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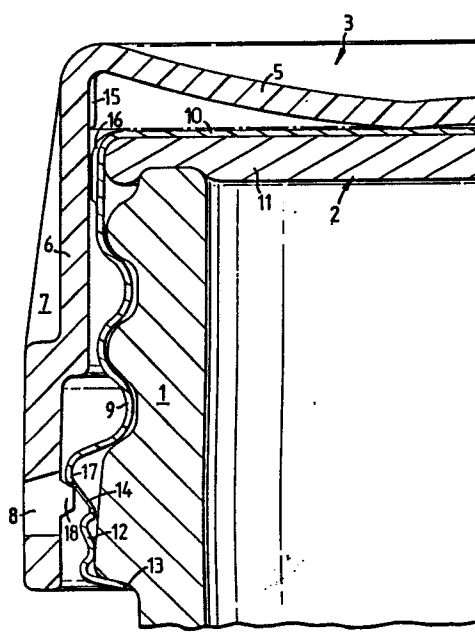
54 **Childproof security closure.**

57 The invention provides a safety closure assembly for a container having a dispensing opening (1) said assembly comprising an inner (2) and an outer (3) closure member, each comprising crown (10.5) and skirt portions (9.6), the inner closure member being adapted to close said dispensing opening, and the outer member being retained on said inner member;

interengagement means (16.15) provided between said members to lock said members together for a common rotation about the dispensing opening,

wherein the skirt portion (9) of the inner closure member terminates in a security band (12) conjoined to the skirt portion by a plurality of flangible bridges (14), and wherein a window (8) is provided in the skirt portion of the outer closure member at a position adjacent the flangible bridges of the inner closure member when the safety closure is in its non-engaged position,

characterized in that a first plurality of radially spaced windows (8) is disposed in the skirt of the outer closure member (3), said first plurality being a number different from the number of spaced frangible bridges (14) on the inner closure member, whereby at least one bridge is always visible through one of said windows without relative rotation of the closure members.



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DESCRIPTION

The present invention relates to childproof security closures for containers having a threaded dispensing opening.

Childproof closures for containers such as medicine bottles are known, for example, from our British Patent No: 1,602,612. This provides a safety closure assembly for a container having a dispensing opening, said assembly comprising an inner, and an outer closure member, each comprising crown and skirt portions, the inner member being adapted to close said dispensing opening, and the outer member being retained on said inner member to allow of relative rotation therebetween in a disengaged position.

Interengagement means provided between said members to lock said members together for a common rotation about the dispensing opening, and wherein the crown portion of the outer closure member, at least, is resilient; the central portion of the crowns of the inner and outer members being spaced apart, whereby the crown of the outer member is normally spaced to the disengaged position, but may be moved to an interengaged position by an axial force exerted on the crown of the outer member which exceeds the resilient forces inherent in the outer member.

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In United States Patent Serial No: 4410098 there is provided a closure of the above general type which also includes a lower security band joined to the skirt of the inner closure member by means of a series of

5 bridges. As is known in the art these bridges are adapted to fracture on application of an axial pressure exerted between the security band and the skirt of the inner closure member. Because of the design of the childproof outer closure member, this axial force can only
10 be exerted when the inner and outer members are engaged for common rotation.

It will be appreciated that in the closure shown in U.S-A-4410098 the outer closure member only extends, in normal circumstances, to a position above the security
15 band, and hence the container in its normal retail condition has its security band exposed so that customers can readily see that the bridges have not been fractured, and assure themselves that the contents of the container have not been tampered with.

20 Unfortunately this arrangement has been found insufficient to prevent dishonest practices essentially because the security band is readily accessible. One possible remedy is to extend the skirt of the outer closure member so that in both its engaged and disengaged condition it covers the security band.

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This has the advantage that the security band is not then readily accessible, but, of course, it is then impossible to ascertain from a visual inspection whether or not the frangible bridges are still in tact. For this reason the
5 extension of the skirt of the outer closure member has not been adopted in the trade.

G.B.-A-1035476 also provides a safety closure assembly for a container having a dispensing opening, said assembly comprising
10 an inner and an outer closure member, each comprising crown and skirt portions, the inner closure member being adapted to close said dispensing opening, and the outer member being retained on said inner member;

interengagement means provided between said members
15 to lock said members together for a common rotation about the dispensing opening,

wherein the skirt portion of the inner closure member terminates in a security band conjoined to the skirt portion by a plurality of flangible bridges, and wherein a
20 window is provided in the skirt portion of the outer closure member at a position adjacent the flangible bridges of the inner closure member when the safety closure is in its non-engaged position.

However, it has also been found that customers are
25 reluctant to tamper with containers which they are uncertain of purchasing. Accordingly, the present invention is characterized by a first plurality of radially spaced windows disposed

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in the skirt of the outer closure member, said first plurality being a number different from the number of spaced bridges on the inner closure member whereby at least one bridge must be visible through at least one window without any relative rotation of the outer closure member relative to the inner closure member. Thus, customers can inspect the frangible bridges, merely by rotation of the container per se.

The window may be provided with a generally trapezoidal cross-section in transverse sense, with the shorter parallel 'side' thereof being contiguous with the outer peripheral surface of the outer closure. This ensures that the opening is as small as it reasonably can be (so that it is relatively difficult to insert implements for dishonest purposes), while also providing as good a view as can be obtained by virtue of the 'cut-away' nature of the window.

Alternatively, the radial faces of the window may be parallel and downwardly directed toward the axis of the closure. Of course, arrangements where the radial faces are normal to the closure axis, and arrangements where one such face is normal, and the other angled upwardly or downward are also useful.

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One embodiment of the present invention will now be described, by way of illustration only, with reference to the accompanying drawings, wherein:

5 Figure 1 shows a vertical cross section of one half of a closure cap assembly disposed on a container opening in accord with the present invention;

 Figure 2 shows a side view of the
10 arrangement shown in Figure 1;

 Figure 3 shows a section on a line A - A of Figure 2, and

 Figure 4 shows a side elevation from below of the arrangement shown in Figure 2.

15 A threaded container neck (1) provided with a security rim (13) is formed of a material such as glass, metal or plastic. In accordance with prior art practice, this container neck has its dispensing opening closed by an inner
20 closure member (2) which is comprised of a crown portion (10) and a depending skirt portion (9). The depending skirt portion (9) is provided about its upper periphery, immediately adjacent its

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point of conjunction with the crown portion (10) with a spline (16) for interengagement with the corresponding ribs in the outer closure. The lower portion of the skirt (9) is also provided with an outwardly directed bead (17). A security band (12) is also conjoined to the skirt (9) by means of bridges (14).

A liner (11) made of a generally resilient sealing material is positioned to the underside of the crown portion (10) and the inner closure member is positioned over the dispensing opening of the container such that the upper rim of the container opening (1) is in abutment with the liner (11). A thread is then rolled onto the skirt (9) so that it conforms with the thread moulded, or otherwise formed, on the outer surface of the container opening. Rolling of the thread does not, however, affect the outwardly directed bead (17). In the rolling of the thread the security band portion (12) is bent inwardly such that it abuts the security rim (13). Alternatively, the thread on the skirt (9) can be

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preformed so that only the band (12) need
be rolled on. The container dispensing opening
is thus firmly closed, but additional
tightening pressure can be applied, if
5 desired, by manual or other means after
rolling. The spline (16) may serve in this
present condition as a means whereby the
inner closure member (2) can be readily gripped
manually for tightening or untightening as
10 necessary. In this condition, the inner
closure member can be utilized as the only means
of sealing the dispensing opening.

In order to render the assembly of the inner
closure (2) and the container neck (1) childproof
15 and more secure as suggested in the present
invention, an outer closure member (3) is
snapped over the inner closure member (2).

The outer closure member (3) is formed of a
generally dished crown (5) and a peripheral
20 downwardly depending skirt (6). The skirt (6)
is provided about its periphery with a series
of generally triangular ribs (7) which assist the

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gripping process during use. Toward the lower portion of the skirt (6) an inwardly directed bead (18) is provided, said bead being provided generally adjacent a plurality of windows (8) at preferably regularly spaced intervals about the periphery of the skirt. In the illustrated instance, 5 windows are provided. The upper, inner surface of the depending skirt (6) is provided with a rib (15) for inter-
engagement, in some circumstances with a corresponding spline (16) on the outer peripheral portion of the skirt of the inner closure member.

In use, as stated above, the outer closure member (3) is forced downwardly over the inner closure member (2) when that closure member is in position on the neck (1). In this condition the dished crown (5) of the outer closure member rests upon the central portion, at least, of the crown (10) of the inner closure member, while the rib (18) interengages under the bead (17) of the inner closure member (2) such that the outer

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member (3) is locked onto the inner closure member (2), but can be readily rotated in either direction with respect thereto. In such a condition, the bridges (14) can be readily viewed through the window (8) and their status ascertained. In the present instance there are 8 bridges and 5 windows, and as can be seen from Figure 3 the arrangement is such that at least some bridges must appear in some windows.

When it is desired to fracture the bridges (14) it is necessary to force the peripheral portions of the outer closure member (3) downwardly relative to the inner closure member (2). This causes the crown portion (5) to flex, and hence allow the depending skirt (6) of the outer closure member to move downwardly relative to the closure member (2). This brings the ribs (15) and splines (16) into inter-engagement and hence rotation in this circumstance of the outer closure member (3) also causes common rotation of the inner closure member (2), thus removing the inner closure

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member (2) from the container neck (1)
and fracturing the bridges (14).

5 The closure assembly may then be withdrawn
from the container and replaced in a similar
fashion.

10 Thus, the invention provides a facile means
of ascertaining whether the bridges, and of
course the security band, are intact prior to
purchase. Further, it becomes immediately
apparent, even to those not conversant with
the art, if the security band has been
completely removed.

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CLAIMS:

1. A safety closure assembly for a container having a dispensing opening (1) said assembly comprising an inner (2) and an outer (3) closure member, each comprising crown (10.5) and skirt portions (9.6), the inner closure member
5 being adapted to close said dispensing opening, and the outer member being retained on said inner member;

interengagement means (16.15) provided between said members to lock said members together for a common rotation about the dispensing opening,

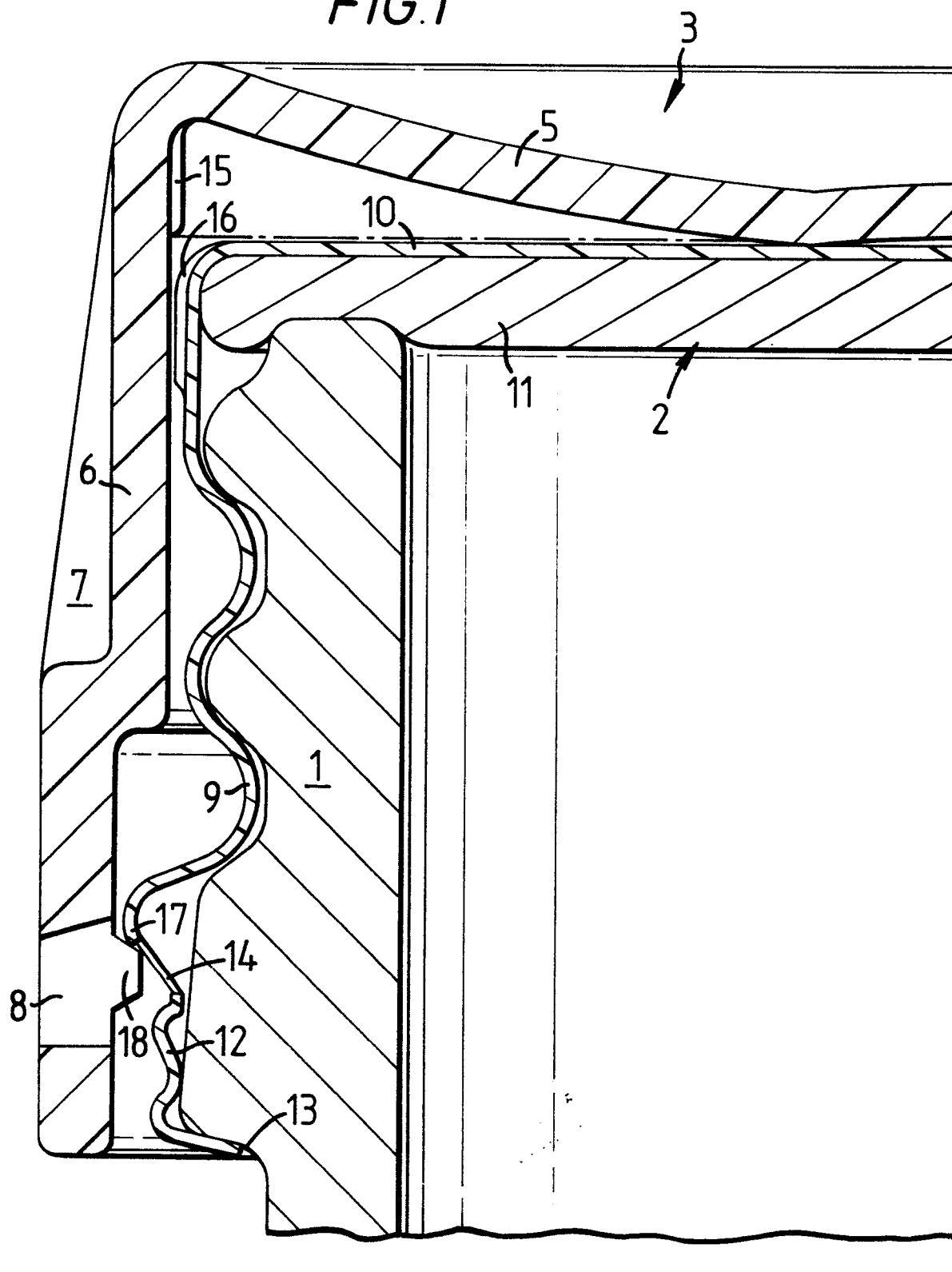
10 wherein the skirt portion (9) of the inner closure member terminates in a security band (12) conjoined to the skirt portion by a plurality of flangible bridges (14), and wherein a window (8) is provided in the skirt portion of the outer closure member at a position adjacent the flangible
15 bridges of the inner closure member when the safety closure is in its non-engaged position,

characterized in that a first plurality of radially spaced windows (8) is disposed in the skirt of the outer closure member (3), said first plurality being a number different
20 from the number of spaced flangible bridges (14) on the inner closure member, whereby at least one bridge is always visible through one of said windows without relative rotation of the closure members.

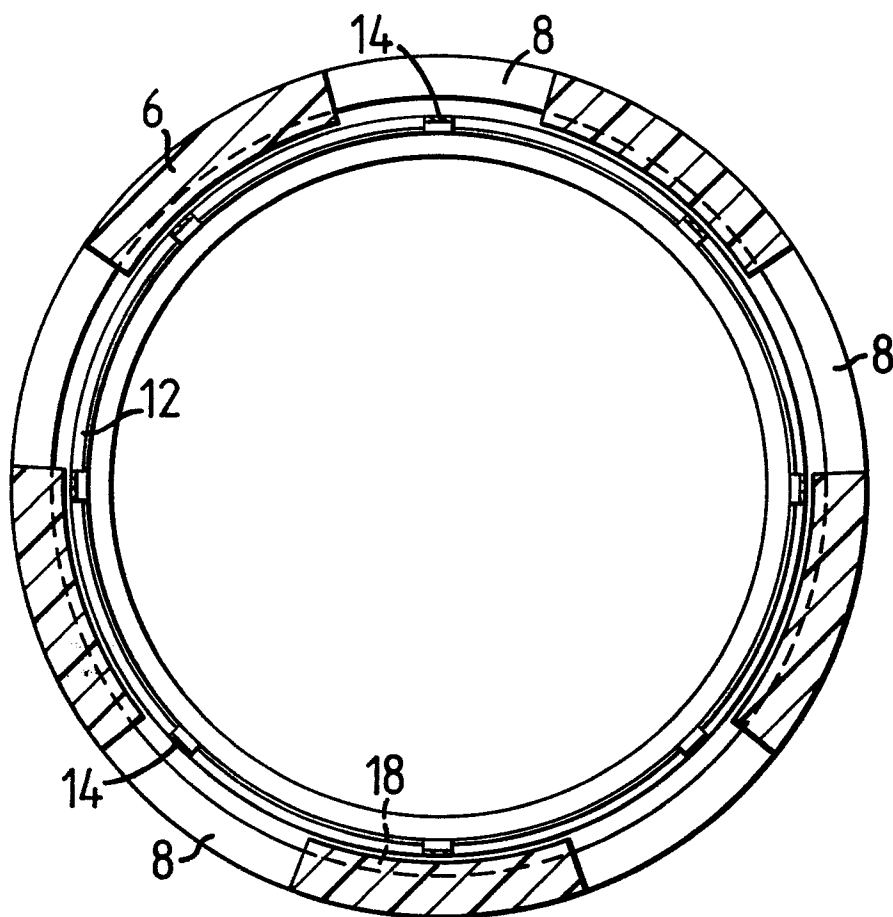
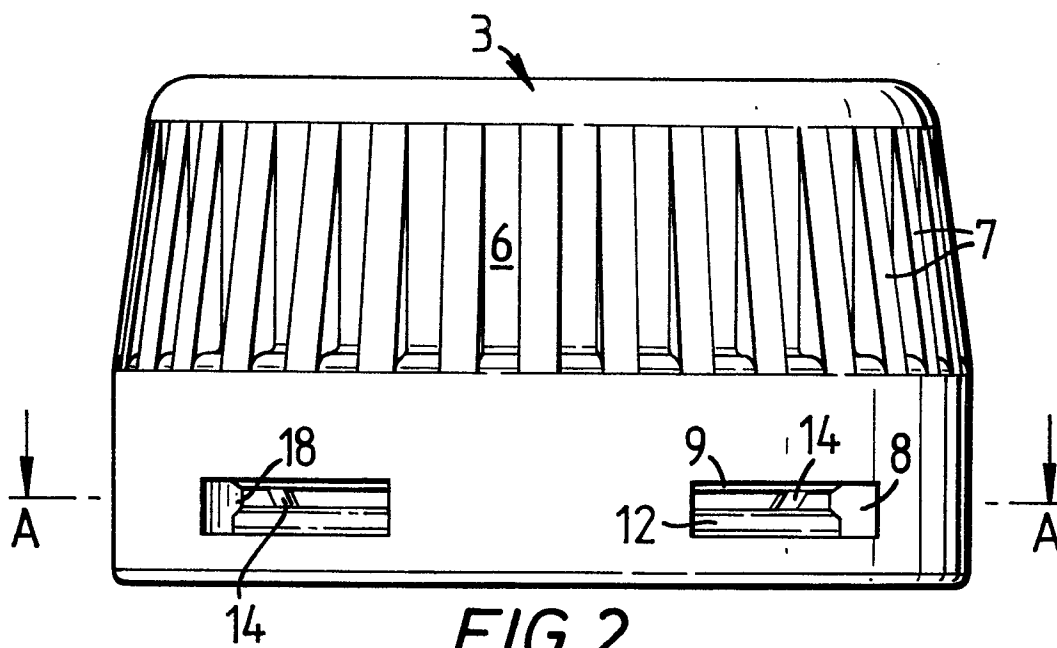
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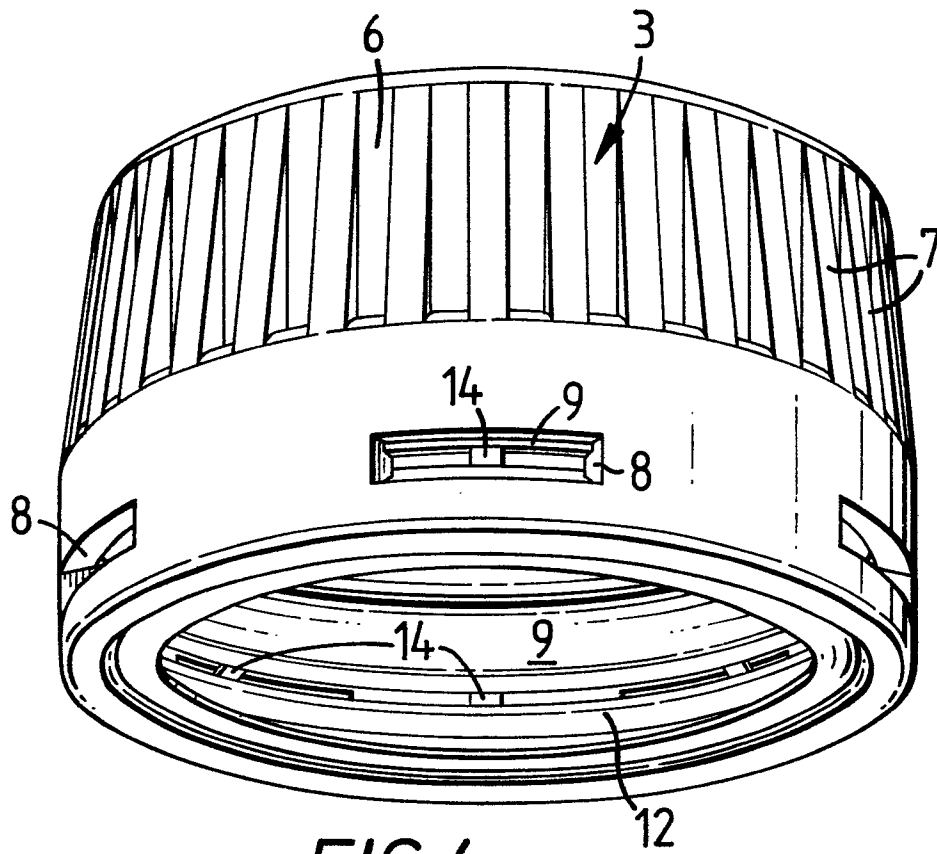
2. An assembly according to claim 1 wherein the outer closure member (3) is biased from the inner closure member to allow of relative rotation therebetween, said bias being overcome by an axial force applied to the outer closure member
- 5 to engage the interengagement means.
3. An assembly according to either of claims 1 or 2 wherein the window has a generally trapezoidal cross-section.
- 10 4. An assembly according to either of claims 1 or 2 wherein the radial faces of the window are parallel and downwardly directed toward the axis of the closure.

FIG. 1



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**FIG. 4**



European Patent
Office

EUROPEAN SEARCH REPORT

0175444

Application number

EP 85 30 4120

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.4)
Y	DE-A-2 943 548 (ALCOR DEUTSCHLAND GmbH) * Page 8, line 1 - page 9, line 12; figure 1 *	1,2	B 65 D 55/02 B 65 D 41/34
Y	FR-A-2 176 620 (CHANDRAKANT SOMABHAL PATEL) * Page 4, line 2 - page 6, line 10; figures 1,2,5-10 *	1,2	
Y,D	FR-A-1 352 712 (ALFRED FISCHBACH KUNSTSTOFF-STRITZGUSSWERK) * Page 1, left-hand column, lines 11-33; page 2, left-hand column, lines 3-26; figures 1,2 * & GB - A - 1 035 476	1,2	
A,D	US-A-4 410 098 (DUBS) * Figures 1,2 *	1	TECHNICAL FIELDS SEARCHED (Int. Cl.4) 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 02-12-1985	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	