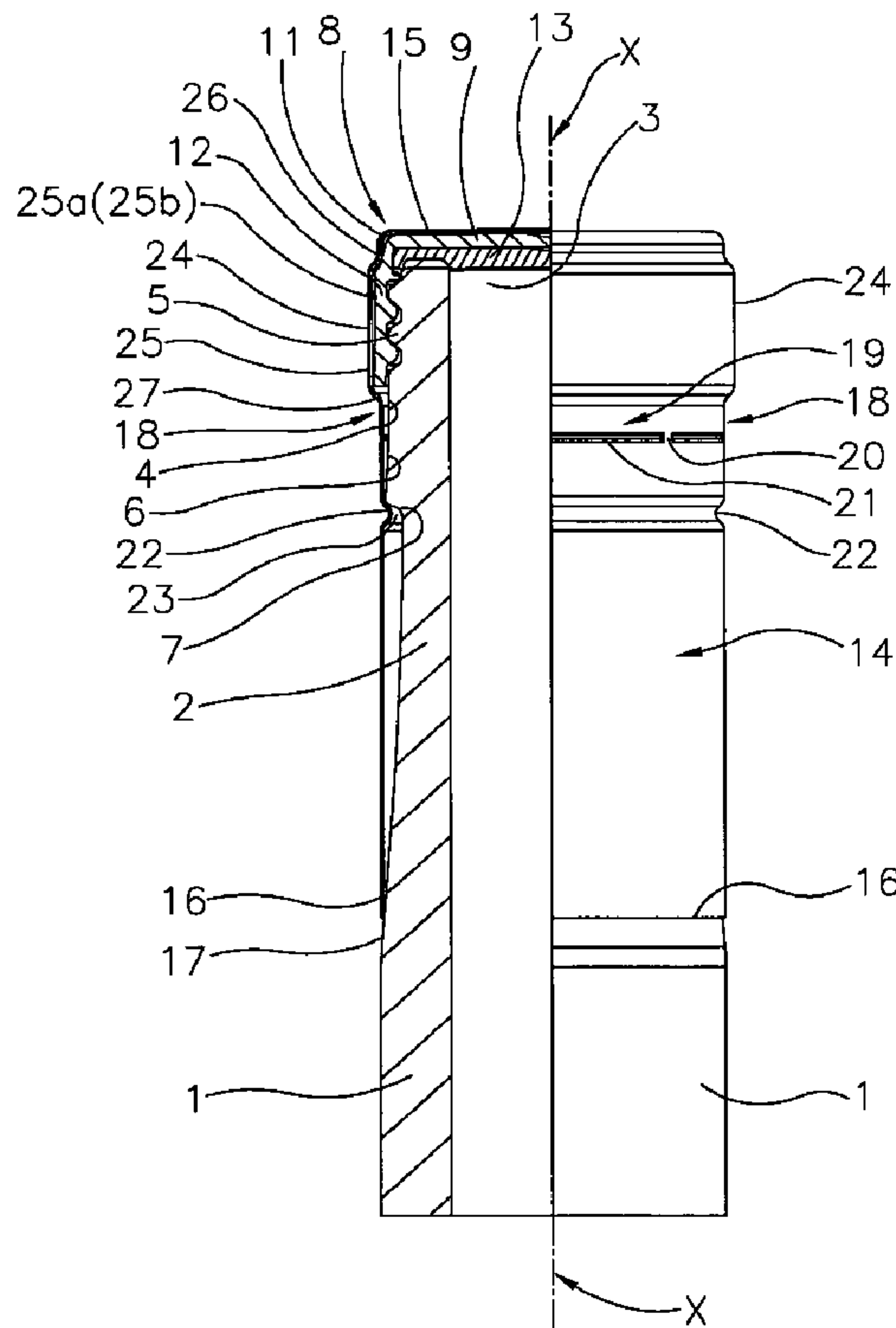




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(54) Titre : SYSTEME DE FERMETURE DE BOUTEILLE
 (54) Title: BOTTLE CLOSURE



(57) Abrégé/Abstract:

Closure for a bottle comprising an inner cap of plastics material having an end wall (9) and a tubular skirt (10) which is provided with an internal thread (12) which engages a corresponding thread (5) provided on the neck of the bottle; an outer cap (14) of sheet

(57) **Abrégé(suite)/Abstract(continued):**

metal which covers the said inner cap and which is fixed to the neck of the bottle by fixing means (22), wherein at least one circular weakening line (19) is provided in the said sheet metal outer cap (14); the said outer cap (14) has a tubular shape and is provided with an annular enlargement (24) forming an inner annular channel (25) delimited by corresponding axial end stops (26, 27); said channel (25) faces the tubular skirt (10) of the inner cap which is provided with an annular thickening (28) extending radially and axially, wherein the said thickening (28) is delimited by corresponding axial end stops (29, 30) and is force-fitted into the said channel (25).

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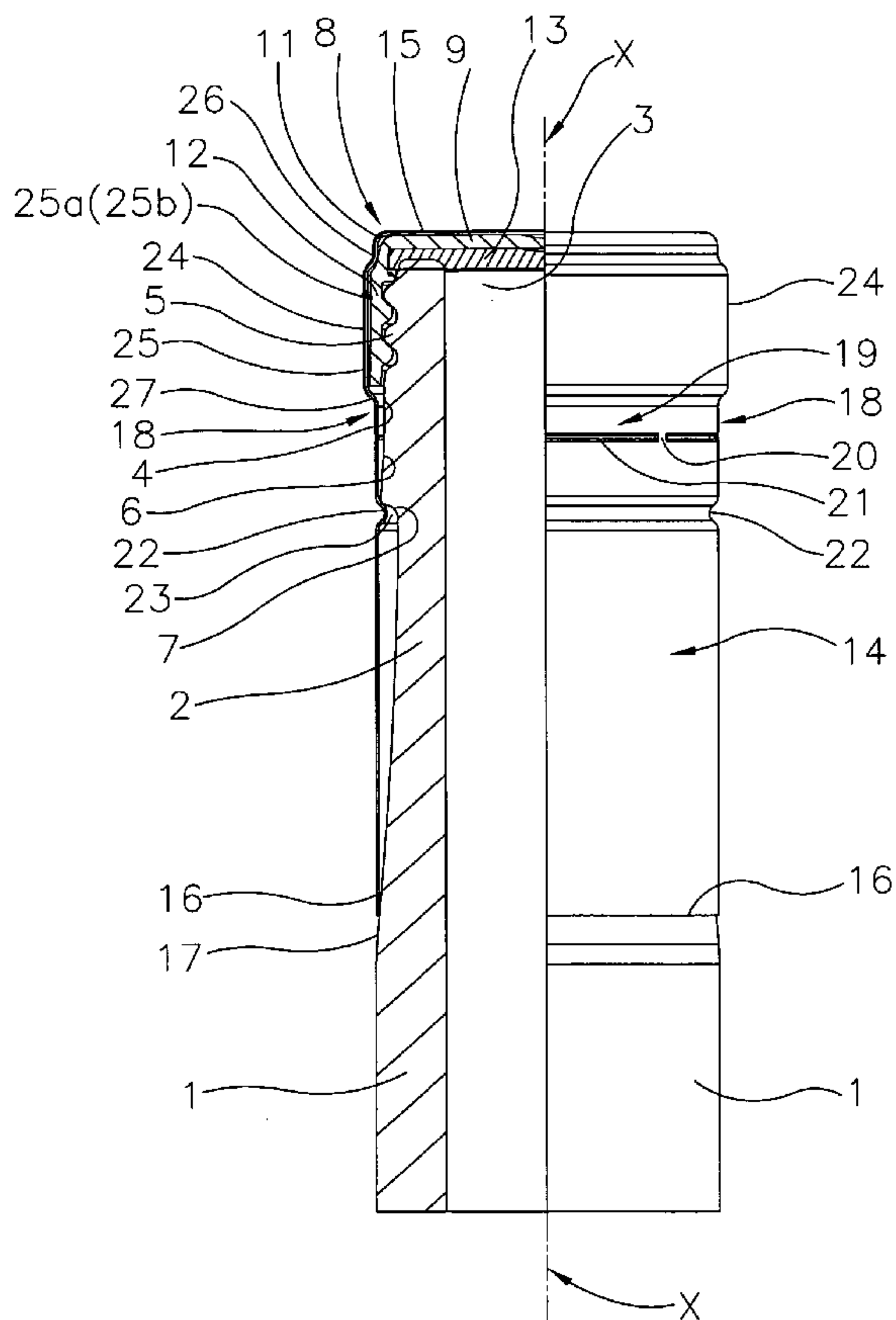
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(54) Title: BOTTLE CLOSURE



(57) Abstract: Closure for a bottle comprising an inner cap of plastics material having an end wall (9) and a tubular skirt (10) which is provided with an internal thread (12) which engages a corresponding thread (5) provided on the neck of the bottle; an outer cap (14) of sheet metal which covers the said inner cap and which is fixed to the neck of the bottle by fixing means (22), wherein at least one circular weakening line (19) is provided in the said sheet metal outer cap (14); the said outer cap (14) has a tubular shape and is provided with an annular enlargement (24) forming an inner annular channel (25) delimited by corresponding axial end stops (26, 27); said channel (25) faces the tubular skirt (10) of the inner cap which is provided with an annular thickening (28) extending radially and axially, wherein the said thickening (28) is delimited by corresponding axial end stops (29, 30) and is force-fitted into the said channel (25).

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DESCRIPTION

Title: "BOTTLE CLOSURE"

The present invention relates to a closure for bottles, particularly for a bottle provided with an opening delimited by the free end of a neck which extends axially from the body of the bottle along a longitudinal axis (X-X) and which is provided with an outer surface having a thread positioned near the opening and with at least one annular stop on the neck of the bottle, positioned between the thread and the body of the bottle, the said closure comprising a inner cap of plastics material with an end wall transverse to the said longitudinal axis, a tubular skirt connected to the rim of the said end wall and extending axially along the said outer surface of the neck towards the said body of the bottle, the said tubular skirt being provided with an internal thread which engages with the said thread provided on the outer surface of the neck, and a outer cap of sheet metal which covers the said inner cap and which is fixed to the neck of the bottle by fixing means which engage with the said annular stop of the neck, at least one circular weakening line being provided in the said sheet metal outer cap, positioned axially immediately above the said means for fixing the outer cap to the neck of the bottle and being provided with an annular enlargement extending radially towards the outside of the outer cap and axially over a portion of predetermined length with the formation of an inner annular channel delimited by corresponding axial end stops and facing the tubular skirt of the inner cap.

Closures for bottles of the type specified above are known. The document WO 94/20237 illustrates an example of practical embodiment of such a closure, which however has the drawback of requiring a particularly high thickness of the skirt of the threaded inner cap element inserted into the metal outer cap, since its adhesion to the inner walls of the metal outer cap is achieved principally by a marked radial

elastic deformation of the skirt and its subsequent release after its axial insertion into the tubular outer cap, to which it adheres by pressure.

This makes it difficult and uneconomical to provide a closure having the characteristics described in WO 94/20237 for use on bottles having standard mouths, with aperture diameters and thread sizes in accordance with UNI 9574, for example, because the high thickness of the skirt of the inner cap required to enable it to be press-fitted into the tubular outer cap would not be compatible with the dimensions of the intermediate spaces available between the thread and the metal outer cap. In order to provide a closure of the type specified above which is suitable for fitting on bottles with standard mouths, solutions have been proposed in which the thickness of the skirt of the inner cap is reduced as far as possible, while remaining compatible with the structural requirement of allowing the formation of an internal thread to engage with the external thread of the bottle neck, the sheet metal outer cap is made without any annular thickening with the formation of an internal channel, and the inner cap is joined to the tubular metal outer cap by the interposition of an adhesive.

An example of a closure of the type indicated above, suitable for bottles with standard mouths, is illustrated in EP-A-1,254,059.

However, this closure has the fundamental drawback of not providing a secure and sufficiently strong joint between the plastics inner cap and the overlying metal outer cap, and therefore, especially at the time of initial opening in which a relatively high force has to be exerted to break the weakened securing area of the outer cap, the outer cap slides on the inner cap skirt, making it difficult to open the bottle.

Furthermore, the use of adhesive in the formation of the structure of the outer cap for bottles containing beverages is considered inadvisable in terms of hygiene and environmental protection.

Finally, the structure of the inner cap formed according to EP-A-1,254,059, which necessarily has a very thin skirt, does not provide satisfactory mechanical behaviour of the closure, because it is subject to possible breakage both during the axial fitting of the closure on to the bottle neck, at the time of capping, and subsequently in the course of unscrewing and screwing for closing the bottle.

The object of the present invention is essentially to provide a closure, particularly but not exclusively suitable for bottles with standard mouths, according to UNI 9574 for example, which is free of the drawbacks encountered in closures according to the prior art.

A further object of the invention is to provide a closure which, when in position on the bottle neck, imparts to this neck the typical shape of the neck of a wine bottle, with the presence of a significant annular rim projecting radially and located around the neck opening or immediately below it.

15

The invention will now be described more fully with reference to some examples of its practical embodiment, provided solely for guidance and without restrictive intent, and illustrated in the attached drawings, in which:

- Figure 1 shows a first embodiment of the closure according to the invention fitted on a bottle neck in the closed position, half in section and half in side view;
- Figure 2 shows the portion of the outer cap and inner cap of the closure of Figure 1, separated from the bottle neck, half in section and half in side view;
- Figure 3 shows the bottle neck with the attached tubular portion of the sheet metal outer cap of the closure of Figure 1, half in section and half in side view;
- Figure 4 shows a perspective view, in partial section, of the sheet metal outer cap

only;

- Figure 5 shows a perspective view, in partial section, of the inner cap only, in a first embodiment;
- Figure 6 shows a perspective view, partially in section, of the seal for the inner cap
5 of the preceding figure;
- Figure 7 shows a perspective view of the bottle neck, partially in longitudinal section;
- Figure 8 shows a second embodiment of the closure according to the invention fitted on a bottle neck in the closed position, half in section and half in side view;
- 10 - Figure 9 shows a perspective view, partially in section, of the inner cap only, in a second embodiment, used in the closure of Figure 8;
- Figure 10 shows a closure according to one of the embodiments of Figure 1 or Figure 8, with the modified closed upper end of the outer cap.

With reference to the aforesaid figures, it will be observed that the number 1
15 indicates the part of the body of the bottle which is joined to the neck 2. The latter, particularly in the case of a conventional standard wine bottle, normally made from glass, is joined to the body of the bottle by a long and slender joining part and has an aperture 3, in the proximity of which a conventional thread 5 is formed on the outer surface 4. The whole mouth of the bottle is formed, for example, according to UNI
20 9574.

Below the thread 5, in the direction of the body 1 of the bottle, the neck 2 has a substantially cylindrical region 6 followed by an annular stop 7. With reference to the first embodiment of Figures 1 to 7, it will be seen that an inner cap 8 of plastics material is placed on the opening 3, this inner cap consisting of an end wall 9,
25 transverse to the axis X-X of the bottle neck 2, and a tubular skirt 10 which extends

axially from the rim 11 of the wall 9. A thread 12, engaged by screwing with the thread 5 of the neck, is formed on the inner surface of the tubular skirt 10.

A conventional disc seal 13 is positioned against the end wall 9 and is interposed between the wall 9 and the free rim of the opening 3 to form a watertight seal.

5 According to the invention, the closure comprises a tubular outer cap, indicated as a whole by 14, made from sheet metal and closed at the upper end 15, which is superimposed on the wall 9 of the inner cap and is open at the lower end 16 which is positioned substantially in the junction region 17 between the body 1 of the bottle and the neck 2.

10 In the region 18 which radially faces the substantially cylindrical region 6, the tubular outer cap 14 is provided with at least one conventional weakening line 19 consisting of breakable links 20 and circumferential cuts 21.

In the area below the weakening line 19, the said tubular outer cap 14, when fitted on the bottle neck, has an annular rib 22 which is inserted into the channel 23 below the
15 stop 7 of the neck 3.

The rib 22 is formed in a conventional way by rolling when the outer cap 14 is fitted on the bottle neck, at the time of the capping of the bottle.

In the region which faces the skirt 10 of the inner cap 8, as shown more clearly in Figure 4, the outer cap 14 has an annular enlargement which extends radially with
20 respect to the axis X-X for a specified distance and forms an inner channel 25 which extends axially between two axial end stops indicated by 26 and 27, separated by a specified distance.

The radial and axial dimensions of the annular channel 25, and the corresponding dimensions of the enlargement 24 which forms it, can be selected so as to give the
25 bottle neck in the proximity of the opening the typical configuration of a bottle of

fine wine.

Similarly, the skirt 10 of the inner cap 8 is provided with an annular thickening 28 which extends radially over a distance substantially matching the radial extension of the channel 25. The said annular thickening 28 also extends axially between two axial end stops 29 and 30 separated from each other by a distance which matches the distance between the axial stops 26 and 27 of the channel 25.

Consequently, the thickening 28 of the channel 10 of the inner cap can be housed in the channel 25 with a degree of force.

The insertion is carried out during the assembly of the closure, by applying radial elastic compression to the skirt 10 and rapidly inserting the inner cap axially into the tubular outer cap 14.

The axial insertion is facilitated by the presence of a taper 31 formed in the proximity of the rim 11 of the inner cap 8. As soon as it has passed the stop 27 of the channel 25, the skirt 10 can expand radially and its annular thickening 28 is inserted into the channel 25, occupying it with a specified degree of force which ensures its adhesion to the inner wall of the channel 25.

The axial stops 29 and 30 of the annular thickening 28 bear on the corresponding axial stops 26 and 27 of the channel 25, thus ensuring the stability of the axial joint between the outer cap 14 and the inner cap 8.

In an alternative method of fabrication, the inner cap 8 can be formed directly inside the outer cap 14 by injecting the plastics material in the molten state and by using suitable moulds.

The axial stops 29 and 30 of the thickening 28 and the corresponding axial stops 26 and 27 of the channel 25 form first means of interference which impede the axial movement of the said inner cap 8 and outer cap 14 with respect to each other.

The interference between the inner cap 8 and the sheet metal outer cap 14, designed to impede the movements of the outer and inner cap with respect to each other, is increased by the provision of second means of interference.

In a preferred embodiment, these means consist of a coat 25a of varnish or lacquer having a composition such that the facing surfaces are welded together when heat is applied.

If the inner cap 8 is formed by moulding directly inside the outer cap 14, the heat required for the welding is supplied by the said material which is in the molten state.

The coat 25a of varnish or lacquer is deposited on the sheet metal of the outer cap 14 in such a way that it is located at least on the surface of the annular channel 24 facing the thickening 28 of the skirt 10 of the inner cap.

However, the coat 25a of varnish or lacquer can alternatively be deposited in such a way that it is located between the end wall 9 of the inner cap and the closed end wall 15 of the outer cap 14, thus causing these walls to be welded together, or, if the varnish or lacquer is also present on the surface of the annular channel 25, between all the outer surfaces of the inner cap and the opposing inner surface of the outer cap.

In another possible variant, the coat 25a of varnish or lacquer, consisting of material suitable for welding, can be replaced with a coat 25b of what is known as opaque material, having a high coefficient of surface friction.

According to another aspect of the invention, illustrated in Figures 8 and 9, the second means of interference designed to impede the angular movement of the inner cap 8 and the sheet metal outer cap 14 with respect to each other are formed in a structural way by the provision of a plurality of axial ribs 32, alternating with axial grooves 33, formed on the outer surface of the thickening 28, and of axial projections indicated by 34 formed in the axial extension of the channel 25.

The projections 34 can be fitted into the grooves 33 and form a secure joint between the parts.

As shown in Figure 8, the axial projections 34 can also consist of one or more axial portions of wording formed in relief towards the inside of the channel 25.

5 Alternatively, the projections 34 can also consist of edges of cuts passing through the thickness of the sheet metal of the outer cap, bent towards the inside of the channel 25.

With reference to Figure 10, it will be seen that, in one variant embodiment, the annular thickening 24 and therefore the corresponding annular channel 25 extend
10 axially from the closed upper end of the outer cap 14.

In this variant embodiment, while all the characteristics described in relation to the other embodiments of the invention remain the same, it can be seen that the axial stop 26 of the channel 25 coincides with the said closed upper end 15 of the outer cap, and has the same functions as those described previously.

15 Because of the axial and angular interference between the inner cap 8 and the outer cap 14 formed as described above, there is no risk that the outer cap will slide angularly on the underlying inner cap when the closure is opened, and therefore the efficient breaking of the weakening line 19 and consequent opening of the closure is ensured.

20 The dimensions and materials may be chosen at will according to requirements, without departure from the scope of the invention as described above and as claimed below.

Claims

1. A closure for a bottle having a body (1) and a neck (2) which extends axially from the body (1) along a longitudinal axis (X-X), the bottle provided with an opening (3) delimited by the free end of the neck (2), the neck (2) having an outer surface (4) having a thread (5) positioned near the opening (3) and an annular stop (7) on the neck (2) of the bottle and positioned between the thread (5) and the body (1) of the bottle, the closure comprising: an inner cap of plastics material with an end wall (9) transverse to the longitudinal axis, a tubular skirt (10) connected to the rim of the end wall (9) and extending axially along the outer surface (4) of the neck towards the body (1) of the bottle, the tubular skirt (10) being provided with an internal thread (12) which engages with the thread (5) provided on the outer surface of the neck, and an outer cap (14) of sheet metal which covers the inner cap and which is fixed to the neck of the bottle by fixing means (22) which engage with the annular stop (7) of the neck, at least one circular weakening line (19) being provided in the sheet metal outer cap (14), positioned axially immediately above the means (22) for fixing the outer cap to the neck of the bottle, the outer cap (14) having a tubular shape and being provided with an annular enlargement (24) extending radially towards the outside of the outer cap and axially over a portion of predetermined length with the formation of an inner annular channel (25) delimited by corresponding axial end stops (26, 27) and facing the tubular skirt (10) of the inner cap, characterized in that the tubular skirt (10) of the inner cap is provided with first means of interference for impeding axial movements of the sheet metal outer cap (14) and the inner cap (8) with respect to each other, said first means of interference being an annular thickening (28) extending radially and axially, the thickening (28) being delimited by corresponding axial end stops (29, 30) and being force-fitted into the channel (25).

2. The closure according to Claim 1, characterized in that the channel (25) extends axially over a distance at least substantially equal to that over which the internal thread (12) of the skirt (10) of the inner cap extends.

5 3. The closure according to Claim 1, characterized in that the channel (25) extends axially from a closed upper end (15) of the sheet metal outer cap (14).

4. The closure according to any one of Claims 1 to 3, characterized in that the thickening (28) of the tubular skirt (10) of the inner cap has a radial extension and an axial extension
10 which substantially match the internal dimensions of the channel (25) formed by the enlargement (24) of the outer cap.

5. The closure according to any one of Claims 1 to 4, characterized in that the closure comprises second means of interference to impede angular movements of the sheet metal
15 outer cap (14) and the inner cap (8) with respect to each other.

6. The closure according to Claim 5, characterized in that the second means of interference designed to impede angular movements of the sheet metal outer cap (14) and the inner cap (8) with respect to each other are positioned at least between the thickening (28) and the
20 inner surface of the annular channel (25).

7. The closure according to any one of Claims 1 to 2, characterized in that the closure comprises second means of interference to impede angular movements of the sheet metal outer cap (14) and the inner cap (8) with respect to each other and the second means of
25 interference designed to impede angular movements of the sheet metal outer cap (14) and

the inner cap (8) with respect to each other are positioned at least between a closed upper end (15) of the outer cap (14) and the end wall (9) of the inner cap (8).

8. The closure according to Claim 7, characterized in that the channel (25) extends axially
5 from the closed upper end (15) of the sheet metal outer cap (14).

9. The closure according to claim 7, characterized in that the thickening (28) of the tubular skirt (10) of the inner cap has a radial extension and an axial extension which substantially match the internal dimensions of the channel (25) formed by the enlargement (24) of the
10 outer cap.

10. The closure according to any one of Claims 5 to 9, characterized in that the first and the second means of interference consist of a coat (25a) of varnish or lacquer consisting of a material which causes facing surfaces to be welded together when heat is applied.
15

11. The closure according to any one of Claims 1 to 9, characterized in that the first and the second means of interference consist of a coat (25b) of material having a high coefficient of surface friction.

20 12. The closure according to Claim 5, characterized in that the second means of interference are positioned between the annular thickening (28) of the skirt of the inner cap and the annular channel (25) of the outer cap (14), and comprise at least one plurality of axial ribs (32) alternating with axial grooves (33) formed in the thickening (28) of the tubular skirt (10) of the inner cap.

13. The closure according to claim 12, characterized in that the second means of interference include axial projections (34) formed in an axial extension of the channel (25) of the outer cap and projecting radially towards the inside of the channel, the axial projections (34) being made to engage with the axial grooves (33) provided in the thickening (28) of the skirt of the inner cap.

14. The closure according to Claim 13, characterized in that the second means of interference formed in the axial extension of the channel of the outer cap and extending radially towards the inside of this channel include projections which form part of wording incised on the outside of a corresponding axial extension of the enlargement of the outer cap.

15. The closure according to claim 14, characterized in that the projections formed in the axial extension of the channel are formed by bending towards the inside of the channel at least one edge of each of a number of cuts made through the thickness of the sheet metal of the outer cap.

16. The closure according to Claim 5, characterized in that the first means of interference which impede the axial movements of the inner cap (8) and the metal outer cap (14) with respect to each other consist of the axial end stops (26, 27) delimiting the channel (25) of the enlargement of the outer cap engaging with the corresponding axial end stops (29, 30) of the thickening (28) of the skirt of the inner cap.

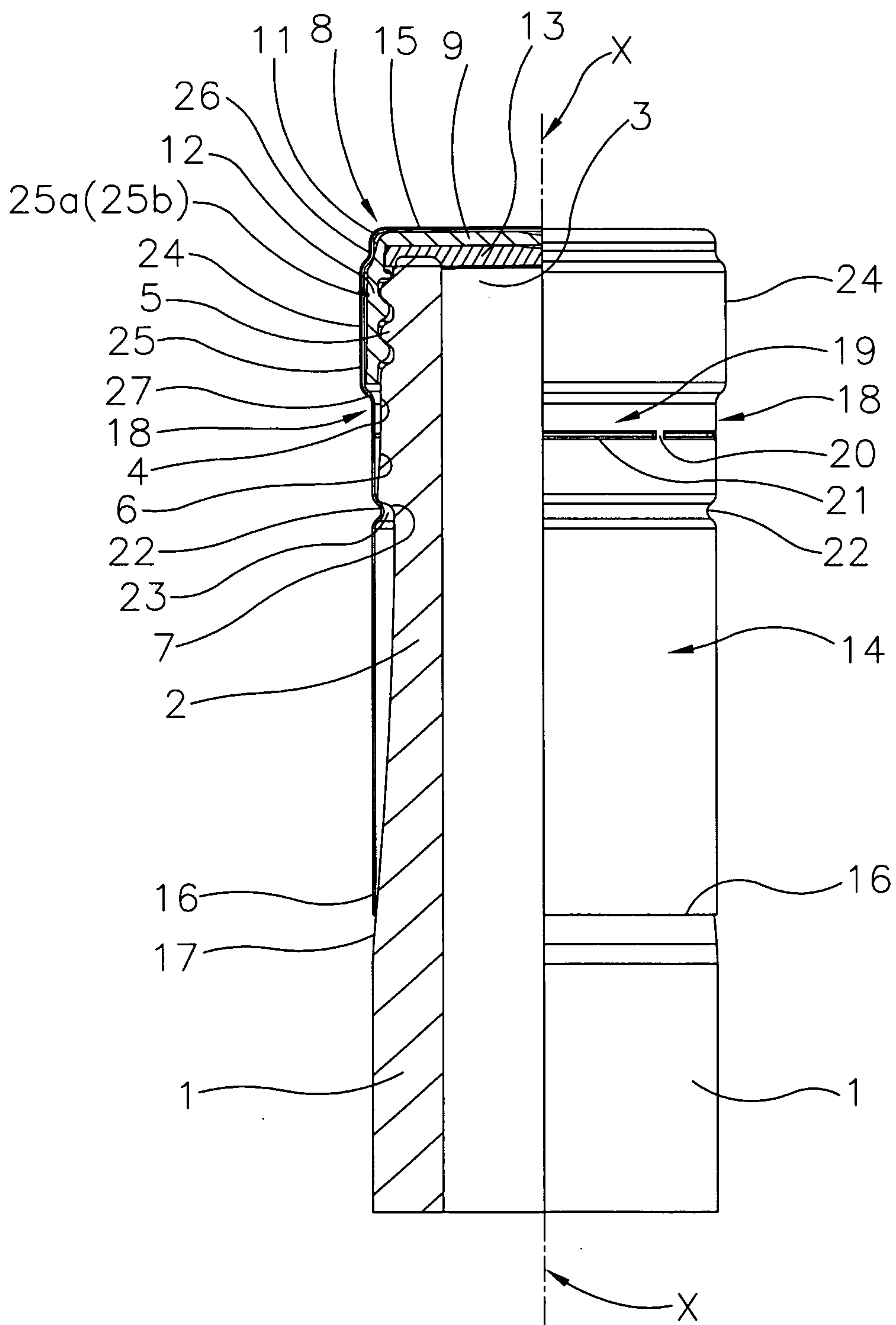
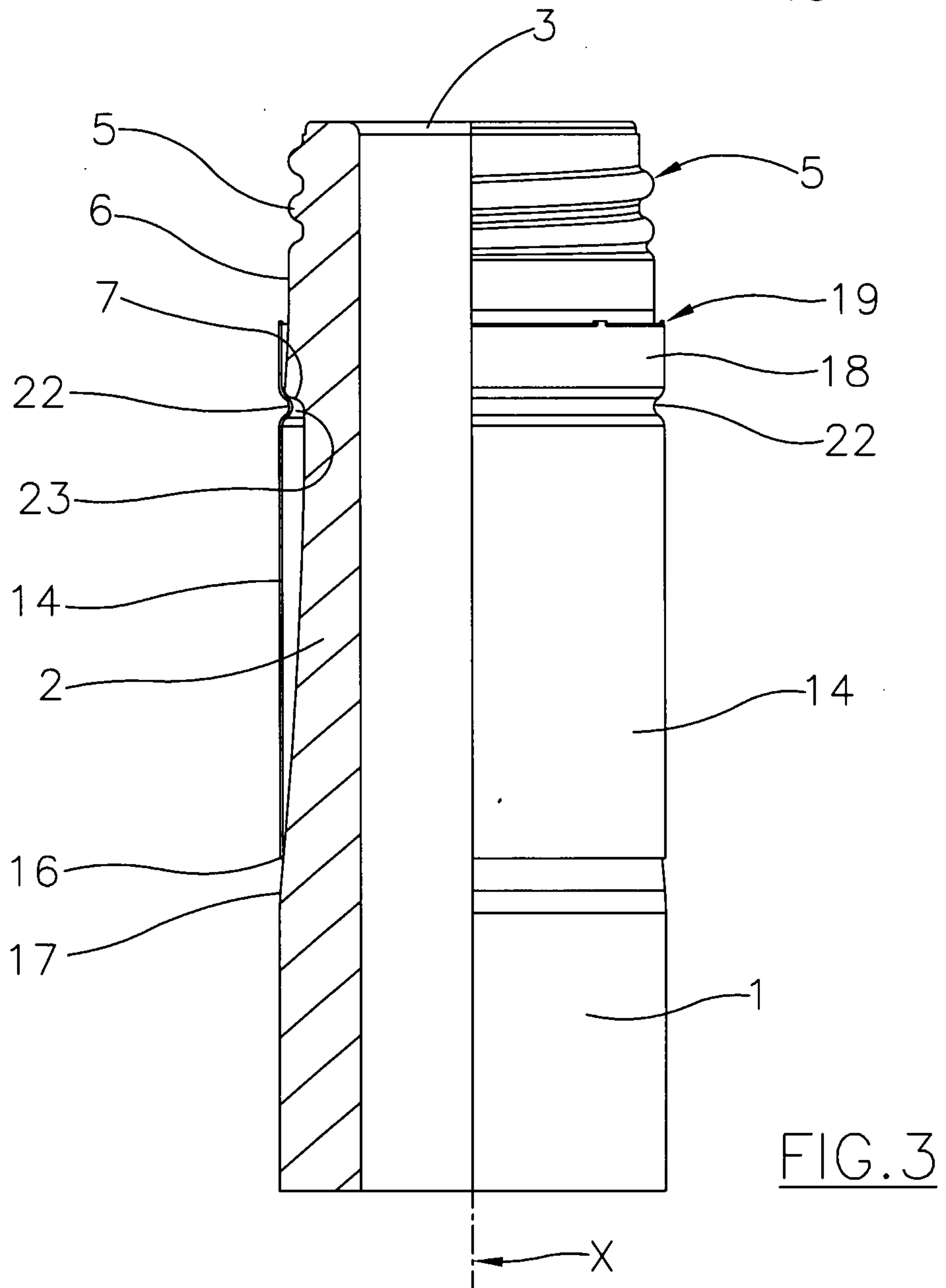
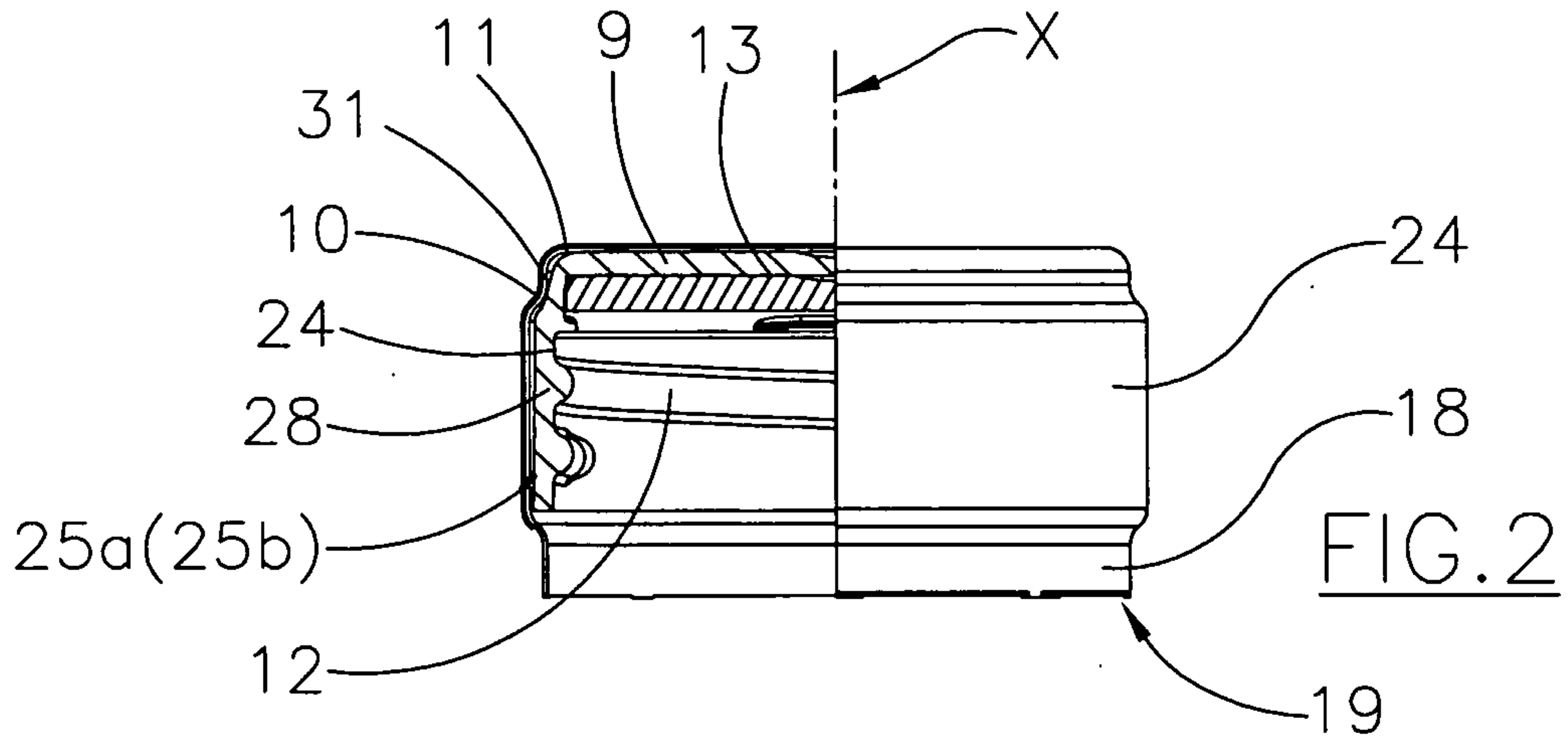
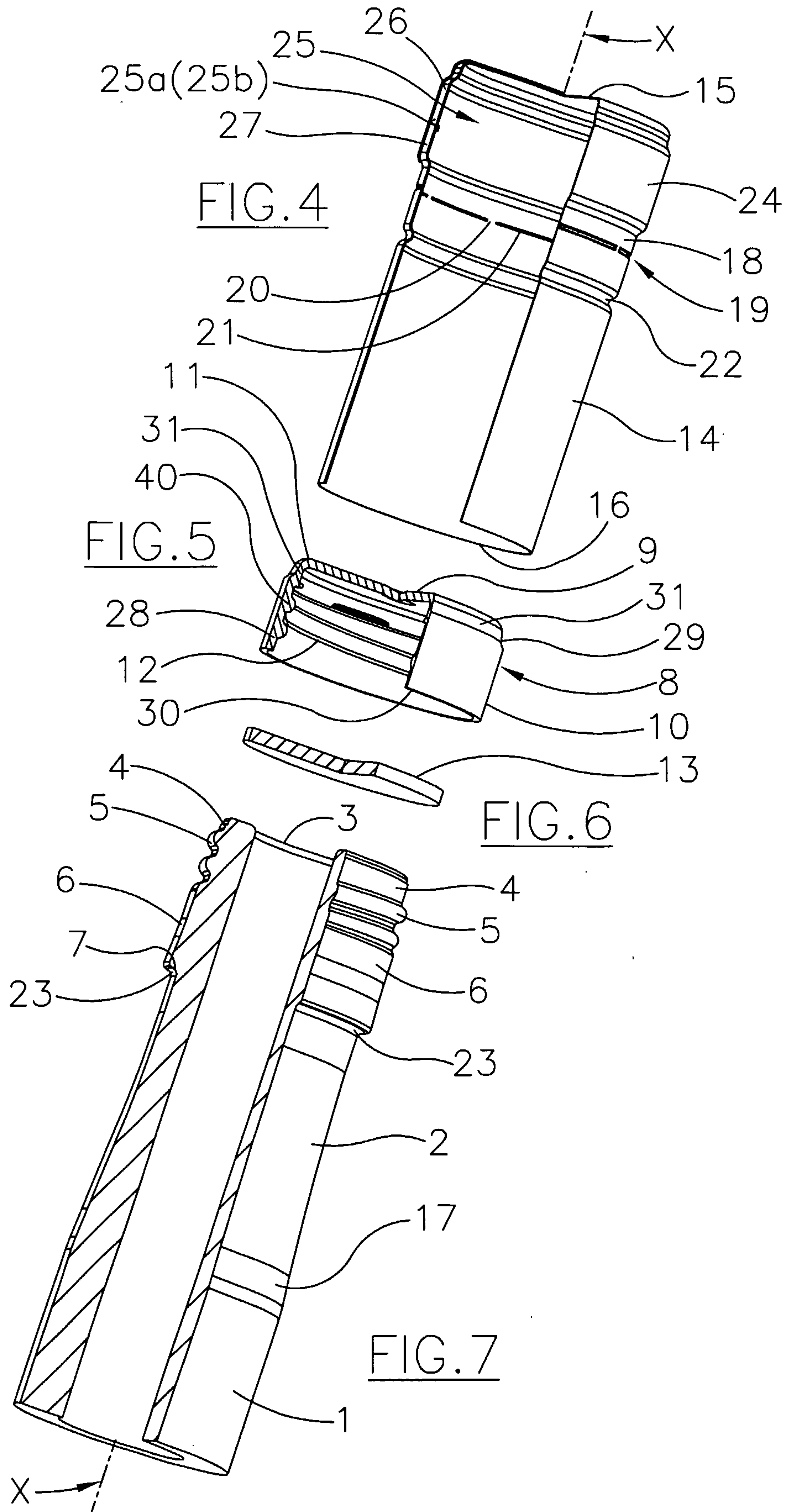


FIG. 1

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3/6



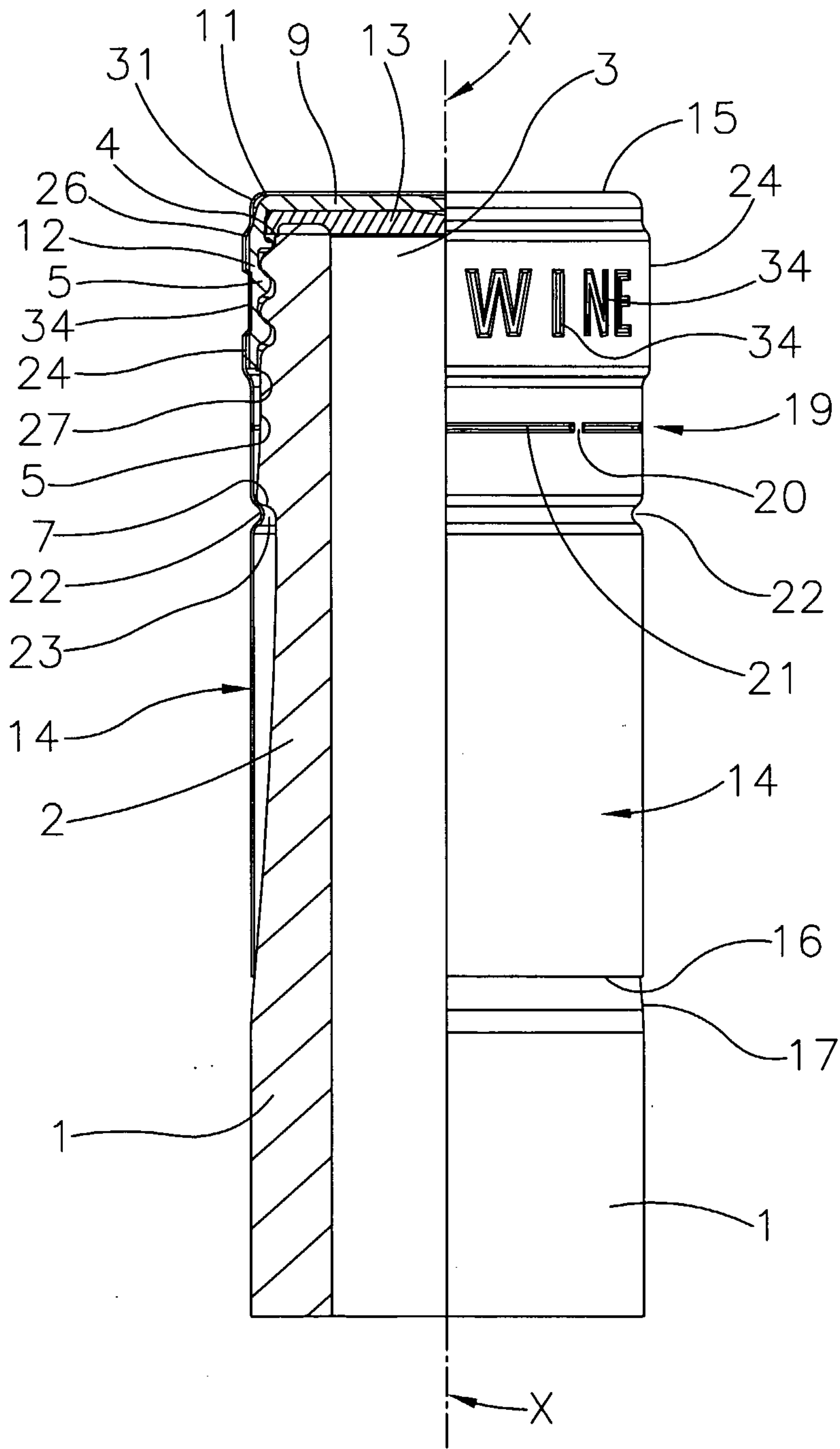


FIG. 8

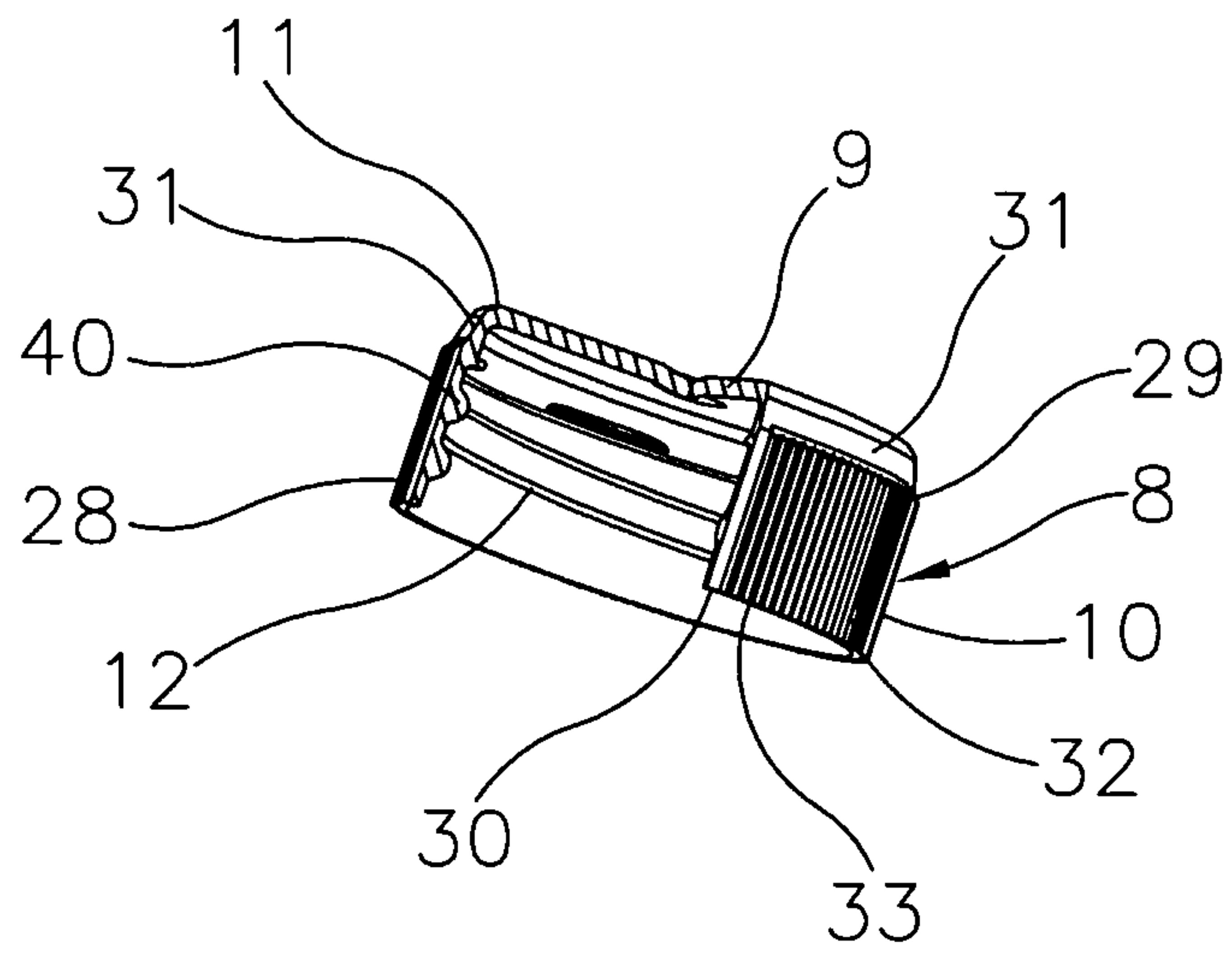


FIG. 9

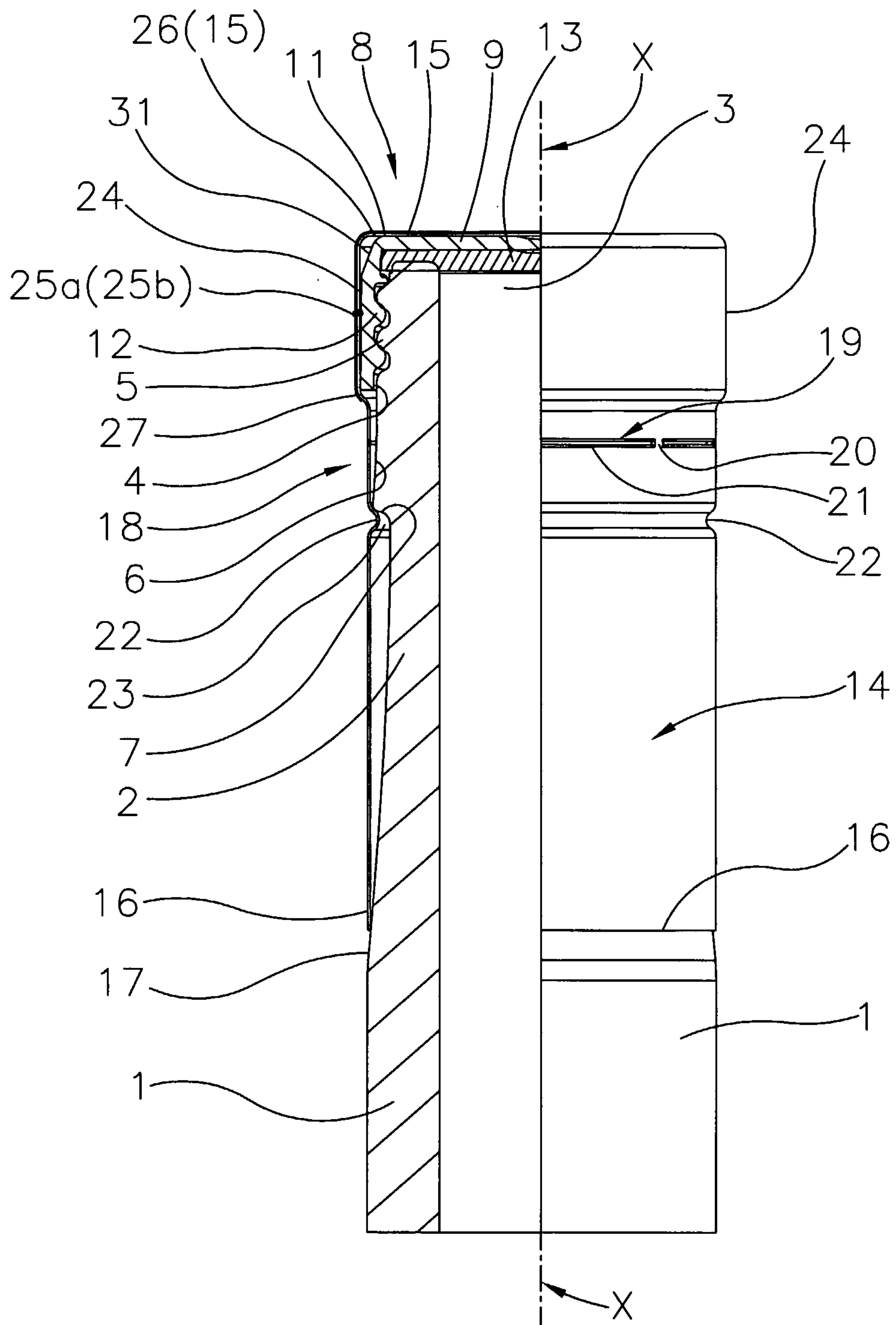


FIG. 10

