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STOPPER AND CAP COMBINATION

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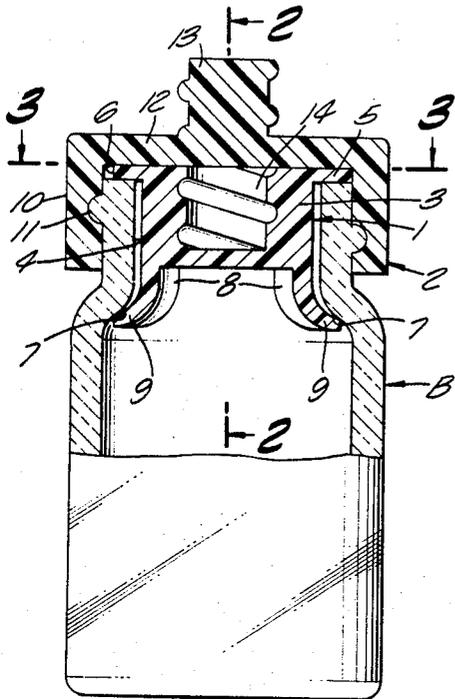


FIG. 1.

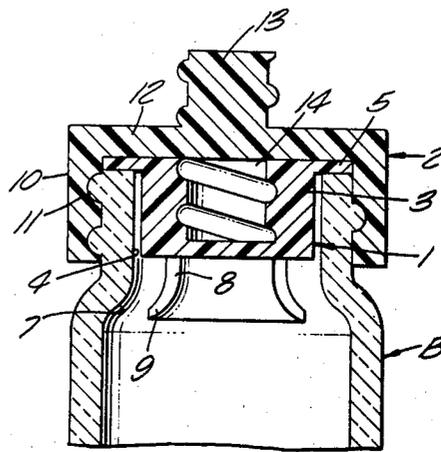


FIG. 2.

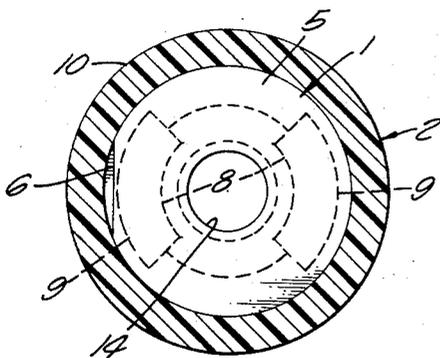


FIG. 3.

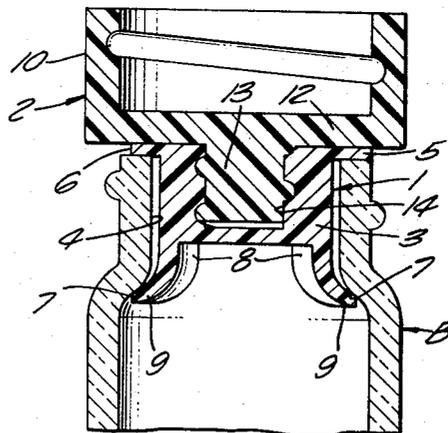


FIG. 4.

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STOPPER AND CAP COMBINATION

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The present invention relates to devices for closing bottles and more particularly to a safety closure device which combines the functions of a screw threaded closure or cap and a stopper type closure.

An object of the present invention is to provide a device which requires a certain degree of manual dexterity in order to accomplish the series of actions required to effect removal of the combined closure from a bottle such as pill, medicine, or other bottles containing material which may be harmful to children or which may be harmful to anyone for whom the material is not intended.

In accomplishing the foregoing, it is a further object to provide a combined closure cap and stopper device wherein a stopper element is adapted to be disposed in the mouth of a bottle and to be retained therein by resiliently deformable portions requiring a certain axial force to effect its dislodgement or withdrawal from the bottle mouth, and wherein the stopper element is so constructed that in itself it affords no significant gripping portion whereby such axial force may be imparted to the stopper element, there being adapted for combination with the stopper element a cap element threadedly engageable with the typical thread at the mouth of the bottle and having externally thereof a member interlockingly coengageable with the outer end of the stopper element, whereby the cap may be removed from the bottle, turned over, and engaged with the stopper element so that the cap provides a knob whereby the necessary axial force to dislodge the stopper element from the bottle may be applied.

Other objects and advantages of the invention will be hereinafter described or will become apparent to those skilled in the art, and the novel features of the invention will be defined in the appended claims.

In the accompanying drawing:

FIG. 1 is a vertical sectional view through a bottle with the combined closure of the invention applied thereto;

FIG. 2 is an enlarged vertical sectional view as taken on the line 2—2 of FIG. 1;

FIG. 3 is an enlarged horizontal sectional view as taken on the line 3—3 of FIG. 1; and

FIG. 4 is a view corresponding to FIG. 1 but showing the outer cap removed, turned end for end, and engaged in the stopper.

Like reference characters in the several views of the drawings and in the following description designate corresponding parts.

The illustrative embodiment of the invention as herein shown comprises an inner member or stopper generally denoted at 1, adapted to be disposed in the mouth of a bottle B, and a cap or outer closure generally denoted at 2, adapted for threaded coengagement with the bottle so as to effectively close the same and hold in place the stopper 1.

The stopper 1 comprises a body 3 of such diameter as to be received within the neck opening or mouth 4 of the bottle B. In the illustrative embodiment, the body 3 loosely fits within the opening 4 and is retained against inward movement into the bottle by an outer end flange 5 which projects outwardly into overlying engagement with the end surface of the bottle neck. For a purpose which will hereinafter more fully appear, the flange 5 preferably is provided with some non-circular peripheral configuration more specifically illustrated as a flat side 6.

At the inner end of the body 3 is resiliently deformable means adapted upon insertion of the body into the opening 4 to expand outwardly into underlying relation to the downwardly facing surface or shoulder 7 of the bottle B typically located at the region where the main body portion of the bottle flares outwardly relative to the neck thereof. The resiliently deformable means in the illustrative embodiment comprises a pair of resilient fingers 8 projecting downwardly from the body 3 and having end flanges or portions 9 projecting radially outward for engagement beneath the just mentioned shoulder 7. These fingers 8 are diametrically opposed and extend on the order of about 90° circumferentially. Other angular extents and other specific finger configurations may be employed, depending upon the inherent resilience of the material of which the stopper 1 is composed. In this connection, the stopper is preferably composed of a moldable plastic material so that the stoppers may be inexpensively produced in large numbers.

In any event, the resistance of the fingers to bending inwardly should be such that the removal of the stopper requires the application of such axial force as to render the removal of the stopper difficult for small children. It will be noted in this connection that in order to remove the stopper 1 from the opening 4, sufficient axial outward force must be imposed on the stopper that the shoulder 7 of the bottle engaged with the flanges 9 of the resilient fingers 8 will flex the fingers inwardly so that they may pass upwardly through the opening 4.

In addition, it is preferred that the axial distance between the opposing surfaces of the end flange 5 which engages the top of the bottle and the flanges 9 of spring fingers 8 be slightly less than the axial extent between the upper surface of the bottle and the bottle shoulder 7 internally of the latter so that the flange 5 will be inherently biased downward into contact with the upper surface of the bottle under the axial force caused by slight resilient deflection of the resilient fingers 8. Moreover, the flange 5 is preferably of such thin cross sectional dimension that it will be both difficult to grip by small children and difficult to apply sufficient axial force to deform the fingers 8 whereby to effect removal of the stopper 1, without benefit of the outer cap now to be described.

The outer cap 2, typical of screw threaded closure caps for bottles, comprises an outer cylindrical side wall 10 having internally thereof a thread for engagement with the typical thread of the bottle neck as indicated at 11. Spanning the side wall of the cap is an end wall 12. It will be noted that the end wall 12 internally thereof will engage the stopper flange 5 upon threaded engagement of the cap 2 with the bottle neck so as to effect a tight sealed closure of the bottle. Externally of the cap 2 on the end wall 12 and at the outer end of the body 3 of the stopper 1 are cooperatively interengageable means whereby the cap may be removed from the bottle neck, turned endwise, and engaged with the stopper so that the cap 2 effectively constitutes a knob easily gripped by the hand to enable the stopper 1 to be pulled.

In the illustrative embodiment the cooperatively coengageable means just referred to comprises a threaded boss 13 on the outer surface of the end wall 12 of cap 2 and a complementally threaded recess 14 in the stopper 1. As previously mentioned, the end flange 5 of the stopper 1 is of noncircular peripheral form by virtue of the provision of the flat surface 6. This flat 6 provides for facility in holding the stopper 1 against revolution as the threaded boss 13 is being threaded into the threaded recess 14. After the boss 13 is engaged in the recess 14, the stopper 1 may be pulled from the bottle by the application of a pulling force to the cap 2.

When it is desired to reapply the closure combination to the bottle, it is simply necessary to engage one of the resilient arms 8 with a side of the open mouth of the bottle in the opening 4 with the top disposed at an angle to the axis of the bottle mouth and apply a deforming pressure tending to flex such arm 8 laterally inward relative to the axis of the stopper until the end of the other resilient arm can be moved into the open mouth of the bottle. Following this, the stopper and bottle axes may be aligned and the stopper may be forced fully into the open mouth until flange 5 abuts with the outer end of the bottle. Thereafter, the cap 2 may be removed from its threaded engagement with the stopper 1, turned end for end, and threaded onto the bottle neck. It is notable in this connection that even if the cap 2 is left engaged in the recess 14, a seal is maintained between the flange 5 and bottle end surface by the resilient fingers as described above. Under these circumstances the cap 2 merely remains in place as a means to facilitate withdrawal of the stopper.

From the foregoing it will be apparent that the present invention provides a combined stopper and cap which cooperate to provide a bottle closure requiring such manual dexterity for its removal from the bottle that young children will be unable to master the sequence of steps necessary, and therefore, the combined closure provides a degree of safety against children having access to undesirable materials kept in such bottles. Moreover, inasmuch as the top is obviously not a typical bottle top, the closure of the present invention provides adequate warning to anyone that the bottle may contain special material such as prescription drugs or other materials which should be used only as prescribed or desired and which, if used inadvertently, may have ill effect.

While specific structural details have been shown and described, it should be understood that changes and alterations may be resorted to without departing from the spirit of the invention as defined in the appended claims.

I claim:

1. A combined bottle stopper and closure cap, comprising: a stopper having a body adapted to be disposed within the mouth of a bottle; said stopper having an inner end provided with resiliently deformable means thereon normally projecting outwardly for engagement with the bottle beneath an internal shoulder therein; said stopper having an outer end provided with an outwardly extended portion engageable with the outer end of the bottle neck; an outer cap having a side wall provided with an internal thread engageable with the thread on the bottle neck; said cap having an end wall; said end wall and said outer end of said stopper having cooperatively coengageable means for interconnecting the same upon removal of said cap from said bottle neck whereby said cap constitutes a knob to enable the application of axial outward force to said stopper to cause resilient deformation of said means at said inner end of said stopper.

2. A combined bottle stopper and closure cap as defined in claim 1, wherein said coengageable means comprises a threaded recess and a complementally threaded boss.

3. A combined bottle stopper and closure cap as defined in claim 1, wherein said portion projecting outwardly from the outer end of said stopper comprises a flange sealingly engageable with the upper end of said bottle.

4. A combined bottle stopper and closure cap as defined in claim 1, wherein said portion projecting outwardly from the outer end of said stopper comprises a flange sealingly engageable with the upper end of said

bottle; and said resiliently deformable means at the inner end of said stopper and said flange being spaced apart a distance slightly less than the distance between said shoulder in said bottle and said upper end of said bottle.

5. A combined bottle stopper and closure cap as defined in claim 1, wherein said resiliently deformable means at the inner end of said stopper comprises a plurality of fingers projecting axially from said stopper and each having an outwardly projecting flange engageable with said shoulder in said bottle.

6. A combined bottle stopper and closure cap as defined in claim 1, wherein said portion at the outer end of said stopper comprises a part having a noncircular peripheral form, and said coengageable means on said cap and said stopper comprise a threaded recess and a complementally threaded boss.

7. A combined bottle stopper and closure cap, comprising: a stopper having a body; said body having an inner end provided with a pair of axially extended fingers; said fingers having outwardly extended end flanges; said stopper having an outer end provided with a radially projecting flange; said flanges on said fingers and said flange at the outer end of said body being coengageable with the internal shoulder and the opposing end of a bottle neck, respectively, with said body disposed in the opening of said bottle neck; said stopper, said fingers, and said end flange being composed of molded plastic material and said fingers having inherent resilience resisting inward deflection to hold said stopper in said bottle; an outer cap having a side wall provided internally with a thread for engagement with the external thread of the neck of the bottle and also having an end wall; said end wall having an outer face provided with an axially extended threaded boss; and said stopper having at its outer end an internally threaded recess complementary to said boss.

8. A combined bottle stopper and closure cap, comprising: a stopper having a body; said body having an inner end provided with a pair of axially extended fingers; said fingers having outwardly extended end flanges; said stopper having an outer end portion coengageable with the end of a bottle neck; said flanges on said fingers and said portion being coengageable with the internal shoulder and the opposing end of a bottle neck, respectively, with said body disposed in the opening of said bottle neck; said stopper, said fingers, and said portion at the outer end of said body being composed of molded plastic material and said fingers having inherent resilience resisting inward deflection to hold said stopper in said bottle; an outer cap having a side wall engageable with the external neck of the bottle and an end wall engageable with said stopper portion; and means for enabling the application of outward axial force to said stopper to cause inward deflection of said fingers and withdrawal of said stopper, said means comprising coengageable means on the outer cap end wall and said stopper for interconnecting the cap and stopper.

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