

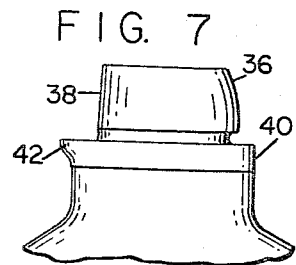
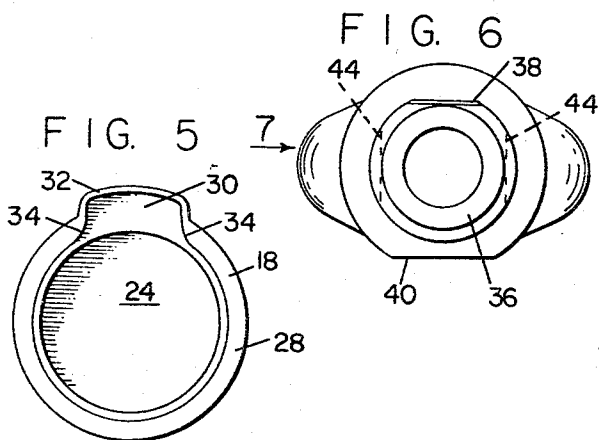
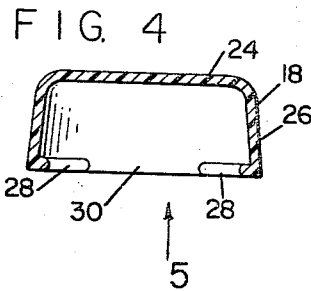
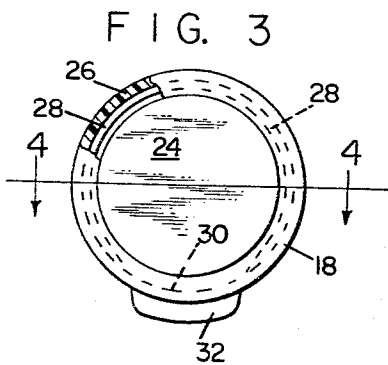
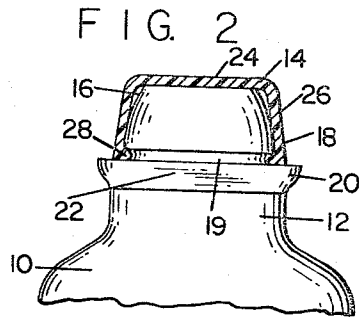
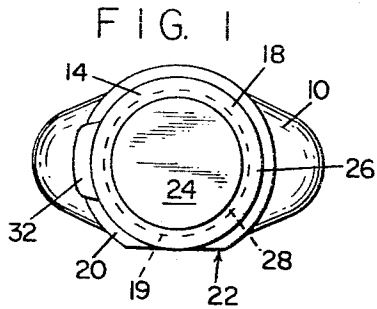
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CONTAINERS AND CLOSURE CAPS THEREFOR

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3,334,763

**CONTAINERS AND CLOSURE CAPS THEREFOR**  
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## ABSTRACT OF THE DISCLOSURE

A safety cap and bottle construction for preventing children from opening the same, there being an annular groove in the neck of the bottle spaced from the mouth, with an annular abutment on the neck of the container adjacent the groove with a flat or reduced area in the abutment, with a snap-on closure cap including a depending skirt and an inwardly directed rib at the edge of the skirt, a small portion of the circumference of the cap at the exterior thereof extending slightly outwardly therefrom to form a fingerpiece, the rib on the cap having a gap in the same area as the fingerpiece, the inwardly directed rib on the cap having an internal diameter less than the diameter of a portion of the neck of the bottle between the rib and the mouth, except at the gap.

This invention relates to a new and improved safety closure cap particularly for medicament containers, and the principal object of the invention resides in a construction tending to prevent the removal of the cap at least insofar as relatively small children are concerned, so that the cap is difficult if not impossible for small children to remove, but does not present a problem for adults.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings in which:

FIG. 1 is a top plan view of a container to which the cap is applied;

FIG. 2 is a view in front elevation thereof with the cap in section;

FIG. 3 is a top plan view of the cap on an enlarged scale, part being in section;

FIG. 4 is a section on line 4-4 of FIG. 3;

FIG. 5 is a bottom plan view thereof, looking in the direction of arrow 5 in FIG. 4;

FIG. 6 is a plan view of a modified container neck, and

FIG. 7 is a view in elevation thereof, looking in the direction of arrow 7 in FIG. 6.

In order to illustrate the invention, the new safety cap is shown as applied to a bottle 10. This bottle is provided with a diametrically reduced neck 12 which extends upwardly from the body portion 10 and defines the more or less usual mouth or rim at 14.

In the preferred embodiment of the invention, a substantial upper portion of the neck diminishes in diameter in an outward, upward direction as is clearly shown in FIG. 2 and indicated at 16. This is for the purpose of facilitating the application of the closure cap 18 thereto as will become apparent hereinafter. At the base of the tapered portion 16 of the neck of the container, there is an inwardly directed annular groove 19 which is continuous all about the neck of the bottle. Below this groove there is an outwardly extending annular abutment 20 which however has a flattened portion at 22 as seen in FIG. 1 so that the abutment 20 is not completely continuous about the container. It is of course clear that

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the diametrically opposed side of the abutment 20 could also be flat if this should be desired.

The closure cap 18 is preferably made of a relatively high impact polyethylene or similar thermoplastic material and the reason for this is that if plastic of stretchable type is used, the cap soon becomes distorted and useless after continued use thereof. In any event, the material of the cap is relatively hard, and although it can bend, it does not do so easily.

The cap 18 includes a top 24 and a depending annular skirt 26 which may be of any cross sectional shape desired or convenient but in any event it terminates at its lower margin in an inwardly directed rib or rim 28. The rib or rim 28 is generally annular but as shown in FIGS. 3, 4 and 5 this rim is not continuous but has a definite gap in an area at 30 and in the area of the gap at 30 there is an outwardly extended or thickened area 32 which acts as a thumb or fingerpiece.

The cap is easily snapped down upon the tapered portion 16 of the neck of the bottle and the rib 28 will come to rest on the abutment 20 with the rib 28 snapped into the channel at 19. The internal diameter of the rib or rim 28 is less than the maximum diameter of the tapered portion 16 of the bottle cap so that this operation will be seen to place the cap on the neck of the bottle and hold the same firmly in position.

The cap can now be rotated on the portion 16 of the neck of the bottle and of course ordinarily if no care is taken in applying the cap except to see that the rim 28 seats in the groove, the cap 30 in the rim 28 will ordinarily not coincide with the flat portion 22 on the abutment 20. A slight twist of the cap with relation to the neck of the bottle however will serve to misalign these areas and conversely when it is desired to open the bottle it is merely necessary to turn the cap on the neck to align the gap 30 with the flattened area 22.

The effect of this construction is that it is almost impossible to remove the cap from the bottle in the event that the gap 30 is misaligned with respect to flat portion 22, see FIG. 1, because the thumb or finger is unable to contact the thickened portion 32 with any appreciable effect because of the extent of the rim or abutment 20. However with the gap 30 in alignment with the flat portion 22, the thumb can be inserted to a degree required under the thickened portion 32 and an upward press will serve to very slightly bend the cap sufficiently to pop the rim 28 out of its groove 18, starting at the ends of the gap, see 34, 34, and therefore remove the cap from the bottle.

If the cap were made of a soft material, it would be more easily removable even though gap 30 is not aligned with flap 32; but with the high impact material referred to used or some similar relatively stiff material, it is almost impossible to remove the cap except under the condition stated. However under such conditions, the high impact material can be bent to a slight degree sufficient in order to remove the cap and at the same time the material of the cap does not then become distorted due to constant use.

As a modification, the cap may be unaltered and retain the full 365° rim or rib, rather than having the gap 30, if the neck of the bottle in the convergent area 36, equivalent to that at 12 in FIG. 2, be provided with a flat 38, at a point other than flat 40, in abutment 42, equivalent to abutment 20 previously described. Such bottle neck flat can be located at 180° to flat 40, or even at 90°, as shown by dotted lines 44, or at variations of such locations. The point here is that the cap fingerpiece 32, if aligned with flat 40, can be used to snap off the cap, even if the rib of the cap be continuous, but only if the bottle

neck has a flat such as at 38, removed from the area of the flat 40, or 22.

Having thus described our invention and the advantages thereof, we do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what we claim is:

1. The combination of a bottle having a neck, a rim on the neck defining a mouth, and an annular groove in the neck spaced from the mouth, an outwardly extending generally annular abutment on the neck of the container adjacent the groove at the side thereof away from said mouth, said abutment having a diameter in general greater than the portion of the neck of the container between the groove and the mouth, and a flattened area in said abutment,

with a snap-on closure cap of relatively high impact thermoplastic material, said cap having a solid top and a depending skirt and an inwardly directed rib at the termination of the skirt, said rib being spaced from said solid top, a small portion of the circumference of the cap at the exterior thereof extending slightly outwardly therefrom forming a fingerpiece, said rib on said cap being provided with a gap in the area of said fingerpiece,

wherein the inwardly directed rib on the cap in general has an internal diameter less than the diameter of the portion of the neck of the bottle between the rib and the mouth thereof except at the gap.

2. The combination defined in claim 1 wherein the inwardly directed rib on the cap is substantially continuous with the exception of the gap.

3. The combination of a bottle having a neck, a rim on the neck defining a mouth, an annular groove about the neck spaced from the mouth, said neck converging inwardly from the area of the groove toward the mouth, an outwardly extending abutment on the neck of the container adjacent the groove at the side thereof away from

the mouth, said abutment having a flattened area therein at a certain portion thereof,

with a snap-on closure cap of relatively high impact thermoplastic material, said cap having a solid top and a depending skirt and an inwardly directed rib at the termination of the skirt, the rib being spaced from the solid top, a small portion of the cap at the circumference thereof extending slightly outwardly therefrom and forming a fingerpiece, said rib snapping into the groove when the cap is applied to the bottle neck,

wherein the neck of the bottle in the convergent area thereof is provided with a flat area at a portion on the circumference thereof relatively remote from the flattened area of the abutment, said cap being easily removable only when said fingerpiece is arranged in alignment with the flat on the abutment.

4. The combination as recited in claim 3 wherein the flat on the convergent portion of the neck of the bottle is arranged approximately at 180° with respect to the flat on the abutment.

5. The combination of claim 3 wherein the flat on the convergent portion of the neck of the bottle is arranged approximately at 90° with respect to the flat on the abutment.

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