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(54) **Closure**

Verschluss

Fermeture

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Description

[0001] This invention relates to a closure, especially for edible oil according to the preamble of claim 1. One such closure is known e.g. from WO 90/08074.

[0002] Known closures for edible oil are generally provided with a drip-preventing pourer to prevent that, due to its viscosity and other properties, the oil sticks to the outer walls of the container, making it troublesome to handle.

[0003] An important characteristic of a pourer for oil (both edible and non-edible oils) is the ability to retain its drip-preventing properties even when it is desired to pour out a small quantity of oil when the container is full; the pourer must protect the container even if the latter is not inclined by very much with respect to the vertical.

[0004] In order to accentuate this advantageous characteristic a plurality of pourers have been proposed in the known art, including the one described in WO90/08074 which makes use of a system of bistable bellows to increase the distance between pouring lip 11 and the mouth of the container.

[0005] The bistable bellows are however complex to manufacture, can break easily if manufactured from polymer materials for edible oils, may undergo viscous relaxation phenomena (creep) and, moreover, in order to be conveniently operated require a relatively complex system of attachment between cap 3 and the pourer body.

[0006] In the light of the described state of the art, the object of this invention is to provide a closure which at least partly resolves at least some of the abovementioned problems, in such a way that it can also be applied to containers for oil or other viscous liquids (such as for example syrups or sugar-containing liquors), preferably for edible liquids.

[0007] According to this invention this object is accomplished through a closure according to claim 1 or 17.

[0008] Other advantages and characteristics of the present invention will become clear from the following detailed description which is given with reference to the appended drawings which are provided purely by way of non-limiting example and in which:

- Figure 1 shows a cross-sectional view of a first embodiment of a closure according to the invention,
- Figure 2 shows a cross-sectional view of the closure in Figure 1, at an instant subsequent to that in Figure 1,
- Figure 3 shows a cross-sectional view of the closure in Figure 1, in an open configuration and without the outer cap,
- Figure 4 shows an exploded axonometric view in partial cross-section of a closure according to a second embodiment of this invention,
- Figure 5 shows a cross-sectional view of a third embodiment of a closure according to this invention, simply attached to the inside of the container mouth,

- Figure 6 shows a cross-sectional view of a fourth embodiment of a closure according to the invention, similar to that in Figure 5, but with non-refillable means,
- 5 - Figure 7 shows a cross-sectional view of a fifth embodiment of a closure according to the invention,
- Figure 8 shows a cross-sectional view of a sixth embodiment in which the outer cap is of polymer material,
- 10 - Figure 9 shows a cross-sectional view of a seventh embodiment, in which the outer cap is of polymer material and is made of one piece,
- Figure 10 shows a cross-sectional view of an eighth embodiment in which the closure is provided with extraction prevention means.
- 15

[0009] Longitudinal axis X-X is the main axis of mouth 102 and closure 1: when closure 1 is fitted to container 10, the two main axes coincide.

20 **[0010]** Closure 1 comprises an outer capsule 2, an attachment element 4 and a pourer 5.

[0011] Outer capsule 2 may advantageously comprise an inner cap 21, and a capsule 22, advantageously of metal, which may comprise means showing evidence of the first opening. In the embodiment in Figure 8, capsule 22 is of polymer, while in the one in Figure 9 inner cap 21 and capsule 22 are made of one piece and of polymer material.

25 **[0012]** For example capsule 22 may be subdivided into an upper portion 221 and a lower portion 222 (or tamper-evident ring), joined together by a weakened line 223.

30 **[0013]** Outer capsule 2 comprises a part C1a of first connecting means C1 which will allow movements to remove outer capsule 2 from the rest of closure 1 and vice versa.

35 **[0014]** These movements, brought about by first connecting means C1, comprise at least one longitudinal movement D1 and also comprise a rotation, they are helical.

40 **[0015]** First connecting means C1 comprise a threaded coupling of pitch P1, for example 23-46, 23-103.

[0016] Attachment element 4 comprises retaining means 451 for attachment to container 100 and a part C3a of third connecting means C3.

45 **[0017]** Structurally, attachment element 4 shown in the figures comprises (from inside to outside) a first inner sleeve 42, comprising part C3a of third connecting means C3 and defining a central longitudinal seat 421, a sleeve 43 comprising sealing means 431 for liquid, an annular upper wall 44 for longitudinally abutting said mouth 102, an outer sleeve 45, comprising retaining means 451, for example in the form of one or more teeth 452 located on the inner surface of outer sleeve 45 so to engage with an outer groove 104 made in neck 101 of container 100.

50 Teeth 452 may also be constructed as sectors of a circle or as keys.

55 **[0018]** Third connecting means C3 illustrated in the figure are a threaded attachment 422/56 of pitch P2 be-

tween pourer 5 and inner sleeve 42.

[0019] $P2 > P1$ so that when outer capsule 2 is integral in rotation with pourer 5, longitudinal movement D1 of outer capsule 2 during removal of the same from container 100 is less than the corresponding movement D2 of pourer 5, thus acquiring a distance of travel which is greater than that which can be achieved for the same displacement in known closures.

[0020] Retaining means 451 serve to prevent closure 1 from falling when container 100 is upside down.

[0021] It is also possible to construct outer sleeve 45 in such a way that it externally also covers part of the neck of container 100. The remaining part C1b of first connecting means C1 can then be constructed on outer sleeve 45. In this embodiment outer capsule 2 directly engages attachment element 4 and does not engage thread 103 of mouth 102.

[0022] Furthermore, as illustrated in Figure 10, outer sleeve 45 can be constructed separately so that it can perform an effective extraction preventing function. In this case the material of outer sleeve 45 may be rigid, such as, for example, PC, and may be provided with means 48 to prevent rotation relative to container 100, for example longitudinal ribs.

[0023] Pourer 5, which has substantially cylindrical symmetry, comprises a lower portion 53, a central portion 52 and an upper portion 51. Lower portion 53 comprises the remaining part C3b of third connecting means C3; central portion 52 comprises a part C2a of second connecting means C2 and upper portion 51 comprises pouring lip 54.

[0024] As will be seen in the figures, lower portion 53 may comprise an outer thread 56 engaging attachment element 4, central portion 52 may comprise teeth 55 engaging outer capsule 2 and pouring lip 54 may be elastic and flexible to compensate for the greater longitudinal displacement of pourer 5 with respect to outer capsule 2. In alternative embodiments teeth 55 may be constructed on outer capsule 2 itself; likewise compensation for the greater longitudinal movement of pourer 5 with respect to outer capsule 2 may be obtained for example in outer capsule 2 by means of a plate biased by a spring and/or in pourer 5 by constructing upper portion 51 as a bellows, as illustrated in Figures 1-3 and 7-10. Advantageously upper bellows portion 51 may be used in combination with flexible lip 54.

[0025] Inner cap 21 illustrated in the figures comprises the remaining part C2b of second connecting means C2 in the form of a central sleeve 211 within which are constructed a plurality of guides 212, the longitudinal extent of which makes them suitable for engaging teeth 55 at least for the time during which outer capsule 2 is attached to mouth 102, advantageously the central sleeve is slightly longer, so that the rotation which users naturally apply to outer capsule 2 even after this has been detached from mouth 102 can be used for achieving further extraction of pourer 5.

[0026] Second connecting means C2 are advanta-

geously constructed so to allow slight relative movement during the final stages of screwing and not to allow it during unscrewing. In this way it is ensured that the correct relative position is reached when it has been fully screwed down even if the user begins to screw pourer 5 before outer capsule 2 engages mouth 102.

[0027] Closure 1 thus described has reduced longitudinal size and, when open, the drip-preventing lip is in a particularly raised position with respect to the mouth 102 of container 100.

[0028] Inner cap 21 further comprises a horizontal wall 213 from which central sleeve 211 and an annular edge 214 extend. A bellows-like seat 215 in which upper portion 51 and/or lower portion 53 can elastically deform during the opening and closing operations is thus defined in this way so to compensate for the different axial displacements of pourer 5 with respect to outer capsule 2.

[0029] Close to its lower extremity annular edge 214 comprises a part of engaging means 216 capable of retaining attachment element 4 (and thus hold the elements of closure 1 together) during the operations of handling closure 1 before it is fitted to container 10.

[0030] These engaging means 216 comprise for example one or more substantially circumferential grooves engaging in one or more matching seats made in an annular wall 46 of attachment element 4 (or vice versa).

[0031] Annular edge 214 may comprise an outer skirt (not shown in the figures) which comprises part C1a of first connecting means C1 mentioned above.

[0032] With closure 1 described above, when outer capsule 2 is removed, at least one section of pourer 5 is moved longitudinally through a distance greater than that of outer capsule 2.

[0033] Pouring lip 54 is therefore pressed against horizontal wall 213, deforming in seat 215.

[0034] At the end of the movement, when outer capsule 2 is completely removed so that first and second connecting means C1, C2 no longer engage, pouring lip 54 resumes its original shape.

[0035] In addition to the abovementioned advantages there is the one of maintaining all the elements of closure 1 under no elastic deformation for most of the time, preventing viscous relaxation phenomena (creep) from quickly overcoming any ability for elastic recovery of the same.

[0036] As may be seen in Figures 5 and 6, attachment element 4 may also be attached to container 100 merely through sealing means 431. In this arrangement attachment element 4 is held within mouth 102 of container 100 merely by friction.

[0037] As may be seen in Figure 6, non-refillable means 6, which make it difficult to add extraneous materials once closure 1 has been fitted to container 100, may be located between pourer 5 and attachment element 4.

[0038] In the illustrated embodiment, pourer 5 comprises an upper retaining portion 57 which holds a valve element, for example a sphere 61, within engaging por-

tion 53; similarly attachment element 4 comprises a terminal retaining portion 47 which helps to hold the valve element within closure 1.

[0039] If the valve element is not present, portion 47 performs the function of a lower end-of-travel for pourer 5; the upper end-of-travel is instead provided by a portion 58 provided in the base of pourer 5, so to interrupt external thread 56.

[0040] The metal in capsule 22 may for example be aluminium, rolled on the threads 103 of neck 101 of container 100; attachment element 4 may be constructed of for example HDPE, LDPE and their combinations, or of PP, so to ensure a sufficient seal for the liquid together with sufficient mechanical attachment to mouth 102; pourer 5 may be made of substantially flexible material (for example LDPE, EVA and their combinations, thermoplastic elastomers); cap 21 (capsule 2, where this is of one piece) may be made of any of these materials.

[0041] Obviously in order to satisfy contingent and specific requirements a person skilled in the art could introduce many modifications and variants to what has been described above, such as for example applying the closure according to this invention to other (not necessarily edible) liquids of high viscosity.

[0042] These variants however lie within the scope of protection of the invention as defined by the following claims.

Claims

1. A closure (1) suitable for attachment to the mouths (102) of containers (100) having a longitudinal axis (X-X), said closure (1) comprising:

- an outer capsule (2),
- an attachment element (4) having a longitudinal inner seat (421) and
- a pourer (5), located in said inner seat (421) and capable of moving longitudinally therein,

wherein, when said closure (1) is attached to said mouth (102):

- said outer capsule (2) is attached to said mouth (102) through first connecting means (C1) so as to prevent liquid from leaving said container (100) and may reversibly be removed from the remainder of said closure (1) by a movement which comprises at least one displacement D1 in a longitudinal direction,
- said outer capsule (2) is attached to said pourer (5) by second connecting means (C2),
- said pourer (5) is attached to said attachment element (4) by third connecting means (C3),
- said attachment element (4) is secured to said mouth (102) by retaining means (431,451),

characterised in that

said first and third connecting a means (C1, C3) are threaded and have pitches P1 and P2 respectively, with $P2 > P1$,

said first, second and third connecting means (C1, C2, C3) are such that when said outer capsule (2) is removed from or applied to the remainder of said closure (1), following a displacement D1 of said outer capsule (2) in a longitudinal direction (X-X) the corresponding displacement D2 of at least one section of said pourer (5) in the longitudinal direction (X-X) is greater than D1, wherein the displacements comprising said displacements D1 and/or D2 are helical.

2. A closure (1) according to any one of the preceding claims, in which displacement D1 includes the entire travel necessary for said outer capsule (2) to detach from said first connecting means (C1).
3. A closure (1) according to any one of the preceding claims, in which said first connecting means (C1) directly connect said outer capsule (2) to said mouth (102).
4. A closure (1) according to any one of claims 1 or 2, in which said first connecting means (C1) connect said outer capsule (2) to said attachment element (4).
5. A closure (1) according to any one of the preceding claims, in which said pourer (5) comprises a flexible pourer lip (54) and a lower portion (51) comprising a part (C3b) of said third connecting means (C3).
6. A closure (1) according to any one of the preceding claims, in which said second connecting means (C2) render said outer capsule (2) and said pourer (5) integral in rotation during at least said displacements D1 and D2.
7. A closure (1) according to any one of the preceding claims, in which said second connecting means (C2) comprise at least one radial tooth (55) which engages at least one corresponding guide (213).
8. A closure (1) according to any one of the preceding claims, comprising tamper-evident means (221, 222, 223).
9. A closure (1) according to the preceding claim, in which said tamper-evident means (221, 222, 223) comprise two portions (221, 222) of annular cross-section connected together through a weakened line (223) provided in said outer capsule (2).
10. A closure (1) according to any one of the preceding claims, comprising non-refillable valve means (6).

11. A closure (1) according to the preceding claim, in which said non-refillable valve means (6) comprise a valve (61) located between said pourer (5) and said attachment element (4).

12. A closure (1) according to any one of claims 1 to 3 or 5 to 11, in which:

- said outer capsule (2) comprises: - said outer capsule (2) comprises:

* an outer element (22) on which a part (C1a) of the first connecting means (C1) is constructed, and

* an inner element (21) on which a part (C2b) of said second connection means (C2) is constructed,

- said pourer (5) comprises:

* a flexible pouring lip (54),

* a central portion (52) comprising the remaining part (C2a) of said second connecting means (C2),

* a lower portion (53) comprising a part (C3b) of said third connecting means (C3),

- said attachment element (4) comprises:

* a first inner sleeve (42) comprising the remaining part (C3b) of said third connecting means (C3),

* a sleeve (43) comprising radial sealing means (431) for liquid capable of engaging the inner surface of said mouth (102),

* an upper annular wall (44) capable of longitudinally abutting said mouth (102),

* an outer sleeve (45) comprising said retaining means (451), in the form of one or more teeth (452) located along the inner surface of said outer sleeve (45).

13. A combination of a closure (1) according to any one of claims 1 to 3 or 5 to 12 with a mouth (102) provided with a thread (103) in which said thread (103) comprises the remaining part (C1b) of said first connecting means (C1).

14. A closure (1) according to any one of claims 1 to 2 or 4 to 11, in which:

- said outer capsule (2) on which a part (C1a) of the first connecting means (C1) is constructed comprises:

* an outer element (22) and

* an inner element (21) on which a part (C2b) of said second connecting means (C2) is

constructed,

- said pourer (5) comprises:

* a flexible pouring lip (54),

* a central portion (52) comprising the remaining part (C2a) of said second connecting means (C2),

* a lower portion, comprising a part (C3b) of said third connecting means (C3),

- said attachment element (4) comprises:

* a first inner sleeve (42) comprising the remaining part (C3b) of said third connecting means (C3),

* a sleeve (43) comprising radial sealing means (431) for liquid, capable of engaging the inner surface of said mouth (102),

* an upper annular wall (44), capable of longitudinally abutting said mouth (102),

* an outer sleeve (45) comprising said retaining means (451), in the form of one or more teeth (452) located along the inner surface of said outer sleeve (45),

* the remaining part (C1b) of said first connecting means (C1).

30 Patentansprüche

1. Verschluss (1), der zur Anbringung an den Mundstücken (102) von Behältern (100) mit einer Längsachse (X-X) geeignet ist, wobei der Verschluss (1) umfasst:

- eine äußere Kapsel (2),

- ein Anbringungselement (4) mit einem in Längsrichtung inneren Sitz (421) und

- einem Gießer (5), der in dem inneren Sitz (421) angeordnet ist und sich in Längsrichtung darin bewegen kann,

- wobei, wenn der Verschluss (1) an dem Mundstück (102) angebracht ist:

- die äußere Kapsel (2) an dem Mundstück (102) durch erste Verbindungsmittel (C1) angebracht ist, um zu verhindern, dass Flüssigkeit den Behälter (100) verlässt, und reversibel von dem Rest des Verschlusses (1) durch eine Bewegung abgenommen werden kann, die zumindest eine Verschiebung D 1 in einer Längsrichtung umfasst,

- die äußere Kapsel (2) an dem Gießer (5) durch zweite Verbindungsmittel (C2) angebracht ist,

- der Gießer (5) an dem Anbringungselement (4) durch dritte Verbindungsmittel (C3) angebracht ist,

- das Anbringungselement (4) an dem Mund-

stück (102) durch Haltemittel (431, 451) befestigt ist,

dadurch gekennzeichnet, dass

- die ersten und dritten Verbindungsmittel (C1, C3) mit Gewinden versehen sind und Steigungen P1 bzw. P2 aufweisen, wobei $P2 > P1$, die ersten, zweiten und dritten Verbindungsmittel (C1, C2, C3) derart sind, dass, wenn die äußere Kapsel (2) von dem Rest des Verschlusses (1) entfernt oder aufgesetzt wird, im Anschluss an eine Verschiebung D 1 der äußeren Kapsel (2) in einer Längsrichtung (X-X) die entsprechende Verschiebung D2 zumindest eines Teilstücks des Gießers (5) in der Längsrichtung (X-X) größer als D 1 ist, wobei die Verschiebungen, die die Verschiebungen D1 und/oder D2 umfassen, wendelförmig sind.
2. Verschluss (1) nach einem der vorhergehenden Ansprüche, bei dem die Verschiebung D 1 die gesamte Wegstrecke umfasst, die notwendig ist, damit die äußere Kapsel (2) von dem ersten Verbindungsmittel (C1) abgenommen werden kann.
 3. Verschluss (1) nach einem der vorhergehenden Ansprüche, bei dem die ersten Verbindungsmittel (C1) die äußere Kapsel (2) direkt mit dem Mundstück (102) verbinden.
 4. Verschluss (1) nach einem der Ansprüche 1 oder 2, bei dem die ersten Verbindungsmittel (C1) die äußere Kapsel (2) mit dem Anbringungselement (4) verbinden.
 5. Verschluss (1) nach einem der vorhergehenden Ansprüche, bei dem der Gießer (5) eine flexible Gießerlippe (54) und einen unteren Abschnitt (51) mit einem Teil (C3b) der dritten Verbindungsmittel (C3) umfasst.
 6. Verschluss (1) nach einem der vorhergehenden Ansprüche, bei dem die zweiten Verbindungsmittel (C2) die äußere Kapsel (2) und den Gießer (5) bei der Drehung während zumindest der Verschiebungen D1 und D2 einteilig machen.
 7. Verschluss (1) nach einem der vorhergehenden Ansprüche, bei dem die zweiten Verbindungsmittel (C2) zumindest einen radialen Zahn (55) umfassen, der mit zumindest einer entsprechenden Führung (213) in Eingriff steht.
 8. Verschluss (1) nach einem der vorhergehenden Ansprüche, der Originalitätssicherheitsmittel (221, 222, 223) umfasst.
 9. Verschluss (1) nach dem vorhergehenden Anspruch, bei dem die O-riginalitätssicherheitsmittel (221, 222, 223) zwei Abschnitte (221, 222) mit ringförmigem Querschnitt umfassen, die durch eine Schwächungslinie (223) miteinander verbunden sind, die in der äußeren Kapsel (2) vorgesehen ist.
 10. Verschluss (1) nach einem der vorhergehenden Ansprüche, der nicht nachfüllbare Ventilmittel (6) umfasst.
 11. Verschluss (1) nach dem vorhergehenden Anspruch, bei dem die nicht nachfüllbaren Ventilmittel (6) ein Ventil (61) umfassen, das zwischen dem Gießer (5) und dem Anbringungselement (4) angeordnet ist.
 12. Verschluss (1) nach einem der Ansprüche 1 bis 3 oder 5 bis 11, bei dem:
 - die äußere Kapsel (2) umfasst:
 - * ein äußeres Element (22), an das ein Teil (C1a) der ersten Verbindungsmittel (C1) angebaut ist, und
 - * ein inneres Element (21), an das ein Teil (C2b) der zweiten Verbindungsmittel (C2) angebaut ist,
 - der Gießer (5) umfasst:
 - * eine flexible Gießerlippe (54),
 - * einen zentralen Abschnitt (52), der den restlichen Teil (C2a) der zweiten Verbindungsmittel (C2) umfasst,
 - * einen unteren Abschnitt (53), der einen Teil (C3b) der dritten Verbindungsmittel (C3) umfasst,
 - das Anbringungselement (4) umfasst:
 - * eine erste innere Hülse (42), die den restlichen Teil (C3b) der dritten Verbindungsmittel (C3) umfasst,
 - * eine Hülse (43), die radiale Dichtmittel (431) für Flüssigkeit umfasst, die mit der Innenfläche des Mundstücks (102) in Eingriff stehen können,
 - * eine obere ringförmige Wand (44), die in Längsrichtung an dem Mundstück (102) anschlagen kann,
 - * eine äußere Hülse (45), die die Haltemittel (451) in der Form von einem oder mehreren Zähnen (452) umfasst, die entlang der Innenfläche der äußeren Hülse (45) angeordnet sind.
 13. Kombination aus einem Verschluss (1) nach einem der Ansprüche 1 bis 3 oder 5 bis 12 mit einem Mundstück (102), das mit einem Gewinde (103) versehen

ist, wobei das Gewinde (103) den restlichen Teil (C1b) der ersten Verbindungsmittel (C1) umfasst.

14. Verschluss (1) nach einem der Ansprüche 1 bis 2 oder 4 bis 11, bei dem:

- die äußere Kapsel (2), an die ein Teil (C1a) der ersten Verbindungsmittel (C1) angebaut ist, umfasst:

- * ein äußeres Element (22) und
- * ein inneres Element (21), an das ein Teil (C2b) der zweiten Verbindungsmittel (C2) angebaut ist,

- der Gießler (5) umfasst:

- * eine flexible Gießlippe (54),
- * einen zentralen Abschnitt (52), der den restlichen Teil (C2a) der zweiten Verbindungsmittel (C2) umfasst,
- * einen unteren Abschnitt, der einen Teil (C3b) der dritten Verbindungsmittel (C3) umfasst,

- das Anbringungselement (4) umfasst:

- * eine erste innere Hülse (42), die den restlichen Teil (C3b) der dritten Verbindungsmittel (C3) umfasst,
- * eine Hülse (43), die radiale Dichtmittel (431) für Flüssigkeit umfasst, die mit der Innenfläche des Mundstücks (102) in Eingriff stehen können,
- * eine obere ringförmige Wand (44), die in Längsrichtung an dem Mundstück (102) anschlagen kann,
- * eine äußere Hülse (45), die die Haltemittel (451) in der Form von einem oder mehreren Zähnen (452) umfasst, die entlang der Innenfläche der äußeren Hülse (45) angeordnet sind,
- * den restlichen Teil (C1b) der ersten Verbindungsmittel (C1).

Revendications

1. Fermeture (1) adaptée pour une fixation sur des goulots (102) de contenants (100) qui présentent un axe longitudinal (X - X), ladite fermeture (1) comprenant :

- une capsule extérieure (2) ;
 - un élément de fixation (4) qui présente un siège intérieur longitudinal (421) ; et
 - un bec verseur (5) situé dans ledit siège intérieur (421) et pouvant se déplacer de manière longitudinale à l'intérieur ;

dans laquelle, lorsque ladite fermeture (1) est fixée sur ledit goulot (102) :

- ladite capsule extérieure (2) est fixée sur ledit goulot (102) par l'intermédiaire de premiers moyens de connexion (C1) de façon à empêcher le liquide de s'échapper dudit contenant (100), et peut être retirée de manière réversible du reste de ladite fermeture (1) suite à un déplacement qui comprend au moins un déplacement D1 dans une direction longitudinale ;
- ladite capsule extérieure (2) est fixée sur ledit bec verseur (5) par l'intermédiaire de deuxièmes moyens de connexion (C2) ;
- ledit bec verseur (5) est fixé audit élément de fixation (4) par l'intermédiaire de troisièmes moyens de connexion (C3) ;
- ledit élément de fixation (4) est fixé sur ledit goulot (102) par l'intermédiaire d'un dispositif de retenue (431, 451) ;

caractérisée en ce que :

lesdits premiers et troisièmes moyens de connexion (C1, C3) sont filetés et présentent respectivement des pas P1 et P2, avec $P2 > P1$; lesdits premiers, deuxièmes et troisièmes moyens de connexion (C1, C2, C3) sont tels que, lorsque ladite capsule extérieure (2) est retirée du reste de ladite fermeture (1) ou appliquée sur celle-ci, après un déplacement D1 de ladite capsule extérieure (2) dans une direction longitudinale (X - X), le déplacement correspondant D2 d'une section au moins dudit bec verseur (5) dans la direction longitudinale (X - X) est plus grand que D1 dans laquelle les déplacements comprenant lesdits déplacements D1 et / ou D2 sont hélicoïdaux.

2. Fermeture (1) selon l'une quelconque des revendications précédentes, dans laquelle le déplacement D1 comprend tout le déplacement nécessaire pour que ladite capsule extérieure (2) se détache desdits premiers moyens de connexion (C1).

3. Fermeture (1) selon l'une quelconque des revendications précédentes, dans laquelle lesdits premiers moyens de connexion (C1) relie directement ladite capsule extérieure (2) audit goulot (102).

4. Fermeture (1) selon la revendication 1 ou la revendication 2, dans laquelle lesdits premiers moyens de connexion (C1) relie ladite capsule extérieure (2) audit élément de fixation (4).

5. Fermeture (1) selon l'une quelconque des revendications précédentes, dans laquelle ledit bec verseur (5) comprend une lèvre flexible de bec verseur (54)

- et une partie inférieure (51) qui comprend une partie (C3b) desdits troisièmes moyens de connexion (C3).
6. Fermeture (1) selon l'une quelconque des revendications précédentes, dans laquelle lesdits deuxièmes moyens de connexion (C2) rendent solidaires en rotation ladite capsule extérieure (2) et ledit bec verseur (5) au cours, au moins, desdits déplacements D1 et D2. 5
7. Fermeture (1) selon l'une quelconque des revendications précédentes, dans laquelle lesdits deuxièmes moyens de connexion (C2) comprennent au moins une dent radiale (55) qui vient en prise avec au moins un guide correspondant (213). 10
8. Fermeture (1) selon l'une quelconque des revendications précédentes, comprenant des moyens inviolables (221, 222, 223). 15
9. Fermeture (1) selon l'une quelconque des revendications précédentes, dans laquelle lesdits moyens inviolables (221, 222, 223) comprennent deux parties (221, 222) qui présentent une section transversale annulaire, reliées ensemble par l'intermédiaire d'une ligne d'affaiblissement (223) disposée dans ladite capsule extérieure (2). 20
10. Fermeture (1) selon l'une quelconque des revendications précédentes, comprenant des moyens de valve anti-reremplissage (6). 25
11. Fermeture (1) selon l'une quelconque des revendications précédentes, dans laquelle lesdits moyens de valve anti-reremplissage (6) comprennent une valve (61) située entre ledit bec verseur (5) et ledit élément de fixation (4). 30
12. Fermeture (1) selon l'une quelconque des revendications 1 à 3 ou 5 à 11, dans laquelle : 35
- ladite capsule extérieure (2) comprend :
 - * un élément extérieur (22) sur lequel est construite une partie (C1a) des premiers moyens de connexion (C1) ; et
 - * un élément intérieur (21) sur lequel est construite une partie (C2b) desdits deuxièmes moyens de connexion (C2) ;
 - ledit bec verseur (5) comprend :
 - * une lèvre flexible de bec verseur (54) ;
 - * une partie centrale (52) qui comprend la partie restante (C2a) desdits deuxièmes moyens de connexion (C2) ;
 - * une partie inférieure (53) qui comprend une partie (C3b) desdits troisièmes moyens
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- de connexion (C3) ;
- ledit élément de fixation (4) comprend :
- * un premier manchon intérieur (42) qui comprend la partie restante (C3b) desdits troisièmes moyens de connexion (C3) ;
 - * un manchon (43) qui comprend des moyens d'étanchéité radiaux (431) de liquide, pouvant venir en prise avec la surface intérieure dudit goulot (102) ;
 - * une paroi annulaire supérieure (44) pouvant venir en butée de manière longitudinale avec ledit goulot (102) ;
 - * un manchon extérieur (45) qui comprend ledit dispositif de retenue (451), sous la forme d'une ou de plusieurs dents (452) situées le long de la surface intérieure dudit manchon extérieur (45).
13. Association d'une fermeture (1) selon l'une quelconque des revendications 1 à 3 ou 5 à 12, avec un goulot (102) doté d'un filetage (103), dans lequel ledit filetage (103) comprend la partie restante (C1b) desdits premiers moyens de connexion (C1).
14. Fermeture (1) selon l'une quelconque des revendications 1 à 2 ou 4 à 11, dans laquelle :
- ladite capsule extérieure (2) sur laquelle est construite une partie (C1a) des premiers moyens de connexion (C1) comprend :
 - * un élément extérieur (22) ; et
 - * un élément intérieur (21) sur lequel est construite une partie (C2b) desdits deuxièmes moyens de connexion (C2) ;
 - ledit bec verseur (5) comprend :
 - * une lèvre flexible de bec verseur (54) ;
 - * une partie centrale (52) qui comprend la partie restante (C2a) desdits deuxièmes moyens de connexion (C2) ;
 - * une partie inférieure qui comprend une partie (C3b) desdits troisièmes moyens de connexion (C3) ;
 - ledit élément de fixation (4) comprend :
 - * un premier manchon intérieur (42) qui comprend la partie restante (C3b) desdits troisièmes moyens de connexion (C3) ;
 - * un manchon (43) qui comprend des moyens d'étanchéité radiaux (431) de liquide, pouvant venir en prise avec la surface intérieure dudit goulot (102) ;
 - * une paroi annulaire supérieure (44) pou-

vant venir en butée de manière longitudinale avec ledit goulot (102) ;

* un manchon extérieur (45) qui comprend ledit dispositif de retenue (451), sous la forme d'une ou de plusieurs dents (452) situées le long de la surface intérieure dudit manchon extérieur (45) ;

* la partie restante (C1b) desdits premiers moyens de connexion (C1).

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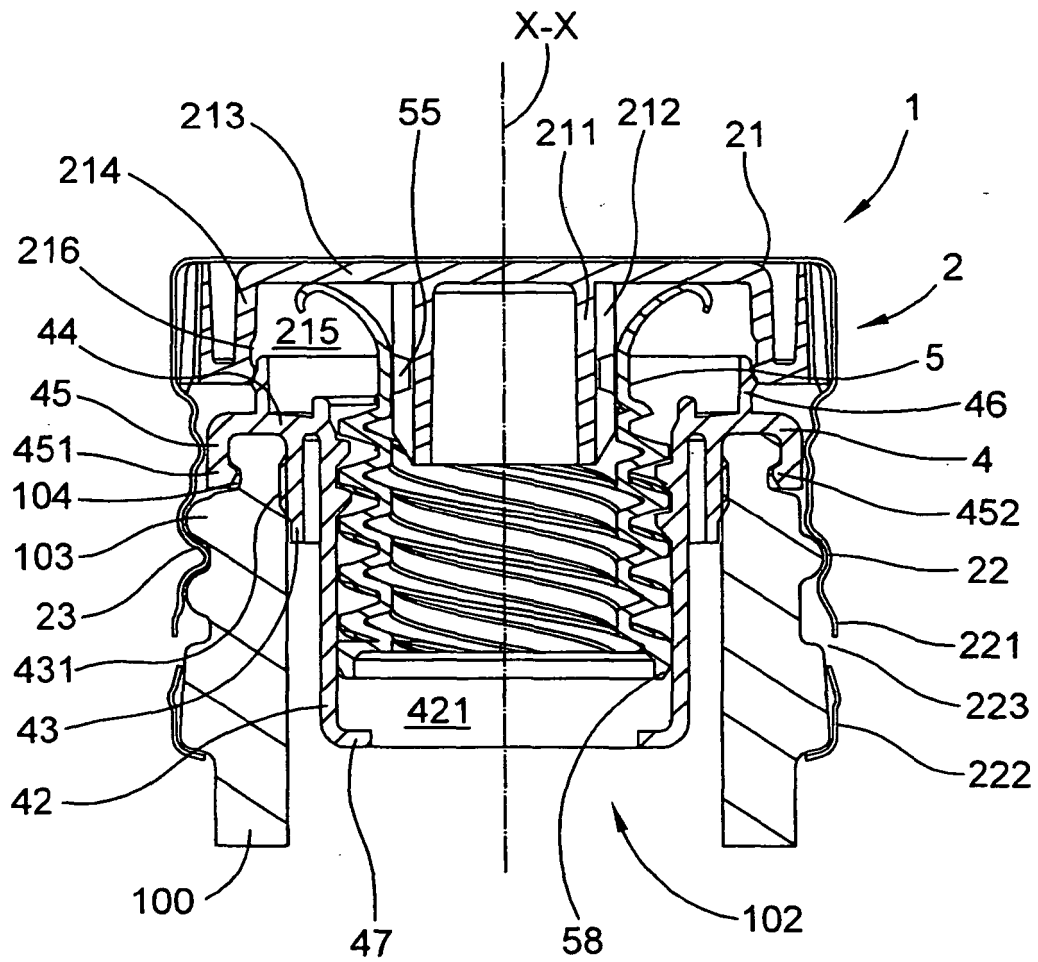


FIG. 1

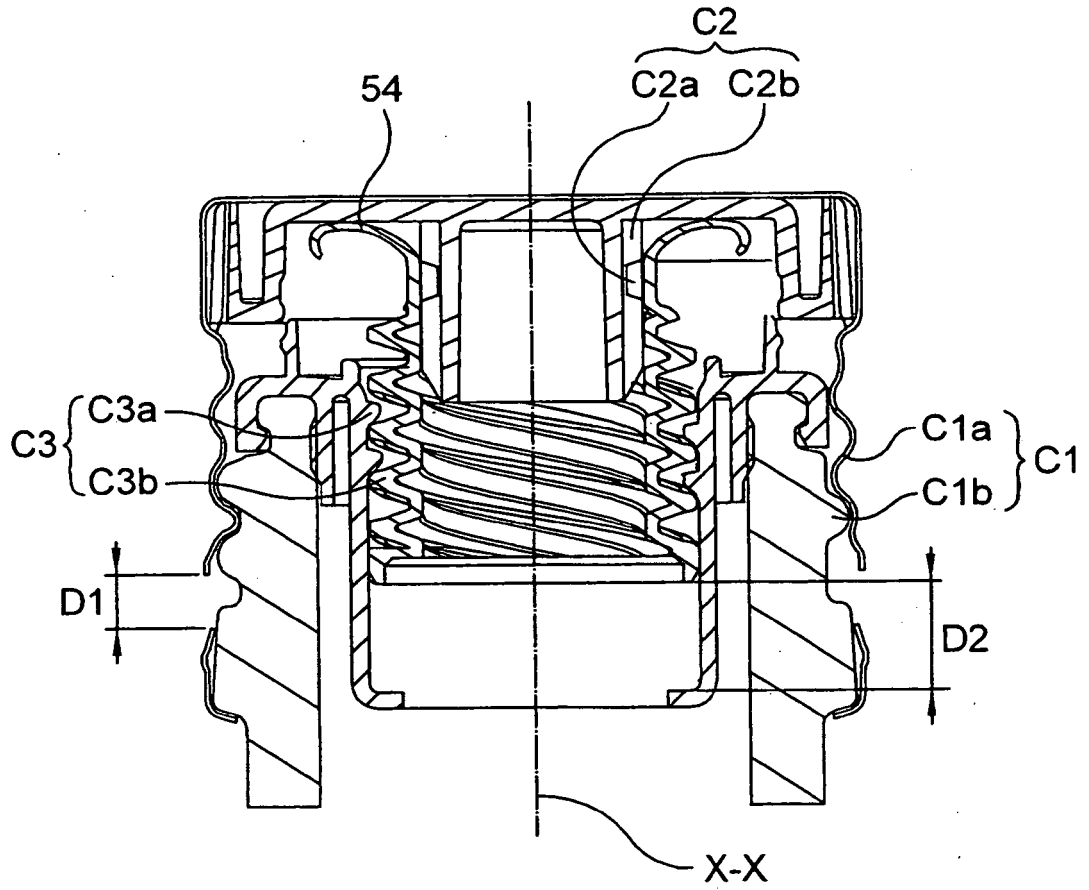


FIG.2

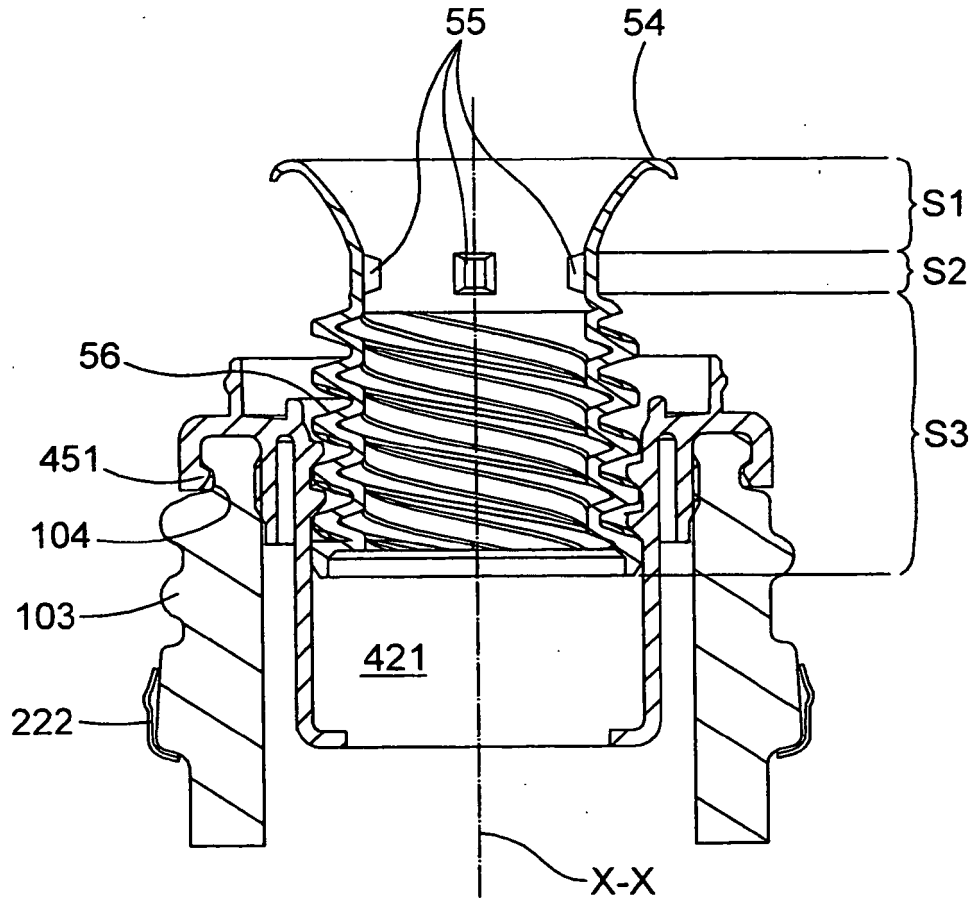


FIG.3

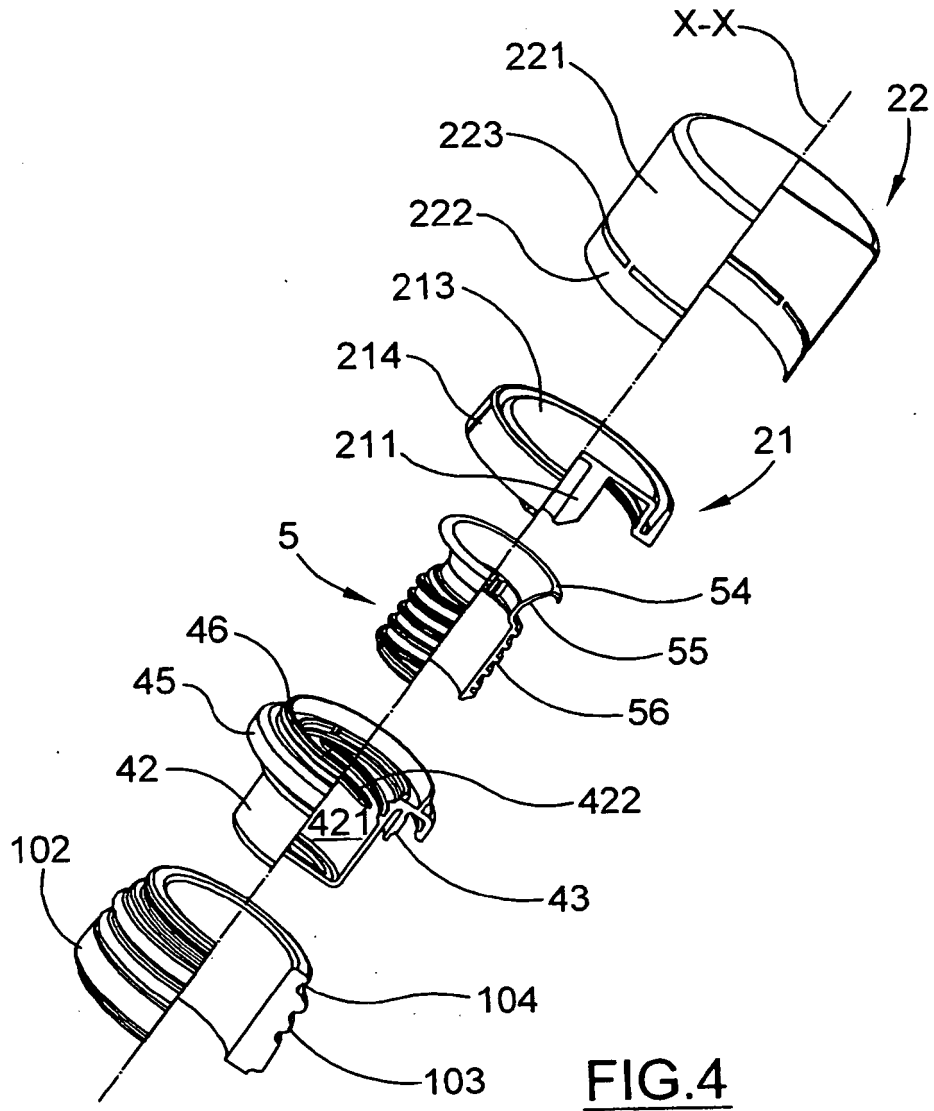


FIG. 4

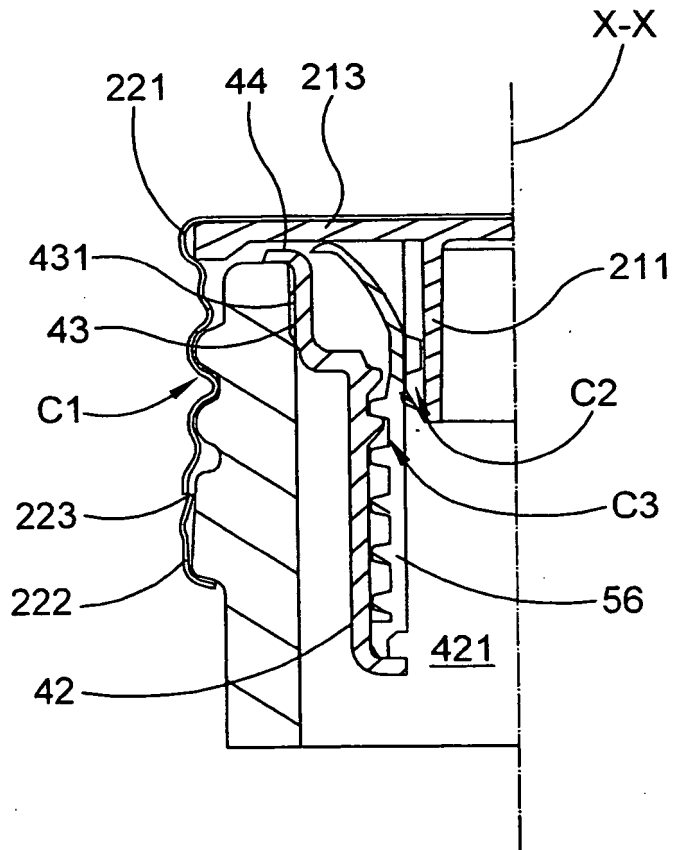


FIG.5

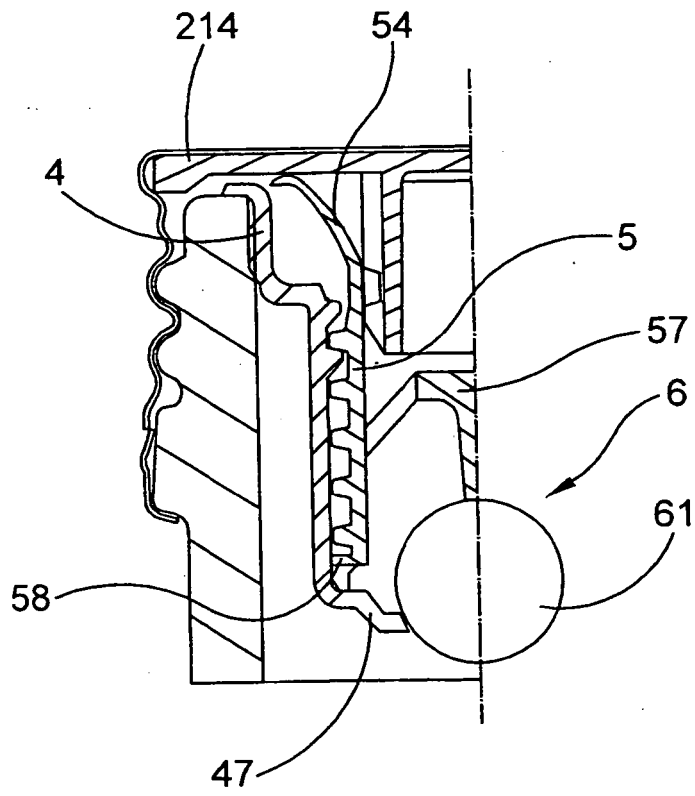


FIG. 6

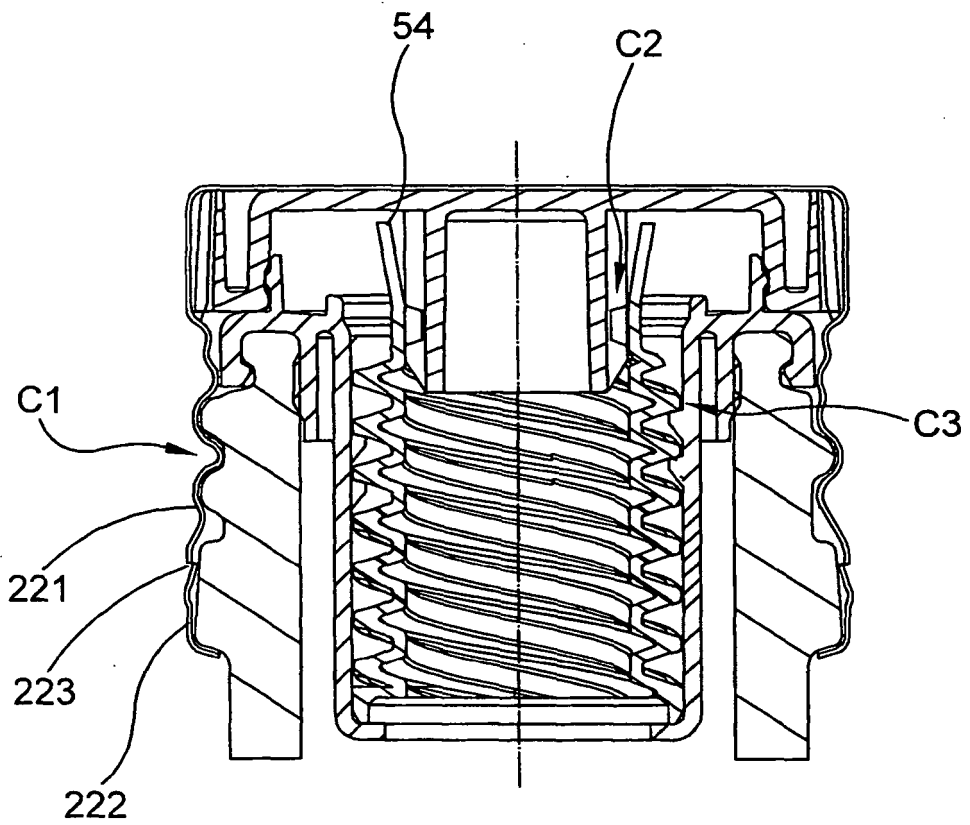


FIG. 7

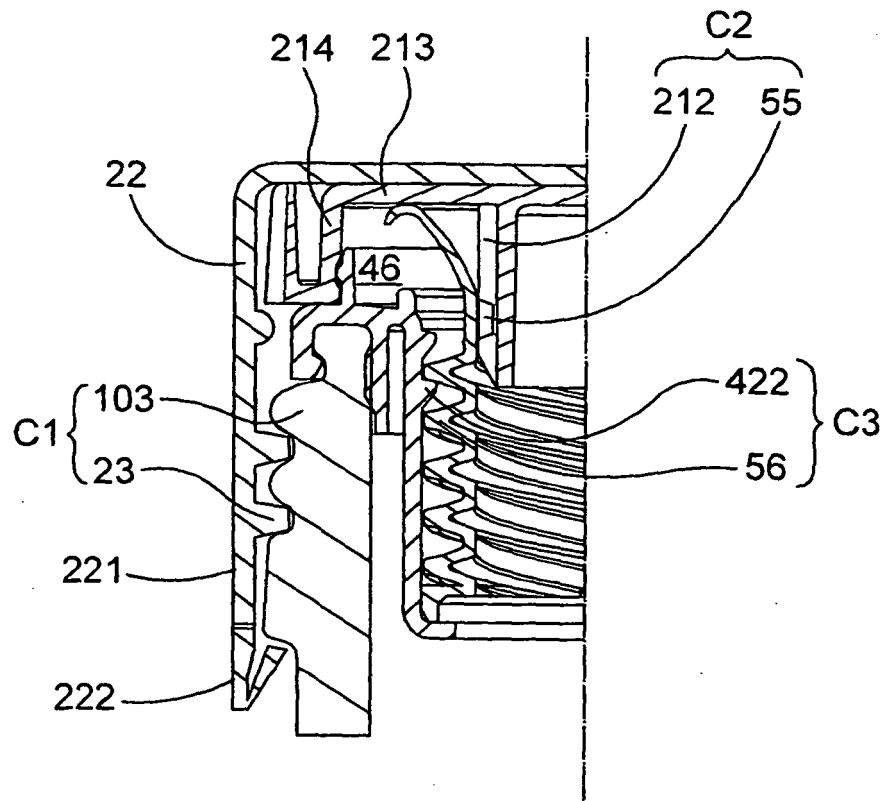


FIG.8

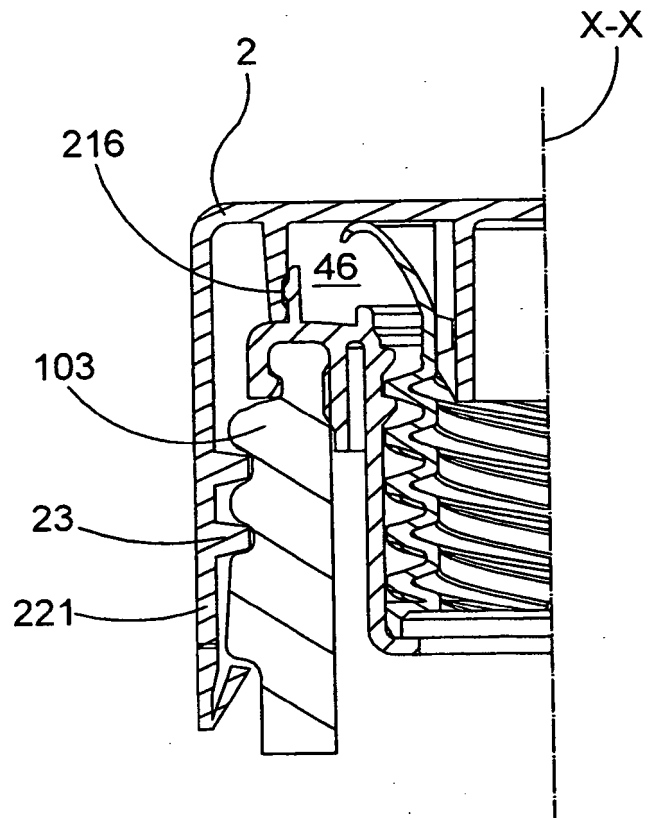


FIG.9

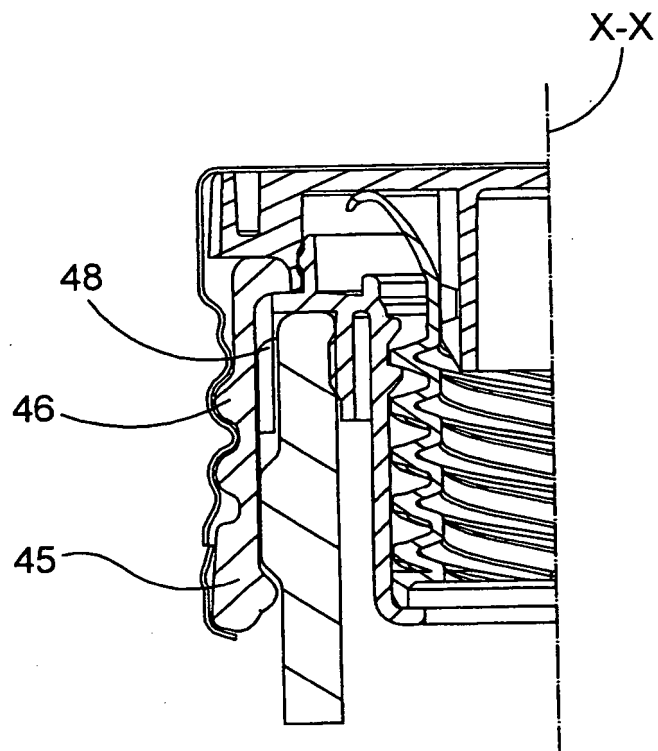


FIG.10

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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