

[54] **CHILD-PROOF CAP FOR MEDICINE BOTTLES**

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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.....**315/9, 43 A**

[57] **ABSTRACT**

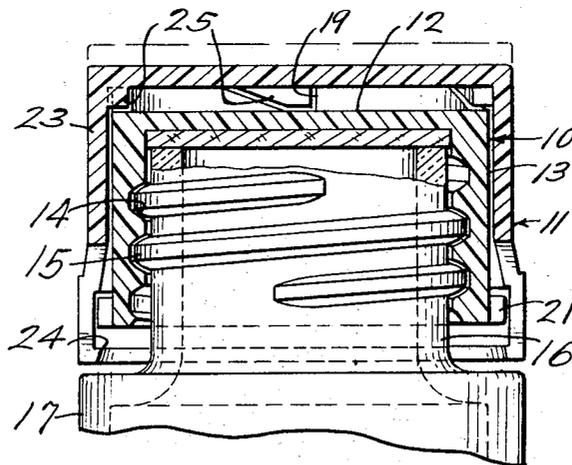
A child-proof cap for medicine bottles or the like having an inner threaded closure member and an outer overcap or driver. The closure and driver have co-operating one-way driving means for screwing the closure onto the bottle which are engaged by pushing the driver down, and second co-operating driving means for unscrewing the closure which are engaged by pulling the driver upwardly and squeezing its walls inwardly.

[56] **References Cited**

**UNITED STATES PATENTS**

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**9 Claims, 9 Drawing Figures**



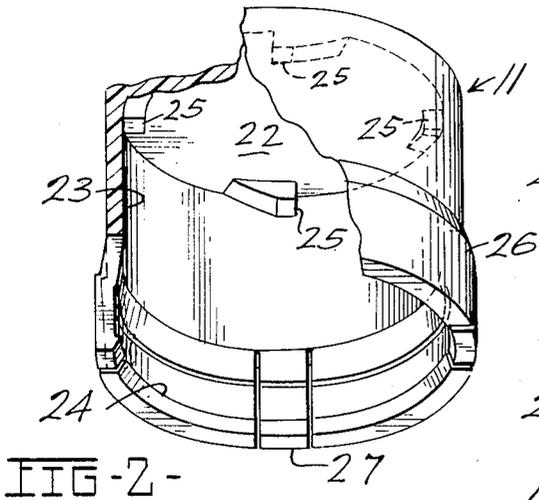


FIG-2-

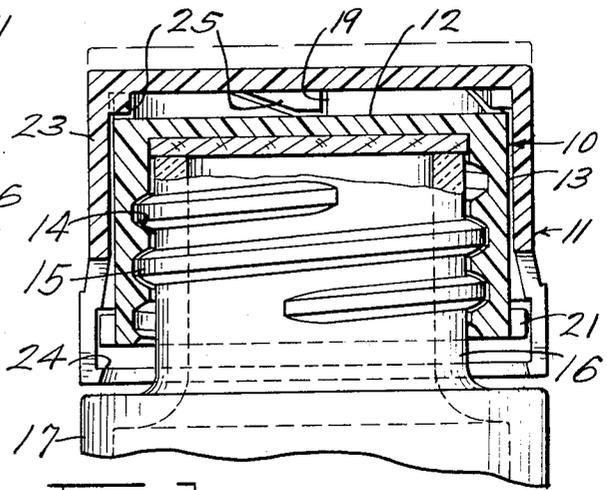


FIG-1-

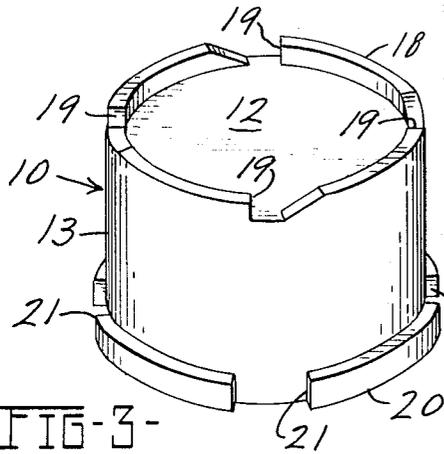


FIG-3-

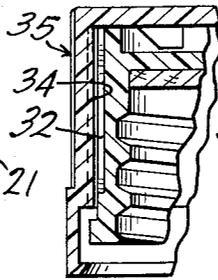


FIG-8-

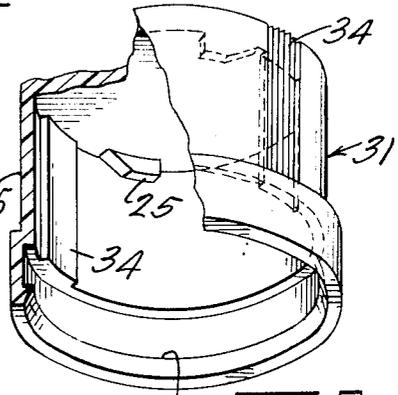


FIG-6-

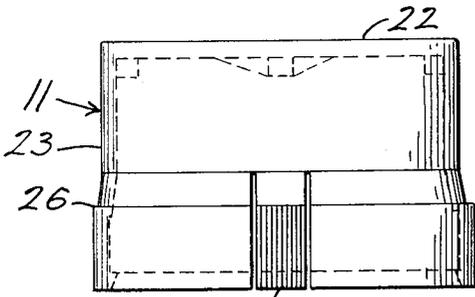


FIG-4-

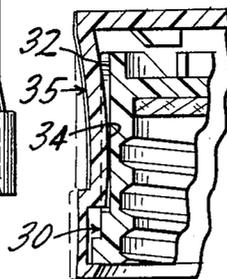


FIG-9-

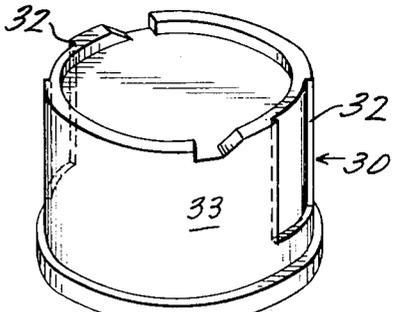


FIG-7-

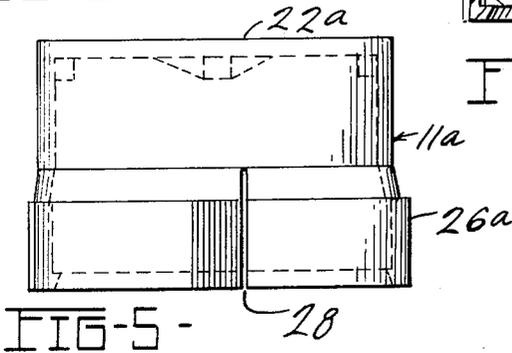


FIG-5-

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## CHILD-PROOF CAP FOR MEDICINE BOTTLES

## BACKGROUND OF THE INVENTION

Many two-part caps for medicine bottles having conventional threaded necks have been designed in the past wherein the inner element or closure is threaded to fit onto the neck of the bottle and there is an outer element or driving member which must be manipulated in one way or another in order to transfer force from that outer member to the inner closure, particularly in order to enable the inner closure to be screwed off of the neck of the bottle.

Many of the prior art closures of this general type require special manipulations of the outside driving members in order to screw the caps onto the bottles. This is not essential and, indeed, is undesirable in many cases because when the bottles are filled and capped in automatic machinery, a cap which requires a special movement in order to screw the cap onto the bottle cannot be put onto the bottle by a conventional capping device. Furthermore, a special manipulation to thread the cap onto the bottle is undesirable because it cannot readily be put onto the bottle whereas the purpose of the closure is to prevent its being readily opened.

It is therefore the principal object of the instant invention to provide a substantially child-proof cap for medicine bottles or the like which can readily be threaded onto the neck of a conventional bottle without the use of special equipment during automatic filling and capping of the bottles and without requiring any special action on the part of the person replacing the cap on the bottle after removal of the pill, medicine, or other dangerous content material.

It is yet another object of the instant invention to provide a substantially child-proof cap for the threaded neck of a bottle designed to contain medicine or other dangerous substances, which is significantly difficult of removal by a child of 5 years of age or less yet which is readily screwed onto the bottle either by hand or by automatic machinery and readily removable from the bottle by an older child or an adult.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary, vertical sectional view taken along the axis of a medicine bottle having a threaded neck and provided with a cap embodying the invention, the assembly being shown in closed position;

FIG. 2 is a fragmentary, isometric view of the outer or driving member of a cap embodying the invention, being taken from the underside thereof;

FIG. 3 is an isometric view of an inner threaded closure of a cap embodying the invention, being taken from an elevated position;

FIG. 4 is a side view in elevation of the outer driving member of a closure embodying the invention;

FIG. 5 is a view similar to FIG. 4 but showing a modified form of the outer or driving member of this embodiment of the cap embodying the invention;

FIG. 6 is a view similar to FIG. 2, shown on a slightly reduced scale and illustrating an outer or driving member of a cap embodying a modification of the invention;

FIG. 7 is a view similar to FIG. 3, but illustrating a modified form of the inner closure which co-operates with the driving member shown in FIG. 6 in a modified embodiment of a cap according to the instant invention;

FIG. 8 is a fragmentary, vertical, sectional view, similar to a part of FIG. 1, and illustrating the driving member of FIG. 6 and the closure of FIG. 7 in assembled position ready to be threaded onto the neck of a bottle; and

FIG. 9 is a fragmentary view similar to FIG. 8 but showing the two elements of this modified form of the invention in their relative positions in order to enable the cap to be unscrewed off of a bottle neck.

## DESCRIPTION OF PREFERRED EMBODIMENTS

A substantially child-proof cap embodying the invention consists of two co-operating elements viz., an inner closure 10 (FIGS. 1 and 3) and an outer driver 11 (FIGS. 1, 2 and 4).

The closure 10 is an inverted cup-shaped member having a disc shaped top 12 and a tubular side wall 13. The interior of the side wall 13 has threads 14 which are designed and adapted to be screwed onto and off of threads 15 of a neck 16 of a conventional medicine bottle or the like generally indicated by the reference number 17. The inner closure 10 has an upwardly extending annular rim 18 which surrounds its disc-shaped top 12, the rim 18 being cut away in a number of places to provide notches 19. The closure 10 also has an annular rim 20 at the lower end of its side wall 13, the rim 20 being cut away in a plurality of positions to provide recesses 21.

The driver 11 (see FIGS. 2 and 4) in this embodiment of the invention has a closed top 22 and a tubular or annular side wall 23. The axial length of the side wall 23 of the driver 11 is longer than the side wall 13 of the inner closure 10 and a lip 24 is formed on the inner side at the lower edge of the side wall 23, being of such diameter as to snap in beneath the rim 20 of the closure 10 when the two are telescoped together (see particularly FIG. 1). A number of lugs or teeth 25 are formed on the underside of the top 22 of the driver 11, the number corresponding preferably to the number of notches 19 in the rim 18 of the closure 10.

The teeth 25 are so shaped and designed as to mate into the notches 19 (see FIG. 1) to provide a first co-operating, one-way driving means by which the inner closure 10 can be rotated (clockwise in the drawing) by pressing downwardly on the driver 11 to engage the teeth 25 and the notches 19 and then rotating the driver 11.

The driver 11 has a slightly larger skirt 26 which forms the lower part of its side wall 23 and, in the embodiment of the invention illustrated in FIGS. 1-4 inclusive, the skirt 26 is slotted to provide a suitable number of flexible lugs 27 of a size appropriate to fit into the recesses 21 in the rim 20 of the inner closure 10.

When the closure 10 and driver 11 are telescoped relative to each other as illustrated in FIG. 1, and the driver 11 is pulled upwardly, disengaging the teeth 25 from the notches 19, the person desiring to open the container squeezes radially inwardly on one or more of the lugs 27, inserting the lugs 27 into the recesses 21 to provide for a second, one-way cooperating driving means in order to unscrew the cap off of the bottle neck 16.

A slightly modified form of driver, generally indicated by the reference number 11a is shown in elevation in FIG. 5. This driver 11a is substantially identical to driver 11 illustrated in FIGS. 2 and 4 except that rather than there being distinct lugs 27 as shown in FIG. 4, a single slot 28 extends upwardly through its skirt 26a thus providing for the inner flexure of that portion of the skirt adjacent the slot 28 which extends circumferentially therefrom in a direction opposite to that in which the driver 11a should be rotated in order to unscrew the closure 10 from the bottle neck 16. In a conventional arrangement where the bottle neck 16 is provided with a right hand thread 15, the flexible portion of the skirt 26a would extend in a clockwise direction from its slot 28.

A second embodiment of the invention is illustrated in FIGS. 6-9 inclusive. In this embodiment of the invention as inner closure 30 and a driver 31 are illustrated as being generally quite similar to the closure 10 and driver 11. The difference between the embodiment of the invention illustrated in FIGS. 1-5 inclusive, and that illustrated in FIGS. 6-9 inclusive, lies in the construction of the second one-way driving means.

The inner closure 30 is illustrated as having a pair of axially extending recesses 32 formed in the upper part of its side wall 33. In this embodiment of the invention the driver 31 has relatively flexible thickened sections 34 formed in its side wall 35 of such size and configuration as to fit within the respective recesses 32 formed in the closure 30.

It should be noted, however, and as is illustrated in FIG. 8, the thickened sections 34 extend axially along the side wall 35 toward its lower edge a distance such that the thickened sections 34 or lugs cannot be squeezed inwardly into the recesses 32 when the driver 31 is telescoped downwardly on the inner

closure 30 a distance sufficient to drive the closure 30 onto the bottle neck 16. Only when the driver 31 is pulled upwardly relative to the closure 30 can the thickened lug sections 34 be squeezed inwardly into the recesses 32 thus to deliver rotational force applied to the driver 31 to the closure 30 in order to unscrew it off of the bottle neck 16.

What I claim is:

- 1. A child-proof cap for medicine bottles and the like, having threaded necks, said cap consisting of
  - a. an inner, inverted, cup-shaped closure having,
    - 1. a tubular side wall,
    - 2. a disc-shaped top,
 the interior of said side wall having threads adapted to be screwed on to and off of such bottle neck,
  - b. an outer, inverted, cup-shaped driver having,
    - 1. a tubular side wall of axial length greater than the side wall of said closure,
    - 2. an inwardly directed lip at the lower end of said side wall adapted to snap beneath the lower edge of the side wall of said closure for retaining said driver on said closure,
  - c. first co-operating one-way driving means on said closure and said driver,
    - 1. said first driving means being engaged by moving said driver downwardly onto said closure and effective for rotating said closure onto the bottle, and
  - d. second, co-operating driving means,
    - 1. a first element thereof comprising an abutment on the exterior of the side wall of said closure and a second element thereof being a radially inwardly displaceable segment of the side wall of said driver.
    - 2. A cap according to claim 1 in which the first driving means consists of co-operating elements on the top of the clo-

sure and the underside of the top of the driver.

3. A cap according to claim 2 in which the first co-operating driving means consists of notches formed in the top of the closure and co-operating teeth integral with the top of said driver and extending downwardly from the undersurface thereof.

4. A cap according to claim 1 in which the closure is formed from a relatively stiff, inflexible material and the driver is formed from a relatively flexible material whereby said driver may be snapped into functioning position over said closure.

5. A cap according to claim 1 in which the elements of the second driving means consists of recesses formed in the outer side of the wall of the closure and radially inwardly displaceable lugs on the side of the wall of the driver.

6. A cap according to claim 5 in which the recesses in the wall of the closure have axially extending side walls lying in radial planes and the lugs on the side walls of the driver are complementary to said recesses.

7. A cap according to claim 5 in which the recesses in the wall of the closure have at least one generally radially extending side wall engageable for screwing the closure off of the bottle and the lugs on the side walls of the driver have at least one opposed edge engageable with the edge of one of such recesses.

8. A cap according to claim 5 in which the lugs are formed on sections of the side wall of the driver which sections are flexibly connected to said side wall and are displaceable radially inwardly by pressure on the exterior of said sections.

9. A cap according to claim 5 in which the recesses in the outer side wall of the closure have circumferentially extending bottom walls and the lugs on the side wall of the driver extend to a level lower than said bottom walls when said driver is at the lower position on said closure.

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