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

(11) **EP 4 491 534 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
15.01.2025 Bulletin 2025/03

(21) Application number: **24174024.0**

(22) Date of filing: **03.05.2024**

(51) International Patent Classification (IPC):
B65D 47/24 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
B65D 47/247; B65D 55/16

(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 ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
GE KH MA MD TN

(30) Priority: **14.07.2023 IT 202300014775**

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(54) **BOTTLE DISPENSER CAP**

(57) A bottle dispenser cap comprising: a body-base (5) comprising a sleeve (13) and a first base (13d), in which a first opening (14) is centrally formed through it, a dispensing valve (7) which is engaged within the sleeve (13) so as to slide in the latter in order to translate along the first axis (A) between a closed position and an open position, a lid (6) comprising: an annular seal (16) that is fitted stably in the body-base (5), a cap (18) and a hinge (19) connecting the cap (18) to the annular seal (16), the hinge (19) is structured to rotate the cap (18) about a second axis (B) approximately transverse to said first axis (A), between a closed and an open position, wherein in the closed position of the lid (6), the cap (18) is coupled to the body-base (5) to delimit with the latter an internal, substantially hermetically closed chamber which internally contains the dispensing valve (7) and the sleeve (13).

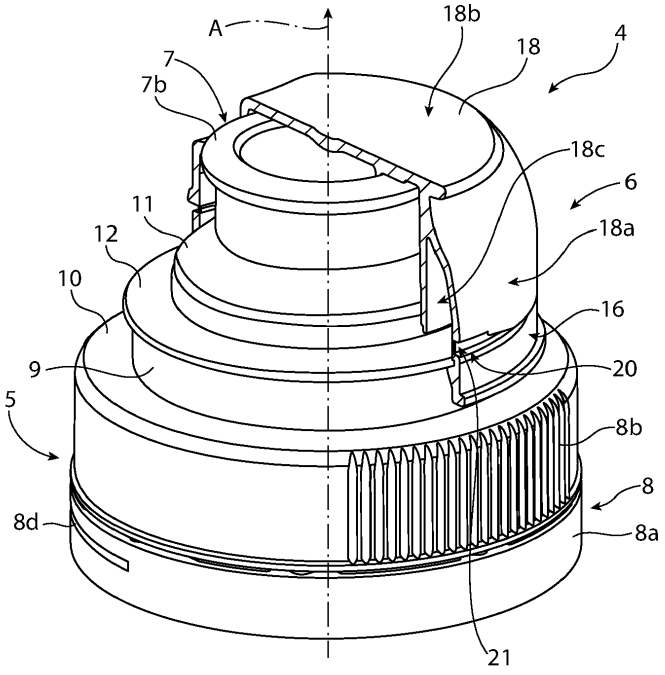


FIG. 4

EP 4 491 534 A1

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This patent application claims priority from Italian patent application no. 102023000014775 filed on July 14, 2023, the entire disclosure of which is incorporated herein by reference.

TECHNICAL FIELD

[0002] The present invention relates to a bottle dispenser cap. Preferably, the dispenser cap, which is the object of the present invention, is structured to allow a user to hermetically close the neck of a bottle containing a beverage and open the bottle allowing the beverage to be dosed.

BACKGROUND

[0003] It is well known that some beverage bottles are fitted with so-called dispenser caps which are generally designed to allow the user to carry out, in addition to the usual opening and closing of the bottle, an adjustment of the amount of beverage dispensed from the bottle itself.

[0004] Some types of bottle dispenser caps comprise a cylindrical base screwed onto the bottle neck, a frusto-conical dispenser body which is stably connected to the base so as to form a single body with it, and a lid provided with an inverted cup-shaped body and a hinge laterally connecting the cup-shaped body to the base.

[0005] Generally, the dispenser body has, centrally in the upper end part, a through opening forming a beverage dispenser orifice, whereas the cup-shaped body of the lid is structured so as to rotate via the hinge between an open position and a closed position in which the perimeter edge of the cup-shaped body is coupled to the upper perimeter edge of the base so as to include the dispenser body on the inside.

[0006] The cup-shaped body of the lid is generally structured so that internally it has a central protrusion which engages the orifice of the dispenser body when the cup-shaped body is arranged in the closed position so that it hermetically closes the bottle to prevent, on one side, accidental spillage of the beverage, and on the other side, its contamination by external contaminants.

[0007] Other types of dispenser caps comprise a central valve body which is mounted so that it can axially slide on the outer wall of an upper cylindrical tubular portion of the dispenser body so that it is manually moved by the user between a closed position, in which the valve body is lowered and engages the orifice by means of an internal protruding appendage so as to close it, and an open position, in which the valve body is raised so as to disengage the orifice and open the bottle to allow the user to drink the beverage.

[0008] The solution described in EP 4 071 078 A1 is also known.

[0009] A technical issue with the dispenser caps described above is that the hinges used in the aforementioned lids of the dispenser caps generally have a brace-like structure characterized by the presence of small through slits or openings between the braces, or between the braces and the cup-shaped body, which do not allow the space inside the lid to be hermetically isolated.

[0010] This issue exposes both the beverage and the external surface of the dispenser body or valve body (which, in use, come into contact with the user's mouth) to the risk of contamination with external agents and/or with the sanitization fluids used during the cap sanitization process.

[0011] The dispenser cap is indeed exposed to contamination by external agents during its storage in the warehouse prior to its assembly on the bottle body. In fact, it is often the case that, during the process, the caps accidentally stack on each other in a so-called "nesting" configuration before being assembled with the bottle body. In the nesting condition, the components of the caps undergo small axial displacements, resulting in the formation of small openings which, together with the slits in the hinge, cause contaminants to enter the cap.

[0012] The cap is also exposed to contamination by external agents even after the user first opens the cap. Indeed, after the first opening, in addition to the slits structurally present in the hinge, other slits also form due to mechanical clearances, especially along the closing edges of the lid, which allow contaminants to enter.

[0013] In addition, during the cap sanitization process using dip or spray treatment lines, the sanitization liquid enters the cap through these slits, becoming partially trapped inside it. Under these conditions, the sanitization liquid trapped inside the cap then comes into contact with the beverage and/or the user's mouth during the use of the bottle.

[0014] In order to ensure hermetic closure of the cap following its assembly and/or until the first opening of the bottle, in some solutions it is envisaged to cover the cap externally with a protective film made of heat-shrinkable plastic material so that any slits can be closed.

[0015] However, this solution turns out to be particularly complex and costly and has a certain environmental impact in terms of both consumption of plastic material and risk of dispersion of the film into the environment after the first opening of the bottle.

[0016] There is therefore a need to provide a dispenser cap which, on the one hand, overcomes the above-described drawbacks from contamination without the use of the protective film, and on the other hand, has a structure such as to reduce the risk of suffocation of the user due to accidental swallowing of component parts of the dispenser cap, and which reduces the risk of environmental impact of the cap caused, for example, by its decoupling from the bottle and its dumping in the environment following the opening of the bottle.

SUMMARY

[0017] The Applicant has therefore carried out an in-depth study aimed at identifying an improved dispenser cap, which allows the following goals to be achieved:

- reducing the risk of contamination of the cap surfaces which, in use, come into contact with the user's mouth,
- maintaining a high level of sterilization of the cap both during storage and during use of the bottle,
    - simplifying the sterilization process;
    - ensuring "single use" of the bottle and reducing the risk of swallowing parts of the cap,
    - keeping the dispenser cap attached to the bottle neck.

[0018] The object of the present invention is thus to provide a solution which allows at least the above-mentioned goals to be achieved.

[0019] This object is achieved by the present invention as it relates to a dispenser cap and a bottle provided with said dispenser cap manufactured as defined in the appended claims.

[0020] The claims describe preferred embodiments of the present invention forming an integral part of the present description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] The present invention will now be described with reference to the accompanying drawings, which illustrate a non-limiting embodiment thereof, wherein:

- Figure 1 shows a perspective view of a bottle provided with a dispenser cap made according to the teachings of the present invention,
- Figure 2 is a side elevation view of the dispenser cap shown in Figure 1, with parts on an enlarged scale, wherein the lid is decoupled from the body-base of the dispenser cap,
- Figure 3 is a side elevation view of the dispenser cap shown in Figure 1, with parts on an enlarged scale, wherein the lid is in an open position,
- Figure 4 is a perspective view of the dispenser cap shown in Figure 1, with parts removed for clarity, wherein the lid is in a closed position,
- Figure 5 is a top view of the dispenser cap shown in Figure 1, wherein the lid is in an open position,
- Figures 6 and 7 are two different perspective views of the dispenser cap coupled to the bottle shown in Figure 1, with parts removed for clarity, wherein the body-base is open and remains attached to the neck through its annular seal,
- Figures 8, 9 and 10 are respective different side elevation views of the dispenser cap shown in Figure 1, in the closed position,
- Figure 11 is a bottom perspective view of the dispenser cap shown in Figure 1,
- Figure 12 is a section I-I of the dispenser cap shown in Figure 10, in the closed position,
- Figure 13 is a top view of the dispenser cap shown in Figure 1, in the closed position,
- Figure 14 is a vertical section of the dispenser cap, with parts removed for clarity, manufactured according to the present invention, in the open position,
- Figure 15 is a section II-II of the manufactured dispenser cap shown in Figure 8,
- Figure 16 is a bottom view, with parts removed for clarity, of the dispenser cap manufactured according to the present invention,
- Figure 17 is a partially sectional view, with parts removed for clarity, of the dispenser cap of the present invention, in the closed position,
- Figure 18 is a partially sectional view, with parts removed for clarity, of the dispenser cap of the present invention, in the open position,
- Figures 19, 20 and 21 are three different perspective views of the dispensing valve of the dispenser cap manufactured according to the present invention.

DESCRIPTION OF EMBODIMENTS

[0022] The present invention will now be described in detail with reference to the accompanying drawings in order to allow a skilled person to implement it and use it. Various modifications to the described embodiments will be readily apparent to those skilled in the art and the general principles described may be applied to other embodiments and applications without however departing from the protective scope of the present invention as defined in the appended claims. Therefore, the present invention should not be construed as limited to the embodiments described and illustrated herein, but it must be given the broadest protective scope consistent with the principles and features described and claimed herein.

[0023] With reference to Figure 1, the number 1 indicates a bottle as a whole. The bottle 1 is suitable for containing food-grade beverages such as, for example, water, orange juice or any other natural, smooth or carbonated beverage. The bottle 1 is preferably made of a polymeric material, e.g. PET (polyethylene terephthalate) or any other similar plastic/polymeric material.

[0024] The bottle 1 comprises a cylindrical tubular body at the top defining a neck 2, and a containment body 3 at the bottom, which is suitable for containing the beverage and is connected to the neck 2 at the top.

[0025] The bottle 1 is further provided with a dispenser cap 4 which is coupled to the neck 2 in order to close its mouth. The dispenser cap 4 is conveniently a tethered cap, i.e., it is designed to remain permanently bound to the neck 2 even after opening it. The technical effect of the tethered dispenser cap 4 is to prevent the user from separating the same dispenser cap 4 from the neck 2 of the bottle 1 in order to reduce the risk of the dispenser cap

4 being thrown into the environment and polluting it.

[0026] It should be pointed out that, in the following description, purely for the purpose of improving the understanding of the present invention but without any loss of generality, the terms upper, lower, horizontal, vertical, inner, outer, bottom and top will be used with reference to a vertical configuration of the dispenser cap 4 as illustrated in the examples in the attached Figures.

[0027] With reference to the attached Figures, the dispenser cap 4 has an axis A and comprises a body-base 5 that is tethered to the neck 2 so as to remain bound to it (Figures 4 and 5), an upper lid 6 that is coupled to the body-base 5 in the way described, and a dispensing valve 7 (Figures 2, 3, 19-21) that is coupled to the body-base 5 and is configured to allow the user to selectively close, open and adjust the dispensing of the beverage from the bottle 1.

[0028] With reference to Figures 4, 12 and 14, the body-base 5 extends along the axis A, coaxially therewith, and inferiorly comprises a tubular portion 8, which has a substantially cylindrical shape and extends along the axis A, coaxially therewith, a tubular portion 9, which has a substantially cylindrical shape and extends along the axis A, coaxially therewith, above the portion 8 and is peripherally connected to the latter via a flat annular portion 10 approximately transverse to the axis A.

[0029] According to a possible exemplary embodiment, the body-base 5 also comprises a portion 11, which is preferably, but not necessarily, frustoconical, extends along the axis A, coaxially therewith, above the portion 9 and is peripherally connected to the latter via an annular portion 12 approximately transverse to the axis A.

[0030] With reference to Figures 12 and 14, the body-base 5 further comprises a central sleeve 13 extending coaxial to the axis A and having: an upper cylindrical portion 13a externally connected, in an axially intermediate position, to the upper perimeter edge of the frustoconical portion 11, a lower cylindrical portion 13b, which is arranged below the portion 13a, has an outside diameter less than the outside diameter of the portion 13a, and has its upper perimeter edge connected to the lower perimeter edge of the portion 13a by a conical portion 13c, and the lower perimeter edge connected to a flat base 13d orthogonal to the axis A.

[0031] With reference to Figures 12 and 14 and 16, the base 13d features a central through-opening 14, coaxial with the axis A, which is shaped so as to have a central circular hole from which apertures 14a extend radially towards the outer perimeter of the base 13d, said apertures 14a being angularly spaced from each other around the axis A. In the exemplary embodiment, the apertures 14a are preferably rectangular. The apertures 14a radially divide the base 13d into as many tongues 15 (Figure 15). According to a preferred embodiment shown in the attached Figures, there are three apertures 14a, which are angularly spaced from each other around the axis A by 120° and form three respective tongues 15.

[0032] According to a preferred embodiment shown in Figures 12 and 14, the upper (internal) surface of the base 13d facing the inside of the sleeve 13 has an approximately conical section passing through the axis A so that the upper faces of the tongues 15 are inclined. The lower surface of the base 13d opposite the upper surface thereof is preferably flat and lies in a plane substantially orthogonal to the axis A.

[0033] With reference to Figures 12 and 14, the dispensing valve 7 is telescopically engaged within the sleeve 13 so that it slides axially therein so as to be translated along the axis A between a closed position (lowered, as shown in Figures 2, 3, 12, 17) in which it hermetically closes the opening 14 of the base 13d so as to hermetically close the bottle 1, and an open position (raised, extracted, shown in Figures 14 and 18) in which the dispensing valve 7 opens the underlying opening 14, so that the dispensing valve 7 is in hydraulic communication with the containment body 3 to allow the dispensing of the beverage. A slight adjustment of the axial position of the dispensing valve 7 along the axis A, in the closed position, allows the dispensing of the beverage to be varied.

[0034] The technical effect of the dispensing valve 7 telescopically engaged within the sleeve 13 is to reduce its risk of contamination, especially when it is in the closed position as it is at least partially protected by the sleeve 13.

[0035] With reference to Figures 12, 14, 17-21, the dispensing valve 7 comprises a tubular portion 7a having a cylindrical shape coaxial with the axis A. The portion 7a is telescopically engaged within the portion 13a of the sleeve 13 in contact with its inner surface, so as to move axially along the axis A to and from the underlying base 13d. The dispensing valve 7 also comprises, at the top, an annular edge 7b extending cantilevered from the upper perimeter edge of the portion 7a in a radial direction, opposite the axis A, so as to project at least partially above the upper perimeter edge of the underlying portion 13a (Figure 12).

[0036] In the example shown, the annular edge 7b is substantially circular and is structured so that its lower face abuts against the upper perimeter edge of the sleeve 13 when the dispensing valve 7 is in the closed position. The annular edge 7b conveniently serves as the upper limit stop of the dispensing valve 7 and is structured to block the axial travel of the latter along the axis A when it reaches the closed position.

[0037] The dispensing valve 7 also comprises, at the bottom, a flat circular base 7c orthogonal to the axis A. The base 7c is sized such that it is engaged by interference in the portion 13b against the inner surface of the portion 13b itself when the dispensing valve 7 is in the closed position, so that the opening 14 is hermetically closed.

[0038] As shown in the examples in Figures 12, 14, 17 and 18, the base 7c is connected to the portion 7a by a series of spokes 7d. Preferably, the spokes 7d are arranged angularly equidistant from each other around the

axis A, extend radially cantilevered from the upper face of the base 7c and are connected at the top to the inner face of the portion 7a.

[0039] According to the exemplary embodiment shown in Figures 19-21, the spokes 7d are preferably shaped as a triangle and delimit, with the lower perimeter edge of the portion 7a and the outer perimeter edge of the base 7c, through-openings 17 designed to be traversed, in use, by the beverage when the dispensing valve 7 is in the open position.

[0040] As shown in Figures 15, 19-21, the dispensing valve 7 also comprises, in its lower end part, a circular annular portion 7e which is arranged coaxial with the axis A and is centrally connected to the lower face of the base 7c by means of a central stem 7f which extends coaxial with the axis A and is engaged in the opening 14 of the base 13d.

[0041] The stem 7f is shaped so that it has a section, orthogonal to the axis A, substantially in the shape of a cross (section shown in Figure 15) and extends from the lower face of the base 7c (opposite the tubular portion 7a) over a length (along the axis A) substantially corresponding to the length of the axial travel/displacement that the dispensing valve 7 makes between the closed position and the open position, and vice versa (Figures 17 and 18).

[0042] As shown in Figure 15, the stem 7f comprises longitudinal spokes 7g extending parallel to the axis A. The spokes 7g form the four segments of the cross-shaped section. The spokes 7g extend radially from the axis A in planes orthogonal to each other. The spokes 7g are structured and sized so as to slide substantially in contact with the perimeter edge of the circular hole of the opening 14 when the dispensing valve 7 is translated in the sleeve 13 (Figure 15). Conveniently, the number of spokes 7g is different from the number of apertures 14a. In the example shown, there are four spokes 7g conveniently arranged orthogonal to each other, whereas there are three apertures 14a. The shape and angular distribution of the four spokes 7g of the dispensing valve 7 around the axis A combined with the angular arrangement of the three rectangular apertures 14a of the base 13d (at 120° from each other) has the technical effect of ensuring that the centering of the dispensing valve 7 in the body-base 5 is maintained along the axial travel of the dispensing valve 7 in any angular position of the dispensing valve 7 around the axis A, that is, in any condition of angular offset between the spokes 7g and the rectangular apertures 14a. The lower end part of the stem 7f is connected to the annular portion 7e and delimits therein four through-openings 7h.

[0043] The annular portion 7e is circular and has an outside diameter larger than the diameter of the central hole of the opening 14 so that its upper face abuts against the lower face of the tongues 15 obtained in the base 13d, when the dispensing valve 7 is in the open position.

[0044] The annular portion 7e defines a lower limit stop for the dispensing valve 7, opposite the upper limit stop defined by the annular edge 7b, which stops its axial travel along the axis A, when the dispensing valve 7 reaches the open position. In particular, when the dispensing valve 7 reaches the open position, the annular portion 7e moves into contact with the tongues 15 of the base 13d.

[0045] When the dispensing valve 7 is in the open position (Figures 14 and 18) and the user attempts to force a further axial movement of the dispensing valve 7 upwards, the tongues 15 tend to flex, thereby reducing their mutual central distance, i.e., the inside diameter of the opening 14, and then tighten vicelike onto the spokes 7g of the stem 7f. The technical effect obtained is to perform a tightening that axially locks the stem 7f and prevents the dispensing valve 7 from decoupling from the sleeve 13. This avoids the risk of the dispensing valve 7 being separated from the body-base 5 and accidentally swallowed by the user.

[0046] With reference to Figures 2-4, the lid 6 comprises an annular seal 16 which is firmly fitted on the body-base 5 and extends coaxial with the axis A; a cap 18, and a hinge 19 connecting the cap 18 to the annular seal 16 and is structured to rotate the cap 18 around an axis B approximately transverse to the axis A, between a closed position (shown in Figures 1, 4, 8, 9, 10, 11 and 12) and an open position (shown in Figures 3 and 5). As shown in Figure 4, in the closed position, the cap 18 is coupled to the body-base 5 in order to delimit with the latter an internal closed chamber which internally contains the dispensing valve 7 and the sleeve 13. In the open position shown in Figure 3, the cap 18 is decoupled from the body-base 5 and is arranged substantially upside down relative to the closed position so that the user has access to the dispensing valve 7.

[0047] A technical effect of the dispensing valve 7 telescopically engaged within the sleeve 13 in its closed position is to keep the bottle closed even when the cap 18 is in the open position.

[0048] As shown in Figures 4 and 12, the cap 18 comprises a cup-shaped body provided with an outer side wall 18a of annular shape surrounding the axis A, and a flat upper wall 18b transverse to the axis A closing the upper opening of the side wall 18a.

[0049] In the example shown in Figures 4, 8-10, the lid 6 is provided with a circular slot 20 (preferably sector-shaped in the example shown), extending in a circumferential direction around the reference axis A and separating the cap 18 from the annular seal 16. Preferably, the lid 6 is provided with a plurality of breakable bridges 21, which connect the annular seal 16 to the side wall 18a of the cap 18, or rather to the lower edge of the side wall 18a of the cap 18. The breakable bridges 21 are initially intact and are structured to break when the cap 18 is first opened. The integrity of the breakable bridges 21 indicates the integrity of the lid 6 prior to its first opening. Preferably, the breakable bridges 21 are distributed at a certain distance from each other along the slot 20.

[0050] The cap 18 also comprises an inner wall 18c of

substantially cylindrical shape extending coaxially to the axis A. The inner wall 18c extends cantilevered from the inner face of the upper wall 18b (oriented towards the body-base 5) and is structured/sized so as to engage on the portion 11 of the body-base 5, when the cap 18 is in the closed position. Preferably, the lower edge of the inner wall 18c is shaped so that its inner face has a section (in a plane lying on the axis A) which is approximately complementary to the section (in the same plane) of the cylindrical surface of the portion 11 on which it is engaged.

[0051] With reference to Figures 4 and 12, when the cap 18 is in the closed position, the inner wall 18c is engaged/fitted in the portion 11 and delimits, together with the latter, the sleeve 13, the annular edge 7b and the inner face of the upper wall 18b, an internal (substantially) hermetically closed chamber 22. The hermetic closure of the chamber 22 is ensured by the fact that the portion of the base 7c is engaged by interference in the cylindrical portion 13b, and at the same time the lower edge of the inner wall 18c of the cap 18 is engaged in the portion 11. When the cap 18 is in the closed position, the upper wall 18b delimits, with the inner faces of the dispensing valve 7, a portion of the volume of the internal (substantially) hermetically closed chamber 22. A technical effect achieved by the inner wall 18c of the cap 18 engaged in the portion 11 of the body-base 5, when the cap 18 is in the closed position, is to prevent contact of the drinking surface, i.e., the surface intended to come into contact with the user's mouth, with external contaminants, both during the storage of the bottle 1 and during its use.

[0052] Furthermore, the engagement of the inner wall 18c on the portion 11 allows hermetic closure of the chamber 22, which conveniently prevents the sanitization liquid used during sanitization from entering therein.

[0053] Recesses are made along the lower edge 18d of the side wall 18a, the former delimiting discharge openings or windows 24.

[0054] The technical effect of the discharge windows 24 is to facilitate the outflow of the sanitizing fluid from the portion of the lid 6 which undergoes sanitization.

[0055] As shown in Figures 12 and 14, in order to increase the outflow of the sanitizing fluid from the dispenser cap 4 during the sanitization of the dispenser cap 4 (when the dispenser cap 4 is separated from the neck 2), the annular portion 12 is shaped to have a section (in a sectional plane passing through the axis A) which is conveniently inclined outwards. The inclined surface of the annular portion 12 conveys any residues of the sanitizing fluid towards the discharge windows 24, thereby facilitating the evacuation of the fluid from the dispenser cap 4 towards the external environment. During the sanitization of the dispenser cap 4 (in a condition of non-coupling to the neck 2) the outflow of the sanitizing fluid acting on the inside in the area close to the seal between the body-base 5 and the dispensing valve 7 is also guaranteed by the apertures 14a obtained on the base 13d.

[0056] According to a preferred embodiment shown in Figures 4 and 5, the cap 18 further comprises an inner centering wall 25 extending cantilevered from the inner face of the upper wall 18b in order to be coaxial with the axis A. The centering wall 25 is engaged in the inner face of the upper end of the tubular portion 7a opposite the annular edge 7b, when the lid 6 is in the closed position. In addition, on the inner face of the upper wall 18b there are a series of spokes or ribs 26 extending radially from the centering wall 25 outwards and sized/shaped so as to be arranged to rest on the upper abutment surface of the annular edge 7b when the lid 6 is in the closed position. The ribs 26 may be straight and be angularly equidistant from each other around the axis A. The ribs 26 may be conveniently arranged at 120° from each other.

[0057] With reference to Figure 12, the upper edge of the portion 13a of the body-base 5 and the three spokes 26 on the inner face of the upper wall 18b of the cap 18 constrain the dispensing valve 7 axially so that it remains in the closed position with the annular edge 7b abutting against the portion 13a, when the lid 6 is in the closed position. A technical effect achieved is to prevent an axial movement between the body-base 5 and the dispensing valve 7 when the latter is in the closed position. The technical problem of contamination to which the sanitized surfaces of the dispenser cap 4 are exposed during the handling and transport of the dispenser cap 4 on the lines and/or when the condition of accidental stacking (nesting) occurs is therefore solved.

[0058] This prevents, on the one hand, the sanitizing fluid from leaking into and remaining in the chamber 22 and, on the other hand, contaminated portions of the dispenser cap 4 from coming into contact with the beverage and contaminating it.

[0059] As shown in Figure 5, the centering wall 25 is missing a portion. The removed portion is adjacent to the hinge 19. The portion of the centering wall 25 facing the hinge 19 is removed. The portion is removed from the centering wall 25 along a stretch or arc that is adjacent to the hinge 19 and has an angular extension of approximately 80° to 120°.

[0060] The technical effect of removing the portion from the centering wall 25 is to avoid interference between the centering wall 25 and the dispensing valve 7 during the opening/closing of the cap 18. The removal of the centering portion 25 makes it easier for the user to open the cap 18.

[0061] Conveniently, according to an embodiment shown in Figure 5, the end portions 25a of the centering wall 25 are asymmetrical with respect to the centerline (median) plane of the dispenser cap 4. The technical effect obtained is to further facilitate the opening even when the thrust point applied by the user on the cap 18 is not in the median plane.

[0062] According to the present invention, the dispenser cap 4 is structured so that, when the dispensing valve 7 is in the open position, the movement of the cap 18 from the open position to the closed position causes the dis-

pensing valve 7 to move to the closed position. In particular, during the first phase of the rotation of the cap 18, the wall 18c abuts against the annular edge 7b and exerts a thrust thereon which causes an axial displacement of the dispensing valve 7 within the sleeve 13 and subsequently, during the end phase of the rotation, the upper wall 18b abuts against the annular edge 7b and pushes the dispensing valve 7 inside the sleeve 13 into the closed position.

[0063] The technical effect is to simplify the operation of closing the dispensing cap 4 for the user, even when the dispensing valve is extracted. The user then conveniently closes the dispensing valve and cap with a single movement.

[0064] According to a preferred embodiment shown in Figures 2, 3, and 9, the hinge 19 comprises an opening 28 which is formed along a section of the circular slot 20 delimited at the bottom and top (along the axis A) by two opposite sides 28a and 28b approximately trapezoidal in shape. The two sides 28a and 28b delimit, with two sides of the through opening 28 parallel to the axis A, two trapezoidal windows which are symmetrical with each other relative to a plane of symmetry lying on the axis A. In the example shown, the trapezoidal windows are connected to each other via a central window, preferably rectangular, which runs in a direction approximately parallel to the lying plane of the circular slot 20.

[0065] The hinge 19 also comprises connecting braces 29 extending within the respective trapezoidal windows of the opening 28 side by side with each other and parallel to the axis A. The braces 29 are substantially flexible, have an approximately trapezoidal shape, and each have the two opposite inclined sides connected, respectively, to the opposite inclined sides of the relevant trapezoidal window.

[0066] The cap 18 further comprises a tooth 30 which is structured so that it rests against the outer surface of the annular seal 16 to keep the cap 18 locked in the open position (Figure 3). In the example shown, the tooth 30 extends cantilevered outwards from the side portion 18a. The section of the tooth 30 in a plane passing through the axis A, when the cap 18 is in the open position (Figure 3) has one side 30a (the upper one in Figure 3) which is substantially flat and parallel to the lying plane of the lower edge 18d of the cap 18, and one side 30b opposite the side 30a (the lower one in Figure 3) which is inclined relative to the outer surface of the side portion 18a.

[0067] The side 30b is shaped so that when the cap 18 rotates and passes the dead centre in which the profile of the braces 29 (Figure 2) goes beyond the axis of rotation B transverse to the axis A, the end portion of the side 30b rests against the outer wall of the seal 16 and under the elastic action of the tensioned braces 29 brings and holds the cap 18 into the open position (Figures 2 and 3).

[0068] The technical effect of the tooth 30 is, on the one hand, to prevent accidental closing of the cap 18 and, on the other hand, to allow the cap 18 to move easily into the open position.

[0069] With reference to Figures 6 and 7, the tubular portion 8 of the body-base 5 comprises an inner surface provided with a thread having a shape complementary to the thread of the neck 2. The inner surface of the tubular portion 8 is threaded so that it is coupled with (screwed in) the threaded outer surface of the neck 2.

[0070] The tubular portion 8 of the body-base 5 is provided with a circular slot 31 extending in a circumferential direction around the reference axis A and separating a lower annular seal 8a from an upper cylindrical portion 8b.

[0071] The annular seal 8a defines a guarantee ring or guarantee band and is fitted on a lower portion of the neck 2, below an annular flange 2a extending cantilevered from the neck 2.

[0072] In addition, the tubular portion 8 of the body-base 5 is provided with a plurality of breakable bridges 8c, that is to say, programmed to break, connecting the annular seal 8a to the upper portion 8b. The breakable bridges 8c are initially intact and are structured to break when the body-base 5 is decoupled (unscrewed) from the neck 2. The integrity of the breakable bridges 8c indicates the integrity of the dispenser cap 4.

[0073] The tubular portion 8 of the body-base 5 further comprises a pair of connecting braces 8d that are designed to keep the upper portion 8b firmly attached to the annular seal 8a and are structured to allow the body-base 5 to rotate about an axis of rotation D (horizontal in Figures 6 and 7) lying in a reference plane orthogonal to the reference axis A between a coupling position in which the body-base 5 is coupled to the neck 2 (Figures 8 and 9) and a decoupling position in which the body-base 5 is decoupled from the neck and is tilted/capsized with respect to the coupling position so as to be placed alongside the neck 2 (Figures 6 and 7).

[0074] The connecting braces 8d are approximately L-shaped. The connecting braces 8d comprise a major plate-like (ribbon-like) segment or portion 8e extending from the annular seal 8a in a circumferential direction over a stretch with a predetermined angular width. In addition, the connecting braces 8d comprise a minor plate-like (ribbon-like) segment or portion 8f extending from the free end of the major portion 8e in an axial direction (parallel to the axis A) and joining/connecting to the upper portion 8b, preferably to its lower edge.

[0075] Preferably, the width of the connecting braces 8d is approximately constant. The width measured along a direction parallel to the axis A of the major portions 8e is approximately equal to the width measured in the circumferential direction of the minor portions 8f. According to a different embodiment (not shown), the minor portions 8f have a width measured in the circumferential direction that is greater than the width of the major portions 8e. According to a different embodiment (not shown), the minor portions 8f have a width measured in the circumferential direction that is smaller than the width of the major portions 8e.

[0076] The connecting braces 8d, or rather the major

portions 8e, are also of such length that the body-base 5 can translate along the reference axis A towards the upper opening of the neck 2, while the annular seal 8a is retained against the annular flange 2b, preferably by anchoring ribs (not shown) present in the annular seal 8a itself.

[0077] Preferably, the connecting braces 8d are arranged symmetrically, i.e., in mirror images of each other. Preferably, the major portions 8e are obtained by creating on the annular seal 8a a pair of separation lines, i.e., slots, extending in a circumferential direction, so that the corresponding major portions 8e of the connecting braces 8d are separated from the annular seal 8a. Preferably, the major portions 8e of the connecting braces 8d originate from two diametrically opposite points of the annular seal 8a. Preferably, the minor portions 8f extend bridge-wise in the axial direction between the free end of the major portion 8e and the lower edge of the upper portion 8b.

[0078] Preferably, the connecting braces 8d of the portion 8 of the tubular body 5 can be conveniently made in an equivalent way to the connecting braces of the cap described in the Applicant's Italian patent application no. 102022000006725, the contents of which are understood to be incorporated herein by reference in their entirety.

[0079] The advantages of the dispenser cap are at least the following. The design of the dispenser cap allows a closed chamber to be obtained, which prevents the drinking surface from coming into contact with external agents both during the storage of the dispenser cap and during its use.

[0080] The discharge windows obtained on the cap allow the outflow of the sanitizer, also facilitated by the inclination adopted for the portion of the body-base coupled to the cap seal. In fact, the inclined surface conveys any residues of the sanitizer towards these openings, facilitating their evacuation into the external environment. The outflow of the sanitizer which acts on the inside of the dispenser cap and in particular on the area close to the seal between the body-base and the dispensing valve is also guaranteed by the four openings on the dispensing valve.

In addition, the annular edge 7b and the ribs 26 on the centering wall 25 constrain the dispensing valve to remain in a fixed position when the cap is closed. This prevents accidental opening of the body-base/dispensing valve seal during the handling and transport of the dispenser cap on the production lines, and in particular when accidental stacking (nesting) of the dispenser caps occurs. This prevents, on the one hand, the sanitizer from leaking into and remaining in the closed volume and, on the other hand, unsanitized portions of the dispenser cap from coming into contact with the beverage and contaminating it. Furthermore, the tongues 15 on the body-base contrasting the portion 7e of the dispensing valve 7, when stressed by the thrust of the portion 7e, tend to flex and close towards the center, reducing the passage diameter of the dispensing valve stem until they abut against the spokes of the dispensing valve. The same flexibility generated both by the stiffness of the material and by the three blocks defining the tongues allows a deformation useful for the insertion of the dispensing valve, avoiding permanent deformation thereof. The difference in the number of tongues compared to the number of spokes on the dispensing valve stem allows adequate centering between the body-base and the dispensing valve throughout the opening stroke and at any offset angle between the two.

The beverage flow is ensured both by the openings in the dispensing valve and by the apertures 14a delimiting the tongues 15 of the body-base.

The cap has a locking tooth, prominent in relation to the main body, which allows the locking thereof when the cap is open. The profile of this tooth has an inclination such that it is tapered in the upper portion, which allows the cap to be kept open in a stable equilibrium position. In fact, the cap, when it overturns, thus opening, passes a dead centre situation when the profile of the braces goes beyond the axis of rotation, defined as the point of contact between the tooth and the cap seal. This system limits accidental closure of the cap and makes reaching the open condition more appreciable.

The centering element between the cap 18 and the dispensing valve 7 deprived of one of its parts, and more precisely, of a portion diametrically opposite the opening thrust point, allows the force needed to open the cap to be reduced, as there is no contrast against the dispensing valve caused by the user pushing the cap to open it.

The braces of the body-base have a reduction in thickness both over the stretch extending vertically and over the stretch extending circularly. As regards the latter, the tapered portion, adjacent to the portion extending vertically, increases the flexibility of the brace and allows it to twist without inducing particular stresses at the point of attachment with the main body.

Claims

1. A bottle dispenser cap presenting a first axis (A) and comprising:

a body-base (5) which is configured to be coupled to the neck (2) of a bottle and comprises a central sleeve (13) extending coaxial to the first axis (A) and presenting inferiorly a base (13d) in which a first opening (14) is centrally formed through it,

a dispensing-valve (7), which is engaged within said sleeve (13) so as to slide internally to the latter in order to translate along said first axis (A) between a closed position in which the dispensing valve (7) closes said first opening (14) hermetically, and an open position in which the dispensing valve (7) opens said first opening (14),

a lid (6) comprising: an annular seal (16) that is fitted stably in said body-base (5), a cap (18) and a hinge (19) connecting the cap (18) to said annular seal (16),

said hinge (19) is structured to rotate the cap (18) about a second axis (B) transverse to said first axis (A), between a closed and an open position,

wherein in said closed position of said lid (6), said cap (18) is coupled to said body-base (5) in order to delimit with the latter an internal, substantially hermetically closed chamber (22) which internally contains said dispensing valve (7) and said sleeve (13),

said cap (18) comprises a cup-shaped body provided with an outer side wall (18a) of annular shape surrounding said first axis (A), an upper wall (18b), and an inner wall (18c) of substantially cylindrical shape extending cantilevered from the inner face of said upper wall (18b), in order to be within said side wall (18a), and structured/sized so as to engage said body-base (5) in order to at least partially delimit, with the surface thereof, said internal, substantially hermetically closed chamber (22).

2. The bottle dispenser cap according to claim 1, wherein said cap (18) and said dispensing-valve (7) are structured in order that the rotation of said cap (18) from the open position to the closed position, causes an axial movement of said dispensing valve (7) within said sleeve (13) from the open position to the closed position.

3. The bottle dispenser cap according to claim 2, wherein when said cap (18) is in the closed position, said upper wall (18b) of said cap (18) delimits, with the inner faces of said dispensing valve (7), at least a portion of the inner volume of said internal closed chamber (22).

4. The bottle dispenser cap according to claim 3, wherein said cap (18) comprises a circular inner centering wall (25) extending cantilevered from said upper wall (18b), in order to be coaxial with said first axis (A), and engaged in said dispensing valve (7), when said lid (6) is in said closed position.

5. The bottle dispenser cap according to claim 4, wherein on the inner face of said upper wall (18b) of said cap (18) there are a plurality of ribs (26) extending radially from said centering wall (25) and sized/shaped so as to be arranged to rest on an upper annular edge (7b) of said sleeve (7a) when said lid (6) is in said closed position.

6. The bottle dispenser cap according to any one of the preceding claims, wherein said first opening (14) formed on said base (13d) is shaped in order to centrally have a circular hole from which apertures (14a) radially divide said base (13d) into a plurality of tongues (15).

7. The bottle dispenser cap according to claim 6, wherein said dispensing valve (7) is structured/sized in order to engage by interference in a portion (13b) of said sleeve (13), when said dispensing valve (7) is in the closed position in order to hermetically close said first opening (14) so as to close said bottle.

8. The bottle dispenser cap according to claims 6 or 7, wherein said dispensing valve (7) comprises an inner cylindrical wall and inferiorly a base (7c) which is connected to said inner cylindrical wall by a series of spokes (7d) delimiting through openings (17) configured to be traversed by the beverage contained in the bottle, when said dispensing valve (7) is in the open position.

9. The bottle dispenser cap according to claim 8, wherein said dispensing valve (7) comprises a circular annular portion (7e) that is arranged coaxial to said first axis (A) and is centrally connected to the base (7c) of said dispensing valve (7) by means of a central stem (7f) that extends coaxial to said first axis (A) and is engaged in said first opening (14) of said base (13d) of said sleeve (13) .

10. The bottle dispenser cap according to claim 9, wherein said central stem (7f) extends from said base (7c) of said dispensing valve (7) over a length along said first axis (A) corresponding substantially to the length of the axial travel/displacement that said dispensing valve (7) makes between the closed position and the open position, and vice versa, and comprises a plurality of spokes extending parallel to said first axis and designed to slide into said first opening (14).

11. The bottle dispenser cap according to claim 10, wherein said first opening (14) is shaped in order to have radial apertures (14a) angularly spaced apart around said first axis (A); the number of spokes of said central stem (7f) being different from the number of radial apertures (14a) of said first opening (14).

12. The bottle dispenser cap according to any one of the preceding claims, wherein said body-base (5) comprises a tubular portion (8) provided with a circular slot (31) extending in a circumferential direction about said first axis (A) and separating a lower annular seal (8a) from an upper cylindrical portion (8b); and a pair of connecting braces (8d) that are designed to keep the upper portion (8b) firmly attached to the annular seal (8a) and are structured to

allow said body-base (5) to rotate about a third axis of rotation (D) lying in a reference plane orthogonal to said first axis (A) between a coupling position in which the body-base (5) is coupled to said neck (2) and a decoupling position in which said body-base (5) is decoupled from said neck (2) and is tilted/capsized with respect to the coupling position so as to be placed alongside said neck (2).

13. A bottle (1) configured to contain food grade beverages, made of a polymeric material and comprising a neck (2), a containment body (3) which is configured to contain said beverage and is connected to the neck (2), and a bottle dispenser cap (4) which is coupled to the neck (2) in order to close its mouth, and is made according to any of the foregoing claims.

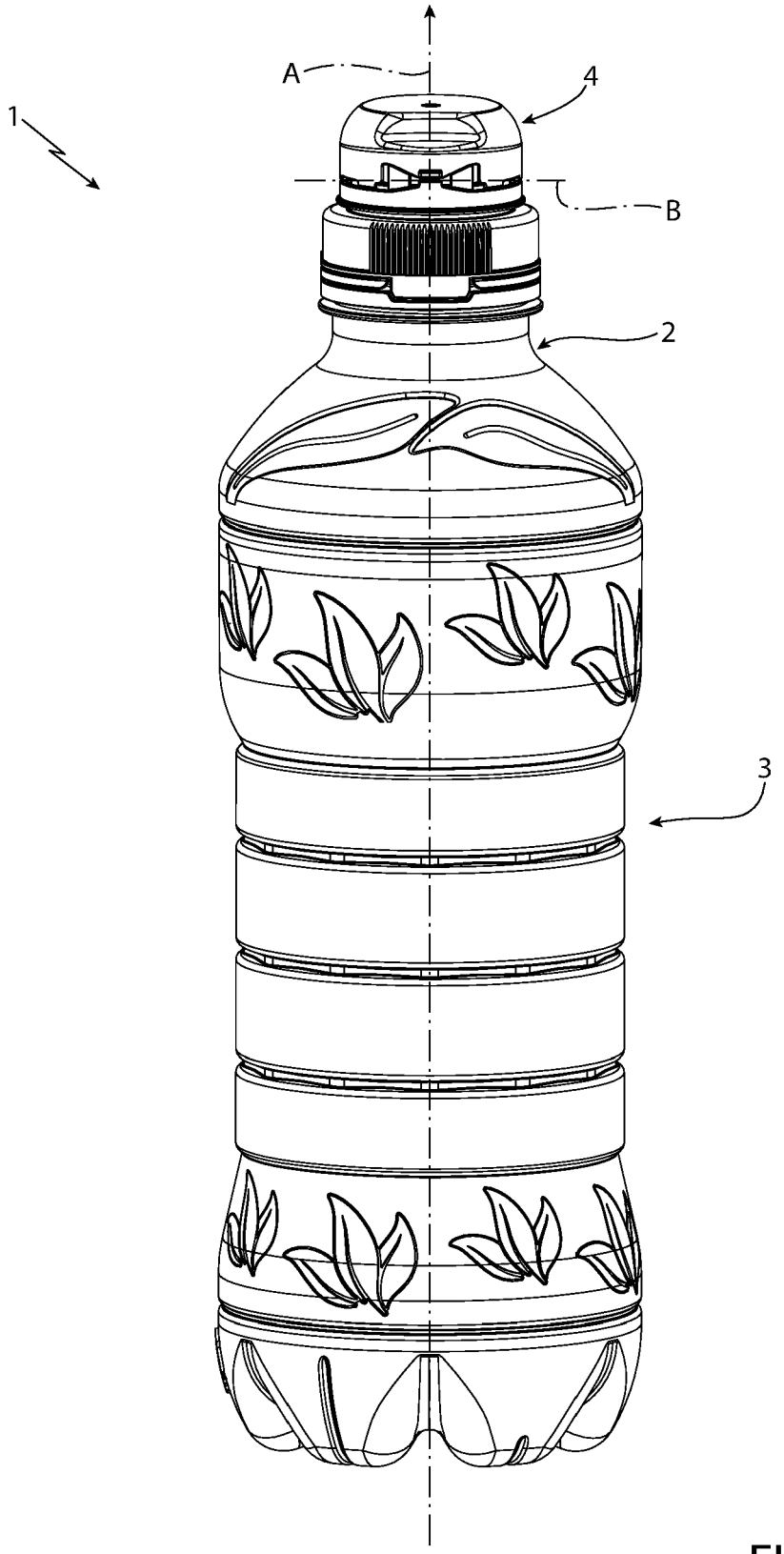


FIG. 1

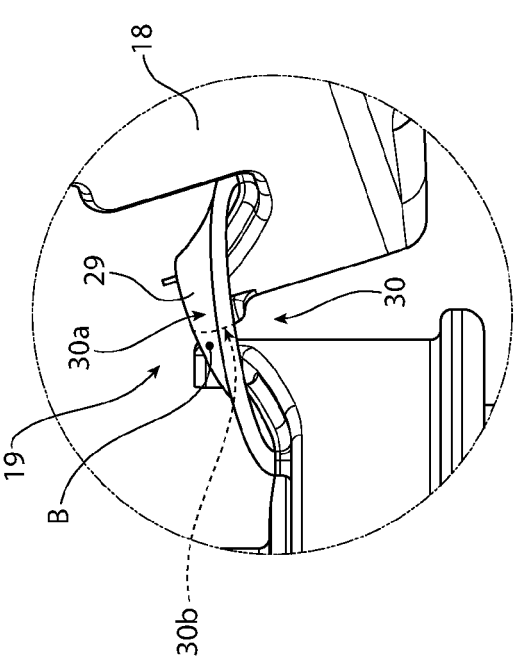

18
29
30a
30
19
B
30b

FIG. 2

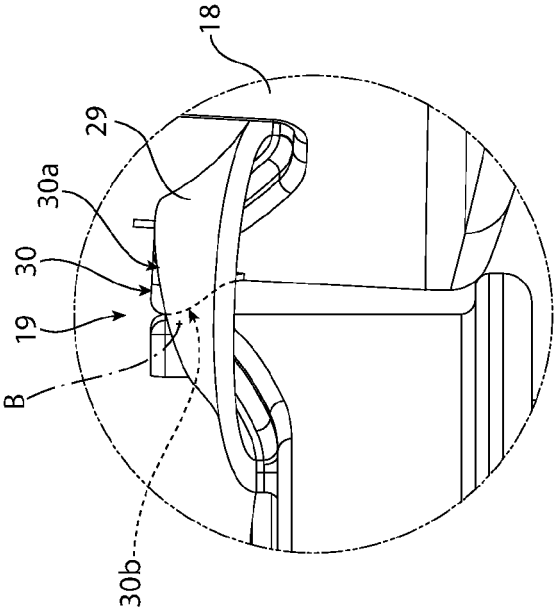
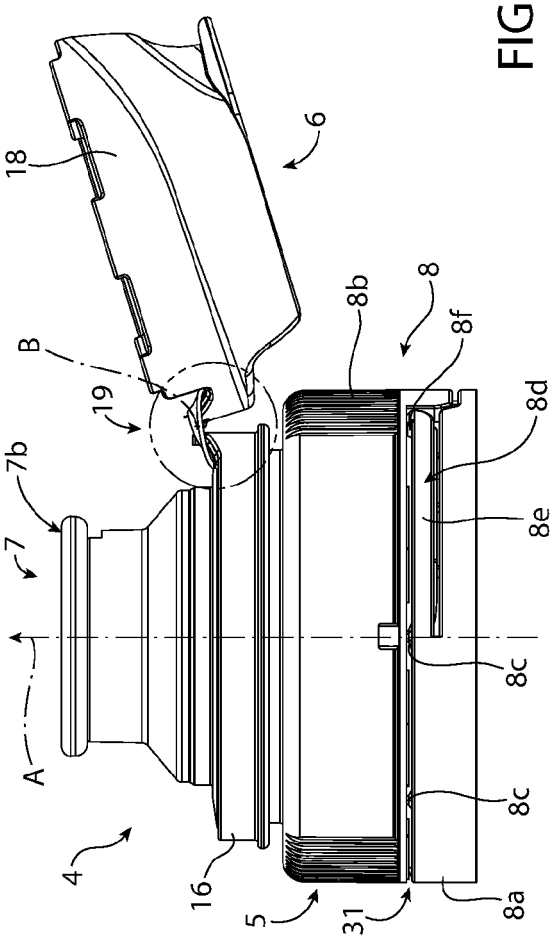
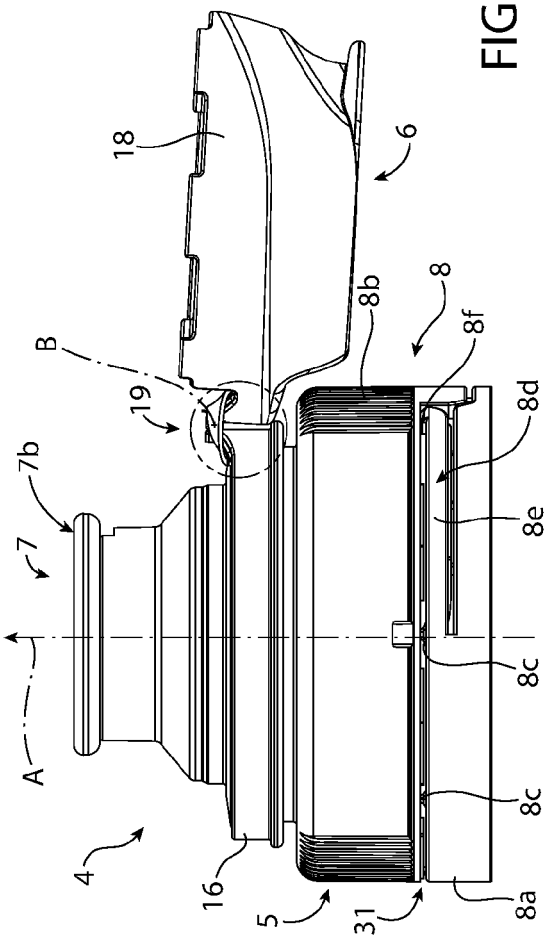

18
29
30a
30
19
B
30b

FIG. 3


18
6
B
19
8b
8
8f
8d
7b
7
8e
A
8c
8c
4
16
5
31
8a


18
6
B
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8b
8
8f
8d
7b
7
8e
A
8c
8c
4
16
5
31
8a

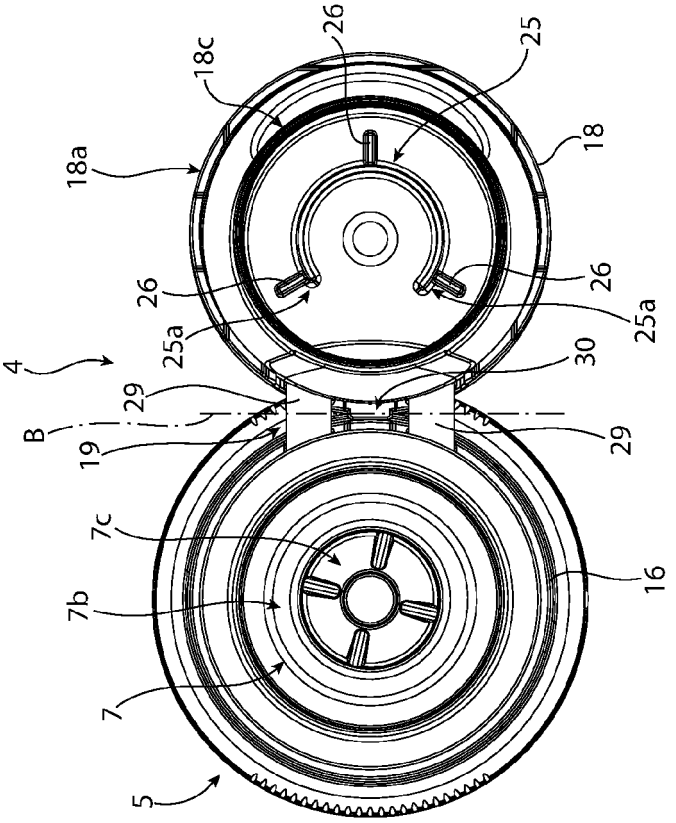

26
25
18c
18
18a
26
26
25a
25a
30
4
29
29
B
19
7c
16
7b
7
5

FIG. 5

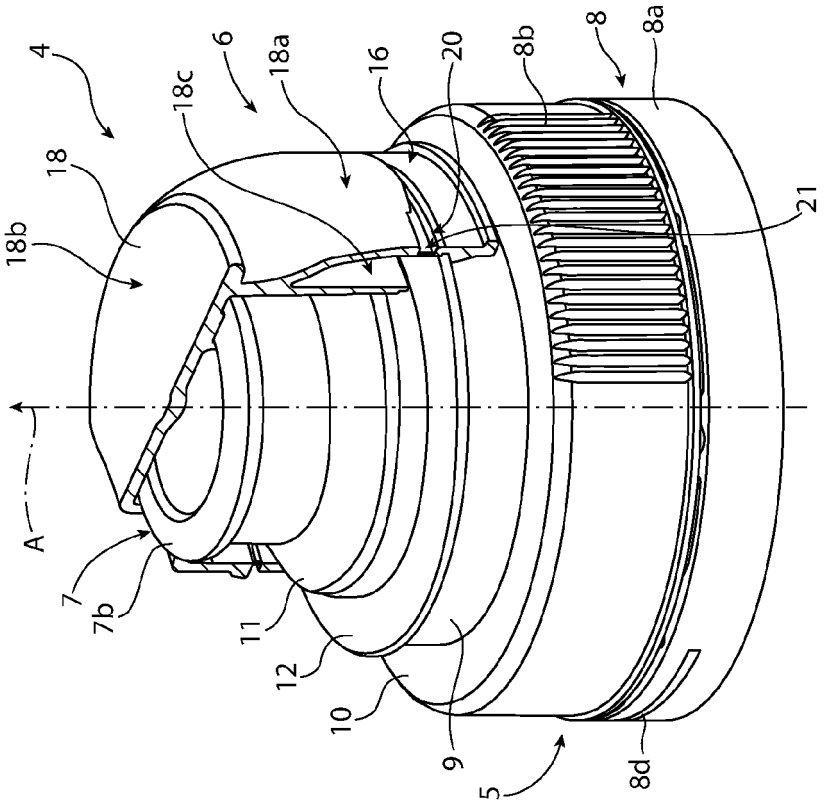

4
6
18a
16
20
8b
8
8a
18c
18
18b
21
A
7
7b
11
12
10
9
5
8d

FIG. 4

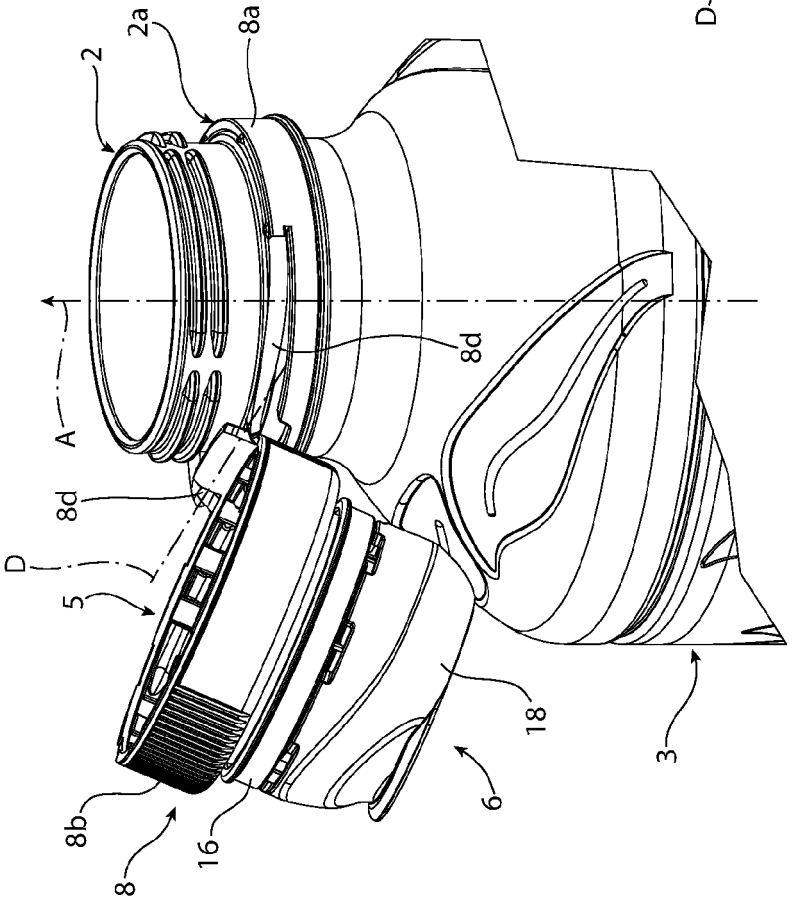


FIG. 6

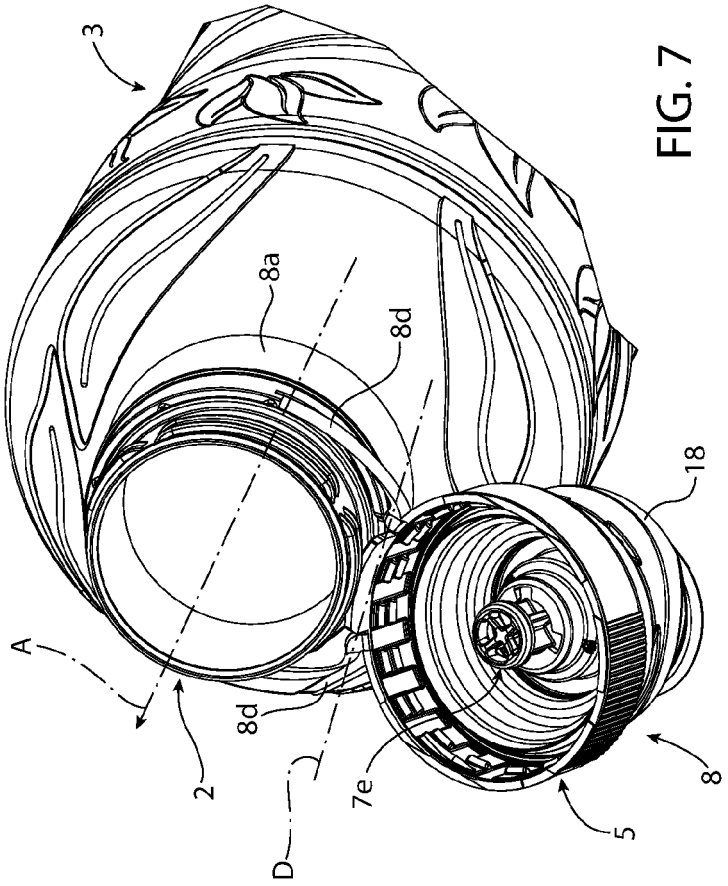
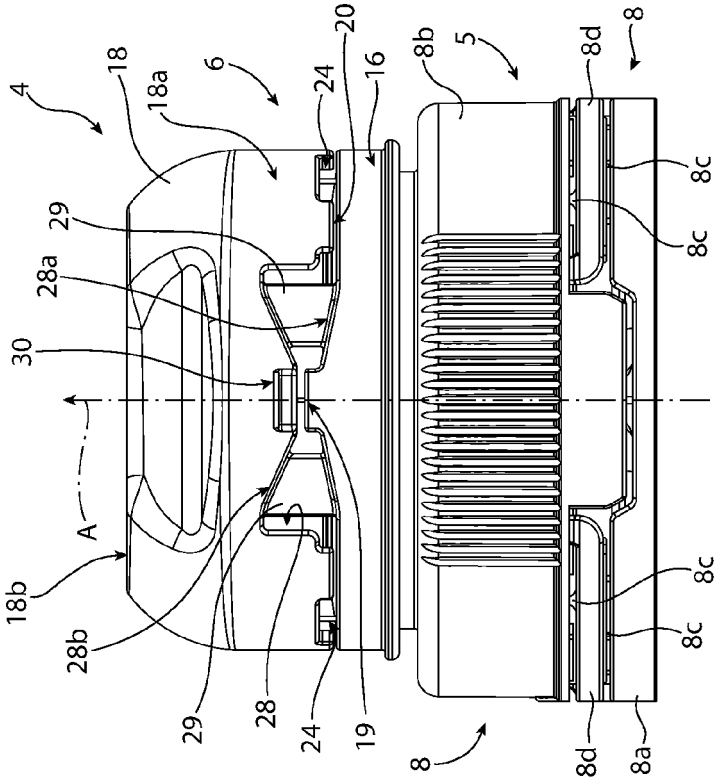


FIG. 7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18
18a
6
24
20
16
8b
5
8d
8
8c
29
28a
30
A
18b
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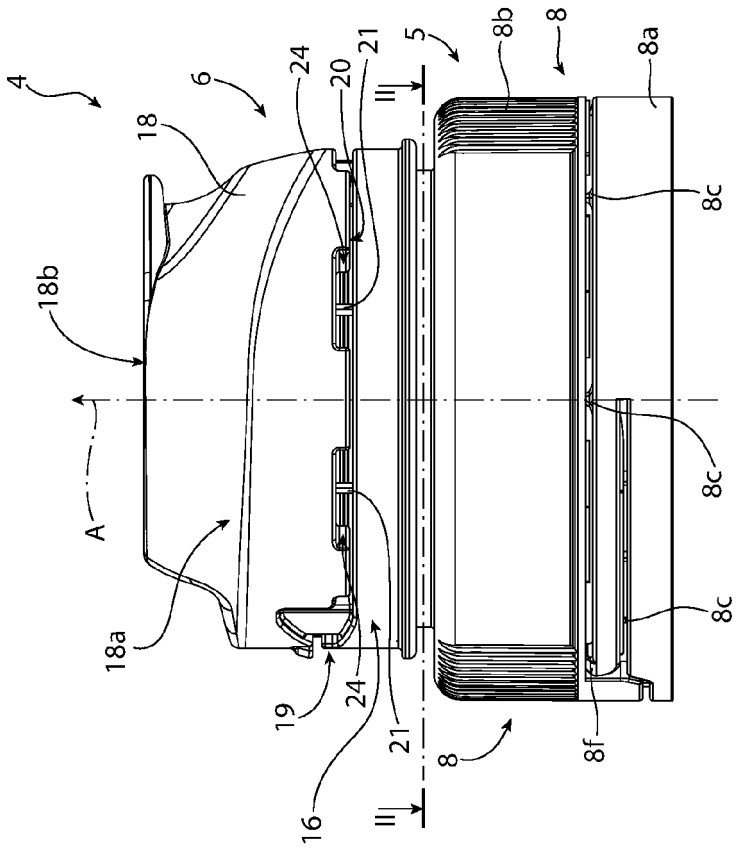
29
28
24
19
8
8d
8a

FIG. 9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6
18
24
20
21
5
II
8b
8
8a
8c
18b
A
18a
19
24
21
16
II
8
8f

FIG. 8

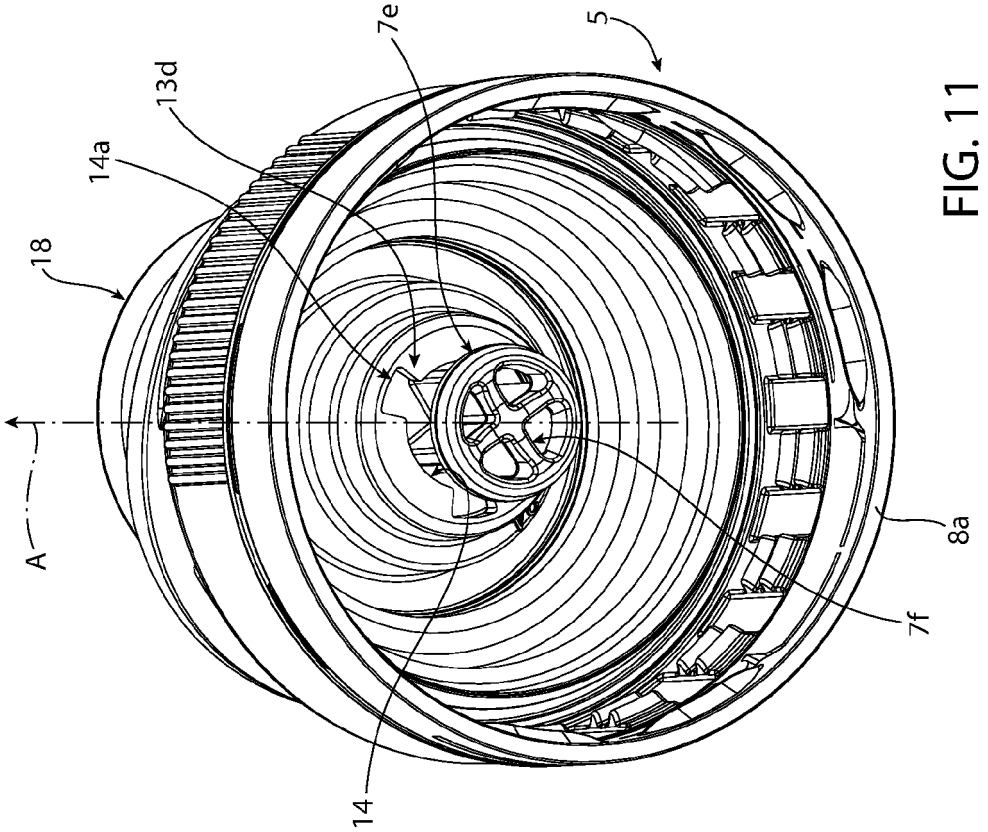


FIG. 11

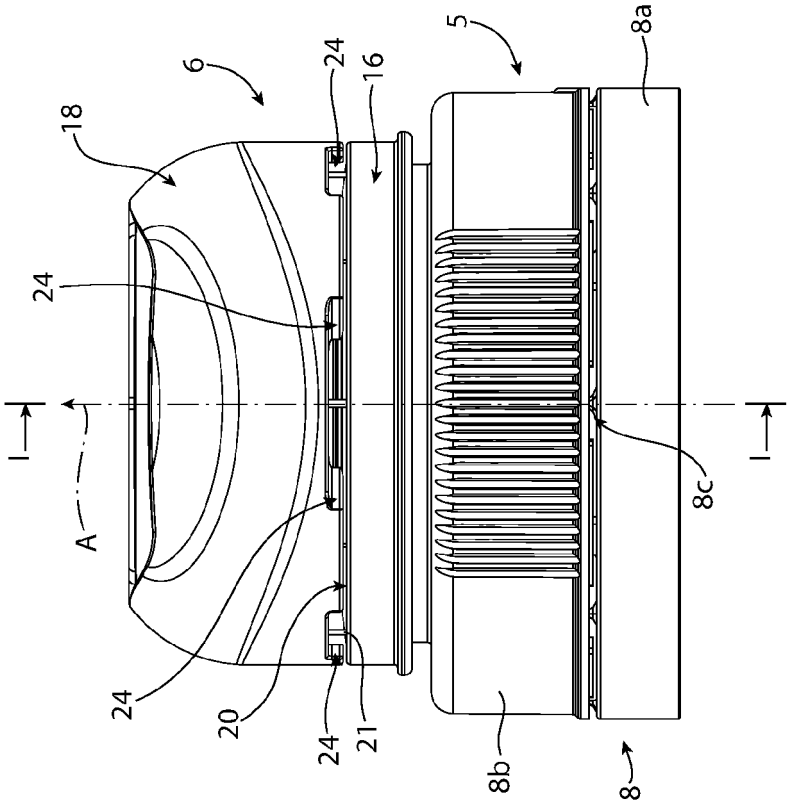
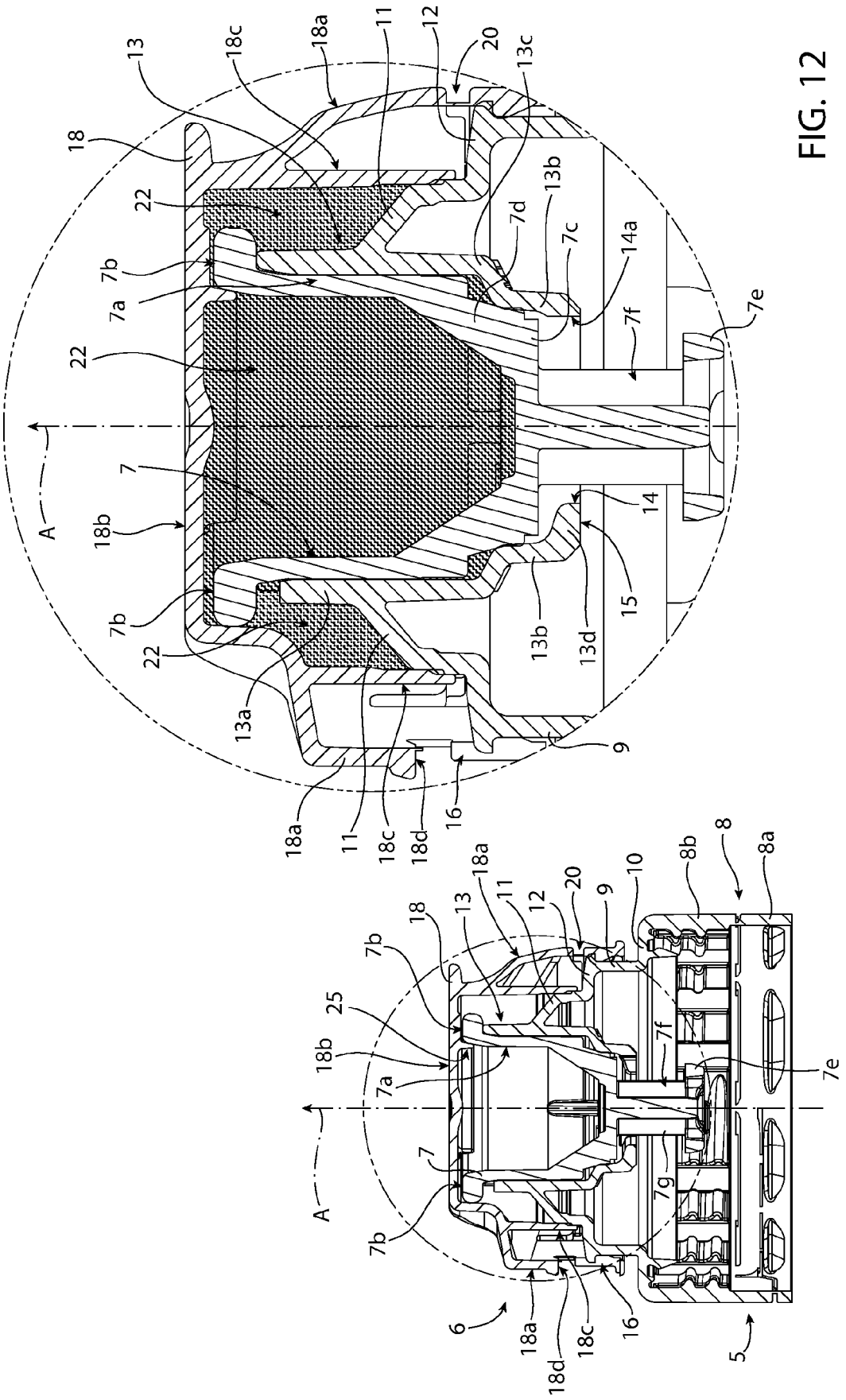


FIG. 10


A
5
6
7
7a
7b
7c
7d
7e
7f
7g
8
8a
8b
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10
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12
13
13a
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14a
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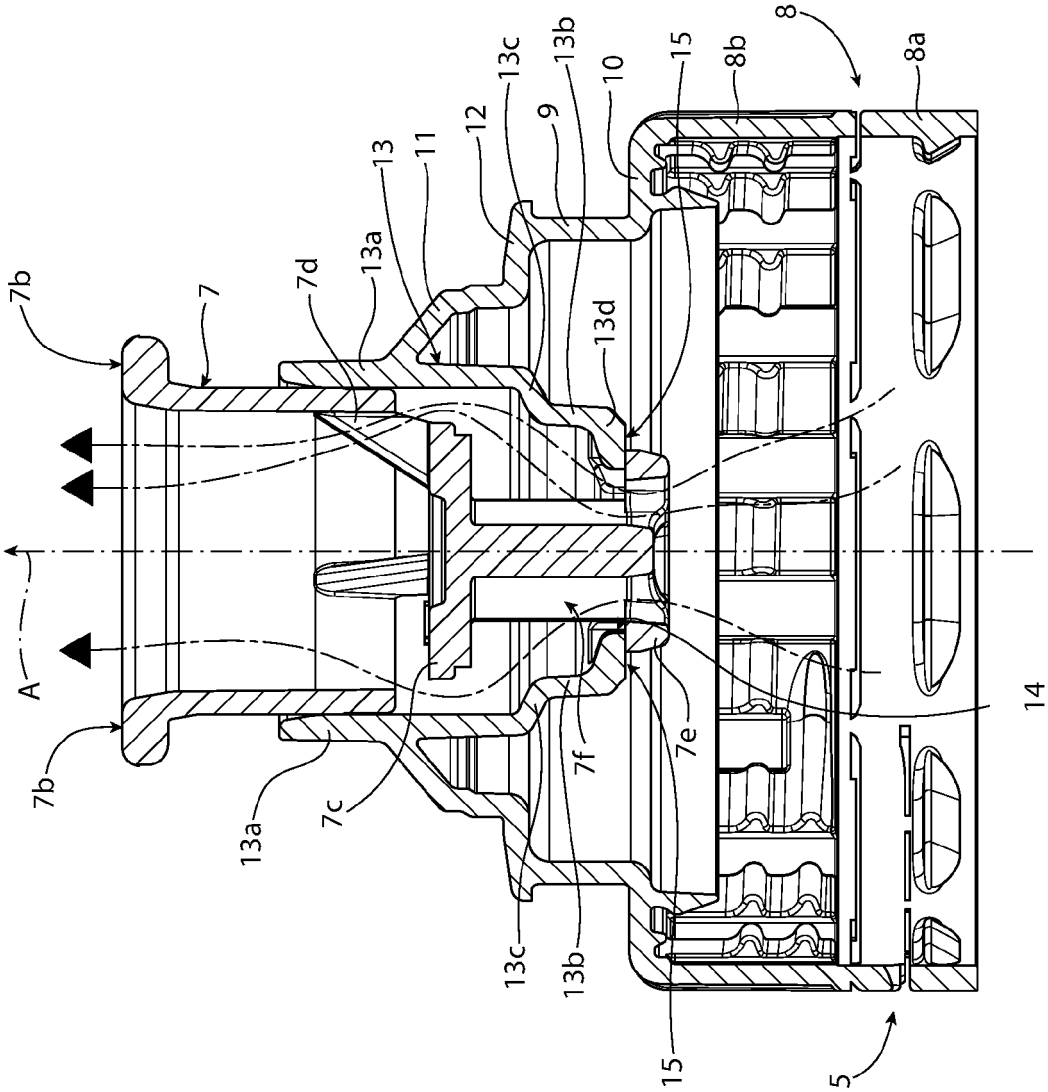
16
18
18a
18b
18c
18d
20
22
25

FIG. 12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8a
8b
15
10
13b
13c
9
12
11
13
13a
7d
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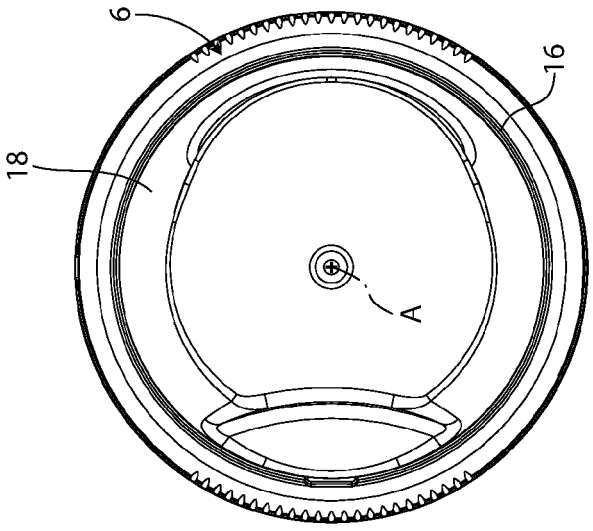
7f
7e
14
13c
13b
15
5

FIG. 14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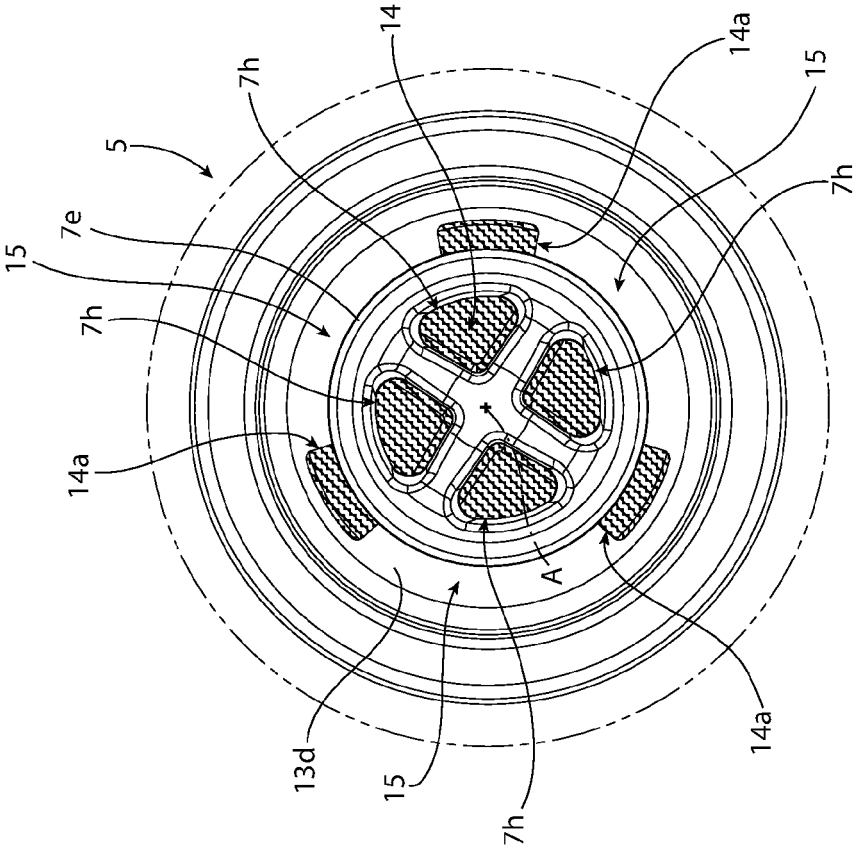
16
18
A

FIG. 13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14a
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7h
7e
15
7h
14a
7h
A
13d
15
7h
14a

FIG. 16

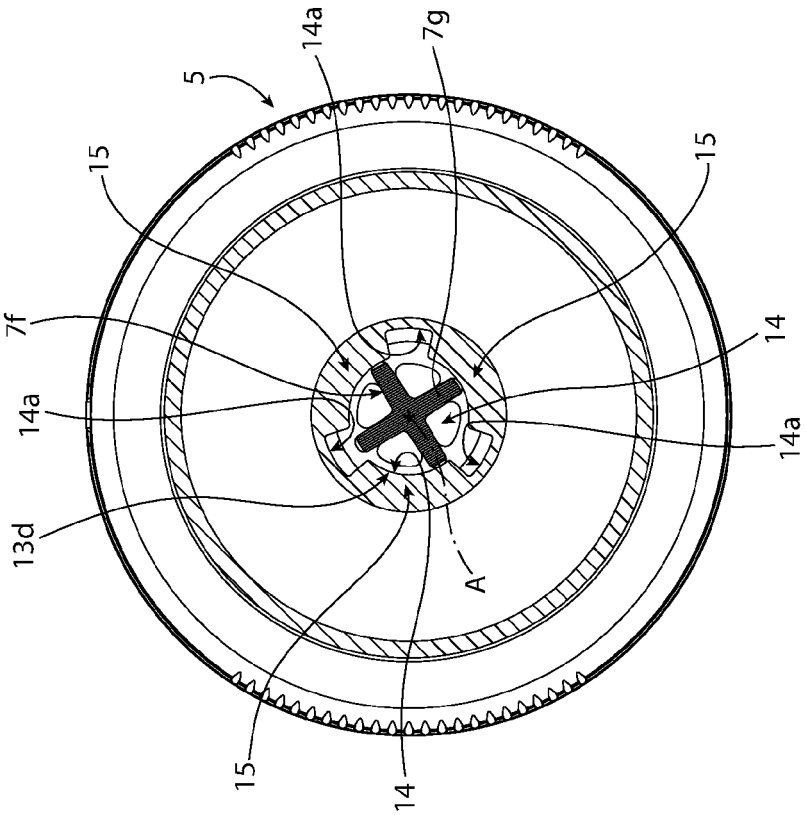
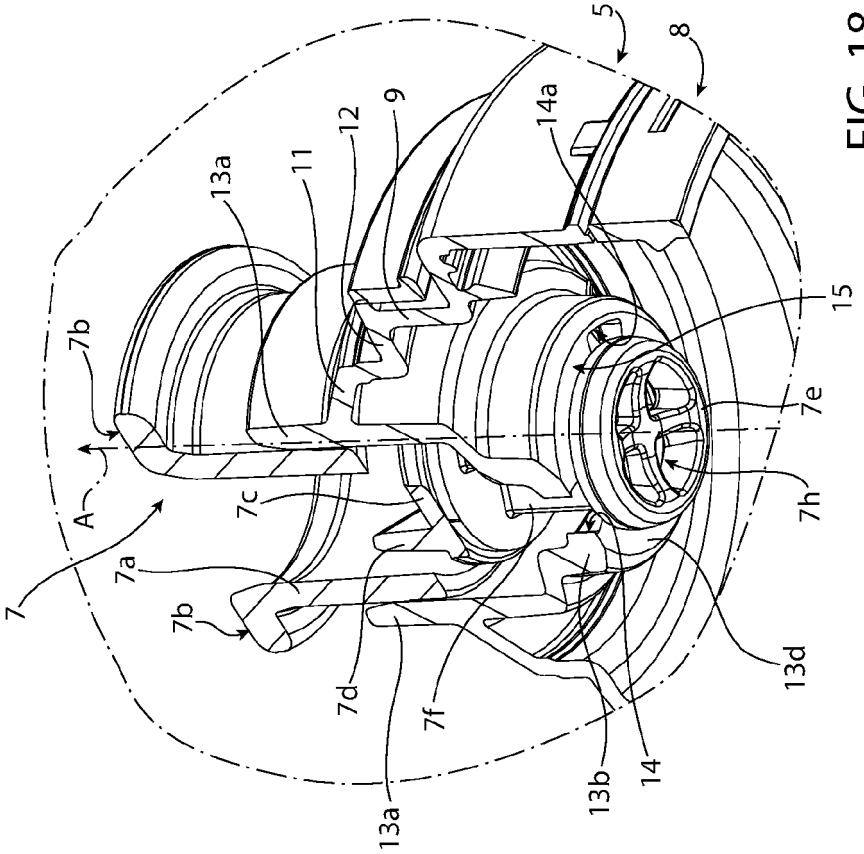

14a
7g
5
15
15
7f
14
14a
14a
13d
A
15
14

FIG. 15


5
8
14a
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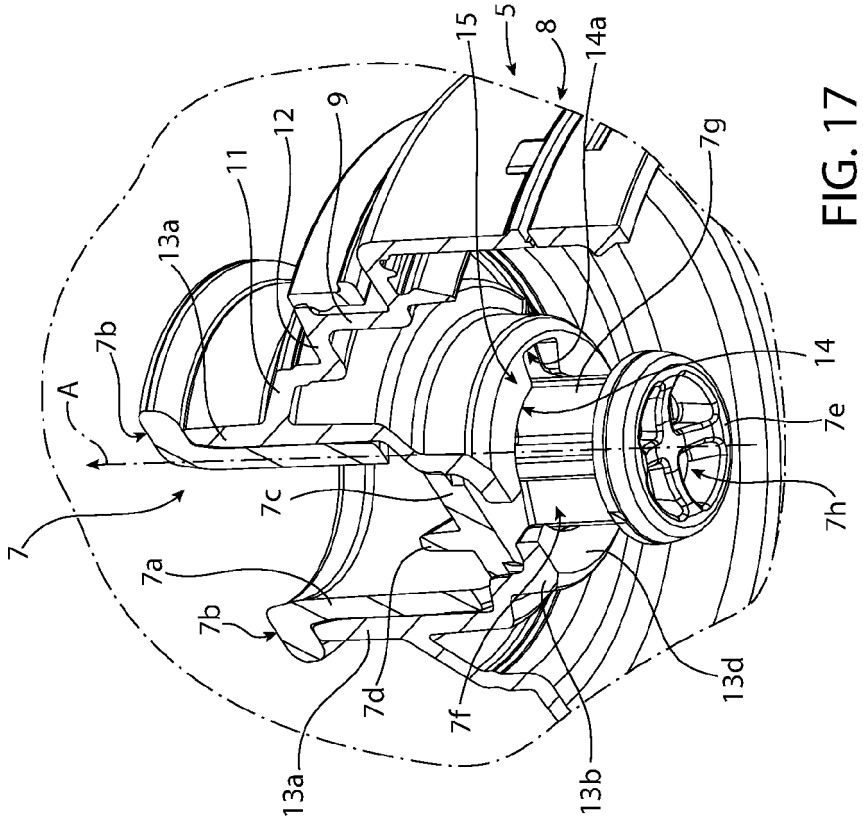
7f
13d
13a
13b
14

FIG. 18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7f
13d
13a
13b

FIG. 17

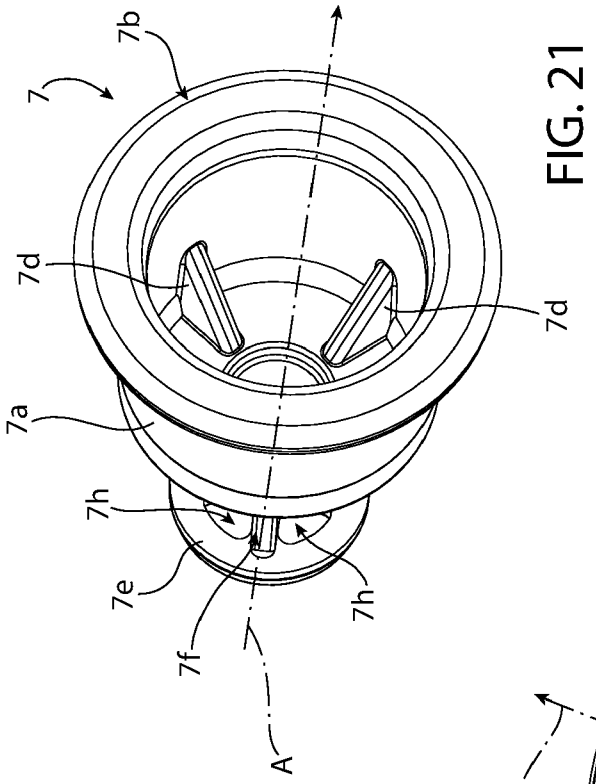

FIG. 21

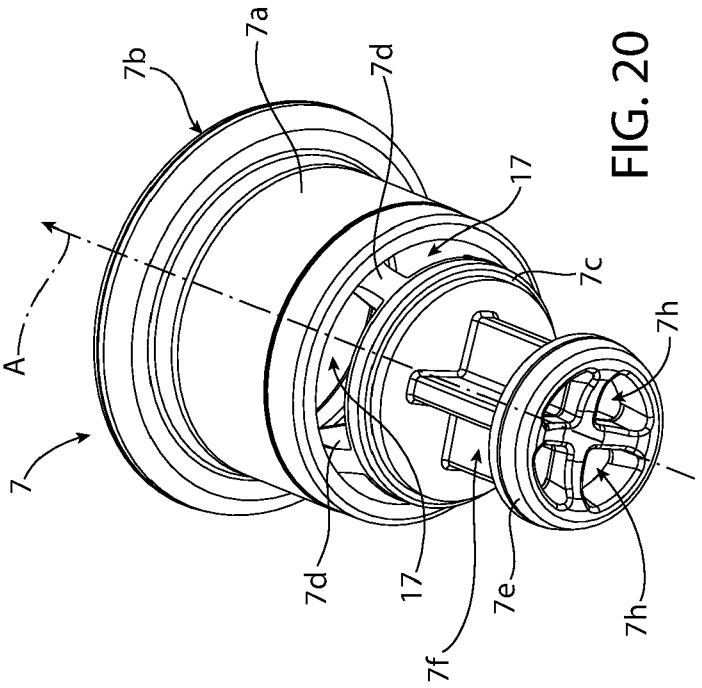

FIG. 20

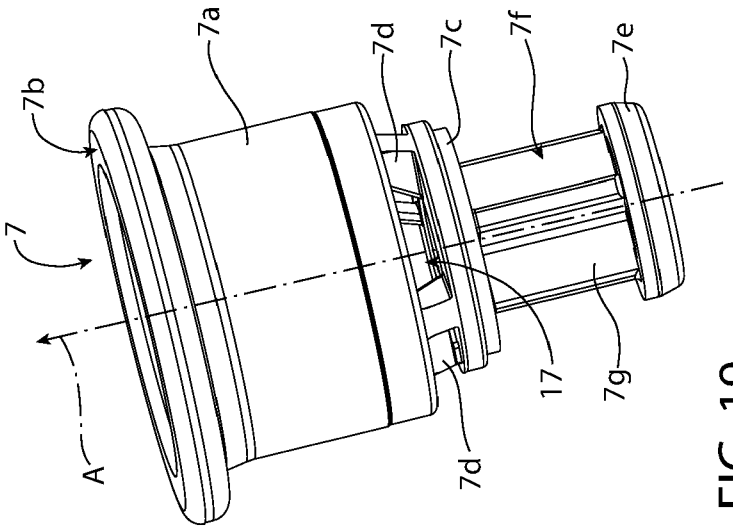

FIG. 19

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EUROPEAN SEARCH REPORT

Application Number
EP 24 17 4024

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 4 071 078 A1 (AFFABA & FERRARI S R L [IT]) 12 October 2022 (2022-10-12) * paragraphs [0017] - [0066]; figures *	1-13	INV. B65D47/24
A	WO 02/34637 A1 (RHO HEE KWON [KR]) 2 May 2002 (2002-05-02) * page 6, line 14 - page 7, line 17; figures *	1-13	
A	EP 3 398 873 A1 (FERRARI SILVIA [IT]; FERRARI GUGLIELMO [IT]) 7 November 2018 (2018-11-07) * figures *	1-13	
A	US 6 334 555 B1 (SEAQUIST CLOSURES [US]) 1 January 2002 (2002-01-01) * figures *	1-13	

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	23 September 2024	Fournier, Jacques

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 24 17 4024

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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23-09-2024

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