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(54) **Flip-top dispensing closure**

(57) Flip-top dispensing closures are typically screwed onto associated containers. Capping of the containers during production involves machinery spinning the closures onto the containers. Accordingly, relative rotation between the base and lid forming the closures can occur damaging the hinge and/or spigot. The present

invention addresses this problem by providing a flip-top dispensing closure (10) comprising a base (20) having a dispensing orifice (80), a lid (30), and hinge means (40) for articulating the lid (30) and base (20) with respect to one another, the closure (10) further including anti-rotation means (60,70) for substantially preventing relative rotation between the lid (30) and base (20).

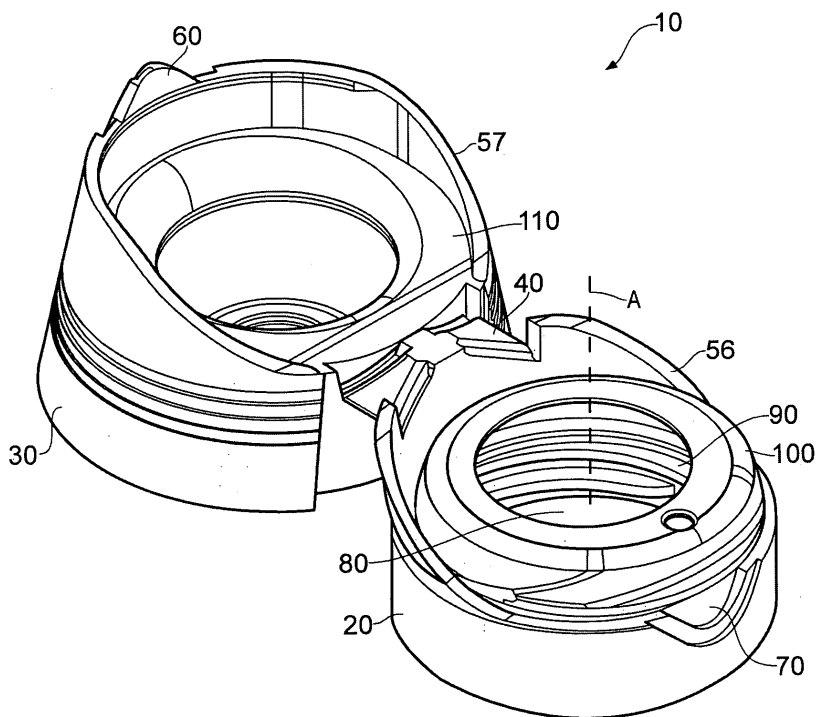


FIG. 3

Description

[0001] The present invention relates generally to a flip-top dispensing closure for a container and particularly to one including anti-rotation means.

[0002] Flip-top dispensing closures typically comprise a base having a dispensing orifice, a lid, and hinge means for articulating the lid and base with respect to one another. The hinge means may be relatively delicate in that it is formed from relatively small pieces of material. For example, the closure including the hinge means may be moulded from plastics and the hinge means may be provided by at least one relatively thin strap.

[0003] Flip-top dispensing closures are typically connected to an associated container in one of two ways. The first way is for the closure to be snap-fitted to the mouth of the associated container by the use of such means as snap-beads. The second way is for the closure to be screwed onto the associated container by means of corresponding screw threads, one set provided on the closure and the other set provided on the neck of the container. Regardless of which method is used to retain the closure onto the associated container, if the lid or base is grasped by a user, or by machinery during production, and twisted relative to the other of the lid and base and/or the associated container (if present), relative rotation between the lid and base may occur. This can lead to damage, and in some cases total destruction, of the hinge. This is undesirable for obvious reasons, for example the lid would not be retained to the base of the closure if the hinge was entirely broken.

[0004] Such relative rotation between the lid and base may occur during capping of the associated container at the manufacturing facility. This may especially occur if the closures are screw-fitted to the containers.

[0005] Although not designed with this purpose it is known that having flip-top dispensing closures with an orifice and an associated sealing spigot in which the orifice is offset from the closure axis (defined below), about which the relative rotation between the lid and base may occur, can help prevent the relative rotation. However, if a torque beyond a threshold value is applied to the lid and/or base then the spigot may break away from the lid and permanently block the orifice in the base. Accordingly, to rely on an offset spigot and associated dispensing orifice to provide anti-rotation means is not always effective and can in fact be detrimental.

[0006] The present invention seeks to address the above described problems.

[0007] According to a first aspect of the present invention, there is provided a flip-top dispensing closure comprising a base having a dispensing orifice, a lid, and hinge means for articulating the lid and base with respect to one another, the closure further including anti-rotation means for substantially preventing relative rotation between the lid and base.

[0008] The anti-rotation means may be independent from the dispensing orifice and/or the hinge means. In

this sense, the term "independent" means separate from, and/or having a different purpose from, and/or located away from the dispensing orifice and/or the hinge means.

[0009] The anti-rotation means may be provided by a projection on one of the lid and base and a corresponding recess, for receiving the projection, on the other of the lid and base.

[0010] The projection and recess may be provided substantially on the perimeter of the lid and base. However, the projection and corresponding recess may be provided radially inward from the perimeter of the lid and base. More than one set of corresponding projections and recesses may be provided.

[0011] In one embodiment, the anti-rotation means may be provided by having a parting plane between the lid and base which lies at a non-orthogonal angle to the closure axis. Alternatively, or additionally, the anti-rotation means may be provided by a parting surface between the lid and base of which part lies at a non-orthogonal angle to the closure axis. These anti-rotation means may be present in addition, or as an alternative, to the projection and associated recess described herein.

[0012] The size and shape of the lid and base along the perimeter of the closure at the parting surface may be substantially similar such that the external surface of the closure is contiguous.

[0013] The dispensing orifice may take the form of a hole in the base through which the contents of the associated container may be dispensed. The hole may have a variety of sizes and shapes and is not limited to being centralised (with respect to the closure axis) and circular. The dispensing orifice may have an associated spout which may be formed integrally, or be separately assembled, with the closure. In one embodiment, the lid may include sealing means for sealing the dispensing orifice in the base when the closure is in the closed position. This sealing means may take the form of a spigot or bore seal.

[0014] The lid and base may be integral with one another in that they are unitary, being connected by an integral hinge. However, the lid and base may be separate with a separate hinge or a hinge integral with either one of the base and lid.

[0015] The anti-rotation features described herein may be separate from tamper evident features included in the closure. This has the benefit that the anti-rotation features still operate despite the possibility of the breakage of the tamper evident features upon first opening of the closure. However, it may be possible to incorporate tamper evident features with the anti-rotation features if desired.

[0016] The closure may be moulded from a plastic material such as polypropylene or polyethylene.

[0017] The parting line between the base and the lid may be substantially rectilinear. Alternatively the parting line may be non-rectilinear. In some embodiments the line is at least partly curved and in others it is inclined. A line including rectilinear and non-rectilinear sections is,

of course, possible.

[0018] At least part of the parting line may run generally perpendicular to the main axis of the closure. Alternatively or additionally at least part of the line may be inclined to a plane running perpendicular to the main axis of the closure backs.

[0019] The present invention will now be more particularly described, by way of example, with reference to the accompanying drawings in which:

Figure 1 is an elevational side view of a closure, formed according to the present invention, in an unopened state;

Figure 2 is an elevational front view of the closure of Figure 1;

Figure 3 is a perspective view of the closure of Figure 1 in an opened state;

Figure 4 is an elevational front view of the closure of Figure 3;

Figure 5 is an elevational side view of the closure of Figure 3;

Figure 6 is a side elevation of a closure formed according to an alternative embodiment;

Figure 7 is a front view of the closure of Figure 6; and

Figure 8 is a side elevation of a closure formed according to an alternative embodiment.

[0020] The closure 10, as shown in Figure 1, comprises a base 20 and a lid 30 articulated to one another by a hinge 40. In the closed position, the lid 30 and base 20 meet at The closure 10, as shown in Figure 1, comprises a base 20 and a lid 30 articulated to one another by a hinge 40. In the closed position, the lid 30 and base 20 meet at a parting line 55 which is defined by a parting surface 56 at the upper axial end of the base 20 and by a parting surface 57 at the lower axial end of the lid 30. The parting line 55 includes an inclined section 55a, extending from the hinge towards the open end of the base, and a linear section 55b which continues from the section 55a around to the tab 60 and recess 70. The parting surfaces 56, 57 are formed such that their size and shape allows the lid and base to contact one another at all points around the perimeter of the external wall of the closure 10 such that the external surface of the closure 10 has a contiguous surface.

[0021] The base 20 and lid 30 are substantially cylindrical having a closure axis "A". This axis "A" passes through the centre of the cylindrical base 20 and lid 30. In use, with the closure connected to an associated container, the axis "A" also passes through the centre of the mouth of the container. This closure axis "A" may also be described as a "dispensing axis".

[0022] The anti-rotation means 50 are provided substantially diametrically opposite, with respect to the closure axis "A", to the hinge 40.

[0023] Without the anti-rotation means the lid 30 and base 20 may rotate relative to one another. This relative rotation may be about the closure axis "A" or another axis

such as one lying substantially parallel to the closure axis "A" but passing through the hinge 40.

[0024] Although the lid 30 and base 20 have been described as substantially cylindrical it may be seen from the drawings that in this specific embodiment the lid 30 has an inverted frusto-conical shape such that the wider end is at the top of the closure and the narrower end is below the wider end when the closure is in the closed position.

[0025] Although within this description the words "top", "below", and other such relative terms are used, it should be understood that they relate to the closure as shown in Figure 1 in that the base part 20 is beneath the lid part 30. In other words, these terms relate to how a closure would typically be fitted to a container, such as a bottle, with this container standing upright with the closure at the top and the closure axis "A" being substantially vertical. These relative terms should not be regarded as limiting in any way to the scope of the invention.

[0026] Figure 2 more clearly shows the inverted frusto-conical shape of the lid 30 and the substantially cylindrical shape of the base 20 with the anti-rotation means 50 being visible on the side of the closure 10 at approximately the point where the lid 30 and base 20 meet.

[0027] The lid 30 includes a stepped portion 35 which extends around its circumference. This may aid opening of the lid 30 in that it provides a gripping point for users.

[0028] In Figure 3, in which only a partial view of the base 20 is visible, the anti-rotation means are more clearly shown. The anti-rotation means comprise a projection 60 provided on the lid 30 and a recess 70 provided on the base 20. The location of the projection and recess may be reversed in that the projection 60 lies on the base 20 and the recess 70 lies on the lid 30.

[0029] In this embodiment the projection 60 comprises a substantially triangular shape having a rounded apex, with its base lying on and forming part of the parting surface 57 which forms part of the skirt surrounding the lid 30. It has a radial thickness substantially equal to the thickness of the upstanding rim, or skirt, which forms the outer wall of the lid 30. The recess, or socket, 70 has a similar size and shape to the projection 60 such that, with the closure in the closed position, the projection 60 may be received within the recess 70 such that there is minimal space therebetween. The projection 60 is provided on the perimeter of the parting surface 57 of the lid 30. Likewise, the recess 70 is provided within the parting surface 56 on the perimeter, or skirt, of the base 20. The projection 60 and recess 70 are provided substantially diametrically opposite, relative to the closure axis "A", to the hinge 40.

[0030] Due to the interlocking of the projection 60 and recess 70, when the closure is in the closed position, relative rotation between the lid 30 and base 20 is substantially prevented or inhibited. This effect may be enhanced by the presence of the hinge 40 in that the lid 30 and base 20 are interlocked together at two points on substantially opposite sides of the closure axis "A".

[0031] In Figure 3, the hinge 40 is shown as an integrally moulded snap-type, or "butterfly" hinge. However, other forms of hinge, such as simple straps, are also possible.

[0032] The base 20 includes an orifice 80 provided within a raised top deck having a shoulder 100 and lying within the perimeter. The lid 30 includes a recessed surface 110 provided within the perimeter and which meets with the shoulder 100 when the closure is closed. When the lid is in the closed position the interaction between the shoulder 100 and the surface 110 may provide a sealing effect. However, this is not always necessary since other forms of sealing the closure may be provided. For instance, a sealing effect may be provided by the interaction of the parting surfaces 56, 57. Alternatively, or additionally, a spigot or bore seal (not shown) may be present on the underside of the lid 30 which seals against and/or within the orifice 80.

[0033] Screw threads 90 are provided on the inside wall or skirt of the base 20. These threads 90 engage with corresponding threads on an associated container (not shown) for retaining the closure 10 to the container.

[0034] Figure 4 shows an alternative view of the closure 10 in the open position in which the base 20, lid 30, hinge 40, parting surfaces 56, 57 and anti-rotation means 60, 70 are visible. The base 20 is visible in the foreground and the lid 30 is visible behind the base 20 in the background.

[0035] In Figure 5, the shape of the parting surfaces 56, 57 is more clearly visible. Each surface 56,57 lies in more than one plane. In other words, they do not lie entirely in a uniform plane. For instance, a portion 56B, 57B of each parting surface 56, 57 lies at a non-orthogonal angle to the closure axis "A" and a portion 56A, 57A. The interaction of the portions 56B, 57B of each of the parting surfaces 56, 57 prevent rotation of the base 20 with respect to the lid 30 about the closure axis "A" with the lid 30 in the closed position. This is because for relative rotation to occur the parting surfaces 56, 57 would have to slide over one another about the axis "A" and the only way this could occur would be for the lid 30 and base 20 to move apart axially. This axial separation may be prevented by the force of a snap-type hinge holding the base and lid in the closed position.

[0036] Although the parting surfaces 56, 57 are shown such that their surfaces do not lie in the same plane along their entire length in one embodiment they do lie in the same plane. This plane lies at a non-orthogonal angle with respect to the closure axis "A" so as to provide the same anti-rotation means in that relative rotation may only occur if the lid and base move apart axially.

[0037] Although the projection 60 and recess 70 are shown on the perimeter of the lid 30 and base 20 respectively, they could lie within the perimeter of the closure 10. Such a design is improved if the anti-rotation features (50,60,70) are located substantially away from the hinge 40.

[0038] Referring now to Figures 6 and 7 there is shown

a closure 110 formed according to an alternative embodiment. The closure 110 comprises a base 120 and a lid 130 joined by a hinge 140.

[0039] Opposite the hinge 140 the base has a recess 170 and the lid has a correspondingly shaped tab 160. In the closed position shown the recess and tab help to prevent relative rotation between the base and the lid. In this embodiment the parting line between the base and the lid is rectilinear, except for the region of the recess and tab.

[0040] Referring now to Figure 8 there is shown a closure 210 formed according to an alternative embodiment. The closure 210 is very similar to the closure 110 of Figures 6 and 7 except that the parting plane 255 is inclined from the hinge towards the free end of the base 220.

Claims

1. A flip-top dispensing closure comprising a base having a dispensing orifice, a lid, and hinge means for articulating the lid and base with respect to one another, the closure further including anti-rotation means for substantially preventing relative rotation between the lid and base.
2. A closure according to Claim 1, wherein the anti-rotation means are independent from the hinge means and/or the dispensing orifice.
3. A closure according to either of claims 1 and 2, wherein the anti-rotation means are provided by a projection on one of the lid and base and a recess, for receiving the projection, on the other of the lid and base.
4. A closure according to Claim 3, wherein the projection and recess are provided substantially on the perimeter of the lid and base.
5. A closure according to Claim 3, wherein the projection and recess are provided radially inward from the perimeter of the lid and base.
6. A closure according to any preceding claim, wherein the anti-rotation means are provided by a parting surface between the lid and base part of which lies at a non-orthogonal angle to the closure axis.
7. A closure according to any preceding claim, wherein the size and shape of the lid and base along the perimeter of the closure at the parting surface are substantially similar such that the external surface of the closure is contiguous.
8. A closure according to any preceding claim, wherein the lid includes sealing means for sealing a dispensing orifice in the base when the closure is in the

closed position.

9. A closure according to Claim 8, wherein the sealing means is a spigot. 5
10. A closure according to any preceding claim, in which the parting line between the base and the lid is substantially rectilinear.
11. A closure according to any of Claims 1 to 9, in which the parting line between the base and the lid is non-rectilinear. 10
12. A closure according to Claim 11, in which the parting line between the base and the lid is at least partly curved. 15
13. A closure according to at least part of any preceding claim in which the parting line is generally perpendicular to the main axis of the closure body. 20
14. A closure according to any of Claims 1 to 12, in which at least part of the parting line is inclined to a plane running perpendicular to the main axis of the closure body. 25

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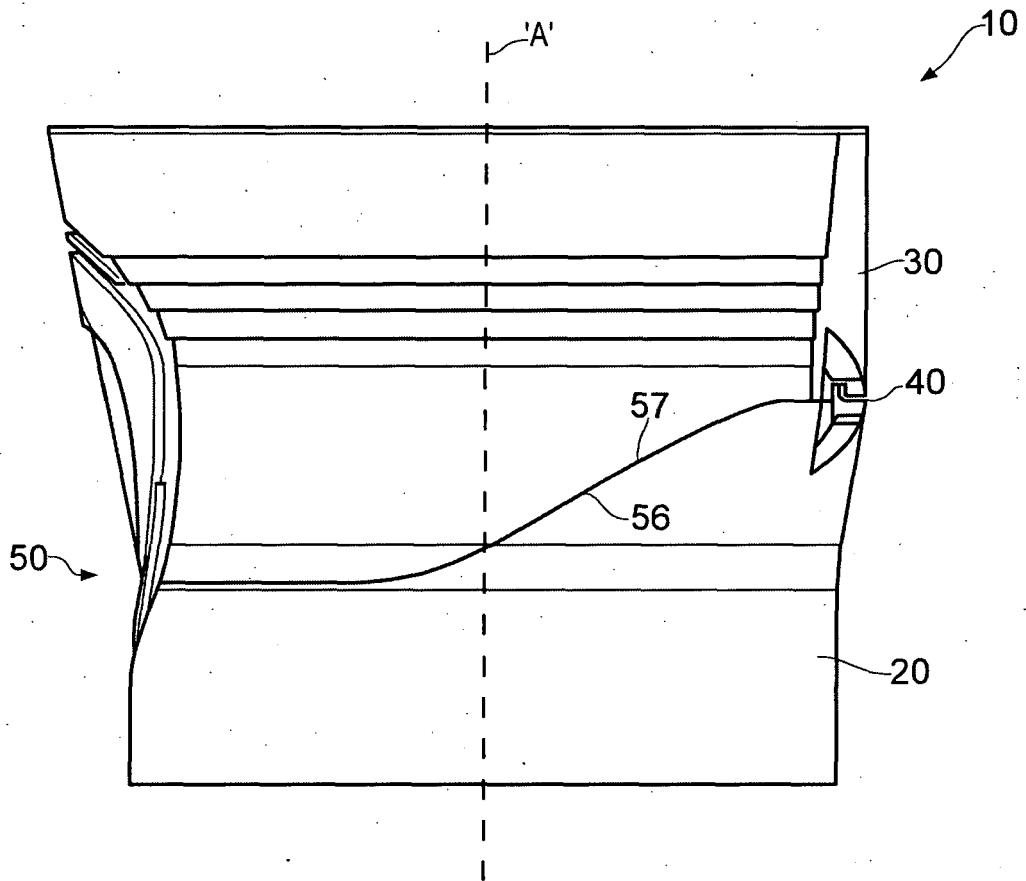


FIG. 1

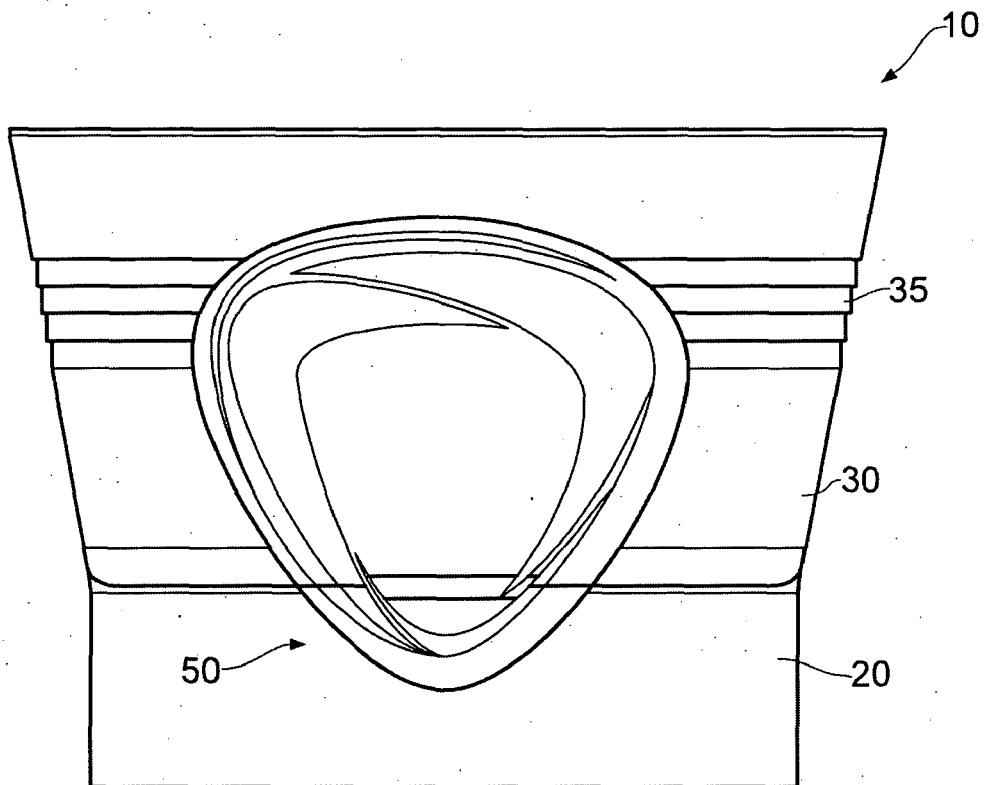


FIG. 2

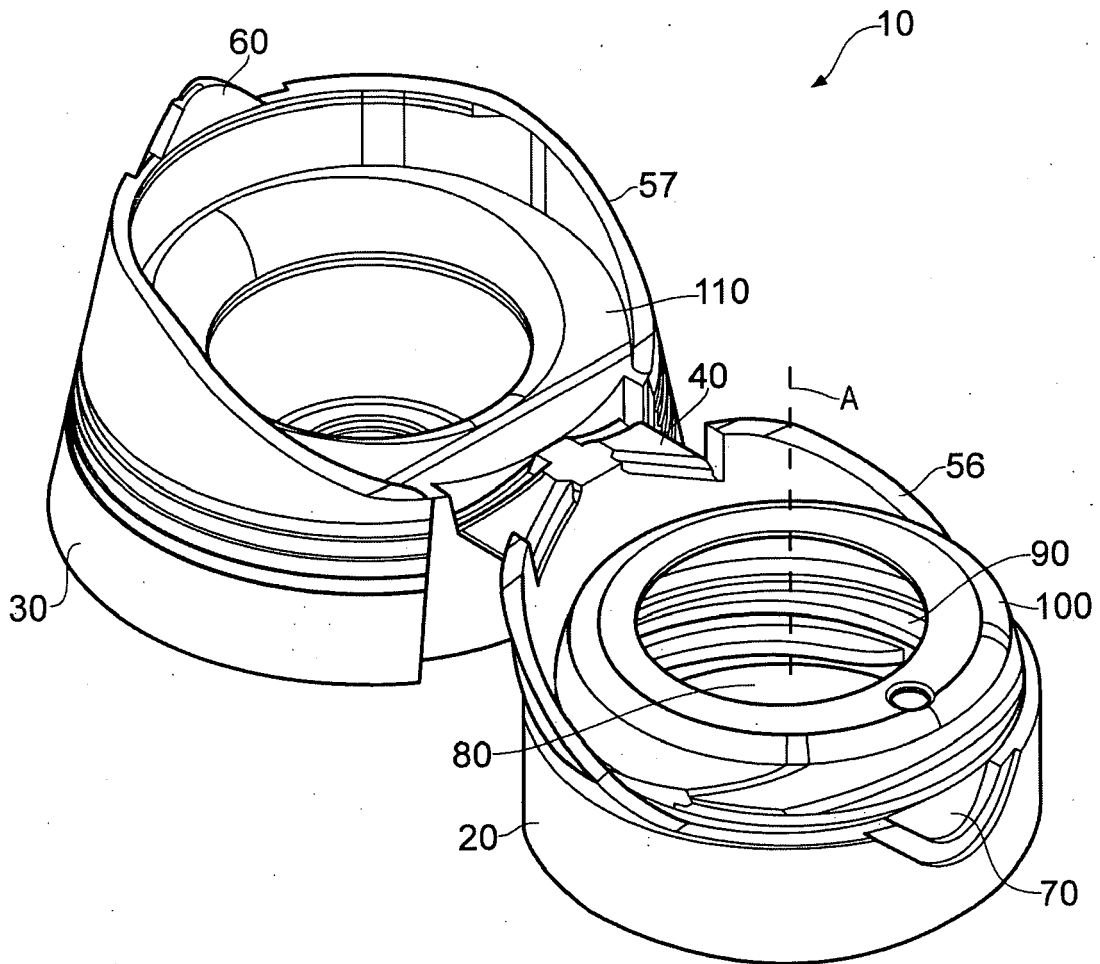


FIG. 3

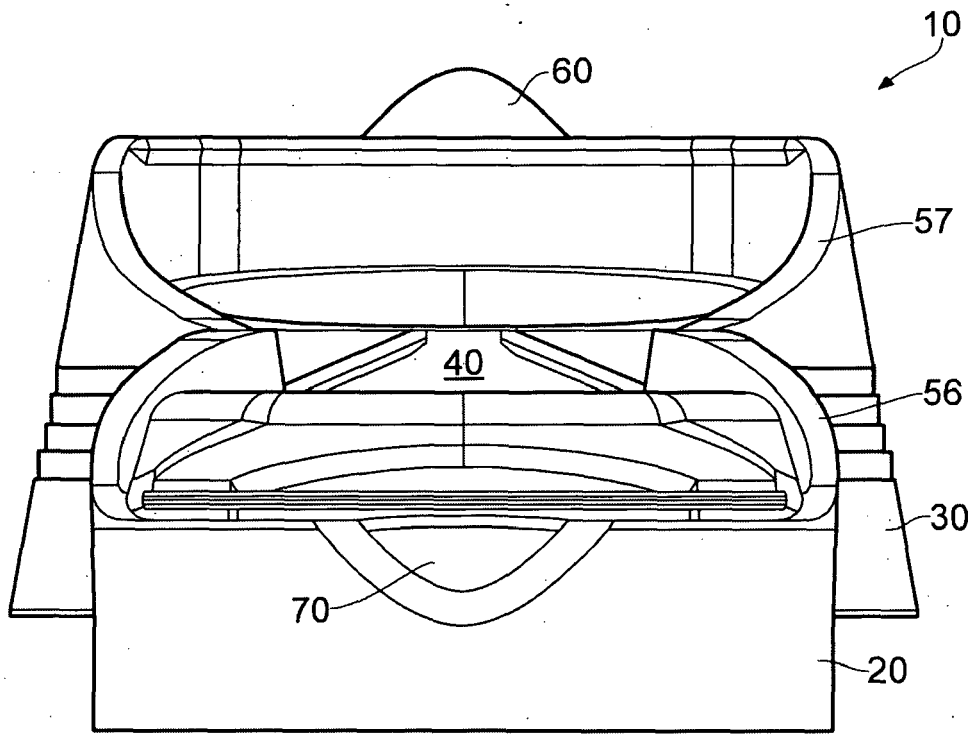


FIG. 4

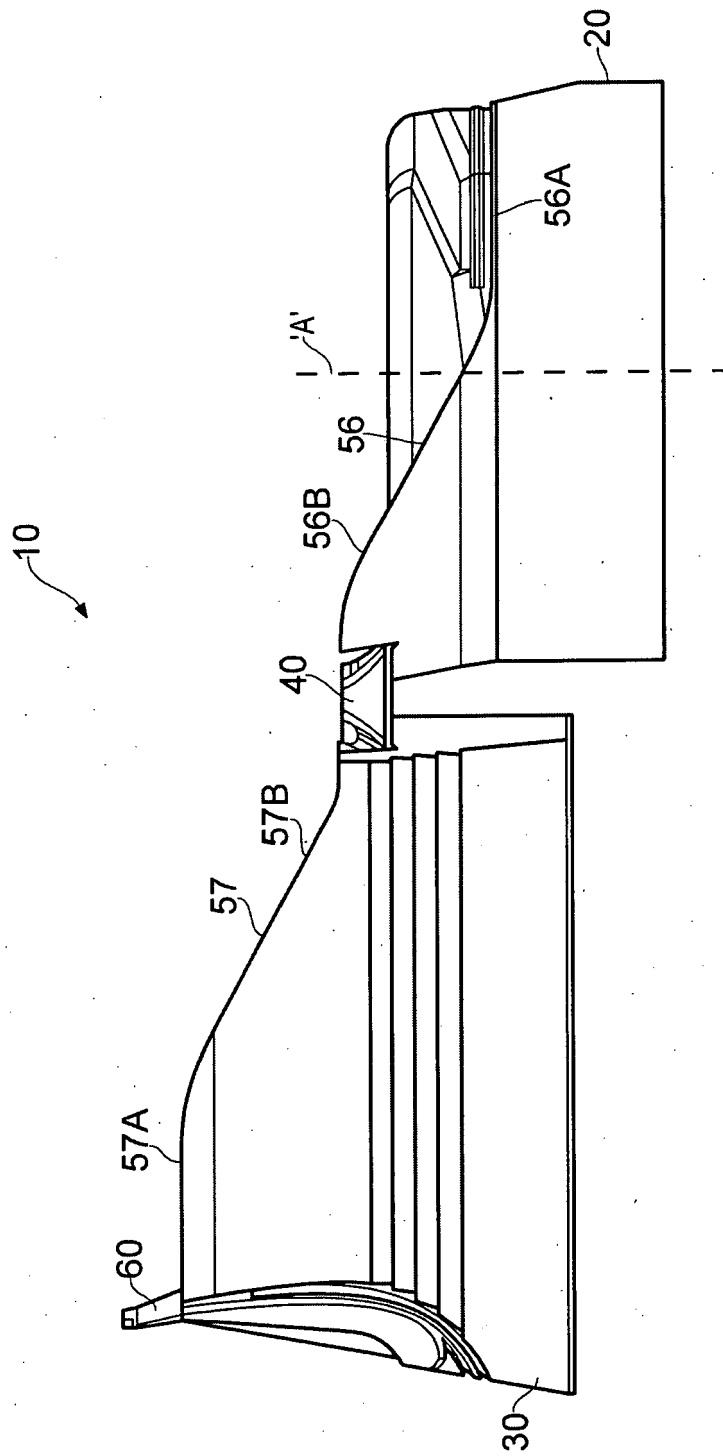


FIG. 5

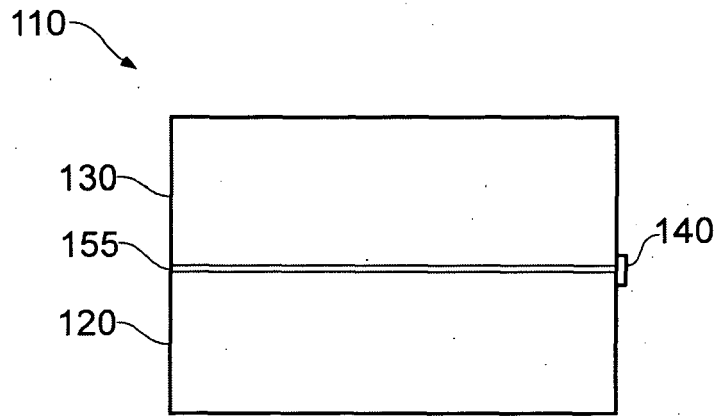


FIG. 6

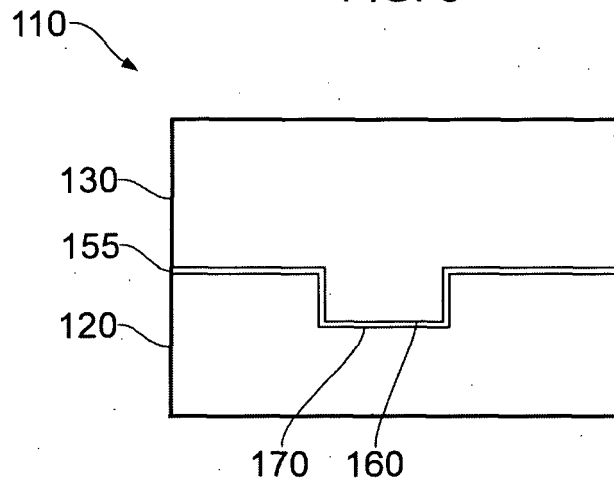


FIG. 7

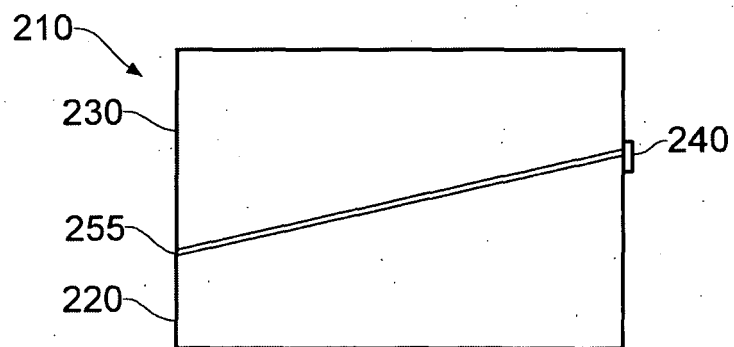


FIG. 8



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EUROPEAN SEARCH REPORT

Application Number
EP 08 25 2743

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The present search report has been drawn up for all claims			
5	Place of search Munich	Date of completion of the search 16 January 2009	Examiner Lämmel, Gunnar
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
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ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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