

SPECIFICATION

Improvements in or relating to closures

This invention relates to closures for containers and more particularly to tear tab closures for bottles and the like for containing fluid under pressure.

For a tear tab closure to be practical, it is essential that a tear tab is provided which is capable of being gripped easily but securely by a user and manipulated effectively to open the closure preferably with minimum risk of injuring the user. In the past it has been proposed to use a relatively long tear tab provided with parallel embossings in the form of pyramids, ridges, or the like disposed perpendicularly to the tearing direction to provide a gripping surface.

It is often difficult for such tabs to be gripped and manipulated properly even by a person of normal ability and muscle strength. Also, under unfavourable conditions, as where the finger of the user or the tear tab is wet, there is risk of injury in the event the fingers of the user slip. Moreover, it is possible for the tear strip to be torn open accidentally if the tab projects from the container and catches against the edge of a table or other object.

It has also been proposed to use caps having a tear tab terminating in an integral circular ring adapted to receive a finger of the user. These caps, however, are very difficult to make and therefore very expensive. Moreover, both they and caps having long tear tabs require complicated machinery in their manufacture.

It is an object of the invention to provide a new tear tab closure in which the above mentioned disadvantages are at least partly obviated.

According to this invention there is provided a tear tab closure for a container said closure comprising a top wall, a downwardly depending skirt and score lines defining a tear strip adapted to be torn out to open the closure; an extension of said skirt defining a tear tab for tearing out said tear strip, and a finger ring formed as a separate member secured to said tear tab to facilitate pulling the tear tab to tear open the closure.

The finger ring may normally lie at one side of the container, depending downwardly from the tear strip end to which it is secured. Alternatively, it may be large enough in diameter so that it can be disposed normally to surround the neck of the container on which it is mounted in relatively close proximity thereto.

Because of the reduced length of the tear tab free end, a substantial saving of material can be achieved in the manufacture of tear tab closures according to the invention, as compared with tear tab closures having an integral finger ring. Also, since the seal can be formed in the cap before the finger ring is attached to the tear tab, the undesirable accumulation of sealing material at the root of the tear tab which sometimes occurs with closures having integral finger rings because of the lever action of the tab and ring is eliminated.

In order that the invention may be more readily understood and so that further features thereof may be appreciated, the invention will now be described by way of example and with reference to the accompanying drawings, in which;

FIGURE 1 is a view in perspective of an inverted closure according to the invention before mounting on a container;

FIGURE 2 is a top perspective view of another embodiment of a closure in accordance with the invention;

FIGURES 3, 3a and 4 illustrate different ways in which a finger ring of a tear tab closure according to the invention is secured to the tear tab; and

FIGURE 5 is a part cut-away view in perspective of a further embodiment of the invention.

Throughout the drawings like parts are given like reference numerals.

The closure shown in Figure 1 is made of thin, light metal and comprises a disc shaped top wall 10, a substantially cylindrical downwardly depending skirt 11 which surrounds the top wall, and a tear tab 12 projecting from the skirt 11. The tear tab 12 is relatively short compared with a conventional tear tab to be gripped by a person, the tear tab in the present embodiment needing only to be long enough to enable a finger ring to be fastened thereto. The tear tab 12 tapers as it extends away from the skirt 11 towards a relatively narrow free end portion 14. To facilitate tearing of the cap, a finger ring 13 is attached to the free end 14 of the tear tab 12, and score lines 15 and 16 (See Figure 2) extend from locations on each side of and immediately adjacent the tear tab 12, up the skirt 11, and over the top wall 10.

The score lines 15, 16 may follow any suitable route which may be symmetrical or asymmetrical. They may contain mutually converging or mutually diverging sections, and they may be of different lengths. Also, the closure may be provided with a sealing insert which may be bonded to the under-surface of the closure by means of an adhesive lacquer or the like. The sealing insert may cover the top section completely, but if the score lines substantially follow the bead which surrounds the aperture of the bottle to be sealed with the closure, the insert may preferably consist of a ring seal.

The finger ring may be made of plastics materials and preferably of reinforced plastics materials. It will be appreciated that the finger ring should be large enough to accommodate the finger of the user comfortably. To this end, its inside diameter should be greater than the width of the tear tab 12, and should preferably exceed approximately 12 mm. In a practical closure, the inside diameter may be approximately 16-18 mm.

The ring thickness need only be great enough to avoid the risk of breakage at the time of pulling, and also the risk of injury, or at least discomfort, to the user when the ring is pulled for the purpose of tearing the cap. Thus, typically the thickness of the ring may be approximately 0.6-1.0 mm and its width in the radial direction may be approximately 1.2-1.8 mm, but these values are intended only to

give guidance as to preferred dimensions, and greater or smaller dimensions may be used where appropriate.

In Figure 1, the ring 13 is attached to the tear tab 12 by curling the free end 14 of the tear tab back on itself to grip the ring 13. However, the ring 13 may equally well be attached by riveting, gluing, or any other well-known method, or by combinations of such methods. Since the tab 12 serves only as anchorage for the ring 13, it may be much shorter than a conventional tear tab, resulting in a substantial saving of material in the manufacture of the closure. As may be seen from Figure 1 the ring 13 is attached to the free end 14 of the tab and extends therefrom so as to form an extension lying substantially in the same plane, and projecting away from the closure on one side.

However, in an alternative embodiment as shown in Figure 2 a finger ring 13' of large enough diameter to be swung over the top of the closure so as to encircle the top of the container in relatively close proximity thereto may be provided. In use, the ring 13' can be pivoted about the free end 14 of the tear tab 12, to a position which allows the ring to be gripped by the user and pulled for the purpose of tearing the cap.

It is important that the rings 13 and 13' be, at least initially, located some distance away from the skirt 11, as shown in Figures 1 and 2, if difficulties are to be avoided in clamping the skirt against the bead of a bottle opening. However, once the clamping process has been completed, the orientation of the ring in relation to the skirt can, of course, be altered, if desired. For example, the tab 12 can be bent in such a way that in the Figure 1 embodiment the ring 13 is brought downwardly and inwardly towards the neck of the bottle, and in the Figure 2 embodiment the ring 13' can be pivoted to surround the skirt section 11. If desired, in the Figure 2 embodiment the side of the ring 13' which is opposite the tab 12 may be detachably fastened in any suitable way.

In the form of the invention shown in Figures 3 and 3a, a finger ring 13'' may be made of a material such as aluminium wire, for example, shaped to have adjacent, upwardly extending ends 17 and 18 separated by a small gap. The ends 17 and 18 are adapted to be inserted through spaced holes or slits 19 and 20 formed in the tear tab 12 and bent parallel to the ring 13'' so as to secure the ring to the tab.

The attachment of the ring 13'' to the tab 12 can be further strengthened by curling the end 14 of the tab 12 over the bent back wire ends 17 and 18 as shown in Figure 3a. In addition, the attachment may be made even more secure by pressing and/or stamping the curled tab end 14 over the ring ends 17, 18.

The ends of the ring 13'' in Figures 3 and 3a, for instance, can as an alternative be attached to the tab 12 in such a way that they overlap. As another alternative the ends of the ring 13'' can be joined to the tab 12 in a hinge-like fashion by inserting the ends 17, 18 of the wire into two holes disposed at a distance from each other

across the width of the tab, or by some similar arrangement. Of course, in the embodiments of Figures 1 to 3a the ring may be disposed on the opposite side of the tab 12 in which event the end 14 of the tab 12 in Figures 1, 2 and 3a can be curled in the reverse direction.

As may be seen from Figure 4 the ends 17, 18 of the finger ring 13'' may overlap each other in scissorlike fashion and be bent back over the opposite side edges of the tab 12 in such a way that they exert a certain amount of spring pressure on the tab edges to grip the tab. Suitable lateral notches 21 and 22 are provided to retain the ends of the ring in place. The ends 17, 18 of the wire ring 13'' in the embodiment of Figure 4 may be more firmly secured to the tab 12 by any of the methods described above, such as pressing and/or stamping and subsequent curling of the end 14 of the tab over the wire ends.

By providing a tear tab terminating in a finger ring of a diameter to accommodate the finger of a user comfortably and made in a shape and of a material free from sharp edges, capture of the ring by the finger of a user may be effected with a minimum of effort and risk of injury. Also, since the finger ring need not be secured to the closure until after the seal has been formed, the usual accumulation of sealing material at the root of the tab that often occurs in the manufacture of tear tab closures having conventional integral, outwardly projecting, long tear tabs may be totally eliminated.

The specific embodiments described herein are intended to be merely illustrative and modifications in form and detail are, of course, possible. Thus, the finger ring may be made of other materials than plastics and it may be attached to the tab in a variety of different ways. For example, instead of curling the tab material around the ring, the ring may be fastened to the tab by riveting or gluing. Also, by the selection of suitable materials, it may, of course, be possible to melt the tab material and the ring material together. Furthermore, the tab and/or the ring may be provided with one or more ridges or similar protruberances, and the ring affixed by deformation of these ridges by cold-rolling or the like. In addition, the joint between ring and tab may be further strengthened by spot welding, and it is also possible to affix the ring by applying suitable corrugations to the tab.

Another way of securing a ring to the short tab is to bend the tab so that it extends substantially parallel to and away from the skirt. A circular band with overlapping ends is then positioned substantially coaxially with the cap so that the ends overlap the tab and the band is rolled into a ring enclosing the tab and securing the ring to the latter.

It will be understood, of course, that a finger ring may be provided comprising a loop of flexible ribbon formed of plastics or similar material as shown in Figure 5, which can be attached to the tab in any suitable manner, as by gluing, riveting, or melting together. Also, the finger ring of any of

the described embodiments may have a shape other than the practically circular shape shown in the drawings. For example, it may be pear shaped.

CLAIMS:

- 5 1. A tear tab closure for a container said closure comprising a top wall, a downwardly depending skirt and score lines defining a tear strip adapted to be torn out to open the closure, an extension of said skirt defining a tear for tearing out said tear strip, and a finger ring formed as a separate member secured to said tear tab to facilitate pulling the tear tab to tear open the closure.
- 10 2. A tear tab closure as defined in claim 1 wherein the tear tab extends outwardly away from said skirt and tapers as it extends towards the free end of the tab.
- 15 3. A tear tab closure as defined in claim 1 or claim 2 in which the free end of the tear tab is curled around a portion of the finger ring to secure the two together.
- 20 4. A tear tab closure as defined in claim 1 or claim 2 in which the finger ring has opposed ends separated by a gap and the opposed ring ends extend through openings in the tear tab and are bent so as to secure the ring to the tear tab.
- 25 5. A tear tab closure as defined in claim 4 in which the free end of the tear tab is bent back over the bent ring ends.
- 30 6. A tear tab closure as defined in claim 1 or claim 2 in which the finger ring has opposed ends separated by a gap, each ring end being bent back on itself the bent back ring ends being overlapped to define a slot and the free end of the tear tab being disposed in said slot.
- 35 7. A tear tab closure as defined in claim 6 said tear tab having means retaining the ring ends in position on the tear tab.
- 40 8. A tear tab closure as defined in any one of the preceding claims in which the finger ring is made of plastics materials.
9. A tear tab closure as defined in any one of the preceding claims in which the finger ring is made of reinforced plastics materials.
10. A tear tab closure as defined in any one of
- 45 claims 1 to 7 in which the finger ring is made of aluminium wire.
11. A tear tab closure as defined in any one of the preceding claims in which the inside diameter of the finger ring is at least 12 mm.
- 50 12. A tear tab closure as defined in any one of the preceding claims in which the inside diameter of the finger ring is between 16 and 18 mm.
13. A tear tab closure as defined in any one of the preceding claims in which the thickness of the
- 55 ring is in the range of 0.6 to 1.0 mm.
14. A tear tab closure as defined in claim 13 in which the radial width of the ring is in the range of 1.2 — 1.8 mm.
15. A tear tab closure as defined in any one of claims 1 to 12 wherein the finger ring is cylindrical in cross section.
- 60 16. A tear tab closure as defined in any one of the preceding claims in which the finger ring has an inside diameter slightly larger than the outside diameter of the skirt.
- 65 17. A tear tab closure as defined in claim 16 wherein the finger ring is mounted substantially coaxially with respect to said skirt, said finger ring being pivotal to a position to allow a user to pull the finger ring to open the closure.
- 70 18. A tear tab closure as defined in claim 1 in which the finger ring comprises a looped flexible ribbon.
19. A container provided with a tear tab closure
- 75 as defined in any one of the preceding claims.
20. A tear tab closure substantially as herein described with reference to and as illustrated in Figure 1 of the accompanying drawings.
- 80 21. A tear tab closure substantially as herein described with reference to and as illustrated in Figure 2 of the accompanying drawings.
22. A tear tab closure substantially as herein described with reference to and as illustrated in Figures 3 and 3a of the accompanying drawings.
- 85 23. A tear tab closure substantially as herein described with reference to and as illustrated in Figure 4 of the accompanying drawings.
24. A tear tab closure substantially as herein described with reference to and as illustrated in
- 90 Figure 5 of the accompanying drawings.

the described embodiments may have a shape other than the practically circular shape shown in the drawings. For example, it may be pear shaped.

CLAIMS:

- 5 1. A tear tab closure for a container said closure comprising a top wall, a downwardly depending skirt and score lines defining a tear strip adapted to be torn out to open the closure, an extension of said skirt defining a tear for tearing out said tear
- 10 strip, and a finger ring formed as a separate member secured to said tear tab to facilitate pulling the tear tab to tear open the closure.
 2. A tear tab closure as defined in claim 1 wherein the tear tab extends outwardly away from
 - 15 said skirt and tapers as it extends towards the free end of the tab.
 3. A tear tab closure as defined in claim 1 or claim 2 in which the free end of the tear tab is curled around a portion of the finger ring to secure
 - 20 the two together.
 4. A tear tab closure as defined in claim 1 or claim 2 in which the finger ring has opposed ends separated by a gap and the opposed ring ends extend through openings in the tear tab and are
 - 25 bent so as to secure the ring to the tear tab.
 5. A tear tab closure as defined in claim 4 in which the free end of the tear tab is bent back over the bent ring ends.
 6. A tear tab closure as defined in claim 1 or
 - 30 claim 2 in which the finger ring has opposed ends separated by a gap, each ring end being bent back on itself the bent back ring ends being overlapped to define a slot and the free end of the tear tab being disposed in said slot.
 - 35 7. A tear tab closure as defined in claim 6 said tear tab having means retaining the ring ends in position on the tear tab.
 8. A tear tab closure as defined in any one of the preceding claims in which the finger ring is
 - 40 made of plastics materials.
 9. A tear tab closure as defined in any one of the preceding claims in which the finger ring is made of reinforced plastics materials.
 10. A tear tab closure as defined in any one of
 - 45 claims 1 to 7 in which the finger ring is made of aluminium wire.
 11. A tear tab closure as defined in any one of the preceding claims in which the inside diameter of the finger ring is at least 12 mm.
 - 50 12. A tear tab closure as defined in any one of the preceding claims in which the inside diameter of the finger ring is between 16 and 18 mm.
 13. A tear tab closure as defined in any one of the preceding claims in which the thickness of the
 - 55 ring is in the range of 0.6 to 1.0 mm.
 14. A tear tab closure as defined in claim 13 in which the radial width of the ring is in the range of 1.2 — 1.8 mm.
 15. A tear tab closure as defined in any one of
 - 60 claims 1 to 12 wherein the finger ring is cylindrical in cross section.
 16. A tear tab closure as defined in any one of the preceding claims in which the finger ring has an inside diameter slightly larger than the outside
 - 65 diameter of the skirt.
 17. A tear tab closure as defined in claim 16 wherein the finger ring is mounted substantially coaxially with respect to said skirt, said finger ring being pivotal to a position to allow a user to pull
 - 70 the finger ring to open the closure.
 18. A tear tab closure as defined in claim 1 in which the finger ring comprises a looped flexible ribbon.
 19. A container provided with a tear tab closure
 - 75 as defined in any one of the preceding claims.
 20. A tear tab closure substantially as herein described with reference to and as illustrated in Figure 1 of the accompanying drawings.
 21. A tear tab closure substantially as herein described with reference to and as illustrated in
 - 80 Figure 2 of the accompanying drawings.
 22. A tear tab closure substantially as herein described with reference to and as illustrated in Figures 3 and 3a of the accompanying drawings.
 23. A tear tab closure substantially as herein described with reference to and as illustrated in
 - 85 Figure 4 of the accompanying drawings.
 24. A tear tab closure substantially as herein described with reference to and as illustrated in
 - 90 Figure 5 of the accompanying drawings.

