



(19)

Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

**EP 0 794 128 A1**

(12)

## EUROPEAN PATENT APPLICATION

(43) Date of publication:  
**10.09.1997 Bulletin 1997/37**

(51) Int. Cl.<sup>6</sup>: **B65D 50/04**

(21) Application number: **97201330.4**

(22) Date of filing: **10.07.1992**

(84) Designated Contracting States:  
**AT BE CH DE DK ES FR GB GR IT LI LU MC NL SE**

(30) Priority: **10.07.1991 GB 9114871**  
**23.09.1991 GB 9120264**  
**17.10.1991 GB 9122097**  
**22.11.1991 GB 9124872**  
**22.11.1991 US 796946**  
**29.11.1991 GB 9125397**  
**11.12.1991 GB 9126242**  
**24.01.1992 GB 9201494**  
**30.04.1992 GB 9209299**  
**30.04.1992 GB 9209374**  
**30.04.1992 GB 9209420**  
**12.05.1992 GB 9210194**

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:  
**92915179.3 / 0 592 580**

(71) Applicant: **BEESON AND SONS LIMITED**  
**Rickmansworth, Herts WD3 2XB (GB)**

(72) Inventors:  
• **King, Witney Milner**  
**Latimer, Buckinghamshire HP5 1UL (GB)**  
• **King, Roger Milner**  
**Latimer, Buckinghamshire HP5 1UL (GB)**

(74) Representative: **Howick, Nicholas Keith et al**  
**CARPMAELS & RANSFORD**  
**43 Bloomsbury Square**  
**London WC1A 2RA (GB)**

### Remarks:

This application was filed on 02 - 05 - 1997 as a divisional application to the application mentioned under INID code 62.

### (54) Improvements in child-resistant container closure assemblies

(57) The invention relates to improved child-resistant container closure assemblies comprising a container neck and a closure. The closure comprises an inner part (350) and an outer part (310), whereby the outer part (310) must be axially displaced relative to the inner part (350) by pressing down on the outer part (310) in order to unscrew the closure from its fully secured position on the container neck. The risk of accidental unscrewing of the closure without depression of the outer closure part is reduced by the provision of a first retaining means on the container neck and a second retaining means (358) on the inner closure part (350). The first and second retaining means engage at said fully secured position, and resist loosening of the closure from the fully secured position until a predetermined minimum release torque is applied to the inner closure part (350).

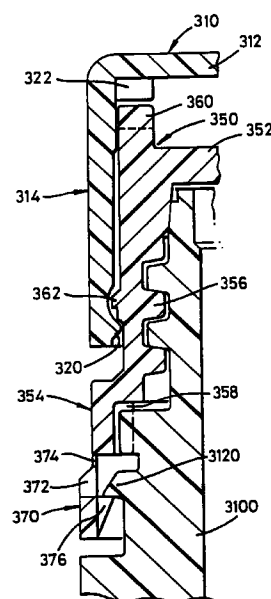


FIG. 7

EP 0 794 128 A1

## Description

The present invention relates to improved child-resistant container closure assemblies.

Prior art relating to child-resistant container closure assemblies is described in US patents nos. 3894647, 4213534, 3770153, 3944101, 3831797, 3944102 and in PCT application no. WO90/04546.

Many known child-resistant closures include a plurality of equidistant ramps on an outer surface of a crown portion of an inner closure part which cooperate with a plurality of equidistant, resilient oblique blades extending inwardly from a crown portion of an outer closure part. When viewed from the centre of the respective closure parts, the ramps have a right triangular section comprising a horizontal base, a vertical left side and a hypotenuse and the blades extend diagonally downward from the left towards a lower right free end.

When the outer closure part is rotated clockwise, i.e. in a right-handed sense, the free ends of the blades abut the vertical faces of the ramps, thereby driving the inner closure part with the outer closure part.

When rotation of the outer closure part is effected in the other, left-handed sense, i.e. anticlockwise, the blades simply trail over the ramps in the manner of a ratchet, the inner closure part being fixed on the container by its closure torque.

Typically, castellations are provided on both inner and outer closure parts which mate when the outer closure part is depressed. The inner closure part is then bound to rotate with the outer closure part. When the outer closure part is released, the blades act as leaf springs to return it to its rest position, in which the castellations are disengaged.

Child-resistant closure systems normally rely on the ability of the closure to spring apart, every time, after pressure has been applied, generally at right angles to the plane of the thread. If, even on rare occasions the two parts of the closure do not spring apart and disengage, the child-resistant feature of the closure no longer functions. It is therefore essential that the blades acting as leaf springs have and continue to retain sufficient resilience to exert sufficient pressure to force the two parts of the closure apart in order that there is disengagement at all times, apart from occasions when direct and sufficient pressure is applied to engage the closure system. The main failure of existing systems to work properly at all times is due to the weakness of the leaf springs which in the past have typically been made of uniform thickness, with a sharp angle on the inside edge where the leaf spring joins the flat face of the underside of the top part of the closure. This design is potentially unsatisfactory as the leaf springs can weaken at the point of joining the flat plane of the underside of the top part of the closure, and the leaves themselves tend to be stiff and as a result do not flex along the length of the spring leaf.

Another problem arises where a closure is primarily intended for use by the elderly, and hence must be easy

to open, but which, for safety, must be child-resistant. The number of castellations provided on known child-resistant closures is normally two, three or four, but this can require the closure to be rotated for up to 180° before engagement of the castellations can take place. Engagement after a much smaller rotation is desirable.

A further drawback of earlier child-resistant closure assemblies has been that the discrete angular ranges of angular displacement of the closure parts at which the castellations may engage one another is one in which the free ends of the blades on the outer closure part lie between ramps on the inner closure part.

A result of this is that it is perfectly possible for a container on which such a closure is installed to be left with the closure parts so oriented that the castellations may be engaged simply by immediate depression of the outer closure part. Such a situation can occur where a closure has been installed with the outer closure part depressed, or where an adult has depressed the outer closure part, but then changed his mind about removing the closure.

Accordingly, it is an object of the present invention to address one or more of the above-identified drawbacks of existing child-resistant closure assemblies of this general type.

The present invention provides a child-resistant container closure assembly as defined in claim 1 of the accompanying claims.

Preferably, the closure is moveable from a fully closed position on the neck to a fully disengaged position by rotation through 360° or less, preferably 180° or less, and more preferably about 90° or less. Preferably, the first and second threads on the container neck and the closure have fully engaging thread profiles to prevent play between the container and the closure and to ensure axial movement of the closure on the container. Preferably, the first and second threads are of square or rectangular section to provide maximum stability when the threads first engage, and increasingly thereafter. This arrangement is preferable to the conventional "V" section threads. The square section thread ensures that the closure is wound down to its closed position on a parallel plane, thereby making it easier for the engagement of the child-resistant closure in one simple turn of the wrist. The same applies when opening. Preferably, one of the first and second threads has four thread starts.

Preferably, one of the closure parts is provided with a tamper-evident ring. For example, the tamper-evident ring may be provided on the inner closure part. A child-resistant closure has not previously been combined readily with a tamper-evident ring, because of the difficulty of opening using conventional child-resistant closure systems.

The first and second retaining means may comprise one or more projections on the container neck for engaging one or more projections on the closure. The projections may "click" past each other when the closure is rotated into, or out of its fully closed position.

Preferably, the first retaining means comprise stop elements on one of the neck and closure, and the second retaining means comprise one or more ribs or projections on the other of the closure and the neck to engage with the stop elements. At least one of the projections may be profiled to have a circumferential ramp surface over which the other projection can ride relatively easily as the closure nears the closing position, and a relatively steep or radial abutment surface against which the other projection bears when the closure is to be unscrewed from the closed position.

Preferably, the child-resistant container closure assembly according to the present invention further comprises an upstanding flange handle on the outer closure part. In an alternative embodiment, side flanges may be provided on the handle to assist in applying torque when opening the closure. Preferably, the closure and container neck are as defined in our International Patent Application W0 91/18799.

Preferably, the angular displacement of the outer closure part relative to the inner closure part between adjacent positions at which the outer closure part can move to its displaced position to engage the first and second sets of castellations is not greater than 45°, and preferably not greater than 25°. A particularly preferred angular displacement is 22.5°, in which case, from a normal rest position, the outer closure would move to a position where it could be moved actually to its displaced position by rotation through 12.25° relative to the inner closure member. This preferred arrangement is provided by the closure having sixteen castellations, in which the maximum turn required for engagement is only 1/16th, i.e 22.5°. This aspect particularly assists and supports ease of opening for the elderly and frail with only a twist of the wrists, without the necessity to let go of the closure or the container, whilst remaining child-resistant.

Preferably, at least one of the first and second sets of castellations has at least 8 equally angularly spaced castellations, and more preferably 16 equally angularly spaced castellations. Preferably, there are 16 of the ratchet ramp projections on the inner or outer closure part. The number of resilient blades (cantilever leaf springs) should be greater than two for stability, and should be a factor of the number of ratchet ramp projections.

Preferably, the child-resistant container closure assembly according to the present invention comprises means for a rotationally biasing (urging) the outer closure part relative to the inner closure part from each angular displacement at which the outer closure part can adopt its axially displaced position at which the castellations engage, to a respective angular displacement at which the outer closure part cannot adopt the axially displaced position.

Preferably, this is achieved by arranging the ratchet ramp projections relative to the resilient blades (cantilever leaf springs) and the first and second sets of castellations such that, when the castellations are aligned

relative to each other so that they can be inter-engaged by axial displacement of the outer closure part, the resilient blades bear resiliently against the ramp surfaces of the ratchet projections to generate a rotational force between the inner and outer parts to urge the outer part away from the aligned orientation and into a misaligned orientation of the castellation.

Preferably, the said rotational force between the inner and outer part is greater in absolute value than any frictional torque resisting relative rotation to the closure parts.

In this preferred case, at no time can the closure of the invention be left in a condition at which immediate movement of the outer closure part from its rest position to its displaced position is possible. The outer closure part must first be rotated against some restoring force before such displacement can be effected.

In the case where the friction between closure parts is sufficient to resist the said rotational force, enabling the closure to be left in a "primed" condition as it were, an advantage is still obtained. Subsequent handling of the closure or the container to which the closure is attached, such as setting the container down, dropping it, picking it up, casting it into a "medicine box", will in most cases be sufficient to cause the outer closure part to move somewhat relative to the inner closure part. The outer closure part will then come to rest near to, if not actually at, an angular displacement at which the castellations are out of alignment.

It is therefore extremely difficult, in normal usage, to leave the closure in a "primed" condition.

Preferably, each resilient blade has a cross-section which tapers towards its free end, and the profile at the acute angle between each resilient blade and the closure part from which the blade extends is radiused. This helps to ensure that the resilient blades retain their resilience and hence the ability to force the two parts of the closure apart, and also to ensure that when being closed the planes of the top and lower part of the closure remain in parallel planes.

A specific embodiment of the present invention will now be described further, by way of example, with reference to the accompanying drawings, in which:-

Figure 1 is a longitudinal sectional view of an outer closure part of a child-resistant closure assembly according to the invention;

Figure 2 is an underneath plan view of the outer closure part of Figure 1;

Figure 3 is a top plan view of the corresponding inner closure part of said child-resistant closure assembly;

Figure 4 is an underneath plan view of the inner closure part of Figure 3;

Figure 5 is a longitudinal sectional view of the inner closure part of Figures 3 and 4 (non-sectioned parts of the ramps 364 have been omitted for clarity);

Figure 6 is a side elevation view of the inner closure

part of Figures 3 to 5;

Figure 7 is a partial longitudinal sectional view of the closure assembly with the closure retained on a container neck; and

Figure 8 is a side view showing the profile of a resilient blade in the form of a leaf spring.

Referring to Figure 1, an outer closure part 310, constructed of moulded plastics (other suitable materials may be used), consists of a crown portion 312 and a skirt portion 314. The crown portion is provided on its outer surface with a diametric handle 316. The particular form of handle shown includes a central opening 318. Towards the lower, free end of the skirt portion 314, there is provided an inwardly extending bead 320, whose purpose is to retain the outer closure part on the inner closure part as will be described below

Both Figures 1 and 2 illustrate that the inner surface of the crown portion 312 is provided with sixteen equidistant castellations 322 of substantially rectangular form and four equidistant oblique resilient blades 324. The resilient blades 324 extend circumferentially from an upper, left-hand end 326, when viewed from the centre of the closure part, to a lower, right-hand free end 328.

As can be seen from Figures 3 to 6, an inner closure part 350, constructed of moulded plastics (other suitable materials may be used), which includes a crown portion 352 and a skirt portion 354. The inner surface of the skirt portion 354 is provided with coarsely pitched threads 356 of square section 356 with vertical tabs 358, the function and purpose of which are described in detail in our International patent application WO91/18799. The top of the skirt portion 354 is provided with a tapered sealing surface.

Depending from the lower end of the inner closure part skirt portion 354 is a tamper-evident ring 370 which will be described below.

The crown portion 352 is provided around its periphery with sixteen upstanding, substantially rectangular castellations 360. These castellations 360 are adapted to engage the complementary castellations 322 on the outer closure part (see Figure 2) 310. The outer periphery of the skirt portion 354 includes an out-standing ridge 362 below which, when the inner 350 and outer 310 closure parts are assembled, the bead 320 on the outer closure part 310 is retained. A degree of axial movement of the outer closure part 310 with respect to the inner closure part is permitted to engage and disengage the two sets of castellations 360, 322.

Partly shown in Figure 5, but fully in Figure 3, are sixteen equidistant ramps 364, provided on the upper surface of the inner closure part crown portion 352. When viewed from the centre of the closure part, each ramp 364 is of substantially right triangular section having a horizontal base, a vertical left-hand side 366 and a hypotenuse, terminating in a right-hand side 368.

When the outer closure part 310 is installed on the inner closure part 350, and the outer closure part 310

rotated clockwise, the free ends 328 of their respective ramps, thus rotating the inner closure part 350 with the outer closure part 310. However, assuming that the inner closure part 350 is reasonably tightly held in place, e.g. by a closure torque, then rotation of the outer closure part 310 anticlockwise will merely result in the resilient blades 324 trailing over the ramps 364 in the manner of a ratchet mechanism.

In order for the inner closure part 350 to be rotated anticlockwise, it is necessary for the outer closure part 310 to be depressed against the action of the resilient blades 324 to allow the complementary castellations 322,360 to engage.

The handle 316 enables the elderly and frail more easily to apply the force required to push down and engage the two parts of the closure, whilst at the same time the handle 316 makes it easy to turn the closure to open it. When closing the same principles and advantages apply. The handle 316 therefore makes the closure much easier to operate, in spite of the child-resistant feature, compared with standard child-resistant closures which many people, not just children find difficult to open.

Alternatively, the handle 316 may be substituted by four side flanges to the outer closure part 310 which again enables easier opening and closing, or a standard cap with ribbed outer edges.

The relative angular displacements at which the complementary castellations 322,360 may be engaged correspond to positions in which the free ends 328 of the resilient blades 324 have already travelled some distances along and up their respective ramps 364. They therefore correspond to positions of increased potential energy. The resilience of the blades 324 is such that, when the outer closure part 310 is released in such a displacement, the free ends 328 of the blades tend to move back down the sloping surfaces of the ramps 364 to their right hand sides 368. Once this has occurred, the complementary castellations 360,322 are no longer so oriented as to be immediately engageable with one another.

Thus, all the rotationally stable positions of the outer closure part 310 with respect to the inner closure part 350 correspond to orientations of the castellations 322,360 in which they cannot immediately be engaged by depression of the outer closure part 310.

The tamper-evident ring 370 carried by the inner closure part 350 is shown in detail in Figures 4 to 6. Attached to the top of the ring and integral therewith are eight connecting members 372 which taper upwards from a relatively thick lower region into a relatively thin frangible bridge 374 attached to the inner closure part skirt portion 354. On the inside of the tamper-evident ring 370, extending between the connecting member are eight triangular section ring retaining clips 376 which are adapted to engage a circumferential projection on the outer surface of a container neck.

The assembled closure is shown in Figure 7, and specific details of the thread 356 and vertical rib 358

and the seal between closure and container 390 may be found in WO91/18799. As can be seen in Figure 7, the thread is essentially square in section, providing positive and axial alignment of the two closure parts. The container 390 includes an outstanding circumferential projection 392 which is engaged by the ring retaining clips 376. Unscrewing the closure will result in the frangible bridges 374 being stretched and broken.

Figure 8 shows a preferred profile of a blade in the form of a leaf spring 324'.

As can be seen, the leaf spring 324' is thicker at its base, becoming progressively thinner towards its free edge 394. The joint of the leaf spring 324' with the remainder of the outer closure part 310 is radiused to provide extra strength. This profile gives sufficient resilience and strength to the leaf spring 324' to ensure that the outer closure part 310 and inner closure part 350 are always separated until axial pressure is applied to counteract the bias of the springs 324'.

An important advantage of this embodiment of the invention is that, in conjunction with features of the container and closure described in WO91/18799, this is the only child-resistant closure which opens in under half a turn, i.e. 180°, and more generally in approximately a quarter turn i.e. 90° or less, also it is the only child-resistant closure system which can be used in conjunction with either or both of a tamper-evident ring and a foil seal whereby the seal of the closure is air and liquid proof after the foil has been removed or broken.

This closure system ensures the functioning of the child-resistant closure, whereby when closed, the resistance to opening is sufficiently strong for the child-resistant feature to operate, but is sufficiently weak as to be overcome by the child-resistant system when properly engaged by an adult. The relevant child-resistant closure is preferably as claimed in WO91/18799. This feature provides the advantage that, upon engagement of the closure system, the closure is held on the container such that the child-resistant closure mechanism operates effectively but that the closure can be released, once the closure outer part is moved to the displaced position, by application of a predictable torque. Conventional spring blades type child-resistant closures are screwed onto a neck thread with more than a 360° turn for closure. In order for all conventional spring blades type child-resistant systems it is essential that they are screwed up very tightly, when being closed, otherwise the child-resistant systems does not become operable at all, thus obviating the purpose of the child-resistant system. The weakness of conventional child-resistant systems is therefore obvious, as arthritic, weak and elderly users are unable to close such containers sufficiently tightly, either to close them properly, or, even if they were closed tightly, perhaps by somebody else, then to open them. This invention overcomes the problem of conventional child-resistant closures of tightening the closure sufficiently, in that the closure does not have to be closed tightly in order for the child-resistant system to become operable, and

therefore is particularly effective for the arthritic, weak and elderly, as this combination of new closure systems enables the containers, bottles and closure to be opened and closed easily, in approximately a quarter of a turn, with an effective child-resistant system.

## Claims

1. A child-resistant container closure assembly comprising a container neck and a closure, said container neck carrying a first screw thread, and said container closure comprising:

an inner part (350) and an outer part (310), said outer part (310) being retained on the inner part (350) and being capable of limited axial movement on said inner part (350) between a rest position and a displaced position;  
 said inner part (350) carrying a second screw thread (356) for screw threaded engagement with said first screw thread of said container neck;  
 a first set of castellations (360) on the inner part (350);  
 a second set of castellations (322) on the outer part (310) arranged to inter-engage the first set of castellations (360) on the inner part (350) when the outer part (310) is in said displaced position to permit full torque to be applied to the inner part (350);  
 a set of resilient blades (324) extending from a first of the inner and outer parts (350,310) towards a second of the inner and outer parts (310,350), said resilient blades (324) bearing against said second of said inner and outer parts (310,350) to urge said outer part (310) axially in a direction away from said inner part (350) such that said outer part is normally held in said rest position with said first and second sets of castellations (322,360) out of inter-engagement;  
 said second of said inner and outer parts (310,350) comprising a set of ratchet ramp projections (364), each of said ratchet ramp projections (364) being constructed and arranged to engage one of said resilient blades (324) when the outer part (310) is rotated in a closing direction to apply the closure to the neck, thereby to permit full torque to be applied to the inner part (350) in said closing direction of rotation;  
 each said ratchet ramp projection (364) being constructed and arranged to enable the resilient blades (324) to slip over said ratchet ramp projections (324) when the outer closure part (310) is rotated in an opening direction opposite to said closing direction without the first and second sets of castellations (322,360)

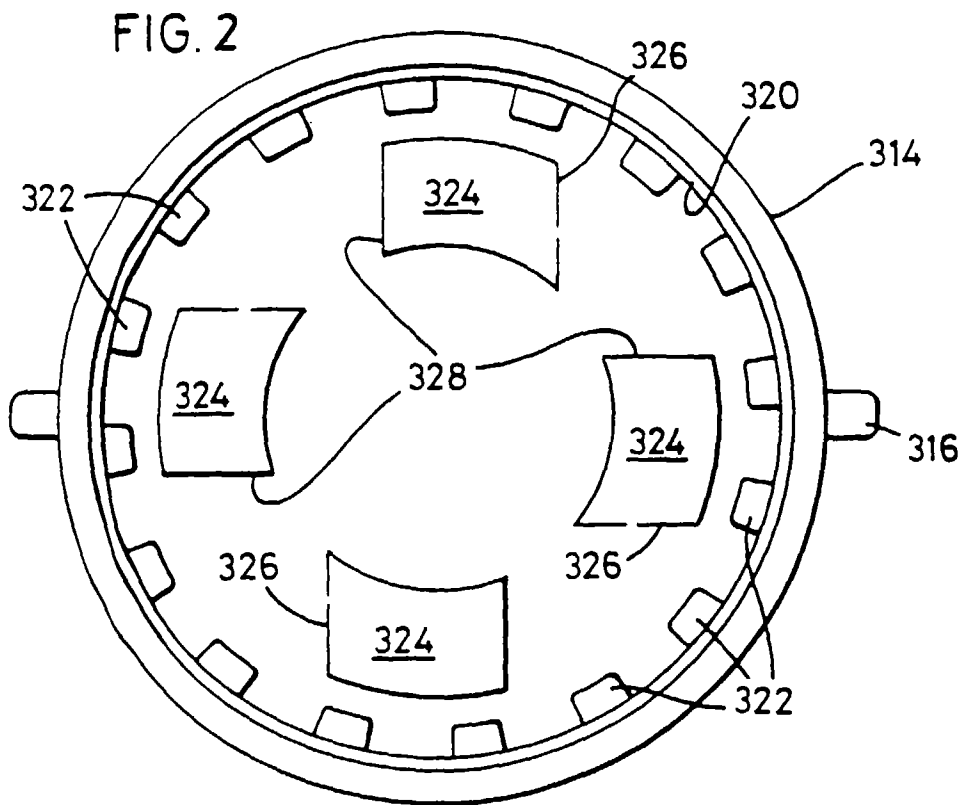
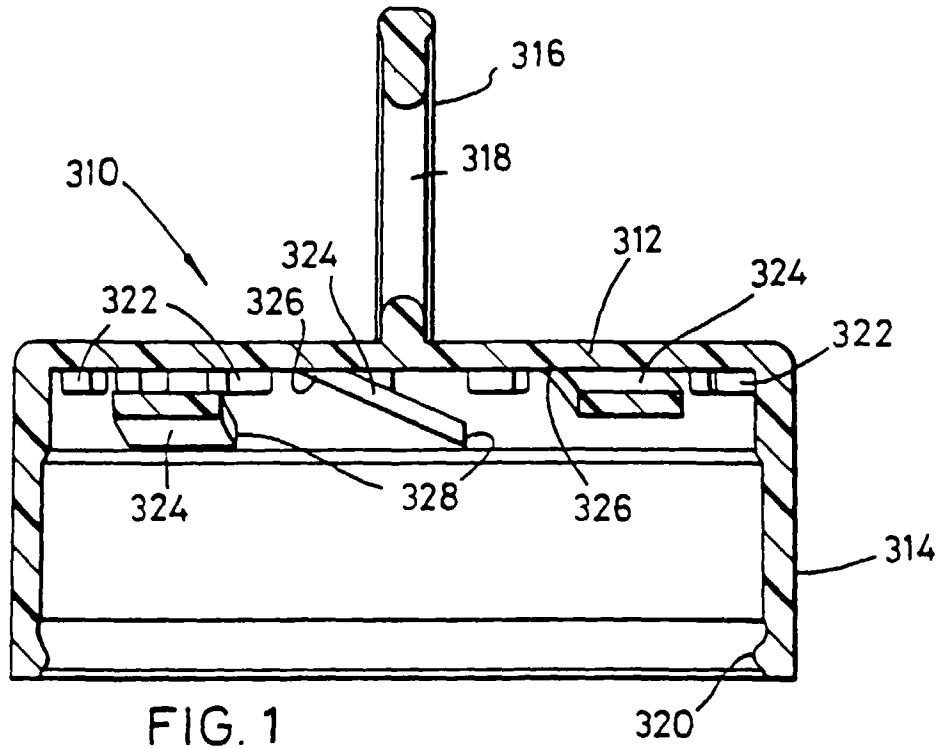
being in inter-engagement, whereby only a limited opening torque is transmitted from said outer closure part to said inner closure part by said resilient blades (324) slipping over said ratchet ramp projections (364),

characterised in that said container neck further carries a first retaining means, and said inner part (350) of said closure further comprises a second retaining means (358) for engaging said first retaining means when said closure is screwed into a closed position on said container neck, said first and second (358) retaining means being constructed and arranged to resist loosening of the closure from said closed position until a predetermined release torque is applied to said inner part (350) in said second direction, which predetermined release torque is greater than said limited opening torque transmitted from said outer closure part (310) to said inner closure part (350) by said resilient blades (324) slipping over said ratchet ramp projections (364), whereby the risk of accidental opening of said assembly when the first and second sets of castellations (322,360) are out of engagement is reduced.

2. A child-resistant container closure assembly according to claim 1, wherein said closure is moveable between said fully closed position and a position at which said closure is fully disengaged from said neck by rotation through approximately 90° or less.
3. A child-resistant container closure assembly according to claim 1 or 2, further comprising a tamper-evident ring (370) fitted to said closure.
4. A child-resistant container closure assembly according to claim 1, 2 or 3, wherein said first and second (356) threads comprise fully engaging thread profiles to prevent play between the container and the closure and to ensure axial movement of the closure on the container.
5. A child-resistant container closure assembly according to claim 4, wherein said first and second (356) threads are of square or rectangular section.
6. A child-resistant container closure assembly according to any preceding claim, wherein said first retaining means comprise stop elements on one of said neck and closure, and said second retaining means comprise one or more ribs or projections on the other of said closure and said neck to engage with said stop elements.
7. A child-resistant container closure assembly according to any preceding claim, further compris-

ing an upstanding flange handle (316) extending from said outer closure part (310).

8. A child-resistant container closure assembly according to any preceding claim, wherein said ratchet ramp surfaces and said resilient blades are arranged relative to said first and second sets of castellations such that when said castellations are aligned relative to each other so that they can be inter-engaged, said resilient blades bear resiliently against said ramp surfaces of said ratchet projections to generate a rotational force between the inner and outer parts to urge said outer part away from said aligned orientation, whereby said outer part is urged away from said aligned orientation in which said castellations can be inter-engaged.
9. A child-resistant container closure assembly according to any preceding claim, wherein said first and second threads have four thread starts.
10. A child-resistant container closure assembly according to any preceding claim, wherein each resilient blade has a cross-section which tapers towards its free end, and the profile at the acute angle between each resilient blade and the closure part from which said blade extends is radiused.
11. A child-resistant container closure assembly according to any preceding claim, wherein at least one of said first and second sets of castellations (322,360) comprise at least eight equally angularly spaced castellations.
12. A child-resistant container closure assembly according to any preceding claim, wherein the angular displacement of the outer closure part (310) relative to the inner part (350) between adjacent angular positions at which the outer closure part (310) can move to said displaced position is not greater than 45°.
13. A child-resistant container closure assembly according to any preceding claim, wherein there are sixteen of said ratchet ramp projections (364).



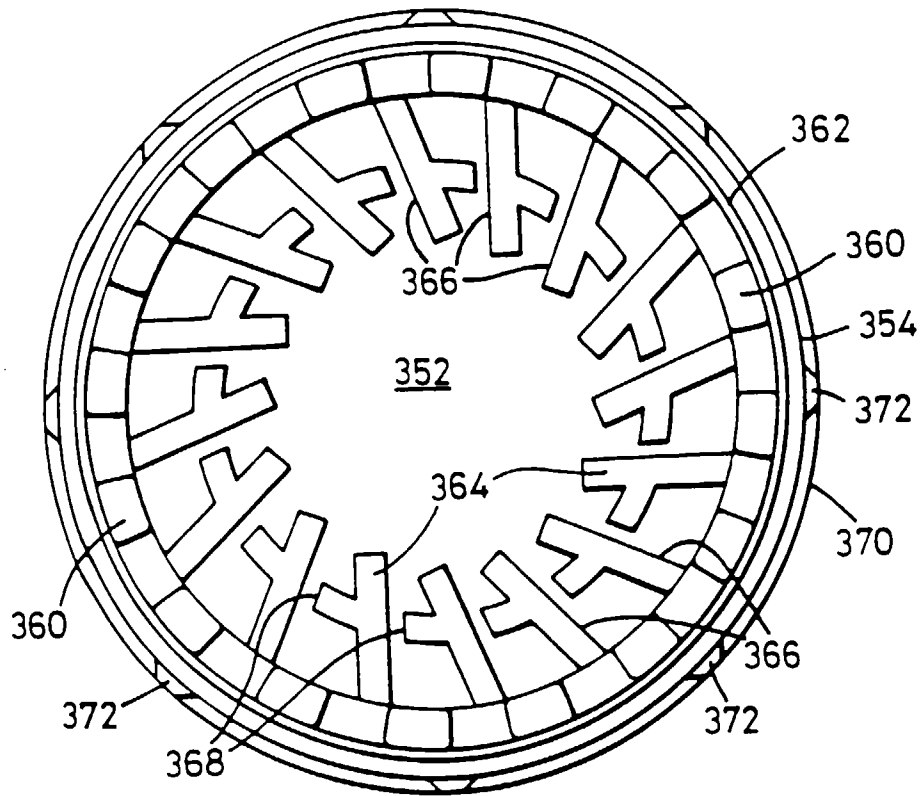


FIG. 3

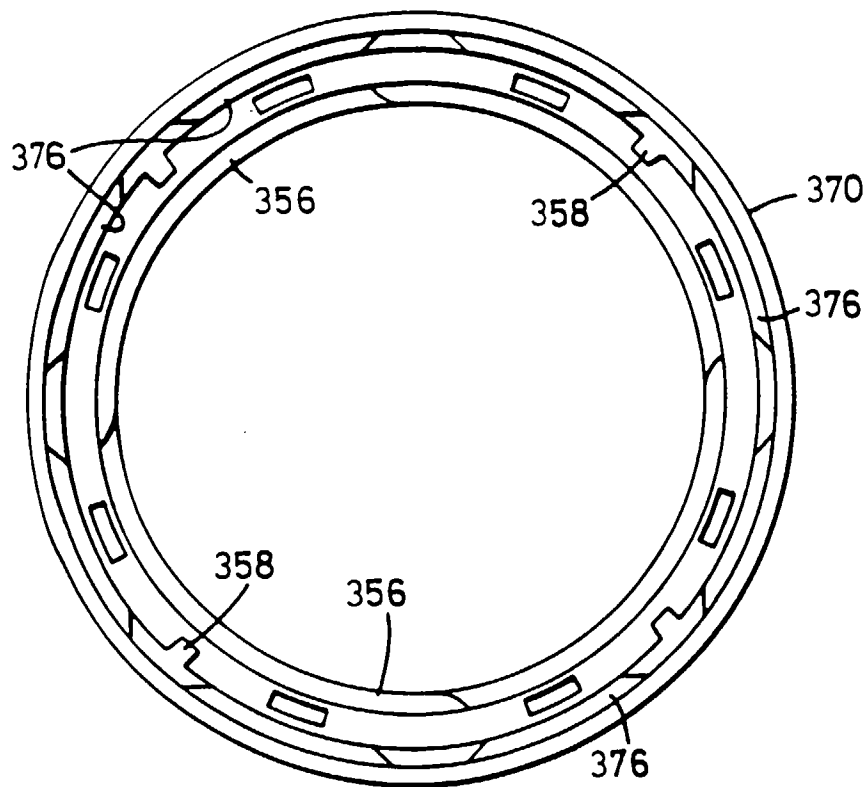
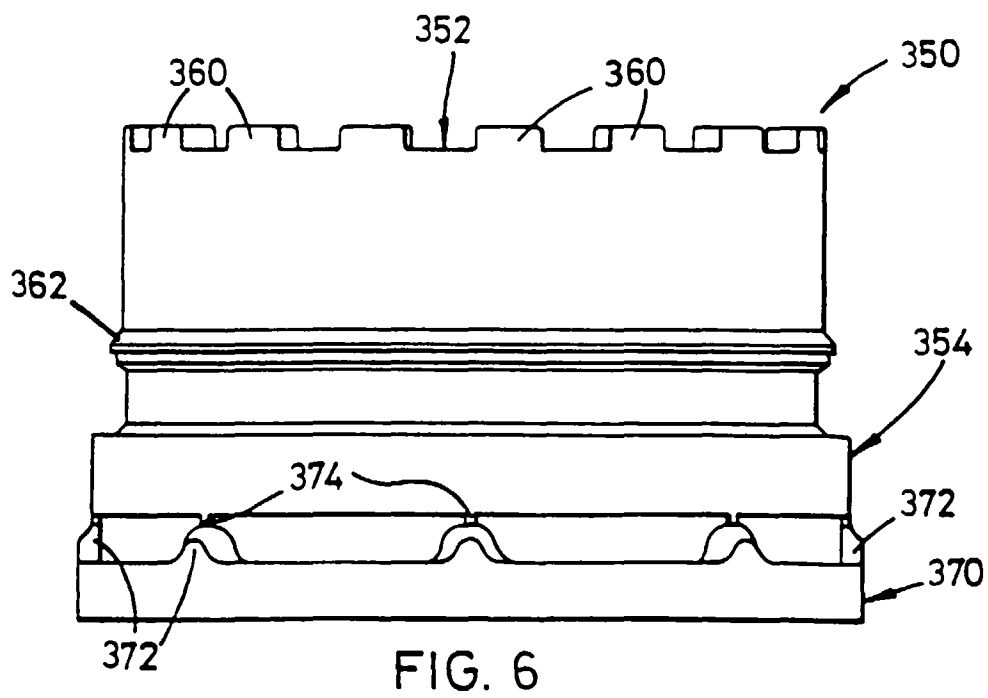
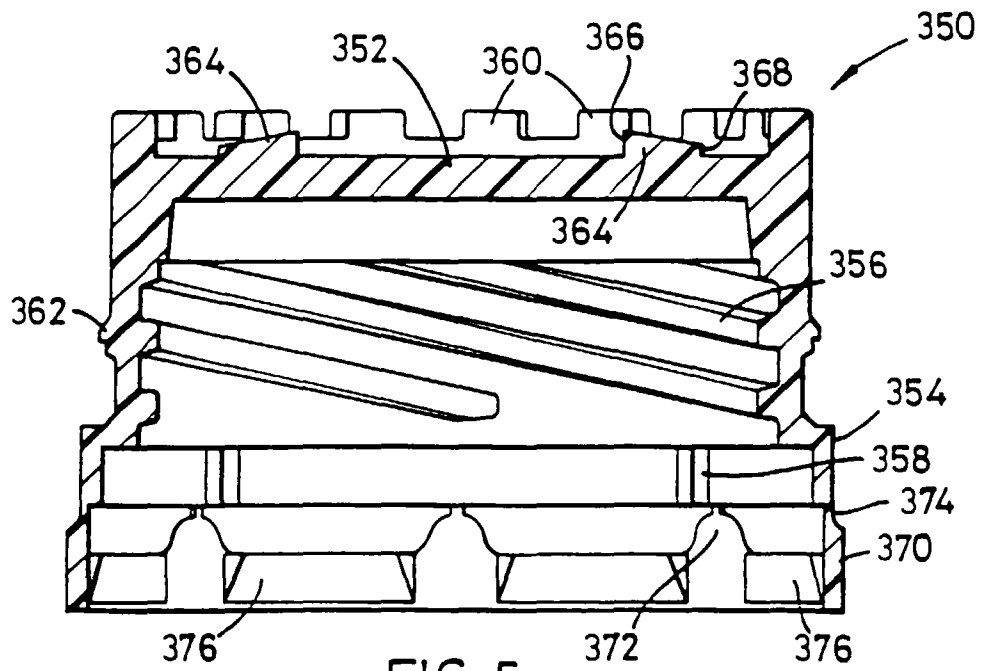


FIG. 4



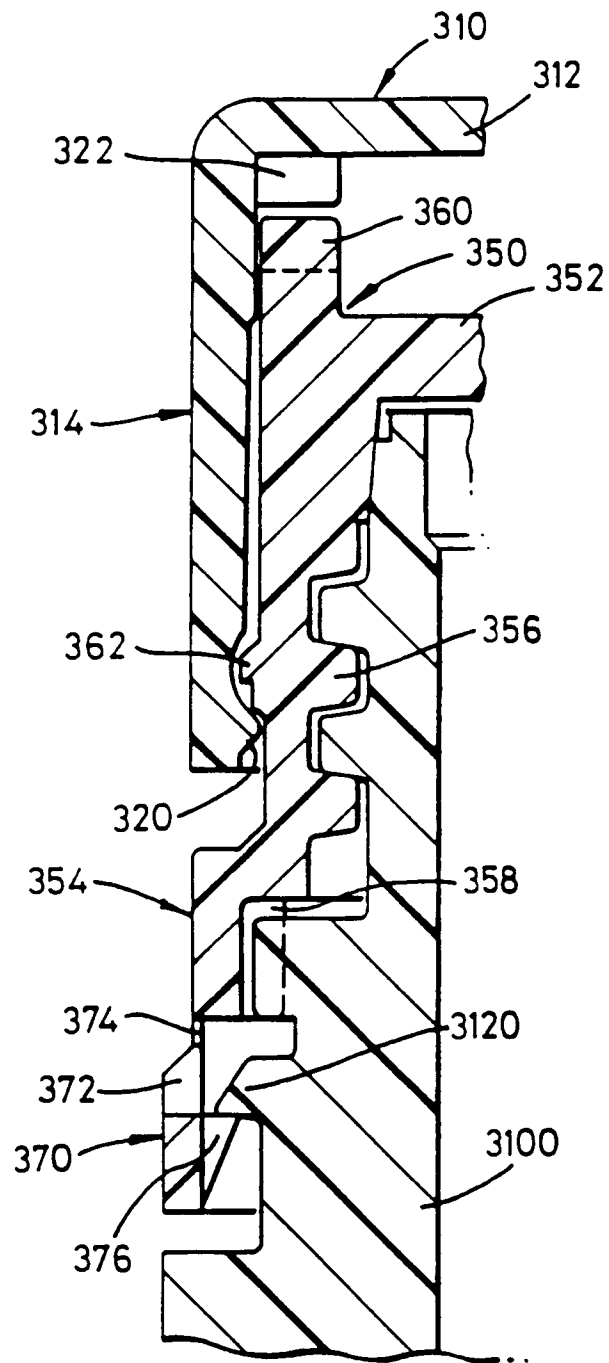
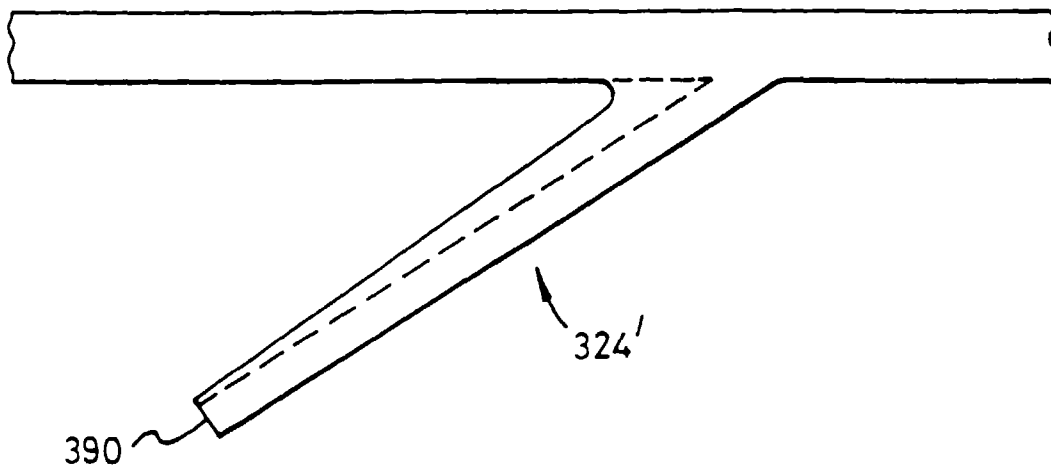


FIG. 7

FIG. 8





European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 97 20 1330

| 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.6) |
| P,D,<br>Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | WO 91 18799 A (BEESON)<br>* the whole document *                              | 1,2,4-10                                         | B65D50/04                                    |
| Y<br>A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | US 5 020 681 A (KUSZ)<br>* the whole document *                               | 1,2,4-10<br>13                                   |                                              |
| D,A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | US 3 944 102 A (GRAU)<br>* figure 1 *                                         | 3                                                |                                              |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | US 4 957 210 A (KUSZ)<br>* figure 7 *                                         | 12                                               |                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                               |                                                  | TECHNICAL FIELDS<br>SEARCHED (Int.Cl.6)      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                               |                                                  | B65D                                         |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                               |                                                  |                                              |
| Place of search<br>THE HAGUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                               | Date of completion of the search<br>10 July 1997 | Examiner<br>Newell, P                        |
| <p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone<br/> Y : particularly relevant if combined with another document of the same category<br/> A : technological background<br/> O : non-written disclosure<br/> P : intermediate document</p> <p>T : theory or principle underlying the invention<br/> E : earlier patent document, but published on, or after the filing date<br/> D : document cited in the application<br/> L : document cited for other reasons<br/> .....<br/> &amp; : member of the same patent family, corresponding document</p> |                                                                               |                                                  |                                              |

EPO FORM 1503 03.82 (P04C01)