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(54) **A tamper evident closure for bottles containing valuable drinks**

(57) A tamper evident closure for a bottle having a neck (2) which extends axially along the longitudinal axis (X-X) of the bottle from the base (3) thereof, with which it is connected to the body of the bottle; the neck (2) having an opening (4) in the region of the free end (5) thereof; the closure comprising stoppering means (6) for the opening (4) of the neck (2), which means are connected by way of a threaded connection (8,9) to the outer surface of the wall (10) of a pourer body (11); the stoppering means (6) having a free circular edge (24) which is directed towards the body (1) of the bottle; a sleeve (17) which is arranged axially along the outer surface of the neck (2) and which is provided with means (18,19) for preventing axial and angular movement thereof with respect to the outer surface of the neck (2) as well as at least one annular flange (20) which extends radially in the opposite direction to the outer surface of the neck (2); the pourer body (11) being connected in an axial direction to the sleeve (17); as well as a tubular element (22), which is radially external with respect to the sleeve (17) and concentric therewith, extending axially substantially from the base (3) of the neck (2) of the bottle as far as the region of the free edge (24) of the stoppering means (6). The annular flange (20) of the sleeve is provided with at least one portion of the radial extent thereof that is positioned between the free edge (24) of the stoppering means (6) and at least one radial portion of the opposite axial end (25) of the tubular element (22) which is concentric with the sleeve (17).

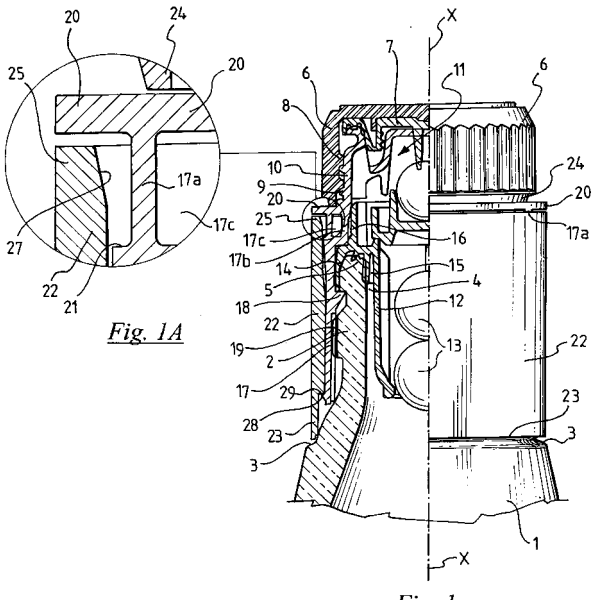

Fig. 1A

Fig. 1

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Description

[0001] The present invention relates to a tamper evident closure for a bottle, which is particularly suitable for containing valuable drinks,

- said bottle being provided with a neck which extends axially along the longitudinal axis (X-X) of the bottle from the base thereof, with which it is connected to the body of the bottle;
- said neck being provided with an opening in the region of the free end thereof;
- said closure comprising stoppering means for the opening of the neck, which means are connected by way of a threaded connection to the outer surface of the wall of a pourer body;
- said stoppering means being provided with a free circular edge which is directed towards the body of the bottle;
- a sleeve which is arranged axially along the outer surface of the neck and which is provided with means for preventing axial and angular movement thereof with respect to the outer surface of the neck as well as at least one annular flange which extends radially in the opposite direction to the outer surface of the neck;
- said pourer body being connected in an axial direction to the sleeve;
- as well as a tubular element, which is radially external with respect to the sleeve and concentric therewith, extending axially substantially from the base of the neck of the bottle as far as the region of the free edge of the stoppering means.

[0002] Closures of the above-indicated type are known in the art and are suitable for making visible attempts to forcibly remove them for fraudulent reasons, for example, those directed towards attempts to replace the original drink contained in the bottle with another counterfeit drink.

[0003] As is known, in order to commit the fraud, the operations carried out by the counterfeiters comprise, for example, obtaining an empty bottle which has already been used and which is provided with a relevant closure with a broken seal, but with the internal valve components intact, removing those components, re-filling the bottle with an equivalent drink, though of low value, and re-closing the bottle by reconstructing the seal.

[0004] In other cases, it has been found that, in order to defraud customers, attempts are sometimes made to remove the closure from the bottle without opening the closure itself so that the valuable product contained in the bottle can be replaced with another product of lesser value.

[0005] For the purposes of making it more difficult, if not impossible, for the counterfeiters to reconstruct the seal, there have been proposed closure structures in which the forcing action applied axially to a tubular element which is fitted externally to the closure and which extends from the base of the neck of the bottle as far as the region of the stopper, brings about cracking of the element itself, destruction of the continuity of the printing or staining of the outer surface thereof, thereby making the absence of integrity of the closure visible.

[0006] An example of closure which, in the event of tampering, behaves as set out above is illustrated in W02004/078612.

[0007] However, it has been found that in practice that known structure has the disadvantage that, following the attempt to tamper with the tubular element, the breaking thereof is brought about predominantly along continuous and localized lines, which allow, even though this is done with difficulty and not in a perfect manner, the edges of the breaking line to be brought back together, and therefore the seal to be reconstructed.

[0008] Given the above, the object of the present invention is to provide a closure for bottles which has tamper evident means which are even more effective than those belonging to known closures and which make the action of tampering as evident as possible and in an irreversible manner, by producing, in the event of tampering, multiple breakages which are distributed over a plurality of zones of the tubular element.

[0009] In accordance with the present invention, that object is achieved by means of a tamper evident closure for bottles, particularly for bottles containing valuable drinks in accordance with the characterising portion of claim 1.

[0010] The present invention allows the construction of a closure which is capable of making an attempt to break it open immediately visible in the case of attempts to take off or remove the closure device.

[0011] The features and advantages of the present invention will become clear from the following detailed description of a number of practical embodiments, illustrated by way of nonlimiting example with reference to the appended drawings, in which:

- Figure 1 is a side view, shown as a partial longitudinal section, of a first embodiment of a closure according to the invention;
- Figure 1A is an enlarged detail of the closure of Figure 1;
- Figure 1B is a perspective view of the internal portion of the tubular element of the closure of Figure 1;
- Figure 2 is a side view, shown as a partial longitudinal section, of a modified form of the closure of Figure 1;
- Figure 3 is a side view, shown as a partial longitudinal section, of another modified form of the closure of Figure 1;
- Figure 3A shows an enlarged detail of the closure of Figure 3;
- Figure 4 is a side view, shown as a partial longitudinal section, of a second embodiment of the closure according to the invention;
- Figure 5 is a side view, shown as a partial longitudinal

section, of a third embodiment of the closure according to the invention;

- Figure 5A shows an enlarged detail of the closure of Figure 5.

[0012] With reference to the above-mentioned Figures and in particular Figure 1, the body of the bottle is designated 1 and the neck of that bottle is designated 2. The neck 2 extends from the base 3 along the longitudinal axis X-X of the bottle. The neck 2 is provided with an opening 4 in the region of the free end 5 thereof. The closure comprises stoppering means which, in the embodiment illustrated, comprise a stopper in the form of a capsule 6 conventionally provided with a sub-stopper 7.

[0013] The capsule 6 is provided, at the interior thereof, with a thread 8 which engages with a corresponding thread 9 which is carried by the outer surface of the tubular wall 10 of a conventional pourer body generally designated 11.

[0014] There is received inside the neck 2 a tubular support 12 for holding valve components in the form of a ball 13 which allow, in a conventional manner, the liquid to be dispensed from the bottle towards the outer side and which impede the introduction thereof.

[0015] The tubular support 12 is secured to the edge of the end 5 of the neck 2 by means of a pair of concentric tubular sleeves 14 and 15 which are fixedly joined to the support 12 and which fit on the end 5, one at the outer side and the other at the inner side of the opening of the neck 2.

[0016] Another sleeve 16 which is fixedly joined to the tubular support 12 extends towards the capsule 6 coaxially relative to the axis X-X of the bottle.

[0017] The pourer body 11 fits axially on that sleeve 16 by means of the tubular wall 10 thereof.

[0018] The same pourer body 11, in the embodiment illustrated in Figure 1, is connected integrally, being constructed in one piece, with a sleeve 17 which is provided with means 18 for preventing axial movement thereof with respect to the neck 2 and means 19 for preventing angular movements thereof with respect to that neck 2 of the bottle.

[0019] Since these are conventional means, they will not be further described.

[0020] As can best be seen in Figure 1A, the sleeve 17 is provided with an annular flange 20 which extends radially in the opposite direction to the outer surface of the neck 2. The structure of the closure according to the invention further comprises a tubular element 22 which is radially external relative to the sleeve 17 and which is fitted thereon in a concentric manner.

[0021] That tubular element 22, whose internal portion is shown as a perspective view in Figure 1B, extends axially substantially from the base 3 of the neck 2, where it has its first end 23, as far as the region of the free edge 24 of the capsule 6, where it has its second free end 25. The wall of the tubular element 22 has a central zone having a thickness greater than the thicknesses that the same wall has gradually moving from that central zone to the free end 25.

[0022] In accordance with the invention, the annular flange 20, with at least a portion of the radial extent thereof, is positioned between the free edge 24 of the stoppering capsule 6 and at least a radial portion of the axial end 25 of the tubular element 22.

[0023] In the construction of the closure in accordance with that illustrated in Figure 1, the tubular element 22 has a smooth cylindrical outer surface and the end 25 thereof is positioned completely below the flange 20.

[0024] With further reference to the construction according to Figures 1, 1A and 1B, it should be noted that the tubular element 22, in the region of the end 25, has a plurality of axial incisions 26 which, as will be better appreciated from the remainder of the description, contribute, in the event of tampering with the closure, to bringing about the breaking of the tubular element 22 in a plurality of points with fragmentation of portions of wall.

[0025] The tubular element 22 further has a portion 27 of the cylindrical inner surface thereof that is widened towards that same end 25 in order to promote the assembly of the pieces. In the case of Figure 1, the widening has a conical profile although, in the alternative, the same widening could have an arcuate profile with the concavity directed towards the inner side of the tubular element 22.

[0026] The structure is complemented by the presence of means for axially connecting the tubular element 22 to the sleeve 17 underneath. Those means in the construction of Figure 1 are constituted by a circumferential edge 28 which is provided on the sleeve 17 and by a corresponding step 29 which is provided in the internal wall of the tubular element 22 in the region of the end 23 thereof.

[0027] They can be replaced by simple dimensional interference between the diameters of the element 22 and the sleeve 17.

[0028] Another small radial flange 21 is provided in a position that is axially spaced-apart from the flange 20, in the direction of the base 3 of the neck 2. That additional radial flange 21 is directed towards the internal wall of the tubular element 22 in the region in which it begins to become inclined towards the central zone of greater thickness of the wall of the tubular element itself.

[0029] The flange 20 is spaced apart axially from the flange 21 by means of an annular wall 17b which forms a single member with the wall 10 of the pourer 11 and the sleeve 17.

[0030] Between those flanges 20 and 21, there are arranged a plurality of small axial bars 17a, with the ends fixedly joined to both the flanges, which are spaced apart from each other in a circumferential direction and which define, with the wall 17b, an annular space for weight reduction 17c.

[0031] Those small axial bars 17a act as pull-rods on the flange 20 when the flange 20 has to be pressed axially towards the stopper 6 by the tubular element 17 in the event of an attempt to tamper with the closure.

[0032] For purposes of the functionality of the seal as a security means to counter attempts to fraudulently remove the entire closure by sliding it from the neck of the bottle, the flange 20, and consequently in accordance with the construction of Figure 1, the pourer body as well as the sleeve 17, are composed of a plastics material which is highly resistant, such as, for example, a polycarbonate.

[0033] The tubular element 22 can be produced from a material which is rigid but very fragile or from a material which is malleable and deformable in a permanent manner.

[0034] As a result, in any attempt to axially slide off the tubular element 22, the end 25 thereof is constrained, in order to pass the flange 20, to undergo radial widening. That widening inevitably brings about, depending on the material from which the tubular element 22 is produced, the breaking of the element 22 in a plurality of zones, or permanent deformations of such a magnitude as to make the element 22 visibly unusable in order to fraudulently reconstitute a closure which may appear intact and original.

[0035] With reference to Figure 2, it will be appreciated that the closure comprises a tubular element 22 whose outer surface has a profile which is formed by a step 22a. The closure of Figure 2 also includes a strip 30 of paper material which is wound so as to be astride the tubular element 22 and the base 3 of the neck 2 so as to make the lower edge of the tubular element, to which any axial force is applied in order to attempt to fraudulently slide it from the neck of the bottle, inaccessible unless that paper strip 30 has previously been damaged.

[0036] With reference to Figures 3 and 3A, it is apparent that the tubular element 22 of the closure has the end 25 modified with respect to the construction of Figure 1 by the presence of a circumferential edge 25a which encloses the flange 20 radially from the outer side.

[0037] Now with reference to Figure 4, it will be appreciated that the sleeve 17 is provided with the single flange 20 produced integrally with the pourer body 11.

[0038] With reference to Figure 5 and Figure 5A, the closure according to the invention is in another embodiment modified with respect to the above-described embodiments, wherein the pourer body 11 is no longer integral with the sleeve 17, but is instead connected thereto by way of engaging means.

[0039] Those means are constituted by the opposed axial abutments 20a and 10a which are formed on the flange 20 and the wall 10 of the pourer body 11, respectively, as well as by the opposed radial abutments 20b and 10b which are also formed on the flange 20 and the wall 10 of the pourer body 11, respectively.

[0040] The tubular element 22 has its outer surface shaped in different manners, with annular protrusions 22b and annular recesses 22c having a purely aesthetic function.

[0041] The operative manner of the closures described with reference to Figures 2 to 5 with respect to means for combating possible break-in attempts remains the same as that already illustrated with reference to the closure of Figure 1, and repetition thereof is therefore considered to be unnecessary.

[0042] Naturally, the materials and the dimensions may vary in accordance with requirements without thereby departing from the scope of the invention as claimed below.

Claims

1. A tamper evident closure for a bottle, which is particularly suitable for containing valuable drinks,

- said bottle (1) being provided with a neck (2) which extends axially along the longitudinal axis (X-X) of the bottle from the base (3) thereof, with which it is connected to the body of the bottle;
- said neck (2) being provided with an opening (4) in the region of the free end (5) thereof;
- said closure comprising stoppering means (6) for the opening (4) of the neck (2), which means are connected by way of a threaded connection (8,9) to the outer surface of the wall (10) of a pourer body (11);
- said stoppering means (6) being provided with a free circular edge (24) which is directed towards the body (1) of the bottle;
- a sleeve (17) which is arranged axially along the outer surface of the neck (2) and which is provided with means (18, 19) for preventing axial and angular movement thereof with respect to the outer surface of the neck (2) as well as at least one annular flange (20) which extends radially in the opposite direction to the outer surface of the neck (2);
- said pourer body (11) being connected in an axial direction to the sleeve (17);
- as well as a tubular element (22), which is radially external with respect to the sleeve (17) and concentric therewith, extending axially substantially from the base (3) of the neck (2) of the bottle as far as the region of the free edge (24) of the stoppering means (6);

characterized in that said annular flange (20) of the sleeve is provided with at least one portion of the radial extent thereof that is positioned between the free edge (24) of the stoppering means (6) and at least one radial portion of the opposite axial end (25) of said tubular element (22) which is concentric with the sleeve (17).

2. A tamper evident closure according to claim 1, **characterized in that** said tubular element (22) which is concentric with the sleeve (17), in the region of the end (25) thereof directed towards the free edge (24)

of the stoppering means (6), has a portion (27) of the cylindrical inner surface thereof provided with a plurality of incisions (26).

3. A tamper evident closure according to claim 2, wherein the incisions (26) are arranged axially.

4. A tamper evident closure according to claim 1, **characterized in that** said tubular element (22) which is concentric with the sleeve (17), in the region of the end (25) thereof directed towards the free edge (24) of the stoppering means (6), has a portion (27) of the cylindrical inner surface thereof that is widened towards that end.

5. A tamper evident closure according to claim 2, **characterized in that** said cylindrical inner surface of the tubular element (22) is widened in accordance with a conical profile.

6. A tamper evident closure according to claim 4, **characterized in that** said cylindrical inner surface of the tubular element (22) is widened in accordance with an arcuate profile with the convexity directed towards the inner side of the tubular element.

7. A tamper evident closure according to claims 1 to 6, **characterized in that** said pourer body (11) is in one piece with the sleeve (17).

8. A tamper evident closure according to claims 1 to 6, **characterized in that** said pourer body (11) is connected to the sleeve (17) by means of axial abutments (10a, 20a) and radial abutments (10b, 20b) which are formed on the sleeve (17) and the pourer body (11), respectively, and which are engaged with each other.

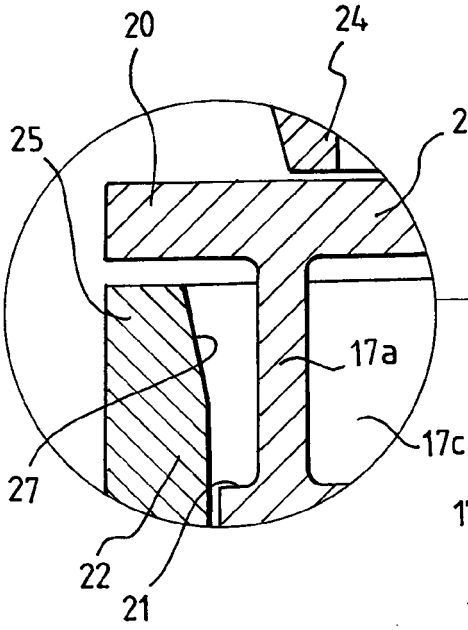
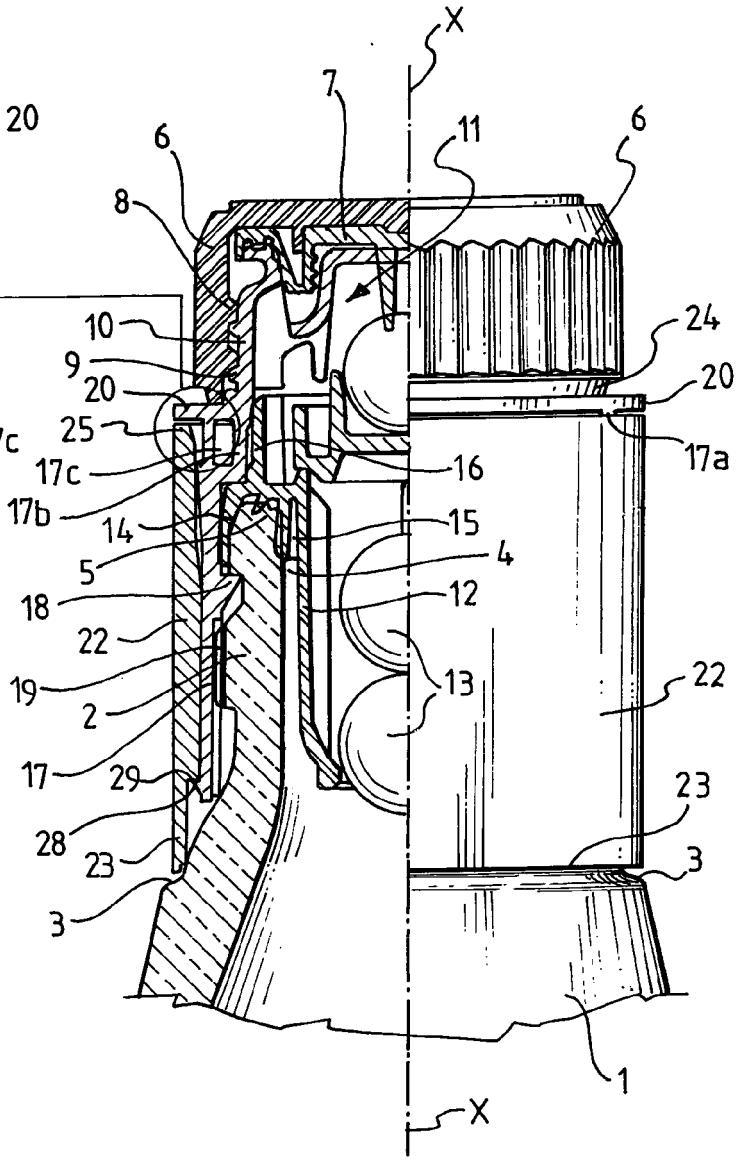

20
24
25
20
17a
17c
27
22
21

Fig. 1A


X
7
6
11
6
8
10
9
20
25
17c
17b
14
5
18
22
19
2
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17a
16
15
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12
13
22
23
3
1
X

Fig. 1

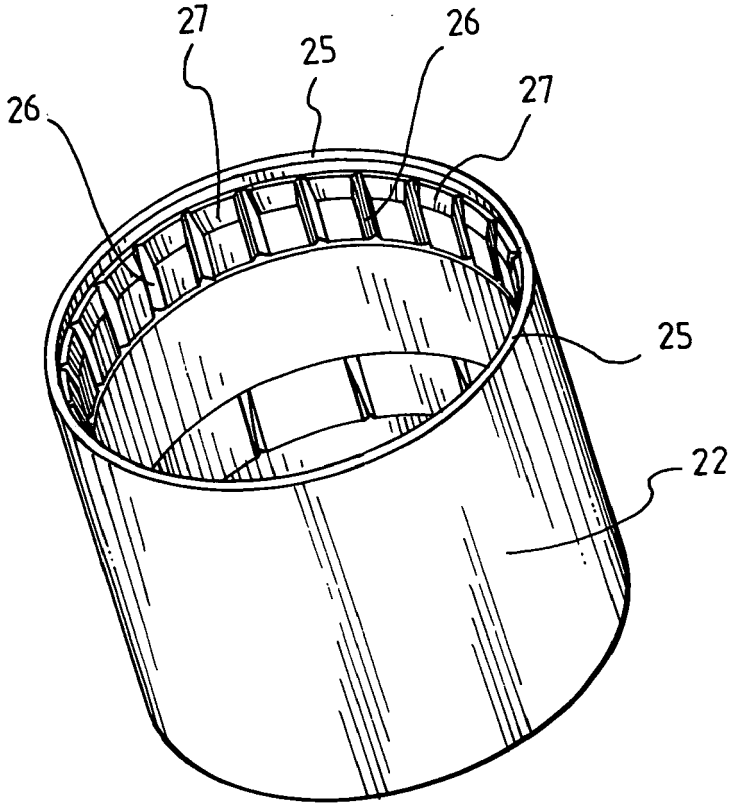
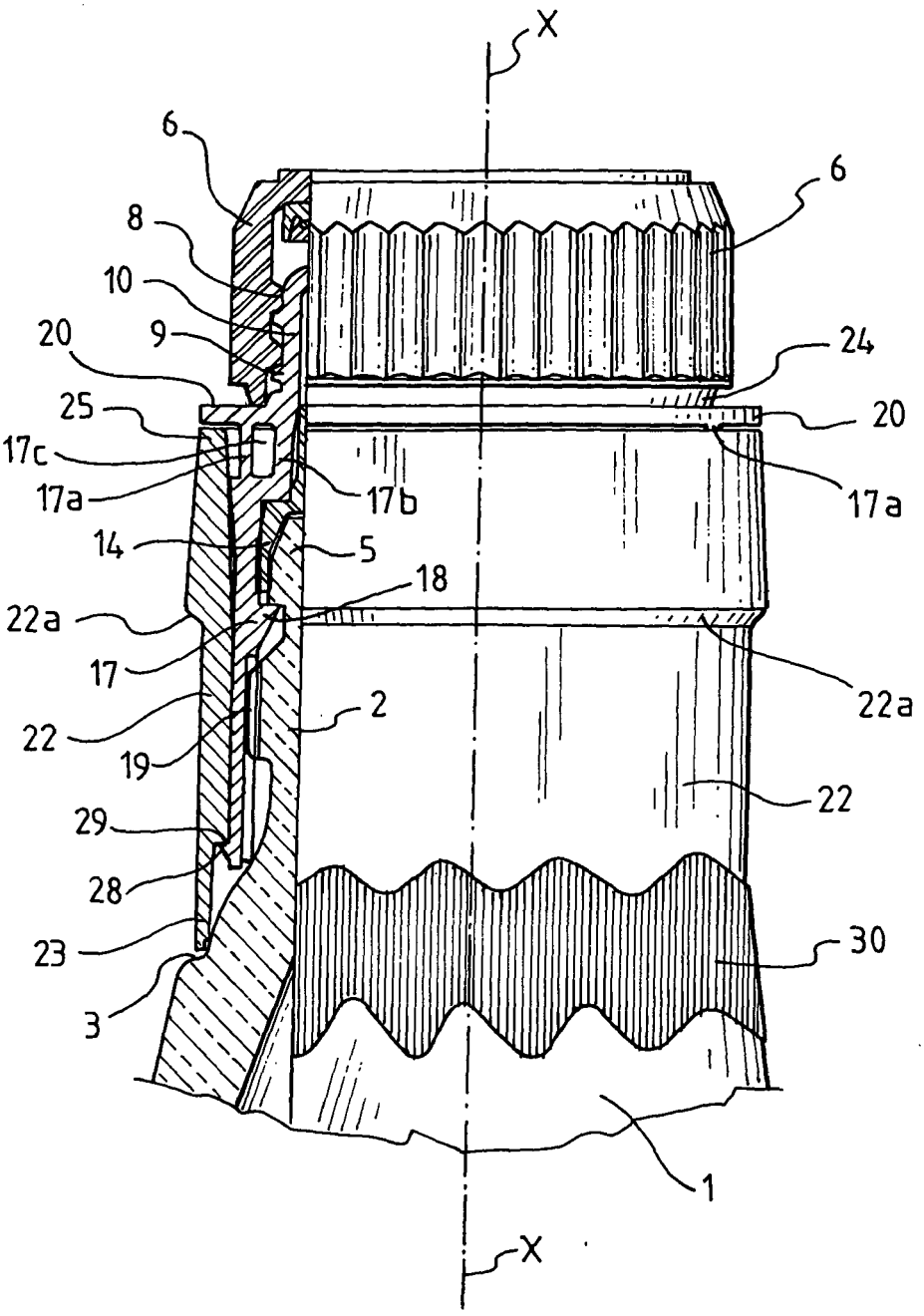


Fig. 1B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8
10
9
20
25
17c
17a
14
22a
17
22
19
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24
20
17a
17b
5
18
22a
2
22
30
1
X

Fig. 2

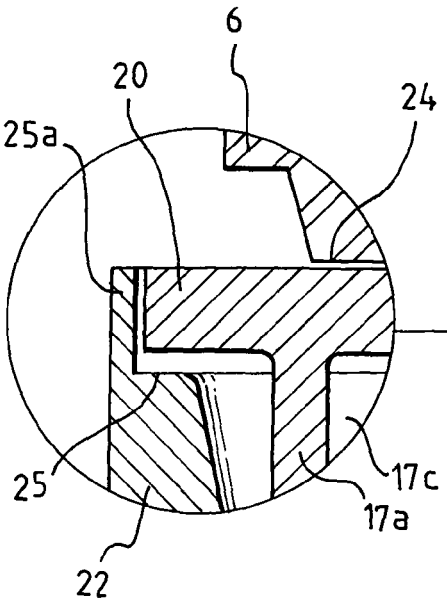
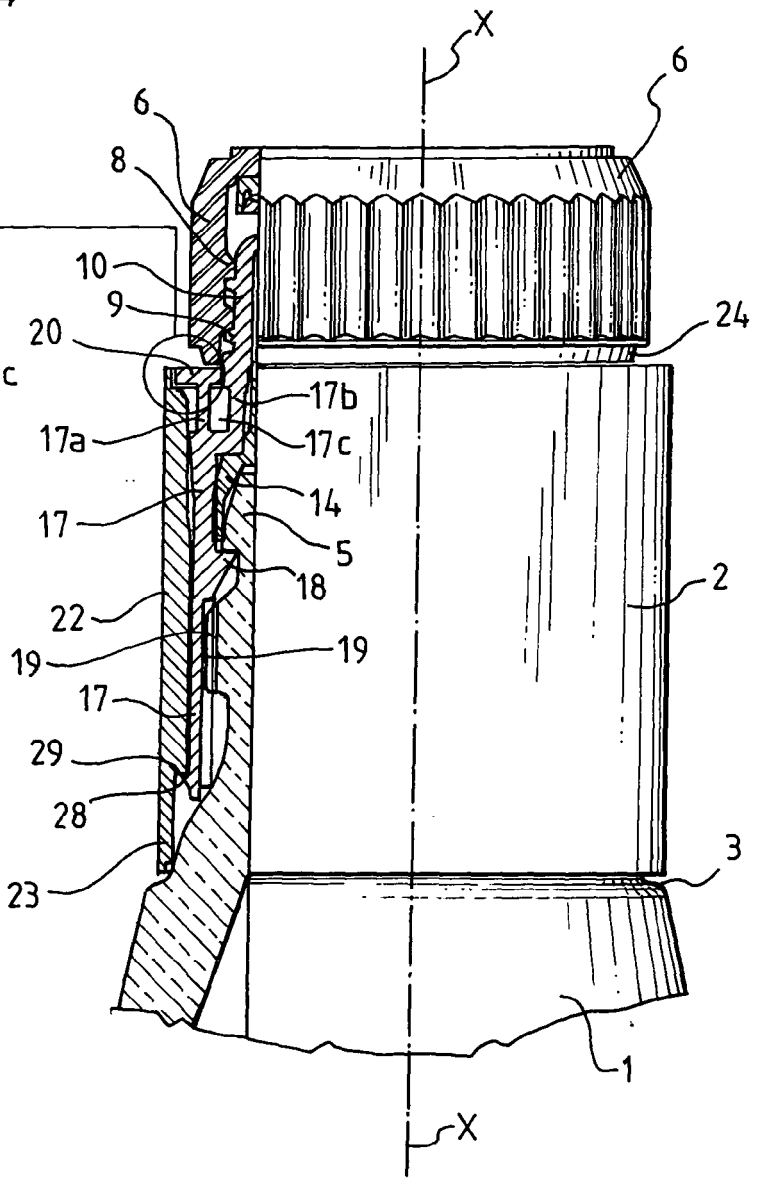

6
20
24
25a
25
22
17c
17a

Fig. 3A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6
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10
9
20
24
17b
17a
17c
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18
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22
19
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29
28
3
23
1
X

Fig. 3

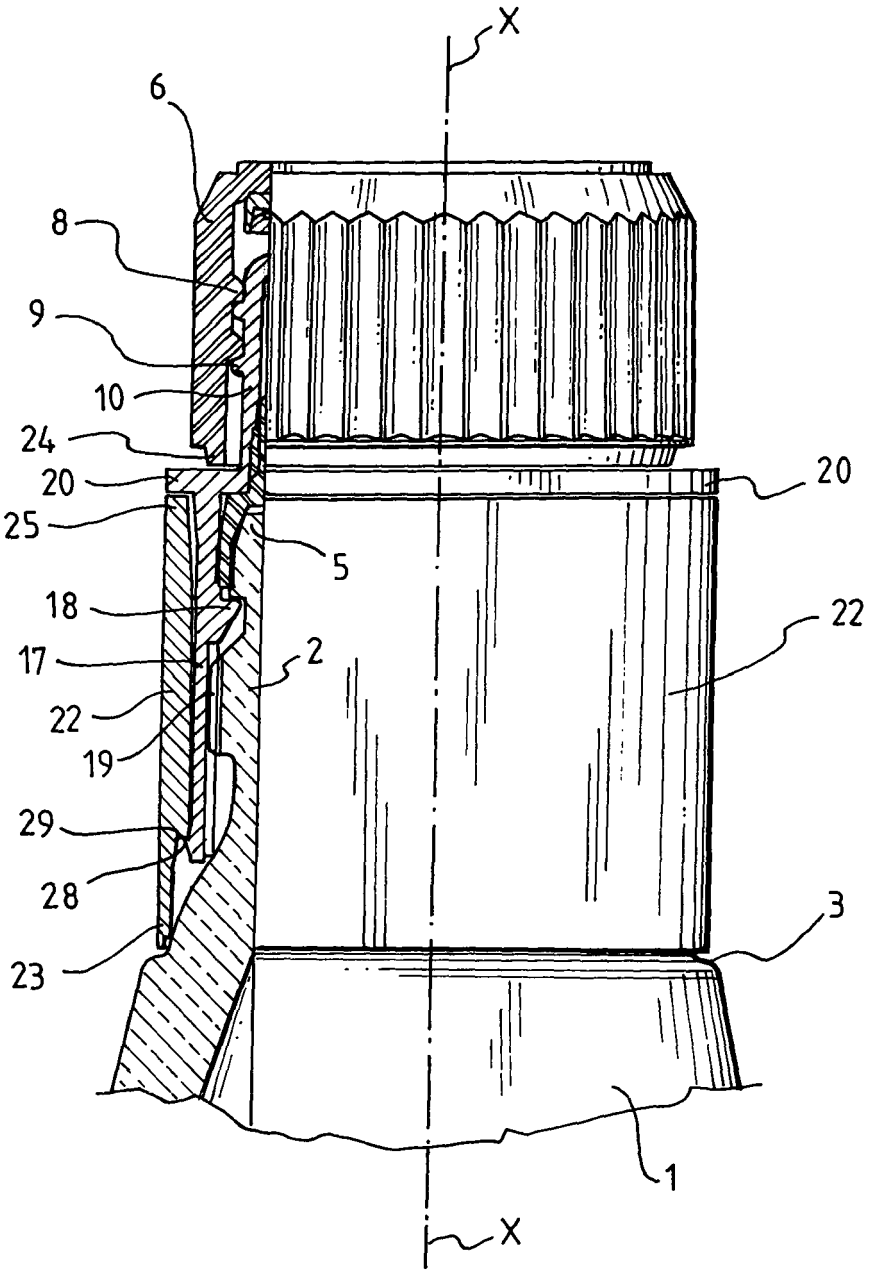

Fig. 4

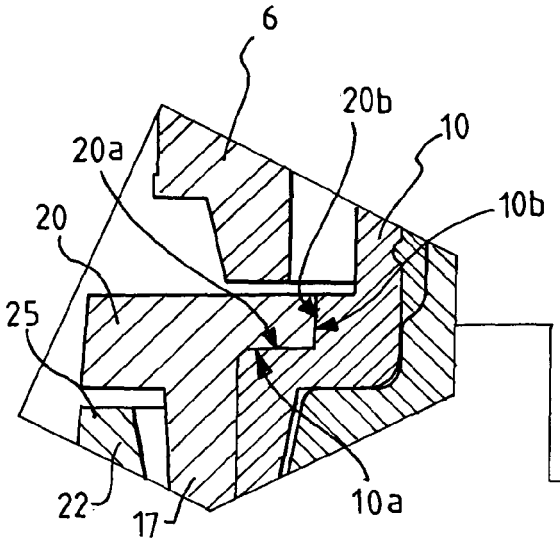
6
20b
10
20a
10b
20
25
22
17
10a

Fig. 5A

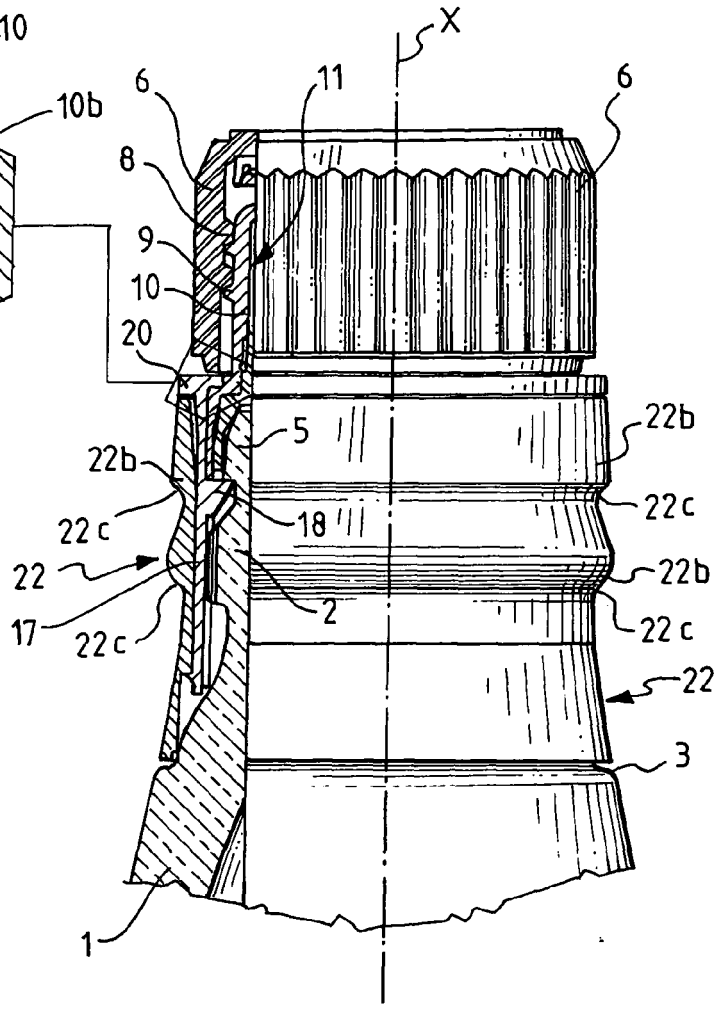
X
6
11
6
8
9
10
20
5
22b
22b
22c
18
22c
22
22b
2
17
22c
22c
22
3
1

Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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