

[54] SAFETY CLOSURE

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

[51] Int. Cl. A61j 1/00, B65d 55/02

[58] Field of Search 215/9, 43 A, 46 R

[56] References Cited

UNITED STATES PATENTS

3,138,277	6/1964	Milbourne	215/9
3,412,886	11/1968	Colella et al.	215/9

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[57] ABSTRACT

A childproof safety closure of two parts, one part having a skirt with internal screw threads to form a conventional screw cap closure, the second part being an overcap completely covering the threaded closure member and being freely rotatable in relationship thereto, said overcap having on its top a projecting stud and a similar shaped opening which serves as a key for unscrewing the inner closure member of another closure of similar construction.

3 Claims, 7 Drawing Figures

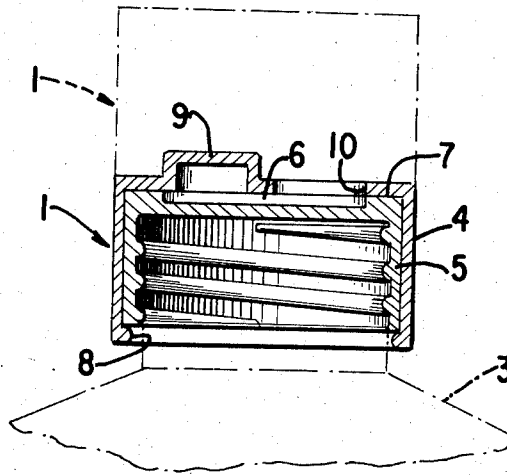


FIG. 1

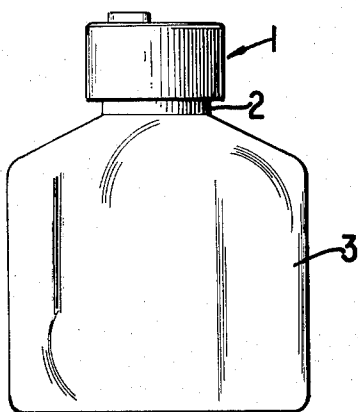


FIG. 2

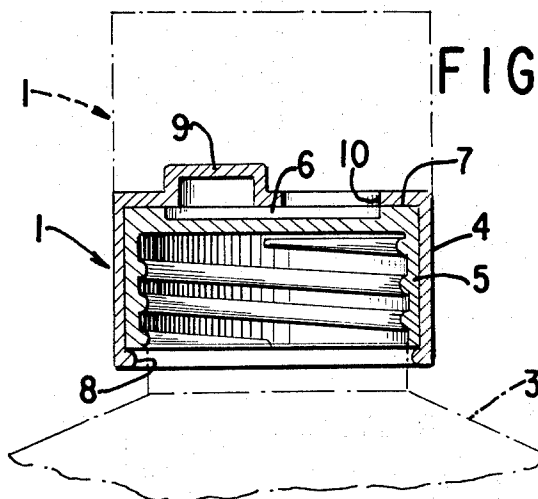


FIG. 3

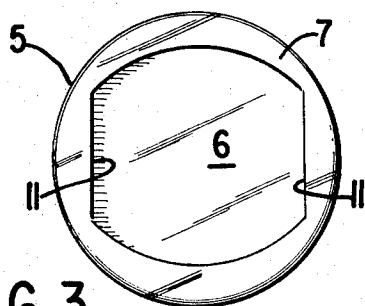


FIG. 5

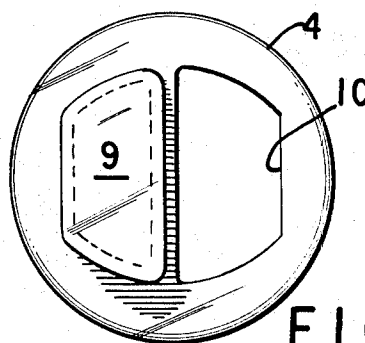


FIG. 4

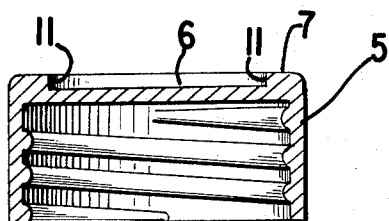


FIG. 6

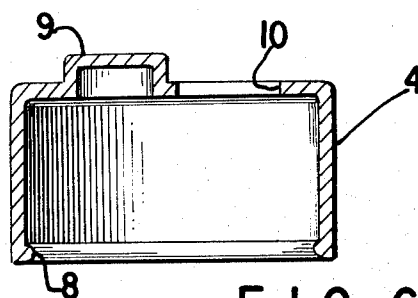
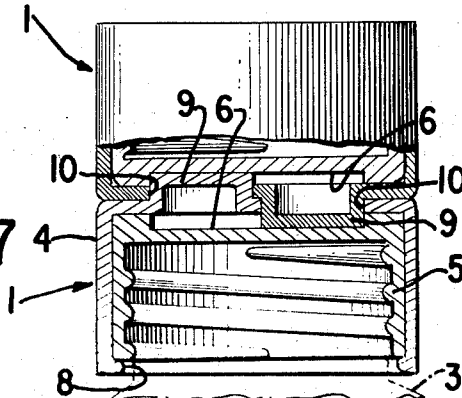


FIG. 7



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SAFETY CLOSURE

BACKGROUND OF THE INVENTION

The increased use of highly potent drugs in the home in recent years has created a demand for safety closures for medicine bottles and other containers which are difficult to open by young children who may obtain possession of such containers while playing. As a result, many different child-resistant safety closures have been developed. One type of safety closure is characterized by having a conventional screw cap to close the bottle with an overcap which covers the screw cap and freely rotates over it so that turning of the outer cap will not result in turning the closure, except under certain conditions. For example, the United States Pat. to Farago, No. 3,027,035, is characterized by having an outer cap which can be deformed by pressure on its skirts which can result in friction on the screw cap closure whereby the latter may be turned off of the bottle. While this cap is quite simple in structure and inexpensive to make, it requires the application of a considerable amount of force on the skirt to create enough friction to loosen the screw cap closure. While very young children cannot produce this amount of force to open the closure, it is also true that older people, particularly those with arthritis of the hands, find it difficult to remove the closure.

Other safety closures which depend upon a loosely fitting overcap may be found in the prior art. For example, in U. S. Pat. No. 3,428,201 to Boys the friction necessary to turn the inner screw cap closure is developed by exerting downward pressure on the top of the cap. This type closure is also difficult to open by the elder.

To avoid the necessity of applying pressure on a freely turning resilient outer cap to develop enough friction to turn the inner screw-on type closure, structures have been devised in which a key element is used to engage the outer cap with the inner closure member so that it may be removed. One such structure is shown in U. S. Pat. No. 3,160,301 to Milbourne. Various other patented structures which employ keys to engage a loose overcap with an inner screw closure so that the latter may be turned have been issued. Note, for example, U. S. Pat. No. 3,485,402 to Tunstall, U. S. Pat. No. 3,164,277 to Reading, and U. S. Pat. No. 3,396,864 to Jones et al.

SUMMARY OF THE INVENTION

The present invention is directed to a safety cap of unique construction which has advantages over the previously described safety caps of the prior art. It is simple in construction, inexpensive to make, and can be readily operated by elderly persons with weak hands, but is not likely to be operated by children and others who are not able to understand the manner in which the screw cap closure may be removed, particularly if they are not allowed access to another safety cap of identical construction which acts as a key. In brief, the structure of the present invention includes a more or less conventional threaded screw cap closure having a recess on its upper surface and an overcap which fits over the screw closure and is freely rotatable with respect thereto, but is so stiff that it cannot be deformed with normal pressure of one's fingers. The overcap is characterized by having an upstanding pro-

jection which serves as a key and a similarly configured opening, or key hole, whereby the freely rotating overcap of one safety cap may serve as a key for turning the screw cap closure of another but identical safety closure.

BRIEF DESCRIPTION OF THE DRAWING

In order that the invention may be more clearly understood, reference is made to the accompanying drawing, in which:

FIG. 1 is a vertical elevation of a bottle having the safety closure of the present invention in place;

FIG. 2 is a cross-section in elevation showing the safety closure of the present invention;

FIG. 3 is a top plan view of the screw cap closure part of the safety closure;

FIG. 4 is a cross-sectional view in elevation of the screw cap closure part of FIG. 3;

FIG. 5 is a top plan view of the overcap portion of the closure of the present invention;

FIG. 6 is a cross-sectional view in elevation of the overcap of FIG. 5; and

FIG. 7 is an elevation, partly in section, showing two identical safety closures joined in position for removing the screw-type closure from the neck of a bottle.

DESCRIPTION OF A PREFERRED EMBODIMENT

A preferred embodiment of the safety closure of the present invention, as shown in the drawings, and the manner in which it operates will be apparent from the drawings with the following description.

In FIG. 1, the safety closure 1 of the invention is attached to the neck 2 of a bottle or other container 3.

As shown in FIG. 2, the closure consists of an outer cap 4 and a screw closure 5. This screw closure may have a conventional liner (not shown) if desired. It may be of any suitable material, but molded plastic is preferred.

The screw cap closure is characterized by having a recessed portion 6 on its upper surface 7 as shown in FIGS. 3 and 4. The recessed portion may vary in configuration but in a preferred embodiment it has an area, generally speaking, which can be designated as a truncated ellipse.

The outer cap 4, as shown in FIGS. 5 and 6, is preferably molded from a relatively stiff but elastic plastic material and is characterized by having an inwardly extending lip 8 which may be expanded by pressure to slip over the outer surface of the inner cap 5. After the lip 8 is forced over the skirt of closure 5, it will return to its normal diameter as shown in FIG. 2 and will lock the overcap in place over the screw closure element and hold it thereon so that it cannot be removed without considerable effort. The outer cap 4 has an inner wall diameter slightly greater than the outer diameter of the screw closure and will freely turn on the closure 5. The outer cap 4 is of sufficient rigidity that it cannot be made to frictionally engage the inner cap 5 with any amount of pressure that could be placed upon it by a small child.

The outer cap 4 is also characterized by having an upwardly extending stud 9 and an opening 10 of substantially the same configuration. The upwardly extending portion 9 of the outer cap is slightly smaller than the opening 10 so that it may fit into the same

opening of another identical cap. Also, the height of the upwardly extending stud is such that it will pass through the opening in said other cap and extend into the recessed space in its screw closure. The recess in the top of the screw cap closure element is sufficiently large so as to permit entry of the upwardly extending portion of an overcap from an identical closure through opening 10 into the recess. The larger the area of the recess, the less likelihood that the inner cap can be turned by an object other than the upwardly extending stud 9 of the overcap which acts as a key, as will be explained.

As noted above, the area of the recess on the screw cap closure is preferably ellipsoidal. Other area shapes may be used, except that it must not be that of a circle concentric with the axis of the cap. The distance of the surface of the inner wall of the recess from the axis of the closure must be less at one point than the maximum distance of the outer wall of the upwardly extending stud from the vertical axis of the overcap. This relative configuration is necessary so that the upwardly extending stud of the overcap of one closure will engage the inner wall of the recess of another screw closure at some point on its periphery as they are turned with respect to each other. Thus, the upwardly extending section 9 may be circular instead of semi-ellipsoidal as shown in the drawings, and the opening 10 may also be circular instead of semi-ellipsoidal and in such a case the stud and opening are symmetrically located on opposite sides of the top of the overcap. The recess 6 may be ellipsoidal or circular, as shown, if its center is not concentric with the vertical axis of the closure cap.

To remove the screw closure and thus open the bottle so that the contents may be removed, one safety closure of the present invention is positioned top to top over another, as shown in FIG. 7, and by grasping the outer sleeve of one of the closures between the fingers, the screw closure of the safety cap must be turned off of the neck of the bottle. The screw closure may be replaced in the same manner.

As will be apparent, it is necessary to have two substantially identical closures in order to remove one from a bottle to which it may be attached. Obviously, it would be necessary to supply the buyer of the first-purchased bottle with an extra safety closure, or the purchaser may be induced to buy two bottles with identical closures. Of course, after the first such purchase, the safety cap of one of the bottles may be saved and used for opening subsequently purchased bottles fitted with the same type closure.

It will be obvious upon consideration of the structure that has been described that coins, knife blades, screwdrivers, and other commonly available objects which might serve as keys to engage the inner screw cap portion of the closure cannot be used to open the bottle as is the case with some of the safety closures of the prior art. Only the upstanding element on another substantially identical closure will pass through the opening 10 of the outer cap and engage the walls 11 of the recessed part of the screw closure whereby it may be turned off the threads of the neck of the bottle with which it may be engaged.

What is claimed is:

1. A safety closure having in combination an inner cap closure member and an overcap member, said inner cap having a skirt with internal threads and a flat top having a recess therein, the inner walls of the recess varying in distance from the vertical axis of said cap, the overcap completely covering the outer surface of the inner cap and being freely rotatable with respect thereto, means for preventing the overcap from being removed from the inner cap, said overcap having on its top an upwardly extending stud and an opening of substantially the same configuration, both stud and opening being symmetrically located on opposite sides of the axis of said overcap, the height of said stud being greater than the thickness of the top of said overcap, the inner wall of the recess of the threaded closure member being at one point a distance from the axis of the closure greater than that of the outermost wall of the stud from the axis of the closure and at one point being less than the outermost wall of said stud from the axis of said closure.
2. A safety closure in accordance with claim 1 in which the recess in the top of the inner cap is ellipsoidal in configuration and the cross-sectional area of the upwardly extending stud on the overcap and the area of the opening in the top of the overcap when taken together have an ellipsoidal area slightly smaller than the ellipsoidal area of the recess.
3. A safety closure in accordance with claim 1 in which the means for preventing the overcap from being removed from the inner cap is an inwardly extending lip on the lower section of the skirt of the overcap having an internal diameter less than the external diameter of the threaded closure member.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,684,115 Dated August 15, 1972

Inventor(s) Richard W. Birch

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 38, "must" should read "may"; In the heading to the printed specification lines 1-2, "Inventor: Richard W. Birch, Macedonia Road, Kent, Conn. 06757" should read "inventor: Richard W. Birch, Macedonia Road, Kent, Conn. 06757, assignor to Richardson-Merrell Inc., New York, N.Y.

Signed and sealed this 1st day of October 1974.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents