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

(11) **EP 4 349 731 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
10.04.2024 Bulletin 2024/15

(21) Application number: **22731799.7**

(22) Date of filing: **24.05.2022**

(51) International Patent Classification (IPC):
B65D 47/04 *(2006.01)* ***B65D 55/02*** *(2006.01)*

(52) Cooperative Patent Classification (CPC):
B65D 47/043; B65D 55/024; B65D 2401/15; B65D 2401/25

(86) International application number:
PCT/IB2022/054848

(87) International publication number:
WO 2022/254285 (08.12.2022 Gazette 2022/49)

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

(30) Priority: **03.06.2021 ES 202131144 U**

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(54) **MULTI-FLOW STOPPER**

(57) A multi-flow stopper for liquids, comprising:
- a part with means of attachment to a gland of a container, said part forming a main body on the stopper,
- two flow outlet openings of unequal size, so as to define a large and a small opening characterized in that said two openings form an integral part of the part forming the main body of the stopper.

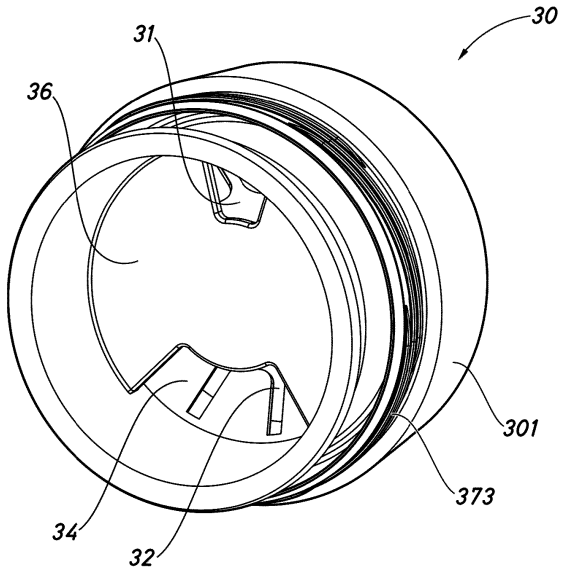

Fig. 2

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Description

[0001] The present invention relates to a multi-flow cap for liquid containers.

[0002] Multi-flow caps are known to have two distinct openings that allow the amount of flow through the cap to be regulated. The main advantage of multi-flow caps is that, depending on the user's need, they allow the container to be emptied at a high flow rate or at a low flow rate, depending on whether emptying speed or precision is required. This multi-flow system allows the use of a single cap, and therefore a single container, for applications requiring two different flows. These types of caps are especially used in the food industry, and more specifically in the food oils industry, since a low flow of oil is especially suitable for seasoning food while a high flow is advantageous when placing oil in pans, etc. for cooking.

[0003] Spanish Utility Model ES1191683U reveals a multi-flow cap with an insert attached to the main body comprising a large opening and a small opening to regulate the outgoing flow from the container to which the cap is attached.

[0004] One problem associated with this type of cap, where fluid regulation is in an insert separate from the main body, is the difficult manufacture of the cap.

[0005] It is an objective of the present invention to reveal a multi-flow cap for liquids comprising a fluid regulation system in the cap itself, such that it facilitates the manufacture of multi-flow caps, also entailing a reduction in the financial cost thereof.

[0006] More specifically, the present invention reveals a multi-flow cap for liquids, comprising:

- a part having means of attachment to a neck of a container, said part forming a main body of the cap,
- two unevenly sized flow outlet openings, such that they define a large and a small opening,

with the special feature that said two openings form an integral part of the part forming the main body of the cap.

[0007] Preferably, the openings are diametrically opposite. More preferably, the openings define an axis of symmetry, the openings being symmetrical with respect to said axis of symmetry. Preferably, the large opening is circular trapezoid in shape. Preferably, the small opening is circular trapezoid in shape. Preferably, both openings are circular trapezoid in shape. Alternatively, the small opening may have a triangular shaped.

[0008] The main body of the cap comprises a first plurality of baffles distributed along an inner perimeter of the main body. More preferably, said baffles are arranged such that each opening is partially coincident with at least one baffle in the outflow direction. These baffles allow flow to be regulated and they produce a continuous and constant outflow, without bubbles, spurting, etc.

[0009] Preferably, the cap comprises a spacing between baffles at least partially coincident with each of the openings. More preferably, the baffles and their respective spacings from each other are evenly distributed.

[0010] Preferably, each of the baffles is petal shaped. Preferably, each of the baffles is circular trapezium in shape. More preferably, each of the baffles is tilted in the opposite direction of the outflow.

[0011] Preferably, the length of each of the baffles is such that its horizontal projection is less than the horizontal projection of the length of each of the openings.

[0012] Preferably, the main body of the cap comprises a second plurality of baffles on a lower face of the main body that are centrally located with respect to the first plurality of baffles.

[0013] Preferably, the main body of the cap comprises a non-return snap-fit and a snap-on protrusion that prevents the cap from being released after passing over a collar of the neck.

[0014] Preferably, the cap comprises a cover configured to close said cap. In a preferred embodiment, the cover is closed by helical thread. Preferably, said cover of the cap is a hinged cover. In a preferred embodiment, said cover is attached to the main body in a hinged manner, the cover and main body forming a single element.

[0015] Preferably, the cap comprises a tear-away first-opening system or tamper resistant system. The first-opening system acts as a tamper-resistant system, enabling "tamper-evident" detection at a glance if a cap has been previously tampered with. More preferably, the first-opening system forms an integral part of the cap before and after its opening. That is, it does not comprise any element that is detached from the cap. Even more preferably, this first-opening system comprises an area of the cap that undergoes a deformation upon first opening of the cap. Preferably, this tamper-proof system comprises at least one tear-away connector and/or a weakened area of the cap.

[0016] Preferably, the tear-away first-opening system or tamper-evident system comprises a token comprising tear-away connectors, the token being deformed during the first opening of the cap, evidencing the opening of said cap. More preferably, the token is attached to the cover of the cap by at least one tear-away connector.

[0017] Preferably, the token comprises a tab to facilitate the opening of the cap.

[0018] More preferably, the token comprises a U-shaped area, comprising two side arms and a lower arm, one of said side arms comprising a tear-away connector. More preferably, the token comprises a weakened area that is plastically deformed by dimensional interference with a protrusion from the cap's main body. This deformation prevents its return to its initial position after a first opening of the cap. Preferably, this weakened area has a thickness less than the rest of said side arm. More preferably, the token comprises a notch or joint to facilitate its breakage.

[0019] In a preferential embodiment, the token of the first opening system is located on the cover of the cap, said token comprising tear-away connectors and a tear-

away security band, preferably housed in a space of the main body. Preferably, the security band is mechanically connected to the main body of the cap, said connector preferably being between a protrusion of the band and a recess of the main body by dimensional interference. Preferably, the token comprises a U shaped or S shaped area. More preferably, said U shaped or S shaped area comprises a weakened and tear-away area, for example, a notch, a joint or a section of less thickness, being attached to the token by said weakened area. More preferably, the security band is generally rectangular in shape. More preferably, the first-opening system comprises a tear-away sealing strip. Preferably, the token comprises a protruding tab located on the security band. More preferably, the tear-away sealing strip is attached to said protruding tab. Even more preferably, the token comprises tear-away connectors that are bridges or tear-away connection points, the security band being connected to a top of the cap in a tear-away manner.

[0020] Preferably, the token comprises a security band or tear-away strip.

[0021] In a preferred embodiment, the cover of the cap is a hinged cap, comprising a token and a ring, the ring preferably arranged at a lower part of the cap. Preferably, the token is a hinged token that hinges the ring of the cover of the cap with an upper part of the cover. More preferably, the token has an area that is deformed after the first opening or unscrewing of the cap such that it cannot return to its original position after a first opening of the cap, as well as an area that acts as a hinge. Preferably, the tear-away first-opening system comprises at least one tear-away connector between the ring and the token.

[0022] More preferably, the token is attached in a tear-away manner to an upper part of the cover of the cap along its full length except for a section of said token acting as a hinge. Even more preferably, the token is attached in a tear-away manner to the ring along its full length except for an area of said token that is deformed upon first opening or unscrewing of the cap.

[0023] Preferably, the ring comprises additional tear-away connectors that are tear-away sealing points, located between the hinge and an area of the ring that is connected to the tear-away token.

[0024] Preferably, said ring comprises means for connection to the main body of the cap. Preferably, the means for connection to the main body of the cap comprise a protruding retention element or elements comprising a circumferential protrusion situated on an inner face of the ring, extending along the entire circumferential perimeter of the cap.

[0025] Preferably, the ring of the cap's cover comprises a skirt. More preferably, the ring has a length greater than the height of the main body of the cap such that said ring may rest on top of a collar of the neck of a container.

[0026] In a preferred embodiment, the tear-away first-opening system comprises a token comprising tear-away connectors, such that the token is attached to an upper part of the cover and the ring by said tear-away connectors. Preferably, these tear-away connectors are tear-away areas located along the upper and lower parts of the token, preferably in the form of a tear-away strip. In this way, the token is connected to the top of the cap's cover in a tear-away manner, and a section of the ring is connected to the token in a tear-away manner. Preferably, the token comprises a tab for facilitating opening of the cap, said token being connected to the cap's cover by said tab, preferably by dimensional interference between a cover element and a tab element. Preferably, the ring comprises additional tear-away connectors that are tear-away sealing points, located between the hinge and the section of the ring connected to the tear-away token. Alternatively, this tab is a hook. Alternatively, this token is a security band.

[0027] For better comprehension, attached by way of explanatory but non-limiting example are drawings of example embodiments of the present invention.

Figure 1 shows an exploded perspective view of a cap according to a first example embodiment of the invention.

Figure 2 shows a perspective view of the main body of the cap of the first example embodiment of the invention, viewed from its upper face.

Figure 3 shows a perspective view of the main body of the cap of the first example embodiment of the invention, viewed from its lower face.

Figure 4 shows a section in elevation through a central cut plane of the cap of the first example embodiment of the invention.

Figure 5 shows a perspective view of a cap according to a second example embodiment of the invention, with the cover closed.

Figure 6 shows a perspective view of the cap of the second example embodiment of the invention, with the cover open and viewed from its upper face.

Figure 7 shows a perspective view of the cap of the second example embodiment of the invention, with the cover open and viewed from its lower face.

Figure 8 shows a section in elevation through a central view of the cap according to the second example embodiment of the invention.

Figure 9 shows a perspective view of a cap according to a third example embodiment of the invention, with the cover closed.

Figure 10 shows a perspective view of a cap according to the third example embodiment of the invention,

with the cover open.

Figure 11 shows an elevation view of a cap according to a fourth example embodiment of the invention, with the cover closed.

Figure 12 shows a perspective view of a cap according to the fourth example embodiment of the invention, with the cover open.

Figure 13 shows a perspective view of a cap according to the fourth example embodiment of the invention, with the cover closed after a first opening.

Figure 14 shows a section in elevation through a central view of the cap according to the fourth example embodiment of the invention.

Figure 15 shows a perspective view of a cap according to a fifth example embodiment of the invention, with the cover closed prior to a first opening.

Figure 16 shows a view in elevation of a cap according to the fifth example embodiment of the invention, with the cover closed prior to a first opening.

Figure 17 shows an exploded perspective view of a cap according to the fifth example embodiment of the invention.

Figure 18 shows a perspective view of a cap according to the fifth example embodiment of the invention, with the cover closed after a first opening.

Figure 19 shows a section in elevation through a central view of the cap according to the fifth example embodiment of the invention.

Figure 20 shows a perspective view of a cap according to a sixth example embodiment of the invention, with the cover closed after a first opening.

Figure 21 shows a section in elevation through a central view of the cap according to the sixth example embodiment of the invention.

[0028] In the figures, equal or equivalent elements have been identified with identical numerals.

[0029] Figures 1 to 4 show a first example embodiment of a multi-flow cap 1 for liquids of the present invention. More specifically, multi-flow cap 1 is a bi-flow or dual-flow cap.

[0030] Figure 1 shows cap 1 of the first example embodiment. The cap 1 comprises a cover 10 configured to close said cap 1 by helical thread. In this example embodiment, the cover 10 is a one-piece independent element that forms a main body 30. The cover 10 and the main body 30 have connecting means uniting them, these connecting means being a helical thread. Other ways of closing access to the main body 30 of the cap 1, such as a cover comprising a hinged ring that is attached to the main body, are also possible.

[0031] Alternatively, the cover need not be an independent element of the main body of the cap. In such a case, the cap's main body could comprise a cover configured to close said cap, said cover of the main body being connected to said main body by a hinge.

[0032] Figures 2 and 3 show the main body 30 of the cap 1. The main body 30 of the cap 1 comprises two dispensing outlets that are two openings 31, 32 of unequal size, such that they define a large opening 32 and a small opening 31. These openings are comprised in the main body 30 of the cap 1 and form an integral part of the said main body 30.

[0033] These openings 31, 32 are responsible for allowing the outward flow of fluid from the container. When the user wishes to empty liquid from the container using a reduced flow rate, the container is emptied by the small opening 31 and the large opening 32 allows air to pass into the container so that the pressure between the inside and outside of the container is equalized. When the user wishes to empty liquid from the container using a high flow rate, the container is emptied by the large opening 32 and the small opening 31 allows air to pass into the container so that the pressure between the inside and outside of the container is equalized. The small opening 31 and the large opening 32 are fully independent and are not connected to one another.

[0034] The openings 31, 32 are located on a diametrically opposite surface 36 of the main body, defining an axis of symmetry, the openings being symmetrical with respect to said axis of symmetry. In the embodiment shown, both openings are circular trapezoid shaped, although the openings may have other shapes not shown, such as for example triangular or quadrangular shape, both openings being able to have different shapes from one another. Additionally, the cap 1 could comprise more than two openings of different size therebetween, such that the cap 1 is a multi-flow cap that allows liquid to be dispensed into the container by more than two different flow rates.

[0035] In the embodiment shown, the surface 36 of the horizontal body is V shaped so it is not completely horizontal. The surface 36 can also be a horizontal surface.

[0036] The main body 30 of the cap 1 comprises a first plurality of baffles 34 distributed along an inner perimeter of the main body 30, located below the two openings 31, 32. These baffles are arranged such that each opening is partially coincident with at least one baffle in the outflow direction, the spacing between baffles being at least partially coincident with each of the openings. The baffles and their respective spacings are evenly distributed between one another, the spacing between baffles being shown at least partially coincident with each of the openings. In the example shown, each of the baffles 34 is petal shaped. Alternatively, the baffles 34 may be circular

trapeze shaped. In the example embodiment shown, the plurality of baffles 34 is composed of ten baffles, but other embodiments with a different number are also possible.

[0037] To have a dual outflow while preventing bubbling of the fluid, both openings act together with the plurality of baffles 34. That is, the plurality of baffles 34 are located closer to the inside of the container than the openings 31, 32 once the main body 30 of the cap is attached to the neck of a container.

[0038] The plurality of baffles 34 are evenly distributed along the inner perimeter of an inner skirt 302 of the main body 30. More specifically, the embodiment of Figures 1 to 4 shows the plurality of baffles 34 arranged at the edge formed by the inner part of an inner skirt 302 of the main body 30 and the lower face of the surface 36. Alternatively, the plurality of baffles 34 may be arranged on said inner part of the inner skirt 302, or on the lower part of said surface 36. Each of the baffles is tilted in the opposite direction of the outflow, with the length of each of the baffles being such that its horizontal projection is less than the horizontal projection of the length of each of the openings. This configuration results in the baffles leaving a centre space free.

[0039] The two openings 31,32 as well as the plurality of baffles 34 define their own axis of symmetry. The centre of each of the openings 31, 32 coincides with the centre of the deflector spacing. This arrangement allows the surface area of the openings to be minimized, since other layouts would partially act as a labyrinthine seal, making it difficult for the fluid to pass through. In the illustrated embodiment, the width of the large opening 32 is such that the horizontal projection of two baffles is centred in the horizontal projection of said opening, in other words, the horizontal projection of the large opening 32 comprises the horizontal projection of two baffles and three separations.

[0040] Additionally, the main body of the cap may comprise a second plurality of baffles on a lower face of the main body that are centrally located with respect to the first plurality of baffles. Figure 4 shows how the various components of the biflow cap 1 interact with each other when the cap is closed. The cover 10 of the cap 1 is shown positioned covering the main body 30, so that the cap is closed. Fig. 4 also shows the closure of the cap by the threading of a screw thread 173 of the cover 10 with a screw thread 373 of the main body 30.

[0041] When the threaded cover 10 is closed, an inner skirt 17 of the cover 10 is housed within the mouth 37 of the main body 30 of the cap, such that the inner skirt 17 of the threaded cover 10 makes a dimensional interference with the mouth 37 of the main body 30. Additionally, the inner skirt 17 of the cover could comprise an additional circumferential protrusion to aid in the proper securing of the cover to the main body.

[0042] The main body 30 of the cap 1 comprises means of connection to the neck 9 of a container, comprising a protrusion 382 located on a skirt 302 of the main body (more specifically located on its outermost face, that is, the face of the inner skirt closest to the outer skirt), as well as a protrusion 381 located in an outer skirt 301 of the main body 30 (more specifically located on the innermost face of the outer skirt 301, that is, the face of the inner skirt closest to the outer skirt) that make dimensional interference with the neck 9 of a container. These protrusions 381 and 382 are circumferential protrusions that fit with the neck 9 of a container and allow the main body 30 of the cap 1 to be fixed on the neck 9 and prevent its relative movement.

[0043] The skirts 301 and 302 could further comprise a plurality of additional protrusions positioned above and/or inside the protrusions 381, 382. Alternatively, these protrusions 381, 382 may not be single protrusions and may be formed of a plurality of protrusions of smaller dimension.

[0044] Figures 5 to 8 show a second example embodiment of a multi-flow cap of the present invention. The cap 20 comprises two dispensing outlets that are two openings 31,32 of unequal size, such that they define a large opening 32 and a small opening 31, in a manner analogous to that of the example embodiment of Figures 1 to 4. Likewise, these openings are within the main body 21 of the cap and form an integral part of said main body 21. The elements analogous to those described in previous embodiments have been represented with analogous numerals.

[0045] In this example embodiment, the main body 21 of the cap 20 comprises a cover 22 configured to close said cap 20, said cover 22 of the main body 21 being a hinged cover, being attached to the main body 21 by a hinge 23. Since the cap is formed of a single main body 21, it can be manufactured from a single piece.

[0046] The cap 20 also comprises a tear-away first opening system (also called a tamper-resistant system), which acts as a tamper-evident system. This tear-away first opening system may be of known type, for example the type that undergoes a deformation after the first opening of the cap and makes it possible to detect at first glance that a cap has been previously manipulated.

[0047] Figures 5 to 8 show an example of a tear-away first-opening system comprising a token 240 that comprises tear-away connectors and which is deformed during the first opening of the cap. The token 240 comprises a U-shaped area that comprises two side arms and a lower arm 242, further comprising a tear-away connector 212 or weakened area in one of said side arms. This weakened area has a thickness less than the rest of said side arm, facilitating the breakage of said side arm when opening the cap 20. Additionally, the opposite side arm does not have such weakening, with the token 240 remaining attached to the cover 22 of the cap 20 at least partially by said tear-away connector 212 or weakened area. The token 240 may also comprise additional tear-away connectors, such as tear-away bridges. The tear-away connector 212 makes it possible to determine at any time and by simply looking whether the cap 20 has been opened, verifying its integrity: if the tear-away con-

nector 212 is broken, the cap 20 has been previously opened. Other types of tamper-resistant systems, such as those shown in other example embodiments, are also considered.

[0048] Figure 5 shows the cap 20 closed, while Figures 6 and 7 show the cap 20 open, showing the inner side of the cap 20 in Figure 6 (i.e. showing the sides of the cover 22 and the main body 21 intended to be in contact with one another once the cap 20 is closed) and the outer side of the cap 20 in Figure 7 (i.e., showing the side of the cover 22 facing the outside and the side of the main body 21 facing the inside of the container once the cap 20 is closed). On closing the cap 20, the cover 22 and the main body 21 are tightened together by dimensional interference between an inner skirt 17 of the cap 20 and the mouth 37 of the main body 21.

[0049] In addition, these figures show a circumferential projection 170, included in the inner skirt 17 of the cover 22, which assists in the correct attachment of both elements and the sealing of the cap.

[0050] When the cap 20 has not yet been opened for the first time, the token 240 is partially placed in a space 241 of the base 21 of the cap 20 (shown in figure 6) and is interlocked with the main body 21 of the cap 20 by dimensional interference existing between the lower arm 242 of said token 240 and a protrusion 342 placed on an interior wall of the main body 21 of the cap 20. During opening, the protrusion 342 hinders upward vertical displacement of the token 240, with the pressure produced by the protrusion 342 on the lower arm 242 of the token 240 being sufficient to break the tear-away connector 212. Figure 6 shows the token 240 once opened.

[0051] During the opening of the cap, the tear-away connector 212 is broken, while the end of the other side arm will not be broken and will exert a grip on the token 240 preventing it from falling. When the tear-away connector 212 is broken, the token 240 undergoes a slight plastic deformation in its side arm that makes it difficult to subsequently place it in the space 241 of the main body after a first opening of the cap.

[0052] Additionally, the token 240 also comprises a tab for providing the token with better stability, as well as a notch 243 or a joint to facilitate its breakage. This notch 243, located on a side arm, also causes an inclination of the side arm upon breakage of the tear-away connector 212, which makes it difficult for said arm to be placed back in the space 241 when closing the cap 20. By not being able to return the token 240 to its initial position after the first opening, the breach is more easily visible.

[0053] Additionally, this tamper-resistant system could comprise a weakened area of the cap or be of any other type.

[0054] Figures 9 and 10 show a third example embodiment of a cap, in which the cap 20 comprises another known type of tamper-resistant system. In this embodiment, and analogous to the embodiment shown in Figures 5 to 8, the main body 21 of the cap 20 comprises a cover 22, attached to the main body by a hinge, said cover being configured to close said cap 20.

[0055] Figure 9 shows a closed cap 20, prior to its first opening, while Figure 10 shows the cap 20 open after a first opening.

[0056] In Figures 9 and 10, the first-opening system comprises a token located on the cover 22 of the cap 20, said token comprising tear-away connectors 420, 421 and a tear-away security band 42, shown housed in a space of the main body 21. The token shown comprises a U-shaped area 425, and the band 42 is generally rectangular in shape, although other shapes are also possible.

[0057] The tear-away band 42 is shown attached to the cover 22 of the cap by tear-away connectors that are tear-away bridges or attachment points 421, and is further attached to the U-shaped area 425 of the token by a tear-away connector in the form of a tear-away strip 420. More specifically, the strip 420 is shown attached to a protruding tab 422 of the band 42 that facilitates the opening of the cap, the tab being attached to said token in a tear-away manner by a tear-away sealing strip 420. During the first opening of the cap, the tear-away connectors 420, 421 are broken, causing the disconnection of the strip 42 with the cover 22 of the cap and tearing the tear-away band 42 of the U-shaped area 425 of the token.

[0058] Additionally, the area 425 may be attached to the band 42 by a weakened tear-away area (not shown) which may be, for example, a notch, a joint or a section of lesser thickness, the latter being in addition to the tear-away connectors 420, 421. In this case, the area 425 could also be S-shaped.

[0059] A second plurality of additional baffles 35, of known type, located on a lower face of the main body 21, are also shown in Figure 10. These baffles 35 are arranged such that each opening 31,32 is delimited by said baffles 35, and are centrally located with respect to the first plurality of baffles.

[0060] Figures 11 to 14 show a fourth example embodiment of a cap 1, comprising a main body 30, two unequally sized openings 31, 32 in the main body 30, and a cover 10 configured to close said cap.

[0061] In this embodiment, the cap comprises a hinged cover 10, the cover comprising a token and a ring 123 located at the bottom of the cover 10 of the cap. This ring 123 is mechanically attached to the main body of the cap.

[0062] The first opening system comprises a token that is a hinged token that articulates the ring 123 of the cover 10 of the cap located at a lower part of the cover with an upper part of the cover, the token having an area 1231 that is deformed upon the first opening or unscrewing of the cap such that it cannot return to its original position after a first opening of the cap, as well as an area 1230 that acts as a hinge. The tear-away first-opening system further comprises tear-away connectors between the ring 123 and the token. More specifically, the ring 123 is connected to the token in a tear-away manner, as well as to an upper part of the cover 10 by tear-away connectors.

This ring 123 is mechanically connected to the main body 30 of the cap, not separating from the main body of the cap upon unscrewing thereof, this connection preferably being threaded.

[0063] This ring 123 is torn away during unscrewing of the cap due to tear-away connectors, which act as controlled break points, leaving the ring 123 attached to the token by a section of area 1231 (which is deformed after the first opening), and leaving the token attached to the top of the cover 10 of the cap by the hinged area 1230 thereof. Figure 11 shows the closed cap 1 before a first opening, while Figure 12 shows the open cap and Figure 13 shows the closed cap after said first opening.

[0064] In the embodiment shown, the surface 36 of the main body is horizontal in form, and the small opening 31 is shown as having a triangular shape. These shapes should be considered as a representation of alternative example embodiments, and other embodiments such as a V-shaped surface and/or a circular trapezoid shaped opening are also possible.

[0065] Additionally, the token may comprise a tab to facilitate the opening of the cap. Furthermore, the ring may comprise additional tear-away connectors that are tear-away sealing points. These sealing points may be moulded points, located between the hinge and the part of the ring attached to the token in a tear-away manner.

[0066] Figure 14 also shows a protruding retaining element or elements comprising a circumferential protrusion 230 located on the inner face of the ring 123, extending along the entire circumferential perimeter of the cap. These connecting means facilitate mechanical attachment of the lower part of the cover 10 of the cap and the ring 123 to the main body 30 of the cap.

[0067] Figure 14 also shows baffles 35, of a known type, located on a lower face of the main body 30. These baffles may be of any known type and have any known shape.

[0068] Figures 15 to 21 show THE fifth and sixth example embodiments of a cap, in which the cap comprises a hinged cover 10, the cover comprising a ring 13, 63 placed at a lower part of the cover 10 of the cap. The ring 13, 63 is mechanically attached to the main body of the cap.

[0069] In these embodiments, the tear-away first-opening system comprises a token 641 or tear-away connector seal comprising tear-away connectors 645, which is attached to the top of the cover and to said ring 13, 63 of the cap by said tear-away connectors 645 prior to the first opening of the cap. These tear-away connectors 645 are tear-away areas located along the top and bottom of the token 641 and are shown in the form of a tear-away strip, although other forms of tear-away connectors are also possible. The token 641 further comprises a tab 640 or hook at one end thereof to facilitate the opening of the cap, being attached to the cover 10 of the cap by said tab 640.

[0070] The upper part and ring 13, 63 of the cover 10 of the cap are also shown attached by tear-away connectors 647 located between the hinge 23 and the section of the ring 13, 63 attached to the token 641 in a tear-away manner by the connectors 645. These tear-away connectors 647 are shown as moulded tear-away connector points, or tear-away sealing points. These connectors 647 facilitate separation of the ring 123 from the cover 10 of the cap when the cap is opened. Figure 16 shows these tear-away connectors 645 and 647. Additionally, the security band 641 also comprises a weakened area 642.

[0071] In said two example embodiments, and prior to the first opening, the token 641 is attached to the ring 13, 63 and to the upper part of the cover 10 of the cap by tear-away connectors 645 and by dimensional interference between one end 6400 of the tab 640 of the seal 641 and a protrusion 6401 of the cover 10 of the cap (as shown in Figure 15).

[0072] During the first opening of the cap, the pressure produced by the dimensional interference between elements 6400 and 6401 facilitates the breaking of the connectors 645 and 647 and the deformation of the weakened area 642, hindering the subsequent placement of the token 641 in its original position. After closing the cap after a first opening, the tear-away area 645 cannot be reattached to the cover of the cap, and the connectors 647 have been separated, evidencing manipulation of the cap.

[0073] Figures 20 and 21 show the ring 63 of the cover 10 of the cap having a length greater than the height of the main body 30 of the cap, such that said ring 63 can rest on top of the neck 9 of a container. The length of the ring is the distance between the uppermost point of the ring and the point of the ring that is located most internally.

[0074] The main body 30 of the cap in turn has a non-return snap-fit 132 and a snap-on protrusion 131 that prevents the cap from being released after passing over the collar 103 of the neck 9. In the example embodiment of Figures 19 and 20, the non-return snap-fit 132 and the protrusion 131 are located at the lower part 63 of the cover 10 of the cap. Additionally, the main body 30 of the cap comprises an additional element 650 that facilitates attachment of the main body to the neck.

[0075] While the invention has been described and represented based on representative examples, it should be understood that such an embodiment is in no way limiting for the present invention, so any variations that are directly or by way of equivalence included in the content of the appended claims should be considered included within the scope of the present invention.

[0076] Additionally, it should be understood that any combination of baffle-shaped seals is covered by this invention.

Claims

1. Multi-flow cap for liquids, comprising:

- a part having means of attachment to a neck of a container, said part forming a main body of the cap,
- two unevenly sized flow outlet openings, such that they define a large and a small opening,

characterized in that said two openings form an integral part of the component that forms the main body of the cap.

2. Cap according to Claim 1, **characterized in that** the openings are diametrically opposite.

3. Cap according to either one of the preceding claims, **characterized in that** at least one of the openings is circular trapezium shaped.

4. Cap according to any one of the preceding claims, **characterized in that** the main body comprises a first plurality of baffles distributed along an inner perimeter of the main body and arranged such that each opening is partially coincident with at least one baffle in the outflow direction.

5. Cap according to Claim 4, **characterized in that** the baffles and their respective spacings are evenly distributed between one another.

6. Cap according to either one of Claims 4 to 5, **characterized in that** the cap comprises a spacing between baffles at least partially coincident with each of the openings.

7. Cap according to any one of Claims 4 to 6, **characterized in that** the baffles are petal shaped.

8. Cap according to any one of Claims 4 to 7, **characterized in that** each of the baffles is tilted away from the outflow.

9. Cap according to any one of Claims 4 to 8, **characterized in that** the length of each of the baffles is such that its horizontal projection is less than the horizontal projection of the length of each of the openings.

10. Cap according to any one of Claims 4 to 9, **characterized in that** the main body comprises a second plurality of baffles on a lower face of the main body that are centrally located with respect to the first plurality of baffles.

11. Cap according to any one of the preceding claims, **characterized in that** it comprises a cover configured to close said cap.

12. Cap according to claim 11, **characterized in that** the cover of the cap is a hinged cover.

13. Cap according to either one of Claims 11 or 12, **characterized in that** it comprises a tear-away first-opening system.

14. Cap according to Claim 13, **characterized in that** the tear-away first-opening system comprises a token comprising tear-away connectors, the token being deformed during the first opening of the cap, evidencing the opening of said cap.

15. Cap according to Claim 14, **characterized in that** the token comprises a tab to facilitate the opening of the cap.

16. Cap according to either one of Claims 14 or 15, **characterized in that** the cover of the cap comprises a ring, the tear-away first-opening system comprising at least one tear-away connector between the ring and the token.

17. Cap according to Claims 12 and 16, **characterized in that** the ring comprises additional tear-away connectors that are tear-away sealing points, located between the hinge and an area of the ring that is attached to the token in a tear-away manner.

18. Cap according to Claim 17, **characterized in that** the token is a hinged token that articulates the ring of the cover of the cap with an upper part of the cover of the cap and that has an area that is deformed after the first opening of the cap.

19. Cap according to any one of Claims 16 to 18, **characterized in that** the ring has a length greater than the height of the main body of the cap such that said ring can rest on top of a collar of the neck of a container.

20. Cap according to either one of Claims 14 or 15, **characterized in that** the token comprises a U-shaped area, comprising two side arms and a lower arm, one of said side arms comprising a tear-away connector.

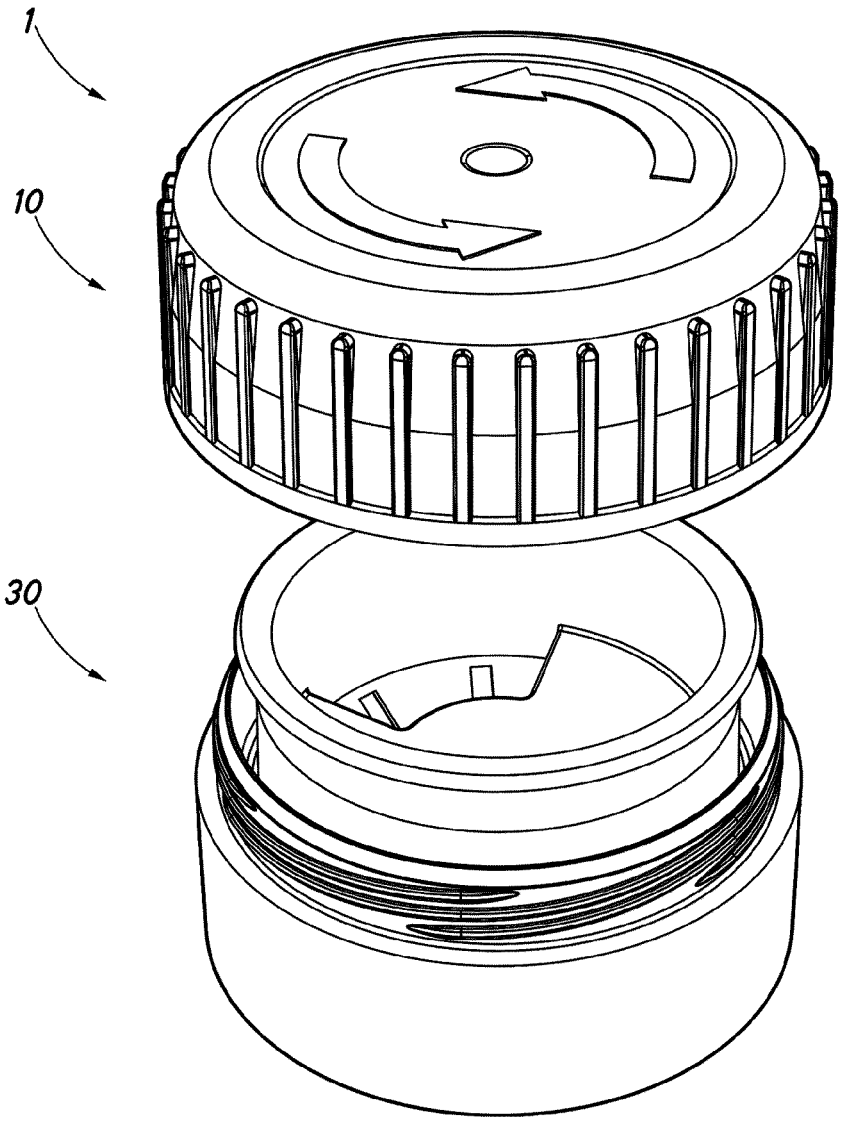


Fig. 1

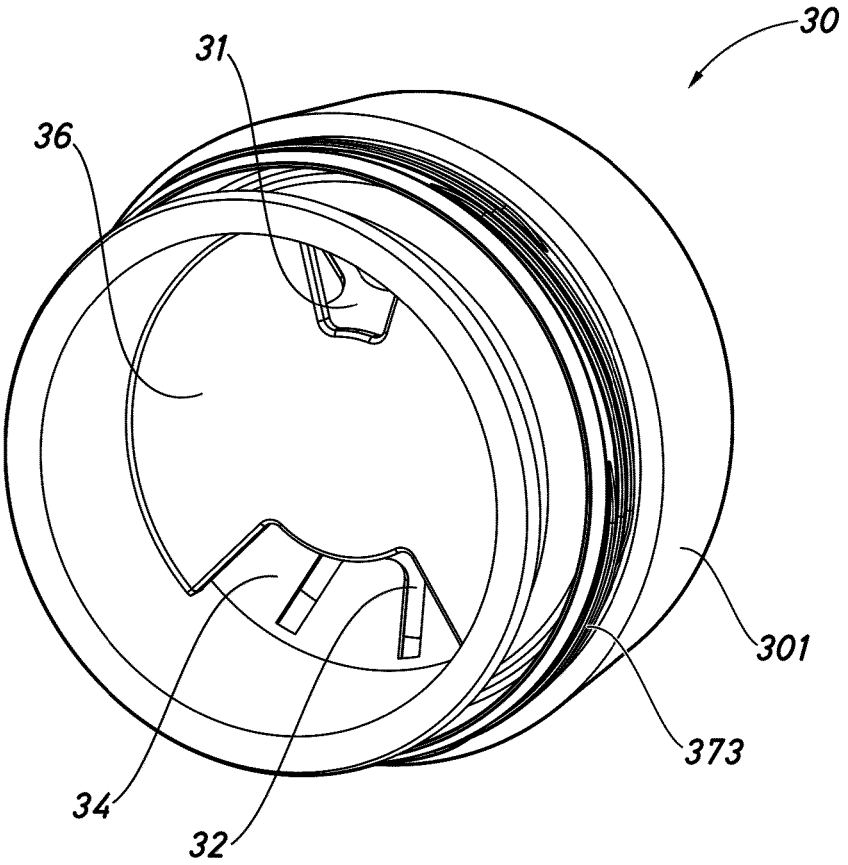


Fig. 2

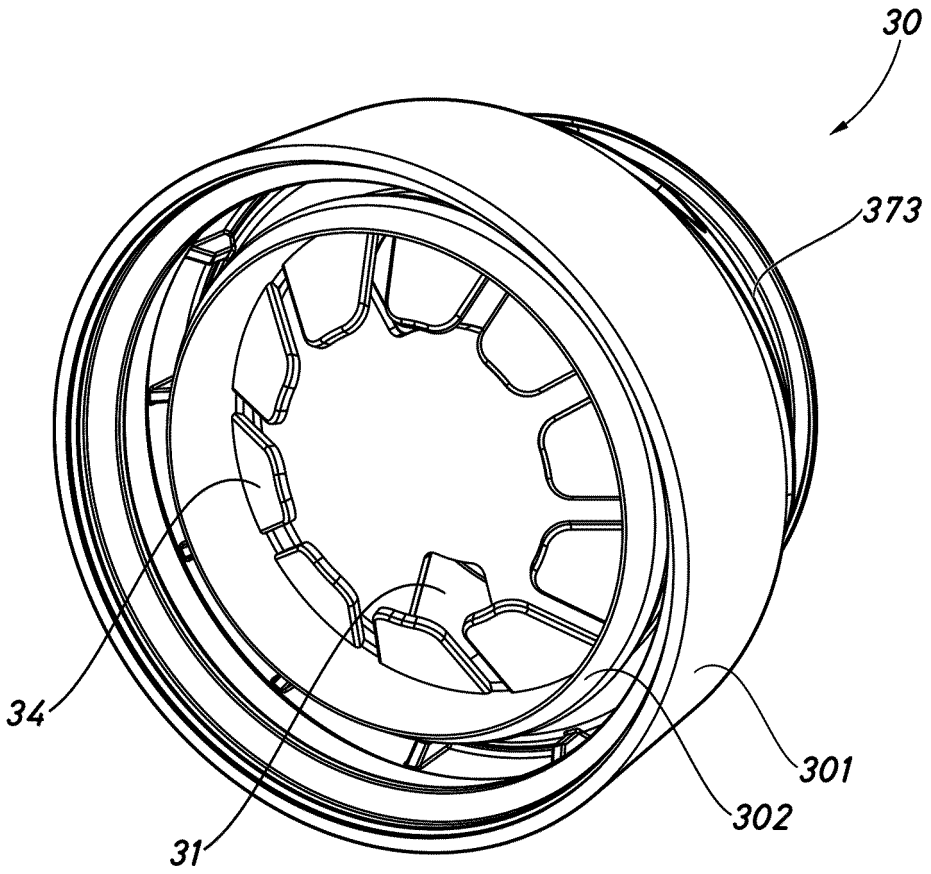


Fig. 3

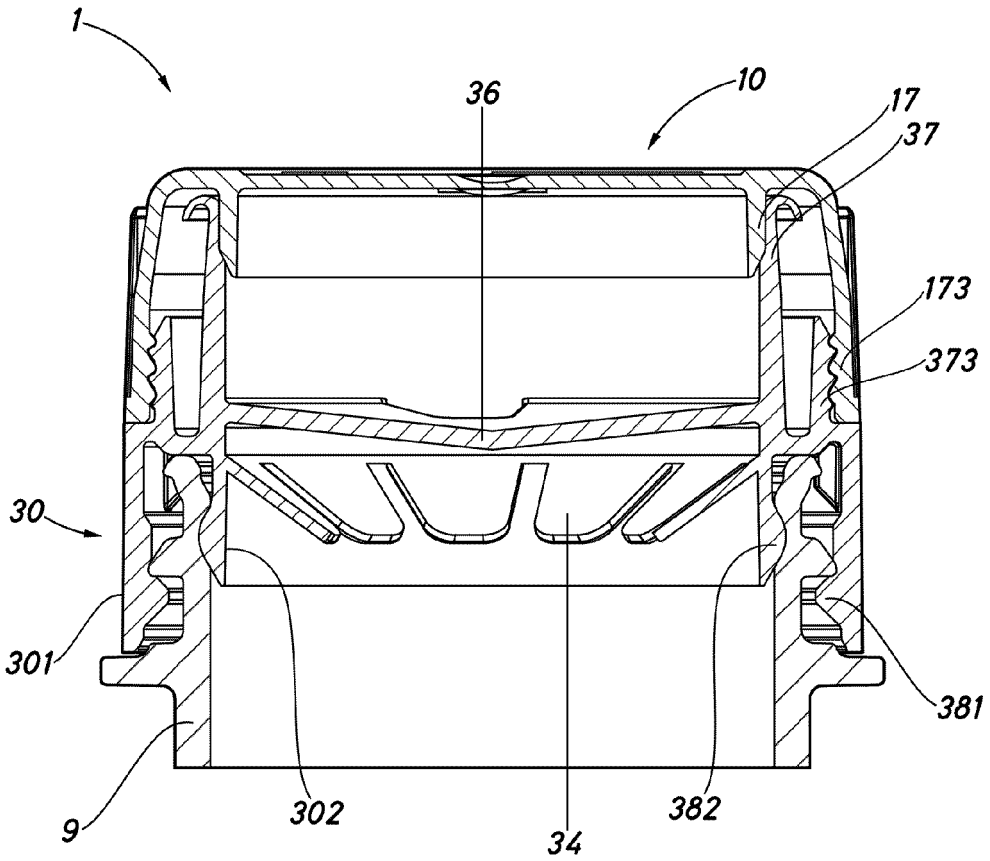


Fig. 4

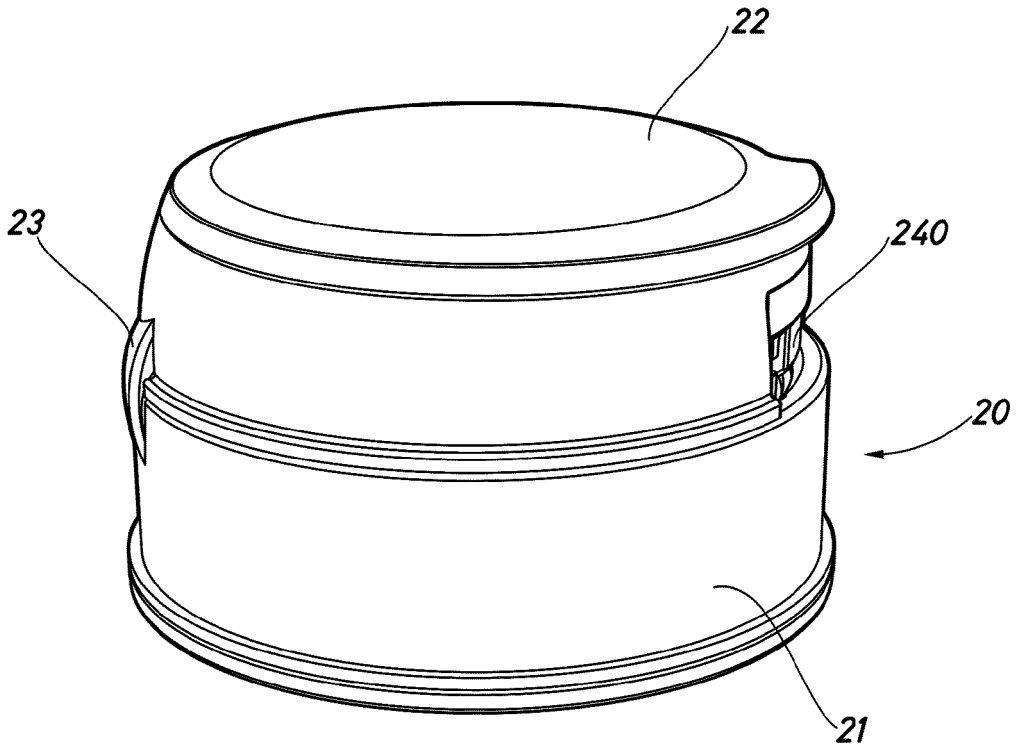
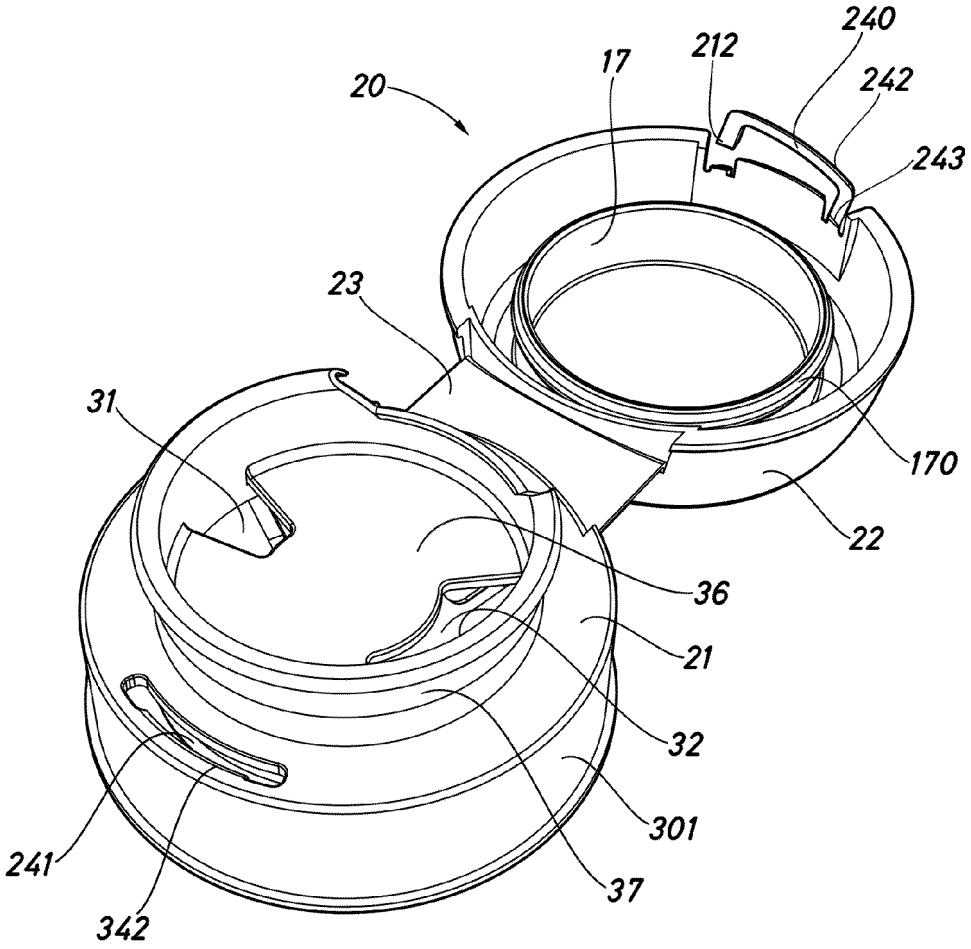


Fig. 5



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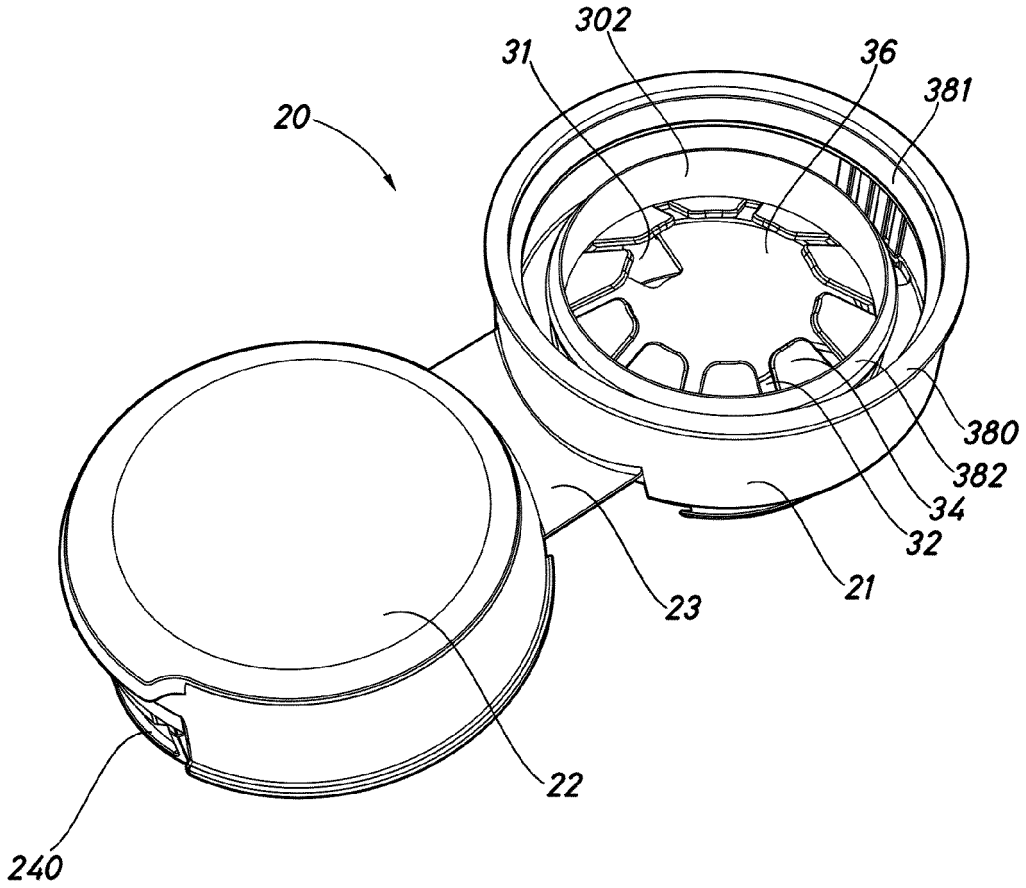


Fig. 7

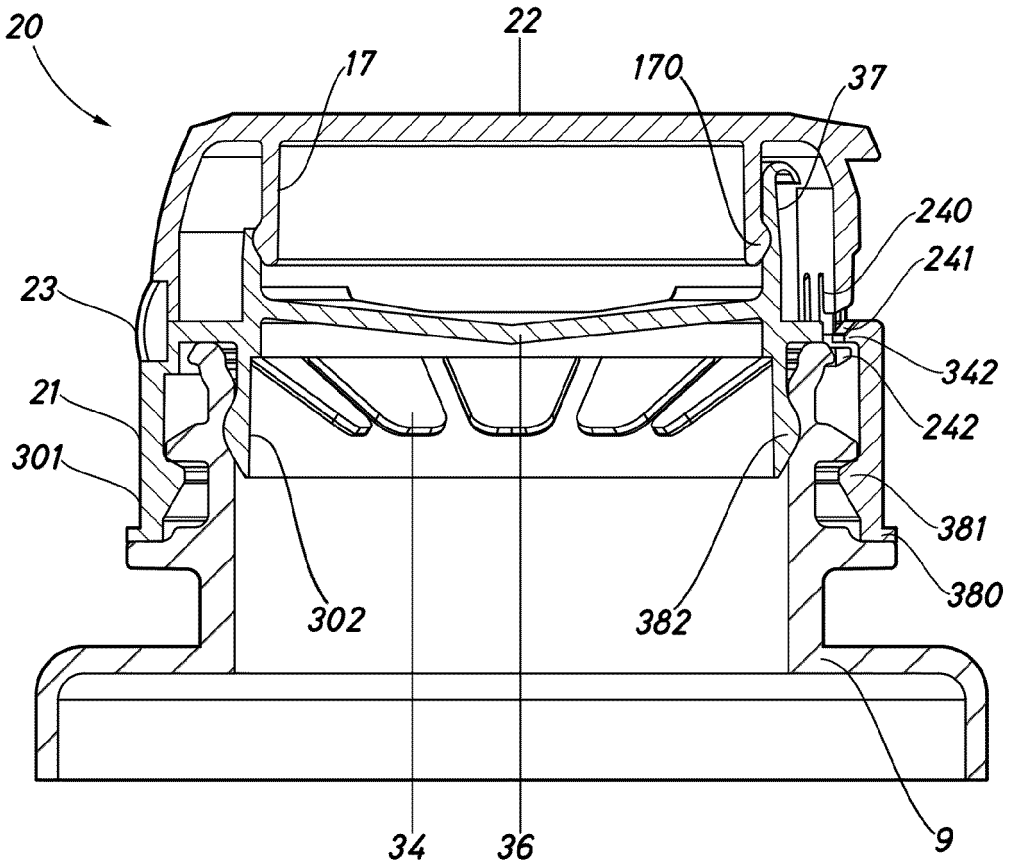


Fig. 8

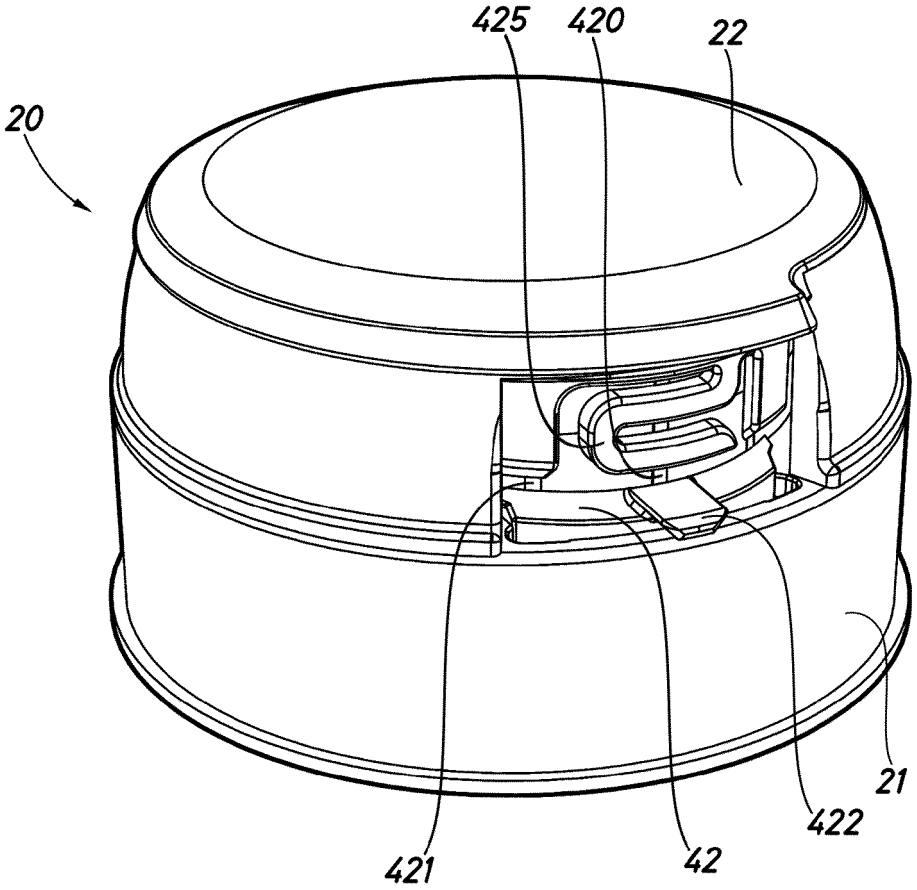


Fig. 9

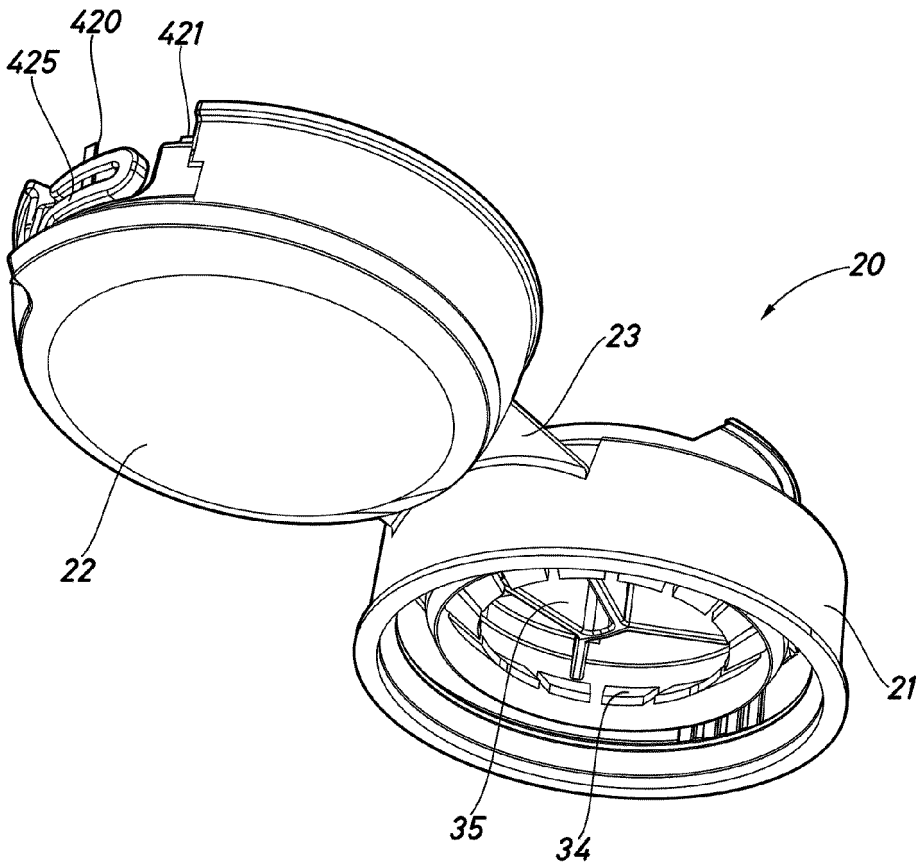


Fig. 10

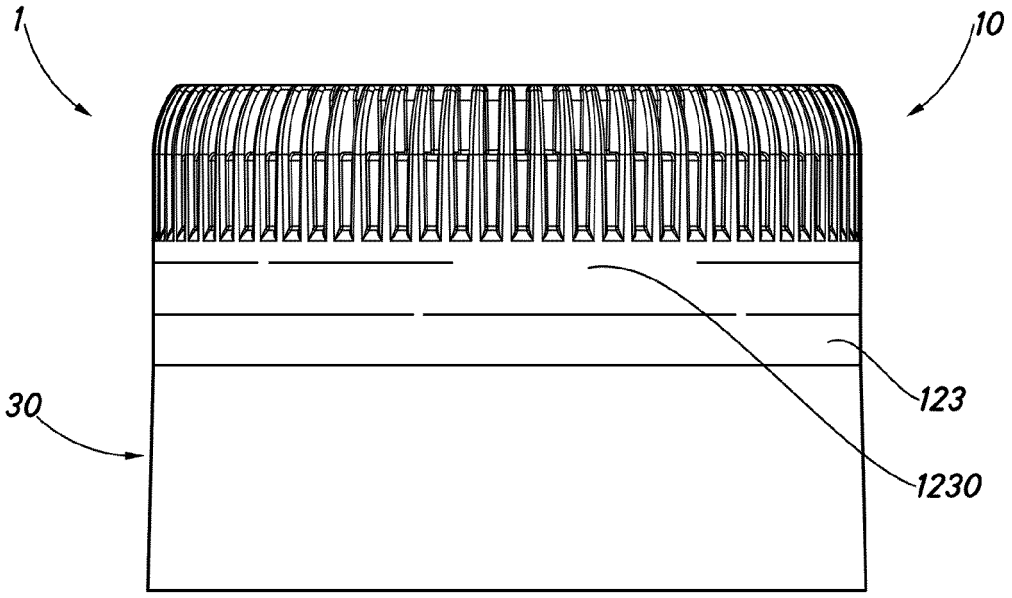


Fig. 11

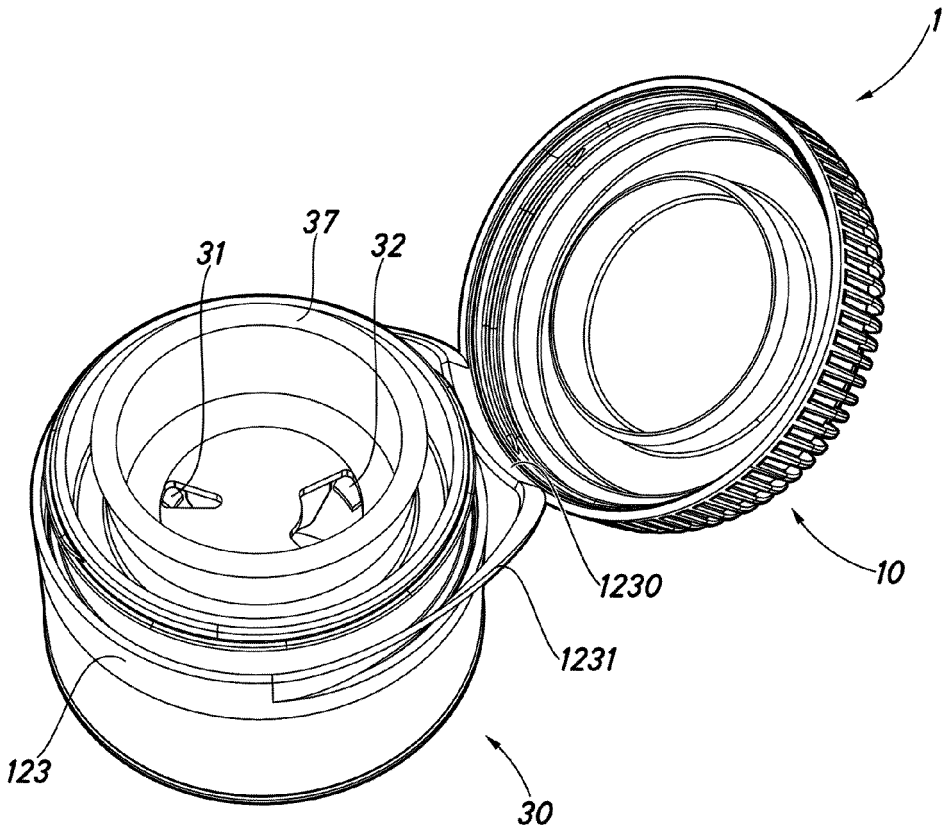


Fig. 12

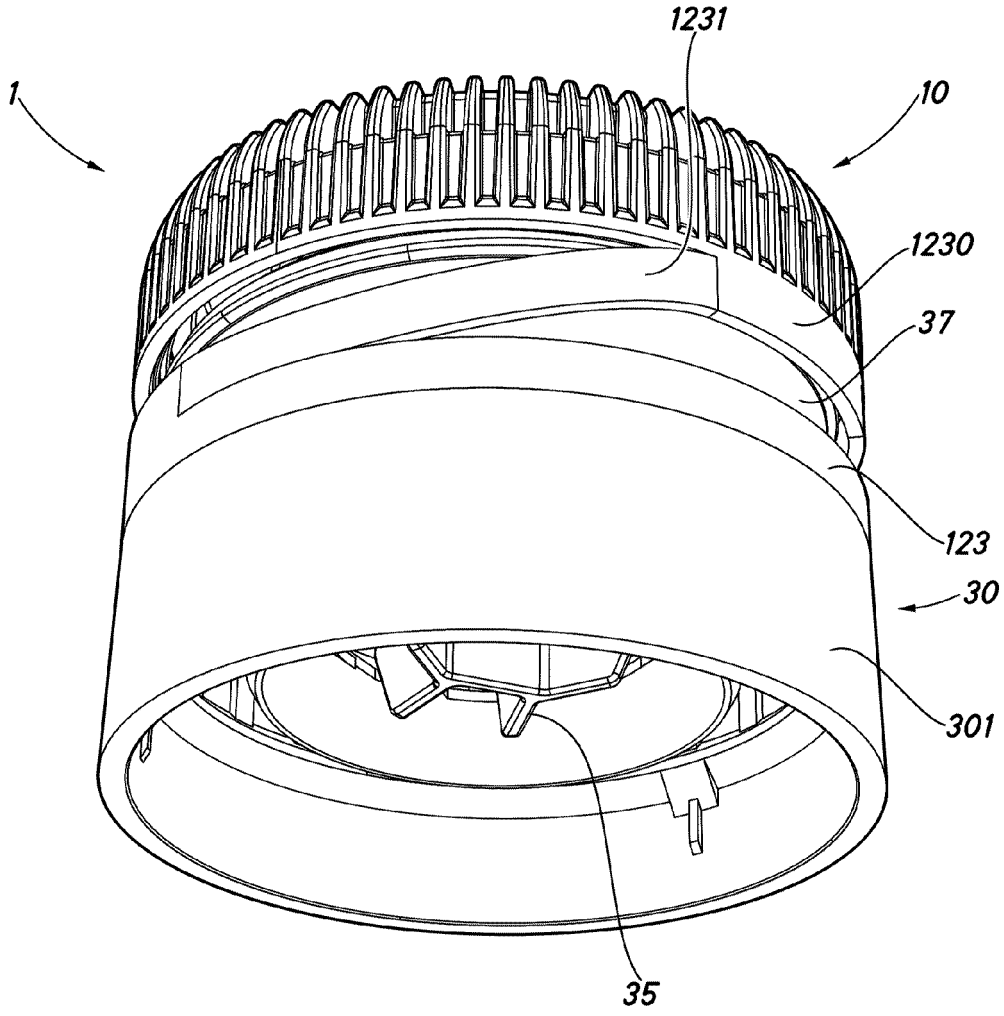


Fig. 13

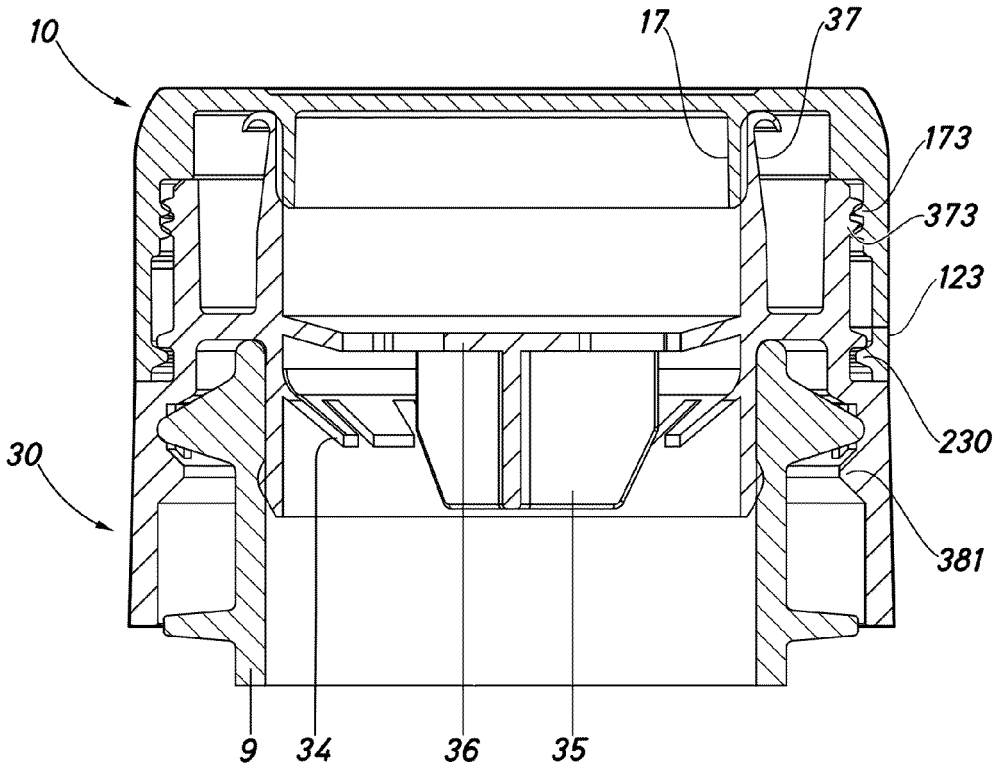


Fig. 14

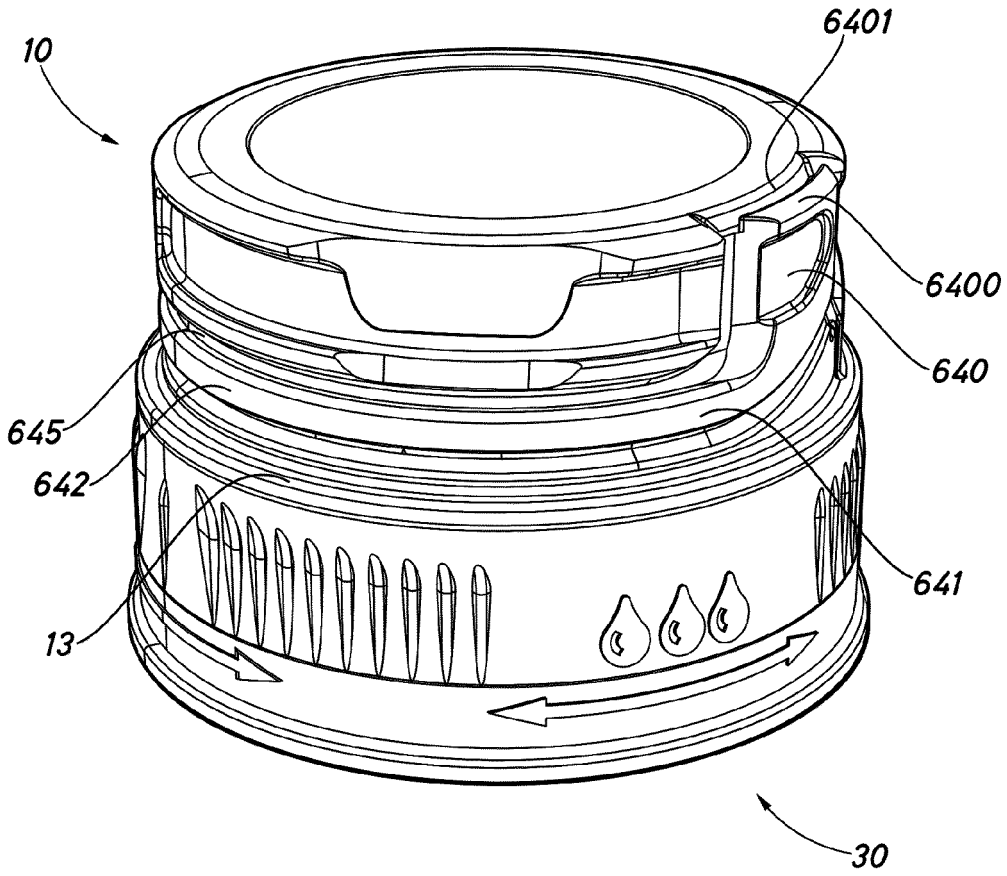


Fig. 15

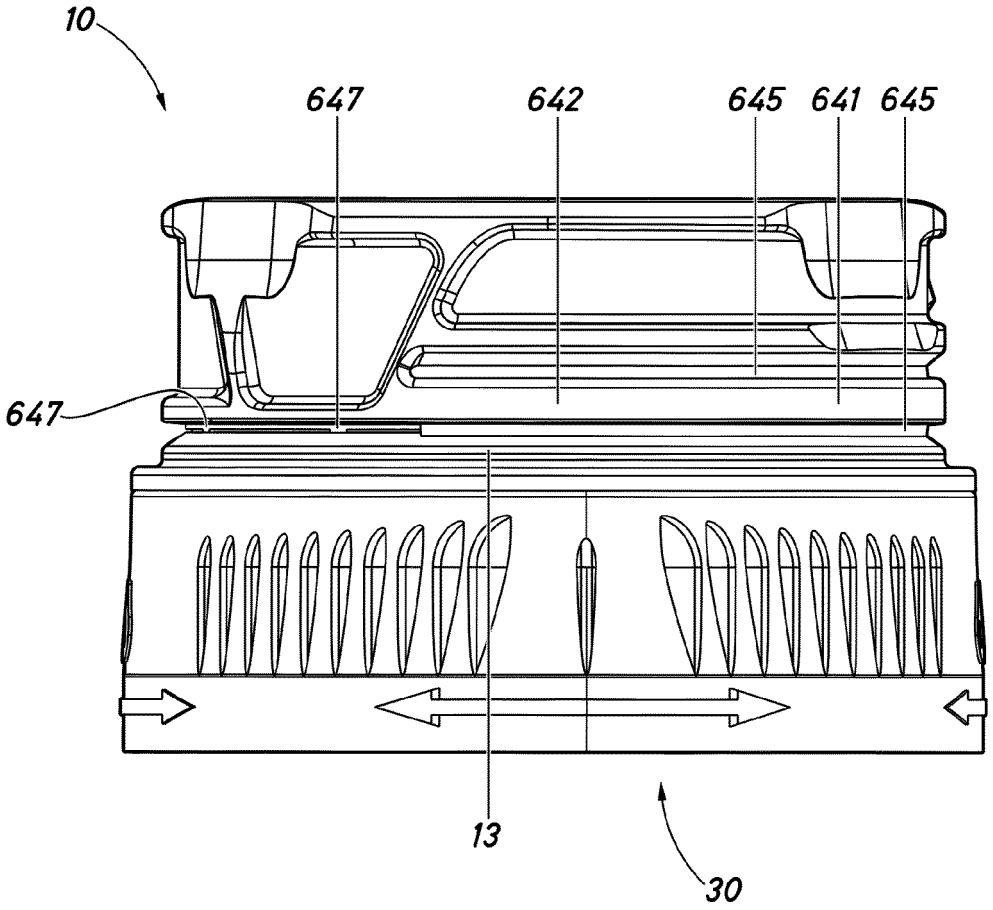


Fig. 16

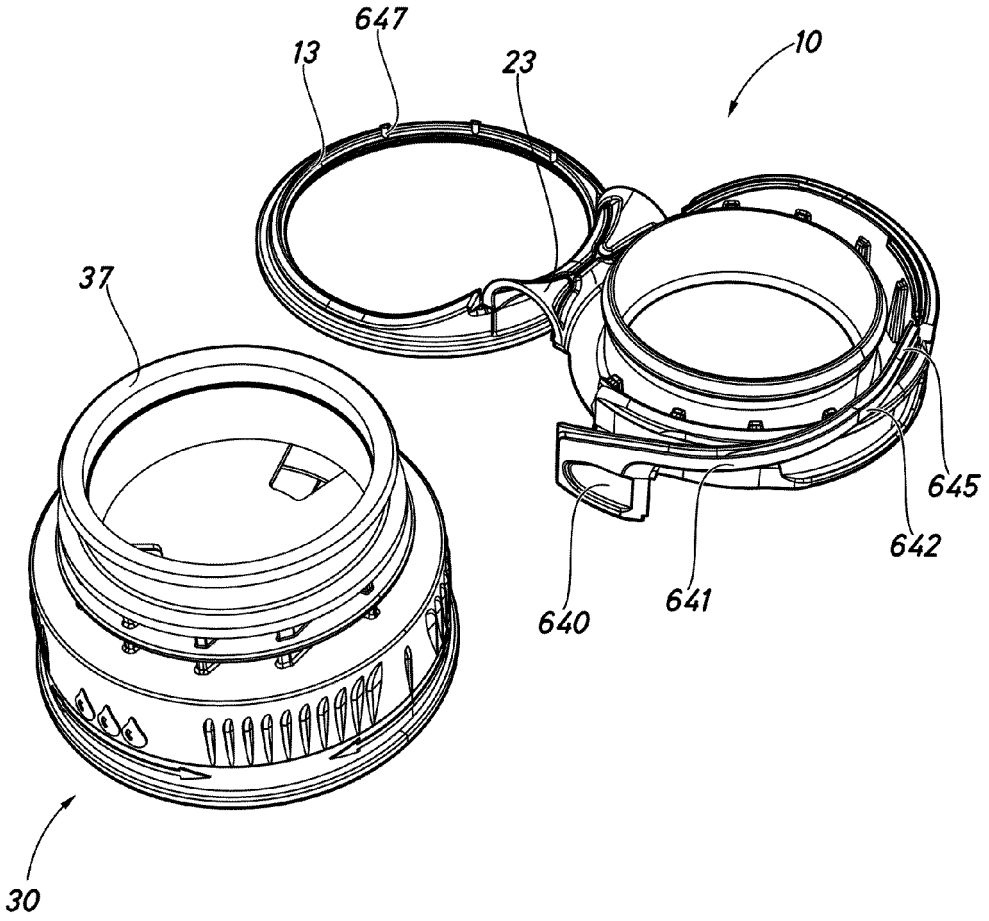
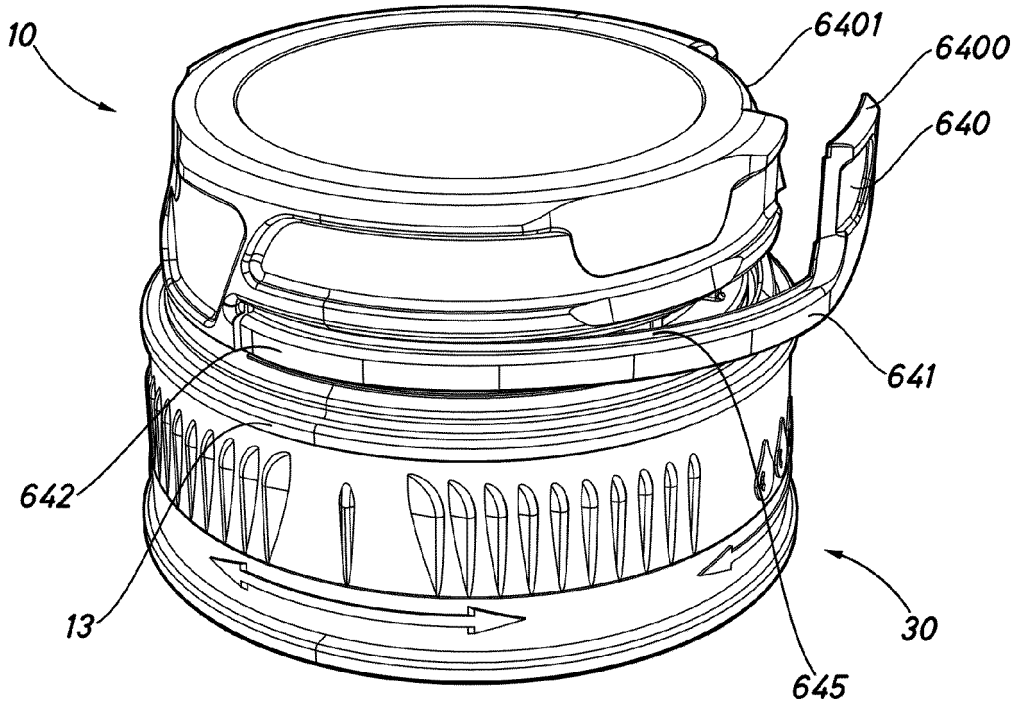


Fig. 17



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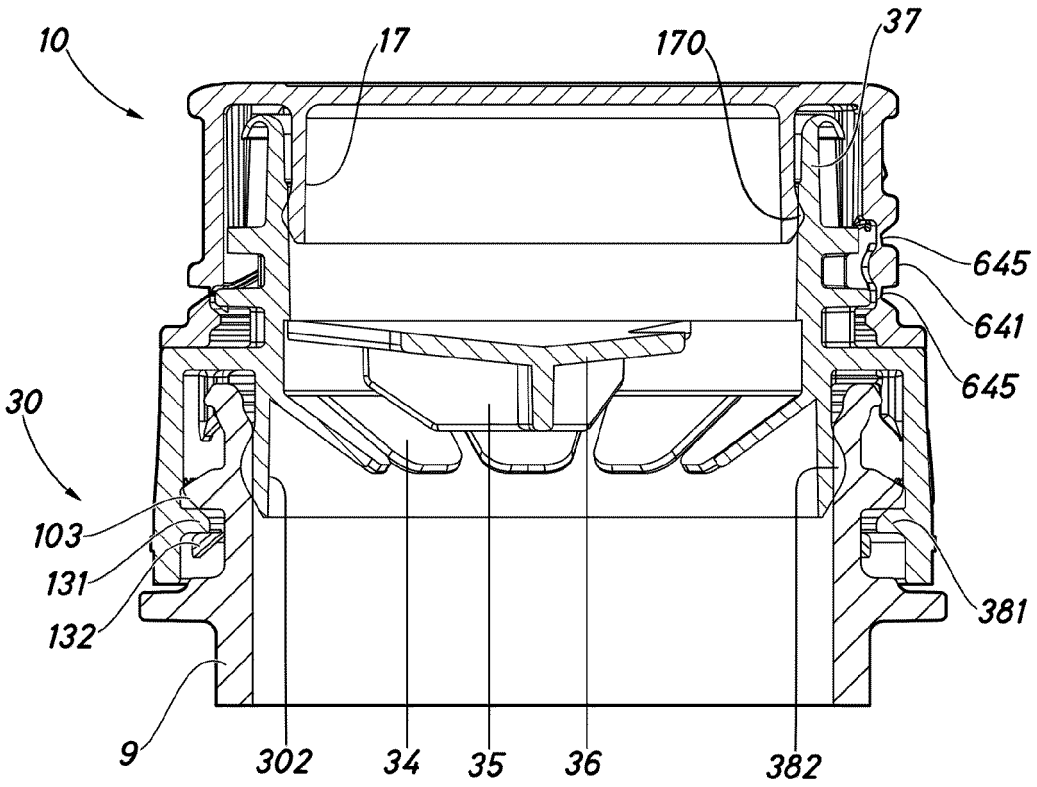

Fig. 19

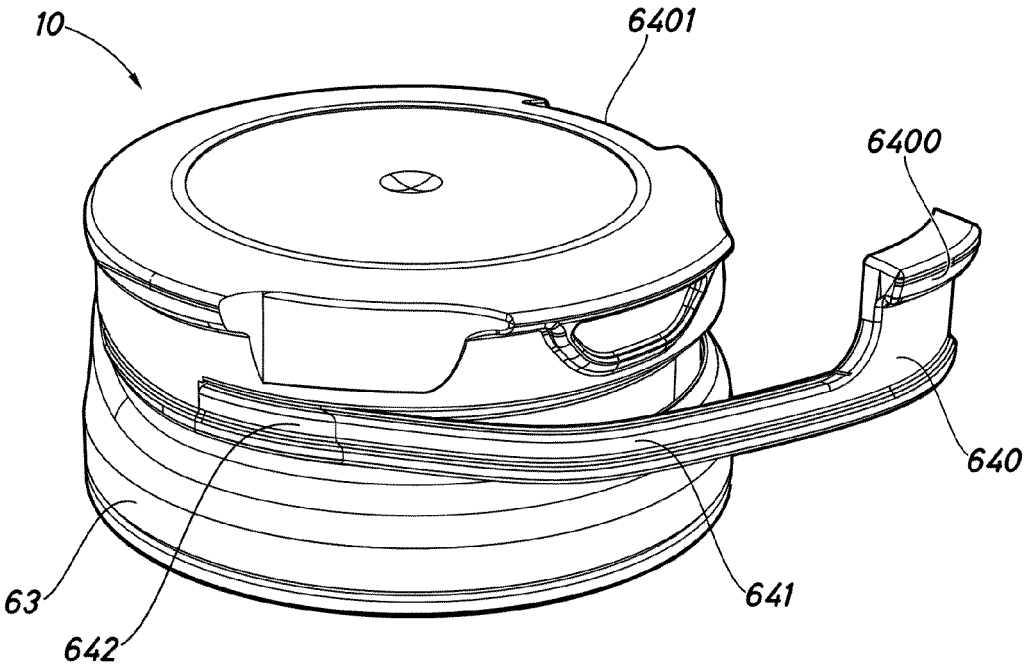

Fig. 20

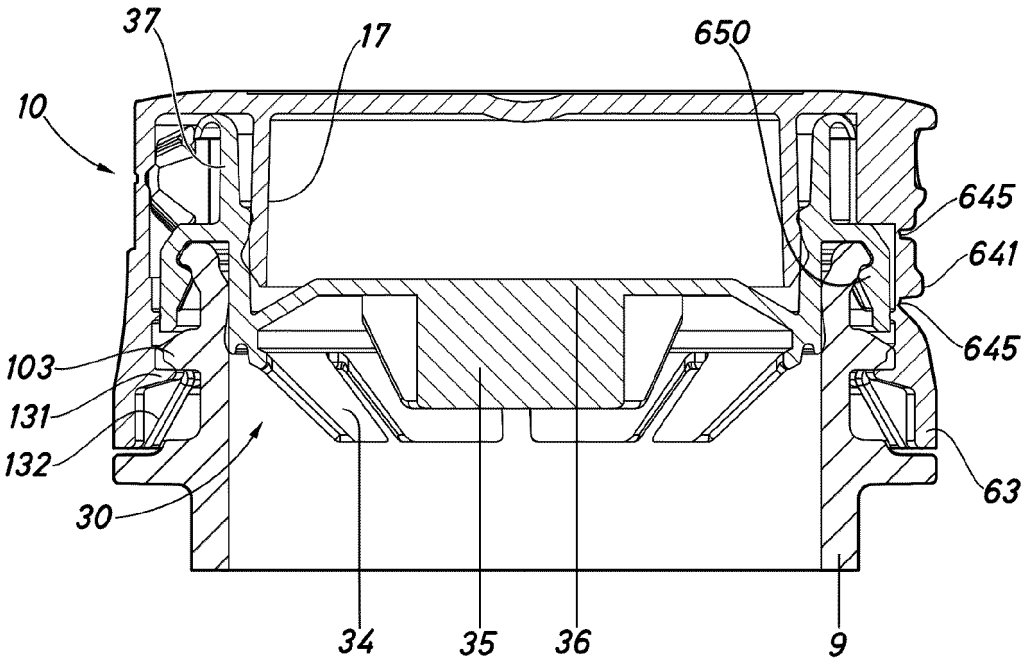

Fig. 21

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2022/054848

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D47/04 B65D55/02
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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	US 2020/115115 A1 (MIGAS JEREMIAH [US] ET AL) 16 April 2020 (2020-04-16) figure 2c	12,16-18
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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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

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Date of the actual completion of the international search	Date of mailing of the international search report
30 August 2022	09/09/2022

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	Sundell, Olli

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INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2022/054848

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