United States Patent [19]

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[11] 3,858,743

[45] Jan. 7, 1975

[54] **TAMPERPROOF PACKAGE**

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[22] Filed: **Oct. 15, 1973**

[21] Appl. No.: **406,645**

[52] **U.S. Cl.** **215/329,** 215/7

[51] **Int. Cl.** **B65d 41/04,** B65d 55/02

[58] **Field of Search** 215/7, 203, 230, 232, 329, 215/353

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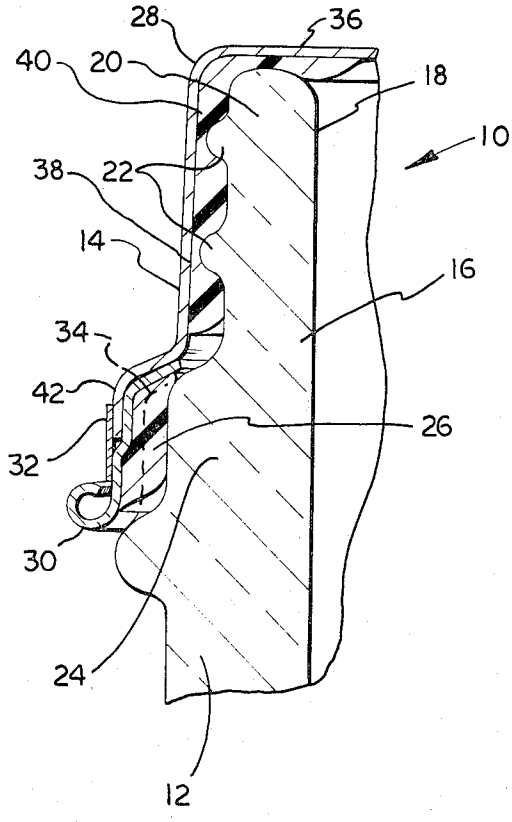
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Attorney, Agent, or Firm—A. J. Steger; E. J. Holler

[57] **ABSTRACT**

A tamperproof package including a container sealed with a turn-off or twist-off type closure. The container neck includes a threaded upper portion and a lower portion having anti-rotation lugs spaced therearound. A retaining ring lined with plastisol is positioned over the lower portion of the container neck so that the plastisol flows around the anti-rotation lugs to prevent rotation of the ring. A closure lined with plastisol is then pressed over the container neck so that the plastisol flows into contact with the threads on the container neck. A tamper-indicating tape or band is positioned around the package so as to overlap and be in contact with both the closure and the ring. The tamper-indicating tape must be removed before the closure may be rotated out of engagement with the container.

5 Claims, 4 Drawing Figures



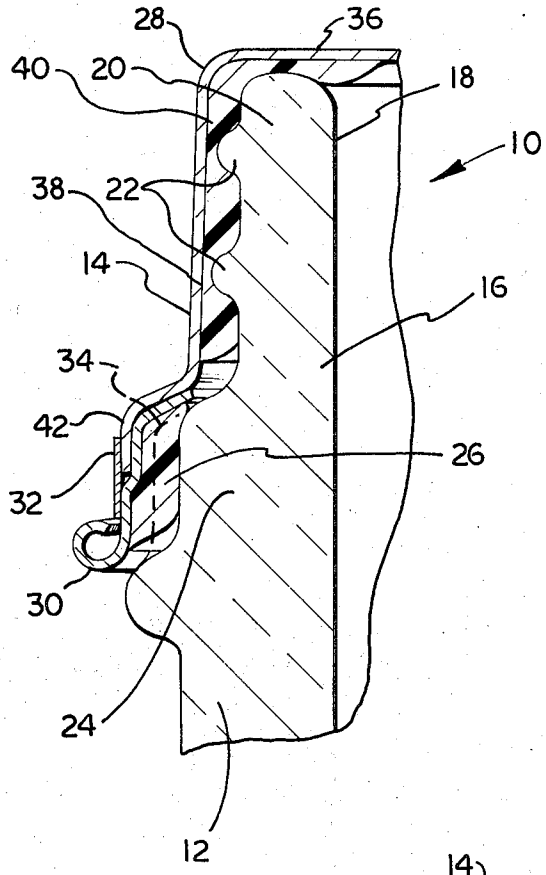


FIG. 2

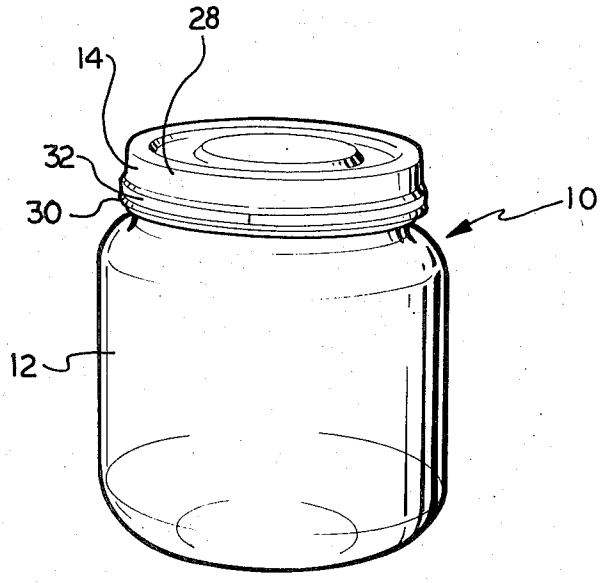


FIG. 1

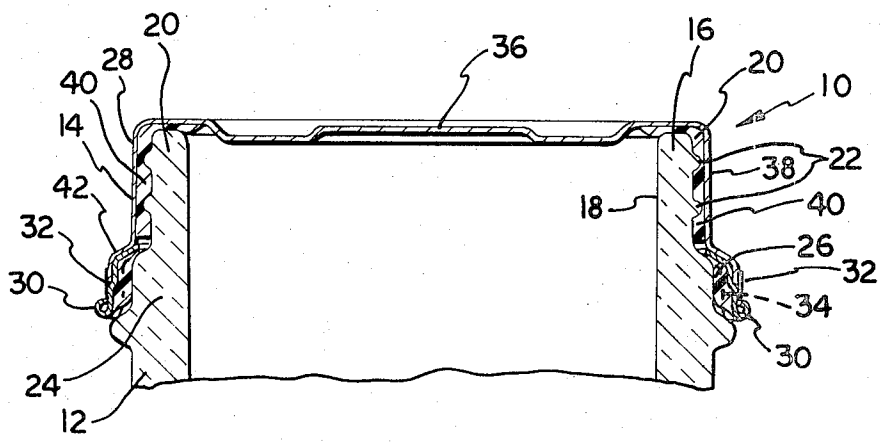

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FIG. 3

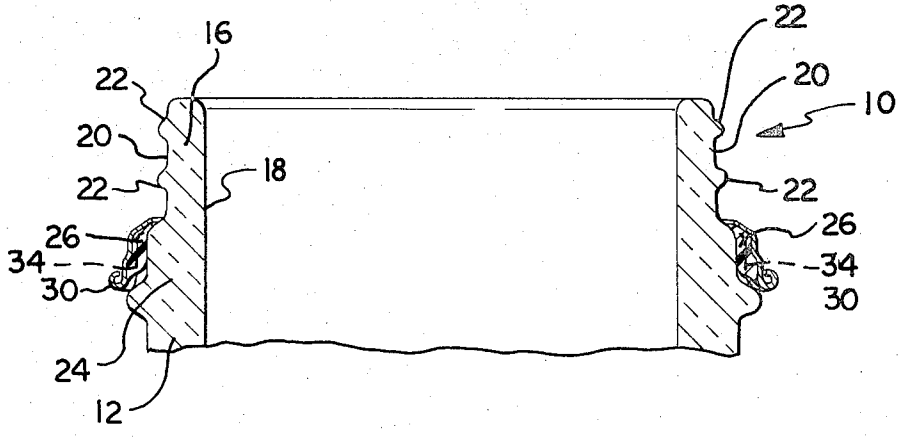

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FIG. 4

TAMPERPROOF PACKAGE

BACKGROUND OF THE INVENTION

This invention relates generally to the field of packaging, and in particular, it relates to the field of packaging food products in hermetically sealed containers. Many food products and liquors are commonly packaged in glass containers that are hermetically sealed by means of turn-off type closure caps. In order to assure a purchaser that the package has not been previously opened, tamperproof closures have been developed. The use of such tamperproof closures is gaining widespread acceptance in the packaging of such products as catsup, sauces and syrups, baby food, and will extend into the packaging of many other food and non-food products in the near future.

Tamperproof packages of the specific type under consideration include a container, usually made of glass, such as a bottle or jar, and a turn-off type metallic closure cap that is in engagement with inclined surfaces, such as the surfaces of threads on the container finish portion adjacent the container mouth opening. In the majority of the prior art designs still in use, the cap includes a separable ring at the lower end of its skirt which is connected to the skirt by circumferentially spaced frangible bridges. Cooperating means are provided on the separable ring and container finish which provide detents to prevent the ring from rotating when the cap is turned for removal. The turning of the cap creates shearing forces acting on the frangible bridges resulting in the rupture of the bridges and the separation of the ring from the upper cap portion. The separable ring, after the breaking of the frangible bridges, remains captive on the container finish to indicate to the consumer that the package has been opened.

However, the use of such separable metal caps has resulted in several problems. It has been found that the edges on the ring portion and on the closure resulting after separation of the two members frequently are rather rough. These exposed rough edges create a problem for the user of the package in that it is possible to receive cuts both from the closure that has been removed and from the ring that remains on the container. In addition, it has been found that the frangible bridges connecting the ring to the cap vary in size so that removal of the cap often takes considerable twisting force to sever the bridges. The separation of these members in some cases has been sufficiently difficult to require the use of separate tools to apply a sufficient twisting force to the cap while retaining the ring in a fixed position. Thus, while these tamperproof closures have been a first step towards indicating to the potential purchaser whether or not the package has been previously opened, they have also resulted in a few unsolved problems.

SUMMARY OF THE INVENTION

It is, therefore, an object of this invention to provide a tamperproof closure which serves as a positive indicator to the potential purchaser as to whether or not the package has been opened and also eliminates the disadvantages associated with previously used tamperproof closures.

In general, this invention provides a relatively simple, yet safe tamperproof package which includes a container sealed with a turn-off or twist-off closure. The container neck includes a threaded upper portion and a lower portion having anti-rotation lugs spaced therearound. A separate retaining ring, which is lined with plastisol, is positioned over the lower portion of the container neck so that the plastisol flows around the anti-rotation lugs to prevent rotation of the ring. A closure, also lined with plastisol, is then pressed over the container neck so that the plastisol flows into contact with the threads on the container neck. These threads then form mating camming surfaces in the plastisol to facilitate removal of the closure by twisting it relative to the container. A unique tamper-indicating tape or band is positioned around the package so as to overlap and be in contact with both the closure and the ring This tamper-indicating tape must be removed before the closure can be rotated out of engagement with the container. In this invention, both the closure and the retaining ring may have smooth edges thereby eliminating the rough edges that are associated with the previously known one-piece tamperproof closures which break in the area of frangible bridges. Once the tamper-indicating tape of this invention has been removed, the closure may be rotated or twisted out of engagement with the container without any excessive turning force, as the retaining ring is a separate member and does not provide resistance to the rotation of the cap.

In the drawings:

FIG. 1 is a perspective view of the unique tamperproof package of this invention.

FIG. 2 is an enlarged sectional view of a portion of the closure and the upper neck portion of the package of FIG. 1.

FIG. 3 is a sectional view of the neck portion of the container of FIG. 1 with the tamperproof closure of this invention positioned thereon.

FIG. 4 is a sectional view corresponding to FIG. 3 showing the retaining ring remaining on the container neck after the tamper-indicating tape and cap have been removed.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

In the drawings, a tamperproof package incorporating the unique features of this invention is illustrated and indicated generally by the numeral **10.** The package includes a container **12** and a tamperproof closure assembly **14.** The container **12** may be of any suitable wide or narrow-mouthed configuration. For the purposes of illustration, a wide-mouthed jar, similar to that used for baby food, has been selected in this case. The container **12** terminates at its upper end in a neck portion **16,** which defines a mouth or opening **18** into the container. For the purposes of this invention, the neck **16** of the container **12** includes a threaded upper portion **20** having threads **22** formed therein and a lower retaining portion **24,** which includes a plurality of anti-rotation lugs **26** formed about its circumference.

The closure assembly **14** includes three separate members, namely, a cap **28,** a retaining ring **30,** and a tamper-indicating band or tape **32.** The retaining ring **30** may be formed as shown in FIG. **2** to conform to the configuration of the retaining portion **24** of the container neck **16.** The retaining ring **30** is lined with a quantity of plastisol material **34** so that when it is placed over the retaining portion **24** of neck **12** the plastisol flows around and conforms to the shape of the anti-rotation lugs **26.** This plastisol material **34,** once it is hardened, cooperates with the anti-rotation lugs **26**

to restrain movement of the ring **30** relative to the container **12.** It should be noted that the ring **30** may be formed with smooth edges and a rolled-over end as illustrated here, as it does not have to mate in an end-to-end relationship with the closure member **28.**

The cap member **28** includes a top panel **36** and a cylindrical depending skirt portion **38.** When placed over the container neck **16** the top panel **36** completely covers the mouth **18** of the container **12** and the skirt **38** extends into overlying relationship with respect to the outer surface of the container neck **16.** The cap member **28** may also be lined with a plastisol material **40** which, when the cap is pressed downwardly over the container neck **16,** flows into engagement with the threads **22** on the container neck. This plastisol material **40** will then form mating camming surfaces to cooperate with the threads **22** to facilitate twisting of the cap **28** from the container neck **16.** It should be noted also that the cap member **28** could also be of the type that has threads formed therein which mate with the threads on the container neck so that the cap may be both screwed on and screwed off. In either case, the cap member **28** terminates in a lower flange **42** which extends into overlapping relationship with respect to the upper end of the retaining ring **30.** The tamper-indicating band or tape **32** is then positioned about the package so as to be in overlapping contact with both the cap member **28** and the ring **30.** It is suggested that the band **32** be formed from a plastic material or from a plastic reinforced paper material in order to provide the least chance of sharp edges which may inflict cuts or injuries to the user. When the package is completely assembled, as shown in FIGS. **2** and **3,** the tamper-indicating band **32** secures the cap member **28** into engagement with the ring **30** thereby preventing removal of the cap member **28.** Once the tamper-indicating band **32** has been removed, the cap member **28** is no longer restrained by the ring **30** and may be removed from the container neck **16** by twisting, for example. The package which results after removal of the tape and cap appears in FIG. **4.**

Thus, the unique package of this invention provides a tamperproof indicator to the potential user through the use of the tamper-indicating tape and a retaining ring. If the tape remains in position, the prospective purchaser can be certain that the cap member **28** has not been removed from the container **12.** If, however, the tape **32** is missing or has been improperly applied to the package, it will serve as a warning to the potential purchaser that the package may have been previously opened. It is suggested that through the use of either a suitable single use adhesive on the tape or a heat bonded tape reapplication of the tape to the container would be impossible once it has been removed. This, of course, would prevent the possibility that it could be removed to gain access to the package and replaced in conjunction with a reapplied cap member. It is also suggested that the tamper-indicating tape could be perforated so it severs thereby removing any physical connection between the cap and the ring.

The resulting tamperproof package of this invention incorporates a tape, ring, and cap, all of which are free from sharp edges which could cause injury to the user. In addition, it eliminates the manufacturing tolerance problem associated with previously used tamperproof packages where the cap member must be physically separated from the retaining ring. In this case, a suitably selected tamper-indicating band may always be removed with a reasonably simple action thereby providing access for the easy removal of the cap member.

I claim:

1. A tamperproof package comprising, in combination: a container, a retaining ring, a closure, and a tamper-indicating tape;

a container having a neck portion terminating at its end in an annular rim defining the periphery of an open mouth, the outer surface of said neck having at least one thread member formed therein adjacent to and axially spaced from said open mouth and at least one lug member formed therein adjacent to and axially spaced from said threaded member;

a retaining ring being lined with plastisol and positioned in overlying relationship with the lug member on the neck portion of said container so that said plastisol hardens around said lug to prevent rotation of said retaining ring relative to said container;

a cap member including a top panel which covers the open mouth of said container and an annular depending skirt portion connected to the marginal edge of said top panel and positioned in overlying relationship with respect to the neck portion of said container, said cap member being lined with plastisol which flows around said thread member to form a mating camming surface for removal of said cap from said container;

and a length of tamper-indicating tape positioned around said package in contact with said retaining ring and said cap to prevent removal of said cap without prior removal of said tamper-indicating tape.

2. A tamperproof package as set forth in claim **1** wherein said cap member has a lower edge which extends into overlapping engagement with said retaining ring.

3. A tamperproof package as set forth in claim **1** wherein said tamper-indicating tape comprises a continuous band of plastic material with adhesive on the side contacting said cap member and said retaining ring, said tape being removable to facilitate removal of said cap member from said container.

4. A tamperproof package as set forth in claim **1** wherein said tamper-indicating tape comprises a continuous band of plastic reinforced paper material with adhesive on the side contacting said cap member and said retaining ring, said tape being removable to facilitate removal of said cap member from said container.

5. A tamperproof package as set forth in claim **1** wherein said tamper-indicating tape comprises a perforated band of material with adhesive on the side contacting said cap member and said retaining ring, said perforated band being severable to facilitate removal of said cap member from said container.

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