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(54) Pilfer-proof closure

(57) A metal pilferproof closure for a container having an externally screw-threaded neck comprises a top 11, skirt 12 and pilferproof band 13. The boundary between band 13 and skirt 12 is defined by a continuous peripheral score line on the internal surface of the closure, and further score lines 15 extend from the lower edge of band 13 to said peripheral score line. The skirt is devoid of any protective bead or ring of knurling immediately above said peripheral score line. The lower extremity of band 13 is turned inward during application of the closure so as to lie against a shoulder which is inclined outward at an angle of 20° to the horizontal. The position of said peripheral score line is such that it is spaced radially away from the external surface of the container. When the closure is unscrewed the band 13 fractures along some or all of the score lines 15 and the peripheral score line forms a hinge axis about which the segments defined by score lines 15 can pivot outward.

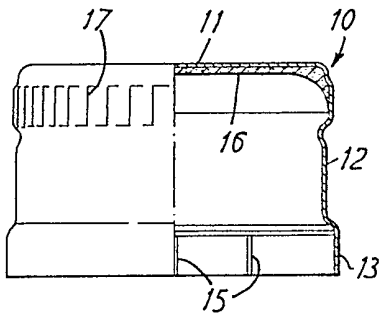


FIG. 1

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The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.
The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.

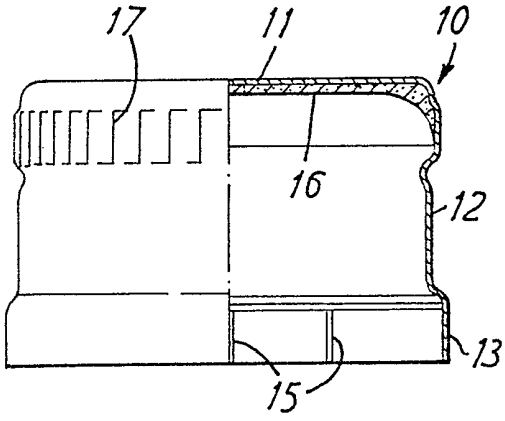


FIG. 1

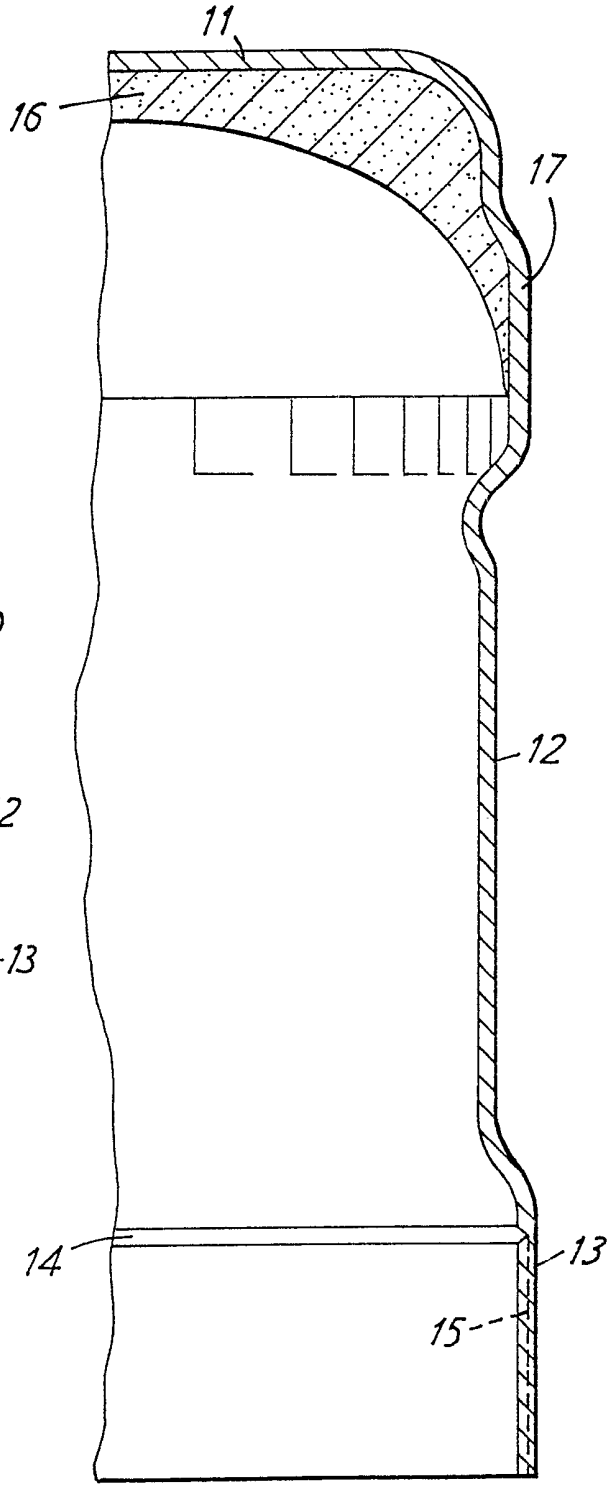


FIG. 2

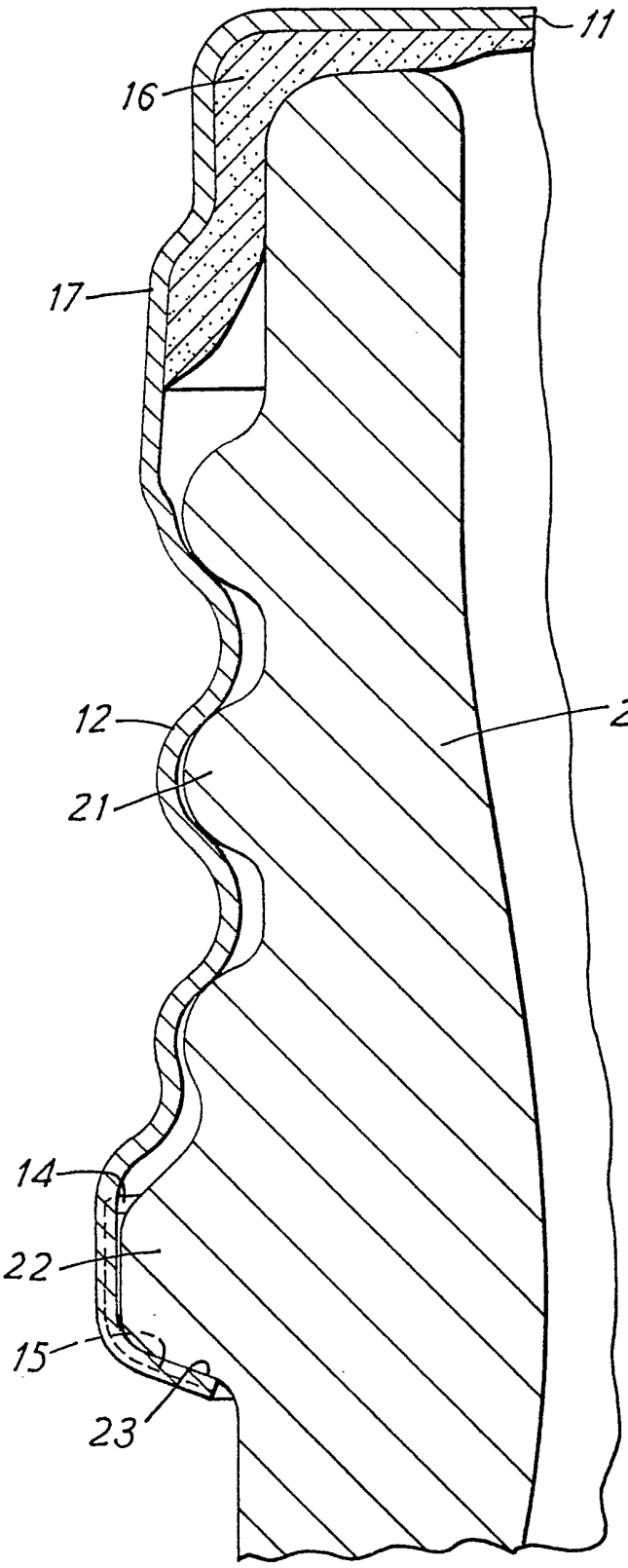


FIG.3

SPECIFICATION

Improvements in or relating to closures

This invention relates to pilfer-proof closures for containers.

According to this invention there is provided a closure blank for a container having an externally-threaded neck, which closure comprises a top, a depending skirt and a security band at the lower margin of the skirt, the junction between the security band and the skirt being defined by a continuous circumferential score line, the region of the skirt adjacent the score line being devoid of any ring of knurling or protective bead for the score line, and the security band being divided into sections by slits or further score lines extending from the free edge of the band to the circumferential score line.

The invention also provides a container having an externally screw-threaded neck with a downwardly facing shoulder below the screw-thread and a closure engaged on the neck, the closure being made from a malleable metal and having a top, a depending skirt, and a security band at the lower margin of the skirt, the skirt being deformed into engagement with the screw-thread on the neck of the container, the junction between the skirt and the security band being defined by a continuous circumferential score line disposed above the level of said shoulder, the region of the skirt adjacent the security band being devoid of any ring of knurling or protective bead for said score line, and the security band being divided into sections by further score lines extending from the free edge of the security band to the circumferential score line and having its free edge portion lying against said downwardly facing shoulder. The outer corner portion of the shoulder is preferably radiussed.

The skirt may or may not have a band of knurling adjacent the top to assist in gripping the closure manually.

On unscrewing the closure the free edge portion of the security band expands or splits along some at least of the further score lines, the circumferential score line forming a hinge for the sections to open out and allow the closure to be removed completely.

The said radiussed corner portion provides a cam action, between the shoulder and the edge portion of the security band in contact with the shoulder, operating to provide a mechanical advantage between the torque which must be applied to the closure to remove it and the force necessary to expand or split the security band.

According to a preferred feature of the invention the shoulder is formed by the bottom face of an outwardly projecting band on the neck of the container, and the circumferential score line is disposed above the location at which the top face of the band meets the outer periphery of the band, so as to be radially spaced from the surface of the container.

The score line or score lines are preferably formed on the internal surface of the closure.

According to another preferred feature of the invention, the shoulder is inclined so as to face outward at a small angle, e.g. 20°, away from the central axis of the neck.

One embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 is a compound elevation, half in axial section, of a closure blank according to the invention,

Figure 2 is an enlarged fragmentary sectional view of the closure blank of Figure 1, and

Figure 3 shows the closure blank of Figures 1 and 2 after application to the neck of a bottle.

Referring to Figures 1 and 2, there is shown a closure blank 10 having a top 11, skirt 12 and security band 13. The closure is formed from a malleable metal and is intended to be applied to a bottle, the lower parts of the skirt being engaged with the thread on the neck of the bottle by a thread rolling operation in the well-known manner. The junction between the security band 13 and the skirt 12 is defined by a continuous circumferential score line 14 formed on the internal surface of the closure. The diameter of the security band is slightly greater than that of the major part of the skirt but the increased diameter may extend a little way upward beyond the score line 14. From score line 14, further score lines 15 (preferably more than three - for example eight in number) extend axially to the free edge of the security band and are evenly spaced along the circumference of the band. A gasket 16, which may be a flowed-in gasket as shown or may be a pre-formed or any other suitable type of gasket or liner, is disposed on the underside of the top, and a broad band of knurling 17 is formed on the skirt near the top 11.

Referring now to Figure 3 the neck 20 of the bottle has an external screw-thread 21 spaced below the top of the bottle and an outwardly-projecting annular band 22 providing a shoulder 23 is formed below the screw-thread. The shoulder is inclined so as to face outwardly at a small angle (20° in the illustrated example) away from the central axis of the neck and the corner 24 where the shoulder joins the outer periphery 25 of the band is radiussed.

The closure is applied to the neck of the bottle in the usual manner, the portion of the skirt nearest the top being re-formed to provide a seal with the cylindrical surface of the neck, and the lower parts of the skirt and the bottom edge portion of the security band being rolled into engagement with the screw-thread 21 and shoulder 23 respectively of the bottle. The circumferential score line 14 is disposed just above the band 22 and is thus spaced away from the surface of the neck.

On unscrewing the closure, the radiussed corner 24 and the inclined shoulder 23 apply a cam-like action to the bottom edge portion of the security band causing it to be expanded and to split the band along some at least of the score lines 15. The circumferential score line 14 acts as a hinge for the split sections of the security band. Unauthorised removal of a previously unremoved closure can

thus be detected.

The spacing of the circumferential score line away from the neck enables the parts of the security band and adjoining portions of the skirt in the immediate vicinity of the upper end of each score line 15 to deform inward towards the neck during removal of the closure to reduce the angle of the split which must be formed at each score line 15 to permit the security band to pass the band 22 on the neck. This assists the opening operation.

Since there is no external slit at the junction between the skirt and the security band, the usual circumferential bead to protect the fingers is not provided on the adjoining lower maeginal portion of the skirt. Since the protective bead is not required, the overall height of the skirt and security band are considerably less than in a pilferproof closure of the type employing connecting bridges, and there is a considerable saving of metal over closures of the said type.

CLAIMS

1. A closure blank for a container having an externally-threaded neck, which closure comprises a top, a depending skirt and a security band at the lower margin of the skirt, the junction between the security band and the skirt being defined by a continuous circumferential score line, the region of the skirt adjacent the score line being devoid of any ring of knurling or protective bead for the score line, and the security band being divided into sections by further score lines extending from the free edge of the band to the circumferential score line.

2. A closure bank as claimed in claim 1, wherein the skirt comprises a substantially cylindrical portion extending towards the circumferential score line, the security band and the lower end portion of the skirt immediately contiguous to such cylindrical portion being cylindrical or substantially cylindrical but of larger diameter than said substantially cylindrical portion of the skirt.

3. A closure blank as claimed in claim 1 or claim 2 wherein said score lines are formed on the internal surface of the blank.

4. A container having an externally screw-threaded neck with a downwardly facing shoulder below the screw-thread and a closure engaged on the neck, the closure being made from a malleable metal and having a top, a depending skirt, and a security band at the lower margin of the skirt, the skirt being deformed into engagement with the screw-thread on the neck of the container, the junction between the skirt and the security band being defined by a continuous circumferential score line disposed above the level of said shoulder, the region of the skirt adjacent the security band being devoid of any ring of knurling or protective bead for said score line, and the security band being divided into sections by further score lines extending from the free edge of the security band to the circumferential score line and having its free edge portion lying against said downwardly facing shoulder.

5. A container as claimed in claim 4, wherein the outer corner portion of the shoulder is radiussed.

6. A container as claimed in claim 4 or claim 5, wherein the shoulder is formed by the bottom face of an outwardly projecting band on the neck of the container, and the circumferential score line is disposed about the location at which the top face of the band meets the outer periphery of the band, so as to be radially spaced from the surface of the container.

7. A container as claimed in any one of claims 4 to 6 wherein the shoulder is inclined so as to face outward from the central axis of the neck.

8. A container as claimed in claim 7, wherein the shoulder is inclined at an angle of 20° to the horizontal so as to face outward from the axis of the neck.

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