SAFETY CLOSURE CAP

Inventor: Burt H. Shulman, 71 Fuller Ave., Hyde Park, N.Y. 12538

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2,499,765 3/1950 Maclaren 215/9 UX
3,313,441 4/1967 Fadden 222/48 X

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Primary Examiner—Robert B. Reeves
Assistant Examiner—Joseph J. Rolla
Attorney, Agent, or Firm—Joseph L. Spiegel

A safety dispensing closure including first and second, cylindrical, open ended, telescopically engaging members, each having a flange portion and a depending skirt portion. The first tubular member has a skirt diameter sufficient to be placed into the opening in a container to seal the opening. A tubular cap member also having a flange portion and depending skirt portion telescopically engages the second tubular member. Intermediate the flanges of the cap and the second member is a sleeve which is rotatably mounted on and circumscribes the skirt portion of the cap member, the skirt of the cap member and the sleeve including apertures which may be brought into registry to effect communication between the interior of the members and the exterior to permit passage of an object therethrough. The members are provided with interlocking projections and grooves to inhibit axial disengagement of the members one from the other while permitting relative rotational displacement of the members one to the other.

Braces extend transversely of each of the members to divide the interior of each of the members, and indicia is applied externally of each of the members to indicate the position of the braces and to insure passage of an object therethrough and out the apertures when desired.

10 Claims, 5 Drawing Figures
SAFETY CLOSURE CAP

SUMMARY OF THE INVENTION AND STATE OF THE PRIOR ART

The present invention relates to a safety cap or closure and more specifically relates to a safety dispensing closure for use with containers, more specifically bottles intended for the carrying of pills and the like.

There are numerous examples in the prior art of safety closures intended for use on bottles or other containers which dispense tablets or pills which, if taken in any quantity, for example by a small child, could be extremely dangerous if not lethal. Some of the closures, for example in the patent to Johnson, U.S. Pat. No. 3,445,021 and in the patent to Leopoldi et al. U.S. Pat. No. 3,684,117 describe container caps in which a combination must be dialed in order for the cap to be removed from the container. While this type of closure is effective, it does necessitate the proper replacement of the cap on the container. Other safety caps, such as described in the patent to Fadden, U.S. Pat. No. 3,313,441, provide a safety combination dispensing closure in which, upon alignment of certain disks in a predetermined position, a tablet or the like may be dispensed from the interior of the container through aligned holes in the several disks and out the top of the cap. The Fadden type structure has a definite advantage inasmuch as the cap is very difficult to remove, one applied to the container, and therefore cannot be inadvertently left off or easily removed from the container such that a child may remove the contents of the container due to the accidental misplacement of the cap. However, there are several disadvantages to the Fadden type dispensing cap. For example, the Fadden structure requires that the bottle be inverted in order to remove a pill, and the pill or other object must be removed through the top of the cap. This leaves an opening on the surface of the cap such that dirt or other foreign material may fall into the first disk and impede the smooth operation of the structure, and even contaminate the interior of the container. In addition, the Fadden type structure requires a material which may be folded under and around the neck flange or rim of the container. This means special tools are required in order to fasten the cap to the container, and it is difficult if not impossible to reuse the cap.

In view of the above it is a principal object of the present invention to provide a safety dispensing closure which requires special manipulation to enable easy extraction of the contents of a container to which the dispensing closure is attached.

Another object of the present invention is to provide a novel safety dispensing closure which may easily be applied to containers of various types.

Yet another object of the present invention is to provide a safety dispensing closure which may be easily modified by the insertion of a sized annulus which cooperates with the closure so as to impede the passage therethrough, without proper alignment, of different objects from the container.

Still another object of the present invention is to provide a safety dispensing closure in which the outlet orifice or aperture remains covered until it is desired to remove an object from the dispensing bottle or container.

Other objects and a more complete understanding of the invention may be had by referring to the following specification and claims in conjunction with the accompanying drawings in which:

FIG. 1 is a side elevational view of a safety dispensing closure constructed in accordance with the present invention and illustrating the closure in a position for dispensing objects through the cap from a container;

FIG. 2 is a fragmentary sectional view in side elevation of the cap illustrated in FIG. 1 and shown in position in a typical container;

FIG. 3 is a fragmentary sectional view of the closure taken along line 3-3 of FIG. 2 illustrating certain portions of the closure in a first position to inhibit the dispensing of an object;

FIG. 4 is a fragmentary sectional view taken along line 4-4 of FIG. 2 and illustrating the dispensing closure cap of the present invention in a position for permitting passage therethrough of an object from the container;

FIG. 5 is an exploded perspective view of the dispensing closure cap illustrated in FIGS. 1-4.

Referring now to the drawing, and especially FIGS. 1 and 5 thereof, a safety dispensing closure 10 is illustrated therein. In accordance with the invention, the parts of the closure are brought together into an interlocking relationship which permits relative rotation of the various parts to secure alignment of means internally of each of the parts so as to permit objects to pass therethrough. To this end, and referring first to FIG. 5, the closure 10 comprises a first, open ended tubular base member 11 having a radially projecting flange portion 12 and a depending skirt portion 13, the skirt portion preferably being composed of a material such as plastic, which may be deformed so as to provide an interference fit in the neck or opening of a container, such as a bottle 14 illustrated in phantom in FIG. 2. The fit, of course, should be tight enough so that enough force is required to remove the closure 10 from the container to prevent a child from being able to remove the cap.

Telescopically engaging the first tubular member is a second open ended, tubular member 15, also including a radially projecting flange portion 16 and a depending skirt portion 17. As shown best in FIG. 2, the skirt 17 of the second member 15 abuts the interior of the first tubular member 11. In a like manner, a tubular cap member 18, including a radially extending flange or lip portion 19 and a depending skirt portion 20, telescopically engages the second member 15. As shown, the cap member includes a closed end 19A and a lower open end in the skirt portion 20.

In order to provide egress from the dispensing closure, of objects from the container, an aperture or dispensing orifice 21 is provided in the skirt portion 20 of the tubular cap member 18, the orifice or opening being dimensioned to permit passage of objects from the container. (See FIG. 2)

In order to provide coverage for the aperture 21 so as to prevent entry thereto of dirt or other foreign materials, a sleeve 22 circumscribes the skirt portion 20 of the cap member 18. The sleeve is dimensioned such that rotation thereof may be effected about the skirt portion 20 while its position, intermediate the flange 19 of the cup 18 and the flange 16 of the second tubular member 15, inhibits axial displacement thereof. Additionally, the sleeve 22 includes at least an axially and circumferentially extending opening 23 therein, in the illustrated instance the sleeve merely having a seg-
ment removed so as to provide an opening which may register with the aperture 21 in the skirt portion 20 of the cap member 18.

In order to inhibit axial displacement of the members, one with respect to the other, means are provided to effect axial engagement of the members one to the other while permitting relative rotation thereof. To this end, and as best illustrated in the drawings, grooves are placed in one of the exteriors or interior of the telescopically engaging portions of the members, the grooves adapted for cooperation with radially extending projections in the mating portions of the telescopically engaging members. For example, and as best illustrated in FIG. 5, and in the illustrated instance, the interior of the first tubular or base member 12 includes a plurality of projections 24 which cooperate with the mating groove 25 in the exterior of the skirt portion 17 of the second tubular member 15. In a like manner, projections 26 located in the bore of the second member 15 cooperate with the circumferentially extending groove 27 in the skirt portion 20 of the cap member 18. Of course, as set forth above, the projections could be on the skirt portions of the cap and second member with the groove on the interior of the second member and base member. Additionally, it should be recognized that for ease of assembly it is preferable that the projections have a limited resiliency and flexibility so that the members may be forced together into interlocking relation. Additionally, the particular manner in which the members cooperate permits relative rotation to occur between the members, for purposes which will be more fully explained hereinafter.

In order to prevent the passage of an object such as a pill out of the aperture 21 and through the opening 23 inadvertently, means are provided to inhibit the passage of an object through the members when the means are rotationally misaligned while permitting passage of an object therethrough when the means are aligned. To this end, and as best shown in FIGS. 3 and 4, object impedance means extend transversely of at least some of the members, in the illustrated instance each of the members, to inhibit such object passage through the members and out through the aperture and opening. Preferably, the object impedance means comprise braces or thin pins which extend across the diameter of each of the tubular members such as illustrated in FIGS. 2 and 3. For example, the first tubular or base member 12 has a pin 28 which extends transversely of the skirt portion 13, adjacent to and underlying the terminal end of the skirt portion 17 of the second tubular member 15. In a like manner, the second tubular member 15 has a pin 29 which extends across the diameter of the interior of the skirt portion 17 and inasmuch as it is adjacent the terminal end of the skirt portion, is in close, axial spaced apart relation with respect to the brace or pin 28 in the first tubular member. As shown, a third such brace or pin 30, in the lower interior portion of the skirt 20 of the cap member 18, also is in close axially spaced apart relation with respect to its adjacent brace 29. The close or limited axial spacing of the braces 28-30 is important so as to prevent objects from following a tortuous path and enabling their exit through the tubular members when the members are in a rotationally misaligned state, as illustrated in FIG. 3. Additionally, the spacing of the tubular members in conjunction with the braces should be such that the only time an object may pass through the tubular members and out the aperture 21 is when the braces or pins are in superimposed aligned relation such as illustrated in FIG. 4.

In order that the relationship may be easily determined by an adult or other mature individual who is attempting to remove an object from the container through the closure, it is desirable that means be provided to enable easy alignment of the object impedance means into a position such as illustrated in FIG. 4. To this end, the flange portions of each of the members, i.e., flanges 12, 16 and 19 are each provided with indicia, in the illustrated instance, knurling 12A, 16A, and 19B respectively which, when aligned, as illustrated in FIG. 1, will insure that the object impedance means are in a position to permit passage therethrough or thereby of an object from the container 14.

In certain instances where the container is very large and the neck of the container is oversized, requiring a large diameter base or first tubular member 12, the interference afforded by the object impedance means heretofore described may be insufficient to prevent inadvertent or accidental passage of a pill or other object from the container through the aperture 21 and opening 22. To prevent the inadvertent passage of such, at least one aperture disk or annulus 31 may be positioned intermediate two of the members to inhibit the passage therethrough, in conjunction with the object impedance means, of the small objects. To this end, and referring to FIG. 5, the annulus 31 includes an aperture 32 having an effective diameter larger than the object which is to pass therethrough. In the illustrated instance, the aperture disk or annulus 31 is positioned in such a manner as to be sandwiched between the brace 28 and the lower terminal end 17A of the skirt 17 of the second tubular member 15. In operation the annulus or aperture disk serves in conjunction with the braces to limit the effective length or diameter thereof and thereby adjusts the effective size of an object which may pass through the members and out the aligned apertures.

Thus the safety dispensing closure of the present invention is simple in operation and yet effective to prevent inadvertent passage of a dangerous object or medicine such as a pill or the like therethrough effectively preventing a child from accidentally receiving a dangerous medication. Additionally, by using the sleeve with the aligned opening therein, the discharge orifice of the closure may be kept free from contamination and does not require complete inversion of the container in order to remove an object therefrom.

Although the invention has been described with a certain degree of particularity, it is understood that the present disclosure has been made only by way of example and that numerous changes in the details of construction and the method of combining parts may be made without departing from the spirit and the scope of the invention as hereinafter claimed.

What is claimed is:
1. A safety dispensing closure comprising in combination:
   first and second open ended, telescopically engaging, tubular members; each of said members having a flange portion and depending skirt portion; a tubular cap member having a flange portion and depending skirt portion and being in telescopic engagement with said second tubular member; a sleeve rotatably mounted on said skirt portion of
said cap member, and positioned intermediate said flange of said second member and said cap member; means to effect axial engagement of said members one to another while permitting relative rotation thereof; means defining an opening in said sleeve and means defining an aperture in the skirt portion of said cap member, said opening and aperture being alignable in radially superimposed relation to provide communication to the interior of said members; and object impedance means extending transversely of at least some of said members to inhibit the passage of an object through said members when said means are misaligned and to permit passage of an object therethrough when said means are aligned.

2. A closure in accordance with claim 1 wherein said object impedance means extend transversely of each of said members and comprise braces.

3. A closure in accordance with claim 2 wherein said braces extend across the diameter of each of said members in close, axially spaced apart relation.

4. A closure in accordance with claim 1 including indicia on each of said members to indicate the position of said object impedance means.

5. A closure in accordance with claim 1 wherein said means to effect axial engagement of said members comprises a groove in one of the telescopically engaging portions of each member and a radially extending projection, in registry with said groove, in the other of said portions of said telescopically engaging members.

6. A closure in accordance with claim 4 wherein said indicia comprises knurling on said flange portions of said members.

7. A closure in accordance with claim 2 including an annulus intermediate two of said members, said annulus having an aperture therein larger than an object which is to pass therethrough, and operative, in conjunction with said braces to limit the effective length thereof and to thereby adjust the effective size of an object which may pass through said members and out said aligned apertures.

8. A safety dispensing closure comprising in combination: a first, open ended tubular base member having a radially projecting flange portion and a depending skirt portion; a second open ended, tubular member telescopically engageable in said base member; a tubular cap member including a radially extending flange portion and a depending skirt portion telescopically engageable in said second member, and an aperture in said cap member skirt portion to provide communication with the interior of said tubular members; a sleeve circumscribing said skirt portion of said cap member and rotatably mounted thereon, said sleeve including at least an axially and circumferentially extending opening therein and dimensioned for registry with said aperture in said skirt portion of said cap member; and means to inhibit axial displacement of said members one with respect to the other while permitting independent relative rotational displacement thereof; and brace means in each of said members to divide the interior of said member, and indicia means externally of said members to indicate the relative rotational position of said members whereby said brace means may be brought into axially aligned superimposition.

9. A safety dispensing closure in accordance with claim 8 wherein said means to inhibit axial displacement of said members comprises a groove in one of the telescopically engaging portions of each member and a radially extending projection, in registry with said groove, in the other of said portions of said telescopically engaging members.

10. A safety dispensing closure in accordance with claim 9 including an annulus intermediate two of said members, said annulus having an aperture therein larger than an object which is to pass therethrough, and operative, in conjunction with said braces to limit the effective length thereof and to thereby adjust the effective size of an object which may pass through said members and out said aligned apertures.