A locking container cap is provided that includes a closure positionable over the top of a container, and a locking ring engaged with the container below the closure and releasably engageable with the closure. The locking member includes a number of lugs that can be engaged within notches formed in the lower end of the closure to securely hold the closure on the container and prevent the removal of the closure by a child. To disengage the closure, the lugs must be disengaged from the notches in the closure prior to rotating either the closure or locking ring with regard to the container.
LOCKING CONTAINER CAP
CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority from U.S. Provisional Patent Application Ser. No. 60/753,548, filed Dec. 23, 2005, the entirety of which is expressly incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The present invention relates to containers, and more specifically to a locking cap for a container, such as a container for holding medication.

BACKGROUND OF THE INVENTION

[0003] In order to prevent children from accessing the interior of a number of containers, such as medication or pill containers, a wide variety of child-proof or safety caps for containers of this type have been developed. The majority of the safety caps include members that are rotatably engaged with the container through the use of a thread disposed on the container that is engageable with the cap. A suitable locking member is disposed on the cap or on the container to securely engage the cap to the container until such time as it is desired to remove the cap from the container. The locking members have various forms, but each is designed to prevent a child from easily disengaging the locking member and separating the cap from the container.

[0004] A number of child-proof caps also include a locking ring formed separately from the cap and positioned on the container. These rings have various functions with regard to the cap, but in virtually every circumstance form a portion of the locking mechanism designed to hold the cap on the container until such time as an adult disengages the locking mechanism.

[0005] However, a significant number of child-proof and safety caps of this type are designed with locking mechanisms that are easily defeated by children of an insufficient age to safely access the contents of containers of this type. Additionally, these various child-proof and safety caps often provide significant difficulties to older individuals who wish to gain access to the contents of the container. As a result, often the individual cannot remove the cap, or because of the difficulty in removing the cap, does not adequately replace the cap to avoid having to remove it again, thereby defeating the purpose of the cap.

[0006] Therefore, it is desirable to develop a locking container cap that can be positioned on a suitable container and that easily confounds a child attempting to remove the cap from the container. However, the locking container cap should also be easily removable by an adult, including adults that are elderly or handicapped.

SUMMARY OF THE INVENTION

[0007] According to a primary aspect of the present invention, a locking cap for a container includes a locking ring threadedly engaged with the container and a closure engaged with the locking ring and the container. The locking ring is formed of a deformable, thermoplastic material and is adapted to be threadedly engaged with a wide variety of containers. The locking ring includes a number of lugs that are engageable within notches formed within the closure that can be conventionally formed and is also threadedly engaged with the container. The lugs are positioned within the closure in a manner that prevents the rotation of the closure with regard to the container until the lugs are displaced from the notches in the closure, allowing the closure to be rotated with respect to the threads on the container. The closure can be formed as a conventional push and turn locking closure, with the locking ring having a configuration adapted to conform to the closure for utilization therewith.

[0008] According to still another aspect of the present invention, the locking ring can be utilized as an add-on feature to existing closures, such as push-to-turn closures, in order to enhance the ability of the closure to prevent children from removing the closure from the container.

[0009] Numerous other aspects, features, and advantages of the present invention will be made apparent from the following detailed description taken together with the drawing figures.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The drawings illustrate the best mode currently contemplated as practicing the present invention.

[0011] In the drawings:

[0012] FIG. 1 is an exploded, isometric view of a locking container cap constructed according to the present invention secured to a container;

[0013] FIG. 2 is an exploded, isometric view of the locking container cap of FIG. 1 secured to another type of container;

[0014] FIG. 3 is an exploded, isometric view of a second embodiment of the locking container cap of FIG. 1 secured to a container;

[0015] FIG. 4 is a top plan view of the locking ring of the locking container cap of FIG. 3; and

[0016] FIG. 5 is a cross-sectional view of the locking ring and closure of the locking container cap of FIG. 3.

DETAILED DESCRIPTION OF THE INVENTION

[0017] With reference now to the drawing figures in which like reference numerals designate like parts throughout the disclosure, a container for holding various types of items, such as medication or pills (not shown), is indicated generally at 10 in FIG. 1. The container 10, such as a standard container in FIG. 1 or an aerosol container in FIG. 2, includes a neck 12 having an open, upper end 13 and a lower end 14 at which is formed a retainer ring 15 that is integrally molded with or fixedly secured to the container 10. The neck 12 also includes an exterior thread 16 extending from the upper end 13 downwardly to the retainer ring 15.

[0018] Attached to the neck 12 is a locking container cap 18 that includes a locking ring 20 and a closure 22. The locking ring 20 is formed of a suitably compressible or deformable material, such as a plastic or rubber material. The ring 20 is generally cylindrical in shape, and defines central aperture 21 that is dimension to be complementary to the diameter of the neck 12, and preferably slightly less than
the diameter of the neck 12, such that the ring 20 can be adequately secured to the neck 12. The ring 20 includes an interior thread 24 extending around the interior surface of the aperture 21 and mateable with the exterior thread 16 disposed on the neck 12 of the container 10. The ring 20 includes an outwardly curving upper end 25 that forms a grippable rim 26 from which extend a number of spaced lugs 28. The lugs 28 can have suitable shape and size, such as the small rectangular shape shown in FIGS. 1 and 2, and extend upwardly from the rim 26 and are located between vertical slots 30 that are cut, or otherwise formed directly in the rim 26. The slots 30 are present such that when a downward force is exerted by an individual on the rim 26 between the slots 30, the section of the rim 26 located between the slots and supporting the lug 28, and consequently the lug 28, is moved downwardly and outwardly with regard to the remainder of the rim 26.

[0019] The number of lugs 28 located on the ring 20 is preferably selected to be more than one, with at least three lugs 28 being especially preferred, though a ring 20 including only one lug 28 can be utilized in the construction for the cap 18. Further, in the preferred embodiment, the lugs 28 are spaced from one another around the periphery of the ring 20, most preferably at intervals of ninety (90) degrees with respect to one another. By placing the lugs 28 around the ring 20 in this configuration, the ring 20 requires that pressure be applied to multiple and separate discrete areas of the ring 20 in order to displace all of the lugs 28 simultaneously. Also, by forming the lugs 28 integrally with the ring 20 of the soft material, if necessary, one or more of the lugs 28 can be severed from the ring 20 in order to reduce the number of positions at which the ring 20 must be depressed to displace the lugs 28.

[0020] To assist in displacing the lugs 28 with regard to the remainder of the ring 20, the ring 20 also includes a number of gripping members 27 disposed on the ring 20 opposite the thread 24. The gripping members 27 are preferably integrally formed with the ring 20 and provide locations here an individual utilizing the cap 18 can easily grip the ring 20 to disengage the cap 18 from the container 10 in a manner to be described.

[0021] The closure 22 is formed with an open lower end 31 and a closed upper end 32 and is employed to enclose the open end 14 of the neck 12. The closure 22 also includes an interior thread (not shown) that is engageable with the thread 16 disposed on the exterior of the neck 12 to securely engage the closure 22 with the neck 12. The closure 22 also includes a retaining structure (not shown) normally located within the closure 22 adjacent the lower end 31 that engages a locking structure (not shown) disposed on the neck 12. The retaining and locking structures on the closure 22 and the neck 12 can be any well known mechanism for holding a cap or closure on a container, such as a mechanism that is operable in a conventional press and turn manner such that the retaining structure on the closure 22 can be disengaged from the locking structure on the neck 12 by pressing the closure 22 downwardly onto the neck 12, and subsequently rotating the closure 22 in a specified direction to release the closure 22 from the neck 12.

[0022] The closure 22 also includes a peripheral flange 34 located adjacent the lower end 31 and extending outwardly or inwardly from the lower end 31. Within the flange 34 are disposed a number of notches 36 that extend upwardly into the flange 34 from a lower end thereof. The notches 36 are formed to have a size and shape complementary to the size and shape of the lugs 28 on the locking ring 20, such that the notches 36 are engageable with the lugs 28 located on the locking ring 20. When the lugs 28 are engaged within the notches 36, the lugs 28 prevent the rotation or other movement of the closure 22 with regard to the neck 12 and/or locking ring 20. The notches 36 are present around the entire flange 34, and preferably spaced equidistant from one another, with between twenty-five (25) and four (4) notches 36 being present on the flange 34 in preferred embodiments.

[0023] To secure the closure 22 on the container 10 with the locking ring 20, initially the locking ring 20 is threadedly engaged with the exterior thread 16 on the container neck 12, such that the locking ring 20 abuts the retaining ring 14. The closure 22 is then engaged with the neck 12 above the locking ring 20 in a threaded and/or press and turn manner. The locking ring 20 can then be rotated around the neck 12 along the thread 16 in order to engage the lugs 28 and locking ring 20 with a number of the notches 36 on the flange 34 of closure 22. Due to the ring 20 and lugs 28 being formed of a deformable material, the lugs 28 can be compressed by the engagement of the ring 20 with the closure 22 until the lugs 28 are completely aligned with the notches 36, such that the lugs 28 expand back into their original configuration within each of the respective notches 36. In addition the positioning of the slot 30 on opposite sides of each lug 28 enables the ring 20 to deform more easily when the lugs 28 are positioned against the flange 34, but prior to the lugs 28 being positioned within the notches 36.

[0024] When the lugs 28 are engaged within the notches 36, the locking ring 20 is prevented from being rotated away from the closure 22, such that the safety cap 18 securely closes the container 10. Additionally, the closure 22 cannot be rotated or pushed downwardly onto the neck 12 to disengage the retaining member on the closure 22 from the locking member on the neck 12 due to the engagement of the closure 22 with the locking ring 20.

[0025] To disengage the locking ring 20 from the closure 22, pressure is simultaneously applied to the rim 26 between each of the pairs of slots 30 which moves the lugs 28 disposed above the slots 30, thereby disengaging the lugs 28 from within the notches 36. The locking ring 20 can then be rotated away from the closure 22, such that the closure 22 can subsequently be disengaged from the container 10.

[0026] Referring now to FIGS. 3-5, in a second embodiment of the cap 18 of the present invention, the cap 18 includes a locking ring 20 and a closure 22. The closure 22 is formed similarly to the previous embodiment, but the locking ring 20 is formed with a relatively thin, plate-like body 100 that defines an aperture 102 therein. The aperture 102 is dimensioned to have an inner diameter slightly smaller than the exterior diameter of the container neck 12, such that the aperture 102 tightly engages the neck 12 when the body 100 is positioned around the neck 12. To assist in maintaining the position of the body 100 on the neck 12, the body 100 also includes a number of braces 104 disposed on a lower surface 106 of the body 100 immediately adjacent the aperture 102, and preferably extending slightly into the aperture 102. The braces 104 contact the neck 12 when the body 100 is positioned thereon, and, due to the high coef-
The cap of claim 1 further comprising a number of braces on the locking ring that are engagable with the neck of the container.

8. The cap of claim 7 wherein the central aperture has a diameter slightly less than the diameter of the neck of the container.

9. The cap of claim 8 wherein the braces extend at least partially into the aperture.

10. The cap of claim 1 further comprising a number of outwardly extending tabs disposed on the locking ring adjacent each of the number of lugs.

11. A method of securing a locking container cap to a container, the method comprising the steps of:

   a) providing a locking container cap including a locking ring having a number of upwardly extending lugs thereon, and a closure including a number of downwardly extending notches therein;

   b) engaging the locking ring with a neck of the container;

   c) engaging the closure with the container; and

   d) engaging the lugs on the locking ring within the notches in the closure.

12. The method of claim 11 wherein the step of engaging the lugs with the notches comprises rotating the locking around the neck to move the lugs into engagement with the notches.

13. The method of claim 12 wherein the locking ring includes an interior thread engageable with an exterior thread on the neck of the container, and wherein the step of rotating the locking ring comprises moving the locking ring upwardly along the threads to engage the lugs within the notches.

14. The method of claim 11 further comprising the steps of:

   a) disengaging the lugs from within the notches after engaging the lugs within the notches; and

   b) disengaging the closure from the container.

15. The method of claim 14 wherein the step of disengaging the lugs from within the notches comprises deflecting the lugs out of engagement with the notches.

16. The method of claim 15 wherein the locking ring includes a number of pairs of slots formed on opposite sides of each of the number of lugs of define deflection portions on the locking ring, and wherein the step of deflecting the lugs comprises pressing downwardly on the deflecting portions of the locking ring.

17. The method of claim 15 wherein the locking ring includes a number of outwardly extending tabs disposed adjacent each of the number of lugs, and wherein the step of deflecting the lugs comprises pulling downwardly on the tabs of the locking ring.

18. A locking container comprising:

   a) a body including a lower containment portion and an upper neck portion, the upper neck portion including an upper, open end and an exterior thread disposed around the upper neck portion;
b) a closure including an open, lower end and a flange including a number of notches disposed adjacent the lower end and an interior thread engagable with the exterior thread on the neck portion; and

c) a locking ring defining a central aperture therein that is engagable around the neck of the container and including a number of lugs selectively engageable within the notches in the closure.

19. The container of claim 18 wherein the locking ring includes an aperture thread in the central aperture engagable with the exterior thread on the neck portion of the container.

20. The container of claim 18 wherein the locking ring includes a number of braces extending partially into the central aperture and engagable with the neck portion.