(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 208 210 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
23.08.2017 Bulletin 2017/34

(51) Int Cl.:
B65D 45/32 *(2006.01)* ***B65D 41/18*** *(2006.01)*

(21) Application number: **16196469.7**

(22) Date of filing: **28.10.2016**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(30) Priority: **30.10.2015 ES 201531563**

(71) Applicant: **Enotop Closures S.L.**
08205 Sabadell - Barcelona (ES)

(72) Inventor: **GÓMEZ CAO, José Luis**
08205 Sabadell - Barcelona (ES)

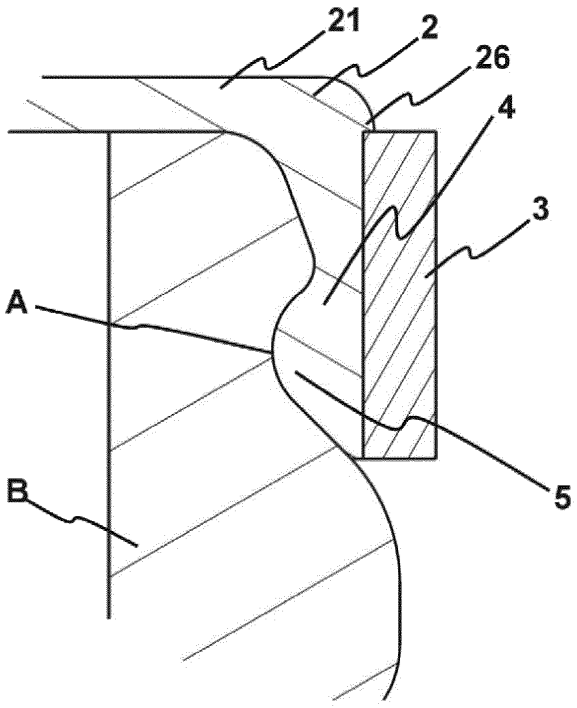
(74) Representative: **Balder IP Law, S.L.**
Castellana 93
28046 Madrid (ES)

Remarks:
Claim 16-21. is deemed to be abandoned due to non-payment of the claims fee (Rule 45(3) EPC).

(54) CAP AND RETENTION RING ASSEMBLY FOR THE TIRAGE OF SPARKLING WINES

(57) A cap and retention ring (3) assembly for the tirage of sparkling wines, configured to be applied to a bottle with a finish that has an upper portion and an annular recess (A) below the upper portion, wherein the cap comprises a lid portion (21) and a plurality of flexible tabs (4) intended to externally clasp the upper portion of the bottle finish; the tabs being provided with protrusions (5) that are radially turned inwards and intended to fit into the annular recess of a retention configuration, the retention ring being intended to slide axially along the outer surface of the tabs to clasp the cap and to externally press the tabs against the finish; wherein, in the retention configuration, there is no space between the ring surface (3) that faces the tabs (4) and the tab surfaces that face said ring surface.

Fig. 3



EP 3 208 210 A1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a cap and retention ring assembly for the tirage of sparkling wines and similar that may be manufactured with plastic materials and at the same time be reliably used in automatic stations for the removal of the tirage cap.

BACKGROUND OF THE INVENTION

[0002] The cap and retention ring assemblies for the tirage of sparkling wines and similar are known.

[0003] The cap comprises flexible tabs that extend like a perimeter skirt and are intended to externally clasp the upper portion of the bottle finish. For this purpose, the tabs are provided with projections turned inwards and are intended to fit into an annular recess of the bottle finish in a way that defines a retention position.

[0004] Thus, the retention ring guarantees the locking of the cap. However, this locking is effective while the ring is arranged in the place that corresponds to it in an axial direction. This cannot be just any location.

[0005] American patent US 5,813,554 by Marangoni and Cao describes a solution of this type that includes stop means to prevent the ring from sliding in the insertion direction of the ring and in the opposite direction of the insertion direction. In this case, the insertion stop of the ring consists of a conical support surface arranged on a step on the periphery of the lid portion of the assembly, and a complementary support surface for the ring arranged under a protrusion that is radially turned inwards. The slide stop in the opposite direction consists of a protrusion arranged on the lower portion of the ring and turned inwards such that the locking position clasps the lower portion of the tabs.

[0006] The objective of the stop means mentioned, in both directions, is to ensure that the attachment of the cap in the mouth of the bottle is sufficient to resist the pressures that are produced inside the bottle during the fermentation process.

[0007] One disadvantage of this solution is that the inner surface of the ring does not come into full contact with the surface of the cap that faces the inner surface of the ring, and there is a space between them that could extend from the insertion stop and the slide stop in the direction that is opposite to the insertion direction.

[0008] Another disadvantage is that the ring has a complex shape, especially due to the presence of the corners in the cross section.

[0009] Another disadvantage of this solution is that major deformations occur during the capping process because the protrusions have a significant radial dimension.

[0010] Moreover, after the sparkling wine ferments, the cap must be removed; in the case of industrial facilities, this operation is carried out in automatic stations provided with a wedge that performs a relative rocking movement with respect to the bottle in order to remove the cap. Specifically, the wedge has a rocking movement that follows a slanting direction with respect to the axis of the bottle, and under normal operating conditions it should only enter into the lower portion of the cap, without actually touching the bottle, and come in contact with the cap long enough to overcome the retention force of the ring/cap portion assembly to remove it.

[0011] Therefore, another problem identified by the inventors in known tirage caps is that the known plastic cap is not optimal for the correct operation of the opening wedge, especially due to the aforementioned automatic stations that are designed to remove metal caps, which have a very small outer skirt. This sector in particular requires a minimal rate of cap removal failures.

[0012] One possible solution would consist of adapting these stations to the shape of the plastic tirage caps that are made of two portions; however, this implies high costs and low versatility of the stations.

DESCRIPTION OF THE INVENTION

[0013] To overcome the aforementioned disadvantages, the present invention proposes a cap and retention ring assembly for the tirage of sparkling wines, configured to be applied to a bottle with a finish that has an upper portion and an annular recess below the upper portion, wherein the cap comprises a lid portion and a plurality of flexible tabs that extend from the lid portion like a perimeter skirt and externally clasp the upper portion of the bottle finish; the tabs being provided with projections that are radially turned inwards and are intended to fit into the annular recess in a retention configuration of the bottle assembly; the retention ring being intended to slide axially along the outer surface of the tabs in the axial direction of the cap to clasp the cap and to externally press the tabs against the bottle finish such that the projections fit into the annular recess; wherein, in the retention configuration, there is no space between the retention ring surface that faces the tabs and the tab surfaces that face said ring surface.

[0014] In this way, the fastening of the tabs by the retention ring is optimal because it leaves no space for the tabs to become deformed. In addition, this feature allows the assembly to be more compact and more resistant.

[0015] In the following description, when the terms 'upper' and 'lower' are used in relation to a portion or component, it should be understood that the first term refers to the area closest to the mouth of the bottle and the second refers to the area closest to the bottom of the bottle, when the assembly is applied to the bottle.

[0016] In some embodiments, the assembly comprises:

- first stop means to lock, in the retention configuration, the sliding of the retention ring by the cap in the axial direction and in the insertion direction of the retention ring, and

- second stop means to lock, in the retention configuration, the sliding of the retention ring by the cap in the axial direction and in the direction opposite to the insertion direction of the retention ring.

[0017] With these characteristics, there is an assembly that can be positioned correctly and by means of a simple axial thrust operation in the retention configuration; in other words, the configuration with the projections of the flexible tabs placed in the annular recess, and which cannot be removed since the retention ring clasps the tabs from the outside and do not allow them to expand; and wherein the tab locking is optimal because the tabs cannot be deformed at any point along the surface that is clasped by the inner surface of the retention ring.

[0018] In some embodiments, the retention ring has a tetragonal cross section that defines an inner cylindrical surface that presses against the cap in the retention configuration, an outer surface opposite the inner cylindrical surface, an upper circular finish that is intended to be pressed by a locking tool of the cap-retention ring assembly and a lower circular finish that is intended to be pressed by an opening tool.

[0019] This retention ring configuration has a cheap, solid and simple piece, unlike the solution disclosed in the aforementioned American patent. This retention ring enables the assembly to be arranged in its retention configuration by means of a simple operation that is easy to automate. Likewise, the ring can be removed from an automated decapping station.

[0020] In some embodiments, each one of the stop means consists of a support area that belongs to the retention ring and a support area that belongs to the cap; these support areas being complementary in the retention configuration, and the support areas of the ring having a portion that is next to the inner cylindrical surface.

[0021] Since the support areas are envisaged next to the inner cylindrical surface, the support is optimized because it is located in areas where the ring and the cap come into close contact, and especially in areas where it is most difficult for deformations to occur than in any other part of the ring. In particular, the only areas that are specifically molded to be supports are the inner areas; the remaining areas being solid and therefore providing greater resistance and rigidity to the ring, which is responsible for resisting the high pressure that will be produced on the cap in the second fermentation process of the sparkling wine. This optimizes the relationship between the dimensions of the ring and resistance, which gives more freedom when the height of the ring is reduced to allow for the correct operation of the opening wedge.

[0022] In some embodiments, the surface of the tabs that is turned towards the inner cylindrical surface of the retention ring has a complementary cylindrical casing for the inner cylindrical surface of the retention ring.

[0023] Thus, relative sliding between the cap and the retention ring during the application operation of the assembly to the bottle is not hindered by obstacles and involves minimum deformation of the parts.

[0024] In especially preferred embodiments, the support areas belonging to the ring and the support areas belonging to the cap are arranged on the intersection between the inner cylindrical surface and the upper circular finish when the assembly is arranged in the retention configuration.

[0025] This arrangement enable the first stop means to be concentrated in an elevated area of the ring, specifically in the area that will be the last to be fitted, such that the entire inner surface of the ring easily slides to the retention configuration. Specifically, the ring is hardly deformed, which enables it to exert the correct pressure on the tabs.

[0026] In some embodiments, the first stop means consist of:

- protrusions on the retention ring turned toward the cap in the retention configuration, the protrusions extending along the perimeter as circular arcs distributed evenly along the intersection between the inner cylindrical surface and the upper circular finish; and
- recesses in the cap that are complementary to the protrusions in the retention configuration.

[0027] This solution has proven to be very effective because in addition to having insertion stop means, it also prevents relative rotational movement from occurring between the ring and the cap.

[0028] In some embodiments, the second stop means consist of protrusions of the lid portion that are distributed evenly along the periphery of the lid portion, each of the protrusions of the lid being provided with a support surface and the protrusions being arranged in a way that, in the retention configuration, they are positioned along the intersection between the inner cylindrical surface and the upper circular finish of the retention ring with the support surfaces facing the upper circular finish.

[0029] In this way, the upper circular finish is used as a support area

[0030] In some embodiments, there are three protrusions of the ring and three protrusions of the lid portion, the protrusions of the ring and the protrusions of the lid portion being alternate.

[0031] In some embodiments, the first stop means comprise outer protrusions on a lower end of the tabs and corresponding recesses in the retention ring.

[0032] In other embodiments, the first stop means comprise a perimeter protrusion on the inner cylindrical surface of the ring or on the outer surface of the tabs, the outer surface of the tabs or of the ring being provided with a slot that is complementary to the protrusion.

[0033] In some embodiments of the assembly, in the retention configuration, the lower ends of the tabs do not protrude from the retention ring by more than 1 mm in the axial direction.

[0034] Since the end of the tabs does not protrude from the lower portion, there is no impediment to the decap-

ping wedge, which facilitates the removal of the cap.

[0035] In other embodiments, in the retention configuration, the lower ends of the tabs are at the same level as the lower circular finish in the axial direction.

[0036] The features sought are optimized by means of the limitation of the portion that protrudes under the tabs.

[0037] In all embodiments, the retention ring and the cap portion are preferably made of polyethylene.

[0038] Polyethylene is a material with a rigidity and resistance that is appropriate for the assembly.

[0039] In some embodiments, the inner surface of the lid has a circular support finish on the bottle lip, the distance between the circular finish and the lower end of the tabs being comprised between 7 and 10 mm.

[0040] According to this characteristic, the failure rate can be reduced during the decapping process. As it is known, the decapping stations have standardized dimensions in accordance with the typical dimensions of the assembly that is formed by the bottle of sparkling wine and the tirage cap. This preferred dimension range allows effective retention of the cap during the second fermentation process and it leaves the minimum amount of space needed by the wedge of the automatic decapping station to minimize the decapping failure rate.

[0041] According to other embodiments, the upper surface of the lid portion is flat and the lower surface of the lid portion is provided with radial ribs.

[0042] This combination of characteristics simultaneously provides resistance to the cap, in order to resist high pressures, and a flat surface for the printing of data relating to the tracking of the bottle in question.

[0043] According to some embodiments, the lid portion extends from its lower surface by means of a tubular protuberance with a diameter that is greater than the inner diameter of the bottle finish, such that the outer surface of the protuberance presses against the inner surface of the bottle finish when the cap is applied to the bottle.

[0044] In this way, the tightness of the cap increases, reducing the possibilities of a gas or wine leak due to the increase in pressure.

[0045] According to an especially preferred embodiment, the maximum outer diameter of the retention ring is 35.8 mm.

[0046] The inventors were able to verify that this maximum dimension enables the minimum dimensions of the ring to resist the high pressure produced and it is also compatible with the dimensions of the holes found in the automatic capping and decapping stations.

[0047] In some embodiments, the outer surface of the retention ring is a cone cross section with an outer diameter of the upper circular finish that is smaller than the outer diameter of the lower circular finish.

[0048] This characteristic helps prevent failures from occurring during the insertion operation of the bottle neck in the decapping station.

[0049] In especially preferred embodiments, the cap and the retention ring are joined together by means of a plurality of frangible pins that are joined to the retention ring at the intersection between the inner cylindrical surface and the lower circular finish and the upper perimeter edge of the lid.

[0050] Therefore, the pins enable the precise relative positioning of the two portions of the assembly before the capping operation is carried out, as well as enabling the assembly to be handled as a single piece before capping.

[0051] Preferably, the frangible pins are arranged together according to the longitudinal direction of the assembly, with space between the tabs.

[0052] Thus, when the capping operation is carried out, the pins do not interfere with the tabs.

BRIEF DESCRIPTION OF THE DRAWINGS

[0053] As a complement to the description, and for the purpose of helping to make the characteristics of the invention more readily understandable, in accordance with a practical embodiment thereof, said description is accompanied by a set of figures constituting an integral part thereof, which by way of illustration and not limitation represent the following:

Figure 1 is the cross section of a typical bottle in which the assembly of the invention is arranged.

Figure 2 shows a schematic cross-sectional view that represents an embodiment of the stop means in the insertion direction of the ring according to the state of the art.

Figure 3 shows a schematic cross-sectional view that represents an embodiment of the stop means in the direction opposite to the insertion direction of the ring, wherein the protrusion of the cap is supported on the upper finish of the ring.

Figure 4 shows a schematic cross-sectional view that represents an embodiment of the stop means in the direction opposite to the insertion direction of the ring, wherein the protrusion of the cap is supported on the small perimeter notch located at the intersection between the inner cylindrical surface and the upper circular finish.

Figure 5 shows a lower perspective view of an embodiment of the assembly according to the invention which shows the relative arrangement between the tabs and the ring in the retention configuration.

Figure 6 shows an upper perspective view of an embodiment of the assembly according to the invention which shows the protrusions of the cap and how they are supported on the upper circular finish of the ring.

Figure 7 shows a cross section of a preferred embodiment of the assembly of the invention in the retention configuration.

Figure 8 shows an elevation view of the assembly of the invention before the capping operation is carried out, in other words how the ring and cap assembly is obtained by means of molding.

Figure 9 shows a cross section corresponding to the

elevation view of figure 8.

Figure 10 shows a plan view of the assembly prior to the capping operation.

Figure 11 shows the assembly from below, such that the joining ribs between the lower surface of the lid and the insertion rim on the mouth of bottle may be seen.

Figures 12, 13 and 14 show alternative embodiments of the first and second stop means

DESCRIPTION OF AN EMBODIMENT OF THE INVENTION

[0054] As seen in the figures, the invention generally relates to an assembly 1 of a cap 2 and a retention ring 3 for triage in sparkling wines, configured to be applied to a bottle B with a finish that has an upper portion and an annular recess A below the upper portion.

[0055] As may be seen in figures 7 and 8, the cap 2 comprises a lid portion 21 and a plurality of flexible tabs 4 that extend from the lid portion 21 like a perimeter skirt intended to externally clasp the upper portion of the bottle B finish; these tabs 4 being provided with projections 5 that are radially turned inwards and intended to fit into the annular recess A in a retention configuration of the assembly 1 in the bottle B.

[0056] To lock the cap onto the mouth of the bottle, the retention ring 3 must slide axially along the outer surface of the tabs 4 in the axial direction of the cap 2 to clasp the cap 2 and to externally press the tabs 4 against the finish of the bottle B such that the projections 5 fit into the annular recess A. This retention or locking configuration is shown for example in the cross section of figure 7.

[0057] As may be seen in the figures, in the retention configuration there is no space between the surface of the retention ring 3 that faces the tabs 4 and the surface of the tabs 4 that face said surface of the ring 3.

[0058] As may be seen in the figures, the assembly comprises:

- first stop means 11, 12, 25, 27, 35 to lock, in the retention configuration, the sliding of the retention ring 3 by the cap 2 in the axial direction and in the insertion direction of the retention ring 3, and
- second stop means 11, 12, 26, 33 to lock, in the retention configuration, the sliding of the retention ring 3 by the cap 2 in the axial direction and in the direction opposite to the insertion direction of the retention ring 3.

[0059] As may be seen in figures 4 and 7, the retention ring 3 has a tetragonal cross section that defines an inner cylindrical surface 32 that presses against the cap 2 in the retention configuration and the surface of the tabs that is turned towards the inner cylindrical surface 32 of the retention ring 3 has a complementary cylindrical casing for the inner cylindrical surface 32 of the retention ring 3.

[0060] The ring also comprises an outer surface 31 opposite the inner cylindrical surface 32, an upper circular finish 33 that is intended to be pressed by a locking tool of the cap-retention ring assembly and a lower circular finish 34 that is intended to be pressed by an opening tool, such as a wedge that has a slanted rocking movement. The purpose of the opening tool, which acts in a slanting manner, is not only to move the retention ring in the direction opposite to the locking direction, but also to remove the entire assembly.

[0061] It is worth nothing that this shape, which is similar to a tube section of the retention ring, is made in a simple way and is optimal when used as a compression element or a rim for the tabs.

[0062] In preferred embodiments, each one of the stop means consists of a support area that belongs to the retention ring 3 and a support area that belongs to the cap 2; these support areas being complementary in the retention configuration, and in particular, the support areas of the ring have a portion that is next to the inner cylindrical surface 32.

[0063] As seen in figures 6 to 10, the support areas belonging to the ring and the support areas belonging to the cap are arranged on the intersection between the inner cylindrical surface 32 and the upper circular finish 33 when the assembly 1 is arranged in the retention configuration.

[0064] In an especially preferred embodiment, shown in figures 3, 5, 6, 7, 8, 9, 10 and 11, the first stop means consist of:

- protrusions 35 on the retention ring 3 turned toward the cap in the retention configuration, the protrusions 35 extending along the perimeter as circular arcs distributed evenly along the intersection between the inner cylindrical surface 32 and the upper circular finish 33; and
- recesses 25 in the cap 2 that are complementary to the protrusions 35 in the retention configuration.

[0065] Furthermore, in this especially preferred embodiment, the second stop means consist of protrusions 26 of the lid portion 21 that are distributed evenly along the periphery of the lid portion 21, as shown for example in figures 8 and 10. In particular, each of the protrusions 26 of the lid 21 are provided with a support surface 22 and are arranged in a way that in the retention configuration they are positioned along the intersection between the inner cylindrical surface 32 and the upper circular finish 33 of the retention ring 3 with the support surfaces facing the upper circular finish 33, such that this surface functions as a support surface for the ring.

[0066] As shown in figure 10, there are three protrusions 35 of the ring and three protrusions 21 of the lid portion, the protrusions of the ring and the protrusions of the lid portion being alternate.

[0067] According to another embodiment, the first stop

means comprise outer protrusions 27 on a lower end of the tabs 4 and recesses that correspond to the retention ring 3. In this embodiment, second stop means such as those shown in figures 3 or 4 can be envisioned.

[0068] According to other embodiments, shown in figures 13 and 14, the first stop means comprise a perimeter protrusion 11, 12 on the inner cylindrical surface 32 of the ring 3 or on the outer surface of the tabs 4, the outer surface of the tabs 4 or of the ring 3 being provided with a slot that is complementary to the protrusion 11, 12.

[0069] In all of the embodiments, it is preferred that in the retention configuration, the lower ends of the tabs 4 do not protrude from the retention ring 3 by more than 1 mm in the axial direction or that they are at the same level as the ring so as not to interfere in the path of the decapping wedge, since the inventors were able to verify that the cap assemblies of this type, in which the ring or the tabs extend too far downwards, lead to failures in the removal of the tirage cap.

[0070] The inner surface of the lid 21 has a circular finish 23 for support on the lip of the bottle B, the edges of which are preferably adapted to the curvature of the edges of the bottle lip.

[0071] In addition, the inventors were able to verify that when the distance between the circular finish 23 and the lower end of the tabs 4 comprises between 7 and 19 mm and when this process is carried out in decapping stations with standardized dimensions, in accordance with the typical dimensions of the assembly formed by the bottle of sparkling wine and the tirage cap, the error rate in the decapping stage is very low.

[0072] As may be seen in the cross sections, the upper surface of the lid portion 21 is flat, which makes it easier to print tracking codes of the bottle B on it. In order for the flat portion to resist both the internal pressure due to the gas of the liquid, as well as external pressure due to the code printing tool, the lower surface of the lid portion is provided with radial ribs 28, as shown in figure 11.

[0073] As shown for example in figures 8 and 9, the lid portion 21 extends from its lower surface by means of a tubular protuberance 24.

[0074] This tubular protuberance or cylindrical rim is meant to press against the inner surface of the mouth of the bottle in order to ensure its leak-tightness. To this end, the outer diameter of this protuberance 24 must be bigger than the inner diameter of the finish of the bottle B by a fraction of a millimeter, which is enough to be able to introduce the protuberance into the mouth of the bottle.

[0075] It is also known that in the opening or decapping process, the mouth of the bottle, where the assembly is attached, should be introduced through a hole of the decapping station which has a standard diameter. In particular, it was determined that the maximum diameter that practically eliminates the failure rate is 35.8 mm.

[0076] To further reduce the failure rate in the decapping station, it may help that the outer surface 31 of the retention ring 3 is a cone cross section and that the outer diameter of the upper circular finish 33 is smaller than the outer diameter of the lower circular finish 34.

[0077] The assembly of the invention is designed to be molded from a plastic material, and since it is made up of two portions, the two portions, cap 2 and ring 3, must be molded together in order to reduce manufacturing costs and provide positioning prior to the capping stage.

[0078] Thus, when leaving the molding, the cap 2 and the retention ring 3 are joined together by means of a plurality of frangible pins 41 that are joined to the retention ring at the intersection between the inner cylindrical surface 32 and the lower circular finish 34 and the upper perimeter edge of the lid 21. This arrangement is shown in figures 8 and 9.

[0079] Finally, the frangible pins 41 are arranged together according to the longitudinal direction of the assembly 1, with space between the tabs 4, so as not to interfere with the tabs when the ring slides along their outer surface to carry out the capping operation, as shown for example in figure 7, which shows two pins 41 on each side, arranged next to the side of the tabs shown.

[0080] In this text, the word "comprises" and its variants should not be understood in an exclusive sense, i.e. they do not exclude the possibility of that which is described including other elements.

[0081] Moreover, the invention is not limited to the specific embodiments described herein, but rather encompasses the variations that a person skilled in the art could make, within the scope of what may be deduced from the claims.

Claims

1. A cap (2) and retention ring (3) assembly (1) for the tirage of sparkling wines, configured to be applied to a bottle (B) with a finish that has an upper portion and an annular recess (A) below the upper portion, such that the cap (2) comprises a lid portion (21) and a plurality of flexible tabs (4) that extend from the lid portion (21) like a perimeter skirt and intended to externally clasp the upper portion of the finish of the bottle (B); the tabs (4) being provided with projections (5) that are radially turned inwards and intended to fit into the annular recess (A) in a retention configuration of the assembly (1) of the bottle (B); the retention ring (3) being intended to slide axially along the outer surface of the tabs (4) in the axial direction of the cap (2) to clasp the cap (2) and to externally press the tabs (4) against the finish of the bottle (B) such that the projections (5) fit into the annular recess (A), **characterized in that** in the retention configuration there is no space between the surface of the retention ring (3) that faces the tabs (4) and the surface of the tabs (4) that face said surface of the ring (3).

2. The assembly according to claim 1, which comprises:

- first stop means (11, 12, 25, 27, 35) to lock, in the retention configuration, the sliding of the retention ring (3) by the cap (2) in the axial direction and in the insertion direction of the retention ring (3), and
- second stop means (11, 12, 26, 33) to lock, in the retention configuration, the sliding of the retention ring (3) by the cap (2) in the axial direction and in the direction opposite to the insertion direction of the retention ring (3).

3. The assembly according to any of the preceding claims, wherein the retention ring (3) has a tetragonal cross section that defines an inner cylindrical surface (32) that presses against the cap (2) in the retention configuration, an outer surface (31) opposite the inner cylindrical surface (32), an upper circular finish (33) that is intended to be pressed by a locking tool of the cap-retention ring assembly and a lower circular finish (34) that is intended to be pressed by an opening tool.

4. The assembly according to claim 3, wherein each one of the stop means consists of a support area that belongs to the retention ring (3) and a support area that belongs to the cap (2), the support areas being complementary in the retention configuration, and the support areas of the ring having a portion that is next to the inner cylindrical surface (32).

5. The assembly according to claims 3 or 4, wherein the surface of the tabs that is turned towards the inner cylindrical surface (32) of the retention ring (3) has a complementary cylindrical casing for the inner cylindrical surface (32) of the retention ring (3).

6. The assembly according to claim 4 or 5, wherein the support areas belonging to the ring and the support areas belonging to the cap are arranged on the intersection between the inner cylindrical surface (32) and the upper circular finish (33) when the assembly (1) is arranged in the retention configuration.

7. The assembly according to any of the claims 2 to 6, wherein the first stop means consist of:

- protrusions (35) on the retention ring (3) turned toward the cap in the retention configuration, the protrusions (35) extending along the perimeter as circular arcs distributed evenly along the intersection between the inner cylindrical surface (32) and the upper circular finish (33); and
- recesses (25) in the cap (2) that are complementary to the protrusions (35) in the retention configuration.

8. The assembly according to any of the claims 2 to 7, wherein the second stop means consist of protrusions (26) of the lid portion (21) that are distributed evenly along the periphery of the lid portion (21), each of the protrusions (26) of the lid (21) being provided with a support surface (22) and the protrusions being arranged in a way that in the retention configuration they are positioned along the intersection between the inner cylindrical surface (32) and the upper circular finish (33) of the retention ring (3) with the support surfaces facing the upper circular finish (33).

9. The assembly according to claims 7 and 8, wherein there are three protrusions (35) of the ring and three protrusions (21) of the lid portion, the protrusions of the ring and the protrusions of the lid portion being alternate.

10. The assembly according to claim 2, wherein the first stop means comprise outer protrusions (27) on a lower end of the tabs (4) and recesses that correspond to the retention ring (3).

11. The assembly according to claim 3, wherein the first stop means comprise a perimeter protrusion (11, 12) on the inner cylindrical surface (32) of the ring (3) or on the outer surface of the tabs (4), the outer surface of the tabs (4) or of the ring (3) being provided with a slot that is complementary to the protrusion (11, 12).

12. The assembly according to any of the preceding claims, wherein, in the retention configuration, the lower ends of the tabs (4) do not protrude from the retention ring (3) by more than 1 mm in the axial direction.

13. The assembly according to claim 3 and any of the dependent claims thereof, wherein, in the retention configuration, the lower ends of the tabs (4) are at the same level as the lower circular finish (34) in the axial direction.

14. The assembly according to any of the preceding claims, wherein the retention ring (3) and the cap portion (2) are made of polyethylene.

15. The assembly according to any of the preceding claims, wherein the inner surface of the lid (21) has a circular support finish (23) on the lip of the bottle (B), the distance between the circular finish (23) and the lower end of the tabs (4) being comprised between 7 and 10 mm.

16. The assembly according to any of the preceding claims, wherein the upper surface of the lid portion (21) is flat and the lower surface of the lid portion is provided with radial ribs (28).

17. The assembly according to any of the preceding

claims, wherein the lid portion (21) extends from its lower surface by means of a tubular protuberance (24) with a diameter that is greater than the inner diameter of the finish of the bottle (B), such that the outer surface of the protuberance presses against the inner surface of the bottle finish when the cap is applied to the bottle.

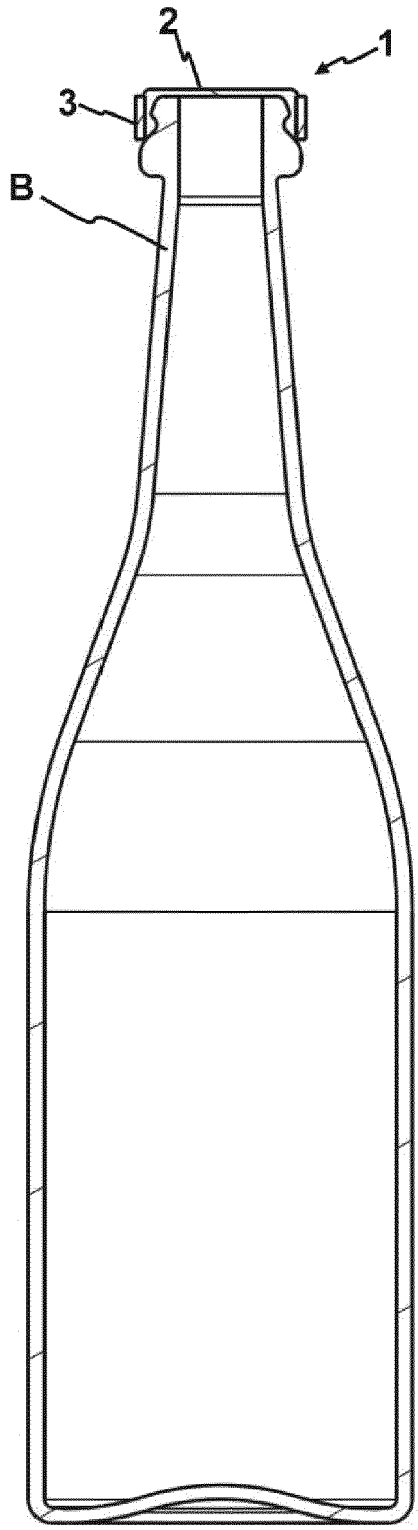
18. The assembly according to any of the preceding claims, wherein the maximum outer diameter of the retention ring (3) is 35.8 mm.

19. The assembly according to claim 3 and any of the dependent claims thereof, wherein the outer surface (31) of the retention ring (3) is a cone cross section, the outer diameter of the upper circular finish (33) being less than the outer diameter of the lower circular finish (34).

20. The assembly according to claim 3 and any of the dependent claims thereof, wherein the cap (2) and the retention ring (3) are joined together by means of a plurality of frangible pins (41) that are joined to the retention ring at the intersection between the inner cylindrical surface (32) and the lower circular finish (34) and the upper perimeter edge of the lid (21).

21. The assembly according to claim 20, wherein the frangible pins (41) are arranged together according to the longitudinal direction of the assembly (1), with space between the tabs (4).

Fig. 1



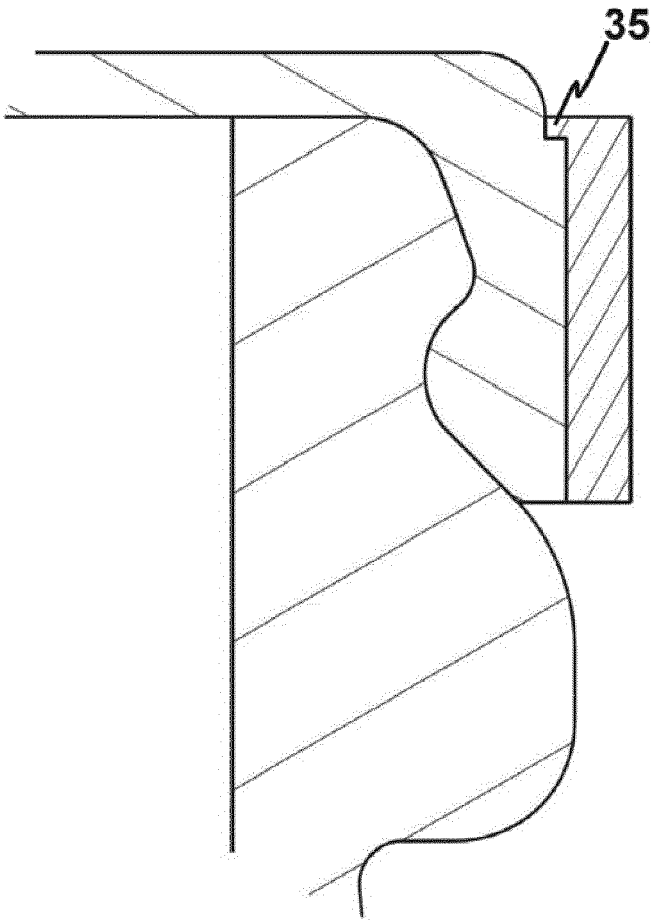
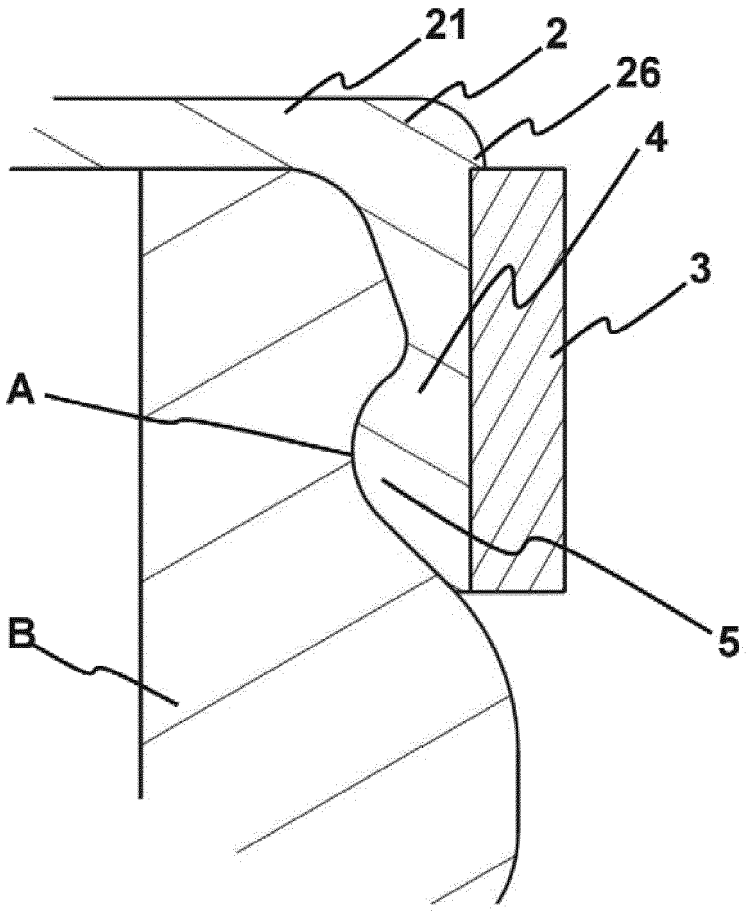


Fig. 2

Fig. 3



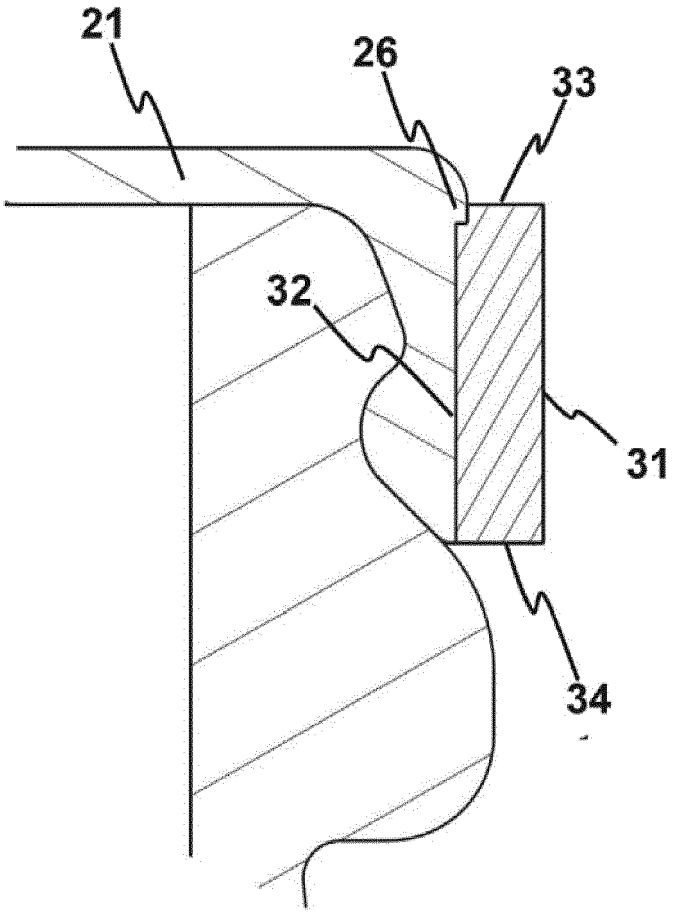


Fig. 4

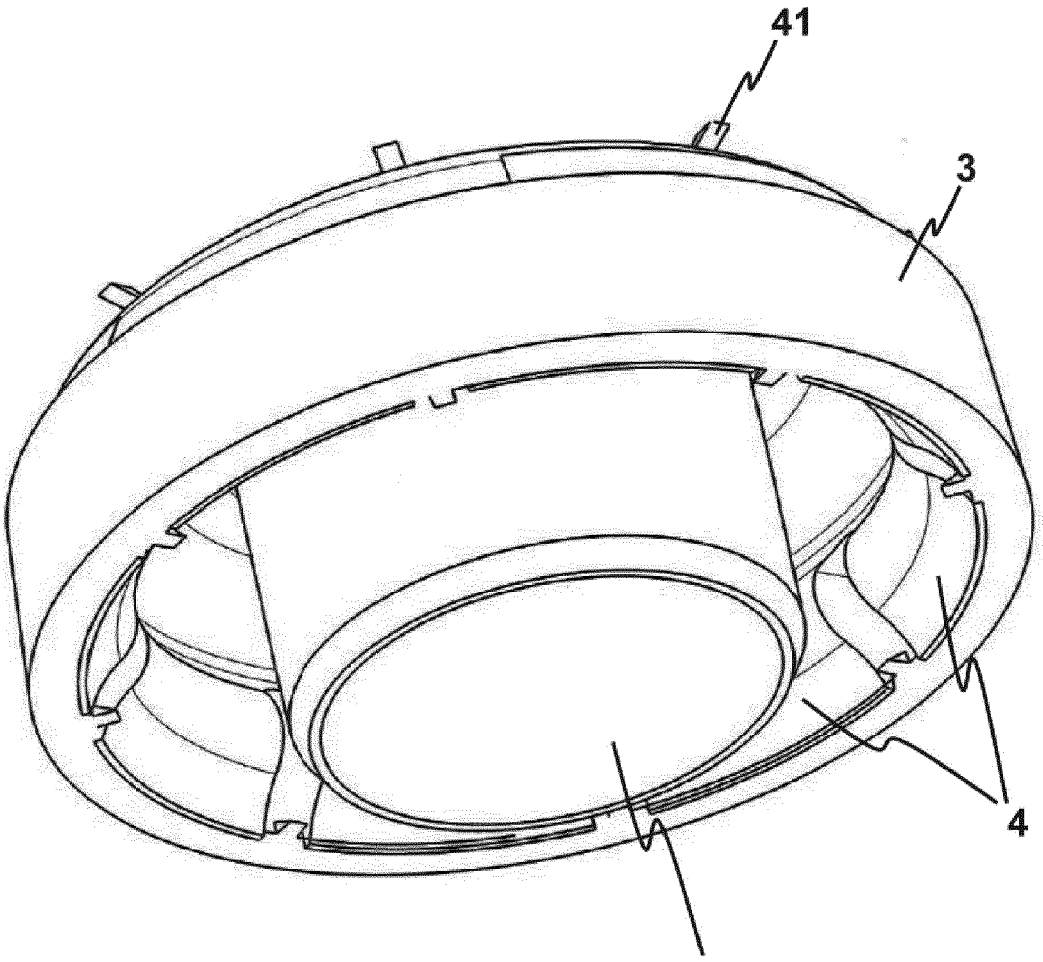


Fig. 5

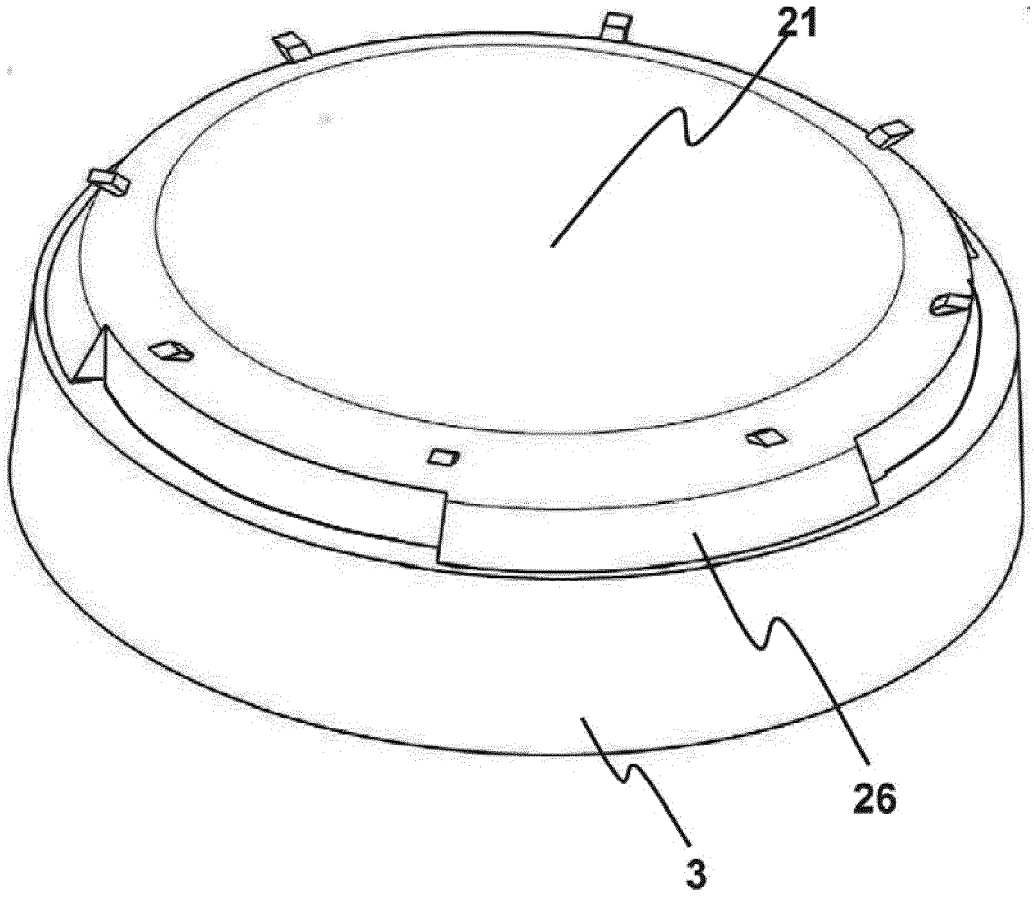


Fig. 6

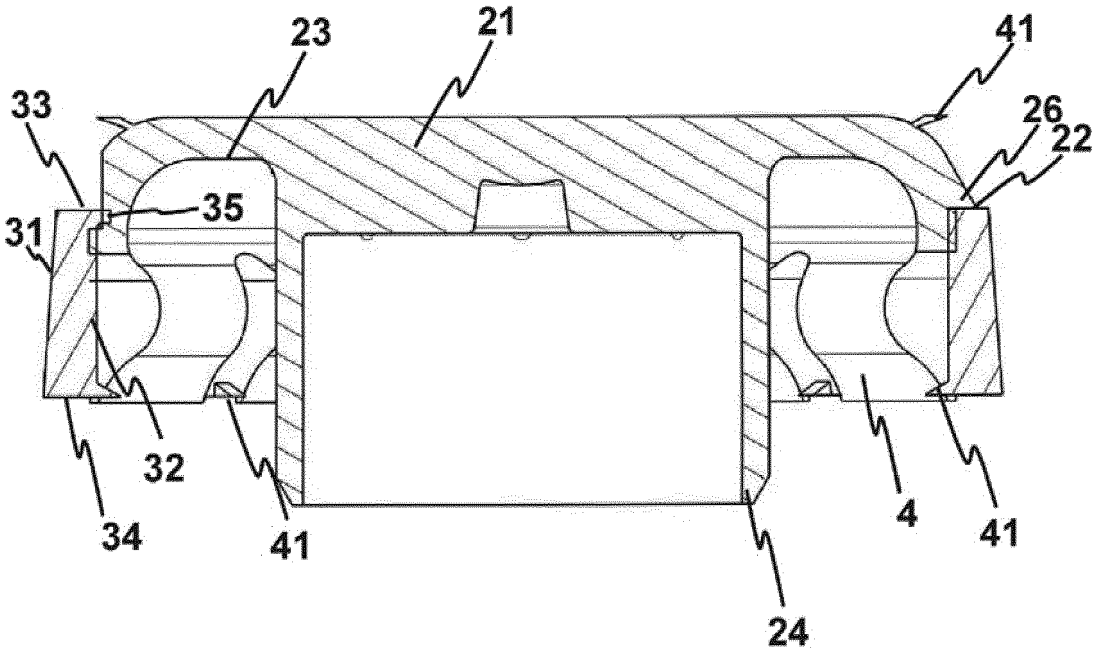


Fig. 7

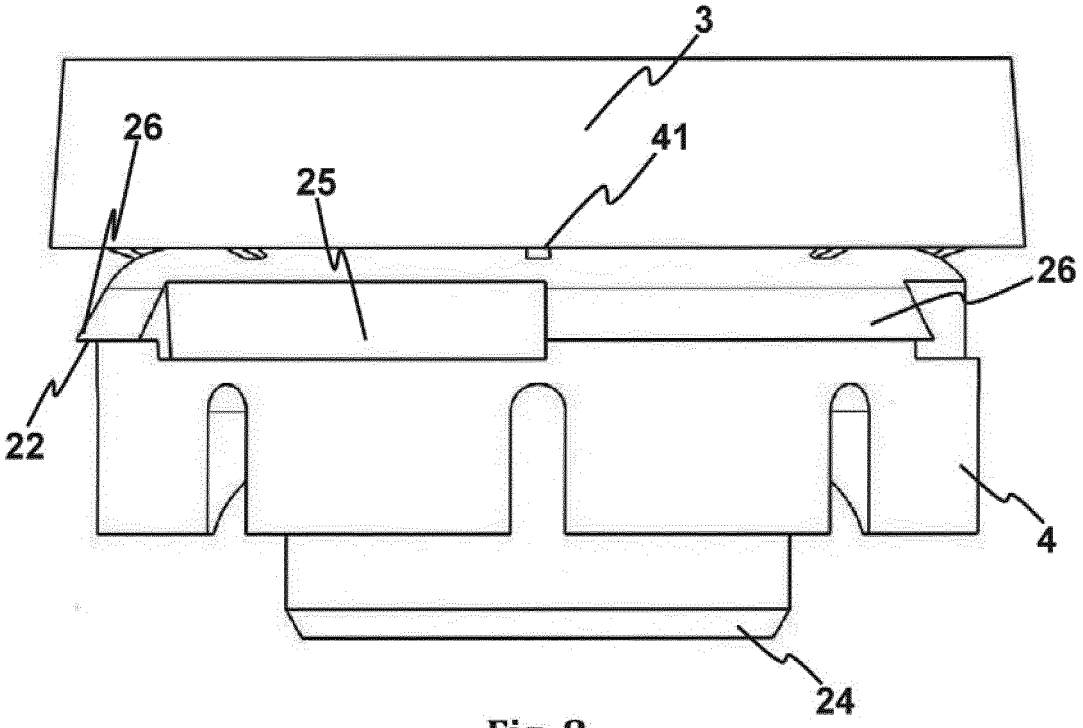


Fig. 8

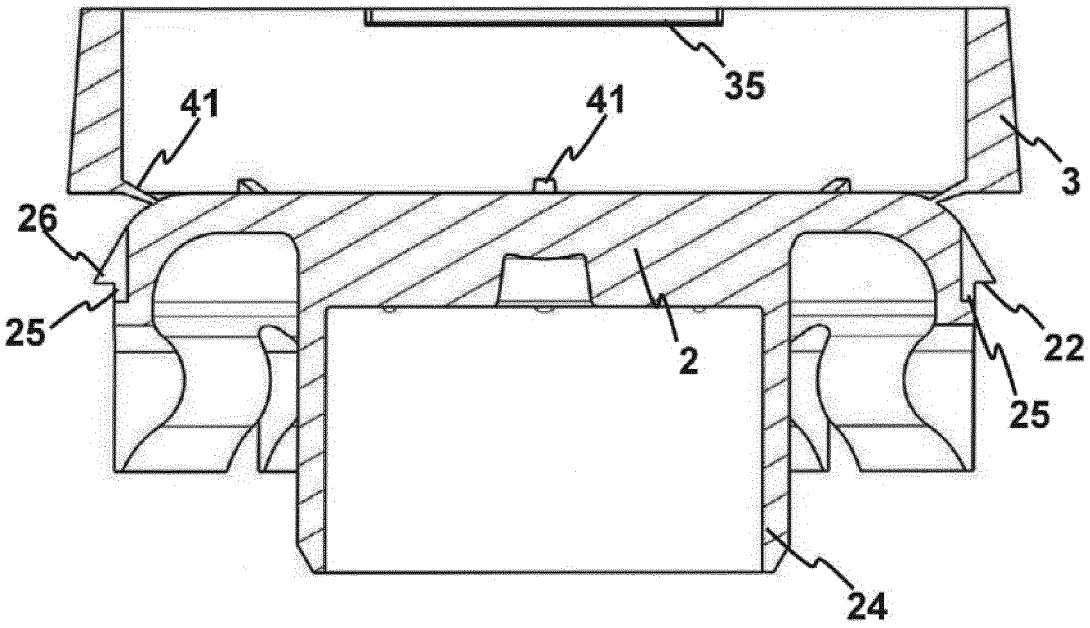


Fig. 9

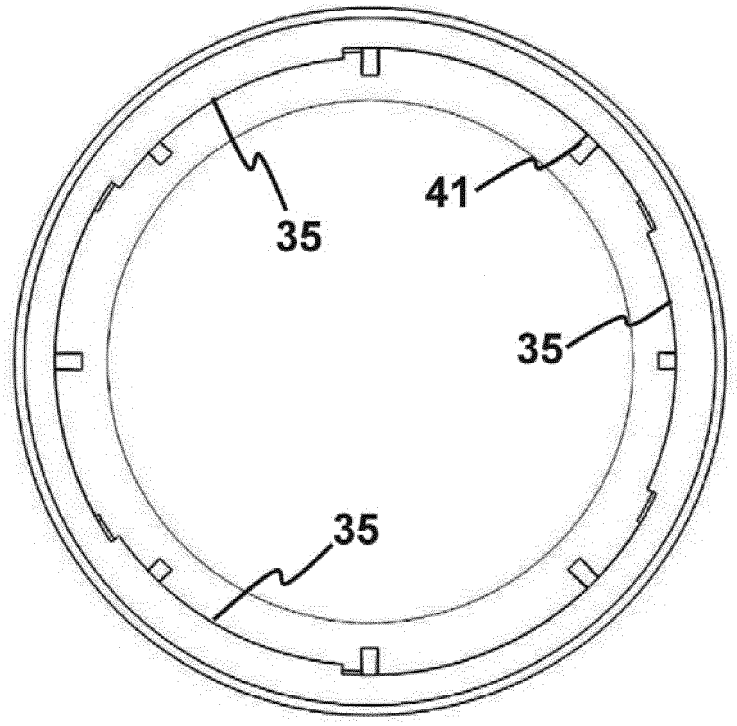


Fig. 10

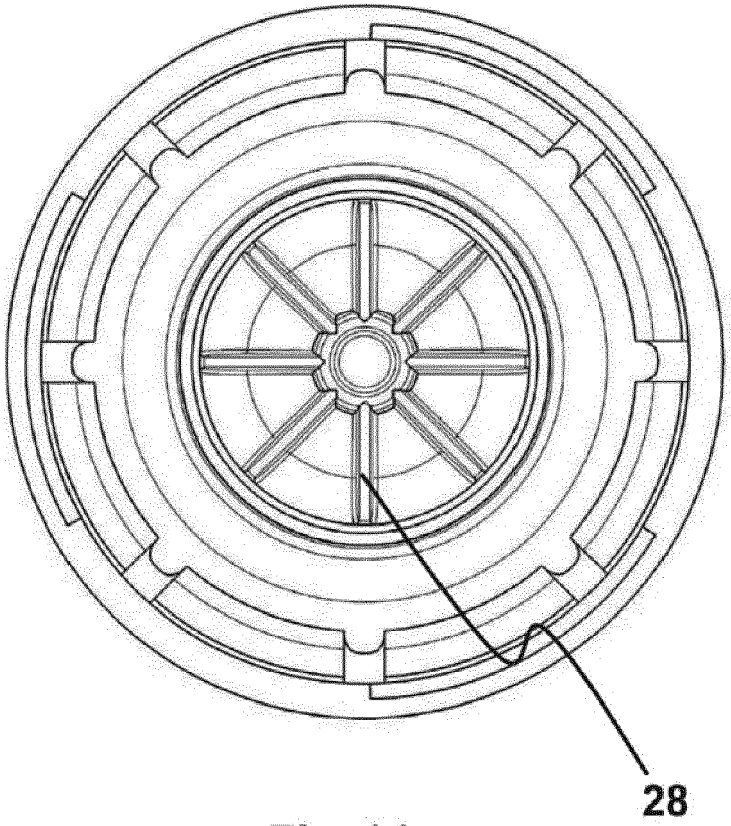
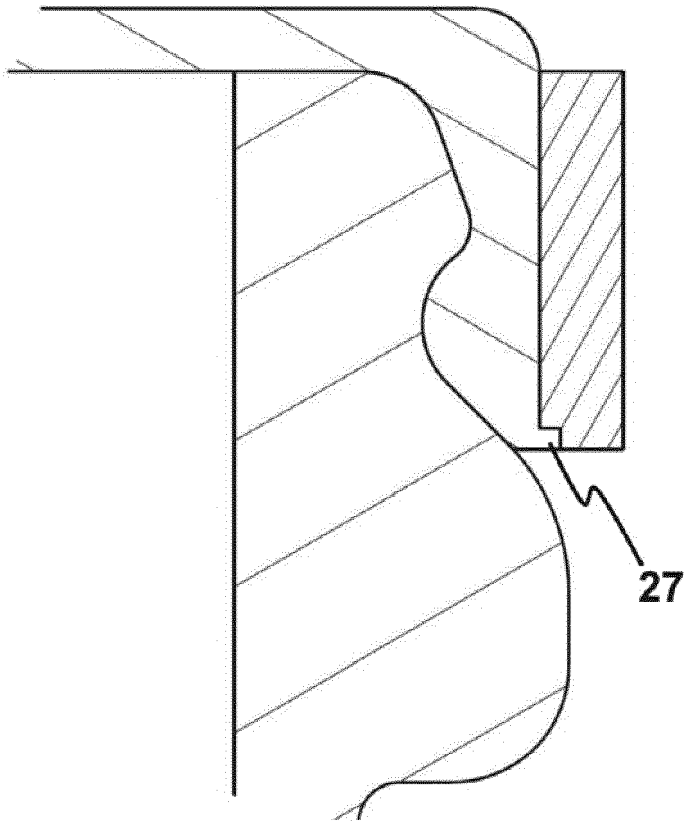


Fig. 11

Fig. 12



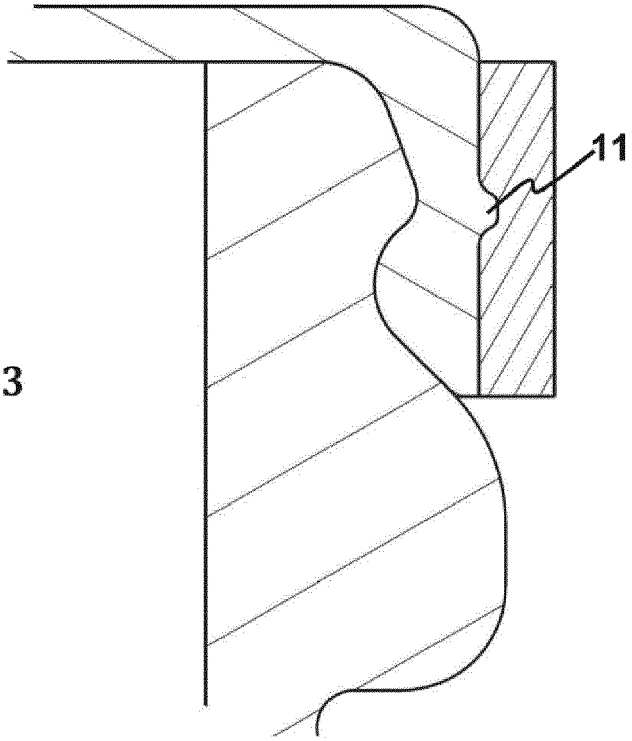


Fig. 13

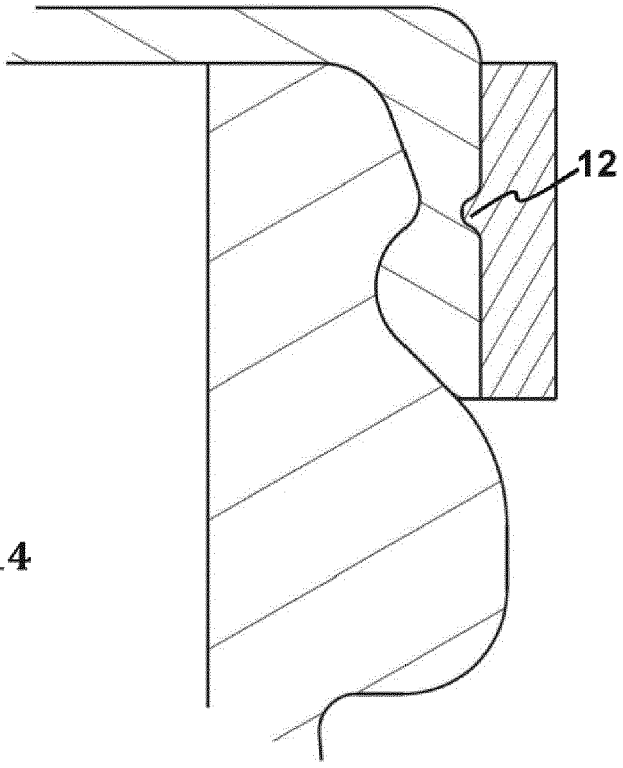


Fig. 14

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 16 19 6469

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y A	US 2014/346134 A1 (TIXIER PIERRE [FR]) 27 November 2014 (2014-11-27) * the whole document * -----	1-6,10, 14,15,18 19-21 7-9,12, 13,16,17	INV. B65D45/32 B65D41/18
Y	DE 30 09 568 A1 (KVAM OLE JACOB) 24 September 1981 (1981-09-24) * the whole document * -----	19	
Y	US 5 957 314 A (NISHIDA HIROTAKA [JP] ET AL) 28 September 1999 (1999-09-28) * the whole document * -----	20,21	
X	GB 929 479 A (ROSEDALE ASSOCIATED MANUFACTUR) 26 June 1963 (1963-06-26) * the whole document * -----	1,14,15, 17,18	
X	GB 2 085 854 A (JOHNSEN JORGENSEN PLASTICS LTD) 6 May 1982 (1982-05-06) * the whole document * -----	1-3,11, 14,15	

TECHNICAL FIELDS SEARCHED (IPC)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	17 July 2017	Pernice, Ciro

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 16 19 6469

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

17-07-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2014346134 A1	27-11-2014	CN 104093642 A	08-10-2014
		EP 2791026 A2	22-10-2014
		HK 1198383 A1	17-04-2015
		RU 2014128753 A	10-02-2016
		US 2014346134 A1	27-11-2014
		WO 2013088087 A2	20-06-2013
DE 3009568 A1	24-09-1981	NONE	
US 5957314 A	28-09-1999	CA 2224166 A1	16-10-1997
		DE 69626019 D1	06-03-2003
		DE 69626019 T2	02-10-2003
		EP 0837008 A1	22-04-1998
		JP H09278051 A	28-10-1997
		US 5957314 A	28-09-1999
		WO 9737902 A1	16-10-1997
GB 929479 A	26-06-1963	DE 1265609 B	04-04-1968
		FR 1308391 A	03-11-1962
		GB 929479 A	26-06-1963
GB 2085854 A	06-05-1982	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 5813554 A, Marangoni and Cao **[0005]**