# United States Patent [19]

**Julian et al.**

[11] **3,716,161**

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[54] **SAFETY CLOSURE FOR A MEDICINE BOTTLE OR THE LIKE**


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[73] Assignee: **Sunbeam Plastics Corporation**, Evansville, Ind.



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[52] **U.S. Cl.** ..... **215/9**

[51] **Int. Cl.** ..... **B65d 55/02**

[58] **Field of Search** ..... 215/9, 44



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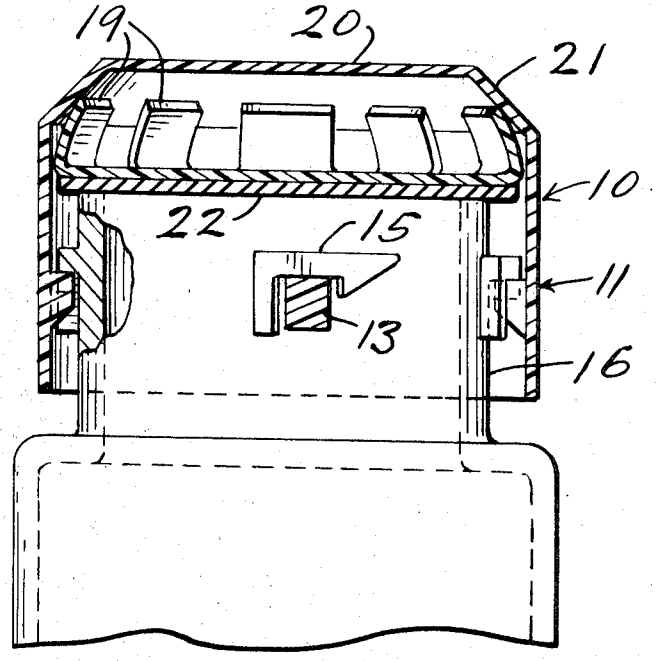
*Primary Examiner*—George T. Hall
*Attorney*—Carl F. Schaffer et al.



[57] **ABSTRACT**

A safety closure for a medicine bottle or the like. The closure and bottle neck have cooperating lug and ramp means of the bayonet type. The closure is placed over the bottle neck, depressed onto the neck and rotated relative to the neck to engage the lugs and ramps. To remove the closure, it is pressed downwardly to disengage the lugs and then rotated in the opposite direction. The closure is biased upwardly relative to the bottle neck by the engagement of an annular conical shoulder on the closure with upwardly turned fingers on a disc-like biasing element that is positioned between the top of the closure and the end of the bottle neck.


**4 Claims, 6 Drawing Figures**



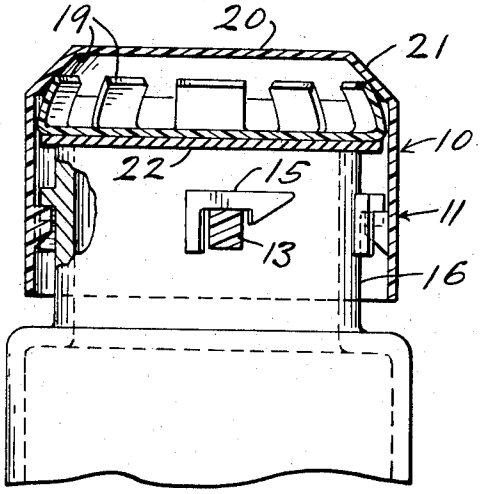



FIG-1-

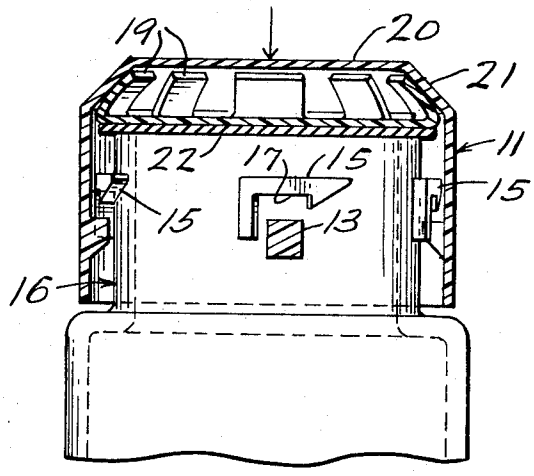



FIG-2-

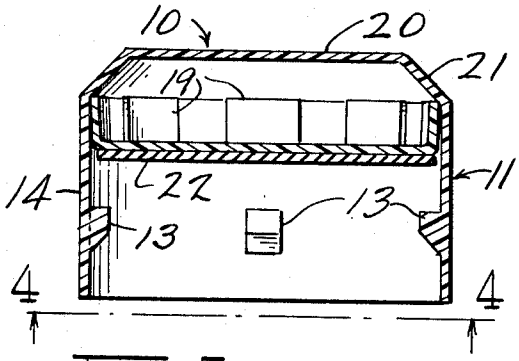



FIG-3-

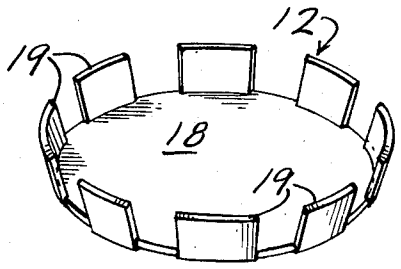



FIG-5-

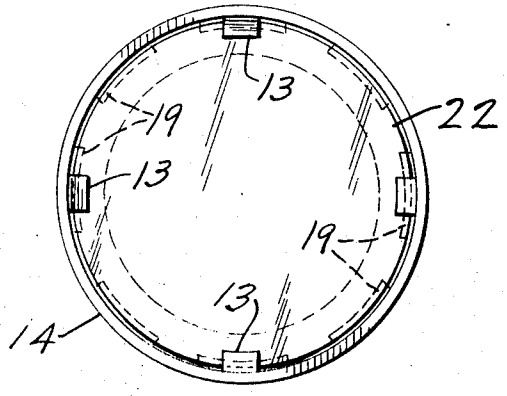



FIG-4-

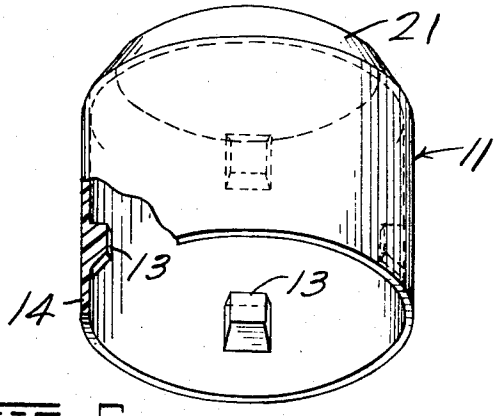



FIG-6-

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# SAFETY CLOSURE FOR A MEDICINE BOTTLE OR THE LIKE

## BACKGROUND OF THE INVENTION

Many suggestions have been made in the past for so-called "safety closures" for bottles containing medicines or other harmful or dangerous materials in order to make the bottles significantly difficult to open by a child of the age of, say, five or six years, yet readily openable by an older child or an adult. Many of these suggestions have been complex, comprising mazes and combination locks; others have been useable only for dry materials such as pills and tablets; others have required numerous engageable pieces which must be assembled by the cap manufacturer and thus which are expensive and raise the cost of the closures beyond the price which can reasonably be included in the sale price of the container and its contents.

Numerous suggestions have also been made of so-called "push-and-turn" closures comprising ramps and lugs formed on the outer sides of the container necks and inner sides of the caps, such ramps and lugs being of the "bayonet type" which are engageable and disengageable by relatively moving the cap and bottle axially and then turning. Some of these push-and-turn closures have been relatively satisfactory for dry products but have not been capable of providing a seal at the end of the container neck so as to satisfactorily contain liquids. Some closures of this type have also been awkward and unsatisfactory because the means for providing a biasing force to hold the bayonet lugs and ramps in engagement have been inefficient so that, even after the caps are in place on the containers, they are relatively loose and can easily be removed.

It is, therefore, the principal object of the instant invention to provide a relatively simple safety closure for a bottle containing either solid or liquid materials and comprising a cap which is retained on the bottle neck by bayonet type interfitting locking means and a simple biasing means positioned between the end of the neck of the bottle and the inner surface of the cap which is effective to bias the cap upwardly relative to the container neck with sufficient force to retain the cap in closed position when on the bottle, to enable the sealing of the end of the bottle for retaining liquids, and to provide a force which is significantly difficult to overcome in order to remove the cap so as to make the cap very difficult to removal by a small child.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary, vertical, sectional view of a container equipped with a safety closure embodying the invention and illustrated in closed position;

FIG. 2 is a view similar to FIG. 1 but illustrating the closure and the bottle in an intermediate position during either the closing or opening of the bottle;

FIG. 3 is a vertical, sectional view of a cap and biasing means embodying the invention;

FIG. 4 is a bottom view taken along the line 4-4 of FIG. 3;

FIG. 5 is a view in perspective of a biasing means constructed according to the instant invention; and

FIG. 6 is a fragmentary view in perspective of the cap shown in FIG. 3.



## DESCRIPTION OF PREFERRED EMBODIMENT

A safety closure embodying the invention is generally indicated by the reference number **10** and comprises an inverted, generally cup-shaped cap **11** and a biasing means **12**. The cap **11** in this embodiment has a plurality of inwardly directed lugs **13** formed on the inner surface of its annular skirt **14**. The lugs **13** are cooperating elements of interfitting locking means also comprising a similar number of ramps **15** formed on the outer cylindrical surface of a container neck **16** with which the closure **10** is to be employed. The lugs **13** and ramps **15** provide locking means of the "bayonet type" which function to retain the cap **10** on the neck **16** when the closure is in place. As in the case of other bayonet type closures, engagement and disengagement of the lugs **13** and ramps **15** is accomplished by relative axial movement of the cap **11** and the bottle neck **16** preceded or followed by relative rotation of the two and then further axial movement of the cap **11**.

Biasing force for retaining the lugs **13** in engaged position (FIG. **1**) and for resisting the axial movement necessary to disengage the lugs **13** from recesses **17** in the ramps **15** (movement from the position of FIG. **1** to the position of FIG. **2**) is provided in this embodiment of the invention by the biasing means **12**. The biasing means **12** has a disc-like body **18** and a plurality of axially extending resilient fingers **19**.

The cap **11** has a generally flat, circular top **20** and an annular, inwardly and upwardly directed shoulder **21** which joins the circular margin of the top **20** to the upper portion of the cap skirt **14**. Although the shoulder **21** is shown in the drawings as being conical, the specific shape is not critical and it is only necessary that the shoulder **21** be inclined inwardly and upwardly so as to be engageably by the upper ends of the fingers **19** in order to flex the fingers **19** inwardly when the cap **11** is forced downwardly thus to apply biasing force against the cap **11** tending to urge it upwardly. The length of the fingers **19** and the relative positions of the lugs **13** and ramps **15** must be such that the fingers are held in inwardly flexed position (FIG. **1**) even after the engagement of the interfitting lugs **13** and ramps **15** thus to continue to exert biasing force for retaining these interfitting means in engagement.

The fingers **19** must also be of such length and so positioned vertically relative to the other elements of the device that when the cap **11** is pressed downwardly to the limit of its movement (FIG. **2**) space still remains between the uppermost end of the container neck **16** and the disc-like body **18** of the biasing means **12**, to provide for the interposition of a seal **22** if the container is to contain liquids. Of course, if the container is merely to contain tablets or the like, the seal **22** may be eliminated.

What we claim is:

1. A safety closure for a pill bottle or the like, said closure comprising

1. a generally cup-shaped cap having a tubular skirt adapted to telescope over the end of the bottle neck, there being cooperating interfitting locking means on the exterior of the bottle neck and on the interior of said skirt, said cap having a generally flat top and an annular generally inwardly and upwardly extending shoulder at the junction between said top and said skirt and

2. a biasing element, said element having a disc-shaped body and a plurality of upwardly extending resilient fingers engageable with the interior surface of said shoulder on said cap and deformable inwardly thereby when said cap is moved downwardly onto the bottle neck.

2. A closure according to claim 1 in which the fingers are of such length as to be deformed inwardly when said interfitting locking means are fully engaged and are deformable further when said cap is depressed onto the bottle neck a further distance for disengaging said interfitting locking means.

3. A closure according to claim 1 in which the interfitting locking means are radially extending lugs and recessed ramps of the bayonet type.

4. A closure according to claim 3 in which the lugs are on the inner side of the skirt of the cap and also act as retainers for the biasing element.

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