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Kessler et al.

[11] **3,830,392**

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[54] **PLASTIC SELF-RECLOSING SAFETY CAP WITH ELASTIC SPRING**

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[73] Assignee: **said Kessler, by said Libman**

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[52] **U.S. Cl.** **215/9,** 215/76, 222/513, 220/35

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

[58] **Field of Search** ..... 215/9, 46 R, 76; 206/42; 220/35; 222/513, 519, 520

[56] **References Cited**

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Primary Examiner—George T. Hall

[57] **ABSTRACT**

A plastic self-reclosing safety cap is described which is made of two molded pieces, one fixed to the bottle or container which it closes, and the other piece nested over the first so as to normally close an aperture, but which can be opened by first pulling and then twisting the outer piece to align its aperture with the aperture in the first cap, against the resilience of an integral elastic annular band which restores the normal closed condition when the opening force is released.

8 Claims, 8 Drawing Figures

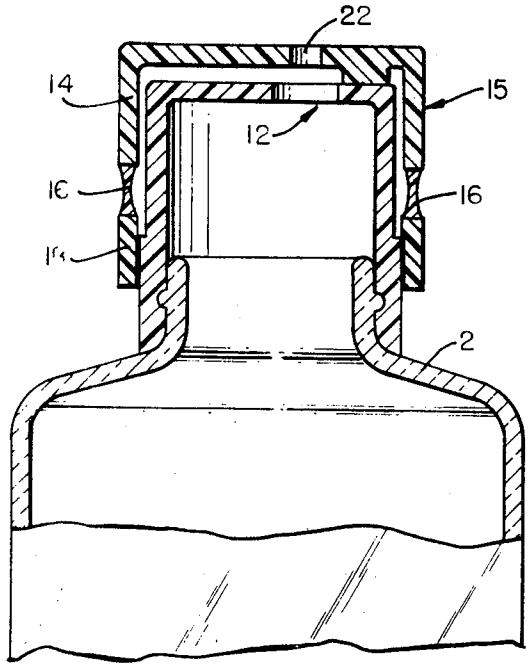


FIG. 1.

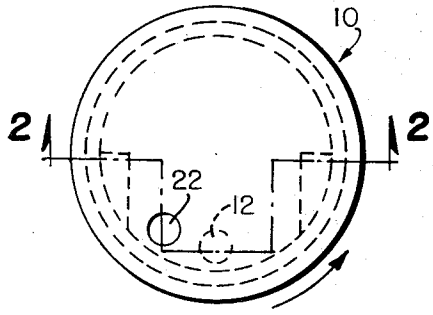
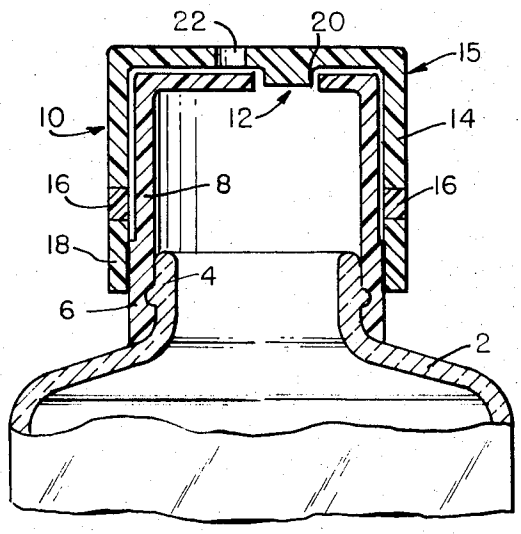


FIG. 2.



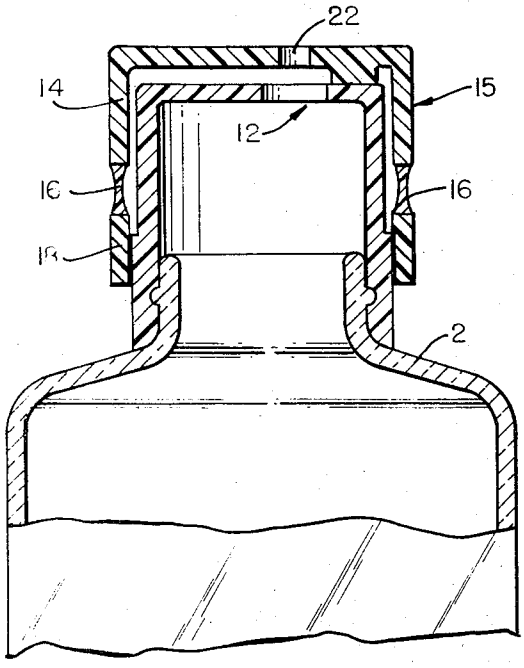


FIG. 3.

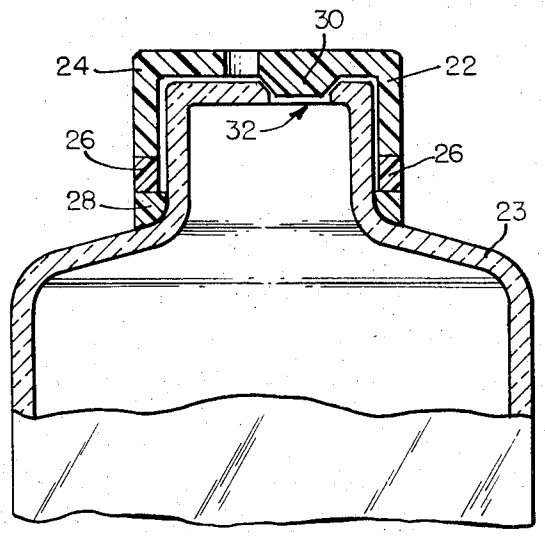


FIG. 4.

FIG. 5.

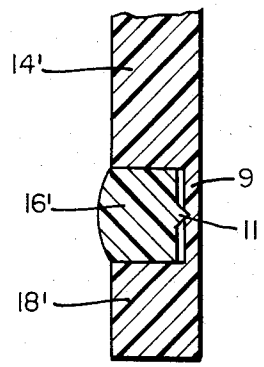


FIG. 6.

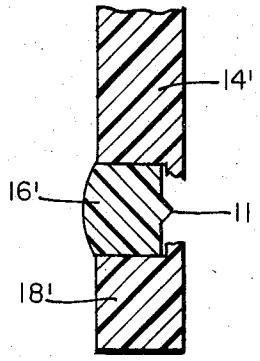


FIG. 7.

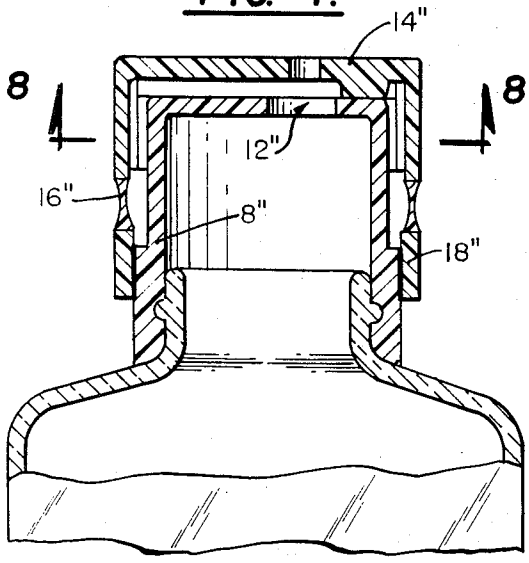
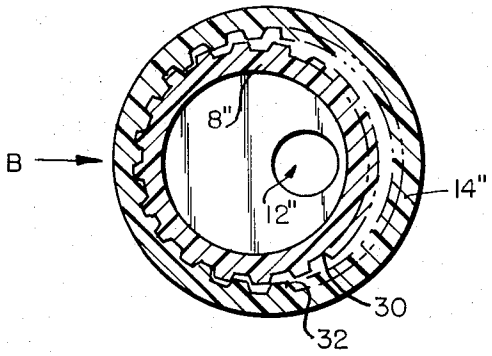


FIG. 8.



PLASTIC SELF-RECLOSING SAFETY CAP WITH ELASTIC SPRING

This invention relates to safety caps for containers such as bottles containing liquids or pills which should not be accessible to small children. Such safety containers usually require the use of both hands, and the application of considerable force in more than one direction so as to be beyond the capabilities of a small child. The present invention provides which a container in which an outer cap must be first pulled axially away from the neck of the bottle or container, and then twisted so as to align an opening in the outer cap with an opening in the inner cap before the contents can be dispensed. This requires the use of both hands, and when the opening force is released, the cap is restored to its initial closed position, in the present case by means of an integral elastic spring which is molded as part of the outer cap.

The specific nature of the invention, as well as other objects and advantages thereof, will clearly appear from a description of a preferred embodiment, as shown in the accompanying drawings, in which:

FIG. 1 is a plan view of a bottle having a cap according to the invention;

FIG. 2 is a sectional view taken on line 2—2 of FIG. 1, showing the cap in its closed position;

FIG. 3 is a view similar to FIG. 2, but showing the cap in its open condition;

FIG. 4 is a similar sectional view of a modified form of cap and bottle;

FIGS. 5 and 6 are sectional views showing one method of making the outer cap unit;

FIG. 7 is a sectional view of another form of the invention; and

FIG. 8 is a sectional view taken on line 8—8 of FIG. 7.

As shown in FIGS. 1 and 2, the bottle 2, which is shown as glass but may also be made of metal or plastic, is provided with a neck 4 preferably having an annular bead 6 for firmly retaining the inner piece 8 of a two-piece plastic cap 10. Cap 8 has an aperture 12 and is preferably immovably fastened to the neck 4 as by adhesive, spin welding, or any other known method. Outer piece 15 has an integral annular band 16 of resilient plastic material having sufficient elasticity to be similar to relatively soft rubber, such materials now being readily available. The outer cap also has a lower portion 18 which is made of hard plastic similar to the top portion 14, and both of these pieces are integrally connected to the elastic band 16 so that the outer piece is an integral unit having an upper and lower section 14 and 18 respectively connected by the resilient band 16. The outer piece has a downwardly projecting closure stop portion 20 which normally fits into the aperture 12 in the inner piece so as to provide a reasonably tight closure for aperture 12; and in addition prevents rotation of piece 14 with respect to the inner piece 8. The outer piece 14 also has an aperture 22 which in the initial position shown in FIG. 2 is displaced from aperture 12 and is therefore locked by the top portion of inner piece 8.

To obtain access to the contents, the outer cap 14 must be pulled away axially from the bottle and from inner cap 8 until the closure stop 20 is clear of aperture 12, and the outer cap is then twisted counterclockwise until aperture 22 is aligned with aperture 12 as shown in FIG. 3. This is accomplished against the resilience of

the elastic band 16, which is shown distorted in FIG. 3 due to the pressure required to align the two apertures. The contents can now be poured or removed from the container 2; it will be noted that both hands must be used to hold the apertures in place while the contents are being removed. When the hand pressure is released on the outer cap, the resilience of elastic band 16 restores the cap to its initial condition. It will be understood that the lower portion 18 of the outer cap is firmly fixed, as by adhesion or spin welding to the inner piece 8, so that only the top portion 14 can be moved with respect to the inner piece.

FIG. 4 shown another form of the invention in which the bottle itself is molded so as to provide, in effect, the inner piece 8 of FIG. 2. In this case, the outer piece is very similar to the outer piece of FIG. 2, with portions 24, 26 and 28 corresponding to portions 14, 16 and 18 of FIG. 2. Piece 28 is, of course, firmly fastened to the container in any known manner. In this Figure, it should be noted that the closure stop plug 30 is shown as tapered, in order to provide a better seal, and the rim of aperture 32 may be correspondingly tapered, if desired, to provide a mating seat.

FIGS. 5 and 6 show one method of making the outer cap 15 by the use of known dual extrusion techniques. First the outer cap is molded as a single piece including both upper section 14′ (corresponding to part 14 in FIG. 2) and lower section 18′ (corresponding to 18 in FIG. 2), both parts being connected by a thin shell 9 bridging and connecting the two sections, which may have a weakening notch 11, or alternatively, the entire bridge portion 9 may be as thin as possible and yet hold the two sections together. At a subsequent step in the operation the soft elastic band 16′ is now applied to produce a cross-section as shown in FIG. 5. After this, the two parts are rotated or otherwise moved relative to each other to break up the frangible shell portion 9 and leave the two sections hold together only by the elastic band 16′, or alternatively, the cap may be assembled on the bottle in the condition of FIG. 5 and the shell 9 broken by the user the first time the cap is opened.

Although the cap is shown as being all-plastic, it will be apparent that the hard plastic parts could also be of aluminum or some other suitable metal.

FIGS. 7 and 8 show a form of the invention which permits the contents of the bottle to be removed with the use of one hand only to keep the cap open. This is accomplished by providing ridges as shown at 30 and 32 respectively on the outer surface of inner section 8″ and the inner surface of outer section 14″, these being preferably axially extending ridges with tapered sides. After the cap is opened with two hands as previously described, one finger (or the thumb) of one hand holding the bottle is pressed against the side of the cap as indicated by arrow B so that opposing ridges 30 and 32 interlock at the side where the pressure is applied, which keeps the outer section 14″ from rotating under the elastic pull of band 16″ so that the cap remains open. When the side pressure is released after use, due to the slight taper of the sides of the axial ridges, the inner and outer parts of the cap disengage and the cap returns to its closed position under the elastic pull of the band 16″.

We claim:

1. a. A dispensing container having a safety closure,

b. said container comprising a fixed portion having a first top wall portion and a first side wall portion,

c. said top wall portion having an off-center first dispensing aperture,

d. an outer cap member having a movable section slidably covering at least a part of said neck portion and having a second side wall portion and a second top wall portion extending across said first top wall portion, and having a second dispensing aperture aligned with said first dispensing aperture in one radial position of said outer cap member,

e. said second top wall portion covering said first aperture in another radial position of said outer cap member,

f. an annular elastic band, having a lower and an upper edge, extending circumferentially around said neck portion and fixed at its lower edge with respect to said fixed portion and at its upper edge to the bottom edge of said movable member to normally retain said outer cap member in said other radial position wherein said first aperture is covered,

g. said elastic band being circumferentially elastically distortable by manual force applied to said outer cap to permit said second aperture to be aligned with said first aperture.

2. The invention according to claim **1,**

h. and a small plug integral with said second top wall and extending downwardly therefrom into said first aperture when said outer cap is in said other radial position, to prevent radial rotation of said outer cap until said outer cap is first pulled away axially from said fixed portion sufficiently to clear said small plug.

3. The invention according to claim **2,**

i. said container having a pouring aperture,

j. and said outer cap and said fixed portion being of at least semi-rigid plastic material, the bottom of said neck portion being fixed to said neck container around said pouring aperture,

k. and an annular rigid plastic rign surrounding said neck portion and fixed thereto, the bottom of said elastic band being fixed to a portion of said ring.

4. The invention according to claim **2,**

i. said fixed portion being integral with said container and of the same material.

5. The invention according to claim **2,** and an annular rigid plastic ring surrounding said fixed portion and fixed thereto, the bottom of said elastic band being fixed to a portion of said ring.

6. The invention according to claim **5,**

i. at least said outer cap member being of rigid plastic material, and including said movable section and a lower section connected by said elastic band, said lower section being said annular plastic ring,

j. and a thin frangible band of said rigid plastic material between said upper and said lower sections and serving to hold them together prior to application of said elastic band to the outer cap.

7. The invention according to claim **1,**

h. and mutually interlocking elements on the inner side of said second side wall portion and on the outer side of said first wall portion for retaining said outer cap member against rotation when lateral pressure is applied between said two wall portions.

8. The invention according to claim **7,**

i. said mutually interlocking elements being axially extending ridges having tapered sides.

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