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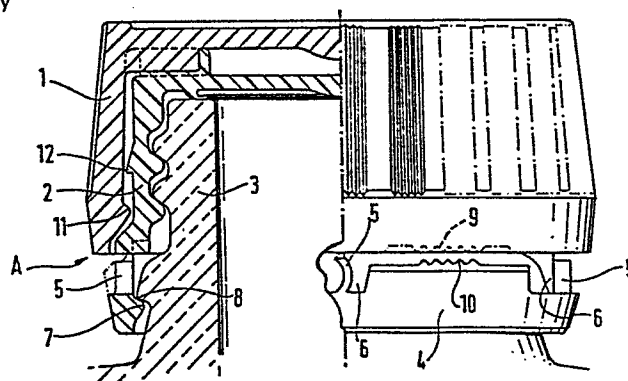
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(54) **Tamper-resistant press-and-turn closure.**

(57) This invention comprises a Turn-Lok closure (1, 2) with a child-resistant press and turn feature within which the closure is also provided with tamper-resistant means (4) including a safety band connected to the Turn-Lok part of the closure by frangible means (5).

FIG.1.



TAMPER-RESISTANT TURN LOK CLOSURE

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This invention is concerned with the provision of a child-resistant and tamper-resistant closure for a container.

Zeller Plastik in their British Patent No. 1529999 have
5 described a very effective child resistant closure which works on a press and turn principle. That closure can be screwed on to the neck of a container to close the mouth but it cannot be unscrewed without at the same time applying top pressure to the closure. The Zeller Plastic closure is
10 now known on the market as a "Turn Lok" closure and this invention incorporates the features of the "Turn Lok" closure as described in Patent No. 1529999 as the child-resistant feature.

In more detail Patent No. 1529999 provides a child-
15 resistant press and turn or Turn Lok closure for a container having an externally screw-threaded neck, the closure being made from plastics material and comprising a screw cap and overcap being relatively movable both axially and angularly, projections on one of said caps
20 and co-operating projections or recesses on or in the other of said caps, said projections or recesses having first faces on one side thereof which co-operate to transmit rotational movement from the overcap to the screw cap when the overcap is rotated in a direction to screw the closure
25 onto the neck of a said container and second faces on the

opposite sides thereof, the second face of each projection or recess of one of said caps being a cam face whereby, in use, the overcap will rotate relative to the screw cap with said projections or recesses of the different caps camming
5 past one another when the overcap is rotated in a direction to unscrew the closure from the neck of a said container unless the overcap is moved axially relative to the screw cap so that each said cam face is engaged by an edge of the second face of a projection or recess of the other cap with
10 a force sufficient to overcome the cam action.

The Turn-Lok closure is very efficient as a child-resistant closure but it is not tamper-resistant and recent events in USA have shown that it is desirable to sell certain products e.g. food, medicaments, toilet
15 preparations and so on in containers with tamper-resistant closures so that purchasers can see whether the container has been opened. However, once opened legitimately by the purchaser, it is essential with products hazardous to children that the package remains
20 child-resistant. It is therefore an object of the present invention to provide a Turn-Lok closure with a tamper-resistant feature.

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According to the present invention there is provided a Turn-Lok closure with a child-resistant press and turn feature characterised in that the closure is also provided with tamper-resistant means including a
5 safety band connected to the Turn-Lok part of the closure by frangible means.

In one embodiment when the closure is in position the safety band may be held down by engagement with an annular projection on an associated container so that
10 when the closure is removed the frangible means, which connect the band to the skirt of the screw cap of the Turn-Lok part of the closure, are broken. In another similar embodiment the safety band is connected by the frangible means to the skirt of the overcap. In each
15 embodiment the upper edge of the safety band is provided with serrations or fine teeth for co-operation with serrations or fine teeth on the skirt to which the safety band is connected.

Each of the two embodiments may be assembled and
20 applied to the container in one screwing-on operation.

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:-

5 Figure 1 is a sectional side elevation of a first embodiment of the invention, and

Figure 2 is a sectional side elevation of a second embodiment of the invention,

 Referring first to Figure 1, the closure may
10 conveniently be divided into two parts, firstly a child-resistant part disposed above the arrow A and secondly a tamper-resistant part disposed below the arrow A.

 The child-resistant part is a standard Turn-Lok
15 closure as described in UK Patent No. 1529999 and comprises an overcap 1 and a screw cap 2, the screw cap 2 can move axially within the overcap 1 and when once in position on the neck of a container 3 overcap 1 can be turned freely in relation to the screw cap 2 as

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long as projections on the screw cap and the overcap are not caused to interlock by the application of axial pressure to the overcap. Full details of the construction and operation of the Turn-Lok closure are given in UK
5 Patent No. 1529999 and so further description will not be given here.

To provide a tamper-evident feature for the closure the screw cap 2 has a tamper-evident band 4 connected to the bottom of the skirt of the screw cap 2 by frangible bridge
10 members 5 disposed in gaps 6 in the band 4. The band 4 also has an internal annular bead 7 to engage below an external annular bead 8 on the neck of the container 3
The lower edge of the skirt of the screw cap 2 has serrations or fine teeth 9 to engage with serrations or
15 fine teeth 10 on the upper edge of the band 4 when the closure is being screwed onto the container.

In operation the closure is applied to the mouth of the container and is screwed on in the usual way. The act of screwing the closure onto the container causes the

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screw cap 2 to move slightly towards the band 4 due to pressure being applied to the closure and this causes the fine teeth or serrations 9 to engage positively with the fine teeth or serrations 10 on the band 4 so that the band 4 turns with the screw cap 2 and the bridge members 5 flex but do not break. At the end of the movement of the closure the bead 7 passes over the bead 8 and snaps into position below the bead 8 as shown in Figure 1. When the closure is to be unscrewed axial downward pressure is applied to the closure so that the projections or engaging dogs with matching recesses on the screw cap 2 with the overcap 1 begin to rise. However the band 4 resists turning, because the bead 7 has settled firmly below the bead 8. The frangible bridge members 5 therefore break as the closure is being removed.

It will therefore be understood that if a closure is in position with the bridge members 5 intact that gives evidence that the closure almost certainly has not previously been removed but if the bridge members 5 are broken the closure has probably been removed and the contents of the container may have been tampered with or contaminated.

In order to minimise the risk of a child removing the overcap altogether the overcap has an annular projection 11

which, in operative position, is disposed below an annular projection 12 on the screw cap in such a position that the overcap 1 can undergo limited upward and downward movement relatively to the screw cap 2, in the manner
5 described in greater detail in UK Patent No. 1529999.

It will be noted that the bridge members 5 have a reduced or weakened portion at their point of connection to the skirt of the screw cap 2. An annular deformable sealing member is arranged for co-operation with the rim
10 around the mouth of the container 3 as shown in the drawing.

The second embodiment of the invention differs from the first embodiment in that the tamper-evident band 4 is connected to the overcap 1 instead of to the screw cap 2.
15 The same references are used in Figure 2 as in Figure 1, for the same parts. When the closure is applied to the container the fine teeth or serrations 9 engage with the fine teeth or serrations 10 and the band 4 turns with the screw cap 2 until the bead 7 is in the position shown
20 in Figure 2, below the bead 8 on the container 3.

Alternatively, the screw cap 2 can be first applied and the overcap 1 can be applied by top pressure only as a secondary sealing operation. When axial pressure is applied to the overcap 1 and the closure is turned to

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unscrew it, the bead 7 engages with the bead 8 as the overcap 1 is moved upwardly and the band 4 is held down so that the frangible bridge members break as in the first embodiment.

5 The closure in both its embodiments is preferably made of a suitable resilient plastics material by a moulding operation and as shown we prefer to provide the overcap with vertical serrations. The container is preferably made of glass with a special neck
10 profile, as shown, for co-operation with the closure, but can, of course, be made from any appropriate alternatives moulded in various plastic materials or fabricated in aluminium or sheet metal.

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CLAIMS:-

1. A Turn-Lok closure with a child-resistant press and turn feature characterised in that the closure is also provided with tamper-resistant means including a safety band connected to the Turn-Lok part of the
5 closure by frangible means.
2. A closure, for closing the mouth of a container having a screw neck finish, wherein the closure has an inner part with an inner skirt adapted to engage with the screw neck of the container and, an outer part
10 surrounding the inner part and including a depending outer skirt, a safety band connected either to the inner skirt or to the outer skirt by frangible means and adapted when in position to engage with the container to form anchor means and drive means on the
15 inner and outer parts of the closure which are inter-engageable with one another in use to allow the inner part to be unscrewed from the container only when the anchor means has been separated from the depending skirt and only by relative axial engagement
20 between the outer and inner parts during unscrewing whereby the closure is child-resistant until separation of the anchor means and is still child-resistant

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thereafter.

3. A closure, for closing the mouth of a container having a screw neck finish, wherein the closure has an inner part adapted to engage with the screw neck of the container, an outer part surrounding the inner part and including a depending skirt connected to a safety band in the form of anchor means by frangible means and drive means on the inner and outer parts of the closure which are interengageable with one another in use to allow the inner part to be unscrewed from the container only when the anchor means has been separated from the depending skirt and only by relative axial engagement between the outer and inner parts during unscrewing whereby the closure is child-resistant until separation of the anchor means and is still child-resistant thereafter.

4. A closure according to claim 1 wherein the safety band is held down against upward movement by engagement with an annular orojection on an associated container so that when the closure is removed the frangible means which connect the band to the skirt of the screw cap of the Turn-Lok part of the closure are broken.

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5. A closure according to Claim 1 wherein the safety band is connected by the frangible means to the skirt of the overcap of the Turn-Lok part of the closure.
6. A closure according to Claim 1 wherein the upper
5 edge of the safety band is provided with fine teeth for co-operation with fine teeth on the skirt to which the safety band is connected.
7. A closure according to Claim 1 wherein the screw cap of the Turn-Lok part of the closure has a tamper
10 evident safety band connected to the bottom of the skirt of the screw cap by frangible bridge members disposed in gaps in the safety band.
8. A closure according to Claim 7 wherein the band has an internal annular bead to engage below an external
15 annular bead on the neck of an associated container.
9. A closure according to Claim 7 wherein the overcap has an annular projection which, in operative position, is disposed below an annular projection on the screw cap.
10. A closure according to Claim 7 wherein the bridge
20 members have a reduced portion at their point of connection to the skirt.
11. A closure according to Claim 1 wherein the overcap of the Turn-Lok part of the closure has a tamper evident

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safety band connected to the bottom of the skirt
of the overcap by frangible bridge members disposed
in gaps in the safety band.

FIG.1.

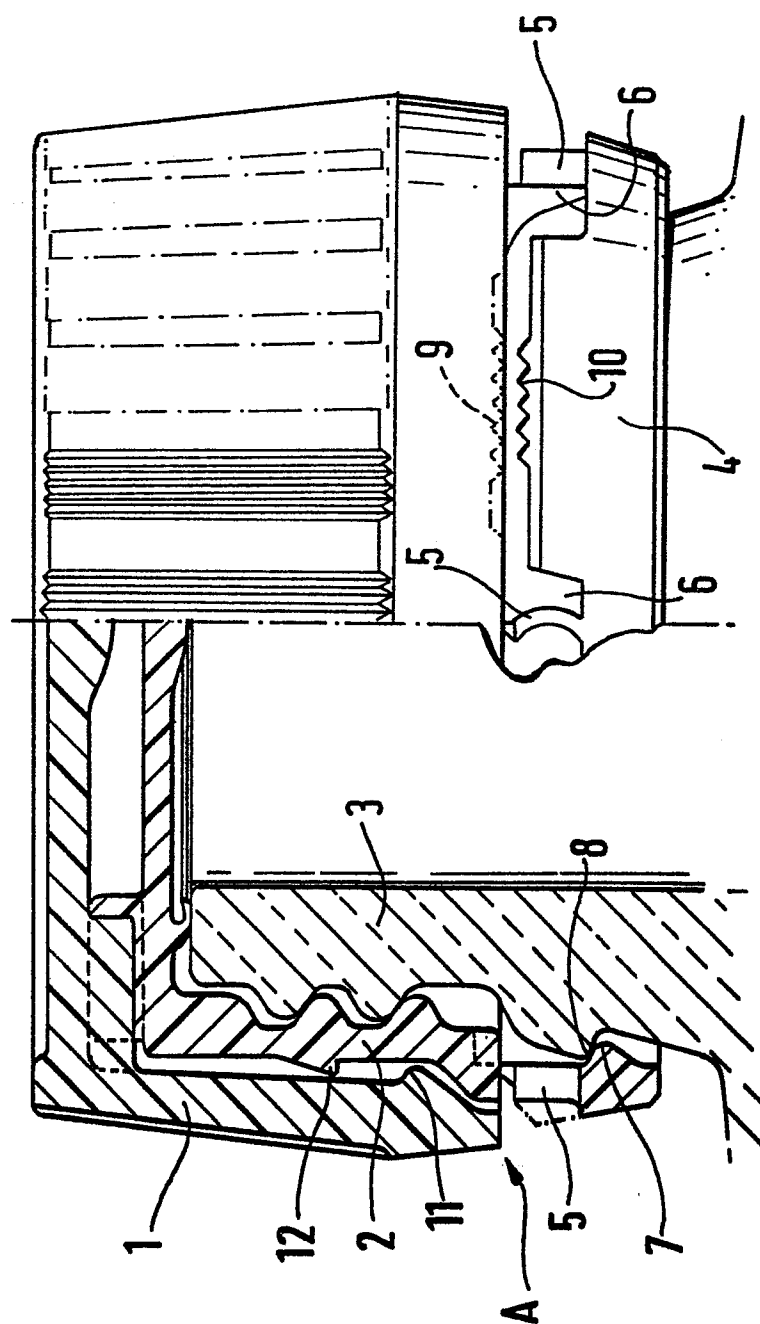
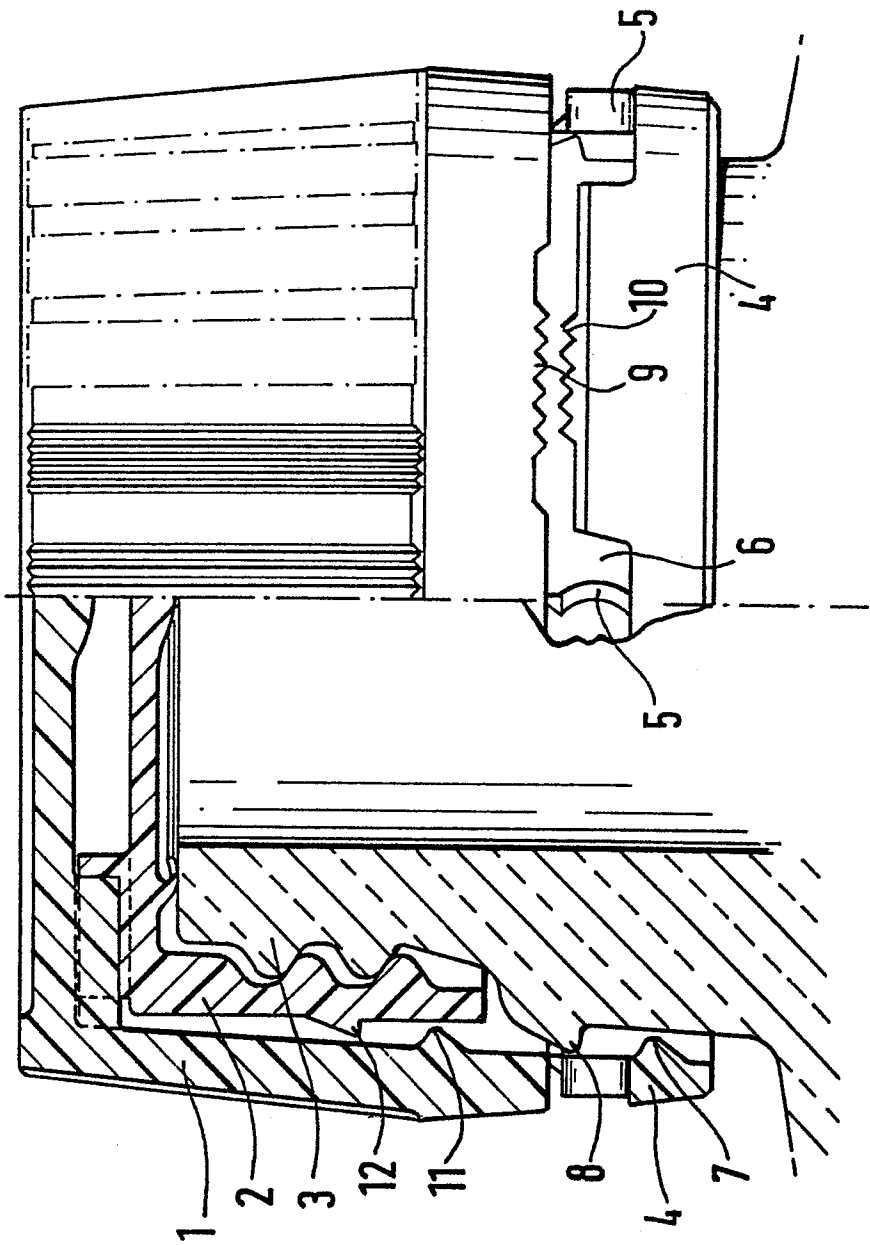


FIG.2.





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. 3)
X	US-A-3 837 518 (GACH) *Column 2, line 57 - column 3, line 53; figures 1-5*	2,3	B 65 D 55/02 B 65 D 41/34
A		5,9	
Y,D	--- GB-A-1 529 999 (ZELLER PLASTIK) *Page 2, lines 45-119; figures 1-4*	1-11	
Y,P	--- EP-A-0 080 846 (JOHNSEN & JORGENSEN) *Page 3, line 7 - page 4, line 2; figures 1-3*	1-11	

			TECHNICAL FIELDS SEARCHED (Int. Cl. 3)
			B 65 D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 20-07-1984	Examiner BERRINGTON N.M.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			