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(54) **Container and closure.**

(57) A closure/container combination of the type in which the closure is released from the container by tilting the closure by downward pressure on the periphery of the closure comprises a container having a circular sealing rib adjacent its mouth and one or more stop formations which limit the downward movement of the closure on the container. The closure has a skirt which is cylindrical or includes a cylindrical portion and the height of the skirt exceeds the distance between the outwardly projecting rib and the stop formation or formations which provide hinge points about which the closure may be tilted. The skirt of the closure forms an interference fit with the outwardly projecting rib. The stop formation is preferably in the form of a part-circular rib extending through 210-270° around the container. The ends of the rib form the hinge points for tilting the closure. The skirt of the closure may include an inwardly extending detent which lies above the level of the stop rib and prevents tilting of the closure except when the detent is aligned with the gap between the ends of the stop rib.

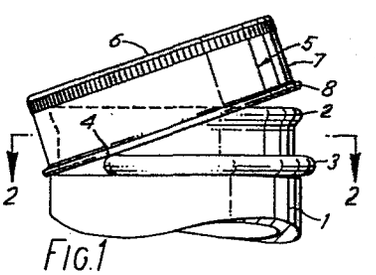


FIG.1

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"CONTAINER AND CLOSURE"

The present invention relates to a closure-container combination in which the closure is released from the container by downward pressure at the periphery of the closure at one (or possibly more than one) locality. Such locality or localities is determined by the construction of the container, rather than the construction of the closure. The release of the closure from the container is achieved by tilting the closure in relation to the container so as to disengage a surface on the inside of the skirt of a generally cup-shaped closure from an external sealing rib, projecting laterally from the neck of the container at or adjacent to the level of the container mouth. The skirt forms an interference fit with the sealing rib on the container. The closure is preferably formed as a metal pressing or as a moulding of a somewhat resilient plastics material to allow easy engagement over the rib by manual pressure.

The closure skirt and the container sealing rib are so arranged that the container neck can be entered into the closure skirt. For this purpose the lower margin of the closure skirt may be slightly flared or stepped in relation to the closure skirt sealing surface and/or the container rib may have a rounded or upwardly tapering profile.

Beneath its sealing rib the container neck is provided with a stop formation or formations which limit the downward travel of the closure. The vertical distance between the stop formation(s) and the top end of the container neck is substantially less than the depth of the container skirt. This allows the closure to be tilted about points of contact between the bottom edge of the container skirt and the stop formation(s). Such tilting is effected, as already stated, by downward pressure, usually by means of the thumb, at one locality at the periphery of the closure and lifts the edge of the closure clear of the container sealing rib opposite the point where downward pressure is applied. The closure may then be lifted off

the container. Typically the closure is tilted through about 15° to disengage its skirt from the sealing rib on the container.

The stop formation is preferably in the form of a part-circular rib, the two ends of which act as hinge points about which the closure tilts. The angular extent of the gap between such points is less than 180° and should be sufficient to allow the force required for tilting to be exerted conveniently by thumb pressure. In most cases an angular spacing of 90-150° is sufficient for that purpose. It will however be realised that the part-circular rib may itself be interrupted even to the extent of providing no more than three stop points, two of which act as hinge points for the closure. Indeed in some instances any two of such points can act as the hinge points to allow the closure to be tilted by pressure applied at different points around its periphery.

In most instances the clearance between the top of the closure, when the skirt is pressed down against the stop formations, and the top of the container is a minimum of 2 mm to allow adequate tilting to take place. In most instances such clearance does not exceed 10 mm and more usually does not exceed 5 mm. The above quoted spacings apply to containers having an external diameter of 20 - 50 mm and may be larger or smaller for repectively larger or smaller containers. The skirt may be provided with one or more detents, arranged to engage under the stop formations by turning the closure. The closure then cannot be removed until it has been returned to a disengaged position in relation to the container.

In the accompanying drawings Figure 1 is a side view of one form of the container/closure combination with the closure tilted for disengagement.

Figure 2 is a horizontal section of the container at line 2-2 of Figure 1,

Figure 3 is a fragmentary vertical section of the closure and container profile,

Figures 4 and 5 are fragmentary sections of alternative forms of closure profiles,

Figure 6 is a perspective view of the container/closure combination.

The container 1 may be formed of any suitable material and is most conveniently a glass container or is a plastics moulding. The container 1 has a circular sealing rib 2 surrounding the container mouth and a part-circular stop rib 3 below the rib 2.

The two ends of the rib 3 lie at an angle of about 120° in relation to the centre of the container mouth and the two ends of the rib are preferably somewhat rounded to act as hinge points 4.

The closure 5, in the present instance, is formed as a metal pressing which may be either formed of aluminium or steel sheet (tinplate or tin-free steel). The closure 5 comprises a top panel 6, skirt 7 and an outwardly rolled bead 8. It will be seen from Figure 3 that the vertical distance between the bead 8 and top panel 6 substantially exceeds the vertical distance between the stop rib 3 and the top end of the container neck. This allows the closure to be tilted by downward pressure on the top panel over the interruption in the rib 3, without the top panel 6 being stopped by contact with the mouth end of the container.

In the construction illustrated in Figures 1-3 the skirt 7 of the closure is essentially truly cylindrical. The container can enter the closure because the sealing rib 2 is slightly rounded and the skirt 7 flares outwardly slightly at the rolled bead. However the internal diameter of the unapplied skirt is slightly less than the external diameter of the rib 2, so that in the applied condition the skirt 7 grips the rib 2.

Figures 4 and 5 respectively show slightly modified constructions. In Figure 4 the lower part of the skirt 7 has a slight taper. The closure skirt is dimensioned so

that when fully applied the untapered upper portion 7a of the skirt is an interference fit over the sealing rib 2. The taper of the lower portion 7b allows the closure to be fitted more easily over the container neck.

The construction of the closure of Figure 5 is similar to that of Figure 4. The upper portion 7a of the skirt is cylindrical and an interference fit over the rib 2. The lower portion 7c of the skirt 7 is of somewhat larger diameter and is joined to the upper portion 7a through a step 7d.

It will be understood that the outwardly rolled ribs 8a and 8b, shown in Figures 4 and 5 respectively, are of lesser diameter than the stop rib 3.

As will be seen from Figure 3 the upper surface 2a of the rib 2 slopes slightly downward to allow the contents of the container to slip backward into the container and thus avoids the formation of deposits on the top surface surrounding the container mouth.

An arrow 11 or other marker is preferably on the container neck to indicate a gap in the stop rib 3 and thus also to indicate where tilting pressure should be applied to the periphery of the closure top panel 7.

Where a detent or detents 12 are provided on the closure, a marker 14 is provided for alignment with the arrow 11 before release of or application of the closure from the container. Figure 6 illustrates the closure in this position.

The detent 12 obstructs downward tilting movement of the cap, except when the detent is aligned with the gap in the stop rib. When the detent is aligned with the gap, it passes through the gap when the cap is tilted, but in all other positions it hooks under the sealing rib 2. Since the detent 12 hooks under the sealing rib 2 the cap cannot be removed by twisting off (as it can be in the absence of the detent or detents). The force required to pry off the cap over the sealing rib 2 is greater than the fingers of a

small child can exert.

This arrangement allows a single type of container to be employed with closures, which have or do not have safety detents 12.

CLAIMS:

1. A closure/container combination of the type in which the closure is released from the container by tilting the closure by downward pressure at a point on the periphery of the closure, the closure being an interference fit on the container characterised in that the closure (5) has a skirt (7) which is cylindrical or includes a cylindrical portion (7a) and in that the container (1) includes a circular outwardly projecting rib (2) adjacent its mouth and stop formation(s) (3) which limit the downward movement of the closure (5) on the container (1), the distance between the rib (2) and stop formation(s) (3) being less than the height of the skirt (7), said stop formation(s) (3) providing hinge points (4), about which the closure (5) may be tilted.

2. A closure/container combination according to claim 1 further characterised in that the stop formation (3) is provided in the form of a part-circular rib, which extends at least 180° around the container.

3. A closure/container combination according to claim 2 further characterised in that the angular spacing between the ends of part-circular rib (3) is in the range of $90 - 150^{\circ}$.

4. A closure/container combination according to any preceding claim further characterised in that there is a space of at least 2 mm between the top of the container (1) and the top panel (6) of the closure (5) when the closure is fully pressed down against the stop formation(s) (3).

5. A closure/container combination according to any preceding claim further characterised in that the diameter of the closure skirt (7) at its bottom end is larger than at the cylindrical portion (7a) which engages the container rib (2).

6. A closure/container combination according to any preceding claim further characterised in that the closure (5) is provided with an inwardly projecting detent (12) formed in the skirt of the closure.

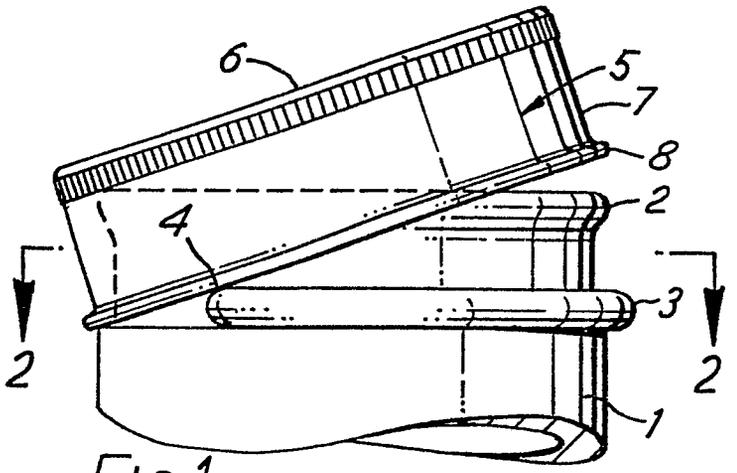


FIG.1

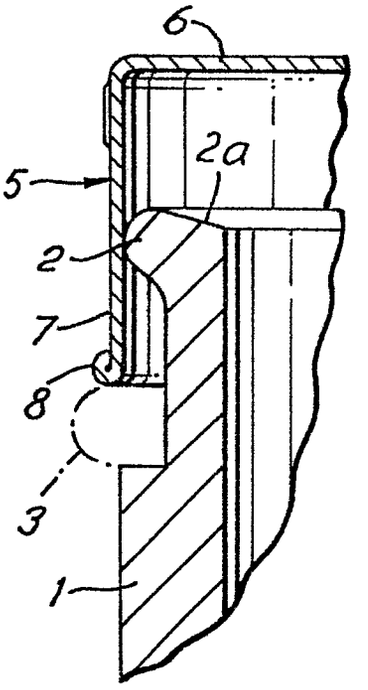


FIG.3

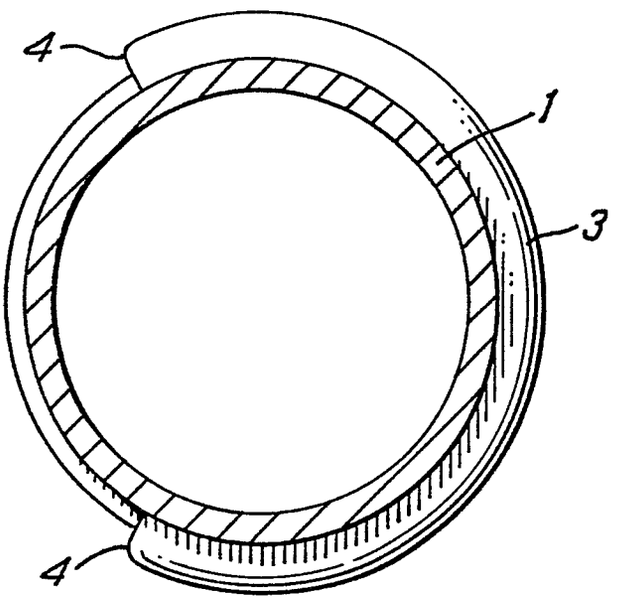


FIG.2

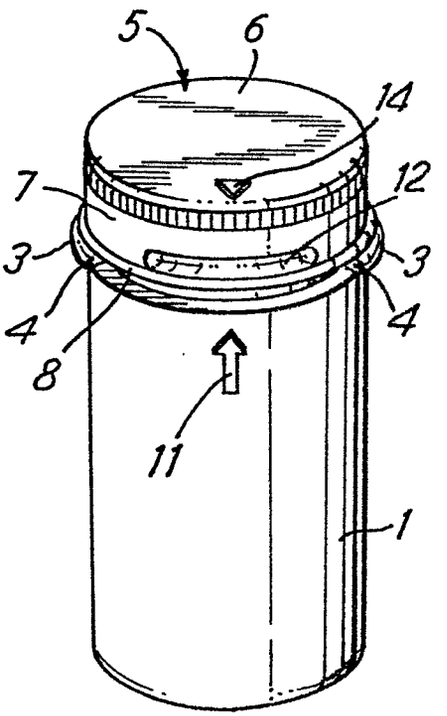


FIG.6

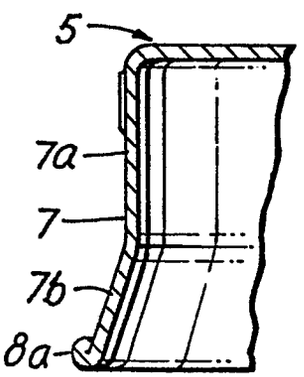


FIG.4

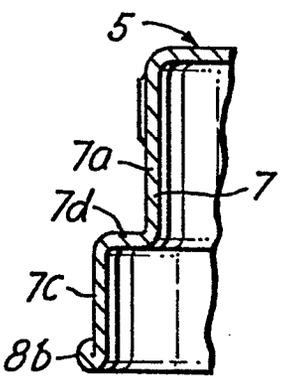


FIG.5

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