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(54) **CAPPING DEVICE INTENDED TO BE FIXED ON THE NECK OF A CONTAINER**

(57) Capping device (1) intended to be fixed on a neck (2) of a container to seal an orifice (5) in said neck (2), including the capping device:
- a lower ring (3) including a first section (15) intended to be axially retained on the neck (2) and a second section (16);
- a cap (4); and
- an articulation device (6) that connects the cap (4) to

the second section (16) of the lower ring (3).

The first section (15) and the second section (16) are articulated to each other so that the second section (16) pivots with respect to the first section (15) from a lowered position to a raised position to allow the cap (4) to move axially away from the neck (2) from the closed position to a released position wherein said cap (4) is no longer coupled to the neck (2) of the container.

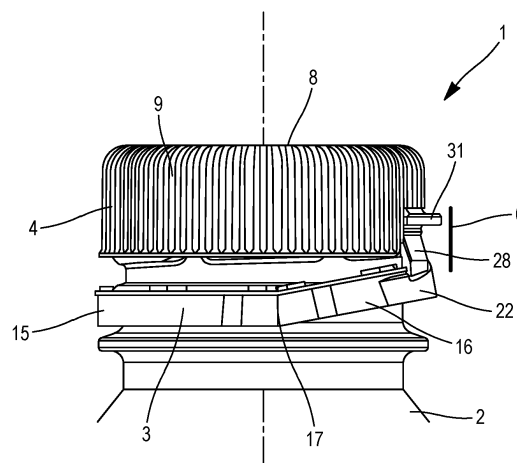


FIG. 2

Description

Technical field

[0001] The invention relates to a container capping device and to an assembly including a container equipped with such a capping device.

[0002] The invention relates more particularly to a capping device that makes it possible to keep a cap attached to the neck of a container, thus avoiding losing the cap in nature.

Technological background

[0003] In the state of the art, capping devices are known that make it possible to keep a cap attached to a neck of the container. Such a capping device is described, for example, in document US2018086510 in the name of the applicant.

[0004] The capping device includes a lower ring that is intended to be retained on the neck of the container, a cap that is designed to cover the orifice of the container in order to seal it, two elastic sheets that link the cap to the lower ring, and a locking device positioned to lock the cap in a tilted open position.

[0005] Such a device is not fully satisfactory. In particular, this cap is intended to fit into the neck of the container. Furthermore, the movement of the cap between the closed position and the tilted open position is a simple pivoting movement, which limits the height of the cap that can be used. This limits the applications of said capping device. In particular, it is not suitable for containers intended to receive carbonated beverages because the pressure prevailing inside containers of this type would lead to unwanted openings of the cap.

Summary

[0006] An underlying idea of the invention consists in proposing a capping device that allows keeping a cap attached to the neck of the container that is reliable, easy to make and use and capable of guaranteeing a satisfactory fastening of the cap, in the closed position.

[0007] According to one embodiment, the invention provides a capping device intended to be attached to the neck of a container in order to close an orifice in said neck, the capping device including:

- a lower ring including a first section intended to be axially retained on the neck and a second section;
- a cap that includes a top wall and an outer peripheral skirt, the cap being capable of being arranged in a closed position wherein the top wall seals the orifice on the neck and the peripheral skirt surrounds said neck; and
- an articulation device connecting the cap to the second section of the lower ring;
- the first section and the second section of the lower

ring being articulated with each other so that the second section pivots with respect to the first section from a lowered position to a raised position to allow the cap to move axially away from the neck from the closing position to a released position wherein said cap is no longer coupled to the neck of the container;

- the articulation device being configured to allow the cap to pivot between said released position and a tilted open position wherein the cap is removed from the orifice on the neck;

the second section including at least one support element that protrudes radially towards the interior of the lower ring and which is configured to be positioned above the engaging collar, abutting against it, when the second section is in the raised position.

[0008] Thus, the kinematics of the cap between the closed position and the open position includes a displacement of the cap from the bottom up and then a pivotal movement towards the rear of the cap. Consequently, this allows the cap to be taller and optionally screwed onto the neck. Likewise, a capping device of this type is capable of being used for a great variety of applications and in particular for containers containing carbonated beverages.

[0009] In addition, by means of the support element that allows the second section to be kept in the raised position, the cap remains uncoupled from the neck. This also ensures good positioning of the cap on the neck during its movement from the tilted open position to the closed position and, in particular, without the consumer having to exert an uncontrolled tensile force on the second section of the lower ring to allow the placement of the cap on the neck.

[0010] According to other advantageous embodiments, a capping device of this type can have one or more of the following features.

[0011] According to one embodiment, the first section and the second section are separated from each other by two thinned areas wherein the lower ring locally exhibits a decrease in radial thickness in order to allow the second section to articulate with respect to the first section.

[0012] According to another embodiment, the lower ring has a sufficiently weak thickness to allow the pivoting movement of the second section with respect to the first section without the first section and the second section being separated from each other by two thinned areas.

[0013] According to one embodiment, the second section extends over the entire height of the lower ring. In other words, the second section includes the entire portion of the lower band that extends in the corresponding angular interval. This makes it possible in particular to guarantee a good resistance against pulling out of the lower ring.

[0014] According to another embodiment, the second section only extends across a part of the height of the lower ring.

[0015] According to one embodiment, the second section has a height, that is, a size taken parallel to axis X, which is substantially equal to that of the first section.

[0016] According to one embodiment, the at least one support element is configured so that, when the second section is in the raised position, the engaging collar exerts a tensile force on the lower ring that produces a reaction force that pushes said at least one support element against the engaging collar. This makes it possible to reduce movements, thereby improving the holding of the cap in position, specifically in the tilted open position.

[0017] According to one embodiment, the second section includes several support elements.

[0018] According to one embodiment, the at least one support element is positioned in a central area of the second section.

[0019] According to one embodiment, the second section extends over an angular interval comprised between 120 and 200° and, preferably, comprised between 160 and 190°.

[0020] According to one embodiment, the neck to which the capping device is intended to be attached includes an engaging collar, the first section including one or more retention elements that protrude radially towards the interior of the lower ring, which are intended to be arranged below the engaging collar and are configured so as to axially retain the lower ring to the neck of the container.

[0021] According to one embodiment, the articulation device is connected to the second section in a central area of the second section.

[0022] According to one embodiment, the central area of the second section extends over an angular interval comprised between 20 and 90°.

[0023] According to one embodiment, the articulation device includes two elastic sheets that connect the outer peripheral skirt and the second section.

[0024] According to one embodiment, the second section of the lower ring includes a recessed portion, and the elastic sheets are attached to the second section of the lower ring in said recessed portion. According to one embodiment, the outer peripheral skirt includes a recessed portion, and the elastic sheets are attached to said outer peripheral skirt at said recessed portion. Such a configuration makes it possible to have elastic sheets with sufficient length, while limiting sizes of interstices, provided between the cap and the lower ring and capable of allowing the passage of dust.

[0025] According to one embodiment, the capping device further includes a locking device configured to lock the cap in the tilted open position.

[0026] According to one embodiment, the locking device includes a tab arranged between the two elastic sheets and extending upward from the lower ring and a heel that protrudes radially outward from the outer peripheral skirt, the heel being positioned to abut against the tab during the pivoting movement of the cap between the released position and the tilted open position, the

elastic sheets, the tab and the heel being configured so that, during the pivoting movement of the cap between the released position and the tilted open position, the elastic sheets are subjected to a pulling force that increases to an intermediate unstable position and then decreases from said intermediate unstable position towards the tilted open position.

[0027] According to one embodiment, the lower ring is intended to be mounted movably in rotation on the neck around an axis X and the outer peripheral skirt of the cap has a helical thread intended to cooperate with a helical thread arranged on the neck of the container in order to allow screwing and unscrewing of the cap on the neck around the axis X.

[0028] According to one embodiment, the capping device is molded in one piece.

[0029] According to one embodiment, the capping device is capable of being molded into the closed position of the cap.

[0030] According to one embodiment, the lower ring is connected to the outer peripheral skirt by means of frangible bridges. Frangible bridges of this type are intended to serve as tamper-evident seals.

[0031] According to one embodiment, the cap includes an internal skirt that extends perpendicularly downward from the upper wall of the cap and is intended to be inserted into the orifice of the neck.

[0032] According to one embodiment, the cap further includes an annular lip extending from the upper wall radially between the inner skirt and the outer peripheral skirt and which is intended to come into contact with an outer face of the neck.

[0033] According to one embodiment, the cap includes a gripping visor that protrudes radially outward from the outer peripheral skirt. According to one embodiment, the gripping visor is diametrically opposite to the articulation device. This makes it possible to optimize the lever effect attributable to the effort application on the gripping visor and a better understanding for the consumer.

[0034] According to one embodiment, the invention also provides an assembly that includes a container equipped with a neck that includes an engaging collar and an orifice and a capping device mentioned above, the first section of the lower ring being axially retained in said engaging collar.

Brief description of the figures

[0035] The invention will be better understood and other purposes, details, features and advantages thereof will be appreciated more clearly in the course of the following description of various particular embodiments of the invention, provided solely by way of illustration and not limitation, with reference to attached drawings.

- **Figure 1** is a perspective view of a capping device according to a first embodiment, in a closed position.

- **Figure 2** is a side view of the capping device of figure 1, wherein the cap is in a released position in which it is no longer coupled to the neck of the container and is thus capable of being lowered into a tilted open position.
- **Figure 3** is a sectional view of the capping device wherein the cap is in the released position, as illustrated in Figure 2.
- **Figure 4** is a side view of the capping device of Figures 1 to 3, in a tilted open position.
- **Figure 5** is a sectional view of the capping device in the tilted open position, illustrated in figure 4.
- **Figure 6** is a detailed view of figure 5, illustrating a support element formed in the second section of the lower ring and which abuts against the engaging collar provided on the neck of the container when the second section of the lower ring is in a raised position.
- **Figure 7** is a bottom view of the capping device of Figures 1 to 6 illustrating the support elements and the retention elements provided on the inner surface of the lower ring.
- **Figure 8** is a detailed view illustrating the geometry of the support elements.
- **Figure 9** is a detailed view illustrating the geometry of the retention elements.
- **Figure 10** is a perspective view of a capping device according to a second embodiment in a tilted open position.
- **Figure 11** is a perspective view of a capping device according to a third embodiment in a tilted open position.
- **Figure 12** is a perspective view of a capping device according to a fourth embodiment in a tilted open position.

Detailed description of embodiments

[0036] In the description and figures, the axis X corresponds to an axis of the capping device intended to be positioned orthogonally to the plane of the orifice to be sealed when the capping device is in the closing position and closes said orifice. The axis X thus corresponds to the axis of rotation of the cap of the capping device when it is screwed onto the neck of the container. By convention, the "radial" direction is directed orthogonally to the axis X. The terms "external" are used to define the relative position of one element with respect to another, with ref-

erence to the axis X, an element close to the axis X is thus qualified as internal as opposed to an external element located radially on the periphery. The terms "upper" and "lower" are used to define the relative position of one element with respect to another with reference to a position in which the orifice on the neck is facing upwards and the cap is in the closed position on the neck of the container, being called, an element intended to be placed below, lower, and being named, an element intended to be placed above, upper.

[0037] With reference to Figures 1 to 9, a capping device 1 is described according to a first embodiment. The capping device 1 is intended to be assembled on the neck 2 or throat of a container, as shown in Figures 1 to 6. The container is, for example, a bottle.

[0038] The capping device 1 includes a lower ring 3 that is intended to be retained on the neck 2 of the container, a cap 4 that is intended to cover the orifice 5 of the container to seal it and an articulation device 6 that connects the cap 4 to the lower ring 3. Advantageously, the capping device 1 also includes a locking device 7 positioned to lock the cap 4 in a tilted open position, shown in Figures 4 and 5, wherein the cap 4 is removed from the orifice 5 of the container and does not obstruct the pouring of the contents of the container.

[0039] The cap 4 includes an upper wall 8 intended to be arranged substantially orthogonal to the axis X, opposite the orifice 5 of the neck 2 when said cap 4 is in the closed position. The cap 4 also includes an external peripheral skirt 9 intended to surround the neck 2 of the container when the cap 4 is in the closed position. The outer peripheral skirt 9 extends, downward, perpendicular to the upper wall 8, from the outer periphery of said upper wall 8.

[0040] As shown in Figures 3 and 5, the outer peripheral skirt 9 has on its internal face a thread 10 formed by a series of helical ribs intended to cooperate with a complementary thread 11, formed by a series of helical ribs, provided on the external surface of the neck 2. Thus, the cap 4 is able to screw onto the neck 2 in order to close the container and to unscrew from the neck 2 in order to open the container. The cap 4 is thus movable between the closed position, shown in figure 1, and a released position, shown in figures 2 and 3. In said released position, the cap 4 is no longer coupled to the neck 2 of the container. It is thus capable of being tilted into the tilted open position, shown in Figures 4 and 5, wherein the cap 4 is removed from the orifice 5 of the neck 2 so that it does not obstruct the pouring of the contents of the container.

[0041] As shown, for example, in Figures 1 and 2, the outer peripheral skirt 9 has on its outer face a series of grooves distributed around the axis X and extending parallel to the axis X. The grooves thus provide a rough surface that facilitates the grip of the cap 4 by the user or by the assembly device of the bottling chain.

[0042] The cap 4 also includes an internal skirt 12, shown, in particular, in figure 3, which extends perpen-

dicularly downward from the upper wall 8 of the cap 4 and is sized to be inserted inside the orifice 5 of the neck 2. The cap 4 also includes an annular lip 13, also visible in figure 3, which extends, from the upper wall 8, radially between the inner skirt 12 and the outer peripheral skirt 9. The inner skirt 12 and the annular lip 13 are sized so that, when the cap 4 is in the closed position, on the neck 2 of the container, the inner skirt 12 is in contact with the inner face of the neck 2 while the annular lip 13 is in contact with the outer face of the neck 2. In this way, the inner skirt 12 and the annular lip 13 make it possible to guarantee the sealing of the closure.

[0043] Advantageously, the lower ring 3 is, before the first opening of the container, connected to the cap 4 by frangible bridges 14, visible in figure 1, intended to break during the opening of the cap 4. These frangible bridges 14 thus constitute some tamper evident seals. More specifically, the frangible bridges 14 are distributed around the axis X and connect the upper edge of the lower ring 3 and the lower edge of the outer peripheral skirt 9. According to another embodiment not shown, the lower ring 3 and the cap 4 are connected to each other by a tear-off band which is interposed axially between the cap 4 and the lower ring 3 and which is, on the one hand, connected to the lower ring 3 by frangible bridges and, on the other hand, connected to the cap 4 by some frangible bridges.

[0044] The lower ring 3 is held axially on the neck 2 of the container, being able to rotate at the same time with respect to it around the axis X. The lower ring 3 includes two parts that are articulated with each other, that is, a first section 15 and a second section 16 whereby the lower ring 3 is connected to the cap 4 by means of the articulation device 6.

[0045] As shown in figure 7, the lower ring 3 includes two thinned areas 17, that is, whose radial thickness is less than the radial thickness of the lower ring 3 outside said thinned areas 17. The two thinned areas 17 delimit the first section 15 and the second section 16. The thinned areas 17 thus form pivots that allow the articulation of the second section 16 with respect to the first section 15. In the embodiment shown, the two thinned areas 17 are diametrically opposite, on both sides of the lower ring 3, so that the first and second sections 15, 16 each extend over an angular section of approximately 180°. However, the relative lengths of the first and second sections 15, 16 are susceptible to variation. Likewise, the second section 16 is capable of extending over an angular interval comprised between 120° and 200° and, preferably, comprised between 160° and 190°.

[0046] By virtue of the aforementioned structure of the lower ring 3, the second section 16 is able to pivot upwards with respect to the first section 15, from a lowered position to a raised position, in order to allow the cap 4 to move upwards with respect to the neck 2 of the container, until the thread 10 of the cap 4 is removed from the thread 11 arranged on the neck 2 of the container. In other words, when the cap 4 is unscrewed, the lower

ring 3 is dragged in rotation around the axis X while the second section 16 of the lower ring 3 pivots with respect to the first section 15 to the raised position to allow axial movement, up the cap 4, from the closed position, shown in figure 1, to the released position, shown in figures 2 and 3.

[0047] The lower ring 3 is held axially on the neck 2 of the container by means of an engaging collar 18, shown, in particular, in Figures 3, 5 and 6. The engaging collar 18 has a frusto-conical external surface that tapers upwards, that is, in the direction of the orifice 5 of the container. The engaging collar 18 delimits, downwards, that is, in a direction opposite to the orifice 5, a projection.

[0048] The first section 15 of the lower ring 3 includes retention elements 19 that cooperate with the engaging collar 18 provided on the container in order to axially retain the lower ring 3 to the neck 2 of the container. The retention elements 19 are protrusions, shown in detail in Figure 9, which protrude radially inward from the first section 15 of the lower ring 3. The retention elements 19 have a radial size that increases, from bottom to top, that is, in the direction of the upper edge of the lower ring 3. The retention elements 19 also have an upper, substantially horizontal end, which forms a stop surface 20 intended to be positioned in front of the projection provided by the engaging collar 18. In the embodiment shown, the retention elements 19 have a general semi-frusto-conical shape. During the assembly of the capping device 1 on the neck 2 of the container, the retention elements 19 slide against the frusto-conical surface of the engaging collar 18 then lock by elastic return behind the engaging collar 18 so that the stop surfaces 20 of the retention elements 19 are located opposite the projection.

[0049] It should be noted that the geometry of the retention elements 19 has been described above by way of example and that it is susceptible to variation.

[0050] The second section 16 includes support elements 21, shown in figures 3, 5, 6 and 8. As shown in figure 8, the support elements 21 are positioned in the central part 22 of the second section 16, that is, in the part of the second section 16 in which the articulation device 6 is placed and which extends over an angular interval comprised between 20° and 90°. The support elements 21 are formed by protrusions that protrude radially inward. The support elements 21 are configured so that, when the second section 16 is in the lowered position, said support elements 21 are located below the engaging collar 18 and that, when the second section 16 is in the raised position, said support elements 21 are located above the engaging collar 18 and are supported on it. Due to the connection of the cap 4 with the second section 16 through the articulation device 6, the lower ring 3 is stressed in traction during the movement of the second section 16 from the lowered position to the raised position, which allows the support elements 21 to move from a low position in which they are located below the engaging collar 18 to a high position in which they are located above the engaging collar 18 and are supported

on it.

[0051] This retention of the central part 22 of the second section 16 above the engaging collar 18 is particularly advantageous because it allows, on the one hand, to keep the cap 4 uncoupled from the neck 2 and, on the other hand, a good positioning of the cap 4 on the neck 2 of the container, during its movement from the tilted open position to the closed position.

[0052] On the other hand, when the second section 16 is in the raised position, the support elements 21 abut against the engaging collar 18, as shown in figure 6, so that the engaging collar 18 exerts a tensile force on the lower ring 3. This produces a reaction force that pushes the support elements 21 against the engaging collar 18. This makes it possible to reduce movement and thus improve the holding in position of the cap 4, specifically in the tilted open position.

[0053] When the cap 4 is screwed into the neck 2 and moves in the direction of the closed position, the outer peripheral skirt 9 bears against the second section 16 of the lower ring 3 so that the support elements 21 slide against the frusto-conical surface of the engaging collar 18 then lock by elastic return behind the engaging collar 18. Consequently, when the second section 16 is in the lowered position, the support elements 21 exert also a function of retention of the lower ring 3.

[0054] As shown in figure 8, the support elements 21 have a substantially flat upper surface, which forms a stop surface 23 intended to be positioned in front of the projection provided by the engaging collar 18 when the second section 16 is in the lowered position. The support elements 21 also have a lower surface, in this case substantially flat, which forms a stop surface 24 intended to bear against the engaging collar 18 when the second section 16 is in the raised position. Furthermore, according to one embodiment, the support elements 21 have, between said upper and lower surfaces, an upper portion 25 having a semi-frusto-conical shape and a lower portion 26 having a semi-cylindrical shape.

[0055] As shown in figure 7, the second section 16 is also capable of including retention elements 27 that have an identical structure to the retention elements 19 of the first section 15. In that case, said retention elements 27 are positioned outside of the central area 22 in which the articulation device 6 is placed.

[0056] The articulation device 6 is configured to allow the cap 4 to pivot between the released position, shown in Figures 2 and 3, and the tilted open position, shown in Figures 4 and 5. In the embodiment shown, the articulation device 6 includes two elastic sheets 28, 29 that connect the cap 4 and, more particularly, the outer peripheral skirt 9 of the cap 4 to the second section 16 of the lower ring 3. The two elastic sheets 28, 29 are positioned in the central part 22 of the second section 16. On the other hand, in order to avoid truncating the thread and deteriorating as little as possible the resistance to pressure for carbonated drinks, the articulation device 6 is advantageously connected to the cap 4 in an area that

is located axially at the same height as the lower end of the thread 10 and is angularly adjacent to said lower end of the thread, that is, angularly spaced from said lower end of the thread 10 at an angle between 0 and 90° and preferably between 0 and 30°. Advantageously, the elastic sheets 28, 29 reach the outer peripheral skirt 9 in a recessed portion. Also, the elastic sheets 28, 29 are advantageously attached to the second section 16 of the lower ring 3 in a recessed portion. In other words, the elastic sheets 28, 29 extend substantially above the lower limit of the outer peripheral skirt 9 and extend substantially below the upper limit of the lower ring 3.

[0057] The locking device 7 includes a tab 30 extending upward from the upper edge of the lower ring 3. The tab 30 is arranged between the two elastic sheets 28, 29. The locking device 7 further includes a heel 31 radially projecting outwards, from the outer peripheral skirt 9 of the cap 4. Heel 31 is configured to abut against the tab 30 when the cap 4 is pivoted to the tilted open position in order to lock the cap 4 in said tilted open position.

[0058] The stretching possibilities of the elastic sheets 28, 29, together with the aforementioned features of the locking device 7, make it possible to create a hard point in the middle of the folding travel of the cap 4 between the released position, shown in Figures 2 and 3, and the tilted open position, shown in Figures 4 and 5. In other words, the elastic sheets 28, 29 as well as the locking device 7 are configured so that, during a first part of the movement of the cap 4 from the released position to the tilted open position, the two elastic sheets 28, 29 are, due to the abut of the heel 31 against the tab 30, subjected to a traction force that increases to an intermediate unstable position and then decreases from said intermediate unstable position towards the tilted open position. This allows the cap 4 to be locked in the tilted open position.

[0059] Advantageously, the locking device 7 is configured so that the opening angle of the cap 4 in said tilted open position is greater than or equal to 180°.

[0060] Advantageously, the capping device assembly is molded in a single piece made of synthetic material, such as polyethylene and advantageously high-density polyethylene, for example. 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.

[0061] The assembly operation of the capping device 1 with the container, on the one hand, and the opening and closing operations of the cap 4, on the other hand, are described below.

[0062] To assemble the capping device 1 to the container, the capping device 1 is placed on the neck 2 by simply screwing the cap 4 onto the neck 2, until the retention elements and support elements 21 provided on the lower ring 3 exceed the projection delimited by the engaging collar 18. The lower ring 3 is then fixed to the neck 2 while being at the same time movable in rotation around the axis X of the neck 2.

[0063] During the first unscrewing, the cap 4 leaves the closed position, illustrated in Figure 1, and moves away from the lower ring 3 to the released position, illustrated in Figures 2 and 3. The frangible bridges 14 break in the course of this movement. Furthermore, during this unscrewing movement of the cap 4, the lower ring 3 is dragged in rotation around axis X and the second section 16 of the lower ring 3 pivots towards the raised position as the cap 4 moves away from the engaging collar 18.

[0064] Next, when the helical ribs of the cap 4 are removed from those of the neck 2, then the cap 4 can be pivoted back in the direction of the tilted open position. In such a tilted open position, the outer peripheral skirt 9 extends upwards from the top wall 8.

[0065] To close the container, the cap 4 is lowered from the tilted open position to the released position. As the second section 16 is kept in the raised position, the placement of the cap 4 on the neck 2 of the container is easy. The cap 4 can then be screwed onto the neck 2 in order to reach the closed position. During the screwing of the cap 4, its outer peripheral skirt 9 abuts against the second section 16 of the lower ring 3 in order to bring it back to the lowered position.

[0066] Figure 10 shows a capping device 1 according to a second embodiment. This capping device 1 differs from the one previously described in relation to Figures 1 to 9 in that the cap 4 is intended to fit into the neck 2 of the container and not to be screwed into said neck 2. The outer peripheral skirt 9 as the neck 2 of the container is therefore not provided with threading. On the other hand, the outer peripheral skirt 9 includes a gripping visor 32 projecting radially outwards. The gripping visor 32 is advantageously arranged on the opposite side of the articulation device 6. The gripping visor 32 thus forms a grip surface intended to facilitate the visibility, comprehension, and manipulation of the cap 4, in particular, to cause it to pivot to the tilted open position.

[0067] On the other hand, the cap 4 also includes an annular collar 33 that protrudes radially outward from the outer peripheral skirt 9. An annular collar 33 of this type makes it possible to facilitate the grip of the capping device by the assembly device that is intended to ensure the assembly of the cap 4 on the neck 2 of the container.

[0068] Figure 11 shows a capping device 1 according to a third embodiment. It does not differ from that described in relation to Figures 1 to 9 except that it includes an annular collar 33, which has been previously described in relation to Figure 10, protruding radially outward from the outer peripheral skirt 9.

[0069] Figure 12 shows a capping device 1 according to a fourth embodiment. It does not differ from that described above in relation to Figure 11 except that it further comprises a gripping visor 32, as described above in relation to Figure 10.

[0070] Although the invention has been described in relation to several 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.

[0071] The use of the verb "consist of", "comprise" or "include" and their conjugated forms does not exclude the presence of other elements or of other stages in addition to those stated in a claim.

[0072] In the claims, any reference signs between parentheses are not to be construed as limiting the claim.

Claims

1. Capping device (1) intended to be fixed on a neck (2) of a container that includes an engaging collar (18) in order to seal an orifice (5) on said neck (2), wherein the capping device includes:

- a lower ring (3) including a first section (15) intended to be axially retained in the engaging collar (18) of the neck (2) and a second section (16);
- a cap (4) that includes an upper wall (8) and an external peripheral skirt (9), the cap (4) being suitable to be arranged in a closed position wherein the upper wall (8) closes the orifice (5) of the neck (2) and the peripheral skirt surrounds said neck (2); and
- an articulation device (6) that connects the cap (4) to the second section (16) of the lower ring (3);
- wherein the first section (15) and the second section (16) of the lower ring (3) are articulated to each other so that the second section (16) pivots with respect to the first section (15) from a lowered position to a raised position to allow the cap (4) to move axially away from the neck (2) from the closed position to a released position wherein said cap (4) is no longer coupled to the neck (2) of the container;
- wherein the articulation device (6) is configured to allow the cap (4) to pivot between said released position and a tilted open position wherein the cap (4) is removed from the orifice (5) on the neck (2); and
- wherein the second section (16) includes at least one support element (21) that protrudes radially towards the interior of the lower ring (3) and that is configured to be positioned above the engaging collar (18), abutting against it, when the second section (16) is in the raised position.

2. Capping device (1) according to claim 1, wherein the first section (15) and the second section (16) are separated from each other by two thinned areas (17) wherein the lower ring (3) locally has a decrease in radial thickness in order to allow the articulation of the second section (16) with respect to the first sec-

- tion (15).
3. Capping device (1) according to claim 1 or 2, wherein the second section (16) extends over the entire height of the lower ring (3). 5
 4. Capping device (1) according to any one of claims 1 to 3, wherein the at least one support element (21) is configured such that, when the second section (16) is in the raised position, the engaging collar (18) exerts a tensile force on the lower ring (3) that produces a reaction force that pushes said at least one support element (21) against the engaging collar (18). 10
 5. Capping device according to any one of claims 1 to 4, wherein the at least one support element (21) is positioned in a central area of the second section (16). 15
 6. Capping device according to any one of claims 1 to 5, wherein the second section (16) extends over an angular interval comprised between 120° and 200° and, preferably, comprised between 160° and 190°. 20
 7. Capping device according to any one of claims 1 to 6, wherein the neck (2) to which the capping device (1) is intended to be fixed includes an engaging collar (18), wherein the first section (15) includes one or several retention elements (19) that protrude radially towards the interior of the lower ring (3), which are intended to be arranged below the engaging collar (18) and are configured to axially retain the lower ring (3) to the neck (2) of the container. 25 30
 8. Capping device according to any one of claims 1 to 7, wherein the articulation device (6) is connected to the second section (16) in a central zone of the second section (16). 35
 9. Capping device according to any one of claims 1 to 8, wherein the articulation device (6) includes two elastic sheets (28, 29) connecting the outer peripheral skirt (9) and the second section (16). 40
 10. Capping device according to any one of claims 1 to 9, further including a locking device (7) configured to lock the cap (4) in the tilted open position. 45
 11. Capping device according to claims 9 and 10 taken in combination, wherein the locking device (7) includes a tab (30) arranged between the two elastic sheets (28, 29) and extending upward from the lower ring (3) and a heel (31) protruding radially outward from the outer peripheral skirt (9), the heel (31) being arranged to abut against the tab (30) when the cap (4) is pivoted between the released position and the tilted open position, the elastic sheets (28, 29), the tab (30) and the heel (31) being configured so that, 50 55
- during the pivoting movement of the cap (4) between the released position and the tilted open position, the elastic sheets (28, 29) are subjected to a pulling force that increases to an intermediate unstable position and then decreases from said intermediate unstable position toward the tilted open position.
12. Capping device according to any one of claims 1 to 11, wherein the lower ring (3) is intended to be mounted movably in rotation on the neck (2) about an axis X and wherein the outer peripheral skirt (9) of the cap (4) has a helical thread (10) designed to cooperate with a helical thread (11) arranged on the neck (2) of the container in order to allow screwing and unscrewing of the cap (4) on the neck (2) around the axis X.
 13. Capping device according to any one of claims 1 to 12, wherein the capping device is molded in one piece.
 14. Capping device according to any one of claims 1 to 13, wherein the lower ring (3) is connected to the outer peripheral skirt (9) by frangible bridges (14).
 15. Set that includes a container equipped with a neck (2) that includes an engaging collar (18) and an orifice (5) and a capping device according to any one of claims 1 to 14, the first section of the lower ring (3) being of the capping device axially retained in the engaging collar (18) of the neck (2).

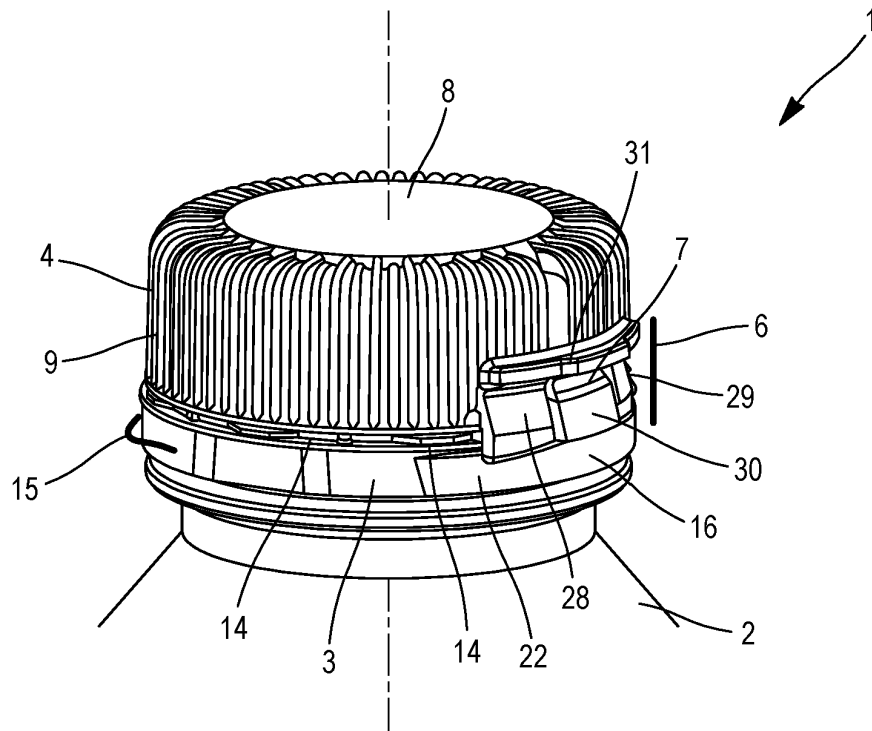


FIG. 1

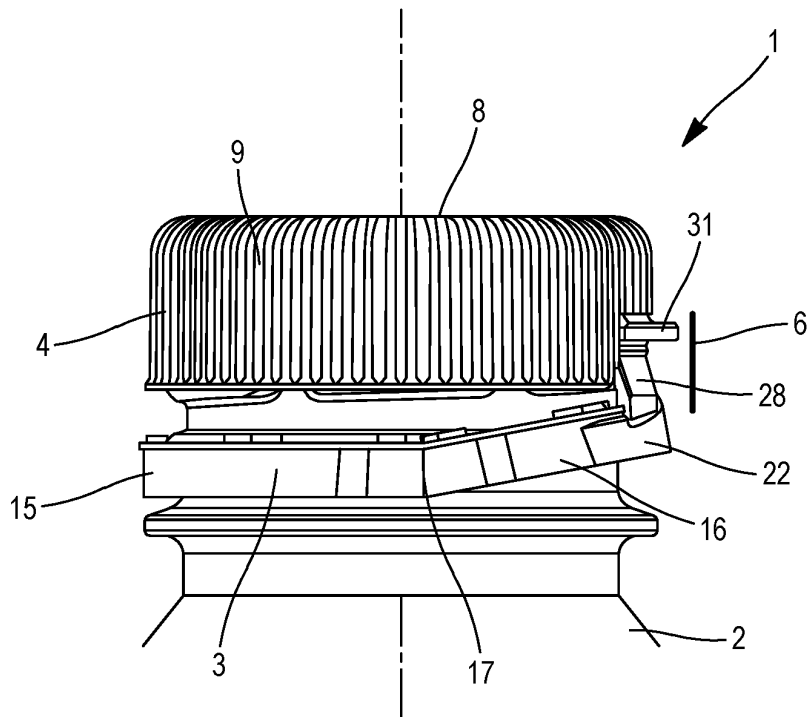


FIG. 2

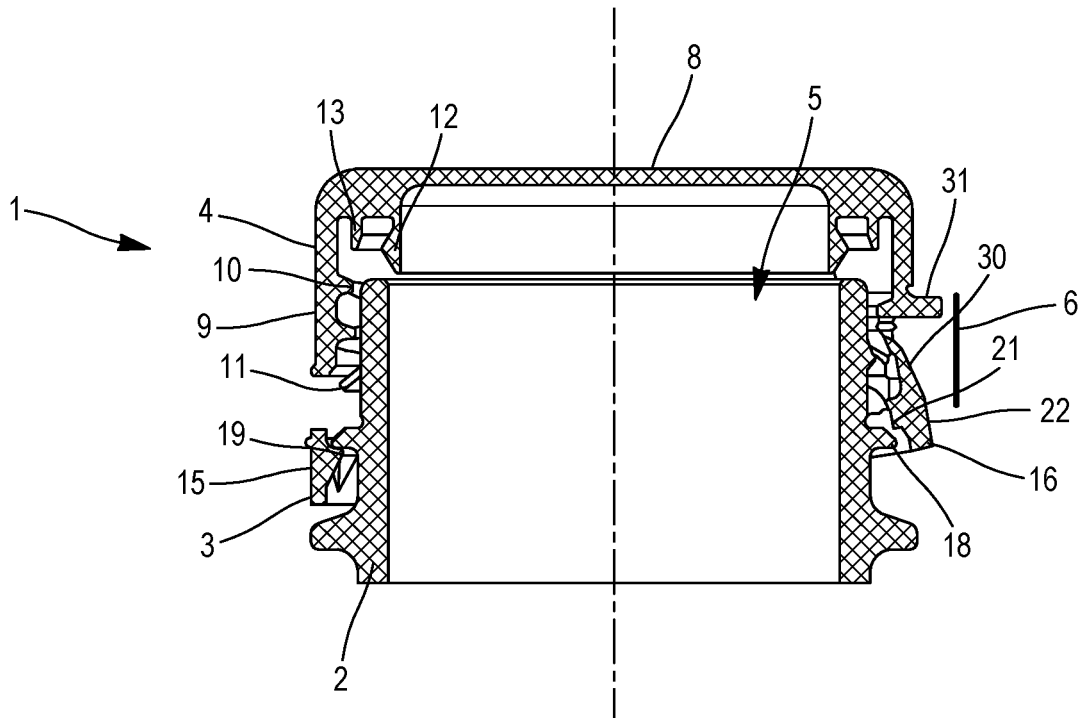


FIG. 3

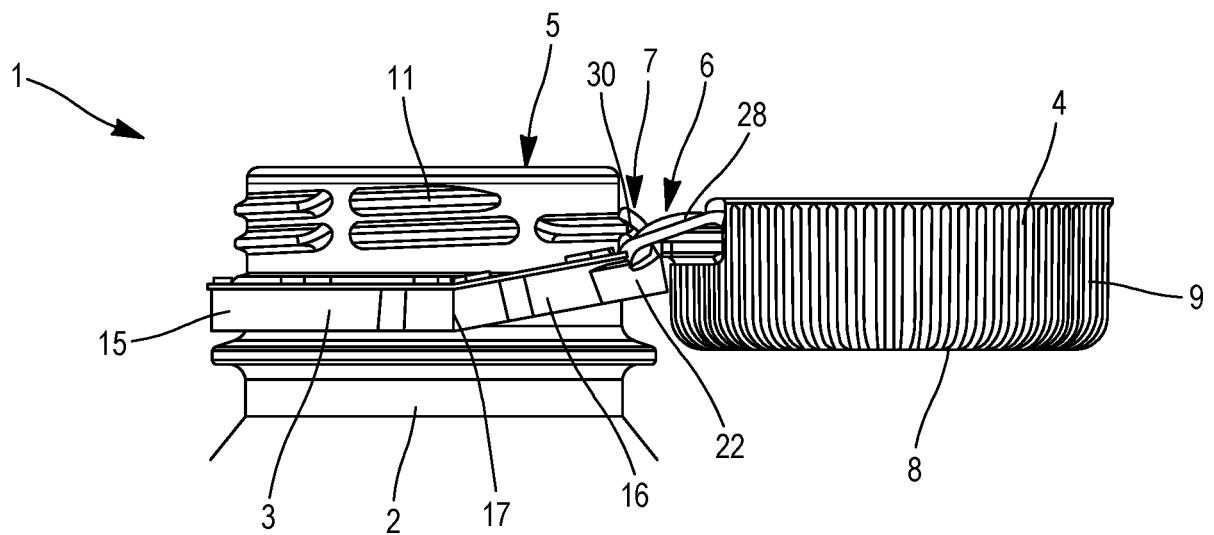


FIG. 4

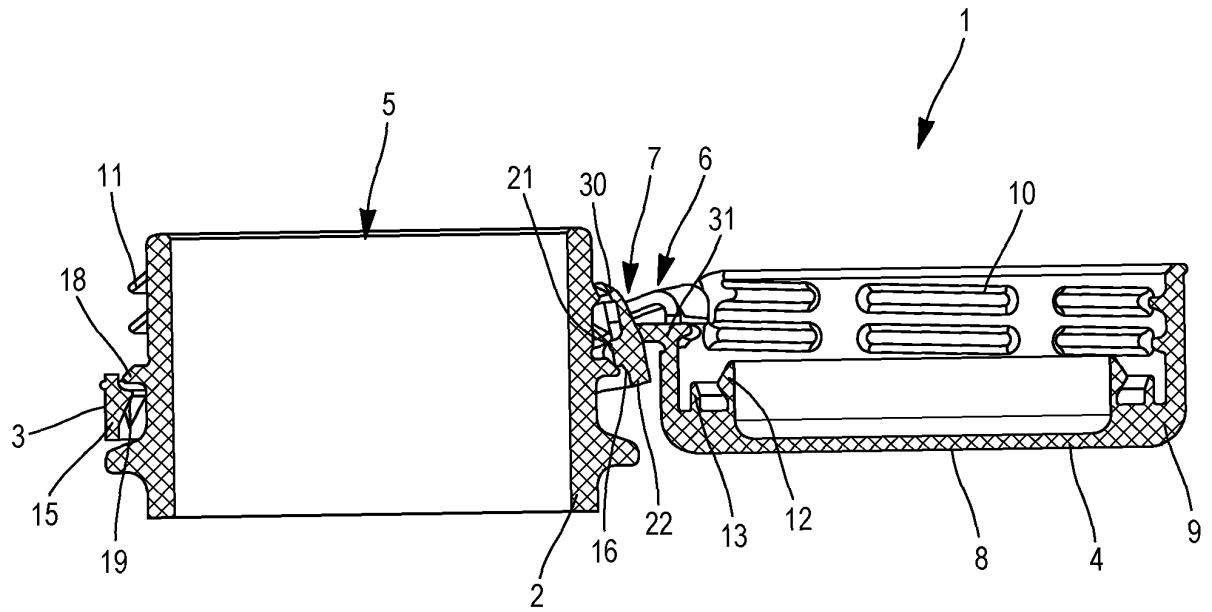


FIG. 5

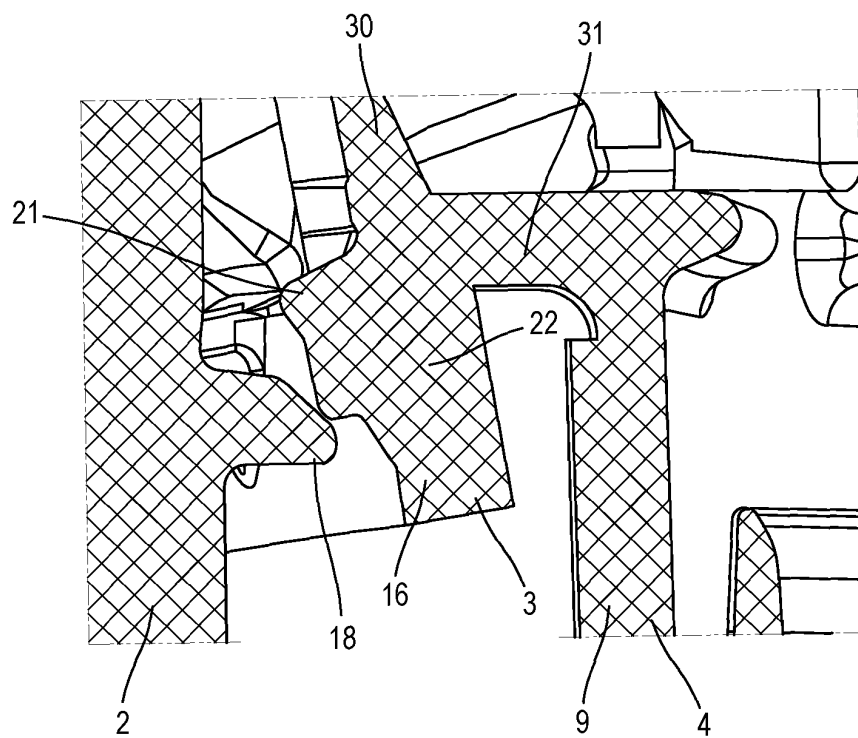


FIG. 6

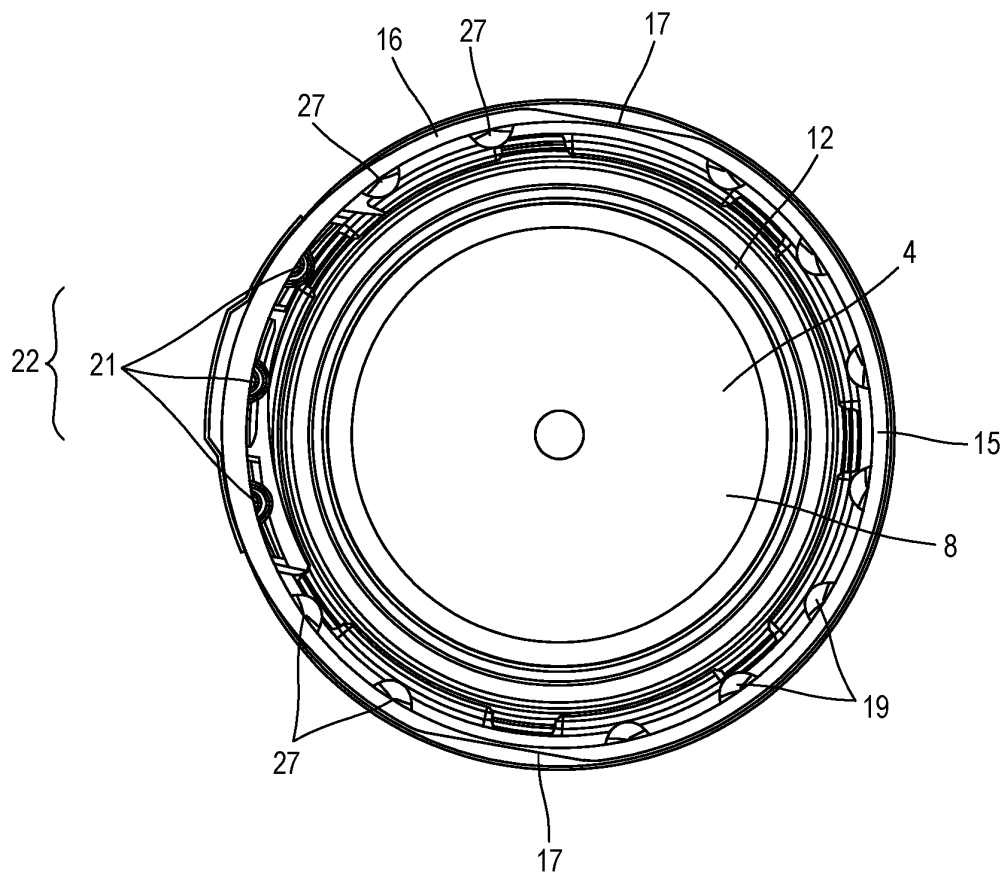


FIG. 7

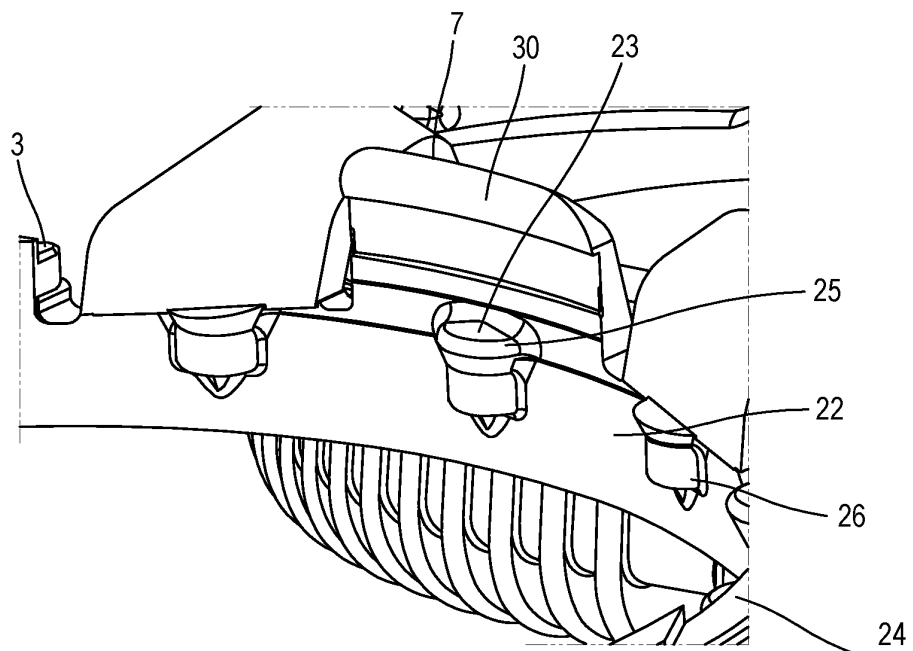


FIG. 8

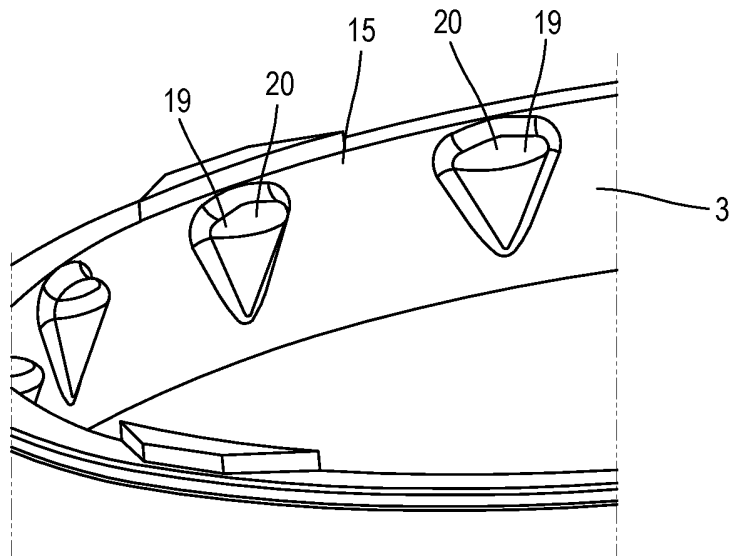


FIG. 9

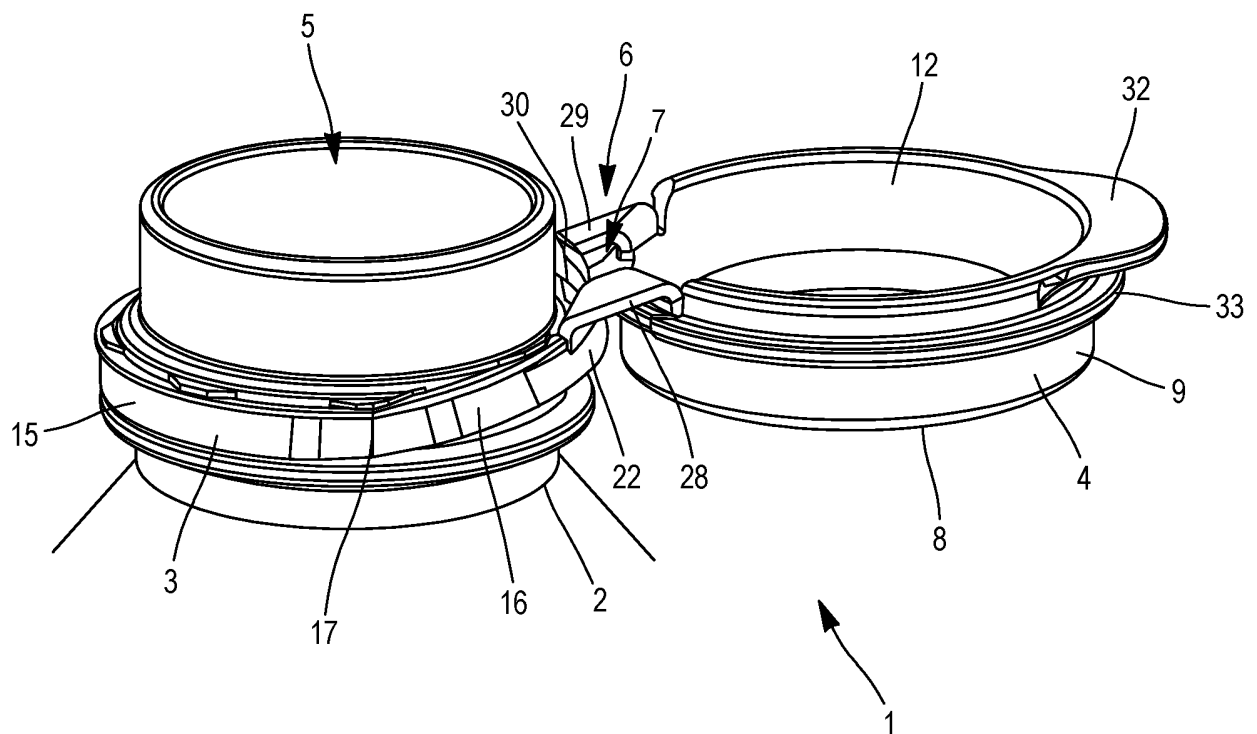


FIG. 10

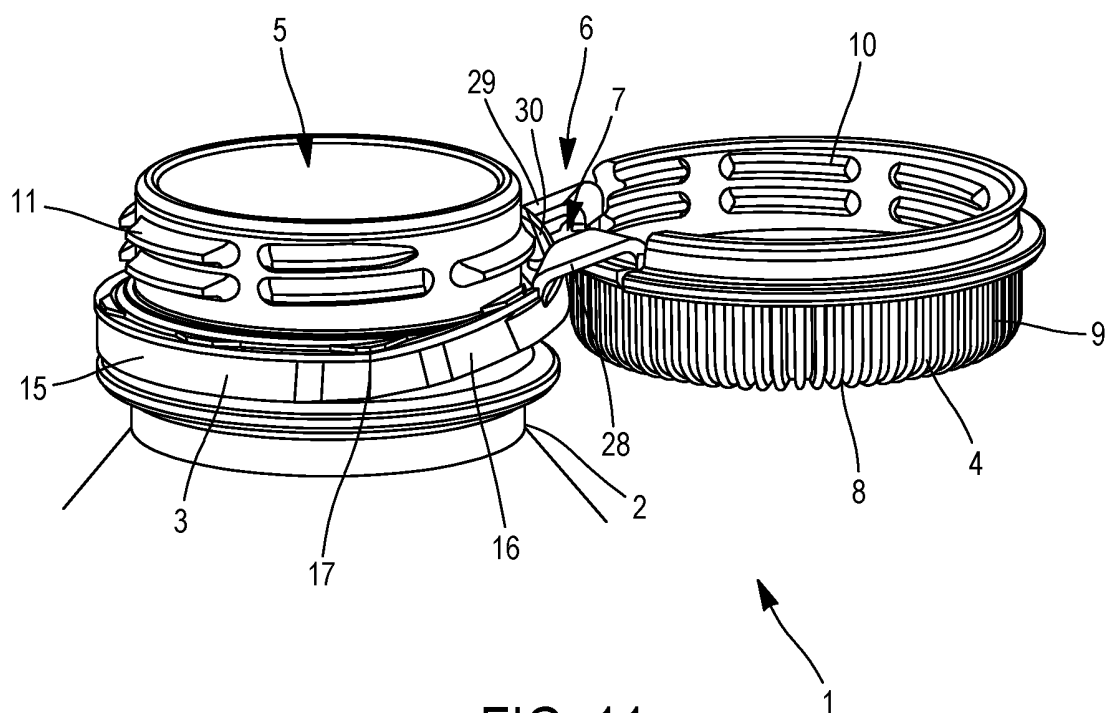


FIG. 11

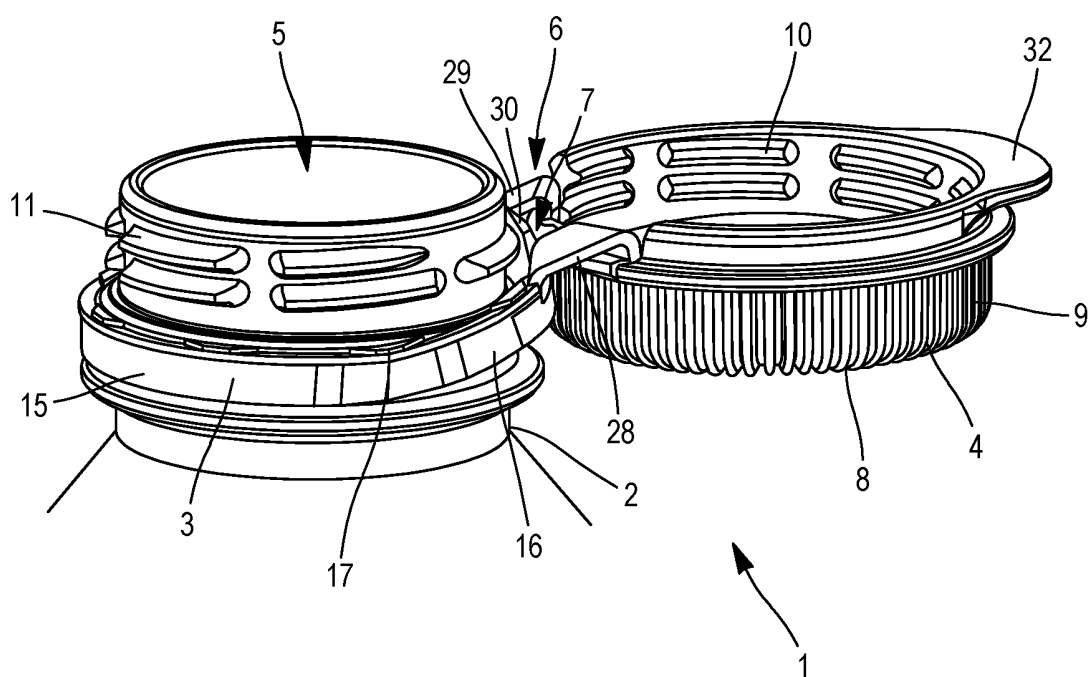


FIG. 12

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2019/070211

A. CLASSIFICATION OF SUBJECT MATTER

B65D41/34 (2006.01)*B65D55/16* (2006.01)

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)

EPODOC, INVENES

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2785264 A1 (CROWN CORK & SEAL TECHNOLOGIES) 05/05/2000, The whole document	1-15
X	WO 2009048273 A2 (BEST EASY CAP) 16/04/2009, Paragraphs [55] - [64]; figures 1-6	1, 4, 7, 8, 12, 13, 15
A	FR 2499519 A1 (GRUSSEN) 13/08/1982, Claims 1 - 5; figures 1 - 3	1-15
A	US 2012305564 A1 (HAYASHI) 06/12/2012, Abstract; figures	1-15
A	US 2015251827 A1 (CAMPBELL) 10/09/2015, Abstract; figures	1-15

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

* Special categories of cited documents:		"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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"E"	earlier document but published on or after the international filing date		
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"O"	document referring to an oral disclosure use, exhibition, or other means.	"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 documents, such combination being obvious to a person skilled in the art
"P"	document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family

Date of the actual completion of the international search
13/12/2019Date of mailing of the international search report
(17/12/2019)

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2019/070211

C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ES 2124625 T3 (CROWN CORK) 01/02/1999, Claims; figures	1-15
A	ES 1218754 U (BETAPACK) 09/10/2018, Claims; figures	1-15

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2019/070211

Information on patent family members

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
FR2785264 A1	05.05.2000	US6474491 B1 MXPA01004170 A WO0026108 A1 ES2178482T T3 EP1124734 A1 EP1124734 B1 DE69902186T T2 BR9914851 A AU6347899 A AT220633T T	05.11.2002 24.04.2002 11.05.2000 16.12.2002 22.08.2001 17.07.2002 03.04.2003 03.07.2001 22.05.2000 15.08.2002
WO2009048273 A2	16.04.2009	ZA201003226 B BRPI0816620 A2 UA100708 C2 US2012024815 A1 CO6270350 A2 MX2010003933 A JP2011500461 A CN101861275 A CN101861275B B EA201070431 A1 EA018556 B1 CA2702174 A1 AU2008311561 A1 AU2008311561B B2 KR100894341B B1 EP2207726 A2 EP2207726 A4 KR100880006B B1 KR100855086B B1	30.03.2011 15.09.2015 25.01.2013 02.02.2012 20.04.2011 26.11.2010 06.01.2011 13.10.2010 03.10.2012 30.08.2010 30.08.2013 16.04.2009 16.04.2009 19.01.2012 24.04.2009 21.07.2010 22.09.2010 22.01.2009 29.08.2008
FR2499519 A1	13.08.1982	US4394918 A JPS57153862 A GB2096114 A DE3204592 A1	26.07.1983 22.09.1982 13.10.1982 14.10.1982
US2012305564 A1	06.12.2012	US8602234 B2 JP2012158389 A JP5086465B B2 CN102582946 A CN102582946B B EP2530026 A1 EP2530026 B1	10.12.2013 23.08.2012 28.11.2012 18.07.2012 24.09.2014 05.12.2012 04.09.2013
US2015251827 A1	10.09.2015	US9776779 B2	03.10.2017
ES2124625T T3	01.02.1999	KR19980702295 A KR19987002295 A CO4480774 A1 ZA9601311 B	15.07.1998 15.07.1998 09.07.1997 06.09.1996

Form PCT/ISA/210 (patent family annex) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2019/070211

Information on patent family members

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
		US5725115 A	10.03.1998
		TR199700740T T1	21.02.1998
		PL321942 A1	05.01.1998
		NZ300142 A	25.02.1999
		MX9706346 A	29.11.1997
		JPH11500091 A	06.01.1999
		IL116937 A	30.10.1998
		HU9702245 A2	30.03.1998
		HU9702245 A3	28.06.2000
		EP0810952 A1	10.12.1997
		EP0810952 B1	25.11.1998
		CN1175930 A	11.03.1998
		WO9626122 A1	29.08.1996
		CA2210633 A1	29.08.1996
		BR9607515 A	30.12.1997
		AU4479996 A	11.09.1996
		AU701971B B2	11.02.1999
		AT173704T T	15.12.1998
		AR001541 A1	26.11.1997
----- ES1218754U U -----	----- 09.10.2018 -----	----- ES1218754Y Y -----	----- 10.01.2019 -----

Form PCT/ISA/210 (patent family annex) (January 2015)

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Patent documents cited in the description

- US 2018086510 A [0003]