to said skirt for pivotal movement of said ring about said skirt.

It is therefore a principal object of the present invention to provide a container closure which is simple in construction and inexpensive to manufacture which can be readily opened by an adult but opened with difficulty by a child.

It is another object of the present invention to provide a container closure adapted for use as a vapor seal and which has tamperproof characteristics for warning purchasers that the closure has been removed and the container vacuum destroyed or the container contents contaminated.

DESCRIPTION OF THE DRAWINGS

These and other objects of the invention and the manner in which they can be attained will become apparent from the following detailed description of the drawing, in which:

FIG. 1 is a perspective view, partly cut away, of the closure of the invention;

FIG. 2 is an enlarged section taken along the line 2–2 of FIG. 1, partly broken away, showing the engagement of closure with the neck of a bottle, and the relationship of the ring to the closure skirt; and

FIG. 3 is a plan view of the closure.

Like reference characters refer to like parts throughout the description of the drawing.

DESCRIPTION OF PREFERRED EMBODIMENTS

The container closure of the present invention shown in FIGS. 1—3 comprises a skirt designated by the numeral 10 having a concave annular recess 12 defined by thin-walled skirt section 14 and a relatively thick portion 16 adapted to receive the neck 18 of a bottle or the like container 20 in tight-fitting engagement. A peripheral shoulder 22 may be formed about the exterior of the neck 18 of the bottle 20 to abut the edge 21 of skirt 10 to obviate the formation of a gap between the bottleneck and skirt to preclude a child prying the skirt from the bottleneck. Circular end wall 24 is joined to the opposite edge of skirt 10 at 26 and an annular groove 28 formed at the bight of the juncture of end wall 24 and skirt 10, together with annular rib 29, are adapted to receive the rim 30 of bottleneck 18 such that a slight space is defined between the cap and the bottle edge for reasons which will become apparent as the description proceeds.

A ring 34 having an inside diameter greater than the outside diameter of skirt 10 is joined to the exterior of skirt 10 by a hinge 36 formed integral with said skirt and ring for pivotal movement of the ring about the skirt, as indicated by the arrow in FIG. 1. A plurality of bridges 38 formed integral with skirt 10 and ring 34 equispaced about the closure, as indicated most clearly in FIG. 3, are adapted to be easily ruptured by finger pressure such that the ring 34 can be readily pivoted from its normal position concentric with skirt 10 to an upright position substantially perpendicular to end wall 24 allowing the consumer to insert a finger in the ring and pull the closure from the bottleneck.

The container closure is formed of a plastic such as polypropylene to tolerances which permits the tight application of the closure to the neck of a bottle such that the skirt 10 makes a tight fit with the neck necessitating the exertion of about 16 pounds pressure on ring 34 in a direction substantially perpendicular to the plane of wall 24 for removal of the closure from the bottle. The maximum pressure that can be exerted by an average child of five years of age and under is less than 16 pounds and, thus, the container closure normally cannot be opened by a small child.

The closure can be readily manufactured by injection moulding to the tolerance desired. Polypropylene and the like plastics are desirable in that the closure has sufficient resiliency and strength for recapping and reuse by the consumer while providing adequate rigidity to ensure an effective vapor seal is provided and the necessary forces must be applied to remove the closure from the bottle.

In use, food products such as baby foods are placed in sterilized containers at elevated temperatures, closures automatically applied, and subsequent cooling of the contents of the container provides a partial vacuum therein. Skirt 10 and rib 29 tightly grip the neck of the container with the partial vacuum in annular groove 28 assisting the formation of a vapor seal. When it is desired to open the container, bridges 38 are ruptured by an upward pressure on ring 34 such that the ring will pivot about axis 36 to a position substantially perpendicular to the plane of end wall 24. An upward pressure on ring 34 in a direction away from bottle 20 results in the closure being pried loose from the bottleneck.

The present invention provides a number of important advantages. The closure is substantially pilferproof and warns potential purchasers and consumers that the container has been opened. The closure also permits the safe storage of proprietary medicines, drugs and other hazardous substances.

What I claim as new and desire to protect by Letters Patent of the United States is:

1. A container closure formed of a material having properties of resiliency and rigidity comparable to that of polypropylene and which comprises a cylindrical skirt having an annular concavity on its inner face adapted to receive a convex ridge formed about the neck of a container in tight-fitting abutting relation therewith, a circular end wall integrally joined to an edge of said skirt defining an annular

groove at the juncture of the skirt and end wall for receiving the rim of a container therein whereby an annular closed space is defined between the container rim and closure, a ring having an inside diameter greater than the outside diameter of the skirt, a plurality of bridges formed about the skirt integral with said ring and adapted to be ruptured by finger pressure for securing said ring to the skirt until broken, and hinge means integrally joining said ring to said skirt for pivotal movement of said ring about said skirt.

2. In a container closure as claimed in claim 1, a peripheral shoulder formed about the container neck adjacent the edge of the skirt for preventing forcible removal of the closure.

3. In a container closure as claimed in claim 1, an annular ridge formed adjacent the annular groove at the juncture of the skirt and end wall for abutment with the inner surface of the rim of a container.

4. A closure of a material having properties of resilience and rigidity comparable to that of polypropylene for a container opening comprising: a skirt and an end wall formed integral with said skirt adapted to receive the container neck therein in tight-fitting abutting relation, an annular groove formed in proximity to the juncture of the skirt and end wall for receiving the container rim therein whereby an annular closed space is defined between the container rim and closure, an external bead formed on one of said container neck and the inner surface of the skirt and a mating annular groove formed on the other of the container neck and skirt inner surface for tight-fitting interlocking engagement of the bead in the groove, a ring formed concentric with and about said skirt having at least one frangible bridge interconnecting said ring to said skirt, and a hinge joining said ring to said skirt permitting pivotal movement of the ring about the skirt upon rupture of said frangible bridge, whereby said closure can be removed from the container by a pull of predetermined force on the said ring.

5. In a container closure as claimed in claim 4, a peripheral shoulder formed about the container neck adjacent the edge of the skirt for preventing forcible removal of the closure.

6. In a container closure as claimed in claim 4, an annular ridge formed adjacent the annular groove at the juncture of the skirt and end wall for abutment with the inner surface of the rim of the container.

7. A container closure as claimed in claim 4, in which the container rim defines with the annular groove by abutment therewith the annular space which, under a partial vacuum therein, enhances the formation of a vapor seal between the closure and container opening.

8. A container closure as claimed in claim 7, in which said skirt grips the container neck sufficiently tightly to require about a 16-pound pull on the ring to pry the closure loose from the container.