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Colella

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[54] SAFETY CLOSURES FOR CONTAINERS

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[52] **U.S. Cl.** **215/215**, 215/207

[51] **Int. Cl.** **B65d 55/02**, B65d 85/56, A61j 1/00

[58] **Field of Search** 215/215, 219, 220, 207, 215/302

[56] **References Cited**

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Attorney, Agent, or Firm—J. Carroll Baisch

[57] **ABSTRACT**

A safety closure having an inner closure cap for threadable attachment to a threaded part of a container and an outer closure cap disposed over the inner closure cap, each cap having a cylindrical skirt and an end wall at one end, the opposite end being open. The caps are rotatably mounted together with the outer cap normally rotatable on the inner cap, and internal annular flange at the free end of the skirt of the outer cap retains the caps together. A diametrical upwardly opening groove is provided in the end wall of the inner cap, said groove being of less depth than the thickness of said end wall. The end wall of the outer cap is provided with a diametrically extending opening therethrough, said opening being hexagonal in cross-section and from the opening, there is an outwardly extending diametrical slot and a downwardly extending diametrical slot which, when the caps are properly oriented, is in register with the groove in the end wall of the inner cap. A key, hexagonal in cross-sectional shape, is slidably disposed in the hexagonal opening in the end wall of the outer cap and said key has a longitudinally extending flange from one of the sides adapted to be slidably disposed in one or the other slots. Normally, the key is disposed in the hexagonal opening with the flange in the outer slot. When in this position, the outer cap is freely rotatable on the inner cap. With the device attached to the externally screw threaded neck of a container, the inner cap cannot be removed when the flange of the key is in the outer slot. In order to remove the inner cap or to screw it back on, the key is removed from the opening and reinserted therein with the flange disposed in the lower slot and in the groove in the end wall of the inner cap. Thus, the inner cap will be rotated upon rotation of the outer cap.

6 Claims, 6 Drawing Figures

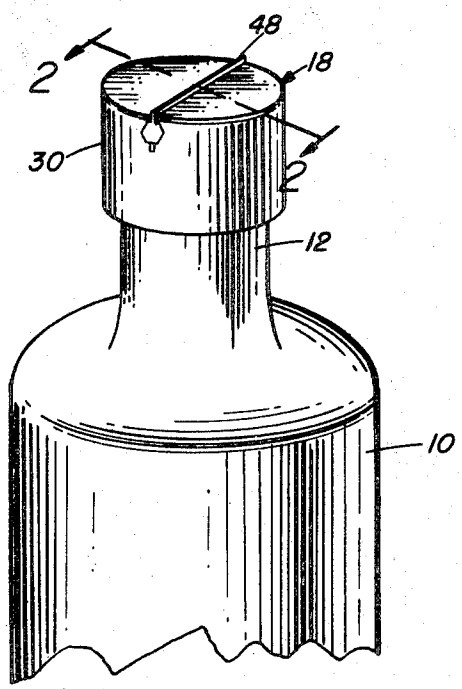


Fig. 1

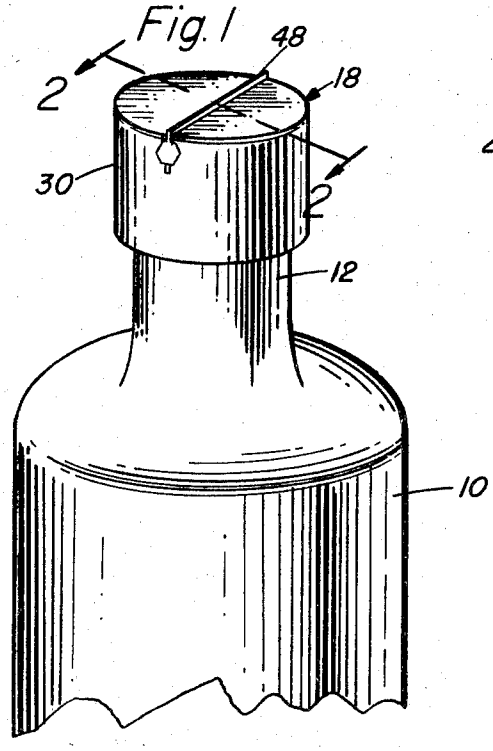


Fig. 2

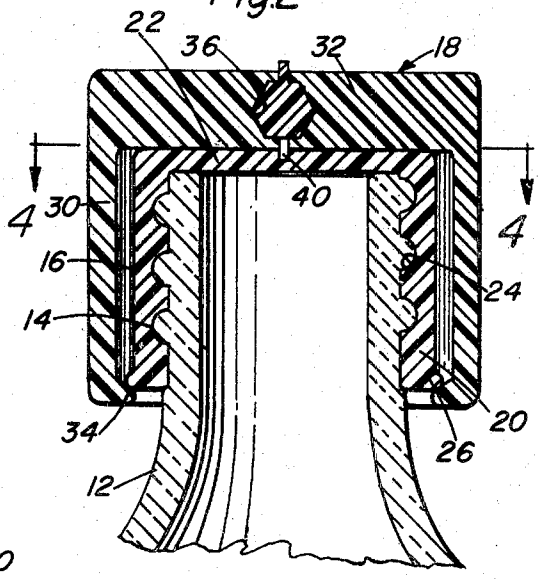


Fig. 3

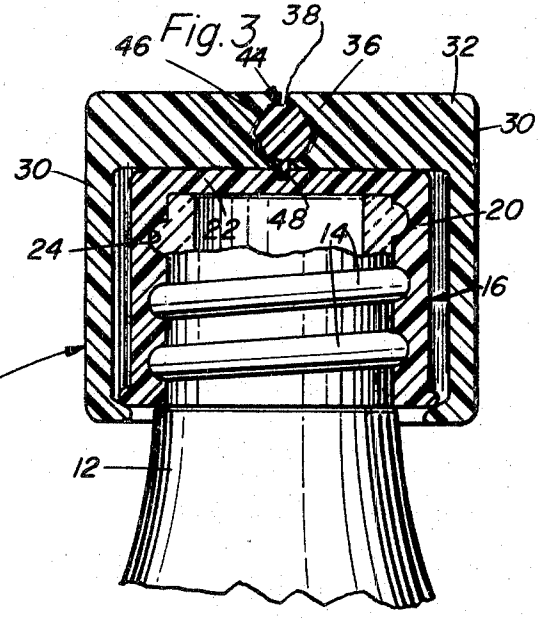


Fig. 4

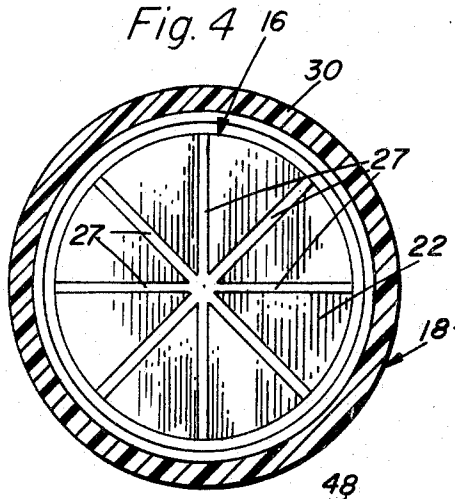


Fig. 5

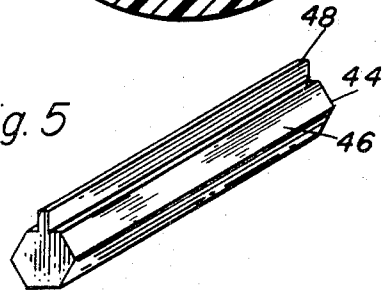
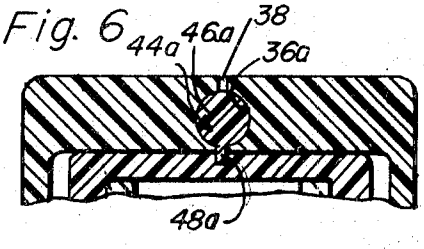


Fig. 6



SAFETY CLOSURES FOR CONTAINERS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to closures or caps for containers and relates more particularly to safety closures for containers for dangerous deleterious substances such as poisons, and other dangerous chemicals and the like.

2. Description of the Prior Art

There are various types of safety caps for containers for medicines, chemicals, and the like. These caps, of which I am aware, have various well-known disadvantages. Some of them are too complicated and some of them are actually not effective as safety caps.

SUMMARY OF THE INVENTION

As is well known, there is always danger that poisons or other dangerous chemicals may be inadvertently or unintentionally taken by adults, but a more serious problem occurs when children get hold of bottles containing dangerous and/or poisonous substances and swallow such substances. In either case, serious illness or death may result. Consequently, the problem of preventing such inadvertent or unintentional taking of poisonous substances, is a very serious one.

While it is important to prevent inadvertent or unintentional taking of dangerous substances, and especially to prevent children from getting into containers for such substances, it is also important to provide means for opening the safety cap by means that can be readily available to adults and which will be of such character that children, especially small children, will not solve the opening problem.

The present invention comprises a safety closure device having an inner closure cap for threadable attachment to a threaded part of a container and an outer closure cap disposed over the inner closure cap, each cap having a cylindrical skirt and an end wall at one end, the other end being open. At the free end of the skirt of the outer cap, there is an internal annular flange extending under the free end of the inner cap to retain the caps together, said caps being normally rotatable relative to each other. The cylindrical skirt of the inner cap is provided with internal threads of the threaded part of the container and the end wall of the inner cap is provided with a diametrically extending outwardly or upwardly opening groove of less depth than the thickness of the end wall. A hole extends diametrically through the end wall of the outer cap and said hole has a hexagonal cross-sectional shape. From the hole in the end wall of the outer cap, there are oppositely arranged diametrical arranged outer and inner slots and the inner slot is adapted to register with the groove in the end wall of the inner cap when said caps have a certain orientation relative to each other.

A key having the same cross-sectional configuration as the opening in the end wall of the outer cap is slidably disposed in said opening, the key having a flange extending outwardly from one face. When the key is disposed in the opening of the outer cap, the flange is positioned in the outer slot so that the outer cap will freely rotate on the inner cap. When it is desired to open the container, the key is removed from the opening and reinserted with the flange disposed in the inner slot and in the groove in the end wall of the inner cap,

the proper orientation of the two caps having been first established. The device now may be unscrewed from the container and the contents of the container or a part thereof used. With the key still in the position last described, the inner cap may be screwed onto the container by appropriate rotation of the outer cap. The key is then removed from the hole and reinserted with the flange thereof disposed in the outer slot.

Thus, an effective safety cap is provided and the key, therefor, is readily available and not likely to be misplaced.

OBJECTS AND ADVANTAGES OF THE INVENTION

It is an object of the invention to provide a safety cap having a key that is readily available and not likely to be misplaced.

It is another object of the invention to provide a device of this character that is highly effective in its safety feature.

It is still another object of the invention to provide a safety cap of this character that while easy to lock and unlock the two caps, is complicated enough so that small children cannot readily operate it to open a container having the cap thereon.

It is a further object of the invention to provide a device of this character that may be used on conventional containers such as bottles and the like.

The characteristics and advantages of the invention are further sufficiently referred to in connection with the following detailed description of the accompanying drawings, which represent one embodiment. After considering this example, skilled persons will understand that many variations may be made without departing from the principles disclosed and I contemplate the employment of any structures, arrangements or modes of operation that are properly within the scope of the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring to the drawings, which are for illustrative purposes only:

FIG. 1 is a perspective view of a safety cap embodying the present invention, disposed on the neck of a container;

FIG. 2 is an enlarged vertical section taken on line 2—2 of FIG. 1, showing the key in the release position;

FIG. 3 is a view similar to FIG. 2 showing the key in the locking position;

FIG. 4 is a sectional view taken on line 4—4 of FIG. 2;

FIG. 5 is a perspective view of the key; and

FIG. 6 is a fragmentary sectional view showing an alternative type of key, this key having a round body in cross section instead of a hexagonal body in cross section.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring more particularly to the drawings, there is shown a container or bottle **10** having the usual neck **12** with external threads **14.**

The present closure comprises an inner cap indicated generally at **16** and an outer cap indicated generally at **18.**

The inner cap comprises a cylindrical skirt **20,** closed at one end by an end wall **22** and open at the opposite end. Internal screw threads **24** are provided in the inner side of the skirt **20,** said screw threads being adapted to be threadably disposed on the external threads **14** of the container. At the open end of the cap **16** there is an outwardly extending radial flange or bead **26** for a purpose to be hereinafter described.

End wall **22** of the inner cap is provided with a plurality of diametrical grooves **27** which open outwardly and are of less depth than the thickness of end wall **22.**

The outer cap **18** has a cylindrical skirt **30** of somewhat greater inside diameter than the outside diameter of the skirt **20** of the inner cap and said outer cap has a wall **32** at one end, the opposite end of the cap being open but being provided with an annular inwardly extending flange **34.** Flange **34** extends inwardly a sufficient distance to overlap the flange **26** of the inner cap so that when the caps are assembled, the outer cap is operatively held on the inner cap. Normally, the caps are rotatable relative to each other but may be locked together for simultaneous rotation as will be hereinafter described.

The inner side of wall **32** of the outer cap rests on the outer side of the inner cap, thus said caps being held against longitudinal or axial movement relative to each other by the end walls and the flanges.

End wall **32** of the outer cap is provided with an opening **36** extending diametrically there-through, said opening being shown as hexagonal in cross-section but may be of any other suitable cross-sectional shape. Two of the sides of the opening are parallel with the outer and inner surfaces of end wall **32** and there are radial slots **38** and **40** extending from the opening **36** to the surfaces of the end wall **32.** These slots are also arranged diametrically of the outer cap and the slots **40** are adapted to register with respective slots **27** of the inner cap when the outer cap is rotated relative to the inner cap.

A key indicated generally at **44** is provided and has a body **46** of the same cross-sectional shape or configuration as the opening **36.** As shown, the key has a hexagonal cross-sectional shape and from one side of the key, there is a flange **48** which extends longitudinally of the body and radially outwardly. Key **44** is slidably disposed in the opening **36** with the flange **48** slidably disposed in one or the other of the slots **38** or **40.** There is, of course, sufficient friction between the key and the opening **36** so that the key will not inadvertently fall out of the opening.

When the key is positioned so that the flange **48** extends through the slot **38,** the outer cap may be freely rotated on the inner cap. When the key is inserted or disposed in the opening **36** with the flange **48** extending through the slot **40** and into one of the diametric grooves **27** of the inner cap, the caps are locked together. It is to be understood that when the caps are suitable oriented, the slot **40** will register with one of the grooves **27.**

With the caps locked together, the device may be screwed onto the neck of the container. Thereafter, the key is slid out of the opening **36** and replaced therein the flange **48** in the slot **38** and the locking connection between the caps is thus released but the key kept readilly available. When it is desired to remove the closure, the key is reversed with the flange **48** extending into one of the grooves **27** of the inner cap.

To assemble the caps, the key should either be removed or be disposed in the opening **36** with the flange **48** extending through the slot **38.** The caps are then forced together. It is to be understood that the bead **26** of the inner cap and the flange **34** are of such size that the caps may be forced together and there will be a slight compression of the flange and bead during this operation. When the inner cap is fully disposed within the outer cap, there will be sufficient overlapping of the bead and flange **34** to prevent the caps from separating. The closure device is attached to the neck of the container when the two caps are locked together and have normal storage, the caps are in the unlocked position.

In FIG. **6,** the hole through the outer cap is round in cross section and indicated at **36*a***, and the body of the key reference numeral **46*a***, here referred to generally by reference numeral **44*a***, is also round in cross section. The flange on the key is indicated by numeral **48*a***. When the key is inserted in the hole with the flange in the slot **38,** the key cannot be rotated and the caps or disconnected. When the flange **48*a*** extends through the slot **40** and into one of the grooves **27,** the caps are locked together.

The invention and its attendant advantages will be understood from the foregoing description and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit or scope thereof or sacrificing its material advantages, the arrangement hereinbefore described being merely by way of example and I do not wish to be restricted to the specific form shown or uses mentioned except as defined in the accompanying claims.

I claim:

1. A safety closure for containers comprising:

a closure member with threadable attachment to a threaded part of a container;

a safety cover means disposed over said closure member to protect said closure member from being inadvertently unscrewed from a container to which it is attached, said safety cover means normally being rotatable relative to said closure member;

a closure member comprising an inner cap and the safety cover means comprising an outer cap having an inside diameter somewhat greater than the outside diameter of the inner cap, each cap comprising a cylindrical skirt part, and an end wall part at one end of the skirt part, the other end of the cylindrical skirt part being open, the inner cap having internal threads for reception on the external threads on a part of a container, the end wall part of the closure member having at least one external diametrically extending groove;

means for rotatably retaining the outer cap on the inner cap;

the end wall part of the safety cover means having an opening extending diametrically therethrough, and oppositely arranged diametrical slots extending from the opening to the respective outer and inner sides of the end wall of the safety cover means;

and a key having the same cross-sectional shape as the opening through the end wall of the outer cap, and a flange extending outwardly from one side of the key and longitudinally of said key, said key being slidable in said opening in the end wall of the outer cap with the flange thereof in one of the slots,

said flange being disposed in the inner slot and groove in the end wall of the inner cap when said caps are oriented so that the inner slot registers with the groove of the inner cap.

2. The invention defined by claim 1, wherein the key and the opening in the end wall of the outer cap have a hexagonal configuration in cross-section.

3. The invention defined by claim 2, wherein the top and bottom walls of the opening through the end wall of the outer cap are substantially parallel with the outer and inner sides of the end wall of the outer cap and the slots extend midway between the ends of said walls of the opening.

4. The invention defined by claim 1, wherein the means for retaining the caps together includes an internal flange at the open end of the skirt, said flange extending inwardly to overlap a portion of the free end of the inner cap.

5. The invention defined by claim 4, wherein the inner cap has an external bead at the free end of the skirt thereof for engagement with the internal flange of the skirt of the outer cap.

6. The invention defined by claim 1, wherein the key and the opening in the end wall of the outer cap have a round cross-sectional configuration.

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