United States Patent [19]

Hrubesky

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[54] **CHILD-RESISTANT PLASTIC OVERCAP**

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[52] **U.S. Cl.** **215/219**

[51] **Int. Cl.²** **B65D 55/02**

[58] **Field of Search** 215/9, 219

[56] **References Cited**

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[57] **ABSTRACT**

A metal screw-cap and deformable plastic overcap are combined to provide a security closure. The overcap in its normal undeformed condition is freely rotatable about the screw-cap. The overcap is deformed by radial pressure to engage its serrations with the knurled screw-cap, thereby allowing removal and reapplication to a container neck. The overcap is provided with strategically placed slits or voids about its periphery which enhance its flexibility. This enables the adult user not only to see the inner cap but also serves to guide him to apply sufficient pressure to achieve a more tightly closed cap. The slits insure that he is adequately gripping the inner cap. The slits also permit the user to see if the overcap is slipping rather than engaging the screw-cap.

13 Claims, 6 Drawing Figures

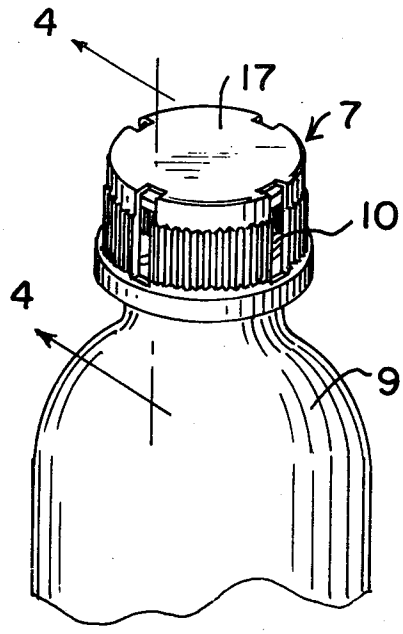


FIG. 1

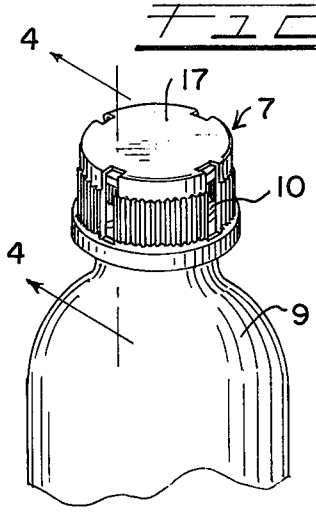


FIG. 2

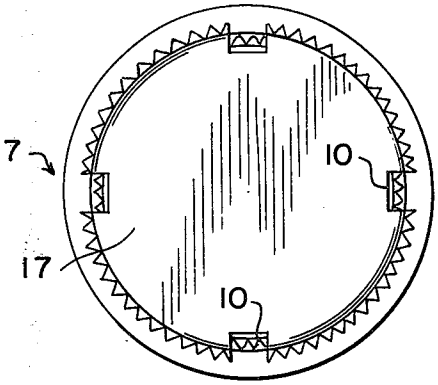


FIG. 3

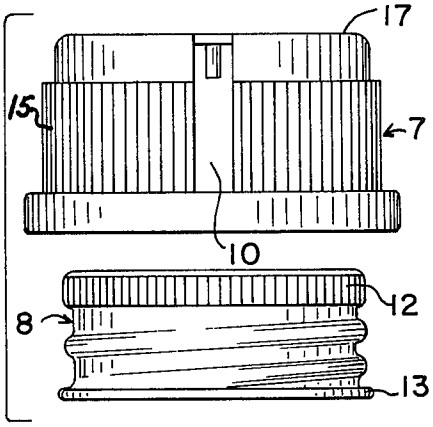


FIG. 4

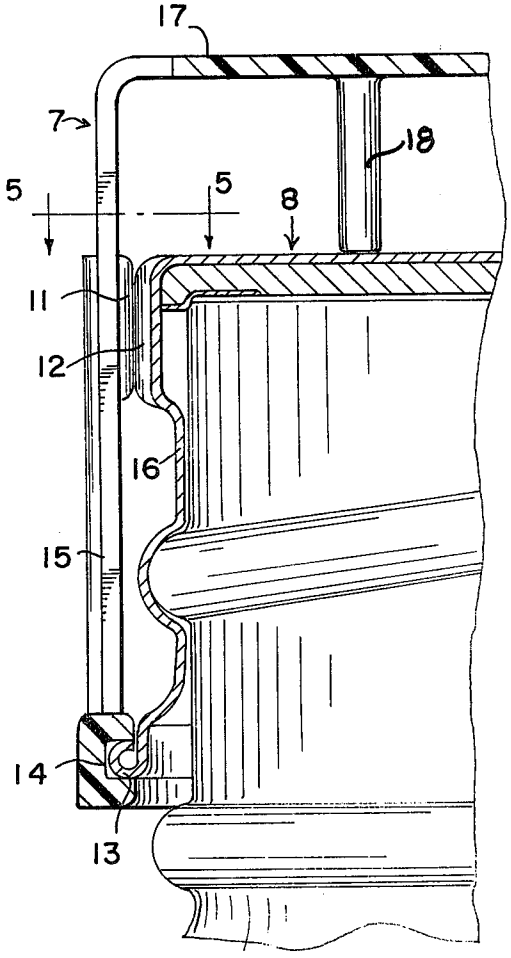
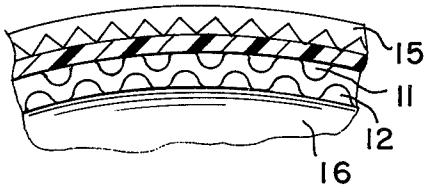


FIG. 5



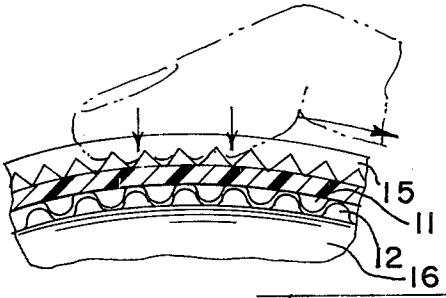


FIG. 6

CHILD-RESISTANT PLASTIC OVERCAP

SUMMARY OF THE INVENTION

It is well known that the accumulation of medicines and household chemicals commonly found in the home poses the threat of death or serious injury to small children. Storage of these materials in places supposedly beyond the reach of such children has not proven wholly satisfactory. It is, therefore, one of the important objects of the present invention to provide an improved safety or security closure for a standard screw-type container which may be readily removed by an adudlt but which will resist the efforts of small children to obtain access to the contents of the container.

It is a further object to provide an improved security closure wherein the standard metal screw-cap may be employed with little or no modification thereto; and more particularly it is an object to provide a cover member that may be combined with such a screw-cap to provide a security closure.

It is another object to provide an improved security closure that provides the adult user with visual clues as to its method of operation while retaining its child-resistant features.

It is still another object to provide an improved security closure that will automatically assume a secured condition and that will require a special radial pressure to be exerted to allow it to be removed.

BRIEF DESCRIPTION OF THE DRAWINGS

The various features and advantages of the security closure of this invention will be more apparent from the following detailed description when considered in connection with the accompanying drawing wherein:

FIG. **1** is a perspective view of the upper portion of a screw-type container having in association therewith a closure device which is representative of the present invention.

FIG. **2** is a top view of the security closure shown in FIG. **1.**

FIG. **3** is a side elevation view of the elements comprising the closure.

FIG. **4** is an enlarged fragmental sectional view of the security closure shown in FIG. **1,** with the overcap and screw-cap shown in uncoupled relation thereby rendering the overcap freely rotatable with respect to the screw-cap.

FIG. **5** is an enlarged fragmental sectional view illustrating the relation of the sidewalls of the undeformed overcap and the screw-cap.

FIG. **6** is a view similar to that of FIG. **5,** but showing the sidewall of the overcap deformed by radial pressure, thereby engaging the internal serrations of the overcap with the knurling of the screw-cap.

As shown in the drawings, the security closure of this invention includes a metal screw-cap **8** which screws onto a container **9** and which is surrounded by an overcap **7.**

The screw-cap **8** as shown in FIG. **3** may be essentially the same as common non-security metal screw-caps. A band of knurling **12** encircles the screw-cap sidewall **15** near the top of the cap and a bead or lip **13** encircles the sidewall **15** at its lower rim.

The overcap **7** as best shown in FIGS. **1** and **3** may be formed of a thermoplastic material such as polyethylene, polypropylene or other plastic material having some flexibility. It consists of a top circular panel portion **17** and depending cylindrical sidewall portion **15.** The overcap sidewall **15** is formed with strategically placed slots or voids **10** of a generally rectangular shape. A band of serrations **11** capable of mating with the knurling **12** of the screw-cap circles the interior of the sidewall **15,** as does a groove or channel **14** near the sidewall bottom. This channel **14** receives and interlocks with the screw-cap lip **13** thereby preventing separation of the overcap **7** and the screw-cap **8.**

A spacing rod **18** is provided which helps maintain the overcap **17** in proper vertical relation with the screw cap **8** and also allows the use of an overcap **17** with a longer sidewall **15,** said greater length serving to increase the flexibility of said sidewall **15.**

The function of the closure should be apparent from the foregoing description, in that while the overcap is in an undeformed state as shown in FIG. **5,** it will rotate freely with respect to the screw-cap **8.** Removal of the closure requires the application of radial pressure as shown in FIG. **6** which deforms the overcap sidewall **15** and causes the overcap serrations **11** to engage the screw-cap knurling **12.**

The overcap sidewall voids **10** serve to enhance the flexibility of the overcap and enable the adult user to directly grasp the inner cap by inserting his finger nodes through the voids, thereby achieving a more tightly closed cap. They further serve to provide the user with a means of visual identification of the inner metal screw-cap and its closure principle while maintaining the child-resistant features of the closure. The voids **10** are configured so as to project somewhat into the overcap top **17** thereby facilitating manufacture of the overcap **7** by the process of injection molding. I claim:

1. A safety closure comprising relatively rotatable telescoped inner and outer caps, said caps each comprising a top and a sidewall depending therefrom, means for interlocking said caps attendant to a radial displacement of said outer cap, said outer cap being flexible and having flexibility-enhancing means comprising peripheral openings reducing structural rigidity in the peripheral portion of said outer cap to accommodate said radial displacement with minimal pressure to engage said means, said peripheral openings serving to provide the user with a means of visual identification of said inner cap and its closure principle while maintaining the child-resistant features of the closure, said openings being dimensioned to admit the nodes of the user's fingers to enable the user to obtain a limited direct grip on said inner cap attendant to distortion of said outer cap against said inner cap.

2. An improved safety closure as defined in claim **1** wherein said peripheral openings are symetrically located.

3. A safety closure comprising a metal inner cap and a flexible plastic outer cap encompassing said inner cap and interlocked therewith, said caps being relatively rotatable, each of said caps comprising a top and a skirt, said outer cap skirt being substantially longer than said inner cap skirt thereby enhancing the flexibility of said outer cap skirt, said outer cap skirt having axially extending circumferentially spaced bands spaced apart a distance sufficient to enable the user to press the nodes of his fingers therebetween and thereby obtain a limited direct purchase on said inner cap and thereby achieve a tightly closed cap.

4. An improved safety closure as defined in claim 3 wherein said slots are generally rectangular.

5. A safety closure comprising a knurled metal screw-cap and a flexible plastic overcap, said overcap and said screw-cap each comprising a generally horizontal panel and integral skirt depending therefrom, said overcap skirt being substantially longer than said screw-cap skirt, whereby said greater length serves to increase the flexibility of said overcap skirt, said overcap skirt having a plurality of slots elongated axially of the closure and having terminal ends extending into the overcap top, said slots having a width of an extent enabling the user to insert the nodes of his fingers through said slots and thereby obtain a limited direct grip on said inner cap, and a band of serrations on the inner surface of said overcap skirt engagable with said screw-cap knurling upon radial inward deformation of said overcap skirt.

6. An improved safety closure as defined in claim 5 wherein said slots extend into the top of said outer cap defining curved openings therein.

7. A safety closure comprising a toothed inner metal threaded cap adapted to be screwed on a threaded container neck and an outer flexible plastic cap encompassing said inner cap, said inner and outer caps each having a skirt and a top, said outer cap skirt being substantially longer than said inner cap skirt and projecting axially beyond one end of the inner cap and defining a supplemental deflection region to enhance the flexibility of said outer cap skirt, said inner and outer caps being relatively rotatable, said outer cap having teeth on its inner surface, adjacent to said deflection enhancing region, engageable with said toothed inner cap upon the radial deformation of said outer cap.

8. An improved safety closure as defined in claim 7 wherein said slots are symetrically located.

9. An improved safety closure as defined in claim 8 wherein said slots are generally rectangular.

10. A safety closure comprising relatively rotatable telescoped inner and outer caps, means for interlocking said caps attendant to a radial displacement of said outer cap, said outer cap being flexible and having means for insertion of the nodes of a user's fingers through the peripheral portion of said outer cap upon gripping the same to provide the user with a limited direct grip on said inner cap thereby enabling the achievement of a more tightly closed cap.

11. A safety closure comprising a metal inner can cap, a flexible plastic outer cap encompassing said inner cap, said caps being relatively rotatable, said outer cap comprising a top and a lower rim, said top and said lower rim being connected by a plurality of circumferentially spaced bands defining nodal-insertion areas therebetween wherein the user may insert the nodes of his fingers and thereby obtain a limited direct grip on said inner cap, means for constraining said caps from separating, and means for interlocking said caps for corotation attendant to a radial displacement of said outer cap.

12. An improved safety closure as defined in claim 2, wherein one of said tops of said caps comprises axially directed spacing means for holding said tops a substantial distance apart and said side wall of said outer cap is considerably longer than that of said inner cap, thereby enhancing the flexibility of said outer cap and minimizing the flexibility of said inner cap.

13. An improved safety closure as defined in claim 12, wherein said spacing means comprises an axially directed spacing rod formed on one of said tops and extending to the other.

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