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BOTTLE CLOSURES AND THE LIKE

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The present invention relates to a closure cap or stopper for bottles which is moulded from synthetic organic plastics material, and more particularly to such a closure which is tamper-proof.

It has hitherto been proposed to provide tamper-proof bottle closures in which a skirt adapted to fit over the exterior of the bottle neck when the closure is fitted thereon is moulded integrally with the closure cap or stopper. This skirt firmly grips or interlocks with the exterior of the bottle neck so as to prevent or resist removal of the cap or stopper from the bottle while the skirt remains intact and connected thereto. A tear strip is provided around the skirt for severing the skirt from the cap or stopper. However, with this arrangement the skirt is left around the bottle neck when it is severed from the cap or stopper, which is disadvantageous if the bottle is to be re-used, the removal of the skirt involving an additional operation.

The specification of British application No. 10,447/61 describes a tamper-proof closure in which the skirt is torn from the bottle neck at the same time as it is severed from a cap portion. In this particular closure, a line of weakening extends around the underside of the cap portion and joins with another line of weakening extending down the skirt to the bottom edge thereof. A tab portion projects from the bottom edge of the skirt adjacent the line of weakening and, when the tab is pulled, the skirt tears along the two lines of weakening so that it may be removed from a bottle neck at the same time as it is severed from the cap portion. However, with this arrangement there is a risk, when applying the closures to bottles with high speed capping machines, of the tab portion being folded under and inside the skirt, thus making tearing of the skirt difficult.

The present invention consists in a tamper-proof closure of the type comprising a hollow cap or stopper portion moulded of plastic material in one piece with a skirt which is adapted to fit over the exterior of the neck of a bottle when the closure is fitted thereon and prevents or resists removal of the cap or stopper portion from the bottle while the skirt remains intact and connected to said portion, wherein slots define a tab portion in the skirt and a line of weakening extends from the tab portion to the bottom edge of the skirt and another line of weakening extends from the tab portion and around the top of the skirt so that, by pulling on the tab portion, the skirt is severed from the cap or stopper portion and is, itself, torn from the top to the bottom edge. The lines of weakening may be formed by grooves, recesses, rows of perforations or the like moulded into the plastic material of the skirt.

Preferably the tab portion is provided with a projection on its internal surface which, when the closure is fitted on to a bottle neck, is engaged by the neck so that the tab is urged outwardly to facilitate raising the tab for gripping by the fingers. If desired the external surface of the tab portion may also be roughened, for example by providing it with a series of ribs extending parallel to the axis of the skirt, in order further to facilitate gripping of the tab portion between the fingers while tearing away the skirt from the cap or stopper portion.

An annular step or rib may be provided around the

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internal surface of the skirt at such a position as to engage beneath the ridge normally provided on the exterior of a bottle neck below the top of the neck. This annular step or rib is urged by the resilience of the plastic skirt to engage beneath the ridge on the bottle neck and provides additional security against the closure being removed without severing of the skirt from the cap or stopper portion. In a modification the annular step or rib may be replaced by one or more lugs or projections arranged on the internal surface of the skirt so as to engage beneath the ridge on the bottle neck.

The closure of the present invention is tamper-proof since it cannot be removed without tearing or severing the skirt and thus give an indication that the closure has been tampered with.

In order that the present invention may be more readily understood, reference will now be made to the accompanying drawing, in which:

FIGURE 1 is a perspective view of one embodiment of closure according to the present invention,

FIGURE 2 is a section on the line II—II of FIGURE 1,

FIGURE 3 is a perspective view of another embodiment of the invention,

FIGURE 4 is a section on the line IV—IV of FIGURE 3,

FIGURE 5 is a section on the line V—V of FIGURE 3, and

FIGURES 6 and 7 show, respectively, modified forms of the embodiments shown in FIGURES 1 and 3.

The tamper-proof closure illustrated in FIGURES 1 and 2 of the drawing is made as a one-piece moulding of a resilient flexible plastic material, preferably polythene, and has a cap portion 1 comprising a top disc-like portion from the periphery of which extends an annular flange 2. The inner surface of the flange 2 is shaped to snap-over the rim flange at the top of the neck of a bottle. A lug 3 is provided on the external surface of the flange 2 to facilitate removal of the cap portion from a bottle.

Extending downwardly from the underside of the flange 2 is a cylindrical skirt 4 having an inwardly projecting rib 5 around its internal surface and close to its lower end. The bottom free edge 4a of the skirt is tapered to a thin edge, and the skirt is made of such dimensions that it will be slightly expanded by the bottle neck to provide a friction grip thereon.

To enable the skirt to be severed from the cap portion 1 and be torn from the top to the bottom edge 4a for removal from the bottle neck when the closure is to be removed, a line of weakening 6 extends from a tab portion 9 adjacent the underside of the flange 2 to the bottom edge of the skirt in helical fashion, and a line of weakening 7 extends completely around the underside of the flange 2. The line 7 is connected to the line of weakening 6 by the slots 8 which define the tab portion 9 in the skirt 4. One of the slots 8 is co-extensive with a portion of the line of weakening 7.

The tab portion 9 is formed with a projection 10 on its internal surface, which, when the closure cap is fitted on to a bottle neck, engages with the surface of the neck which thus forces the tab slightly outwardly whereby it is slightly raised above the external surface of the skirt 4 and can easily be gripped by inserting a fingernail thereunder. The external surface of the tab portion is also provided with a series of ribs 11 in order, in conjunction with the projection 10, to provide a good finger grip on the tab and facilitate tearing of the skirt. By manually pulling on the tab portion, the skirt 4 tears away from the cap portion 1 along the line of weakening 7 and is, itself, torn along the line of weakening 6. Thus the skirt is completely severed from the cap portion so as to en-

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able the cap to be removed from a bottle to which it is applied, and at the same time the skirt is torn completely off the bottle neck.

FIGURES 3, 4 and 5 show a further embodiment of closure. The arrangement of the skirt 4 and tab portion 9 and the way in which the skirt is split and severed from the portion 12 is the same as that in the previous embodiment. However, in this embodiment the closure is in the form of a stopper and not a snap-over cap. It comprises a top disc-like portion from the periphery of which depends an annular flange 13. The stopper part of the closure is provided by an annular portion 14 extending downwardly from the under surface of the top disc-like portion. The portion 14 is formed on its external surface with annular reinforcing ribs 15 and 16 which are adapted to seal against the internal surface of a bottle neck. The lower edge of the annular flange 13 rests on the top edge of the neck of a bottle to which the closure is applied and is provided with a shoulder 17 for this purpose. The skirt 4 depends from the flange adjacent the external surface thereof which is serrated or knurled, as shown at 18, to facilitate gripping the cap when it is to be removed from a bottle.

As with the previous embodiment the closure is moulded in one piece from resilient flexible plastic material, preferably polythene.

FIGURES 6 and 7 show modified forms of the closures illustrated in FIGURES 1 and 3 respectively. In this modification a tab portion 19, defined by slots 20, is formed approximately half way down the skirt 4 and a line of weakening 21 extends from the tab to the bottom edge 4a of the skirt while another line of weakening 22 extends up the skirt from the tab portion and completely around the top of the skirt adjacent the underside of the flange 2 or 13. When the tab portion 19 is pulled, the skirt 4 tears along the lines of weakening 21 and 22 and the skirt is thus severed from the cap or stopper portion 1 or 12 and is, itself, torn from the top to the bottom edge 4a. As with the previous embodiments, the tab portion 19 may be provided with a projection on its internal surface in order to raise the tab above the surface of the skirt when the closure is fitted on a bottle, and the external surface of the tab may be provided with a series of ribs 23 in order, in conjunction with the projection, to provide a good finger grip on the tab when the skirt is being torn.

While particular embodiments have been described it will be understood that various modifications may be made without departing from the scope of the invention.

I claim:

1. A tamper-proof bottle closure for a bottle having a neck, said closure being moulded in one piece from a resilient plastic material, comprising a head portion associated with means for sealing the closure on to a bottle neck, and an elongated thin-walled capsule skirt depending downwardly from the head portion, said skirt being adapted to fit over the exterior of the bottle neck when the closure is fitted thereon and to firmly grip the exterior of the bottle neck to resist removal of the closure while the capsule skirt remains intact and connected to the head portion, said capsule skirt being formed with slits therethrough to define a cut-out tab portion surrounded by said skirt and normally lying substantially

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flush with the external surface of the skirt, said tab portion being adapted to be gripped by the fingers and pulled in order to tear the capsule skirt, a first line of weakening in the skirt extending obliquely downwards from the end of a slit defining said tab portion to the bottom edge of the skirt, and a second line of weakening in the skirt extending from the end of another slit defining said tab portion and completely around the top of the skirt where it joins the head portion, and said tab portion having a projection on its internal surface which, when the closure is fitted on to a bottle neck, is engaged by the bottle neck so that the tab is flexed outwardly of the external surface of the skirt to facilitate raising the tab for gripping by the fingers.

2. A tamper-proof bottle closure for a bottle having a neck, said closure constituting a combined bottle stopper and capsule which is moulded in one piece from a resilient plastic material, comprising a head portion, an elongated cylindrical stopper body portion projecting downwardly from the underside of the head portion and adapted to fit within the bottle neck, and an elongated thin-walled capsule skirt depending downwardly from the head portion and spaced from and surrounding the stopper body portion and being adapted to fit over the exterior of the bottle neck when the closure is fitted thereon and to firmly grip the exterior of the bottle neck to resist withdrawal of the stopper while the capsule skirt remains intact and connected to the head portion, said capsule skirt being formed with slits therethrough to define a cut-out tab portion surrounded by said skirt and normally lying substantially flush with the external surface of the skirt, said tab portion being adapted to be gripped by the fingers and pulled in order to tear the capsule skirt, a first line of weakening in the skirt extending obliquely downwards from the end of a slit defining said tab portion to the bottom edge of the skirt, and a second line of weakening in the skirt extending from the end of another slit defining said tab portion and completely around the top of the skirt where it joins the head portion, and said tab portion having a projection on its internal surface which, when the closure is fitted on to a bottle neck, is engaged by the bottle neck so that the tab is flexed outwardly of the external surface of the skirt to facilitate raising the tab for gripping by the fingers.

3. A tamper-proof bottle closure as claimed in claim 2, wherein said tab portion lies approximately midway between the upper and lower ends of the capsule skirt and said second line of weakening in the skirt extends from the end of said another slit firstly obliquely upwards to the upper end of the skirt and then completely around the skirt where it joins the head portion.

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