

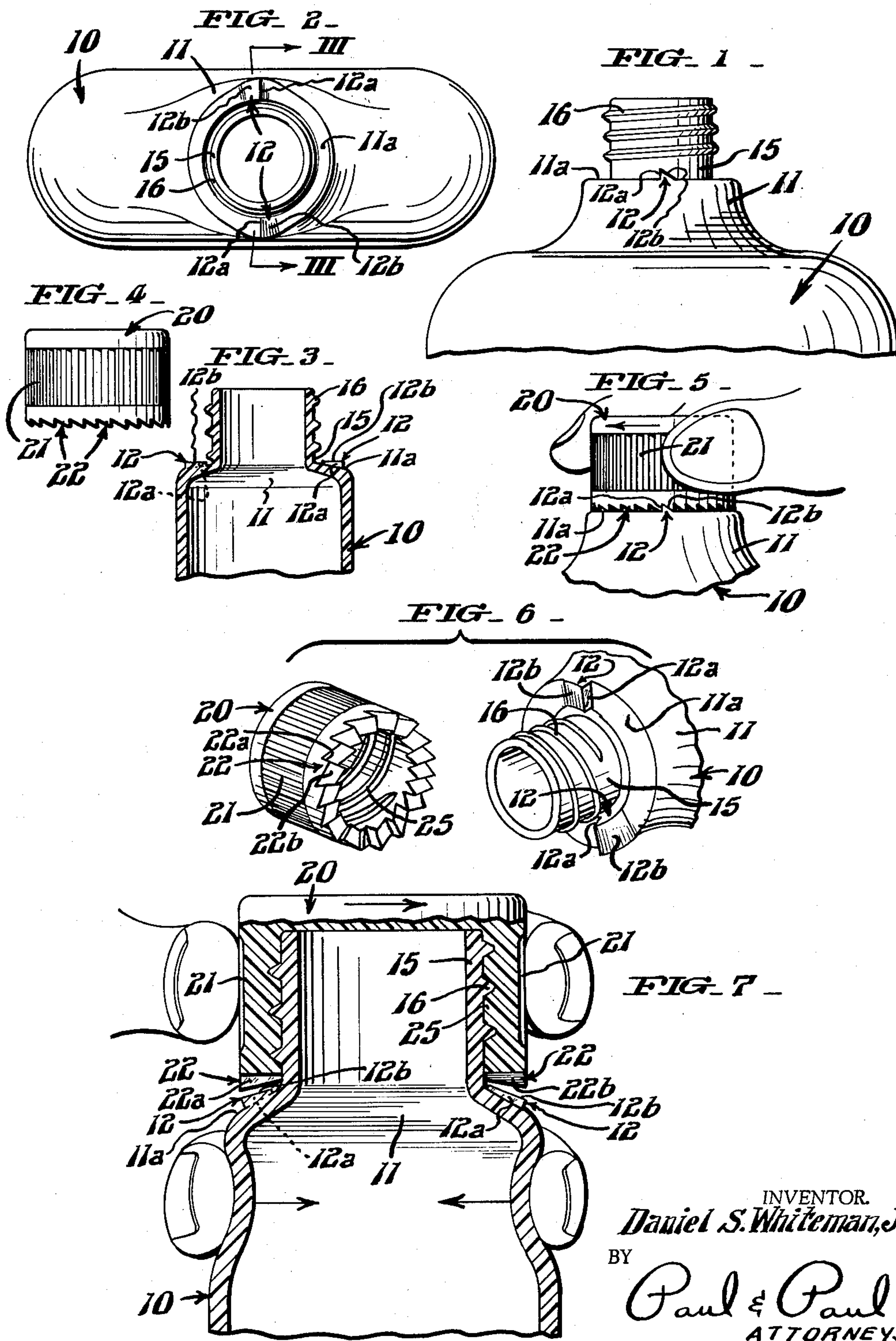
Aug. 27, 1963

D. S. WHITEMAN, JR

3,101,856

BOTTLE CLOSURE

Filed April 18, 1962



1

3,101,856

BOTTLE CLOSURE

Daniel S. Whiteman, Jr., Box 25, Prospectville, Pa.

Filed Apr. 18, 1962, Ser. No. 188,450

15 Claims. (Cl. 215-9)

This invention relates to a bottle closure and, in particular, to a bottle closure incorporating a locking mechanism for securing the cap to the bottle whereby the same cannot be removed without the proper manipulation of the bottle. As many deaths and injuries each year, especially to children, are caused by easy access to a bottle containing poison or other harmful substance, this invention is directed to providing a bottle and cap locking means which renders it difficult for a child under the age of six years to remove the cap, and yet fairly simple for an adult or older child to overcome the locking mechanism and have access to the contents.

The prior art shows a variety of containers and mechanisms for securing the cap to the container proper. One such reference is the U.S. Patent No. 2,980,275, inventor R. A. I. Lundgren, issued April 18, 1961. The locking mechanism for jars as disclosed in that patent, necessitates the use of a separate, flexible ring which fits over the top of a jar and has a series of spurs which engage indentations in the cap. The mechanism disclosed by Lundgren has certain disadvantages which are overcome by the present invention. First, the Lundgren mechanism requires the use of a separate component which must be provided for each jar and cap and which must be of such size and construction as to fit tightly over the neck of the particular jar so as to engage a notch on the jar. Second, Lundgren's mechanism is substantially easier to disengage than that disclosed by applicant, and does not provide locking means which grips the cap as positively as does the mechanism disclosed by applicant.

Therefore, it is an object of this invention to provide locking means associated with the bottle for securing an ordinary screw-on bottle cap which allows the cap to be removed only when the bottle is manipulated correctly.

It is another object of this invention to provide a locking mechanism for a cap and bottle closure in which the parts may be quickly and easily operated to disengage the locking means by a person or older child who understands the mechanism involved.

It is a further object of this invention to provide a bottle locking mechanism which may be fabricated from commonly available materials according to a simple construction. These and other advantages will become more apparent from the description herein and the drawing attached hereto, in which:

FIG. 1 is a side elevational view showing one form of the top of the container of this invention;

FIG. 2 is a top view of the container shown in FIG. 1;

FIG. 3 is a sectional view taken along the lines and arrows III-III of FIG. 2;

FIG. 4 is a side elevational view of the cap of one form of this invention;

FIG. 5 is a side elevational view showing the cap assembled on the bottle;

FIG. 6 is a perspective view showing the cap and the top of the container; and

FIG. 7 is an enlarged side elevational view partly in section, showing one form of the locking mechanism of this invention and the method of releasing the same.

One specific form of my invention is illustrated in FIG. 1, wherein the flexible wall container 10 is shown with an upwardly extending shoulder portion 11 and a neck 15 connected thereto. The container may be fabricated from any of a variety of flexible materials, such

2

as plastic, which contain sufficient structural strength to support a fluid or such, and yet are flexible enough to allow the sides of the container to be manually flexed inwardly. The neck 15 can be of the relative size shown in FIG. 1, joining the upwardly extending shoulder portion 11, or the neck can be connected directly to the container itself. The top annular surface 11a of the shoulder portion 11, as shown also in FIG. 2, is relatively flat and is provided with one or more saw-tooth protrusions or spurs 12 which extend outwardly from the flat surface 11a. The two protrusions 12 shown in FIGS. 1 to 3, are preferably positioned diametrically opposite to each other across the neck 15 of the container and these protrusions have a shape substantially that of a wedge. As shown, the spur 12 preferably is straight on one side 12a and tapered on the other 12b. In addition, the spur 12 extends outwardly away from the neck of the container, as shown in FIG. 3, with the top edge of the spur substantially horizontal. It should be understood that any number of spurs or teeth 12 may be arranged in the position desired around the top surface 11a of the shoulder 11. The neck 15 is equipped with a spiral thread 16 which complements the thread positioned in the interior surface of cap 20.

Cap 20, as shown in FIGS. 4 and 6, has a knurled surface 21 which extends around the cap 20 so as to provide a gripping surface. The bottom annular surface of the cap 20 is provided with a series of indentations 22 which are in the form of saw-tooth grooves. Each indentation 22, substantially similar in shape to the protrusion 12, has a straight side 22a and a tapered side 22b whereby the protrusion 12 engages the straight side of the serration 22, shown in FIG. 5, and prevents the cap from rotating in the loosening direction, i.e., the direction of the arrow of FIG. 7. The internal surface of cap 20 is provided with a spiral thread 25 which is of such size as to engage thread 16 of neck 15. As the protrusions 12 are composed of the same flexible material as the container 10 and are angularly disposed similar to the indentations, as described, the cap and indentations slip over the top of the protrusions as the cap is tightened in the direction of the arrow in FIG. 5, thus allowing the cap to be threaded into contact with the flat surface 11a of the shoulder 11.

As shown in FIGS. 5 to 7, the cap 20 is securely fastened to the neck 15 of the container 10 by rotating the cap in the direction of the arrow in FIG. 5. As the cap, and more specifically thread 25, progresses down the thread 16 of the neck, the indentations 22 around the annular bottom surface of the cap pass over the tapered spurs 12 until the bottom surface of the cap is firmly against the shoulder 11, at which time the spur 12 fits within one indentation as shown in FIG. 5. When the spur 12 is firmly within the serration, the cap is prevented from rotating in the loosening direction.

To allow the cap to be removed from the container, or rotated in the direction of the arrow of FIG. 7, the container body 10 is flexed inwardly as shown in FIG. 7. When the sides of the container 10 are flexed inwardly at a position adjacent the shoulder 11 and adjacent the protrusions 12, the top surface of the flexible shoulder 11 is displaced downwardly or away from the fully threaded cap 20. When so displaced, the spur 12 is automatically removed from the indentation as shown in FIG. 7, and the cap is freed from the locking spur and is capable of being rotated in the loosening direction and removed from container 10.

It should be understood that the locking means of my invention, although simple in construction and easy to operate, demands the simultaneous manipulation of the fingers of two hands. One hand is used to flex the con-

tainer sides inwardly so as to dislodge the spur from the indentation of the cap, and the second hand is used to rotate the cap in the loosening direction while the spur is displaced away from the indentation. Further, it should be understood that as the container and cap may be composed of materials having varying degrees of flexibility, the degree of strength required to flex the container inwardly will vary according to the material used, and, correspondingly, a stiffer material will require strength not found normally in younger children. As the opening of this container requires the dexterous use of both hands, the container hardly could be opened by chance by children at play.

In this single embodiment of my invention, the shoulder portion 11 is fitted with only two spurs. If desired, a single spur or a plurality of spurs may be provided arranged around the shoulder at convenient positions. Similarly, a different locking mechanism may be used in place of the tapered protrusions and indentations shown without departing from the spirit of this invention.

Further, this invention is not to be understood as restricted in other ways to the details set forth, since these may be modified to provide for a container with various shapes, sizes and uses to satisfy widely divergent needs in daily living. Such changes and modifications will be well within the scope of the appended claims without departing from the spirit and scope of this invention.

Having described my invention, I claim:

1. A container closure having releasable locking means for preventing a screw-on cap from becoming loosened, said container closure comprising a flexible walled container having an externally threaded neck and a relatively flat-surfaced shoulder portion annularly disposed around the neck; an internally threaded cap to fit over the container neck and engage the threads of the neck, said cap having a bottom annular surface which contacts the surface of the shoulder portion when the cap is fully threaded on the neck; and locking means comprising a protrusion extending from the surface of the shoulder portion and an indentation positioned in the bottom annular surface of the cap whereby said protrusion fits within the indentation when the cap is fully threaded on the neck preventing the loosening of the cap, said locking means being released by an inward flexing of the walls of the container whereby the shoulder portion moves away from the cap dislodging the protrusion from the indentation.

2. The container closure as defined in claim 1 wherein is provided a series of indentations extending around the bottom annular surface of the cap.

3. The container closure as defined in claim 2 wherein a plurality of protrusions are provided extending from the surface of the shoulder portion.

4. A container closure having releasable locking means for preventing a screw-on cap from becoming loosened and separated from the container, said container closure comprising a flexible walled container having an externally threaded neck and a relatively flat-surfaced shoulder portion annularly disposed around said neck; an internally threaded cap to fit over the container neck and engage the threads of the neck, said cap having a bottom annular surface which contacts the surface of the shoulder portion when the cap is fully threaded on the neck; and locking means comprising a plurality of protrusions extending from the flat surface of the shoulder portion and a series of indentations distributed evenly around the bottom annular surface of the cap whereby said protrusions fit within a plurality of serrations of the cap, when the cap is fully threaded on the neck of the container preventing the loosening of the cap, said locking means being released by an inward flexing of the walls of the container adjacent the shoulder portion whereby the shoulder portion moves away from the cap dislodging the protrusions from the indentations of the cap.

5. The container closure as defined in claim 4 wherein the protrusions and indentations are angularly disposed

so as to facilitate the rotation of the cap in the tightening direction and prevent its rotation in the loosening direction.

6. A container closure having locking means to secure a screw-on container cap, the container closure comprising a container composed of a substantially flexible material having a shoulder portion and a neck portion, the neck portion extending from the container and having an external thread, the shoulder portion having a substantially flat surface disposed annularly around the base of the neck portion, a screw-on container cap having an internal thread designed to engage the thread of the neck portion, said cap having a bottom annular surface which contacts the flat surface of the shoulder portion when the cap is fully threaded on the container, locking means associated with the container and cap comprising a spur extending from the surface of the shoulder portion and an indentation positioned in the bottom surface of the cap, said spur being of such size as to engage the indentation when the cap is fully threaded on the neck portion and prevent loosening of the cap whereby said spur is disengaged from the indentation by a movement of the shoulder portion away from the bottom surface of the cap caused by an inward flexing of the sides of the container adjacent to said shoulder portion.

7. The container closure as defined in claim 6 wherein is provided a plurality of indentations positioned around the annular surface of the cap.

8. A container closure having locking means to secure a screw-on container cap, the container closure comprising a container composed of a substantially flexible material having a shoulder portion and a neck portion, the neck portion extending from the container and having an external thread, the shoulder portion having a substantially flat surface disposed annularly around the base of the neck portion, a screw-on container cap having an internal thread designed to engage the thread of the neck portion, said cap having a bottom annular surface which contacts the flat surface of the shoulder portion when the cap is fully threaded on the container, locking means associated with the container and cap comprising a plurality of spurs extending from the flat surface of the shoulder portion and a plurality of tapered indentations disposed evenly around the bottom surface of the cap, said spurs being of such size and shape as to engage a plurality of indentations in the cap when the cap is fully threaded on the neck portion of the container and prevent loosening of the cap whereby said spurs are disengaged from the tapered indentations by a movement of the flat surface of the shoulder portion away from the bottom surface of the cap caused by an inward flexing of the sides of the container adjacent to said shoulder portion.

9. A container closure having locking means to secure a screw-on container cap, the container closure comprising a container composed of a substantially flexible material having a flat-surfaced shoulder portion and a neck portion, the neck portion extending from the container and having an external thread, the flat-surfaced shoulder portion annularly disposed around the base of the neck portion, a screw-on container cap having an internal thread designed to engage the thread of the neck portion, said cap having an annular bottom surface which contacts the shoulder portion when the cap is fully threaded on the container, locking means comprising a plurality of spurs extending from the flat-surfaced shoulder portion and a plurality of indentations positioned around the bottom annular surface of the cap, said spurs and indentations being angularly disposed so as to facilitate the rotation of the cap in the threaded direction and to prevent the rotation of the cap in the loosening direction, said spurs engaging said serrations when the cap is fully threaded on the neck portion to prevent loosening of the cap whereby said spurs are disengaged from the indentations by a movement of the shoulder portion away from the bottom surface of the cap caused by an

5

inward flexing of the sides of the container adjacent to said shoulder portion.

10. A bottle closure having cap locking means wherein said locking means may be released by flexing the sides of the bottle inwardly, said bottle closure comprising a bottle having a flexible body portion, an externally threaded neck portion and a substantially flat-surfaced shoulder portion annularly disposed around the base of the neck portion; an internally threaded cap to fit over the neck portion and engage the threads of the neck portion, said cap having an annular bottom surface which contacts the shoulder portion when the cap is fully threaded on the neck portion of the bottle; and cap locking means comprising a series of tapered, tooth-like indentations extending around the bottom annular surface of the cap and a plurality of tapered tooth-like protrusions extending from the flat-surfaced shoulder portion of the bottle, said protrusions being of such size and tapered in the tightening direction so as to allow the cap to slip over the protrusions until the cap is tightly threaded on the neck portion of the bottle at which time the protrusions fit into a plurality of indentations in the cap preventing the cap from rotating in the opposite direction, said protrusions being removed from the indentations by a movement of the shoulder portion away from the cap caused by the inward flexing of the sides of the bottle.

11. A bottle closure having cap locking means wherein said locking means may be released by flexing the sides of the bottle inwardly, said bottle closure comprising a bottle having a flexible body portion, an externally threaded neck portion and a substantially flat-surfaced shoulder portion annularly disposed around the base of the neck portion; an internally threaded cap to fit over the neck portion and engage the threads of the neck portion, said cap having an annular bottom surface which contacts the shoulder portion when the cap is fully threaded on the neck portion of the bottle; and cap locking means comprising a series of tooth-like indentations positioned around the bottom surface of the cap and a plurality of tooth-like protrusions extending from the shoulder portion of the bottle, said protrusions and indentations being angularly displaced so as to facilitate the rotation of the cap in the tightening direction and prevent its rotation in the loosening direction, said protrusions being of such size as to allow the cap to slip over the protrusions until the cap is tightly threaded on the neck portion at which time the protrusions fit into a plurality of indentations of the cap preventing the cap from rotating in the opposite direction, said protrusions being removed from the indentations by a movement of the shoulder portion away from the cap caused by the inward flexing of the sides of the bottle.

12. A bottle closure having cap locking means to prevent the unintentional removal of the screw-on cap wherein the locking means may be released by an inward flexing of the sides of the bottle, said bottle closure comprising a bottle having a flexible body portion, an externally threaded neck portion and a shoulder portion with a substantially flat surface annularly disposed around the neck portion; an internally threaded screw-on cap to seal the bottle by fitting over the neck portion and engaging the threads of the neck portion, said cap having an annular bottom surface which contacts the flat surface of the shoulder portion when the cap is fully threaded on the neck portion of the bottle; and cap locking means comprising a plurality of tooth-like protrusions extending from the flat surface of the shoulder portion and a series of tooth-like indentations extending around the bottom annular surface of the cap, said protrusions being composed of a flexible material to allow the cap to be tightly

6

threaded on the neck portion at which time said protrusions mesh with a plurality of said indentations thereby preventing the rotation of the cap in the loosening direction, said locking means being released by displacing the protrusions from the indentations by a movement of the flat surface of the shoulder portion away from the cap caused by the inward flexing of the body portion of the bottle.

13. A bottle closure having cap locking means to prevent the unintentional removal of the screw-on cap wherein the locking means may be released by an inward flexing of the sides of the bottle, said bottle closure comprising a bottle having a flexible body portion, an externally threaded neck portion and a shoulder portion with a substantially flat surface annularly disposed around the neck portion; an internally threaded screw-on cap to seal the bottle by fitting over the neck portion and engaging the threads of the neck portion, said cap having an annular bottom surface which contacts the flat surface of the shoulder portion when the cap is fully threaded on the neck portion of the bottle; and cap locking means comprising a plurality of tooth-like protrusions extending from the flat surface of the shoulder portion and a series of tooth-like indentations positioned around the bottom annular surface of the cap, said protrusions and indentations being angularly disposed so as to facilitate the rotation of the cap in the tightening direction and prevent its rotation in the loosening direction, said protrusions being composed of a flexible material to allow the cap to be tightly threaded on the neck portion at which time said protrusions mesh with a plurality of said indentations thereby preventing the rotation of the cap in the loosening direction, said locking means being released by displacing the protrusions from the indentations by a movement of the flat surface of the shoulder portion away from the cap caused by the inward flexing of the body portion of the bottle.

14. A bottle closure having cap locking means to prevent the unintentional removal of the screw-on cap wherein the locking means may be released by an inward flexing of the sides of the bottle, said bottle closure comprising a bottle having a flexible body portion, an externally threaded neck portion and a shoulder portion with a substantially flat surface annularly disposed around the neck portion; an internally threaded screw-on cap to seal the bottle by fitting over the neck portion and engaging the threads of the neck portion, said cap having an annular bottom surface which contacts the flat surface of the shoulder portion when the cap is fully threaded on the neck portion of the bottle; and cap locking means comprising a plurality of tooth-like protrusions extending from the flat surface of the shoulder portion and a series of tooth-like indentations extending around the bottom annular surface of the cap, said protrusions and indentations being angularly disposed so as to facilitate the rotation of the cap in the tightening direction and prevent its rotation in the loosening direction, said protrusions being composed of a flexible material and of such size as to allow the cap to be tightly threaded on the neck portion at which time said protrusions mesh with a plurality of said indentations thereby preventing the rotation of the cap in the loosening direction, said locking means being released by displacing the protrusions from the indentations by a movement of the flat surface of the shoulder portion away from the cap caused by the inward flexing of the body portion of the bottle.

15. The bottle closure as defined in claim 14 wherein the cap is provided with a series of serrations to provide gripping surface.

No references cited.