Sept. 12, 1967 D. B. VALK 3,341,044

SAFETY BOTTLE CAPS

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Fig. 1.

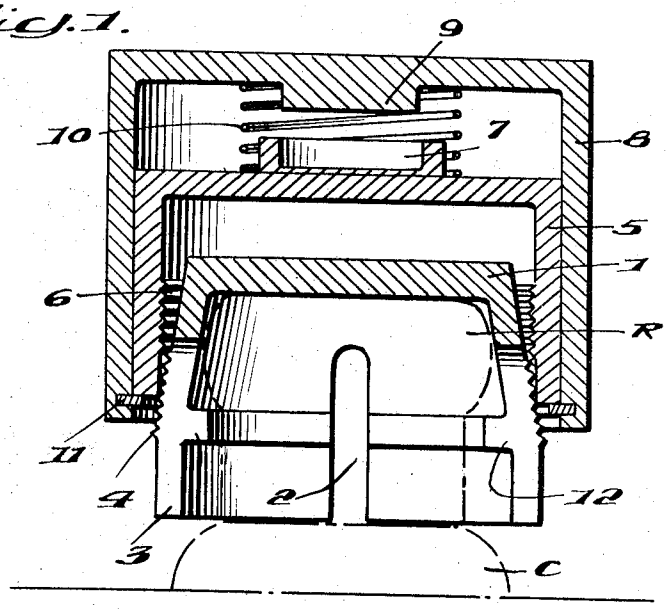

Fig. 2.

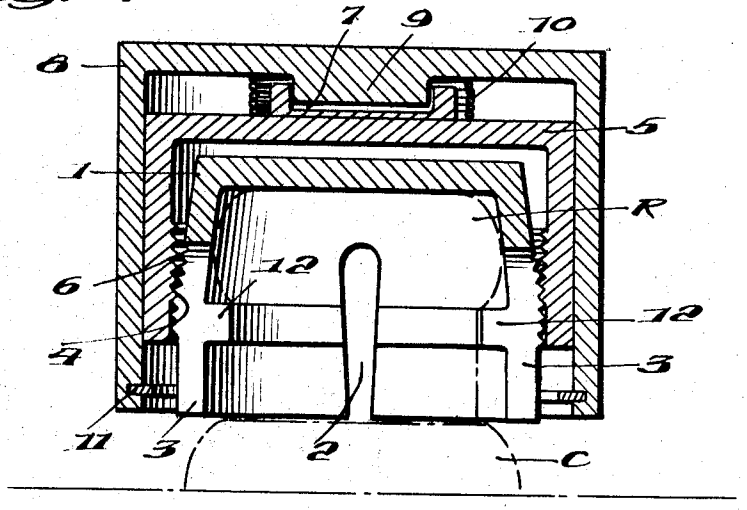

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Fig. 3.

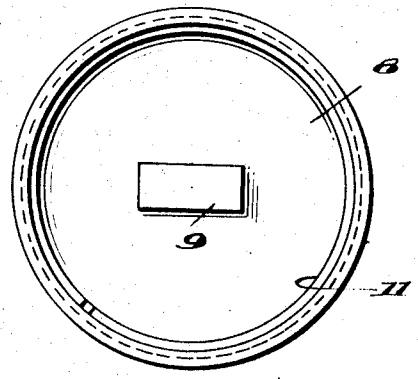


Fig. 4.

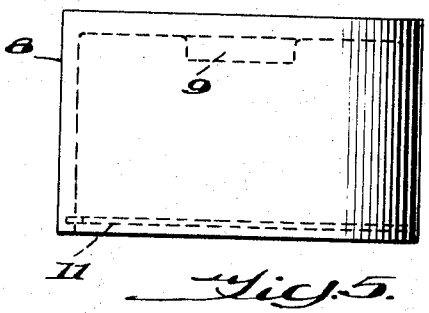


Fig. 5.

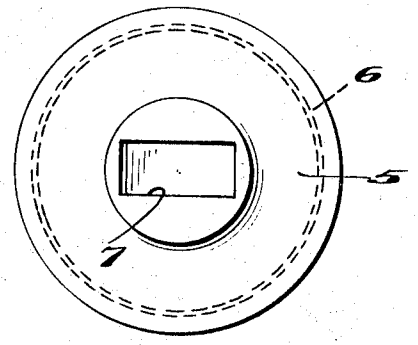


Fig. 6.

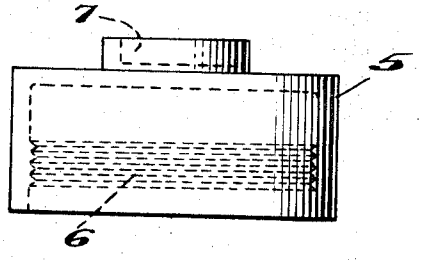


Fig. 7.

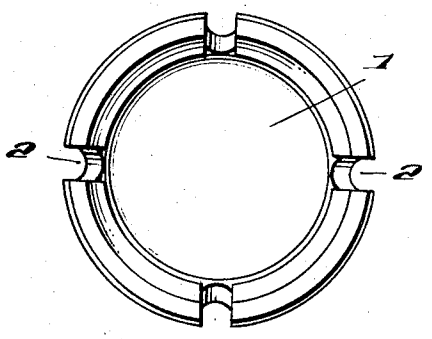
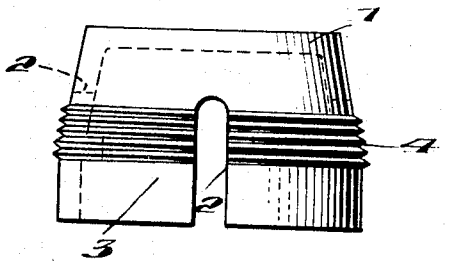


Fig. 8.



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3,341,044

SAFETY BOTTLE CAPS

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Filed Aug. 18, 1966, Ser. No. 573,311
8 Claims. (Cl. 215—9)

This invention relates to improvements in safety bottle caps of the character intended for preventing young children from opening and removing the caps of bottles or other containers which may contain harmful substances in the form of pills, capsules, powders, or liquids.

It has long been recognized that there is a need for safety bottle caps for use in most households on glass bottles, plastic bottles or jugs, or metal cans containing medicines, detergents or other household supplies, which present serious hazards to curious young children who cannot possibly know of their potential dangers.

Attempts have been made heretofore to provide safety closures for containers, but these have not been entirely satisfactory. They have been too complex and expensive to manufacture and to use, so as to render them unsuitable for the average person or, due to simplicity of construction, they are capable of separation and removal by an average child, with attendant dangers from the contents of the containers.

One object of this invention is to overcome these objections and to provide a practical and effective safety bottle cap which only an older child or an adult can readily utilize for opening the container, whereas a young child would find it virtually impossible to perform the required movement needed to open the cap.

Another object of the invention is to provide for coordinated actions in a safety bottle cap in opening or closing the same so as to effect a relative movement between two parts and then the joint movement of these parts with respect to a third, which must be held in order to apply this to or remove it from the container. These actions may be accomplished by relative motion of the two hands of the person, which requires coordinated actions of an older child or an adult, but which are almost impossible for a young child to perform.

Still another object of the invention is to simplify and improve the construction of a bottle cap to enable this to be applied to or removed from a container in a simple and effective manner.

These objects may be accomplished by utilizing a connector member sleeved over the neck of the container and which is secured thereto by a locking member which surrounds the connector member and is interfitted therewith. A cover member, in turn, is sleeved over the locking member and interfits with the latter. A relative axial movement of the cover member with respect to the locking member causes the interfitting relation thereof needed to effect turning movement of the locking member and thereby securing the connector member to the container. Usually, the connector member will be held by one hand of the operator, while the cover member is held with the other hand and moved inward into engagement with the locking member and turned to effect the engaging or disengaging action, as the case may be.

This embodiment of the invention is illustrated in the accompanying drawings, in which:

FIG. 1 is a longitudinal sectional view through the bottle cap, in disengaged relation;

FIG. 2 is a similar view, in engaged relation;

FIG. 3 is a bottom plan view of the cover member;

FIG. 4 is a side elevation thereof;

FIG. 5 is a top plan view of the locking member;

FIG. 6 is a side elevation thereof;

FIG. 7 is a bottom plan view of the connector member; and

FIG. 8 is a side elevation thereof.

The invention is described in connection with a container C such, for example, as a bottle, but of course it is understood that it can be applied to any suitable or desired form of container and made of any desired material, such as glass, plastic, metal or the like. The neck of the container herein shown has a rib R surrounding the same, so as to anchor a locking cap in place thereon, but it will also be understood that any other suitable means may be used such, for example, as a screw cap, snap cap, etc.

The safety bottle cap constructed according to this invention comprises three main parts, illustrated in detail in FIGS. 3 to 8 and which are telescoped together in an assembly intended to fit over the neck of the container, as illustrated in FIGS. 1 and 2.

A connector member **1** is cup-shaped and formed to fit over the open end of the neck of the container so as to close and seal the neck when the cap is in place thereon. The surrounding wall of the cup-shaped connector member extends around the neck of the container and in order to be readily compressed into clutching engagement therewith, the surrounding wall is provided with longitudinal slots **2** at intervals therein. This surrounding wall is also preferably frusto-conical, with a depending skirt portion **3** at the lower end thereof, smooth and capable of being grasped in the hand.

An externally threaded portion **4** is formed in the frusto-conical wall of the connector member **1** immediately above the skirt portion **3** and extending upwardly along the surrounding wall less than the height of the slots **2**, so that the height of the slots extends above the threaded portion **4**.

A locking member **5** (see FIGS. 5 and 6) is sleeved over the connector member **1**. The locking member **5** has a cylindrical wall portion internally threaded at **6** for intermeshing with the threads **4** when the locking member **5** is screwed down upon the connector member **1**. The locking member **5** is also cup-shaped with a closed top wall provided with a polygonal recess **7** therein, which is shown as rectangular in plan, as illustrated in FIG. 5.

A cover member **8** is also cup-shaped, with a closed top wall, and is sleeved over the parts **1** and **5**, as shown in FIGS. 1 and 2. The undersurface of the top wall of the cover member **8** is provided with a downward projection or lug **9** corresponding in shape and size with the recess **7** so as to fit in the latter as these parts are moved into interfitted relation, as shown in FIG. 2. This cover member **8** may be ribbed, knurled, or otherwise roughened on the external surface to facilitate turning thereof by hand in the usual manner.

The cover member **8** is normally urged away from the locking member **5** by a coiled spring **10** interposed therebetween. This movement is limited, however, by a split ring, rib or other suitable means, as indicated at **11**, secured in the lower edge of the cover member **8** in abutting relation against the lower edge of the locking member **5**.

The inner portion of the connector member **1** has suitable means for interlocking with the container when the cap is secured to the container. In this embodiment of the invention, a locking lip is formed on the inner wall of the connector member in position to interfit with the ring R of the container when the wall portion is compressed in locked relation.

The parts are placed on the container in the released relation substantially as shown in FIG. 1. Then the cover member **8** is pressed downward until it engages the locking member **5**. While holding it down and while also grasping the skirt portion **3** of the connector member **1**, the cover member **8** may be turned in a direction to

tighten the inner threaded neck at 4–6. This will continue until the split wall portion of the connector 1 has been compressed on the container and the rib 12 has been moved into interfitting relation with the neck portion of the container. This will cause the flexible connector member to tighten on the container and it will remain in this tightened condition until the cover member is unscrewed.

When the cover member is released from its interfitting relation with the locking member at 7–9, it rotates freely relative to the locking member without loosening the connector member. The spring 10 between the parts 5 and 8 keeps these parts from operating except when pressure is applied in an axial direction sufficient to interengage the parts 7 and 9 and thus form a clutch engagement therebetween.

To release the lock, it is necessary merely to press downward on the cover member 8 until it engages at 7–9. Then, while holding this cover down in such clutch engagement and grasping the lower edge of the connector member 1, the cover member is turned to release the threaded connection at 4–6. When this threaded connection is released, the locking lips at 12 will be disengaged from the rib R on the container and thus allow the entire bottle cap to be removed from the container.

The entire cap cannot be removed, however, unless the coordinated action, using both hands, are performed at the same time. One hand is utilized to press down on the cover member, while the other hand grasps the lower edge of the connector member. These coordinated actions can be performed by an older child or an adult, but would be almost impossible for a young child to perform.

The bottle cap can be manufactured either from plastic or lightweight metals and in a variety of sizes to fit containers of different dimensions. It can be made in different shapes, depending upon the size or character of the container. It can be used on containers having screw caps, snap caps, or other types.

The construction is simple and inexpensive and may be readily assembled and yet is effective for the intended purpose.

While the invention has been illustrated in one embodiment, it is recognized that variations and changes may be made therein without departing from the invention as set forth in the claims.

I claim:

1. A safety bottle cap comprising a connector member having means for interlocking connection with a container, a locking member sleeved over the connector member and having means for causing interlocking of the connector member with the container, a cover member sleeved over the locking member and movable axially and rotatably relative thereto, and clutch means for interconnecting the cover member with the locking member upon said axial movement for thereafter causing turning movement of the locking member in clutch engagement.

2. A safety bottle cap according to claim 1, including spring means interposed between the cover member and the locking member normally tending to separate said members.

3. A safety bottle cap according to claim 1, wherein the clutch means includes a recess in one member and a projection on the other member each polygonal in cross section and in interfitting relation.

4. A safety bottle cap according to claim 1, wherein the connector member is frusto-conical externally threaded and interfitting with threaded interior of the locking member, said connector member being split longitudinally for radial compression.

5. A safety bottle cap according to claim 4, wherein the connector member has an internal rib for clamp engagement with the container upon radial compression.

6. A safety bottle cap comprising a connector member cup shaped to fit over the end of a container neck and having a frusto-conical wall portion with a depending skirt, said wall portion being longitudinally split for radial expansion and having a surrounding threaded portion above the skirt, a locking member having an end wall and a cylindrical wall sleeved over the frusto-conical wall portion and internally threaded in mesh with the threaded portion, a cover member having an end wall and a cylindrical wall sleeved over the locking member and journaled thereon for relative rotation and for axial movement relative to each other, and means for clutch engagement between the end walls of the cover member and the locking member for joint rotation thereof upon said axial movement of the cover member to compress the connector member on the container.

7. A safety bottle cap according to claim 6, wherein the clutch means includes a recess in one member and a projection on the other member and both polygonal in cross section and interfitting relation.

8. A safety bottle cap according to claim 6, including a coiled spring interposed between the cover member and the locking member normally tending to hold them separated from each other.

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