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(54) CAPPING DEVICE FOR A CONTAINER NECK

(57) Capping device intended to be fixed on a neck (2) of a container, including the capping device:
- a cap (1) having a helical thread (7) to cooperate with a helical thread (6) formed on the neck (2);
- a lower ring (9) fixed axially to the neck (2);
- a hinge device (10) that joins the cap (1) with a second section (17) of the lower ring (9) and extends over a first angular range that is cut into two equal parts by a bisection plane Pb;
the helical thread (7) developing around the axis X according to a first direction and having a lower end and an upper end. The lower end is arranged in a second angular range defined between the bisection plane Pb and a radial plane positioned at 160° from the bisection plane Pb according to a second direction opposite to the first direction.

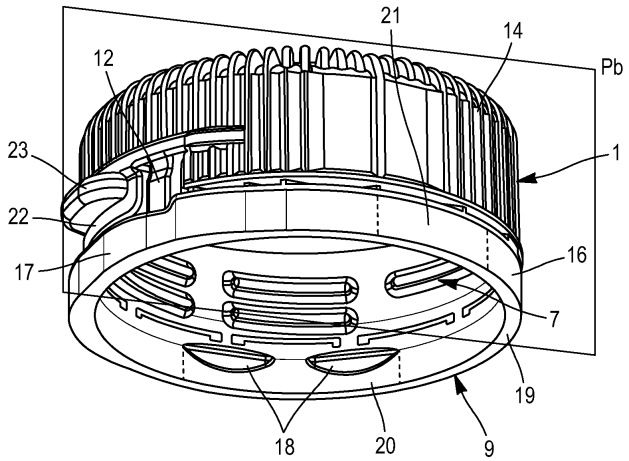

FIG. 5

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Description

Technical field

[0001] The invention relates to an assembly comprising a container and a capping device that is equipped with a cap and makes it possible to keep said cap fixed to the neck of a container, thus avoiding completely losing the cap.

Technological background

[0002] Document ES1232089U discloses a capping device that includes a lower ring designed to be axially fixed on the neck of a container, a cap that includes a thread designed to engage a complementary thread formed on the neck of the container and a hinge that joins the cap with the lower ring. The lower ring includes engaging means provided to retain the lower ring with the neck of the container. The section of the diameter of the lower ring on which there are engaging means extends between 25 and 75% of the diameter of the lower ring. The section of the lower ring that is connected to the cap by the hinge device lacks engaging means which allows said section to rotate between a lowered position and a raised position, in particular, to allow the cap to be unscrewed. On the other hand, the cap includes ratchet means intended to cooperate with the complementary ratchet means formed in the lower ring and, therefore, allows the cap to be kept in a tilted open position.

[0003] This capping device is not completely satisfactory. Indeed, despite the absence of engaging means in the section of the lower ring that is connected to the cap by the hinge, manipulating the cap to allow the section of the lower ring that is connected to the cap to rotate into a raised position when the cap should move from the tilted open position to the closed position is not easy.

Summary

[0004] An underlying idea of the invention is to propose a capping device that allows keeping a cap attached to the neck of the container that is reliable, easy to make and use.

[0005] According to one embodiment, the invention provides a capping device intended to be fixed to the neck of a container that includes an orifice and an engaging collar, including the capping device:

- a cap including a top wall and an outer peripheral skirt, the outer peripheral skirt having a helical thread designed to cooperate with a helical thread formed in the neck to allow:
  - unscrewing the cap from the neck around an axis X to move the cap from a closed position in which the upper wall closes the orifice of the neck and the peripheral skirt surrounds said neck to a released position in which the cap is no longer coupled to the neck; and
  - screwing the cap on the neck to move the cap from the released position to the closed position;
- a lower ring axially fixed to the neck and rotationally movable on the neck about said X axis, said lower ring including a first section that includes engaging elements that project radially into the lower ring and are intended to be arranged below the engaging collar to axially retain the lower ring on the neck of the container, the first section and the second section of the lower ring are hinged to each other so that the second section rotates with respect to the first section between a lowered position in which the second section is intended to be arranged below the engaging collar and a raised position in which the second section is intended to be arranged at least partially above the engaging collar;
- a hinge device that attaches the cap to the second section of the lower ring and is configured to allow the cap to rotate between the released position and an tilted open position in which the cap is disengaged from the orifice of the neck, the hinge device extends over a first angular range which is cut into two equal parts by a bisection plane Pb;
- the lower ring is configured so that the second section rotates with respect to the first section from the lowered position to the raised position to allow the cap to move from the closed position to the released position;
- the lower ring can move radially from front to back to facilitate the passage of a part of the second section to each side of the engaging collar during the movement of the second section between the lowered position and the released position, the helical thread developing around the axis X in a first direction and having a lower end and an upper end, the lower end of the helical thread is arranged in a second angular range which is defined between the bisection plane Pb and a radial plane positioned at 160° of the bisection plane Pb according to a second direction opposite to the first direction.

[0006] This facilitates engagement of the cap on the neck when the cap is moved from the tilted open position to the closed position.

[0007] According to other advantageous embodiments, a capping device of this type may have one or more of the following features.

[0008] According to one embodiment, the lower end of the helical thread is arranged in an angular range defined between two radial planes, respectively, positioned at 90° and 160° from the bisection plane Pb according to

the second direction of rotation.

[0009] According to one embodiment, the first section of the lower ring includes a front area that is diametrically opposite to the second section and two engagement areas that are each arranged between the front area of the first section and the second section, the engaging elements are arranged only in the two engagement areas to allow radial movement of the lower ring. In this way, the tensile forces that will be exerted on the lower ring to allow the second section to move between the lowered position and the raised position are less, which facilitates the use of the capping device.

[0010] According to one embodiment, the front area of the second section extends over an angular range comprised between 90 and 150°.

[0011] According to one embodiment, each of the two engagement areas extends over an angular range of between 30 and 90°.

[0012] According to one embodiment, the two engagement areas extend over angular sections that are symmetrical to each other with respect to the bisection plane Pb.

[0013] According to one embodiment, the engaging elements are protrusions that project radially inward.

[0014] According to one embodiment, the second section extends over an angular range comprised between 90 and 150°.

[0015] According to one embodiment, the engaging elements are protrusions that project radially inward.

[0016] According to one embodiment, the second section does not have engaging elements.

[0017] According to one embodiment, the capping device further includes a locking device configured to lock the cap in the tilted open position, said locking device including a stop that projects radially outward from the cap and is configured to rest against the engaging collar of the the neck during movement of the cap from the tilted open position to the released position to exert on the second section a tensile force having a component directed radially outward and a component directed axially upward to aid the movement of the second section between the lowered position towards the raised position. This makes it possible to further facilitate the use of the capping device, in particular when the cap must move from the tilted open position towards the closed position.

[0018] According to one embodiment, the stop is configured so that, during the movement of the cap from the released position to the tilted open position, the stop rests against an upper end of the second section of the lower ring to move it from the raised position towards the lowered position. This also makes it easier to use the capping device.

[0019] According to one embodiment, the locking device further includes a heel which is formed on the outer peripheral skirt of the cap and extends axially, the heel being configured to rest against a helical rib of the helical thread formed on the neck of the container during movement of the cap from the tilted open position towards the released position to exert on the second section a tensile force having a component directed radially outward and a component directed axially upward to aid movement of the second section from the lowered position towards the raised position.

[0020] According to one embodiment, the stop protrudes radially outward from the heel.

[0021] According to one embodiment, the hinge device includes two foils and the heel is formed between the two foils.

[0022] According to one embodiment, the hinge device includes two foils and the capping device also includes a device for locking the cap in the tilted open position, said locking device including a stop that is formed in the outer peripheral skirt, between the two foils of the hinge device, and which is configured to rest against the neck of the container when the cap is in the tilted open position, the heel has an internal side on which at least one rib of the helical thread is formed. This makes it possible to improve the pressure resistance of the capping device.

[0023] According to an embodiment, the invention also relates to an assembly comprising a container equipped with a neck that includes an orifice, an engaging collar and a helical thread and a capping device mentioned above, the lower ring being axially fixed to the neck and being rotatably movable on the neck around said axis X.

Brief description of the figures

[0024] The invention will be better understood and other purposes, details, features and advantages thereof will become more apparent in the following description of several particular embodiments of the invention, provided solely by way of illustration and not limitation, with reference to the attached drawings.

Figure 1 is a perspective view of three quarters of a capping device.

Figure 2 is a sectional view of a container neck intended to receive the capping device of Figure 1.

Figure 3 is a side view of the capping device mounted on the neck of the container and showing the cap of the capping device in a released position in which it is no longer engaged with the neck of the container

Figure 4 is a perspective view of the capping device mounted on the neck of the container and showing the cap of the capping device in a tilted open position in which the cap is disengaged from the orifice of the neck.

Figure 5 is a side perspective view of the capping device.

Figure 6 is another side perspective view of the capping device.

Figure 7 is a rear perspective view of the capping device.

Figure 8 is a front perspective view of the capping device.

Figure 9 is a sectional view of the capping device mounted on the neck of the container and showing the cap of the capping device in a tilted open position in which the cap is disengaged from the orifice of the neck.

Figure 10 is a sectional view of the capping device mounted on the neck of the container and showing the cap of the capping device in an intermediate position between the released position and the tilted open position.

Figure 11 is a perspective view of the capping device mounted on the neck of the container and showing the cap of the capping device in the tilted open position.

Detailed description of the embodiments

[0025] In the description and the figures, the axis X corresponds to the axis of rotation of the cap 1 of the capping device when it is screwed onto the neck 2 of the container. By convention, the "radial" orientation is directed orthogonal to the axis X and the axial orientation is directed parallel to the axis X. The terms "external" and "internal" are used to define the relative position of one element with respect to another, by reference to the X axis, an element close to the axis X is thus classified as internal as opposed to an external element located radially on the periphery.

[0026] The terms "upper" and "lower" are used to define the relative position of one element with respect to another by reference to a position in which the orifice 3 of the neck 2 is oriented upwards and the cap 1 is in the closed position on the neck 2 of the container, an element intended to be placed lower being named lower and an element intended to be placed higher being named, upper. The terms "front" and "back" are used to define the relative position of one element with respect to another along a diameter perpendicular to the axis X.

[0027] With reference to Figures 1 to 10, an assembly comprising a capping device, represented, in particular, in Figure 1, and a container equipped with a neck 2, represented, in particular, in Figure 2, are described below.

[0028] As shown in figure 2, the neck 2 of the container has an upper end on which an orifice 3 is formed that allows the contents of the container to be poured. The neck 2 of the container includes a support collar 4 projecting radially outward and an engaging collar 5 that also projects radially outward and is arranged axially between the support collar 4 and the orifice 3. A cylindrical portion is axially formed between the support collar 4 and the orifice 3. On the other hand, the neck 2 includes, axially positioned between the engaging collar 5 and the orifice 3, a helical thread 6 formed by a series of helical ribs, projecting radially towards the exterior from an external surface of the neck 2. The helical thread 6 is intended to cooperate with a complementary helical thread 7 formed from a series of helical ribs that are formed on the cap 1 of the capping device.

[0029] According to one embodiment, the helical thread 6 formed on the neck 2, as well as the helical thread 7 formed on the cap 1 are interrupted. In other words, the adjacent helical ribs are separated by a space that forms a vent and that allows, in particular, to evacuate the gas present inside the container while the cap 1 is still attached to the neck 2.

[0030] The capping device includes a lower ring 9 that is retained in the neck 2 of the container, a cap 1 that is intended to cover the orifice 3 of the container in order to seal it, a hinge device 10 that joins the cap 1 with the lower ring 9 and a locking device positioned to lock the cap 1 in an tilted open position, shown in Figures 4, 9 and 11. In the tilted open position, cap 1 is disengaged from the orifice 3 of the container and does not hinder the pouring of the contents of the container.

[0031] As illustrated in Figures 7 and 8, the hinge device 10 extends over an angular range S1 which is intersected in two equal parts by a vertical bisection plane Pb.

[0032] Returning to Figure 1, it is observed that the cap 1 includes an upper wall 13 intended to be arranged substantially and orthogonally to the axis X, opposite the orifice 3 of the neck 2 when said cap 1 is in the closed position. The cap 1 further includes an outer peripheral skirt 14 intended to surround the neck 2 of the container when the cap 1 is in the closed position. The outer peripheral skirt 14 extends, downward, perpendicular to the upper wall 13, from the outer periphery of said upper wall 13.

[0033] The outer peripheral skirt 14 has, on its inner face, a helical thread 7, visible in Figures 2 and 5 to 7, formed by a series of helical ribs that extend around the axis X in a first direction of rotation. The helical thread 7 is intended to cooperate with the helical thread 6 formed on the external surface of the neck 2. In this way, the cap 1 is able to screw into the neck 2 in order to close the container and to unscrew from the neck 2 in order to open the container. The cap 1 can thus be moved between a closed position and a released position, shown in figure 3. In said released position, the cap 1 is no longer engaged with the neck 2. Therefore, it is capable of tilting towards the tilted open position, represented in figures 4, 9 and 11, wherein the cap 1 is disengaged from the orifice 3 of the neck 2 so as not to hinder the pouring of the contents of the container.

[0034] As shown in particular in Figure 9, the cap 1 also includes an internal skirt 8, which extends perpendicularly downward from the upper wall 13 of the cap 1 and is dimensioned to insert into the orifice 3 of the neck 2. The cap 1 also includes an annular lip 15 extending,

from the upper wall 13, radially between the inner skirt 8 and the outer peripheral skirt 14. The inner skirt 8 and the annular lip 15 are dimensioned so that, when the cap 1 is in the closed position, in the neck 2 of the container, the inner skirt 8 is in contact against the inner face of the neck 2 while the annular lip 15 is in contact against the outer face of the neck 2. In this way, the internal skirt 8 and the annular lip 15 make it possible to guarantee the sealing of the closure.

[0035] Advantageously, the lower ring 9 is, before the first opening of the container, connected to the cap 1 by some frangible bridges, not visible in the figures, intended to be broken during the opening of the cap 1. These frangible bridges thus constitute tamperproof seals.

[0036] The lower ring 9 is held axially on the neck 2 of the container while it can rotate with respect to it about the axis X. As shown in figure 3, the lower ring 9 includes two parts that are articulated to each other, that is, a first section 16 and a second section 17 whereby the lower ring 9 is connected to cap 1 by means of the hinge device 10.

[0037] According to one embodiment, the lower ring 9 includes two narrowed areas, that is, the radial thickness of which is less than the radial thickness of the lower ring 9 outside of said narrowed areas. The two narrowed areas delimit the first section 16 and the second section 17. The narrowed areas thus form pivots that allow the second section 17 to articulate with respect to the first section 16.

[0038] According to another embodiment, the lower ring 9 does not have narrowed areas that delimit the first and second sections 16, 17.

[0039] The second section 17 is able to rotate upwards with respect to the first section 16, between a lowered position in which the second section 17 is intended to be arranged under the engaging collar 5 and a raised position, wherein the second section 17 is arranged at least in part above the engaging collar 5. This allows the cap 1 to move upward relative to the neck 2 of the container, until helical thread 7 of cap 1 disengages from the helical thread 6 formed on the neck 2 of the container. In other words, when cap 1 is unscrewed, the lower ring 9 is rotatably driven around the axis X while the second section 17 of the lower ring 9 rotates with respect to first section 16 to the raised position to allow axial movement, up the cap 1, from the closed position, to the released position, represented in figure 3. When the cap 1 rotates from the released position to the tilted open position, the second section 17 of the lower ring 9 rotates in the opposite direction with respect to the first section 16 and then returns to the lowered position. On the other hand, as described in more detail below, the second section 17 also rotates relative to the first section 16 from the lowered position to the raised position when the cap 1 rotates from the tilted open position to the released position.

[0040] The lower ring 9 is held axially on the neck 2 of the container by means of the engaging collar 5, in particular, visible in Figures 5 to 7. The engaging collar 5 presents a frusto-conical external surface that tapers upwards, that is, in direction to the orifice 3 of the container. The engaging collar 5 delimits, downwards, that is, in a direction opposite to the orifice 3, a projection. The first section 16 of the lower ring 9 includes engaging elements 18 that cooperate with the engaging collar 5 formed on the container in order to axially retain the lower ring 9 to the neck 2 of the container. The engaging elements 18 are protrusions, represented in detail in particular in Figures 5 and 6, which protrude radially inward from the first section 16 of the lower ring 9. The retaining elements 18 have a radial dimension that increases, from bottom to top, that is to say, in the direction of the upper edge of the lower ring 9. During the assembly of the capping device on the neck 2 of the container, the engaging elements 18 slide against the frusto-conical surface of the engaging collar 5 and then are locked by an elastic return behind the engaging collar 5.

[0041] As shown in Figures 5 and 6, the first section 16 of the lower ring 9 includes a front area 19 that is diametrically opposite to the second section 17 of the lower ring 9 and two engagement areas 20, 21 that are arranged on each side of the front area 19 and are each arranged between the front area 19 and the second section 17 of the lower ring 9. The engaging elements 18 are only arranged in the two engagement areas 20, 21. Thus, due to the absence of engaging elements 18 in the front area of the first section 16, there is a radial space between the lower ring 9 and the neck 2 that allows the lower ring 9 to move from front to back and vice versa. The radial clearance between the lower ring 9 and the neck 2 in the front / rear direction is, for example, between 0.5 and 1 mm. This facilitates the passage of a part of the second section 17 on either side of the engaging collar 5 during the movement of the second section 17 between the lowered position and the raised position. In other words, the tensile forces that shall be exerted on the lower ring 9 to allow the second section 17 to pass to each side of the engaging collar 5 are less.

[0042] Advantageously, the second section 17 extends over an angular range between 90 and 150°, and for example, in the order of 120°, the front area of the second section 16 extends over an angular range between 90 and 150°, for example, in the order of 120°, while each of the two engagement areas 20, 21 extends over an angular range comprised between 30 and 90°, for example, in the order of 60°.

[0043] On the other hand, the bisection plane Pb cuts the second section 17 into two equal parts, as well as the front part of the second section 17. The angular ranges corresponding to the two engagement areas 20, 21 are therefore symmetrical with each other with respect to the bisection plane Pb.

[0044] The hinge device 10 is configured to allow the cap 1 to rotate between the released position, shown in Figure 3, wherein the outer peripheral skirt 14 extends downward from the upper wall 13 of the cap 1, and the tilted open position, represented in Figures 4, 9 and 11,

wherein the outer peripheral skirt 14 extends upwards from the upper wall 13 of the cap 1. In the embodiment shown, the hinge device 10 includes two foils 11, 12, in particular visible in figure 4, which join the cap 1 and, more particularly, the outer peripheral skirt 14 of the cap 1 with the lower ring 9, and more particularly, with the second section 17 of the lower ring 9. The two foils 11, 12 are symmetric with respect to the bisection plane Pb.

[0045] The locking device includes a heel 22, in particular, visible in figure 1, which is formed on the outer peripheral skirt 14 of the cap 1. The heel 22 is arranged between the two foils 11, 12. The lower end of the heel 22 it is advantageously located at the same height as the lower end of the outer peripheral skirt 14. The heel 22 includes a stop 23 which extends circumferentially about the axis X and projects radially outward from the heel 22.

[0046] During the movement of the cap 1 from the released position towards the tilted open position, the stop 23 abuts against the upper end of the second section 17 of the lower ring 9 which tends to return said second section 17 towards the lowered position.

[0047] On the other hand, during the movement of the cap 1 from the tilted open position towards the released position, at first, the stop 23 rests against the engaging collar 5, as shown in figure 10, to exert on the second section 17 of the lower ring 9 a tensile force having a component directed radially outward and a component directed axially upward. This allows the lower ring 9 to be moved from the front to the rear to press the front area 19 of the first section 16 of the lower ring 9 against the neck 2 of the container in order to facilitate the movement of the second section 17 towards the raised position. This also allows aiding the movement of the second section 17 between the lowered position and the raised position.

[0048] Then, as shown in figure 10, during the movement of the cap 1 from the tilted open position to the released position, the outer surface of the heel 22, comes in a second moment, rests against the upper surface of a helical rib of the helical thread 6 formed in the neck 2 of the container, which also allows to exert on the second section 17 a tensile force having a component directed radially outward and a component directed upward to move the second section 17 towards the raised position.

[0049] On the other hand, as shown in Figure 11, the lower end 24 of the helical thread 7 formed on the inner face of the outer peripheral skirt 14, that is, the beginning of the helical thread 7, is arranged in an angular range S2 which is defined between the bisection plane Pb and a radial plane Pr located at 160° from the bisection plane Pb according to a second direction opposite to the first direction of rotation, that is, in the direction of rotation of the helical thread 7 about the axis X. Thus, a lower front portion 25 of the outer peripheral skirt 14 lacks a helical thread 7, which makes it easier to fit the cap 1 on the neck 2 of the container. This arrangement is particularly advantageous when the cap 1 is capable of being presented in a slightly rearward position when it comes into contact with the neck 2 of the container. This is particularly the case, when the engaging elements 18 are absent from the front area 19 of the first section 16 and that, consequently, the lower ring 9 can move radially from front to back with respect to the neck 2 of the container.

[0050] Advantageously, the lower end of the helical thread 7 is arranged in an angular range defined between two radial planes respectively positioned at 90 ° and 160 ° from the bisection plane Pb according to a second direction of rotation opposite the direction of the helical thread 7 of the cap 1.

[0051] On the other hand, as schematically represented in Figures 8, 9 and 10, at least one of the ribs of the series of ribs of the helical thread 7 is formed on the inner face of the heel 22. In other words, at least one of the ribs of the helical thread 7 is formed between the two foils 11, 12 of the hinge device 10. The presence of said rib formed on the heel 22 makes it possible to increase the resistance to pressure of the helical thread 7 and, therefore, prevents cap 1 from opening unintentionally due to excessive pressure on the container, in particular when it is intended to receive carbonated beverages.

[0052] The kinematics of the cap 1 is as follows. During the first unscrewing, the cap 1 leaves the closed position and moves away from the lower ring 9 to the released position, illustrated in figure 3. The frangible bridges break in the course of this movement. Furthermore, during this unscrewing movement of the cap 1, the lower ring 9 is rotatably driven around the axis X and the second section 17 of the lower ring 9 rotates towards the raised position as the cap 1 moves away from the engaging collar 5.

[0053] The cap 1 can then be rotated backwards in the direction of the open tilted position in which the outer peripheral skirt 14 extends upward from the top wall 13. During the movement of the cap 1 back in the direction of its open tilted position, the stop 23 abuts against the upper end of the second section 17 of the lower ring 9, so that the second section 17 of the lower ring 9 rotates from the raised position to the lowered position.

[0054] As shown in figure 9, when the second section 17 of the lower ring 9 is in the lowered position and the cap 1 is in its tilted open position, the stop 23 is supported against the engaging collar 5. In this way, the cap 1 remains in its tilted open position since, due to this abutment of the stop 23 against the engaging collar 5, the cap 1 cannot rotate towards the released position in which the cap 1 faces the dispensing orifice 3 while the second section 17 of lower ring 9 remains in the lowered position. This makes it possible to increase the minimum opening angle of the cap 1. Thus, advantageously, when the cap 1 is in its tilted open position and the second section 17 of the lower ring 9 is in the lowered position, the opening angle of the cap 1 is greater than 120° and, advantageously, greater than or equal to 145° and, for example, in the order of 180°. The opening angle corresponds to the projecting angular section that is formed at the intersection between a plane parallel to the upper wall 13 of the cap 1 and a horizontal plane.

[0055] To close the cap 1 again, the user tilts the cap 1 forward to the released position. During this tilting, the stop 23 rests against the engaging collar 5 to exert on the second section 17 of the lower ring 9 a tensile force that has a component directed radially outward that makes it possible to move the lower ring 9 from front to back and a component directed axially upwards that allows to aid the movement of the second section 17 of the lower ring 9 towards the raised position. The outer surface of the heel 22 also abuts against a helical rib of the helical thread 6 which also facilitates the movement of the second section 17 of the lower ring 9 towards the raised position.

[0056] When the second section 17 is in the raised position and the cap 1 is in the released position, the cap 1 can then be screwed back into the neck 2 of the container. During screwing, the lower ring 9 is rotatably driven around the axis X and the second section 17 of the lower ring 9 rotates towards the lowered position as the cap 1 is close to the engaging collar 5.

[0057] Advantageously, the entire capping device is molded in a single piece of synthetic material, such as polyethylene and advantageously high-density polyethylene. Advantageously, the capping device is molded in the configuration of figure 1, that is, in a closed position, a position in which it can be mounted directly on the neck 2 of the container.

[0058] Although the invention has been described in relation to various particular embodiments, it is more than evident that it is not limited in any way by them and that it comprises all the technical equivalents of the means described, as well as their combinations if they fall within the framework of the invention as defined by the claims.

[0059] The use of the verb "consist of", "comprise" or "include" and its conjugated forms do not exclude the presence of other elements or stages other than those established in a claim.

[0060] In the claims, any reference signs in parentheses are not to be construed as limiting the claim.

Claims

1. Capping device intended to be fixed on a neck (2) of a container that includes an orifice (3) and an engaging collar (4), including the capping device:

- a cap (1) including an upper wall (13) and an outer peripheral skirt (14), the outer peripheral skirt (14) having a helical thread (7) intended to cooperate with a helical thread (6) formed on the neck (2) to allow:
  - an unscrewing of the cap (1) of the neck (2) around an axis X to move the cap (1) from a closed position in which the upper wall (13) closes the orifice (3) of the neck (2) and the peripheral skirt surrounds said neck (2) towards a released position in which the cap (1) is no longer engaged with the neck (2); and
  - a screwing of the cap (1) into the neck (2) to move the cap (1) from the released position to the closed position;

- a lower ring (9) axially fixed to the neck (2) and rotatably movable on the neck (2) around said axis X, said lower ring (9) including a first section (16) that includes engaging elements (18) that radially project into the lower ring (9) and are intended to be arranged below the engaging collar (4) to axially retain the lower ring (9) in the neck (2) of the container, the first section (16) and the second section (17) of the lower ring (9) being articulated to each other so that the second section (17) rotates with respect to the first section (16) between a lowered position in which the second section (17) is intended to be arranged below the engaging collar (4) and a raised position in which the second section (17) is intended to be arranged at least partially above the engaging collar (4);
- a hinge device that attaches the cap (1) to the second section (17) of the lower ring (9) and is configured to allow the cap (1) to rotate between the released position and an open tilted position in which the cap (1) is disengaged from the orifice (3) of the neck (2), the hinge device extends over a first angular range which is cut into two equal parts by a bisection plane Pb;
- the lower ring (9) being configured so that the second section (17) rotates with respect to the first section (16) from the lowered position to the raised position to allow the cap (1) to move from the closed position to the released position;
- the lower ring (9) being able to move radially from front to back to facilitate the passage of a part of the second section (17) on each side of the engaging collar (4) during the movement of the second section (17) between the lowered position and the released position.

the helical thread (7) developing around the axis X according to a first direction and having a lower end and an upper end, the lower end of the helical thread (7) being arranged in a second angular range defined between the bisection plane Pb and a radial plane positioned at 160° from the bisection plane Pb according to a second direction opposite to the first direction.

2. Capping device according to claim 1, wherein the lower end of the helical thread (7) is arranged in an angular range defined between two radial planes, respectively, positioned at 90° and 160° from the bisection plane Pb according to the second direction

of rotation.

3. Capping device according to claim 1 or 2, wherein the first section (16) of the lower ring (9) includes a front area (19) that is diametrically opposite to the second section (17) and two engagement areas (20, 21) which are each arranged between the front zone (19) of the first section (16) and the second section (17), the engaging elements (18) being arranged only in the two engagem,ent areas (20, 21) to allow radial movement of the lower ring (9).

4. Capping device according to claim 3, wherein the front zone (19) of the first section (16) extends over an angular range between 90 and 150 °.

5. Capping device according to claim 3 or 4, wherein each of the two engagement areas (20, 21) extends over an angular range between 30 and 90 °.

6. Capping device according to any one of claims 3 to 5, wherein the two engagement areas (20, 21) extend over angular sections that are symmetrical to each other with respect to the bisection plane Pb.

7. Capping device according to any one of claims 1 to 6, wherein the engaging elements (18) are protrusions projecting radially inward.

8. Capping device according to any one of claims 1 to 7, wherein the second section (17) extends over an angular range comprised between 90 and 150°.

9. Capping device according to any one of claims 1 to 8, wherein the capping device further includes a locking device configured to lock the cap (1) in the tilted open position, said locking device including a stop (23) radially projecting outward of the cap (1) and is configured to rest against the engaging collar (5) of the neck (2) during the movement of the cap (1) from the tilted open position towards the released position to exert on the second section (17) a tensile force having a component directed radially outward and a component directed axially upward to aid the movement of the second section (17) between the lowered position to the raised position.

10. Capping device according to claim 9, wherein the stop (23) is configured so that, during the movement of the cap (1) from the released position towards the tilted open position, the stop (23) rests against an upper end of the second section (17) of the lower ring (9) to move it from the raised position to the lowered position.

11. Capping device according to claim 9 or 10, wherein the locking device further includes a heel (22) that is formed on the outer peripheral skirt (14) of the cap (1) and extends axially, the heel (22) being configured so that it rests against a helical rib of the helical thread (6) formed on the neck (2) of the container during the movement of the cap (1) from the tilted open position towards the released position to exert on the second section (17) a tensile force having a component directed radially outward and a component directed axially upward to aid movement of the second section (17) from the lowered position to the raised position.

12. Assembly comprising a container equipped with a neck (2) including a dispensing hole (3), an engaging collar (5) and a helical thread (6) and a capping device according to any one of claims 1 to 11, the lower ring (9) being axially fixed to the neck (2) and rotatably movable on the neck (2) around said axis X.

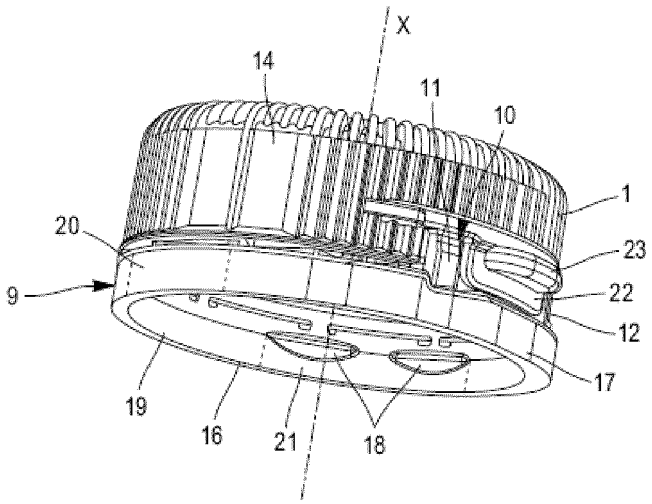

FIG. 1

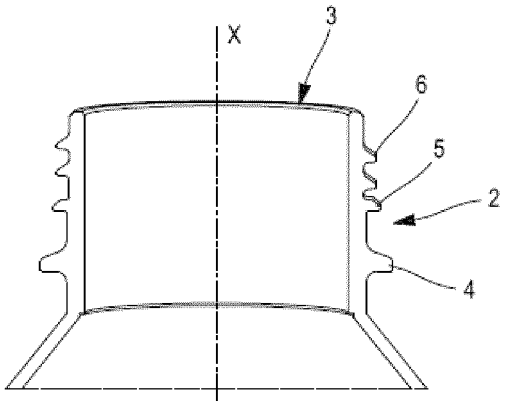

FIG. 2

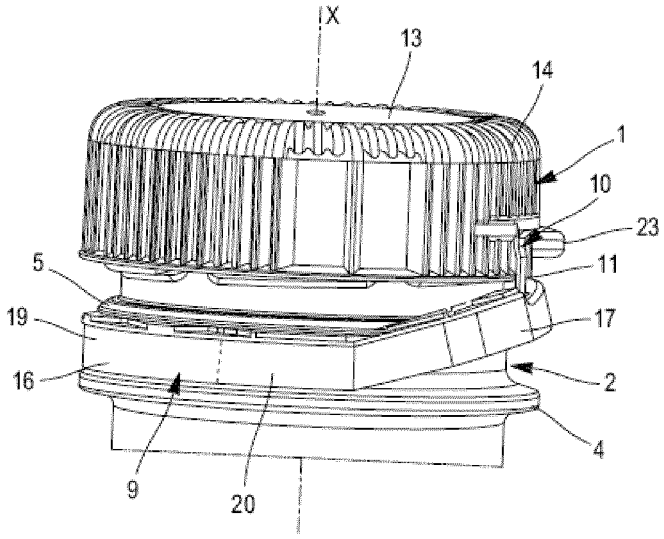
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FIG. 3

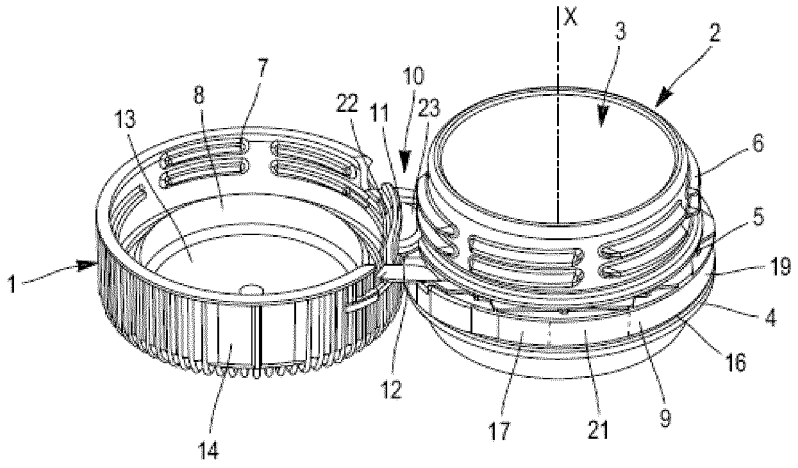
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FIG. 4

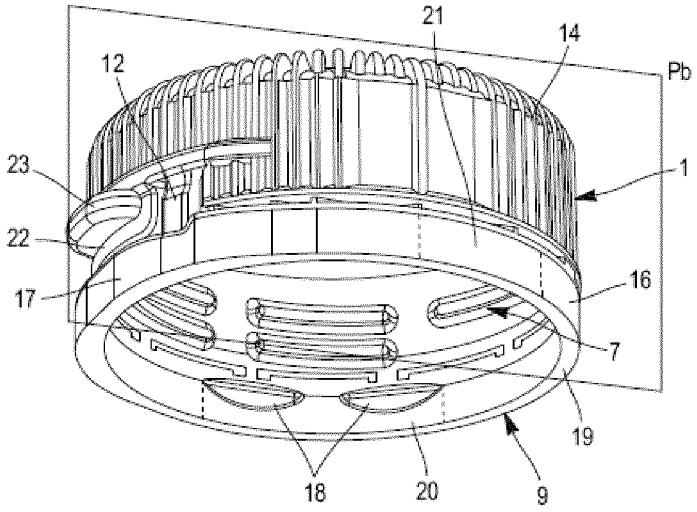
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FIG. 5

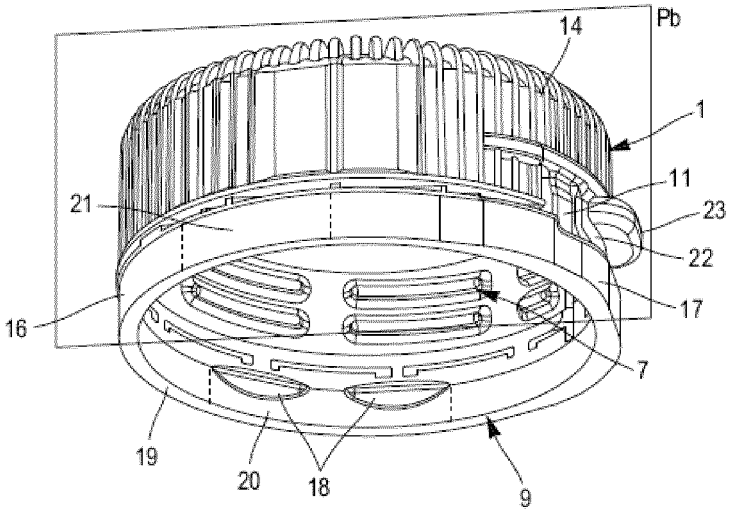
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FIG. 6

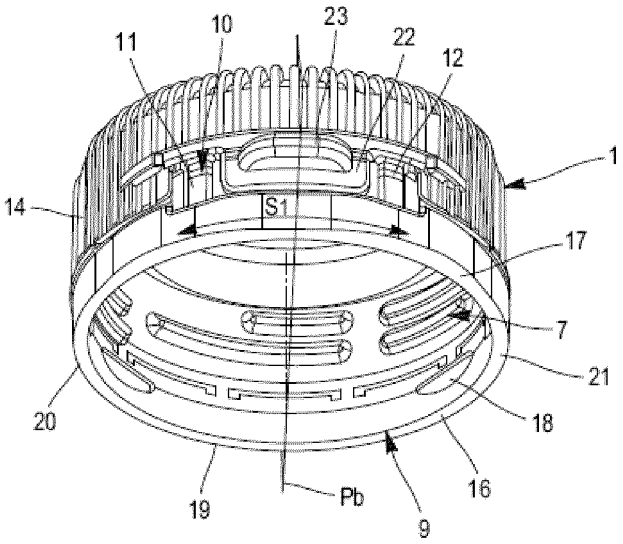

FIG. 7

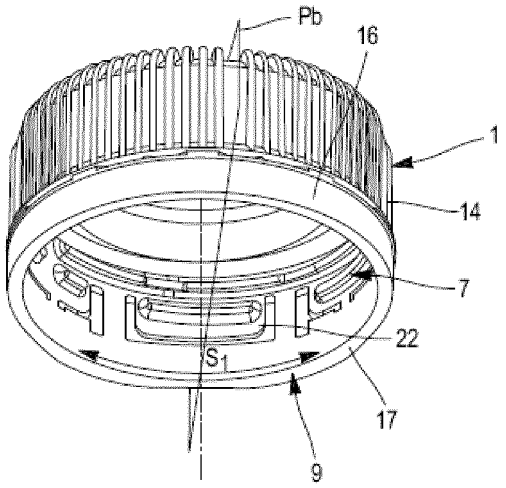

FIG. 8

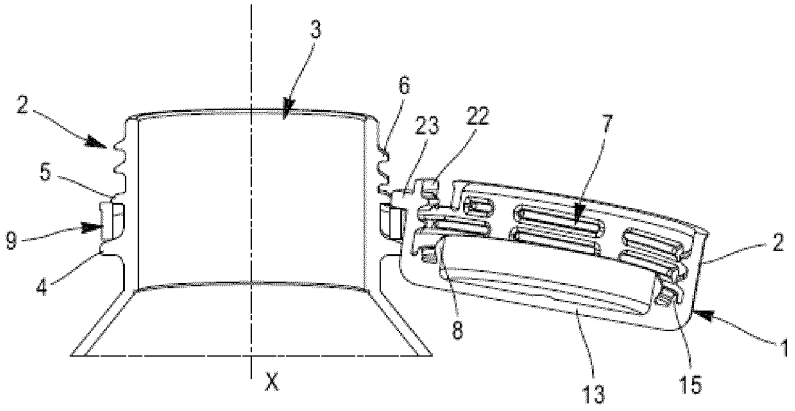

FIG. 9

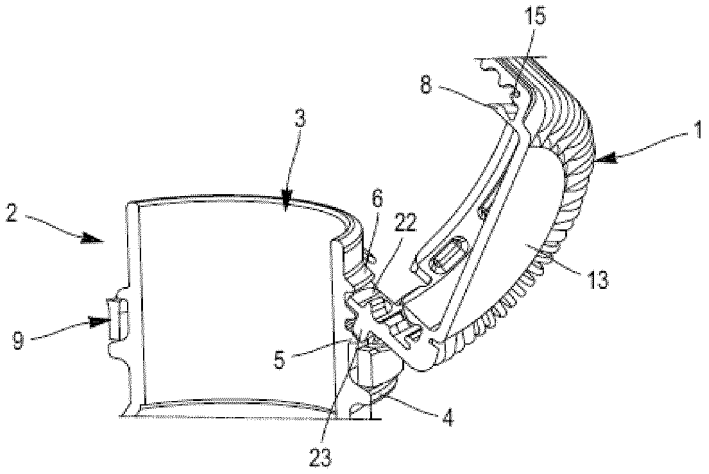

FIG. 10

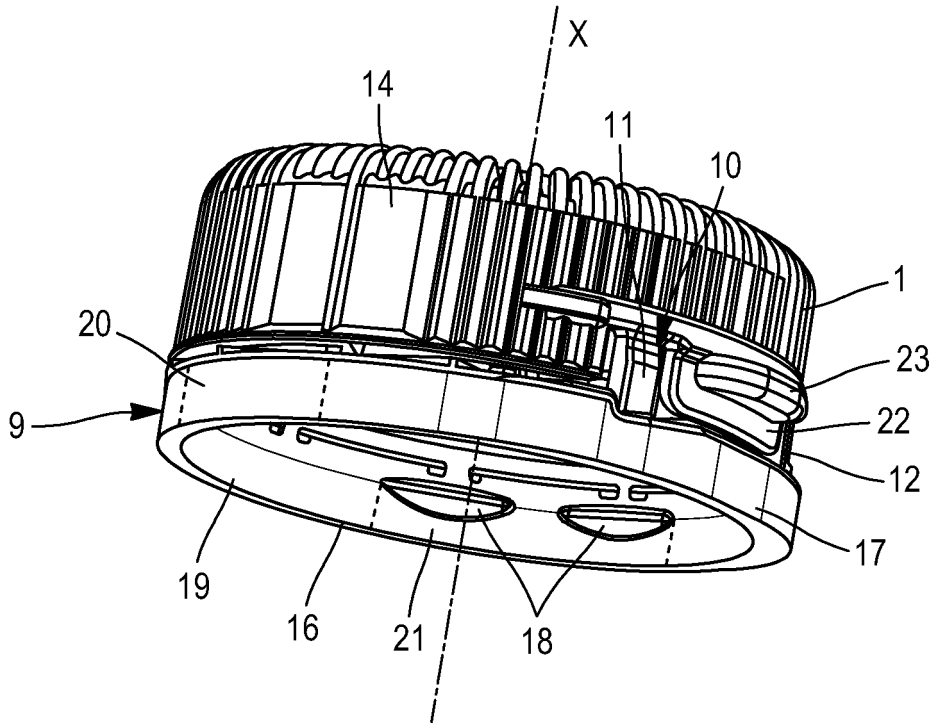

FIG. 1

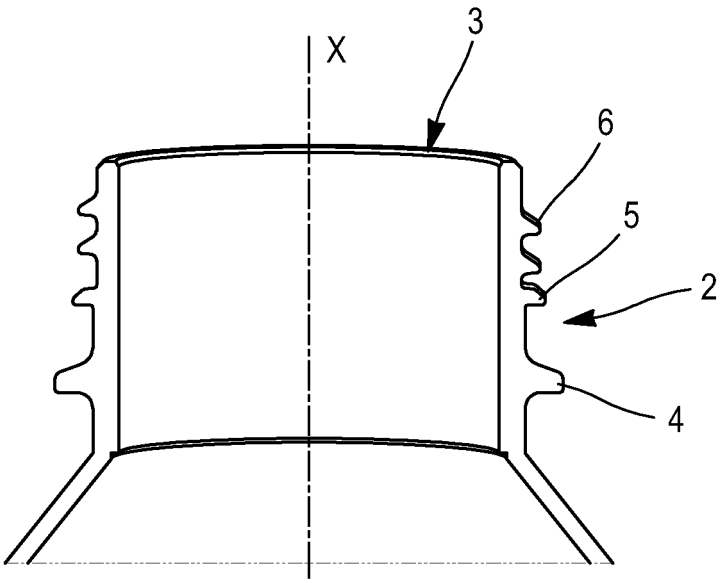

FIG. 2

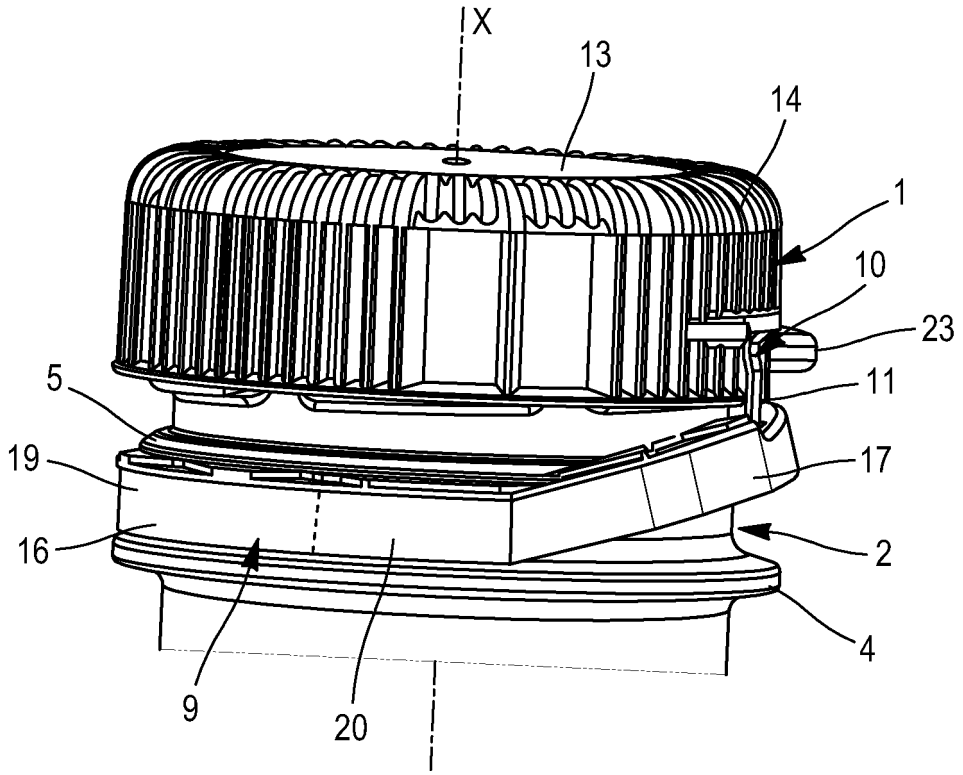
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FIG. 3

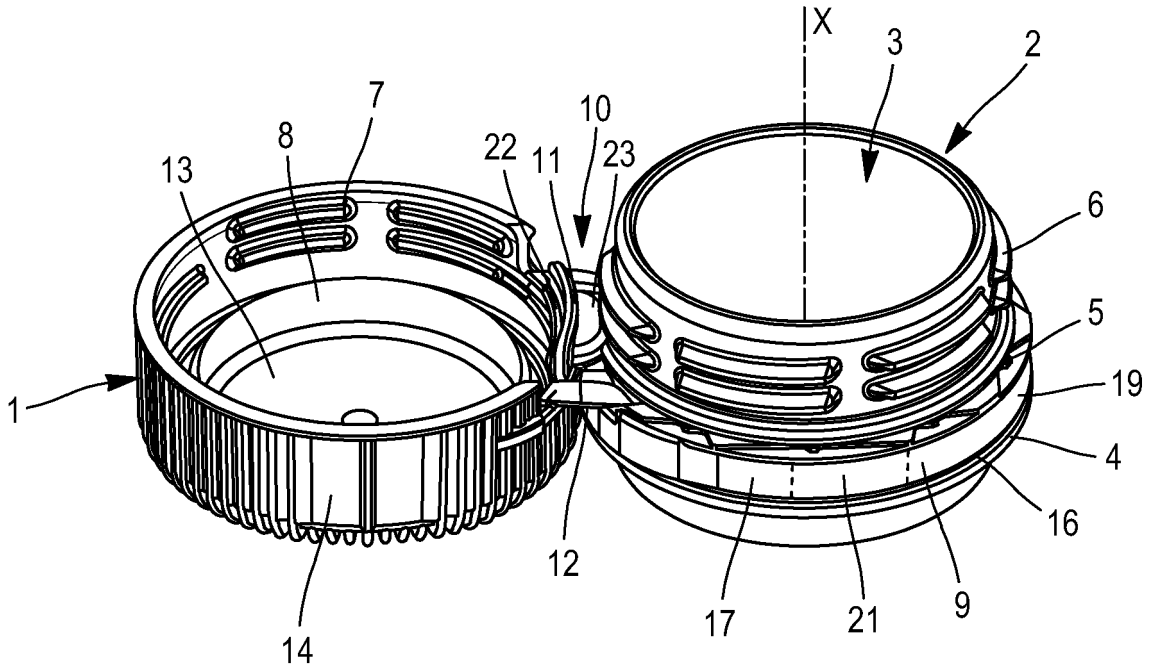
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FIG. 4

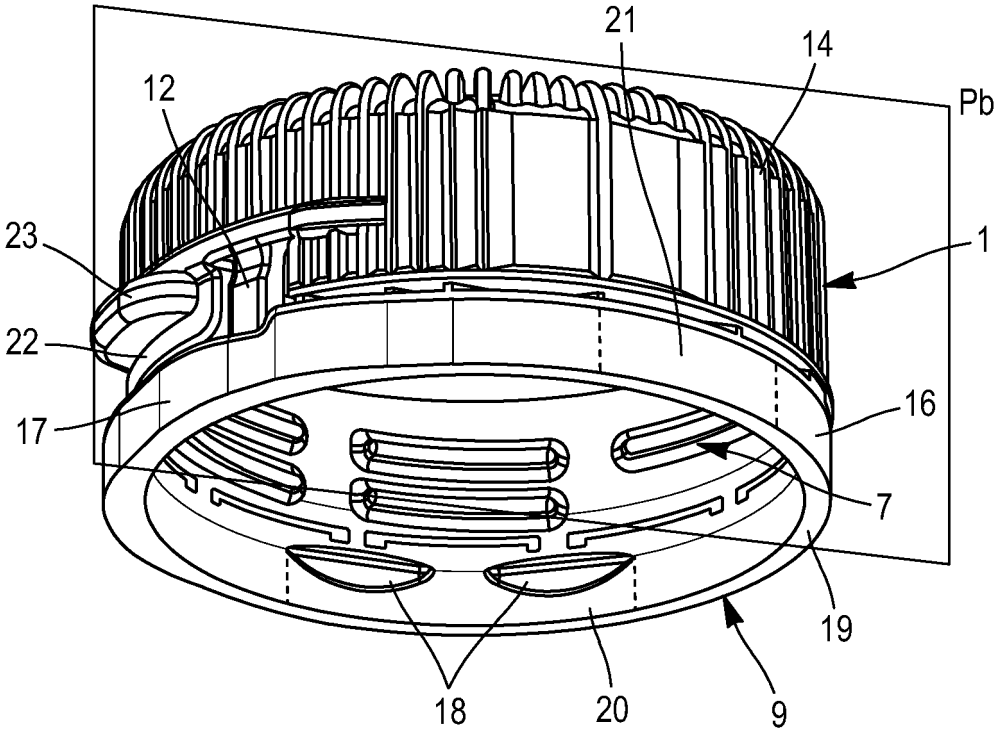
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FIG. 5

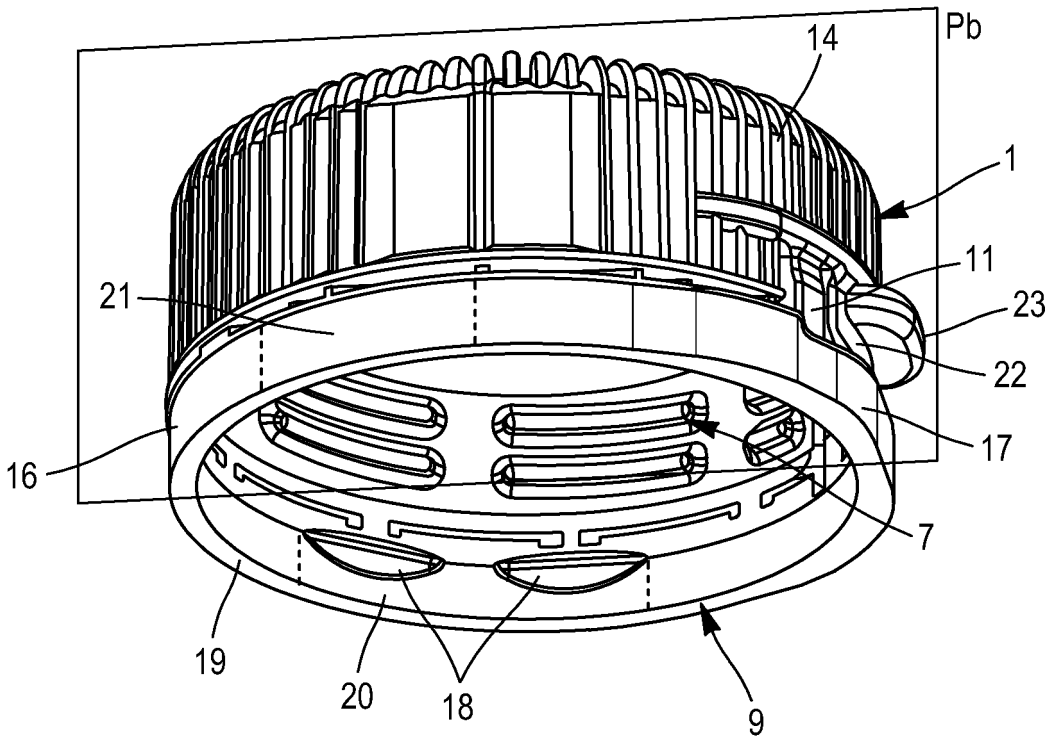
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FIG. 6

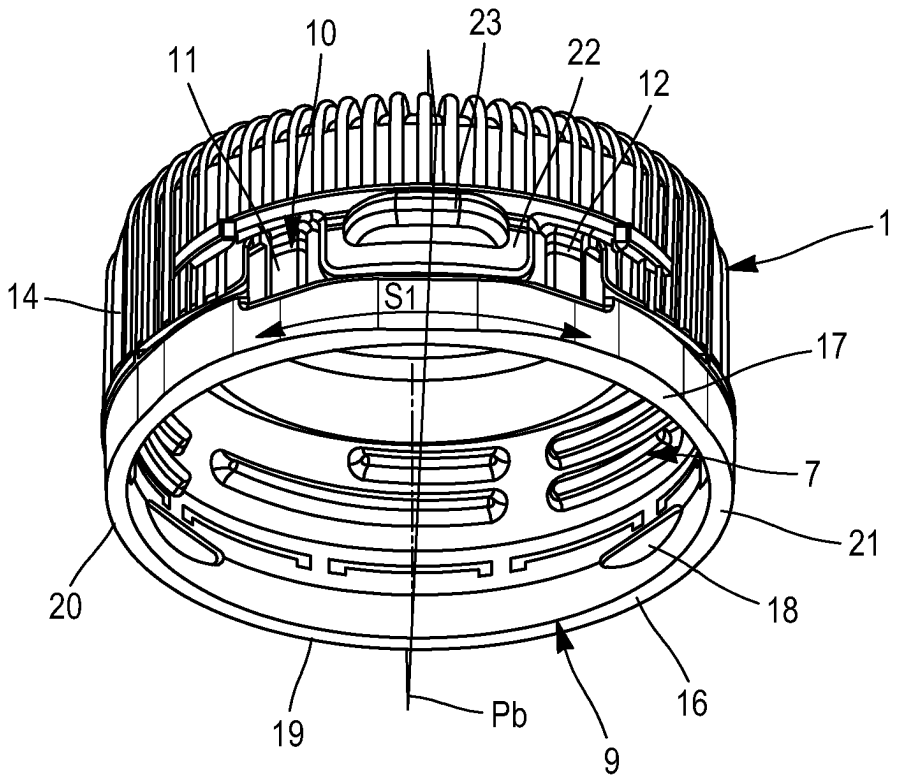

FIG. 7

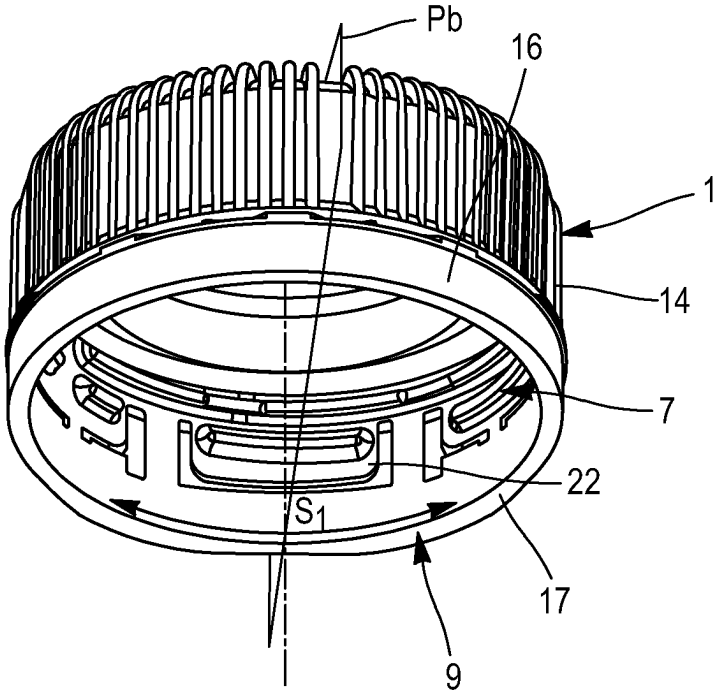

FIG. 8

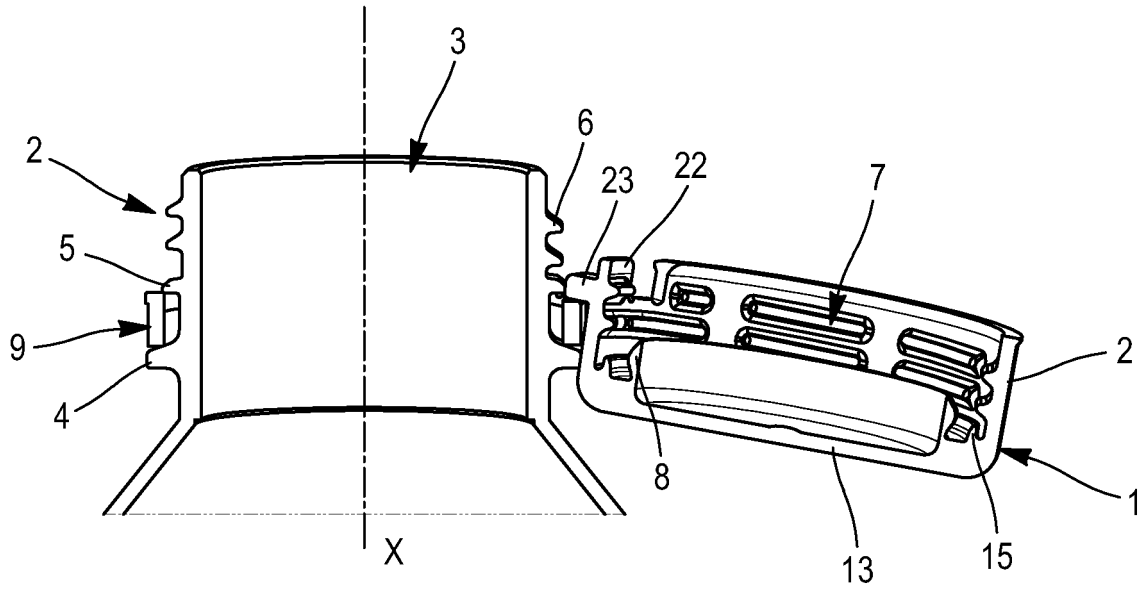

FIG. 9

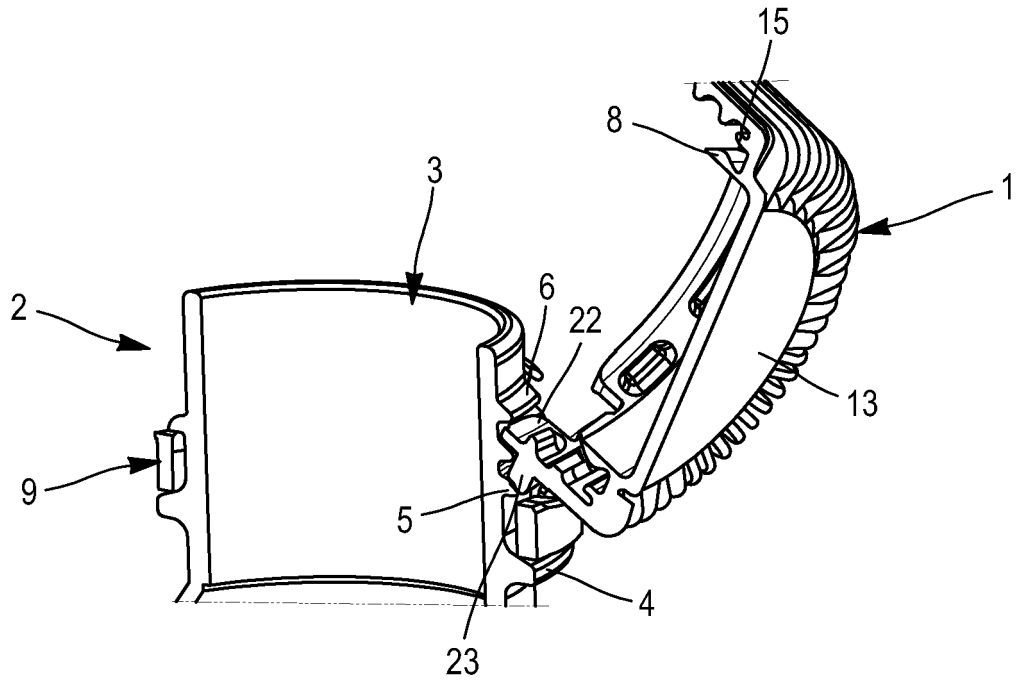

FIG. 10

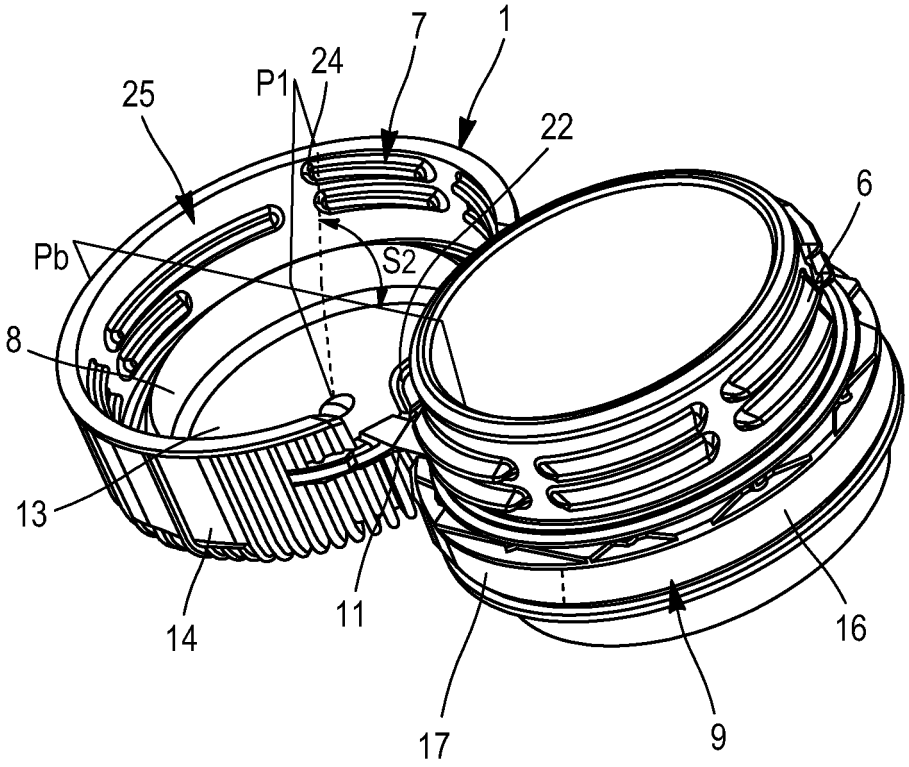

FIG. 11

INTERNATIONAL SEARCH REPORT

International application No
PCT/ES2021/070050

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D41/34 B65D55/16
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ES 1 232 089 U (GONZALEZ SANCHEZ) 8 July 2019 (2019-07-08) cited in the application the whole document	1-12
A	WO 2009/048273 A2 (BEST EASY CAP CO LTD [KR]; KWON SI JOONG [KR]) 16 April 2009 (2009-04-16) paragraphs [0056] - [0058]; figures 1-6	1-12

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
7 May 2021	21/05/2021

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Serrano Galarraga, J

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/ES2021/070050

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
ES 1232089 U	08-07-2019	NONE	
WO 2009048273 A2	16-04-2009	AU 2008311561 A1	16-04-2009
		BR PI0816620 A2	15-09-2015
		CA 2702174 A1	16-04-2009
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		WO 2009048273 A2	16-04-2009
		ZA 201003226 B	30-03-2011

Form PCT/ISA/210 (patent family annex) (April 2005)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- ES 1232089 U **[0002]**