



(11) **EP 2 451 718 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention  
of the grant of the patent:  
**13.03.2013 Bulletin 2013/11**

(51) Int Cl.:  
**B65D 41/48** *(2006.01)* **B65D 55/02** *(2006.01)*  
**A47K 5/12** *(2006.01)*

(21) Application number: **10734549.8**

(86) International application number:  
**PCT/GB2010/051137**

(22) Date of filing: **12.07.2010**

(87) International publication number:  
**WO 2011/004202 (13.01.2011 Gazette 2011/02)**

(54) **A BOTTLE WITH A SECURE CAP**

FLASCHE MIT SICHERER VERSCHLUSSKAPPE

BOUTEILLE DOTÉE D UN BOUCHON DE SÉCURITÉ

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB  
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO  
PL PT RO SE SI SK SM TR**

(30) Priority: **10.07.2009 GB 0912064**

(43) Date of publication of application:  
**16.05.2012 Bulletin 2012/20**

(73) Proprietor: **Reckitt & Colman (Overseas) Limited  
Slough  
Berkshire SL1 3UH (GB)**

(72) Inventors:  
• **ZHOU, Xianzhi  
Guangdong (CN)**

• **PADAIN, Christopher Leonard  
Henley on Thames, RG9 3HW (GB)**

(74) Representative: **Bowers, Craig Malcolm et al  
Reckitt Benckiser Corporate Services Limited  
Legal Department - Patents Group  
Dansom Lane  
Hull Humberside HU8 7DS (GB)**

(56) References cited:  
**EP-A2- 2 005 871 GB-A- 947 126  
GB-A- 2 306 454 US-B1- 6 371 316  
US-B1- 6 609 637**

**EP 2 451 718 B1**

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

## Description

**[0001]** The present invention relates to a bottle with a secure cap.

**[0002]** Caps are known in the art which are designed so that, once they have been attached to a bottle, they are difficult, in practice, to remove. Such caps are designed so that they cannot be removed by an average person using just their hands. It may, however, be possible for the cap to be removed by the use of tools or in some other way applying an unusually high force, but any such removal will often result in destruction of the bottle.

**[0003]** Screw-on caps are known which have ratchet teeth which bias the lid in such a way as to prevent engagement of the complimentary screw threads as the lid is rotated in a direction opposite to the direction in which it was screwed onto the lid. Whilst such mechanisms are effective, the requirement for a screw thread and the ratchet teeth results in a lid which is reasonably thick to accommodate the mechanism. Also, the shape of a cap does not always lend itself to a screw thread engagement, for example if the lower edge or outer skirt of the cap has a non-planer profile.

**[0004]** A number of documents are known in the art (for example, US 4,022,464, US 3,237,819, EP 1 847 472, GB 1 107 605 and US 3,295,730) which disclosed snap-on lids, in which a limited amount of rotation of the cap is specifically provided for in order to open up dispensing orifices. Such containers are generally used for fine powdery material, such as talcum powder and the like. These closures have nothing to do with the secure closure contemplated by the present invention.

**[0005]** The present invention is specifically designed for a bottle which provides a refill for soap and the like which is then dispensed by an automatic dispenser. Once the refill is empty, if the user could remove the cap and refill the bottle, there is a danger that they would fill the bottle with a product which was incompatible with the dispensing device, or would fail to replace the cap properly resulting in leakage into a dispenser which would at best be messy and at worst would damage the device.

**[0006]** One way of addressing this problem is disclosed in our earlier application GB 0820984.3, WO 2 010 055 313 A1. In this, we disclose a bottle with a tamper-proof cap. This is designed with a retaining member for the lid which is held in place by a frangible member. The frangible member is broken when the cap is removed so that the cap cannot subsequently be retained on the bottle.

**[0007]** While this is effective in achieving the purpose of preventing re-use of the bottle, because it allows the lid to be readily removed, if a consumer inadvertently removes the lid, for example, if they wish to smell the contents of the bottle, they will render the bottle unusable.

**[0008]** A bottle with a secure cap disclosing all the technical features of the preamble of appended claim 1 is known from document GB947126.

**[0009]** According to a first aspect of the present inven-

tion, there is provided a bottle with a secure cap, comprising:

a bottle having an open neck and a first retaining flange around at least a portion of the neck; and a push-on cap fitted over the neck, the cap having an outlet with a valve for controlling flow through the outlet and a second retaining flange positioned so that, upon placement of the cap on the bottle, the first and second retaining flanges deflect relatively to one another as they pass and snap back into place once they have passed with a shoulder of the first retaining flange engaging a shoulder on the second retaining flange to hold the cap securely on the bottle; one of the bottle neck and cap having a protrusion which fits into a complimentary recess on the other of the bottle neck and cap to substantially prevent relative rotation of the cap and bottle.

**[0010]** The present invention therefore takes a fundamentally different approach from that of GB 0820984-3 (WO2010055313A1) in that, rather than preventing re-attachment of the cap, it aims to prevent the cap from being removed at all.

**[0011]** The combination of the engaging shoulders of the first and second retaining flanges, together with the means to prevent relative rotation of the cap and lid makes it very difficult for an average person to gain sufficient purchase on the cap to remove it readily. The mechanism could, of course, be defeated by a determined effort, for example a person inserting a knife or some other implement between the cap and bottle. However, the mechanism can be made robust enough to resist all but the most determined efforts to remove it.

**[0012]** The first and second retaining flanges may be configured so that one or both of them is arranged to be damaged if the cap is removed from the bottle thereby compromising the functionality of the cap.

**[0013]** Preferably, the cap is provided with an auxiliary flange which is positioned so that, with the cap on the bottle, the first retaining flange is retained between the second retaining flange and the auxiliary flange. The auxiliary flange acts to prevent inward deflection of the first retaining flange, thereby making it more difficult for the user to disengage the two shoulders.

**[0014]** Preferably, there is more than one protrusion and corresponding complimentary recess. The protrusion is preferably provided on the bottle while the recess is preferably provided on the lid. The recess is preferably defined by a pair of ribs which extend between an outer skirt of the cap and an inner circumferential element which defines the second retaining flange. This provides structural rigidity for the ribs.

**[0015]** Preferably, at least one of the protrusions, recesses first and second shoulders are provided with bevelled edges to provide guide surfaces as the cap is placed onto the bottle.

**[0016]** According to a second aspect of the invention,

there is provided a bottle with a secure cap, comprising a bottle having an open neck and a first retaining flange around at least a portion of the neck; and a push-on cap fitted over the neck, the cap having an outlet which is closed by a closure which is openable by a non-rotational movement and a second retaining flange positioned so that, upon placement of the cap on the bottle, the first and second retaining flanges deflect relatively to one another as they pass and snap back into place once they have passed with a shoulder of the first retaining flange engaging a shoulder on the second retaining flange to hold the cap securely on the bottle; one of the bottle neck and cap having a protrusion which fits into a complementary recess on the other of the bottle neck and cap to limit or prevent rotation of the cap and bottle.

**[0017]** The closure may be any element which does not rely on rotational movement of the cap in order to open. It could, for example, be a piercable foil but is preferably a resiliently deformable member such as a zel/slit valve or a valve member biased onto its seat by resiliently deformable members.

**[0018]** An example of a secure cap will now be described with reference to the accompanying drawings, in which:

- Fig. 1 is a plan view of the bottle;
- Fig. 2 is a side view of the bottle;
- Fig. 3 is a perspective view of the bottle;
- Fig. 4 is an underneath plan of the cap;
- Fig. 5 is an underneath perspective of the cap;
- Fig. 6 is a cross-section showing the cap on the bottle;
- Fig. 7A is the partial cross-section of the cap and bottle just prior to insertion of the bottle into the cap;
- Fig. 7B is a similar view with the bottle fully inserted;
- Fig. 7C is a similar view showing a slight rotation of the bottle with respect to the cap;
- Fig. 8 is an underneath perspective of a second example of the cap;
- Fig. 9 is an underneath plan of a second example of the cap; and
- Fig. 10 is a cross-section through the cap of Figs 8 and 9 and the lower end of the second bottle.

**[0019]** The bottle 1 is a generally rigid plastics container containing liquid soap and the like. It is generally elliptical in cross-section as shown in Fig. 2. It may also be used to dispense other liquid or semi-liquid products (ideally with a viscosity greater than water), such as hand cream, body lotion, moisturiser, face cream, shampoo, shower gel, foaming hand wash, shaving cream, washing-up liquid, toothpaste, or a sanitising agent such as alcohol gel. The bottle is specifically designed to be used in an inverted configuration on an automatic dispenser. However, this does not form part of the present invention and will not be described here.

**[0020]** The bottle has a neck 2 which is surrounded by a first retaining flange 3. This may either be continuous

around the circumference of the neck, or may be intermittent. As shown in Fig. 6, the retaining flange 3 is provided with a projection having a tapered surface 4 on one side and a shoulder 4' on the other for the reasons described below.

**[0021]** At diametrically opposed locations on the upper portion of the neck, there are a pair of protrusions 5 which have a tapered upper surface 6 as shown in Fig. 3. There could equally be only one or more than two of these protrusions.

**[0022]** The cap 7 is best shown in Figs. 4 and 5. The cap has a generally elliptical shape corresponding to that of the bottle and is provided, from the inside out, with a circular auxiliary flange 8 which may or not be continuous, a second retaining flange 9 described in more detail below and an outer skirt 10 having the elliptical shape of the lid and being provided with a pair of lugs 11 to locate on the dispenser (not shown). The auxiliary flange 8 also serves to seal against the inner wall of the neck 2.

**[0023]** The second retaining flange 9 is best shown in Fig. 6. This may be intermittent or circumferentially continuous and projects upwardly from the lower surface of the cap. The free end of the flange 9 is an enlarged portion 12 defining an upper tapered surface 13 and a downwardly facing shoulder 13'.

**[0024]** At diametrically opposed locations which correspond to the locations of the protrusion 5, the second retaining flange 9 is provided with a number of notches 15 which allow the second retaining flange 9 to deflect as the bottle is inserted into the cap. Between each pair of notches 15 are a pair of radial ribs 16 which extend outwardly to the outer skirt 10. Between the ribs 16, the second retaining flange is interrupted and this defines recesses 17 which accommodate the protrusions 5. Circumferentially outwardly of the ribs 16 is a tapered surface 18.

**[0025]** The manner in which the bottle 1 is inserted into the cap will now be described with reference to Fig. 7A. This shows the bottle partially inserted into the cap. In this case, the bottle is slightly out of alignment with the cap and the tapered surfaces 6 on the protrusions co-operates with the surfaces 18 in the cap to guide the bottle to the correct alignment. As the bottle is inserted, the tapered surface 4 on the first retaining flange 3, co-operates with the tapered surface 13 on the second retaining flange 9 to deflect it outwardly aided by the notches 15 until the shoulders 4', 13' pass one another at which point the second flange 9 snaps back into place thereby securely locating the shoulders as shown in Fig. 6 retain the first flange 3 between the second flange 9 and auxiliary flange 8.

**[0026]** As shown in Fig. 7B, the protrusions 5 are within recesses 17. The cap can rotate to a small degree (less than 25°, more preferably less than 20° and most preferably less than 15°) until the protrusions 5 abut one of the ribs 16 (as shown in Fig. 7C) to prevent further rotation.

**[0027]** In this position, the cap is securely retained on

the neck of the bottle and it is very difficult for a user to gain any purchase on the cap, particularly as they are unable to rotate it to any significant extent. In practice, the cap and neck are designed so that the cap cannot be removed by force of less than 15kg, preferably less than 20kg, and more preferably 30kg. When such a force is applied, one of the first three and second flanges is designed to be broken or plastically deformed to such an extent that the cap can no longer be retained on the bottle.

[0028] It will also be noted from Figs. 7A to 7C that, as well as having a generally elliptical configuration, the upper edge 21 of the skirt 10 and the facing surface 22 of the bottle 1 have a curved profile. Under these circumstances, any significant relative rotation of the cap and bottle 1 would re-generate a significant force tending to separate the cap from the bottle. By preventing or significantly limiting relative rotation of the two components, this force cannot be applied. Also, if the cap could be rotated relatively to the bottle, because of the substantially elliptical shape, there would be a large overhang between the bottle and cap which would allow the user to gain significant purchase on the lid. Again, this is prevented by preventing or significantly limiting the relative rotation of the lid on the bottle.

[0029] Also shown in Fig. 6 is the valve mechanism. The lower surface of the cap has an outlet orifice 30 surrounded by an annular wall 31. The valve element 32 sits on top of the wall 31 and is biased in place by the plurality of resilient members 33. An air inlet opening 34 shown schematically and is closed by a valve member 35. In use, the bottle is placed into a base in the orientation shown in Fig. 6. The base is provided with a spigot (not shown) the top of which is provided with castellations. The spigot opens the valve element 32 against the action of the resilient members 33 thereby creating a flow path beneath the valve element 32 and through the castellations in the spigot. As liquid leaves the bottle 1, pressure drops and the lowering in pressure causes the air inlet valve element 35 to open to allow air into the bottle.

[0030] The second example of a cap end bottle is shown in Figs. 8 to 10. This is similar in most respect in the first example. The same reference numerals have been used as appropriate. The same valve 32 and outlet 30 shown in Fig. 6 will also be present although this is not shown in Fig. 10.

[0031] The only difference relates to the configuration of the second retaining flange 9'. In this case, the continuous flange of the first example has been replaced by a component with supported on a plurality of support members 36 separated by gaps 37. Above each gap is a tapered surface 13' with a similar cross-section to the surface 13 on the first example. As shown in Fig 10, the engagement is similar to that of Fig. 6, although the intermittent nature of the second retaining flange 9' enables greater overlap between the two parts in the assembled state. Also, the provision of a number of discrete sections engaging with the first flange 3 increases the likelihood that one or more of these will be broken as the cap is

removed.

## Claims

1. A bottle with a secure cap, comprising:

a bottle (1) having an open neck (2) and a first retaining flange (3) around at least a portion of the neck; and

a push-on cap (7) fitted over the neck, the cap having an outlet (30) and a second retaining flange (9) positioned so that, upon placement of the cap on the bottle, the first and second retaining flanges (3, 9) deflect relatively to one another as they pass and snap back into place once they have passed with a shoulder (4') of the first retaining flange (3) engaging a shoulder (13') on the second retaining flange (9) to hold the cap securely on the bottle; **characterized in that** one of the bottle neck and cap has a protrusion (5) which fits into a complimentary recess (17) on the other of the bottle neck and cap to substantially prevent rotation of the cap and bottle.

2. A bottle according to claim 1, wherein the first and second flanges (3, 9) are configured so that one or both of them is arranged to be damaged if the cap is removed from the bottle thereby compromising the functionality of the cap.

3. A bottle according to claim 1 or claim 2, wherein the cap (7) is provided with an auxiliary flange (8) which is positioned so that, with the cap on the bottle, the first retaining flange (3) is retained between the second retaining flange (9) and the auxiliary flange (8).

4. A bottle according to any one of the preceding claims, wherein there is more than one protrusion (5) and corresponding complimentary recess (17).

5. A bottle according to any one of the preceding claims wherein the recess (17) is defined by a pair of ribs (16) which extend between an outer skirt (10) of the cap (7) and an inner circumferential element which defines the second retaining flange (9).

6. A bottle according to any one of the preceding claims, the outlet (30) having a valve (32) for controlling flow through the outlet.

7. A bottle according to any one of the preceding claims, wherein the outlet (30) is closed by a closure which is operable by a non-rotational movement.

8. A bottle according to claim 7, wherein the closure is a resiliently deformable member.

9. A bottle according to any one of the preceding claims, the outlet (30) having a valve (32) for controlling flow through the outlet.

#### Patentansprüche

1. Flasche mit sicherer Kappe mit einer Flasche (1) mit einem offenen Hals (2) und einem ersten Halteflansch (3) um mindestens einen Abschnitt des Halses herum und einer Aufdrückkappe (7) über dem Hals, die einen Auslass (30) und einen zweiten Halteflansch (9) hat, der so positioniert ist, dass der erste und der zweite Halteflansch (3, 9) beim Platzieren der Kappe auf der Flasche bezüglich einander abgelenkt werden, wenn sie aneinander vorbeigehen, und wieder an Ort und Stelle einrasten, sobald sie aneinander vorbeigegangen sind, wobei eine Schulter (4') des ersten Halteflansches (3) eine Schulter (13') am zweiten Halteflansch (9) in Eingriff nimmt, um die Kappe sicher an der Flasche zu halten, **dadurch gekennzeichnet, dass** der Flaschenhals oder die Kappe einen Vorsprung (5) hat, der in eine komplementäre Aussparung (17) an der Kappe bzw. dem Flaschenhals passt, um eine Drehung der Kappe und der Flasche im Wesentlichen zu verhindern.
2. Flasche nach Anspruch 1, wobei der erste und der zweite Flansch (3, 9) so konfiguriert sind, dass einer von ihnen oder beide so angeordnet ist/sind, dass er/sie beschädigt wird/werden, wenn die Kappe von der Flasche entfernt wird, wodurch die Funktionalität der Kappe beeinträchtigt wird.
3. Flasche nach Anspruch 1 oder 2, wobei die Kappe (7) mit einem Hilfsflansch (8) versehen ist, der so positioniert ist, dass der erste Halteflansch (3) mit der Kappe auf der Flasche zwischen dem zweiten Halteflansch (9) und dem Hilfsflansch (8) gehalten ist.
4. Flasche nach einem der vorhergehenden Ansprüche, wobei mehr als ein Vorsprung (5) und entsprechende komplementäre Aussparung (17) vorliegen.
5. Flasche nach einem der vorhergehenden Ansprüche, wobei die Aussparung (17) durch ein Paar Rippen (16) definiert ist, die sich zwischen einem äußeren Schurz (10) der Kappe (7) und einem inneren Umfangelement, das den zweiten Halteflansch (9) definiert, erstrecken.
6. Flasche nach einem der vorhergehenden Ansprüche, wobei der Auslass (30) ein Ventil (32) zur Steuerung des Durchflusses durch den Auslass hat.

7. Flasche nach einem der vorhergehenden Ansprüche, wobei der Auslass (30) durch einen Verschluss verschlossen ist, der durch eine Bewegung betätigt werden kann, bei der es sich nicht um eine Drehbewegung handelt.

8. Flasche nach Anspruch 7, wobei der Verschluss ein federnd deformierbares Element ist.
9. Flasche nach einem der vorhergehenden Ansprüche, wobei der Auslass (30) ein Ventil (32) zur Steuerung des Durchflusses durch den Auslass hat.

#### Revendications

1. Bouteille dotée d'un capuchon de sécurité, comprenant :  
 une bouteille (1) ayant un goulot ouvert (2) et une première bride de retenue (3) autour d'au moins une portion du goulot ; et un capuchon pressable (7) ajusté par-dessus le goulot, le capuchon ayant une sortie (30) et une deuxième bride de retenue (9) positionnée de telle sorte que, lors du positionnement du capuchon sur la bouteille, les première et deuxième brides de retenue (3, 9) fléchissent relativement l'une par rapport à l'autre lors de leur passage et reviennent en place après leur passage, un épaulement (4') sur la première bride de retenue (3) s'engageant avec un épaulement (13') sur la deuxième bride de retenue (9) pour retenir le capuchon fixement sur la bouteille ;  
**caractérisée en ce que** le goulot de la bouteille ou le capuchon présente une saillie (5) qui s'ajuste dans un retrait complémentaire (17) sur l'autre élément parmi le goulot de la bouteille et le capuchon, pour empêcher substantiellement la rotation du capuchon et de la bouteille.
2. Bouteille selon la revendication 1, dans laquelle les première et deuxième brides (3, 9) sont configurées de telle sorte que l'une d'entre elles ou les deux soient prévues pour être endommagées si le capuchon est enlevé de la bouteille, pour ainsi affecter la fonctionnalité du capuchon.
3. Bouteille selon la revendication 1 ou la revendication 2, dans laquelle le capuchon (7) est pourvu d'une bride auxiliaire (8) qui est positionnée, lorsque le capuchon est sur la bouteille, de telle sorte que la première bride de retenue (3) soit retenue entre la deuxième bride de retenue (9) et la bride auxiliaire (8).
4. Bouteille selon l'une quelconque des revendications

précédentes, dans laquelle il est prévu plus d'une saillie (5) et plus d'un retrait complémentaire correspondant (17).

5. Bouteille selon l'une quelconque des revendications précédentes, dans laquelle le retrait (17) est défini par une paire de nervures (16) qui s'étendent entre une jupe extérieure (10) du capuchon (7) et un élément circonférentiel interne qui définit la deuxième bride de retenue (9). 5  
10
6. Bouteille selon l'une quelconque des revendications précédentes, la sortie (30) ayant une valve (32) pour réguler l'écoulement à travers la sortie. 15
7. Bouteille selon l'une quelconque des revendications précédentes, dans laquelle la sortie (30) est fermée par une fermeture qui peut être actionnée par un mouvement non rotatif. 20
8. Bouteille selon la revendication 7, dans laquelle la fermeture est un organe déformable élastiquement.
9. Bouteille selon l'une quelconque des revendications précédentes, la sortie (30) ayant une valve (32) pour réguler l'écoulement à travers la sortie. 25

30

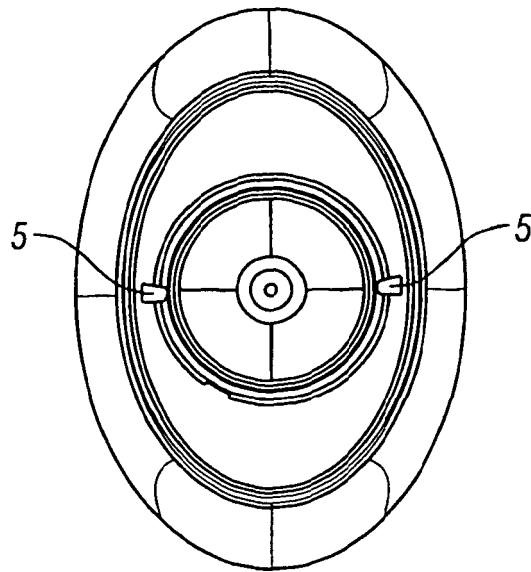
35

40

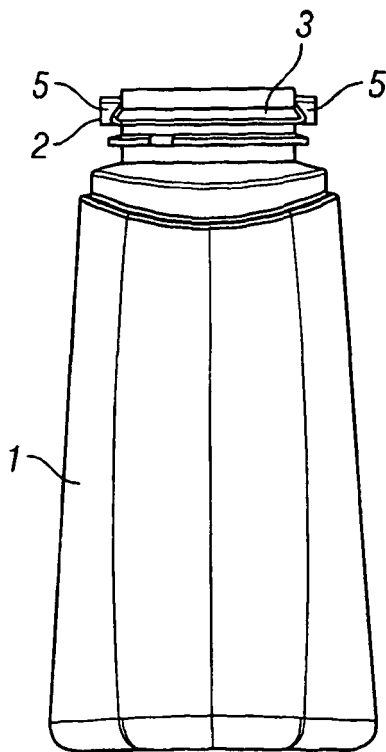
45

50

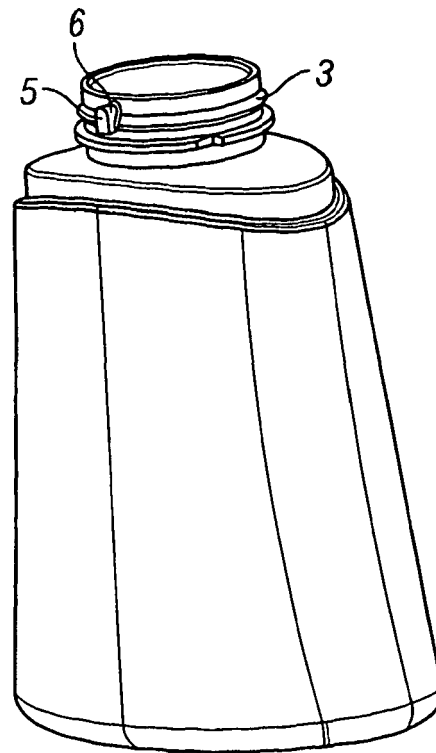
55



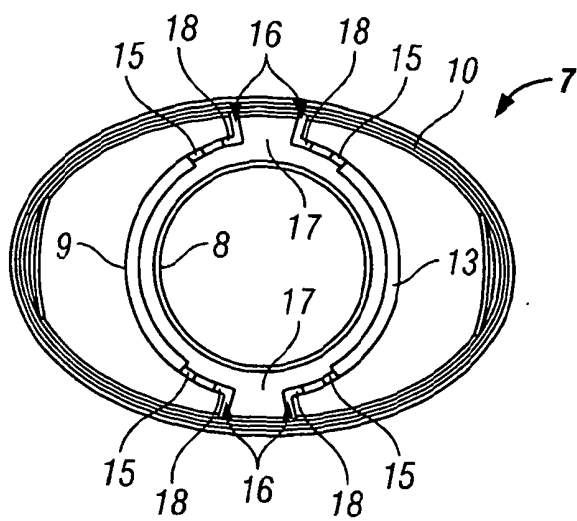
**FIG. 1**



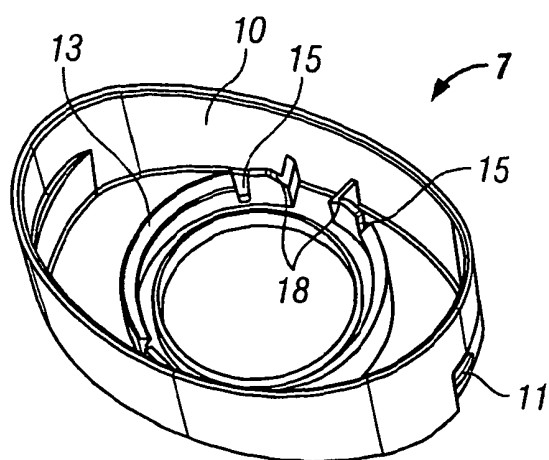
**FIG. 2**



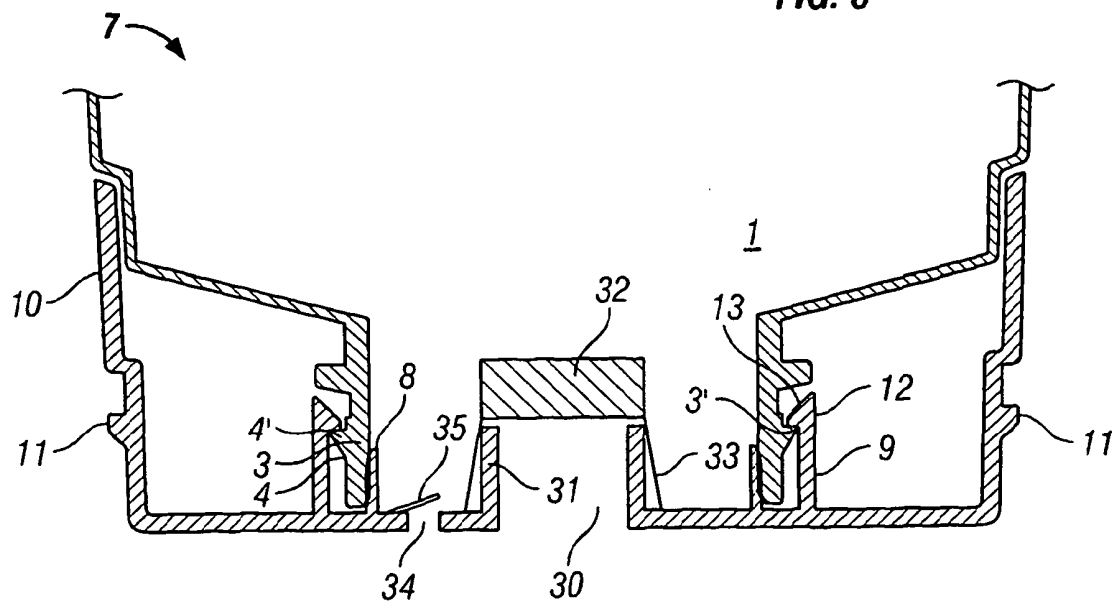
**FIG. 3**



**FIG. 4**



**FIG. 5**



**FIG. 6**



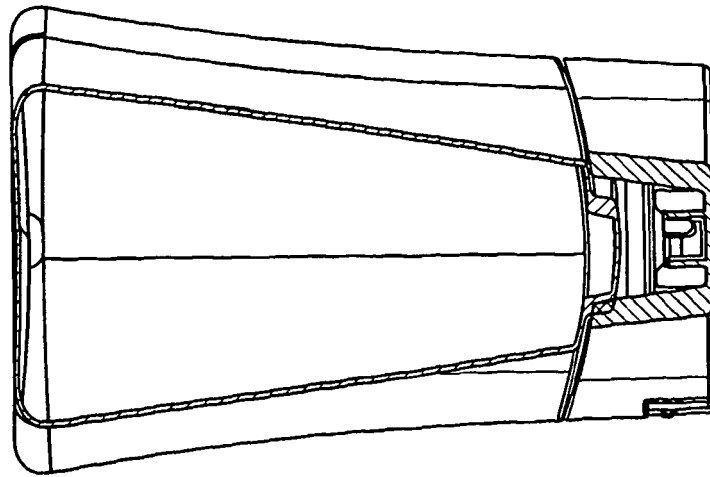


FIG. 7C

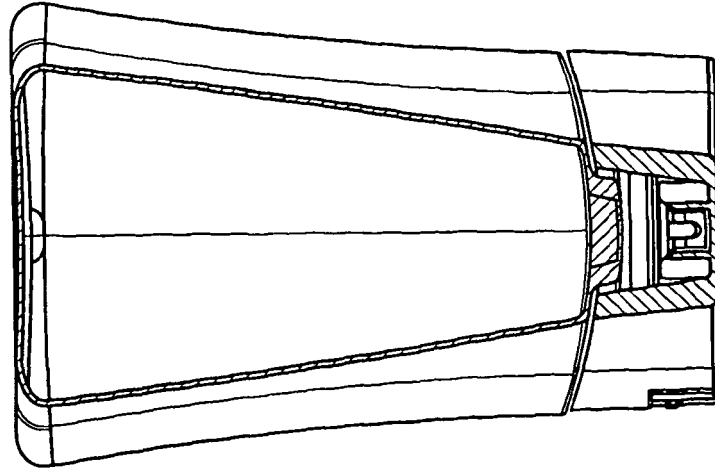


FIG. 7B

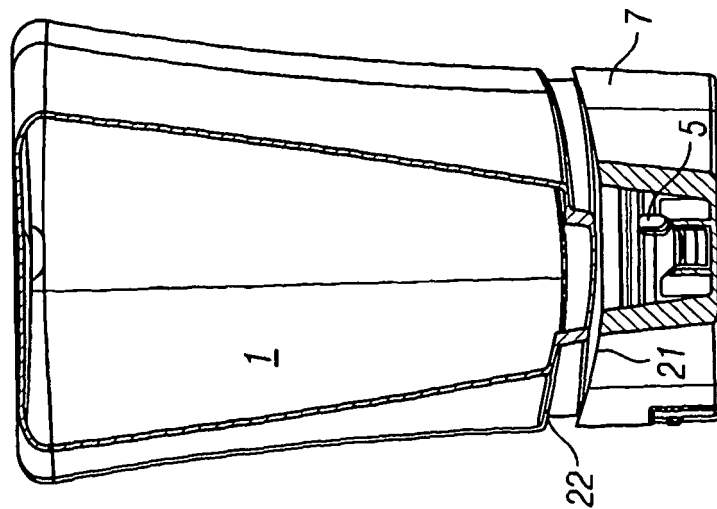


FIG. 7A

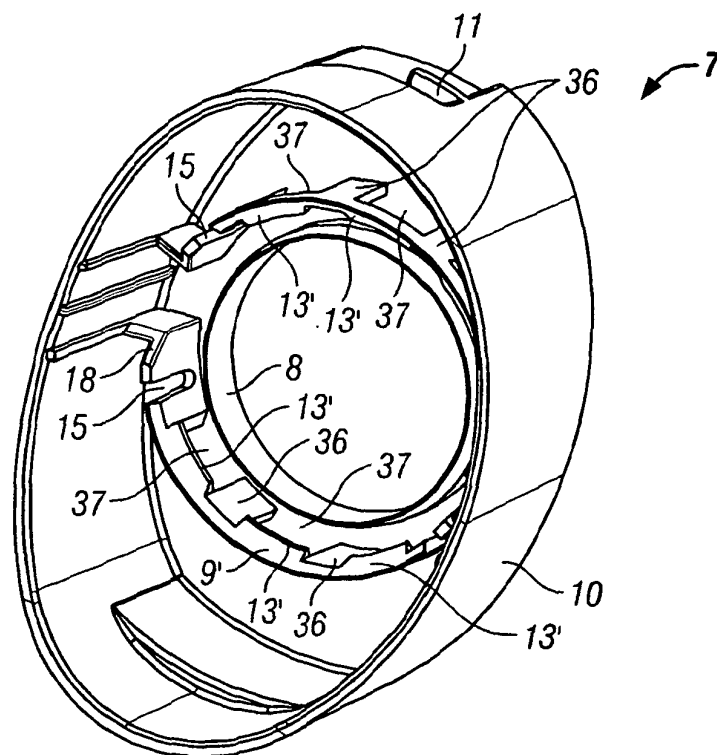


FIG. 8

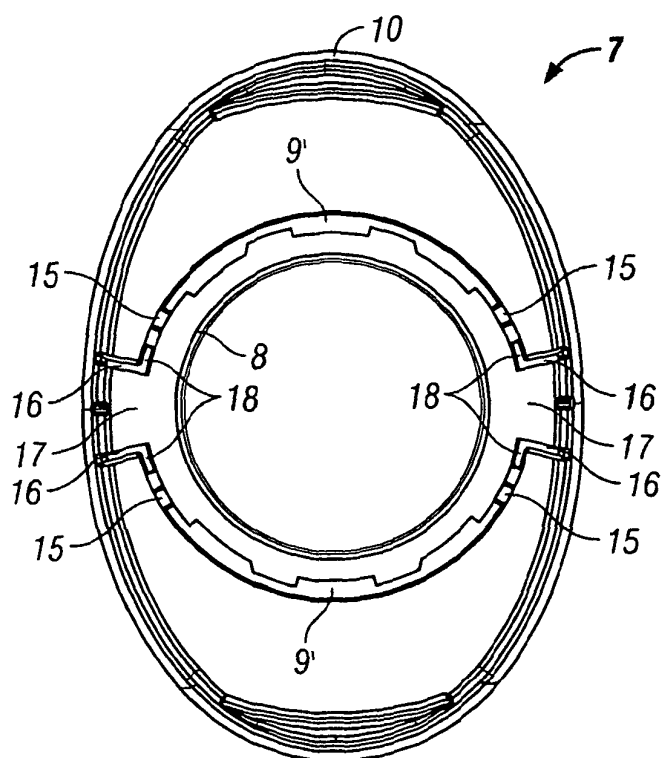
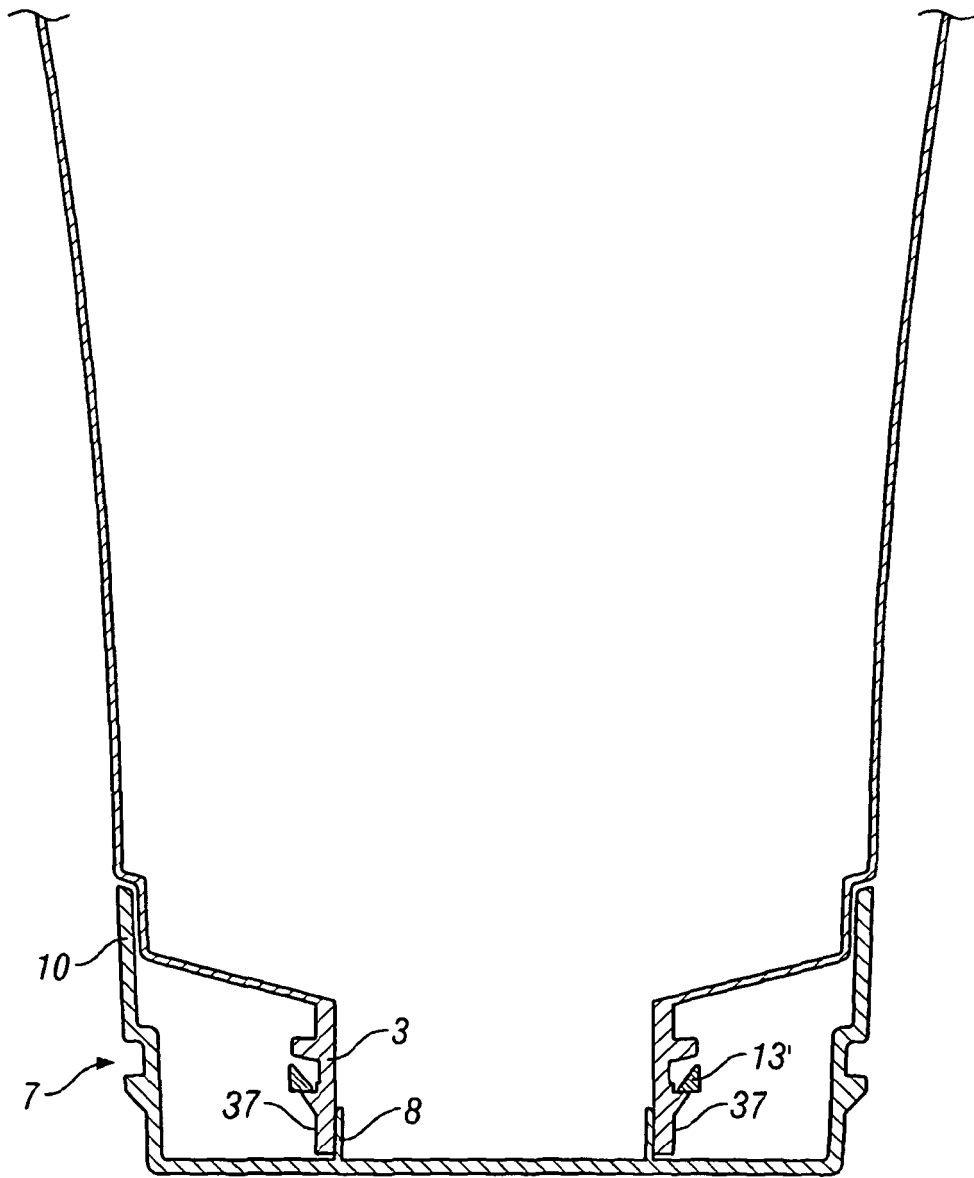


FIG. 9



**FIG. 10**

**REFERENCES CITED IN THE DESCRIPTION**

*This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.*

**Patent documents cited in the description**

- US 4022464 A [0004]
- US 3237819 A [0004]
- EP 1847472 A [0004]
- GB 1107605 A [0004]
- US 3295730 A [0004]
- GB 0820984 A [0006]
- WO 2010055313 A1 [0006] [0010]
- GB 947126 A [0008]
- GB 08209843 A [0010]