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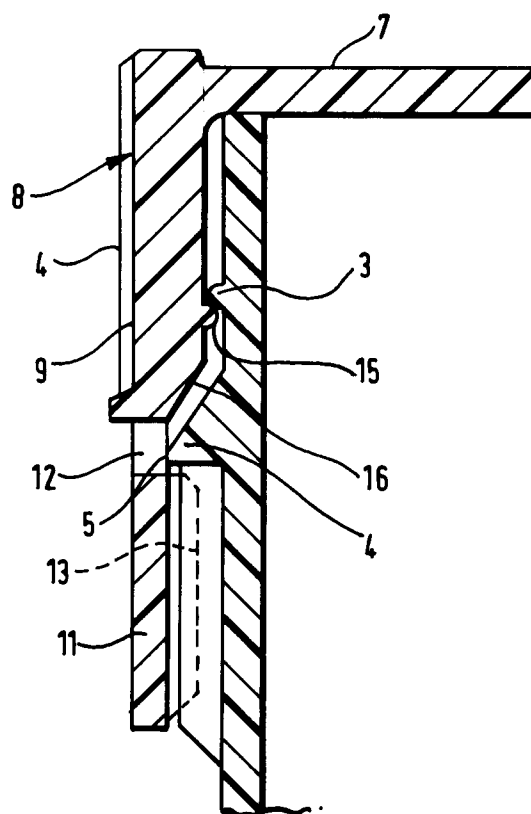
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London EC1N 2JT(GB)(54) **Tamper evident container and closure assembly.**

(57) A tamper-evident container and closure assembly is disclosed wherein the closure includes an anchor band (11) connected to a cap part (8) of the closure by frangible means (12), the anchor band (11) being provided internally with restraining means (13), to engage with external restraining means (6) on the container when the closure is first applied to the container and wherein the assembly includes means to prevent removal of the closure from the container by simple upward pressure while the anchor band (11) is connected to the cap part (8) of the closure, the arrangement being such that to remove the closure from the container it is necessary only to twist the cap part (8) of the closure which in turning relative to the anchor band (11) breaks the frangible means (12) whereupon the cap part (8) can be lifted off the container and the anchor band (11) can be discarded.

**FIG.6.****EP 0 521 633 A1**

This invention is concerned with the provision of an improved and simplified tamper-evident container and closure assembly.

Many proposals have been put forward in recent years to provide industry with an effective tamper evident container and closure assembly and many of such proposals have met with success in the market place. Some of the most successful have included the provision of a tear away band which has to be removed before the closure can be removed from the container.

It is an object of the present invention to provide an improved and simplified assembly in which there is no need for the provision of a tear away band.

Instead of providing a tear away band, I provide, in accordance with the present invention, a tamper evident container and closure assembly wherein the closure includes an anchor band connected to a cap part of the closure by frangible means, the anchor band being provided internally with restraining means to engage with external restraining means on the container when the closure is first applied to the container and wherein the assembly includes means to prevent removal of the closure from the container by simple upward pressure while the anchor band is connected to the cap part of the closure, the arrangement being such that to remove the closure from the container it is necessary only to twist the cap part of the closure which in turning relative to the anchor band breaks the frangible means whereupon the cap part can be lifted off the container and the anchor band can be discarded.

In order that the invention may be more clearly understood reference is now directed to the accompanying drawings given by way of example, in which:-

Figure 1 is a side elevation of an assembly in accordance with this invention.

Figure 2 is a part sectional, part elevational view of a closure for use in an assembly in accordance with this invention;

Figure 3 is a side elevation of a container for use in an assembly in accordance with this invention; and,

Figures 4, 5 and 6 are respectively detailed sectional views of a closure, a container and an assembly.

Referring to the drawings in more detail and looking particularly at Figure 3, a tubular container has a bottom wall 1, a side wall 2 and an open mouth at the top. Around the outside of the container below the open mouth there is an annular projecting ring 3, below the ring 3 there is an annular projecting shoulder 4 which tapers downwardly and outwardly from the outer surface of the container to an apex 5 thus providing an inclined

surface and below the shoulder 4 there is an annular ring of serrations 6. The closure, as shown e.g. in Figure 2, has a top 7 on a cap part 8 which includes a depending annular skirt 9 with a thumb or push tab 10. The skirt 9 is connected to an annular anchor band 11 by frangible means e.g. in the form of break nibs 12 and internally the band 11 has a ring of serrations 13 which in operation cooperate with the serrations 6 on the container to prevent the band 11 from turning when the cap part 8 is manually twisted so that the band 11 in operation forms a break band.

In operation when the closure is first applied to the container e.g. by simple downward pressure by hand or in a capping machine, the band 11 rides over the shoulder 4 and seats on the ring of serrations 6 so that the internal serrations 13 on the band 11 engage with the external serrations 6 on the container. The engagement of the two sets of serrations 6 and 13 forms a restraining means to prevent the band 11 from turning if the cap part 8 be twisted and the band 11 cannot be removed by simple upward pressure because in operative position it seats below a sharp step formed by the lower edge of the shoulder 4 below the apex 5. The bottom edge of the skirt 9 has an internal sloping surface 16 which matches the slope of the shoulder 4 and assists in guiding the closure into place.

To remove the closure it is necessary to twist the cap part 8 and to assist in that operation the outside of the cap part may be roughened or provided with an external ring of serrations or knurls 14. The act of twisting the cap part 8 breaks the spaced apart nibs 12 so that the cap part can be lifted off the container and the band 11 can fall away downwardly, especially if the container be slightly tapered downwardly.

The cap part can be easily replaced and clip-on engagement of the ring 3 below the mouth, with a bead 15 on the inside surface of the skirt 9 minimises the risk of the cap part simply falling off. The ring 3 is shown in Figure 5, and the cooperating bead 15 on the closure is shown in Figure 4. Cooperation of the bead 15 with the ring 3 holds the cap part in position after removal of the band 11. The interengagement of bead 15 and ring 3 is shown in Figure 6.

The parts of the assembly are preferably moulded from suitable plastics material and it will be understood that if desired the nubs 12 can be replaced by any other suitable frangible means. It will also be understood that the serrations 6 and 13 can be replaced by other suitable restraining means adapted to hold the band 11 in position while the cap part is twisted. It will also be understood that the container body below the serrations 6 can be of any desired shape and is not limited to

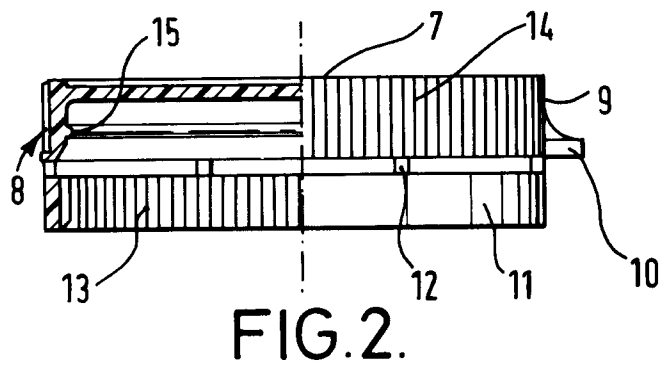
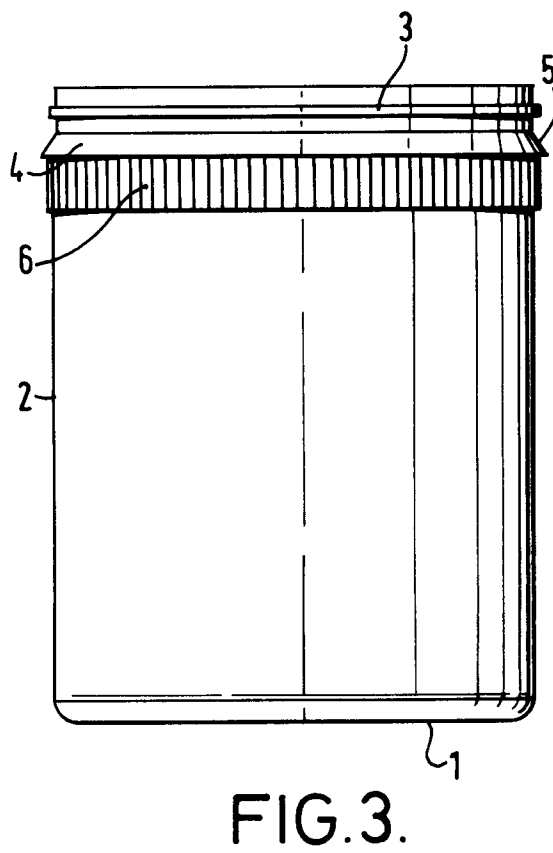
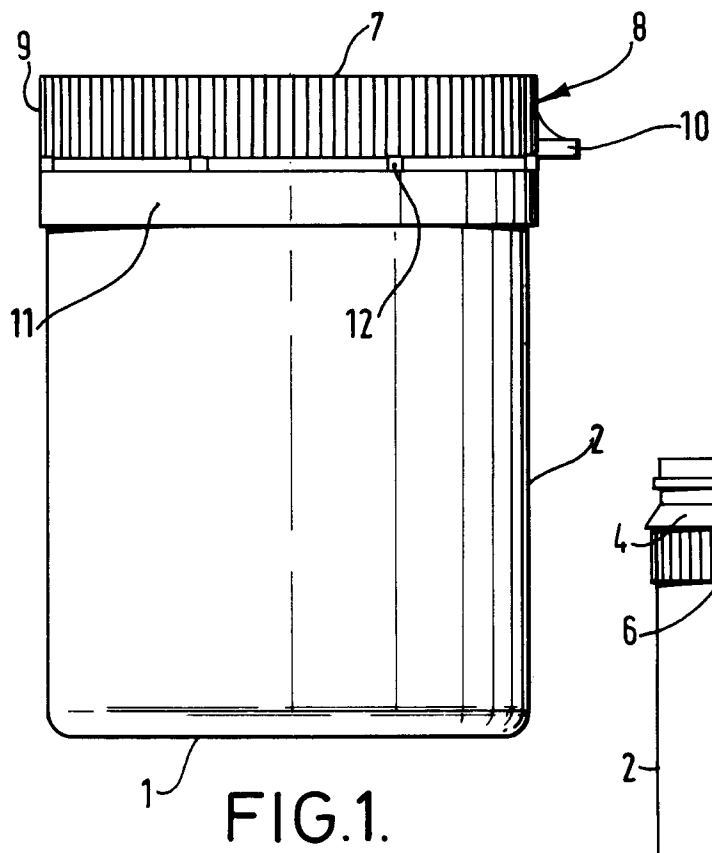
the simple tapered cylindrical form shown, by way of example, in Figs. 1 and 3.

I have therefore provided a container and closure assembly which can be sealed by simple downward pressure and in which the closure can only be removed initially by twist action. The closure has an anchor band which engages with the container to prevent the band turning when the cap part of the closure is twisted thus breaking frangible means connecting the band to the cap part and allowing the band to fall away to give evidence that the cap may have been removed.

replaced on the container after removal of the anchor band to prevent the cap part from simply falling off.

Claims

1. A tamper-evident container and closure assembly wherein the closure includes an anchor band connected to a cap part of the closure by frangible means, the anchor band being provided internally with restraining means to engage with external restraining means on the container when the closure is first applied to the container and wherein the assembly includes means to prevent removal of the closure from the container by simple upward pressure while the anchor band is connected to the cap part of the closure, the arrangement being such that to remove the closure from the container it is necessary only to twist the cap part of the closure which in turning relative to the anchor band breaks the frangible means whereupon the cap part can be lifted off the container and the anchor band can be discarded.
2. An assembly according to claim 1 wherein the restraining means on the anchor band and on the container, are in the form of cooperating serrations.
3. An assembly according to claim 1 or 2 wherein removal of the closure from the container by simple upward pressure while the anchor band is connected to the cap part of the closure is prevented by the anchor band being seated below a sharp step formed by an external shoulder on the container.
4. An assembly according to claim 3 wherein the cap part of the closure has an annular skirt provided at its bottom edge with an internal sloping surface which matches a sloping external surface on the shoulder on the container.
5. An assembly according to claim 4 wherein the container has an external projecting ring and the skirt of the cap part has a projecting internal bead which cooperates when the cap is



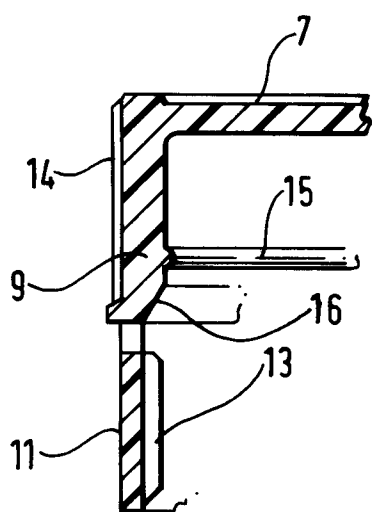


FIG. 4.

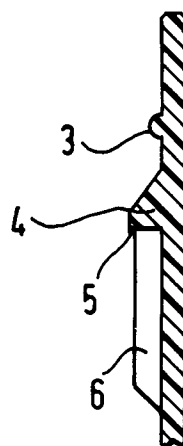


FIG. 5.

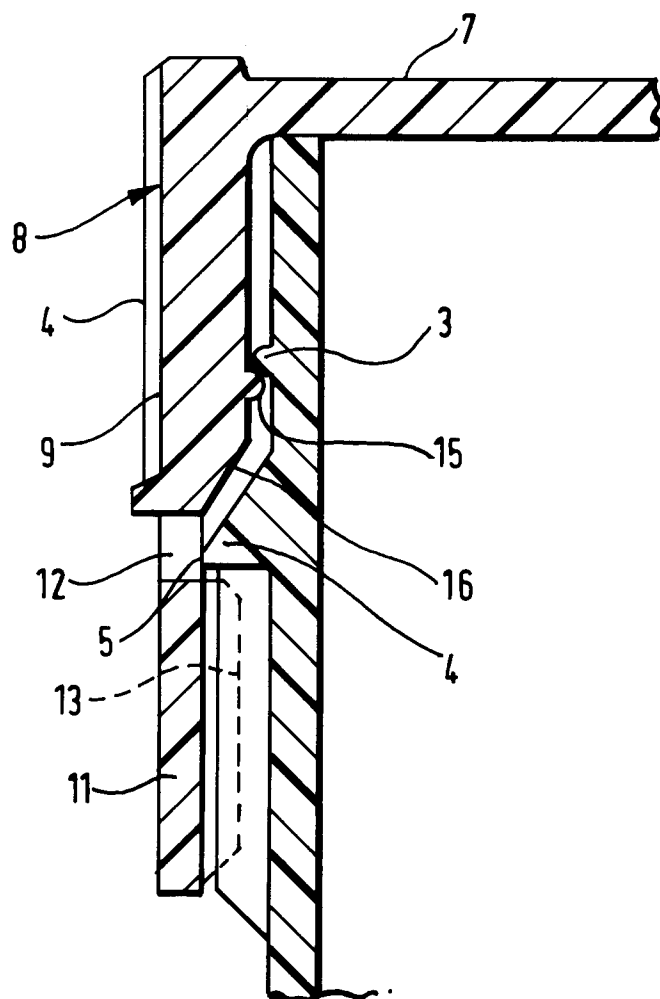


FIG. 6.



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EUROPEAN SEARCH REPORT

Application Number

EP 92 30 5549

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X Y	DE-A-2 314 864 (GEORG MENSCHEN & CO.) * page 6, line 11 - page 7, line 25; figures 1-4 *	1,2 3	B65D41/48
Y	GB-A-2 116 155 (ANGELO GUALA SPA) * page 2, line 42 - line 69; figures 3,8 *	3	
X	DE-A-1 814 680 (ROEHR METALS & PLASTICS) * page 4, line 1 - page 6, line 21; figures 1-4 *	1	
X A	AU-A-1 003 076 (G.E.CRANE PTY) * page 7, line 24 - page 7A, line 27; figures 6-10 *	1,3 5	
X	US-A-4 694 971 (ELSMO) * column 4, line 52 - column 7, line 9; figures 1-7 *	1-3	
X	US-A-4 709 823 (BECK) * figures 1-12 *	1-3	
X	GB-A-1 507 868 (JOHNSEN) * page 1, line 44 - line 102; figures 1-3 *	1	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	US-A-4 989 740 (VERCILLO) * column 3, line 43 - column 4, line 6; figures 4,6 *	2-4	B65D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 23 SEPTEMBER 1992	Examiner BERRINGTON N.M.
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