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SAFETY CLOSURE DEVICE FOR A CONTAINER

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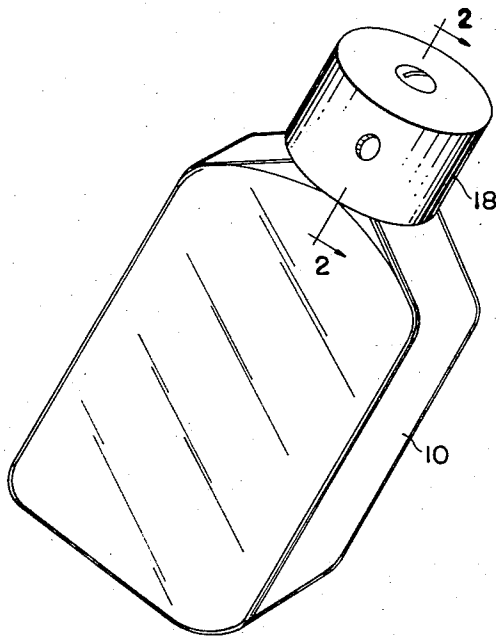


FIG. 1

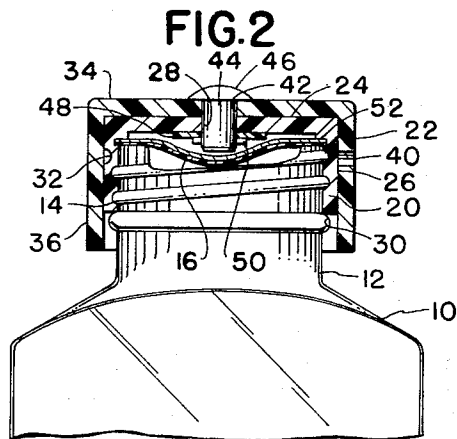


FIG. 2

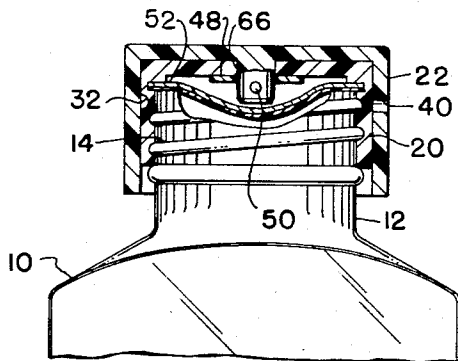


FIG. 4

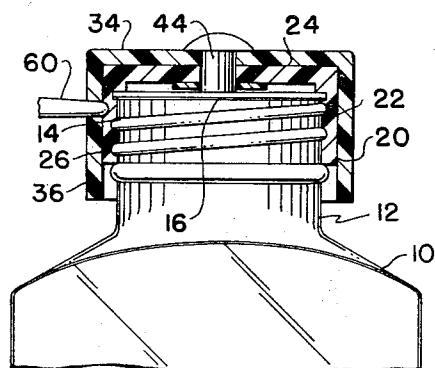


FIG. 3

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3,370,731 SAFETY CLOSURE DEVICE FOR A CONTAINER

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ABSTRACT OF THE DISCLOSURE

An assembly including a container and a safety closure therefor is disclosed which requires several manipulations to open. The assembly comprises a container having a cylindrical neck at the top end thereof and integral threads molded on the cylindrical neck. The safety closure includes an interior cup-shaped cap element adapted to engage and seal the threaded neck of the container. An exterior cup-shaped element fits concentrically over the interior cap element and is loosely connected thereto by means of a centrally located coupling element. The depending collar of the exterior cap element is provided with a relatively small opening which is adapted to be aligned with a relatively small recess provided in the collar of the interior cap element. The corresponding opening and recess are located a fixed distance below the top wall of the exterior cap element. A tool having a relatively small head is adapted to be inserted through the opening in the collar of the exterior cap element into the recess in the interior cap element to hold the cap elements together as a unit to permit relative rotation between the cap elements and the container for applying or removing the cap elements. Such manipulations are difficult for small children to perform.

The safety closure device of the present invention is primarily designed for use on containers or bottles containing poisons or otherwise dangerous materials, such as certain pharmaceutical products, and has as its principal feature the provision of a safety cap which is adapted to prevent accidental removal of the contents from the container and subsequent accidental usage or ingestion of the contents.

The safety cap or closure device as contemplated by the present invention includes an inner or interior cap element adapted to be threaded tightly on the threaded neck of a container in the manner of an ordinary cap, and an outer or exterior cap element which subsequently encloses and is freely rotatable on the interior cap element. Thus the user cannot, by grasping the outer cap element, exert sufficient torsional force on the interior cap element to remove the latter from the neck of the container. The outer cap element is provided with an opening in the collar thereof through which a tool may be inserted to engage the outer surface of the collar on the inner cap element. Thereafter, the interior and exterior cap elements are held together as a unit by the tool so as to permit relative rotation between the unit formed by the cap elements and the container. The utilization of a tool and its usage with the safety closure device of the present invention are, of course, conscious actions of the user requiring a relative degree of alertness and concentration while simultaneously serving as an effective reminder to the user that the container contains a dangerous or harmful substance and that use thereof should first be carefully checked and verified. A further safety precaution is the provision of the opening in the collar of the exterior cap element which, after the exterior cap element is rotated, is brought into generally radial alignment with a recess provided in the collar of the interior cap element and into which the leading end of the tool is inserted. This is a visual opera-

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tion which cannot easily be performed in the dark. The user must therefore open the container in the presence of light. This additional provision further reduces the possibility that the user might be deceived, for example, when removing a bottle from a medicine cabinet in the dark.

It is an object of the present invention to provide a safety closure device or cap which requires a series of skillful manipulations in order to remove the closure device from the container.

Another object of the present invention is to provide a container which is of conventional construction, in so far as it is equipped with the usual threads on the neck thereof, and a safety closure or cap therefor which may be easily manipulated by adults but may only be manipulated with difficulty by small children so that the medicines, corrosive substances, poisons or other dangerous types of material may be placed and kept in the container with relative safety to children of tender age.

It is thus another object of this invention to provide a simplified low cost structure of the aforementioned type having certain advantages contributing to efficiency, reliability and long life as well as ease of maintenance.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing wherein a preferred form of the present invention is clearly shown.

FIGURE 1 is a perspective view of a container provided with a safety closure device.

FIGURE 2 is a fragmentary view, partly in section, taken substantially on the line 2—2 of FIGURE 1 and illustrating certain features of the present invention.

FIGURE 3 is a fragmentary view, partly in section, illustrating a tool inserted through an opening in the collar of the exterior cap element into a recess provided in the collar of the interior cap element so that both cap elements may be held together as a unit to permit the container to be unthreaded therefrom.

FIGURE 4 is a fragmentary view, partly in section, similar to FIGURE 1 but showing a modified form of the present invention.

This invention comprises a container and a safety closure device therefor. The container is provided with a cylindrical neck at the top thereof and integral threads are molded in the neck as is well known in the art. The container is provided with a closure device having an interior cap element including a planar top and a cylindrical collar having internal threads mating with the threads on the neck of the container. The top of the interior cap element is provided with a centrally located opening. The safety closure device further includes an exterior cap element having a planar top and a cylindrical collar fitting loosely with respect to and being concentrically arranged with respect to the collar of the interior cap element.

A centrally located coupling element is secured to the top of the exterior cap element and extends through the opening in the top of the interior cap element. Fastening means, such as a pin, is carried by the coupling element for securing the cap elements together for relative rotation therebetween. With such a construction the coupling element permits the exterior cap element to be rotated with respect to the interior cap element. A second opening is provided in the collar of the exterior cap element through which a tool may be inserted so as to engage the outer surface of the collar on the interior cap element to hold the cap elements together as a unit and to thereby permit the cap elements to be rotated as a unit relative to the neck of the container.

Referring now to the drawing, there is illustrated a conventional bottle or container 10 provided with a generally cylindrical neck 12 having formed or molded there-

on continuous helical threads 14 as is conventional in the art. The top annular surface of the neck 12 surrounding the entrance to the container 10 is designated by the numeral 16. The safety closure device 18 includes an inner or interior cup-shaped element 20 and an outer or exterior cup-shaped cap element 22. The safety closure device 18 of this invention requires no costly special bottle structure. The closure device 18 generally resembles in appearance a conventional cover or cap having internal threads which mate or register with the threads 14 provided on the neck 12 of the container 10.

The inner cap 20 and the outer cap 22 may, as an example, be made from molded plastic or other suitable material. The inner cap 20 is provided with a planar top 24 which overlies the mouth of the container 10 and a generally cylindrical collar 26. The top 24 is provided with a centrally located opening 28 therein. The inner surface of the collar 26 is provided with continuous helical threads 30 which are adapted to mate with the threads 14 on the neck 12 of the container 10. The outer surface of the collar 26 is provided with an indentation or recess 32 which is used for a purpose to be hereinafter described. The outer or exterior cap element 22 includes a planar top 34 having depending therefrom a generally cylindrical collar 36 which has a length greater than the length of the collar 26 provided on the interior cap element 20. The collar 36 is provided with an opening 40 which is used for a purpose to be hereinafter described. The planar top 34 of the exterior cap element 22 is provided with a centrally located opening 42 which overlies the opening 28 provided in the planar top 24 of the interior cap element 20.

A pin 44 having an enlarged head 46 is inserted through the aligned openings 42 and 28 in the inner and outer cap elements towards the mouth of the bottle or container 10. The pin 44 forms a coupling element. A washer 48 is sleeved over the inner end of the pin 44. As an example, the pin 44 and washer 48 may be made from plastic materials. A fastening pin 50 is inserted through an opening provided in the inner end of the pin or coupling element 44 so as to secure the inner and outer cap elements 20 and 22 and washer 48 together in an assembled but loose relationship. The pin 44 is carried by the outer cap element 22 and rotates therewith. With such a construction the exterior cap element 22 and pin 44 are mounted for relative rotation with respect to the inner cap element 20 due to the rather loose fit or connection provided therebetween. When the exterior cap element 22 is rotated the inner cap element 20 remains sealed.

A sealing element or disc 52 is located between the inner surface of the top 24 of the inner cap element 20, with the peripheral edge thereof held in place, as an example, by means of a groove provided in the inner cap element. The disc 52 is adapted to engage and seal the top surface 16 of the neck 12 of the container 10. The disc or liner 52 may be made from rubber, cork, plastic, plastic coated paper or the like as is well known in the art which seals the mouth of the container 10 when the closure device 18 is in assembled position on the container 10 as illustrated in FIGURE 2. The disc 52 is the last element of the closure device which is assembled. The disc 52 is most generally required when a liquid substance is in the container 10.

As illustrated in FIGURE 2 the safety closure device 18 seals the contents of the container 10, with the collar 36 of the exterior cap element 22 fitting loosely and being concentrically arranged with respect to the collar 26 provided on the inner cap element 20. At such time the outer cap element 22 may be rotated with respect to the inner cap element 20 without disturbing or breaking the threaded and sealed connection between the interior cap element 20 and threads on the neck 12 of the bottle or container 10.

When it is required to open the container 10 the exterior cap element 22 is rotated to a position to align the open-

ing 40 provided in the collar 36 with the recess 32 provided in the collar 26 of the interior cap element 20. Thereafter a suitable tool 60 is inserted through the opening 40 into the recess 32 of the interior cap element 20. Various types of tools may be used such as a bobbie pin, a car key, a fork prong, a ball point pen point, a pencil, etc. With the tool 60 in the position illustrated in FIGURE 3 the cap elements 20 and 22 cooperate together as a unit. In order to open the container 10 the container 10 is rotated in one direction with respect to the cooperating cap elements 20 and 22 and the tool 60 so as to unthread the neck of the container 10 from the safety closure device 18.

When it is required to replace the safety closure cap 18 on the container 10 the reverse operation takes place or in other words the cap elements 20 and 22 are held by the tool 60 and thereafter the container 10 is rotated in the opposite direction.

FIGURE 4 illustrates a modified form of the present invention and where applicable the same numbers will be used to designate similar parts. Rather than utilizing as the coupling element the pin 44, a generally cylindrical stud or stem 66 is molded integrally with the formation of the outer cap element 22. The stem 66 performs the same functions as the pin 44 of FIGURES 2 and 3. The operation of the modified safety cap is the same as heretofore described.

It should be appreciated that the safety closure device may be made from various commercially available materials and used on any size, kind or type of bottle or container.

While there is shown and described certain specific embodiments of the invention, it will nevertheless be readily apparent that many minor changes of structure and operation could be made without departing from the spirit of the invention as defined by the scope of the appended claims.

What I claim as my invention is:

1. An assembly including a container and a safety closure therefor including in combination: a container having a cylindrical neck at the top end thereof and integral threads molded in the cylindrical neck, an interior cup-shaped cap element adapted to engage and seal the threaded neck of said container and including a planar top wall and a cylindrical collar having internal threads mating with the threads on the neck of said container, a centrally located opening in the top wall of said interior cap element, an exterior cup-shaped cap element having a planar top wall and a cylindrical collar fitting loosely concentrically about the collar of said interior cap element for rotation relative thereto, a centrally located coupling element carried by said exterior cap element and extending through the opening in said interior cap element into the interior of said container, said coupling element having an inner end terminating below the inner surface of the top wall of said interior cap element, a washer on the inner end of said coupling element which is engageable with the inner surface of the top wall of said interior cap element, a transversely extending aperture in the inner end of said coupling element, a locking pin extending through said aperture for holding said washer against the top wall of said interior cap element and for securing said cap elements together, said coupling element and said pin permitting said exterior cap element to be rotated with respect to said interior cap element, and a second relatively small opening in the collar of said exterior cap element, said second opening having an axis which is generally perpendicular to the axis of the container and is located a fixed distance below the top wall of said exterior cap element laterally opposite the neck of said container, a relatively small recess in the outer surface of the collar of said interior cap element, said recess when said cap elements are assembled being located the same fixed distance below the top wall of said exterior cap element as said second opening, said exterior cap element being rotatable

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with respect to said inner cap element and said container
to align with said second opening with said recess, said
second opening when aligned with said recess being
adapted to receive a tool having a relatively small head
which extends completely through said second opening 5
into said recess to engage the collar of said interior cap
element to hold both of said cap elements together as a
unit and to thereby permit the said cap elements to be
rotated as a unit relative to the neck of the container for
applying or removing said cap elements.

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