# United States Patent [19]

**Rose**

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[54] **SAFETY CLOSURE**


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[52] **U.S. Cl.** ..... **215/9,** 215/46 R
[51] **Int. Cl.** ..... **A61j 1/00**
[58] **Field of Search** ..... 215/9, 43, 44, 41, 46 R



[56] **References Cited**

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[57] **ABSTRACT**

A safety closure or top for screw-type containers is provided with one or more beads, or inwardly extending ridges, to engage the bottom of the threads on the bottle, and, in certain cases to seat below a bead, or outwardly extending ridge on the bottle. To remove the top, flexible sidewalls of the top are pressed inwardly and normally disengaged bumps or partial threads on the inner side walls of the top are engaged with the threads of the bottle and the top is turned off, with the engaged threads providing the force to overcome the restraint of the bead or beads.


**8 Claims, 5 Drawing Figures**

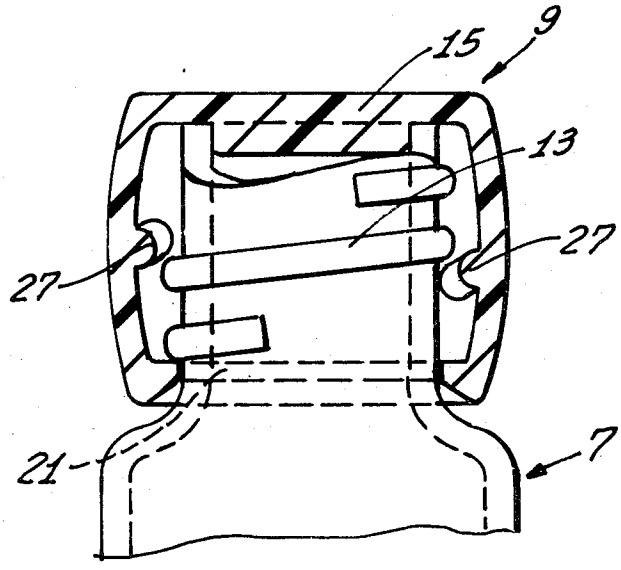


Fig. 1

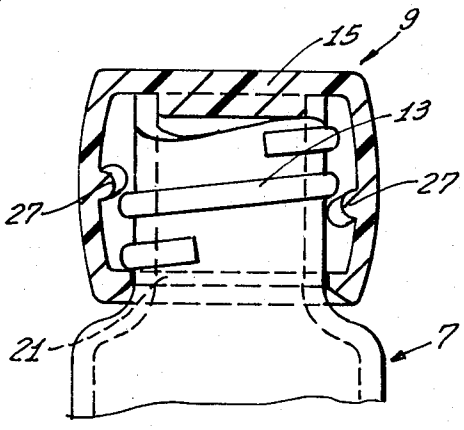



Fig. 2

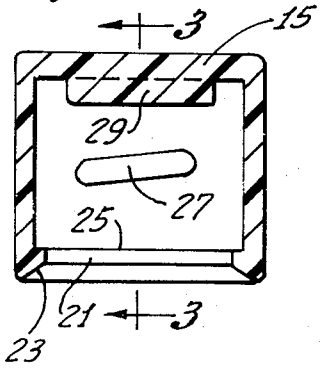



Fig. 3

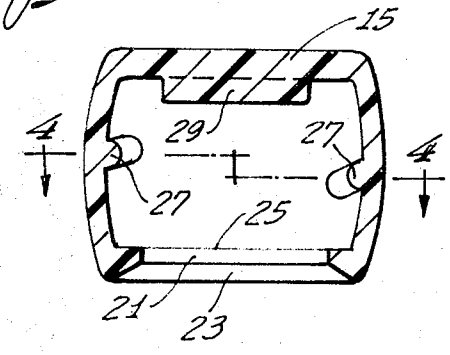



Fig. 4

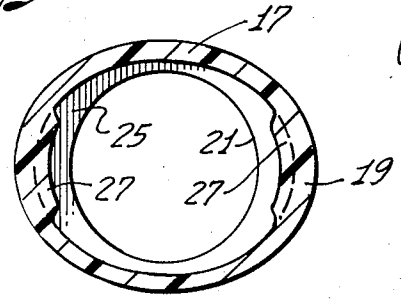
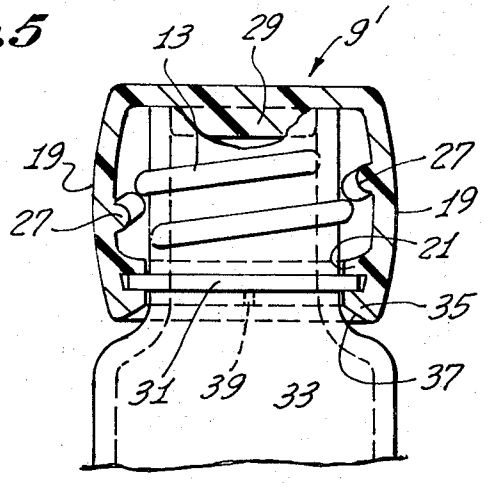



Fig. 5



# SAFETY CLOSURE

This invention relates to safety closures or tops.

In order to avoid poisoning young children, a variety of safety closures have been proposed heretofore. These include tops having an inner and an outer part, with the inner part sealing and the outer part freely rotating until interlocked with the inner sealing part of the top by one means or another. Other special tops requiring a specially constructed mating bottle are also known. These include the "Palm and Turn" bottle of U.S. Pat. No. 3,344,942, for example.

In the case of the double top safety closures, the cost of two tops is excessive. In the case of other safety closure systems, the requirement that the container be specially constructed makes for increased expense, as the common screw thread equipped bottle or other container cannot be used.

Accordingly, a principal object of the present invention is to make one-piece safety tops which can be used with simple conventional screw threaded containers.

This object is achieved, in accordance with the present invention, by making a safety top having one or more circular beads which engage the bottom of the threads on the container, and, in some instances, an additional mating bead on the container. The top is made of bendable or semi-rigid material, and is further provided with bulged out portions between the sealing top and the bead or beads. On the inner surfaces of the bulged out portions are bumps or segments of a screw thread, extending inwardly, but normally disengaged from the container threads.

If desired, the top may have a central portion which is oval in cross-section, with the bulged out portions carrying the thread engaging bumps or thread segments located at the ends of the oval, with the smooth portions of the top engaging the sides of the thread on the container.

One principle which is involved in the present design is that the oval shape simulates a handle for turning the top while pressure is applied across the shorter (smooth) portion of the oval. This tendency will provide safety against opening by young children who do not know the inner construction of the closure. On the other hand, adults, who can read instructions on the bottle, will press in at the bulged out portions, engage the threads, and open the closure.

The closures are preferably of opaque or translucent material rather than transparent material, to avoid disclosure of the inner construction of the cap.

Other objects, features and advantages of the invention will become apparent from a consideration of the following detailed description and from the drawings, in which:

FIG. 1 shows a bottle provided with a safety closure;

FIGS. 2, 3 and 4 are various views of the closure shown assembled to a bottle in FIG. 1; and

FIG. 5 shows a modified illustrative form of the closure of the invention.

With reference to the drawings, FIG. 1 shows a bottle 7 provided with a safety closure 9. The bottle is provided with threads 13 in the usual manner.

The cap 9, as shown both assembled in FIG. 1 and by itself in FIGS. 2 through 4, includes a sealing top 15, sidewalls 17, 19 which may be generally oval in cross-section, and an inwardly extending substantially circular rim 21 at the lower edge of the sidewalls. The rim 21 may have a bevelled lower surface 23 (see FIG. 2), and an upper surface 25 extending genrally perpendicular to the axis of the cap and the bottle to resist normal removal of the cap over the threads 13.



The sidewalls 17 are smooth and normally engage the threads 13 of the bottle. Walls 17 are spaced closer together than the sidewalls 19, and the latter are normally bowed or bulged outwardly away from the threads 13. The outwardly bowed walls 19 are also provided with inwardly extending partial threads, or bumps 27 positioned at the same height as the threads 13, but normally disengaged from them.

When a child tries to take the cap off the bottle, the upper surface 25 of the lip 21 engages the lower edges of the threads and prevents removal. Hwever, when an adult, after reading instructions printed on the bottle, presses in on bendable walls 19, and engages the bumps or partial internal threads 27 with the external threads 13 on the bottle, the cap is readily removed by simultaneously turning the cap, thus starting the bead 21 over the threads 13. Of course, once the bead is depressed in one region around its periphery, further turning will remove the cap.

The bevelled edge 23 of the retaining bead 21 is to facilitate recapping of the bottle.

The cap 9 may be provided with an integral sealing plug 29 on the inner surface of the top 15 to insure against fluid leakage, if desired.

The bottle cap may be made of any suitable semi-rigid or semi-bendable material such as polypropylene, Teflon, or the like, with polypropylene being preferred because of its relatively low cost.

Many standard bottles are provided with a circumferential ridge 31 of the type shown on bottle 33 in FIG. 5.

The top 9' of FIG. 5 is similar in most respects to the top 9 of FIGS. 1 through 4 but is modified to provide additional security against removal, by the addition of the lower bead 35 which engages the ridge 31. The bead 35 may be provided with a chamfer 37 for ease in recapping.

The bead 35 may be interrupted in two places, as indicated at 39, so that, when the walls 19 are pressed inward to engage the partial threads or bumps 27 with the threads 13 on the bottle, the cap tilts about the intermediate bead 21, and loosens the grip of bead 35 on the rim 31 of the bottle 33 of FIG. 5.

It is to be understood that minor variations of design are within the scope of the invention. Thus, by way of example but not of limitation, the cap could be slit vertically, either partially or completely, on either side of partial threads 27, to increase flexibility, where the flexibility and thickness of the material of the cap makes this desirable, and similarly the lower bead 21 of the cap of FIGS. 1 through 4 could be partially cut to facilitate removal.

What is claimed is:

1. A safety closure for threaded containers comprising:

a sealing top portion;

means including a lower inwardly extending bead for engaging the threaded container below the threads for preventing removal of the closure;

bendable sidewalls interconnecting said top portion and said bead; and

means including protrusions on the inner surfaces of said sidewalls, normally spaced outwardly from the threads on said container, for selectively engaging said threads and providing longitudinal force to remove said closure from said container when said bendable sidewalls are squeezed in the vicinity of said protrusions to engage said protrusions with the threads, and said cap is rotated.

**2.** A safety closure as defined in claim **1** wherein said sidewalls of said closure are generally oval in cross-section, and wherein said protrusions are located on the portion of said sidewalls which are spaced farthest from the threads of the threaded container.

**3.** A safety closure as defined in claim **1** wherein said protrusions are partial threads complementing those of the container.

**4.** A safety closure as defined in claim **1** wherein said closure is provided with an additional inwardly directed bead to engage a peripheral ridge on the container.



**5.** A safety closure as defined in claim **4** wherein said additional bead is interrupted to facilitate removal of said closure.

**6.** A safety closure as defined in claim **1** wherein said closure is made of bendable plastic material.

**7.** A safety closure as defined in claim **1** wherein said bead is provided with a bevelled lower surface to facilitate recapping of the container.

**8.** A safety closure as defined in claim **7** wherein said cap has a greater lateral dimension in one direction than another, whereby the sidewalls of said cap are located different distances from the threads of the container, and wherein said protrusions are located on sidewalls of said closure spaced away from the container threads.

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