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(54) **NON-REFILLABLE CLOSURE FOR THREADED MOUTHS**

EIN WIEDERAUFFÜLLEN VERHINDERNDER VERSCHLUSS FÜR GEWINDEMÜNDUNGEN

FERMETURE NON RÉUTILISABLE POUR EMBOUCHURES FILETÉES

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Description

[0001] The present invention relates to a non-refillable closure for containers which have a threaded mouth. Such a closure is known, e.g. by EP633195.

[0002] The containers of interest for the present invention, such as bottles for example, have a threaded mouth able to engage directly with the thread of the closure and, underneath the thread, the mouth has a collar able to allow engagement of means for preventing removal of the closure, so as to prevent complete separation of the closure from the container.

[0003] In bottles, the mouth is connected to the main body of the bottle by means of a neck which is normally smooth.

[0004] According to the closure disclosed in US3063589, a closure comprises one element which is made up by a lower sleeve internally threaded for engagement with the container and by an upper sleeve externally threaded for engagement with the closure cap. The two sleeves need to be separated by a horizontal ring, for ensuring liquid tightness, thus resulting in a very cumbersome closure, which is also complex to manufacture.

[0005] In the art, non-refillable closures are likewise known; an example is provided by the patent EP 1,511,677 B1 which describes a closure comprising a threaded pouring spout which is firmly engaged with the unthreaded mouth of the container.

[0006] In this case the thread of the pouring spout replaces that of the container mouth.

[0007] This type of closure increases the longitudinal extension of the container/closure assembly since the threaded portion of the pouring spout provides the engaging system for the external cap, but allows the use of valve systems, also of a sophisticated nature, able to prevent the unauthorised addition of liquid into the container.

[0008] However, it would be desirable to be able to apply non-refillable closures also onto threaded containers, so as not to have to increase the longitudinal extension of the container/closure assembly.

[0009] Nowadays closures which are externally smooth, namely without any outer beading, knurling or threading, are increasingly more in demand on the market; it would therefore be desirable to achieve the aforementioned aim on an externally smooth closure and, in order to rationalise the management of stocks in bottling plants, it would also be desirable to be able to apply onto the same (standard) bottle a normal smooth closure and a non-refillable smooth closure.

[0010] Lastly, it would be desirable to obtain at least some of the abovementioned advantages by means of a closure which has a simpler design.

[0011] In view of the described state of the art, the object of the present invention is to obtain a closure provided at least partly with at least one of the abovementioned desirable properties.

[0012] In accordance with the present invention this object is achieved by means of a closure according to Claim 1.

[0013] The characteristic features and advantages of the present invention will become clear from the following detailed description of a practical embodiment provided by way of a non-limiting example with reference to the accompanying drawings in which:

- Figure 1 shows a partially cut-away perspective view of a preferred embodiment of a closure according to the present invention, applied to a threaded mouth;
- Figure 2 shows a partially cut-away exploded view of some of the components of the closure according to Figure 1;
- Figure 3 shows two of the components of Figure 2, on a larger scale;
- Figure 4 shows a cross-section through the closure according to Figure 1;
- Figure 5 shows the cross-section according to Figure 4, after initial opening.

[0014] For the sole purposes of the present description, the axis X-X is defined as "main longitudinal axis". "Top" and "bottom" are defined with regard to the normal orientation of the container, i.e. with the mouth directed upwards, while the transverse or radial direction is that perpendicular to the longitudinal axis.

[0015] With reference to the figures, closure 1 comprises an internally and externally threaded sleeve 3. Preferably sleeve 3 comprises a first portion 37 on which threads 31, 32 and removal-prevention means 33 are formed, such that, when closure 1 is applied to mouth 102 of a container, sleeve 3 cannot be removed.

[0016] Removal-prevention means 33 comprise a bottom ring 332 fastened to first portion 37 via internal fastening means 333, preferably bridge-pieces with a sufficient tensile strength and rigidity to effectively prevent sleeve 3 from being pulled off the mouth 102.

[0017] Removal -prevention means 33 are such that, in order to apply sleeve 3 onto mouth 102 of container 1, no operation is necessary other than simple screwing of sleeve 3 onto mouth 102.

[0018] Advantageously, these removal-prevention means 33 are of the snap-engaging type and/or comprise one or more engaging tongues 331 able to engage against collar 104 of mouth 102.

[0019] Tongues 331 are formed so that, during screwing, the outer surface of collar 104 pushes them into a deformed configuration which allows the descending movement of sleeve 3 over mouth 102; after tongues 331 have passed over collar 104, they snap-engage back into their rest configuration where they are able to about against the bottom surface of collar 104 and effectively

prevent removal of closure 1 from mouth 102.

[0020] For this reason, inner surface 334 of tongues 331 preferably has an upwardly converging conical shape.

[0021] Advantageously, the annular part comprises two to six tongues 331, for example three or four.

[0022] Sleeve 3 therefore does not comprise any part which is designed to break during the normal operational use of closure 1.

[0023] In Figure 3 tongues 331 are visible between bridge-pieces 333, these being formed as upper lugs of bottom ring 332 projecting inside sleeve 3 and having a longitudinal extension slightly smaller than that of bridge-pieces 333.

[0024] Outer surface 335 of tongues 331 may define an empty volume with a radial extension advantageously at least equal to that of bridge-pieces 333, situated above bottom ring 332, this allowing tongues 331 to be deformed outwards.

[0025] Bottom end 35 of upper portion 37 comprises a conical outer surface, advantageously converging upwards, so as to co-operate with external capsule 5, as will be clarified below.

[0026] Sleeve 3 is advantageously threaded internally and externally only over a longitudinal section 36 which is smaller than the longitudinal extension of first portion 37; advantageously, the thickness of the wall of sleeve 3 is constant, except at the most for terminal portion 35 and for removal-prevention means 33. Inner thread 32 may therefore correspond to the threads of standard mouths (namely manufactured in accordance with the Standard UNI 9574 or standards equivalent thereto, such as, for example, the French standard GME 30.06).

[0027] The constant thickness also means that outer thread 31 and inner thread 32 have a reverse form with respect to each other.

[0028] Sleeve 3 comprises, advantageously at the top end, an annular portion 34 which is arranged in a transverse plane and has a radial extension greater than the thickness of mouth 102.

[0029] The closure 1 shown in the figures comprises a cap 2 having a cylindrical portion 21 with an inner thread 22. Cap 2 comprises furthermore a transverse wall 23 which is able to prevent the outflow of liquid from the container.

[0030] Thread 22 is such as to engage with outer thread 31 of sleeve 3.

[0031] Cap 2 may further comprise an inner ring 24 with the outer surface tapered so as to engage, as can be clearly seen in Figure 4, with part 41 of anti-refilling valve device 4.

[0032] Advantageously ring 24 has engaging means (not shown) able to engage with cage frame 41, preferably with inner annular portion 411 of cage frame 41, so as to support the weight of valve device 4 and of sleeve 3 during the operations involving movement of closure 1, so that the latter does not separate into its component parts.

[0033] An example of these engaging means may be an annular projection which engages in a corresponding groove, or equivalent systems.

[0034] Alternatively, said engagement may be achieved by forming the outer diameter D4 of upper flange 434 so that it engages with interference with the inner edge of sleeve 3.

[0035] In this case, outer diameter D4 of upper flange 434, when closure 1 is assembled, is substantially equal to bottom outer diameter D2 of annular portion 34 of sleeve 3.

[0036] The anti-refilling valve device 4, shown in Figures 2, 4 and 5, may comprise a cage 43 inside which a valve 42, preferably a ball valve, is inserted, and a cage frame 41 which, having a base wall 413, stops the upward travel of valve 42.

[0037] Cage 43 may have an upper flange 434. To said flange may be joined the rest of valve body 4, which for example comprises a substantially cylindrical main portion 433 to which a bottom end-of-travel surface 432, advantageously hemispherical in shape and having a bottom circular opening bounded by a longitudinal annular edge 431, is joined.

[0038] Advantageously there may be one or more ribs 435 inside cage 43, having the task of always leaving an aperture for the outflow of the liquid from the container independently of the orientation of the container itself.

[0039] As can be seen in Figures 4 and 5, cage frame 41 can be inserted, advantageously with interference, inside cage 43.

[0040] Upper flange 434 has a radial extension such as to be able to rest on top surface 105 of mouth 102 and comprises means for ensuring a liquid-tight seal.

[0041] As can be seen clearly from Figure 5, internal diameter D1 of annular portion 34 is advantageously smaller than minimum diameter D3 of upper flange 434 and even more advantageously is smaller than internal diameter D5 of outer annular portion 412.

[0042] External diameter D4 of upper flange 434 is advantageously smaller than or equal to bottom outer diameter D2 of annular portion 34.

[0043] Sleeve 3 may be made of rigid polymer material, such as, for example, PC, ABS, PP, etc.

[0044] Closure 1 is advantageously lined with an external capsule 5 (visible only in Figures 1, 4 and 5), preferably made of metal, for example aluminum.

[0045] Capsule 5 comprises a top cap 51 and a bottom skirt 52 which are preferably joined together by breakable bridge-pieces 53. However, it is also possible for top cap 51 and bottom skirt 52 to be separate from each other.

[0046] Advantageously, top cap 51 is mechanically fastened to cap 2 so as to make possible the normal opening and closing operations of closure 1. Bottom skirt 52 is longitudinally fastened with respect to sleeve 3, but may be free to rotate.

[0047] Advantageously, breakable bridge-pieces 53 may be alternated with tongues which rest on the outer surface of bottom end 35 so as to form an axial stop

between sleeve 3 and bottom skirt 52.

[0048] Advantageously bottom skirt 52 comprises removal-prevention parts 54, for example formed by tongues 55 projecting towards the inside of closure 1 at a height such that, when bottom skirt 52 is pulled upwards, top 56 of tongues 55 bears against the bottom surface of ring 332.

[0049] Alternatively, the longitudinal position of tongues 55 may be such that top 56 abuts against the bottom surface of bottom end 35 of sleeve 3. In this case sleeve 3 may be provided with a suitable annular seat which allows relative rotation between bottom skirt 52 and sleeve 3.

[0050] Downwards sliding of bottom skirt 52 is advantageously prevented by the fact that bottom skirt 52 abuts on neck 101 of the container.

[0051] Owing to this design of external capsule 5 it is possible to obtain a closure 1 which is externally smooth, which is particularly appreciated in the sector of high-quality liqueurs.

[0052] An alternative embodiment, not shown, envisages that tongues 55 are formed at the same height as bridge-pieces 53, instead of lower down.

[0053] Obviously, a person skilled in the art, in order to satisfy unforeseen and specific requirements, may make numerous modifications and variations to the configurations described above, all of which, however, are contained within the scope of protection of the invention as defined in the claims below.

Claims

1. Closure (1), for containers with a threaded mouth (102), comprising:

   - a valve device (4) inserted inside said mouth (102) so as to prevent the unauthorised introduction of liquid, said valve device (4) comprising an outer sleeve (433) having an upper flange (434) able to rest on the top surface (105) of said mouth (102),
   - a sleeve (3) which is threaded internally and externally, said sleeve (3) comprising an annular portion (34) arranged in a transverse plane and having a radial extension such as to be superimposed on said upper flange (434) above part of the top surface (105) of said mouth (102).

2. Closure (1) according to claim 1, in which said sleeve (3) comprises removal-prevention means (33) so that, when said closure (1) is applied to a mouth (102), said sleeve (3) cannot be removed from said mouth (102).

3. Closure (1) according to any one of the preceding claims, comprising a threaded cap (2) which is able to prevent the outflow of liquid from said container and which engages with the outer thread (32) of said sleeve (3).

4. Closure (1) according to any one of the preceding claims, in which said sleeve (3) is threaded internally and externally only over a longitudinal section (36) smaller than the longitudinal extension of said sleeve (3) .

5. Closure (1) according to any one of the preceding claims, in which the thickness of the wall of said sleeve (3) is constant along the entire threaded section (36).

6. Closure (1) according to claim 1, in which the minimum diameter (D1) of said annular portion (34) is smaller than the minimum diameter (D3) of said upper flange (434).

7. Closure (1) according to claims 1 or 6, in which the maximum diameter (D2) of said annular portion (34) is greater than or equal to the maximum diameter (D4) of said upper flange (434).

Patentansprüche

1. Verschluss (1) für Behälter mit Gewindemündung (102) umfassend:

   - eine in die Gewindemündung (102) eingefügte Ventilvorrichtung (4) zur Verhinderung eines unbefugten Einfüllens von Flüssigkeiten, wobei die Ventilvorrichtung (4) eine Außenhülse (433) mit einem Oberflansch (434) umfasst, der in der Lage ist, auf der Oberseite (105) der Gewindemündung (102) aufzuliegen,
   - eine Hülse (3) mit Innen- und Außengewinde, wobei die Hülse (3) einen ringförmigen Abschnitt (34) umfasst, der auf einer Querebene angeordnet ist und eine Radialausdehnung besitzt, um den Oberflansch (434) auf einem Teil der Oberseite (105) der Gewindemündung (102) zu überlagern.

2. Verschluss (1) nach Anspruch 1, wobei die Hülse (3) abzugsverhindernde Mittel (33) umfasst, so dass beim Aufsetzen des Verschlusses (1) auf die Gewindemündung (102) die Hülse (3) nicht von der Mündung (102) entfernt werden kann.

3. Verschluss (1) nach einem beliebigen der vorstehenden Ansprüche, umfassend eine Gewindekappe (2), die in der Lage ist, ein Auslaufen der Flüssigkeit aus dem Behälter zu verhindern und in das Außengewinde (32) der Hülse (3) eingreift.

4. Verschluss (1) nach einem beliebigen der vorste-

henden Ansprüche, wobei die Hülse (3) ein Innen- und ein Außengewinde nur über einen Längenabschnitt (36) aufweist, der kleiner als die Längenausdehnung der Hülse (3) ist.

5. Verschluss (1) nach einem beliebigen der vorstehenden Ansprüche, wobei die Hülse (3) über den gesamten Gewindeabschnitt (36) hinweg eine gleichbleibende Wanddicke aufweist.

6. Verschluss (1) nach Anspruch 1, wobei der Mindestdurchmesser (D1) des ringförmigen Abschnitts (34) kleiner als der Mindestdurchmesser (D3) des Oberflansches (434) ist.

7. Verschluss (1) nach Anspruch 1 oder 6, wobei der Höchstdurchmesser (D2) des ringförmigen Abschnitts (34) größer als der Höchstdurchmesser (D4) des Oberflansches (434) ist.

Revendications

1. Fermeture (1), pour des contenants avec une embouchure filetée (102), comprenant :

- un dispositif de vanne (4) inséré à l'intérieur de ladite embouchure (102) de manière à empêcher l'introduction non autorisée de liquide, ledit dispositif de vanne (4) comprenant un manchon externe (433) ayant une bride supérieure (434) en mesure de reposer sur la surface supérieure (105) de ladite embouchure (102),
- un manchon (3) qui est fileté à l'intérieur et à l'extérieur, ledit manchon (3) comprenant une partie annulaire (34) disposée dans un plan transversal et ayant une extension radiale telle à être superposée sur ladite bride supérieure (434) au-dessus d'une partie de la surface supérieure (105) de ladite embouchure (102).

2. Fermeture (1) selon la revendication 1, dans laquelle ledit manchon (3) comprend des moyens de prévention d'enlèvement (33) de sorte que, lorsque ladite fermeture (1) est appliquée à une embouchure (102), ledit manchon (3) ne puisse être enlevé de ladite embouchure (102).

3. Fermeture (1) selon une quelconque des revendications précédentes, comprenant un bouchon fileté (2) qui est en mesure d'empêcher l'écoulement de liquide à partir dudit contenant et qui s'engage avec le filetage externe (32) dudit manchon (3).

4. Fermeture (1) selon une quelconque des revendications précédentes, dans laquelle ledit manchon (3) est fileté à l'intérieur et à l'extérieur seulement sur une section longitudinale (36) plus petite que l'extension longitudinale dudit manchon (3).

5. Fermeture (1) selon une quelconque des revendications précédentes, dans laquelle l'épaisseur de la paroi dudit manchon (3) est constante tout le long de la section filetée (36).

6. Fermeture (1) selon la revendication 1, dans laquelle le diamètre minimum (D1) de ladite partie annulaire (34) est plus petit que le diamètre minimum (D3) de ladite bride supérieure (434).

7. Fermeture (1) selon les revendications 1 ou 6, dans laquelle le diamètre maximum (D2) de ladite partie annulaire (34) est plus grand ou égal au diamètre maximum (D4) de ladite bride supérieure (434) .

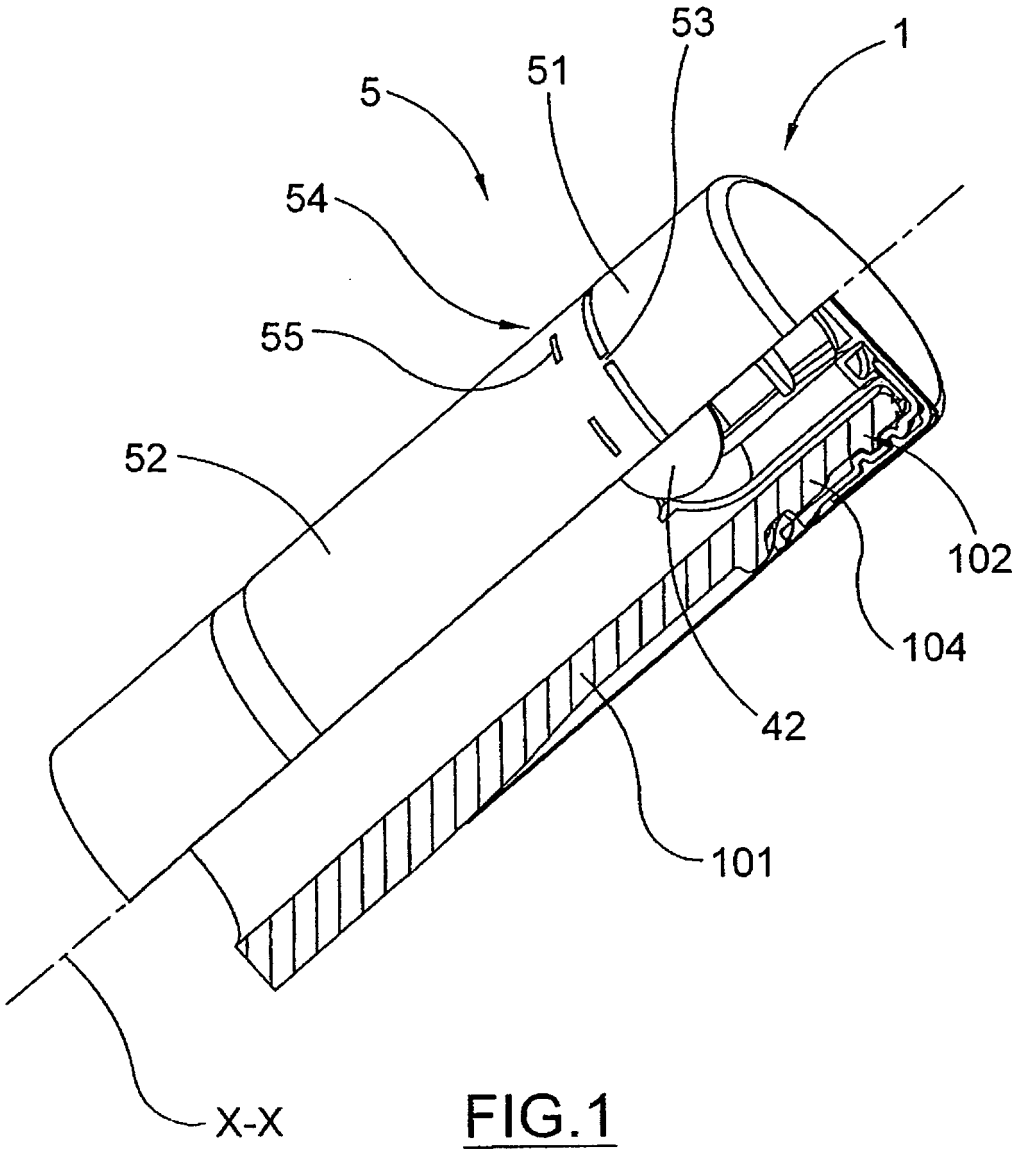


FIG.1

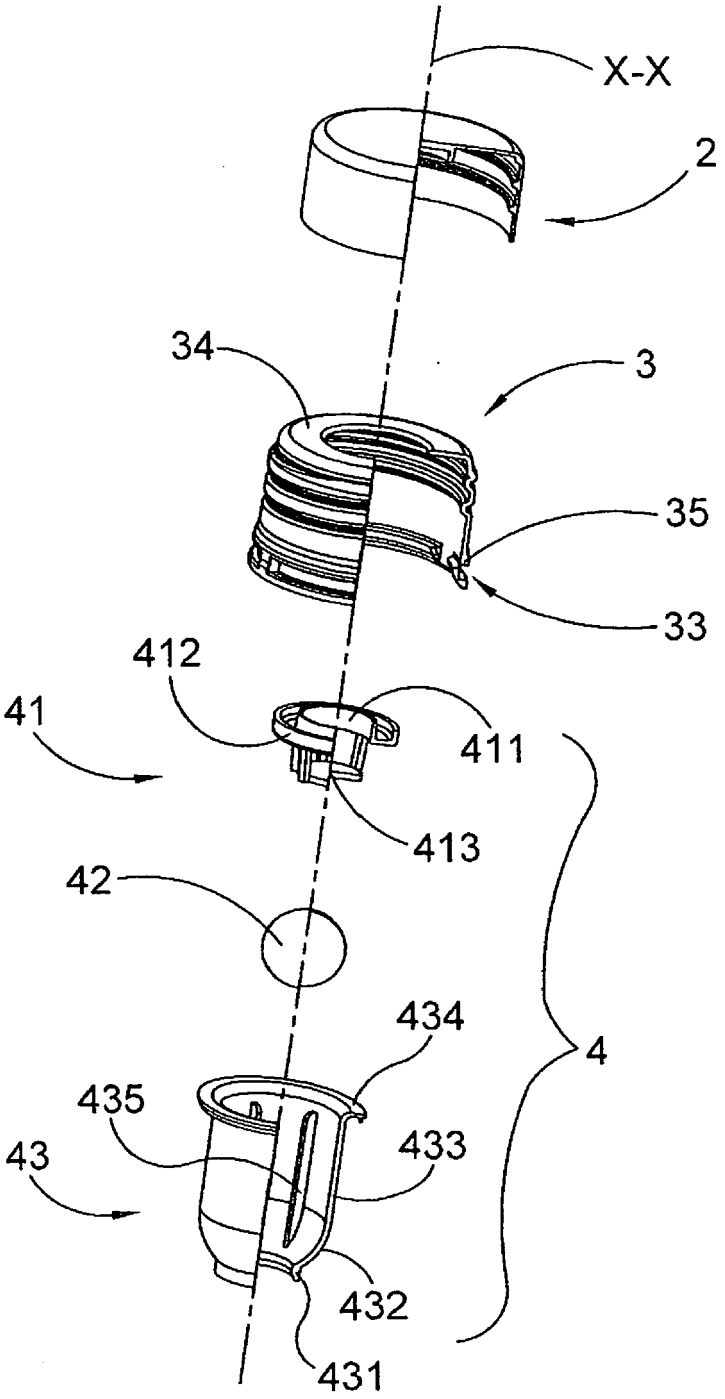


FIG.2

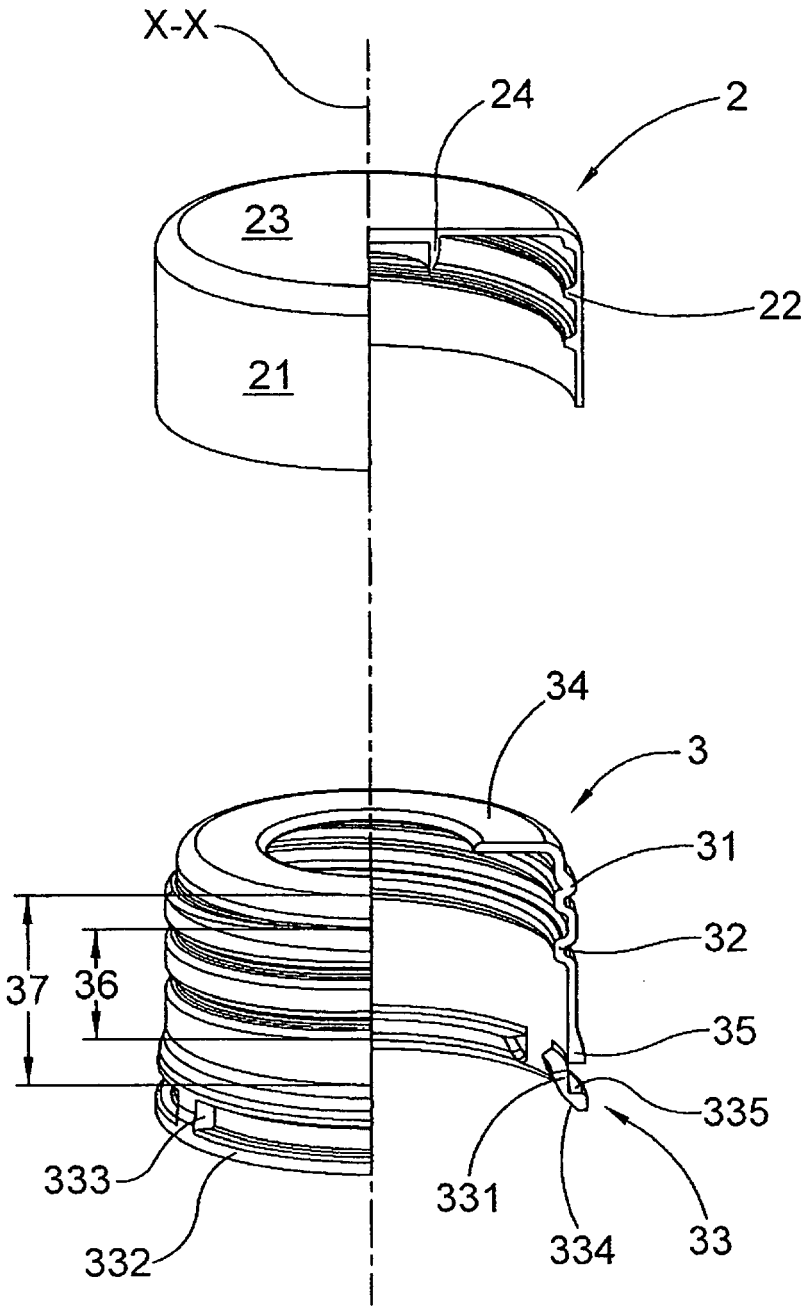
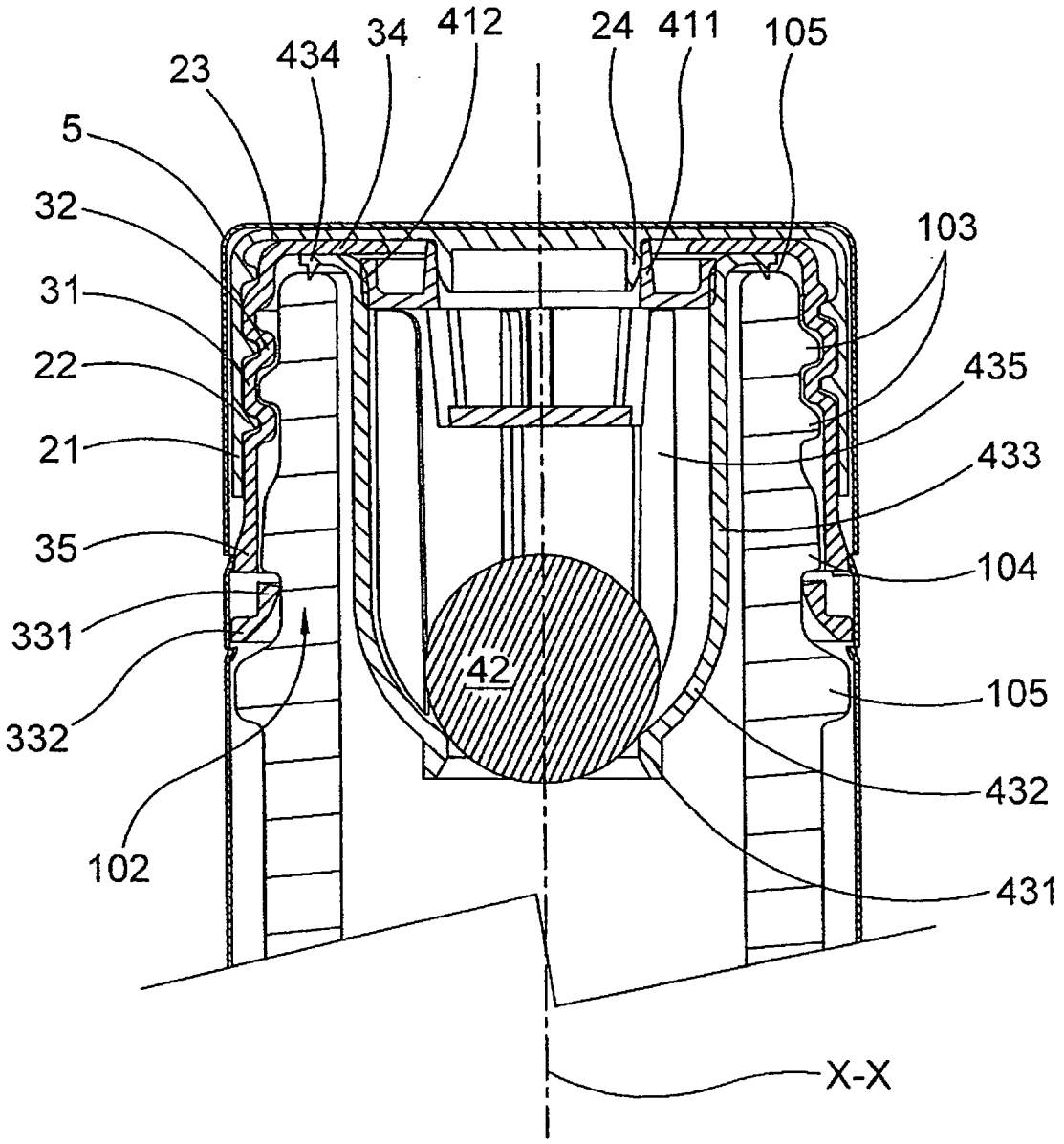


FIG.3


23
434
34
412
24
411
105
5
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22
21
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331
332
102
103
435
433
104
42
105
432
431
X-X

FIG.4

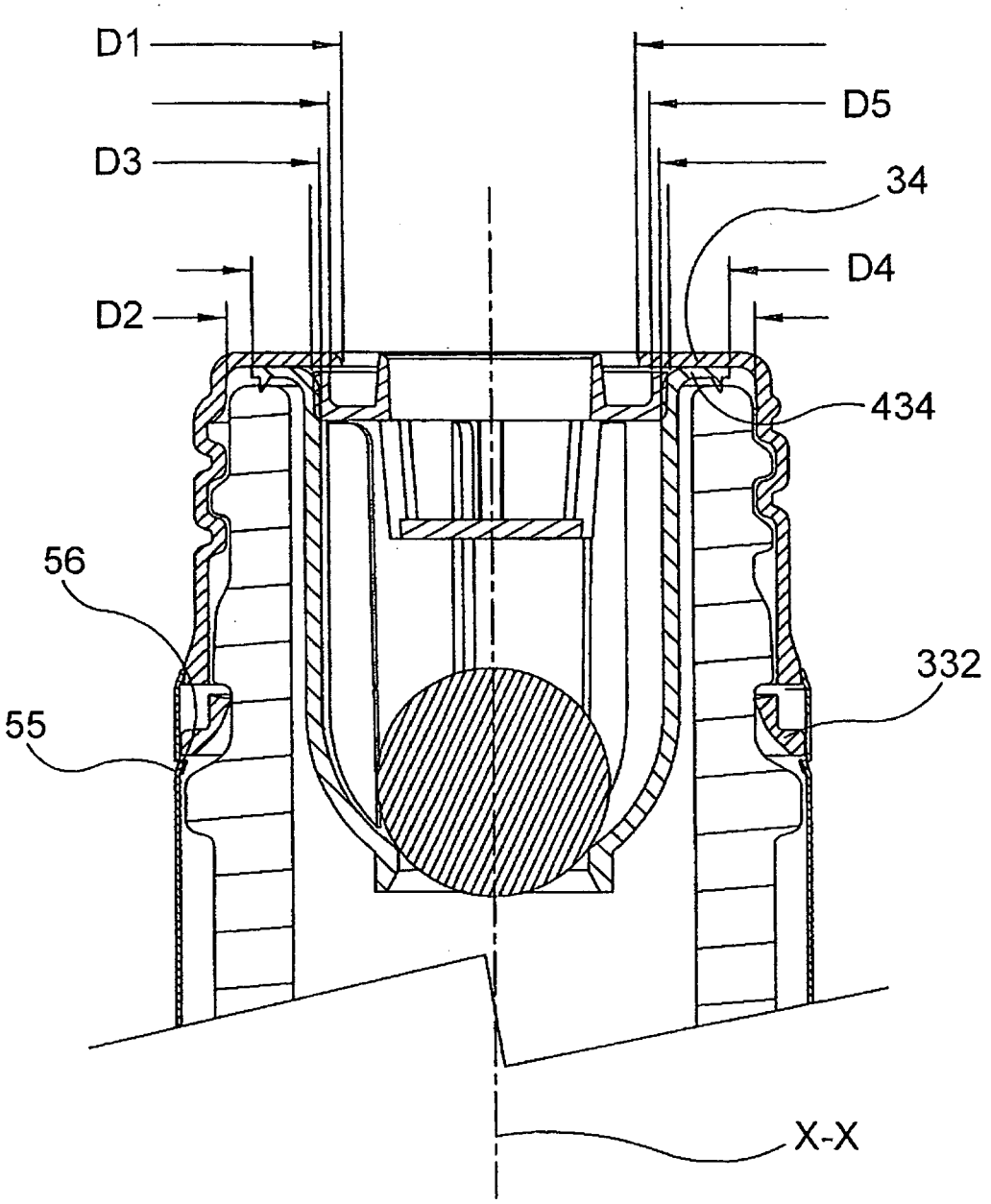

FIG.5

REFERENCES CITED IN THE DESCRIPTION

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