

[54] SAFETY PACKAGE FOR COLLAPSIBLE
TUBES

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[58] Field of Search 215/9, 1 C, 11, 12, 46 R,
215/219; 222/105, 102, 183

[56] References Cited

UNITED STATES PATENTS

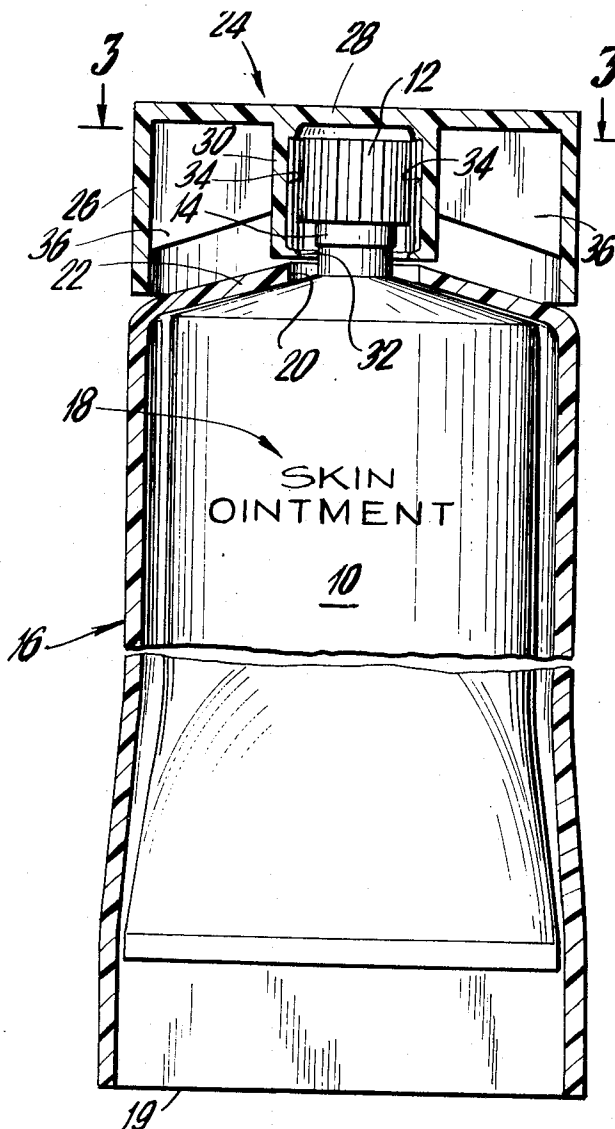
3,269,604 8/1966 Serry 222/105.

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Calimafde

[57] ABSTRACT

A flexible, unbreakable protective tube or sleeve is placed and retained about a conventional collapsible squeeze tube which may contain a harmful substance. The protective tube prevents a child from breaking and biting into the squeeze tube, and yet permits an adult user to apply pressure to the collapsible tube and thereby cause material to be forced out of that tube. Also disclosed is a flexible safety cap enclosure for the tube, in which pressure greater than that which can be applied by a child must be applied to the outer wall of the enclosure to bring the latter into engagement with the squeeze tube cap, after which rotation of the closure removes the cap from the tube.

5 Claims, 6 Drawing Figures



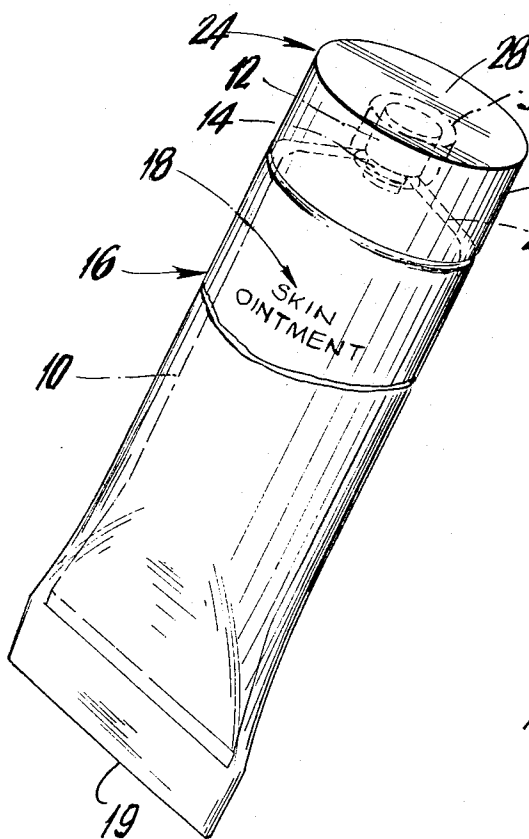


FIG. 1

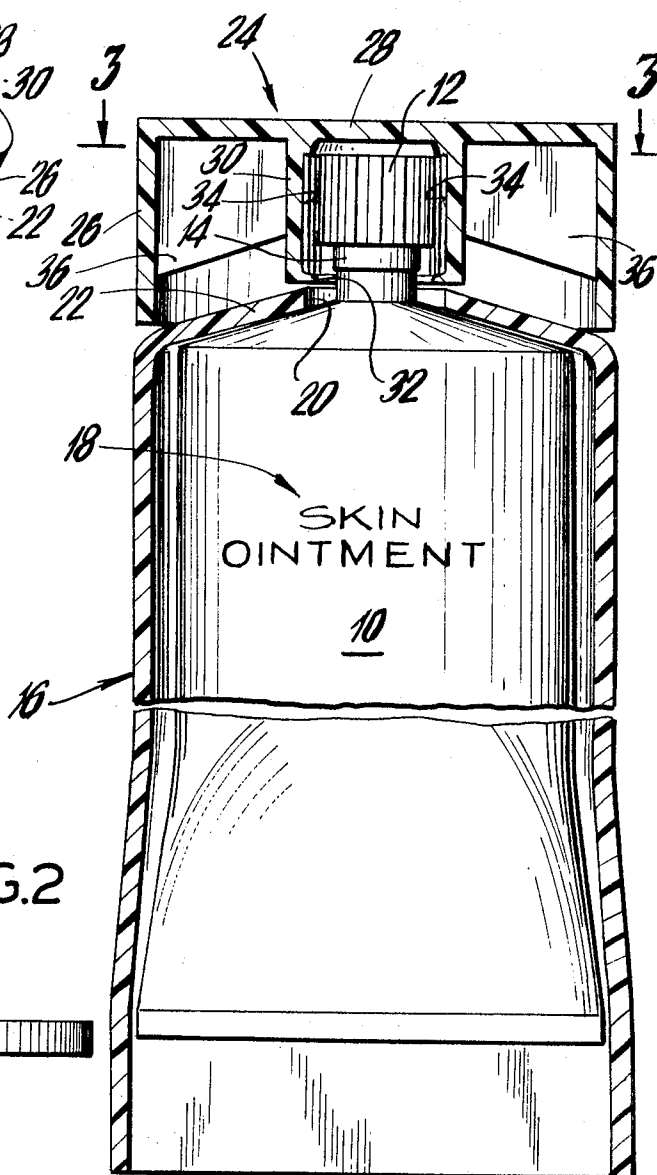


FIG. 2

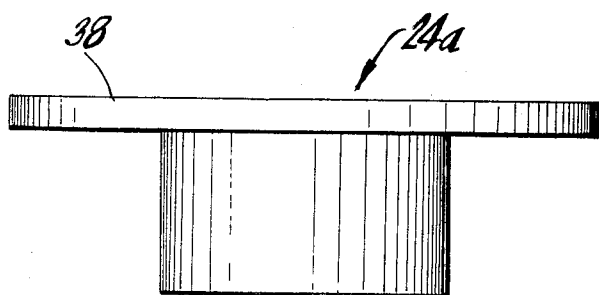


FIG. 4

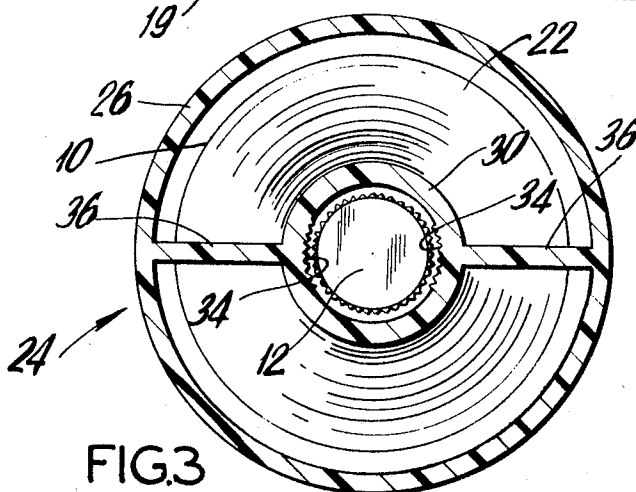


FIG. 3

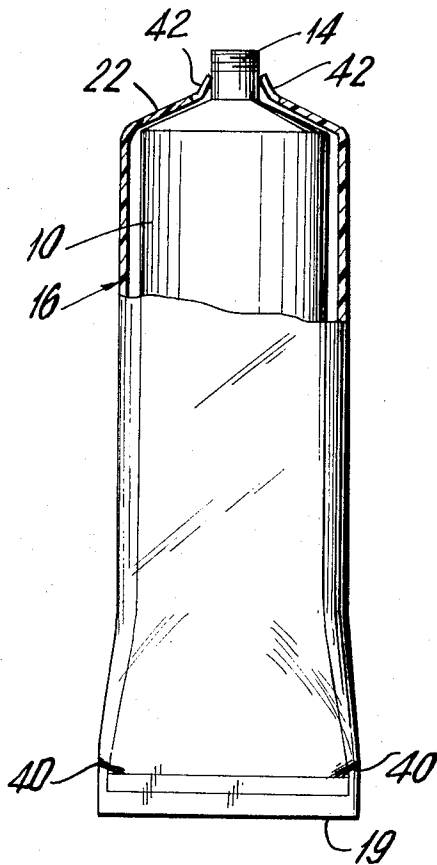


FIG. 5

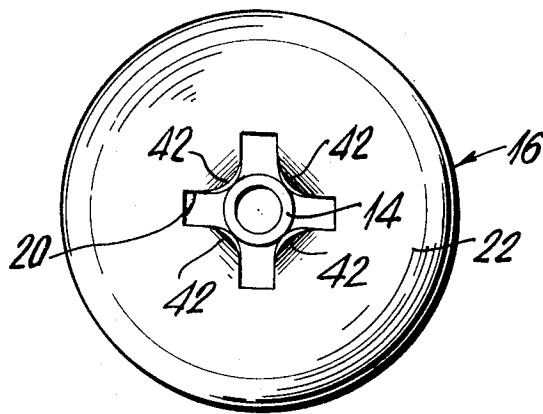


FIG. 6

SAFETY PACKAGE FOR COLLAPSIBLE TUBES

The present invention relates generally to containers, and more particularly to a safety enclosure for a squeezable container which prevents undesired access to the contents of the container.

The use of a squeezable or collapsible metal tube to store certain materials such as shampoos, ointments, insecticides, oven cleaners, glue, and other toxic substances has become widespread, largely as a result of the convenience of use of such containers. A controlled amount of the material may be removed from these tubes simply by removing the closure cap and then squeezing the body of the tube to cause the material to be expelled through the opening in the tube.

However, the use of squeezable containers has also created serious hazards, primarily to children who, when not watched by an adult, may gain access to the tube and remove and ingest some of the toxic material from the tube.

As a result of the long-recognized potential hazards of the use of squeezable tube containers, the federal government is establishing strict requirements for their design, primarily to prevent the undesired removal of the cap or closure of the tube to gain access to the toxic material in the tube.

Although the removal of the closure cap by a child is the major source of accidents involving the use of these tubes, another significant cause of accidents involving the use of squeezable tubes is the biting into and breaking of the tube wall by a child. After the wall of the tube has been broken by the child biting into the tube, the toxic material in the container can then be quickly ingested by the child with potentially tragic results.

As a result of the proposed federal safety requirements for the design of containers for toxic material, several designs have been proposed to prevent the child from removing the cap from the container; however, no practical design has heretofore been proposed to prevent the child from biting into and thereby breaking the container wall to gain access to the material within the container.

It is an object of the invention to provide an improved safety enclosure for a collapsible or squeezable tube which effectively prevents a child from biting into and breaking the tube wall.

It is another object of the invention to provide a safety enclosure of the type described in which removal of the cap from the squeezable tube is reliably prevented.

It is further another object of the invention to provide a safety enclosure of the type described which is reliable in use, inexpensive to fabricate, and which enhances the overall appearance of the collapsible tube with which it is used.

It is yet a further object of the invention to provide a safety enclosure of the type described which can also be employed as a display container for the collapsible tube with which it is used.

The safety enclosure of the invention is in the form of a flexible sleeve which is placed about a conventional squeezable or collapsible container or tube. The safety enclosure is made of a flexible, and unbreakable material such as polyethylene or polyvinyl chloride. When a compressive force is applied to the safety enclosure by the user, that force is transmitted to the

walls of the tube, thereby to squeeze the contents out of the open end of the tube. The non-breakable characteristic of the flexible, protective sleeve ensures that a child will not be able to bite into and break the walls of the collapsible tube and thereby ingest the contents of that tube.

The upper end of the protective enclosure is opened and tapered to enclose the neck of the tube and allow the capped upper end of the tube to extend there-through. The cap and the upper end of the tube may be enclosed as herein disclosed by a safety cap enclosure that includes a flexible outer wall and an inner central shell placed about the cap and connected to the outer wall by a pair of radial ribs. When the outer wall of the enclosure is pressed inwards by an adult user, the walls of the central shell are urged into engagement with and frictionally grasp the tube cap so that subsequent rotation of the enclosure rotates and thereby removes the cap from the tube.

To the accomplishment of the above and to such further objects as may hereinafter appear, the present invention relates to a safety package for a collapsible tube as defined in the appended claims, and as described in the following specification taken together with the accompanying drawings in which:

FIG. 1 is a perspective view of a safety package for a collapsible tube according to one embodiment of the invention;

FIG. 2 is a cross-sectional view on an enlarged scale as compared to FIG. 1 and partly broken away of the safety package of FIG. 1;

FIG. 3 is a horizontal cross-section taken along line 3—3 of FIG. 2;

FIG. 4 is an elevation of an alternative design of a safety cap enclosure for use with the safety package of the invention;

FIG. 5 is an elevation of an alternate embodiment of the safety package of the invention; and,

FIG. 6 is a plan view of the embodiment of the safety package of the invention shown in FIG. 5.

The safety package of the invention is illustrated in FIG. 1 as employed with a conventional squeeze or collapsible tube or container 10. As is known, such tubes are commonly used to contain and dispense a wide variety of substances such as toothpaste, shampoo, ointments and the like, many of which may be harmful if ingested by a child. The tube has an opening at its upper end which is normally closed by a closure or cap 12 that is threadably engaged to a neck portion 14 of the tube. When it is desired to dispense material from the interior of the tube, the cap is removed and the tube walls are squeezed by the user to force material out from the open end of the tube.

The wall of the tube is of necessity relatively thin so that it can be squeezed and is commonly made of lead, tin, or aluminum. Because of its thinness, the tube wall may be easily broken by the teeth of a child, who, once having thus broken the tube, can proceed to ingest a quantity of the substance contained in the tube with potentially tragic results.

The safety package of the invention effectively prevents this from occurring while still permitting unhindered use of the collapsible tube. That package, generally designated 16, is in the form of a sleeve made of a plastic material such as polyethylene, which is both flexible and sufficiently tough so that it cannot be broken by a child's teeth. The protective sleeve is also

preferably transparent or translucent to allow the printing and other indicia 18 on the wall of the squeezable tube to be clearly visible through the safety package.

The plastic sleeve, in the embodiment herein shown, is generally cylindrical in form and closed at its lower end, such as by a conventional heat sealing operation as shown at 19. As shown in FIG. 2, package 16 has a reduced diameter circular opening 20 at its upper end. Opening 20 is of a sufficient diameter to allow neck 14 and cap 12 of the tube to extend therethrough, but is less than the width of the collapsible tube.

Opening 20 is formed and surrounded by a tapered shoulder portion 22 of the safety package and generally corresponds in form to the upper shoulder portion of the collapsible tube. The tapered shoulder portion of the safety package prevents the collapsible tube 10 from being removed from the safety package.

The flexibility of the safety package allows the user to dispense material from the collapsible tube by applying a squeezing force to the plastic safety package, which force compresses the safety package against the thin walls of the collapsible dispensing tube, such that additional squeezing of the safety package causes the walls of the collapsible tube to be similarly compressed, thereby to cause material to be dispensed from the open end of the tube.

However, since the plastic material of the safety package is relatively non-breakable as compared to the wall of the collapsible tube, it cannot be broken by a child's teeth so that a child will be unable to gain access to the contents of the collapsible tube by breaking the walls of that tube. The relative indestructibility of the safety package allows it to be used as a carton during shipment and display of the tube to prevent damage to the tube.

In order to ensure complete safety of use of the tube, removal of the cap by a child must also be prevented. To this end, a safety cap enclosure generally designated 24 and formed of a flexible plastic material, is placed over cap 12. As seen in FIGS. 2 and 3, cap enclosure 24 includes a cylindrical outer wall 26 and an upper wall 28. A central cylindrical shell 30 is formed integrally with and depends downwardly from the upper wall 28.

The inner diameter of shell 30 exceeds on cap of the tube cap 12. A peripheral lip 32 is formed at the lower end of shell 30 to reduce the diameter of shell 30 at its lower end to a value greater than that of the neck of the tube, but less than that of the cap, thereby to prevent the enclosure 24 from being removed from about the cap. The inner surface of shell 30 is formed with complementary ribs or grooves 34 for frictionally engaging the ridges formed on cap 12. Ribs 36 extend radially between the outer surface of shell 30 to the inner surface of outer wall 26.

The enclosure cap is normally free to rotate about the cap. However, when pressure is applied to the outer surface of wall 26 in substantial alignment with ribs 36 (as shown in FIG. 3), wall 26 is inwardly compressed. That force is also transmitted by the ribs to the walls of shell 30, thereby to compress the inner surface of the shell against the cap of the collapsible tube in frictional engagement therewith. Rotation of the enclosure 24 under this condition will cause corresponding rotation of the cap until the cap is removed from the collapsible tube along with safety enclosure 24. The force required to compress the shell against the cap exceeds that

which a child is able to apply, thereby to ensure that only an adult capable of exerting a sufficient compressive force on the outer wall of the safety enclosure will be able to remove the cap and thereby dispense material from the tube.

The safety cap enclosure shown in FIGS. 2 and 3 can also be made oval, elliptical, or triangular in shape rather than circular as shown, so long as the application of the pressure to the enclosure will produce a frictional engagement between the inner shell and the cap. A further modification of the cap enclosure is shown in FIG. 4, in which the enclosure 24a is substantially the same as that illustrated in FIGS. 2 and 3, but further includes an increased diameter peripheral flange 38 extending beyond the outer wall of the enclosure. The diameter of flange 38 exceeds the hand span of a child to further ensure that a child will be unable to apply the necessary force to the enclosure to produce rotation and consequent removal of the cap from the tube.

An alternate construction of the safety package of the invention is illustrated in FIG. 5 in which the heated sealed end 19 of package 19 extends over the folded and crimped lower end of the collapsible tube. The lower heat-sealed end of the safety package engages the crimped lower end of the collapsible tube as indicated at 40, thereby to effectively limit or prevent relative movement between the lower end of the collapsible tube and the heat-sealed lower end of the safety package, and thus lock the collapsible tube in place within the safety package.

Another way to increase the retention of the collapsible tube within the safety package is shown in FIG. 6 in which resilient fingers 42 extend radially from the inner periphery of shoulder portion 22. As shown in FIGS. 5 and 6, these fingers engage the neck portion 14 of the collapsible tube and serve to maintain the collapsible tube in place within the safety package by preventing the collapsible tube from falling into the safety package as the tube is emptied over the period of its use.

The safety package and cap enclosure are each effective to prevent a child from removing a potentially harmful substance from a collapsible tube. The safety package is inexpensive and easy to fabricate, and thus adds little to the cost of the collapsible tube at a considerable increase in safety.

The safety package can also serve as the display carton for the tube, thereby reducing the costs of the tube by doing away with the need for a separate display container. Although the safety package is herein shown as being transparent, it may be translucent or even opaque, if desired, or decorative markings may be printed on the package to enhance the appearance of the tube.

Thus, while the safety package of the invention has been herein described with respect to several presently preferred embodiments thereof, it will be apparent that modifications may be made therein all without departing from the spirit and scope of the invention.

I claim:

1. A safety package for use in combination with a flexible squeeze tube of the type made of a material that can be broken by a child to enable the child to reach the contents of the tube and having a discharge opening formed in a reduced-diameter neck that extends from the tube, a closure cap being removably secured to the neck to cover the discharge opening when

the tube is not in use to dispense material therefrom, said safety package comprising a sleeve member made of a flexible material that cannot be broken by a child, said sleeve member being shaped and dimensioned so as to enclose the squeeze tube, a permanently sealed lower end portion for receiving and retaining the lower end of the squeeze tube, and a tapered upper end portion having an opening therein of a diameter greater than that of the tube neck portion through which the neck portion passes, said tapered end portion enclosing the upper end of the squeeze tube and providing, along with said sealed lower end, means for permanently retaining the squeeze tube within said package.

2. In combination with the safety package of claim 1, an enclosure for placement about the cap, said enclosure including an inner member normally surrounding but spaced from the cap, an outer wall, and rib means extending between said inner member and said outer wall, whereby a force applied to said outer wall is trans-

ferred by said rib means to said inner member to urge the latter into frictional engagement with the cap.

3. The combination of claim 2, in which said cap enclosure includes an enlarged diameter flange extending radially outwardly from said outer wall, said flange having a dimension in the direction of said rib means that exceeds the span of a child's hand.

4. The combination of claim 2, in which said inner member is a cylinder open at its lower end and having a diameter normally exceeding that of the cap, said cylinder having means for frictionally engaging the outer surface of the cap when a sufficient force is applied to said outer wall.

5. The safety package of claim 1, in which said removal preventing means further includes at least a pair of opposing resilient fingers extending radially from said opening for engaging the neck portion of the squeeze tube.

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