

[54] BOTTLE CLOSURE

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[51] Int. Cl..... B65d 41/06, B65d 41/22

[58] Field of Search..... 215/31, 41, 46 R, 1 R; D9/59-76

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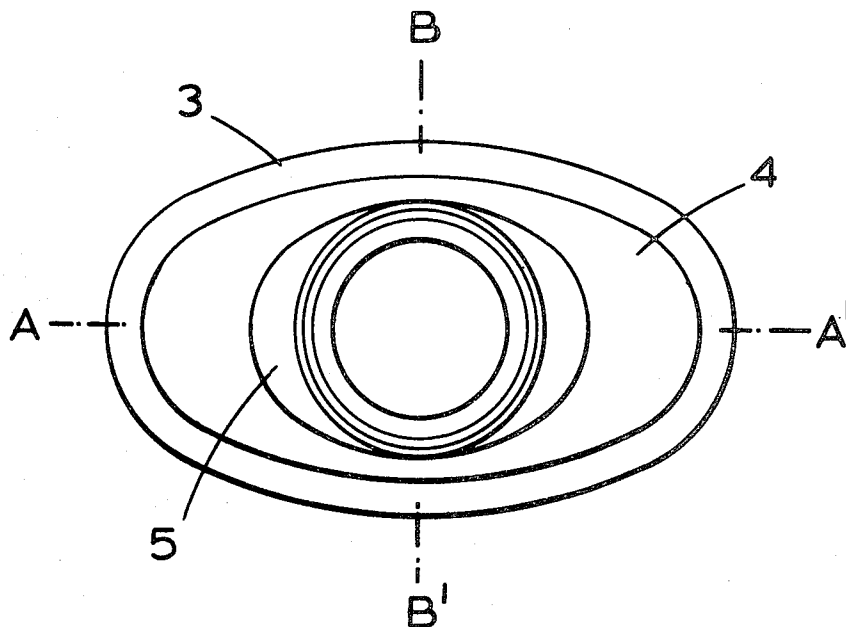
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[57] ABSTRACT

A bottle and cap combination wherein the upper region of the body of the bottle is elliptical or oblong, the neck of the bottle is elliptical and is joined to the body by a shoulder portion having sloping sides; and the cap comprises a hollow cup-shaped member having a downwardly-extending skirt a snap-lock liquid-tight sealing arrangement internal of the skirt and at least one internal rib which is adapted to ride over the shoulder portion and which rib also serves as a guide means to position the cap on the bottle.

6 Claims, 13 Drawing Figures



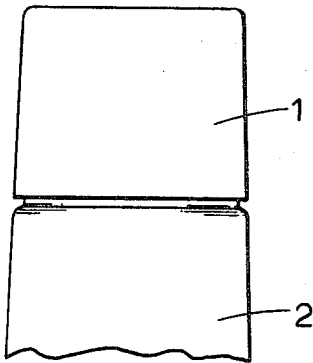


Fig. 1.

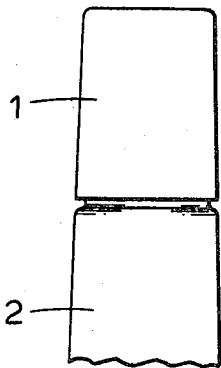


Fig. 2.

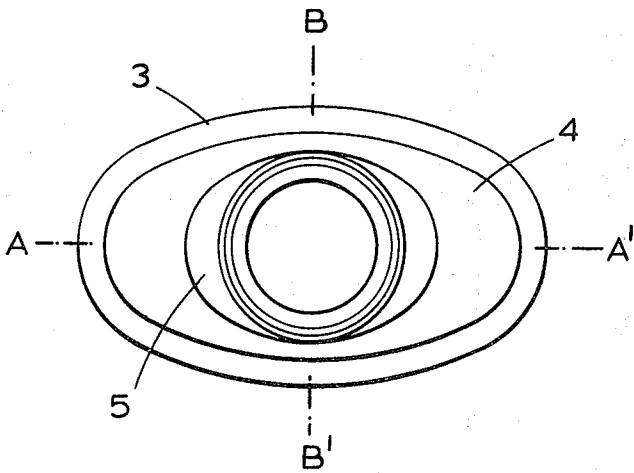


Fig. 3.

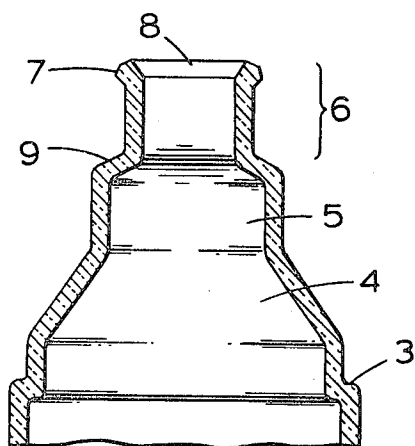


Fig. 4.

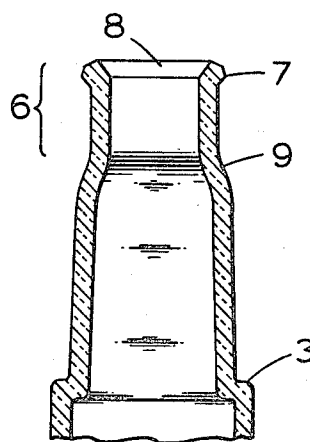


Fig. 5.

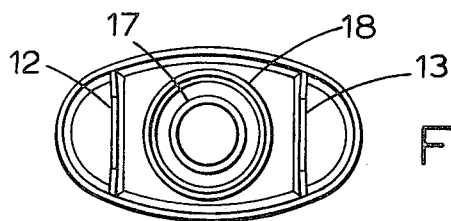


Fig. 6.

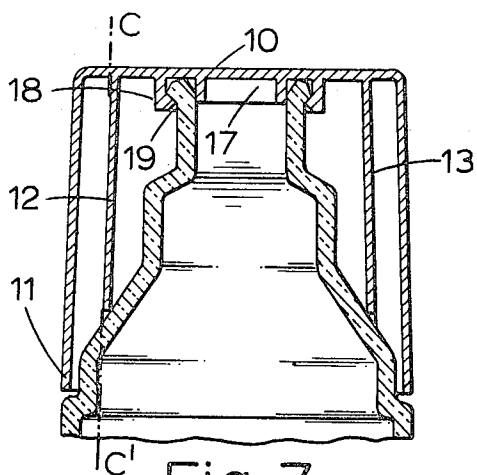


Fig. 7.

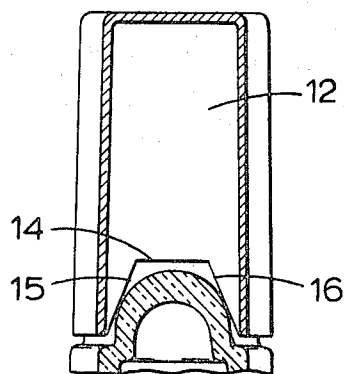


Fig. 8.

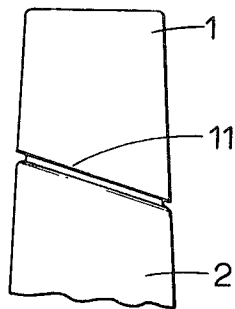


Fig. 9.

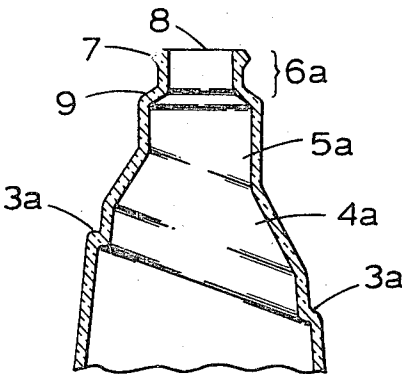


Fig. 10.

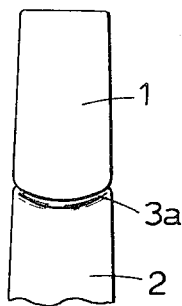


Fig. 11.

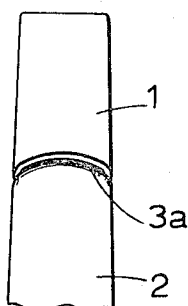


Fig. 12.

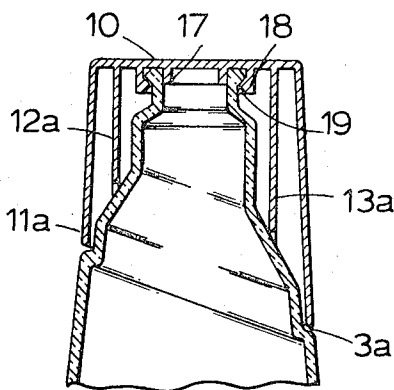


Fig. 13.

BOTTLE CLOSURE

This invention relates to bottle closures wherein the cap is adapted to be easily gripped in the hand and removed by a simple twisting motion through not more than 90° and wherein the upper part of the bottle is adapted so that the cap is easily aligned with the bottle when being placed or replaced thereon.

Prior application Ser. No. 765,914 filed Oct. 8, 1968, now U.S. Pat. No. 3,471,052 discloses a closure designed for use in bottles intended to be used for packaging liquid consumer goods.

When liquid consumer goods are packaged in bottles it is essential that the contents should be readily and easily accessible. Thus it is essential that the cap or closure device shall be easily removable without the need to apply any excessive forces or pressures. On the other hand, when the bottle is closed by the cap being in position on the bottle it is essential that the closure should be liquid-tight and not liable to be displaced by change, for instance when the goods are in transit or when the bottle is being shaken prior to use. These are the prerequisites of any cap and bottle device but other factors come into operation in particular circumstances. For example, with mass produced bottle and caps it is essential that the bottles and caps should each separately be relatively cheap to produce without any especially intricate interengaging surfaces or devices which need to be designed and constructed to excessively close tolerances. Thus simple caps with only one component member which can be moulded in one piece out of readily available cheap materials such as plastics are particularly suitable. It is also advantageous that caps should be applicable to the bottles in simple manner by machines. Another factor is that when all of the goods in the bottle will not be used at once the bottle should be re-closable as readily as it is openable.

These desirable qualities are to be found in the closable bottle of application Ser. No. 765,914 which comprises a cap-sealed bottle wherein the bottle comprises a body, a shoulder portion and a neck, the shoulder portion commencing inwards from the top of the body thereby leaving a peripheral ledge at the uppermost boundary of the body, and wherein the shoulder portion and the upper region of the body immediately adjacent to the shoulder have half-turn symmetry about a vertical axis of the bottle such that their plan view is substantially elliptical or oblong the shoulder having a convex surface along any vertical plane parallel to the minor axis of the elliptical or oblong plan and extending upwards to merge into the neck of circular cross-section; and wherein the cap is made of resilient plastic material and comprises an inverted hollow cup-shaped member having a downwardly extending skirt the lower edge of which skirt conforms with the peripheral ledge on the body of the bottle and snap-lock liquid-tight sealing arrangement interval of the skirt to close the aperture of the bottle neck, the cap having at least one internal rib which is adapted to ride up the convex surface of the bottle shoulder when the cap is turned out of register with the bottle and thereby to release the snap-lock seal and cap from the bottle.

However, it has been found that if the cap is not properly aligned over the bottle by the packaging machine, the snap-lock sealing arrangement may not enter into full engagement without damage to the arrangement, particularly if the bottle is of some hard material

such as glass. Moreover, the cap may sometimes be forced onto the bottle in an unsightly non-aligned position. It has now been found that these disadvantages can be overcome by some modification to the previous design, the principal one of which is to provide the bottle with a neck of elliptical, rather than of circular, cross-section as hitherto.

Accordingly, the present invention provides a bottle and cap combination wherein the bottle comprises a body, a shoulder portion and a neck leading to an orifice, the upper region of the body of the bottle immediately adjacent to the shoulder being substantially elliptical or oblong, the neck portion being substantially elliptical with its major axis parallel to and smaller than the major axis of the upper region of the body and the shoulder portion having sloping sides joining the upper region of the body with the neck and the cap is made of resilient plastic material and comprises a hollow cup-shaped member having a downwardly-extending skirt, the lower edge of which substantially conforms with the upper region of the body of the bottle, a snap-lock liquid-tight sealing arrangement internal of the skirt to close the orifice of the bottle neck and at least one internal rib which is adapted to ride over the shoulder portion and which rib also serves as a guide means to position the cap on the bottle such that it is fixed thereon with the major axis of the cap skirt coincident with that of the upper region of the bottle body.

Preferably, the upper region of the body terminates in a peripheral ledge with which the lower edge of the cap skirt conforms.

Preferably, the major axis of the neck of the bottle is slightly greater than the minor axis of the lower edge of the cap skirt.

Preferably the bottle orifice is circular.

Preferably there are two internal ribs each shorter than and connecting the inner sides of the skirt of the cap and projecting downwardly from the top of the cap parallel to, and on either side of, the minor axis of the other edge of the skirt. Preferably, also the ribs terminate in a concave or V-shaped position adapted to cooperate with the shoulders of the bottle at the ends of the major axis thereof.

The bottle may be made of any suitable material such as glass or plastic. Such plastic may be of high, medium or low density so that rigid or flexible bottles may be used.

The cap is constructed of a resilient material. A preferred material is plastic, suitable plastic materials including high density polyethylene, polypropylene, polyvinylchloride and the like.

An embodiment of the invention is illustrated by way of example in the attached drawings which:

FIG. 1 is a frontal view of the upper region of the bottle with the cap in position;

FIG. 2 is a side view of the upper region of the bottle with the cap in position

FIG. 3 is a plan of the upper region of the bottle with the cap removed;

FIG. 4 is a vertical section along the line AA' in FIG. 3

FIG. 5 is a vertical section along the line BB' in FIG. 3;

FIG. 6 is a plan view of the inside of the cap;

FIG. 7 is a vertical section through the major axis in FIG. 1;

FIG. 8 is a vertical section along the line CC' in FIG. 7

FIG. 9 is a frontal view of the upper region of an alternative bottle with the cap in position.

FIG. 10 is a frontal view of the upper region of the bottle shown in FIG. 9 with the cap removed.

FIGS. 11 and 12 show the two side views of the upper region of the bottle shown in FIG. 9

FIG. 13 is a vertical section through the major axis in FIG. 9.

As shown in FIGS. 1 and 2, a cap (1) made of plastic is provided for fitting on a bottle (2). As shown in FIGS. 3 to 5 the body has an upper peripheral ledge (3) situated at the base of the shoulder portion (4), the shoulder portion being joined at the other end to a neck portion (5) which in turn has its upper end joined to a mouthpiece (6) which carries an annular flange (7) surrounding the orifice (8) of the bottle. As illustrated the body of the bottle has a generally elliptical plan section. The shoulder portion (4) and the neck portion (5) of the bottle also have generally elliptical plan sections as shown in FIG. 3, those two elliptical forms being essential features of the present invention.

In general, the minor axes of these ellipses do not differ greatly, but the major axes of plan sections of the shoulder portion decrease progressively between the peripheral ledge (3) (or the upper part of the body if the ledge is not present) to the base of the neck portion, that is the shoulders in front elevation view have sloping sides. However, the neck portion (5) has substantially vertical sides, though at its upper end it has side bevels (9) so that the mouthpiece (6) annular flange (7) and orifice (8) are each substantially circular.

One form of the cap will now be described. The outer shape can easily be appreciated by reference to FIGS. 1 and 2 which show side views of it in position on the bottle, and FIG. 5 which shows a plan view of the inside, the top outside plan being a plan ellipse of the same outside dimension as that shown in FIG. 5. The cap comprises an inverted hollow plastic cup with an elliptical top surface (10) and downwardly extending side walls or skirt (11). Inside the cap are two strengthening ribs (12) and (13) which are substantially rectangular in shape except for a trough-shaped cut-out portion (14) at the bottom. The inclined surfaces of the cut-out are labelled on rib (12) as faces (15) and (16). The slope and position of these faces (15) and (16), [and the corresponding faces on rib (13)] are such that they are just tangential to the shoulder portion (4) of the bottle when the cap is in the position. The cap also has an inwardly extending plug in the form of a short cylindrical wall (17) extending from and integral with the top surface (10). When the cap is on the bottle, this cylindrical plug fits inside the delivery aperture of the neck of the bottle. Concentric with this cylindrical plug (17) is a second sealing member in the form of a cylindrical wall (18) of larger diameter than (17) and which itself carries an annular inwardly extending bead (19). When the cap is in position on the bottle, the annular flange (7) of the neck is gripped between the cylindrical plug (17) and the cylindrical wall (18) with bead (19) of the cap.

The mode of fitting the cap to the bottle is to place the cap over the neck of the bottle and then apply a simple downward push. The downward push will cause the faces of the trough cut out of the ribs (12) and (13)

to press against the bottle shoulder (4) and the natural tendency will be for the cap ribs to ride down the slope of the shoulder to centralise the cap above the major vertical sectional axis of symmetry of the bottle. Thus the cap cannot be applied wrongly.

An alternative form of closable bottle and its caps are shown in FIGS. 9 - 13. This particular alternative form dispenses with the half-turn symmetry of the embodiment of the invention described above.

As may be seen from FIG. 10 this second form of bottle has a neck portion (5a) and shoulder portion (4a) that are longer on one side of the minor axis than on the other, this results in the peripheral ledge (3a) sloping downward. Apart from these variations, the bottle is as described above.

The outer shape of the cap to fit this bottle may be appreciated from FIGS. 9, 11, and 12 where it may be seen that the skirt (11a) extends downward further on one side of the minor axis than on the other and so enable the cap to fit flush with the bottle. Inside the cap the one strengthening rib (13a) extends downward further than the other strengthening rib (12a). Apart from these features the cap is as previously described.

The mode of fitting the cap to the bottle is to place the cap over the neck of the bottle with the long side of the skirt over the side of the bottle with the deepest neck portion (5a) and shoulder portion (4a) and then push down. As before, the downward push will cause the faces of the trough cuts out of the ribs (12a) and (13a) to press against the bottle shoulder (4a) so that the cap ribs will ride down the shoulder slopes and centralise the cap above the major vertical sectional axis of symmetry of the bottle. Thus the cap cannot be applied wrongly.

It will be appreciated that the exact shape of the shoulder portion of the bottle can be varied somewhat, provided that it is still convex in cross section along the lines where the ribs contact it. Thus, an alternative construction is, for example, one wherein the shoulder is concave along the line of the major axis. However, when a moment is applied to the cap about a vertical axis through the bottle neck axis and cap center, the effect will still be the same, namely that the trough-shaped cut-out in the ribs will ride up the convex shoulder causing the cap to be lifted upwards and off the bottle.

One obvious advantage of this type of removal is that the shape of the cap is such that it can be held easily in the hand even when wet or slippery. Various other modifications can be made to the bottle neck and cap without departing from the inventive principle. Thus the elliptical plane shape of the bottle and cap illustrative above can be varied slightly making the plan view nearer to a rectangle.

Many other sealing arrangements and snap-lock devices and variations are known in the container art which can be adapted to the cap and bottle of this invention. For example, the walls of the cylindrical plug (17) need not contain a hollow area but meet so as to form a solid projection extending downwards from the top surface (10) of the cap. This projection may be of large or small diameter as long as it fits into and substantially seals the orifice (8) of the bottle.

I claim:

1. A bottle and cap combination wherein the bottle comprises a body having a shoulder portion and a neck leading to an orifice, the upper region of the body im-

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mediately adjacent to the shoulder being substantially elliptical, the neck portion being substantially elliptical with its major axis parallel to and smaller than the major axis of the upper region of the body and the shoulder portion having sloping sides joining the upper region of the body with the neck; and a cap made of resilient material which comprises a hollow cup-shaped member having a downwardly-extending skirt, the lower edge of which substantially conforms with the upper region of the body of the bottle, a snap-lock liquid-tight sealing arrangement internal of the skirt to close the orifice of the bottle neck and at least one internal rib which is adapted to ride over the shoulder portion and which rib also serves as a guide means to position the cap on the bottle such that it is fixed thereon with the major axis of the cap skirt coincident with that of the upper region of the bottle body, the major axis of the neck of the bottle being greater than the minor axis of the lower edge of the cap skirt.

2. A bottle and cap combination according to claim 1 wherein the upper region of the body terminates in a peripheral ledge with which the lower edge of the cap skirt conforms.

3. A bottle and cap combination according to claim 1 wherein the bottle orifice is circular.

4. A bottle and cap combination according to claim

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1 wherein the cap has two internal ribs each shorter than and connecting the innersides of the skirt of the cap and projecting downwardly from the top of the cap parallel to, and one of the ribs being on each side of, the minor axis of the other edge of the skirt.

5. A bottle and cap combination according to claim 4 wherein the internal ribs of the cap terminate in a concave or V-shaped position adapted to co-operate with the shoulders of the bottle on the major axis thereof.

6. A bottle and cap combination according to claim 1 wherein the cap of the body of the bottle, the shoulder and the neck portion are substantially elliptical in plan, the orifice is circular, the shoulder portion commencing inwards from the top of the body thereby leaving a peripheral ledge at the uppermost portion of the body, the cap being provided with two internal ribs each shorter than and connecting the inner sides of the skirt of the cap and projecting downwardly from the top of the cap parallel to, and one of the ribs being on each side of, the minor axis of the other edge of the skirt and which ribs have a substantially trough-shaped cut-out at their base adapted to co-operate with the shoulders of the bottle on the major axis thereof.

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