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(54) **Tamper evident closure system for bottles**

Sicherheitsverschlussystem für Flaschen

Système de fermeture inviolable pour bouteilles

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Description

[0001] The present invention relates to a new closure system having an indicator ring for indicating the first opening of the closure. The closure system is particularly designed as an anti-tamper closure system for bottles containing alcoholic beverages.

[0002] It is known that closure systems of bottles for valuable beverages might be tampered for replacing the content of the bottle. Re-filling with a replacement quantity of another liquid shall be prevented in order to secure the quality of the original beverage contained in the bottle. It therefore is a requirement that the end purchaser shall be enabled to easily recognize whether or not the bottle has been opened prior to the moment of purchase.

[0003] EP 1 602 591 A1 discloses a means for sealing bottle caps with evidence of opening, it is set as an objective that it should be made apparent after the cap is first opened that this opening has taken place. A threaded cap is attached to a ring seal by means of breakable bridges. During the first opening, the rotation and axial displacement of the threaded cap break the breakable bridges of the ring attaching the ring to the cap.

[0004] EP 1 392 575 A1 discloses a tamper-evident device for a closure assembly adapted to be applied to the mouth of a container. The tamper-evident device comprises a sleeve member which comprises a first portion associated with a second portion by means of a frangible portion. The first portion of the sleeve is adapted to be applied to a mouth and neck portion of a container and said second portion is associated with a container closure member. An initial container opening operation causes said frangible portion to fracture or break such that when the container is reclosed, said first and second portions are located in a spaced apart relationship to one another.

[0005] WO 2008/041119 A2 discloses a closing device comprising a cap consisting of a top portion and a side portion, a top diffuser suitable for coupling with the cap and a bottom diffuser suitable for coupling at the top with the top diffuser. The closure system has a covering lining divided into a top portion and a bottom portion connected to one another along a predetermined breakage line. The cap further comprises at least one closing tab connected to said side portion of the cap which can take a first position of assembly of the closing device wherein it does not interfere with the coupling between the cap and the top diffuser. The closing tab has a second safety position incurred subsequent to the first opening of the device. The closing tab interferes with at least one abutment portion of the top diffuser preventing the complete re-closure of the device on the bottle.

[0006] EP 1 981 774 A2 discloses a closing device for bottles having a cap consisting of a top portion and a side portion. The closing device further comprises a pourer suitable for coupling with said cap and for being fastened to the neck of a bottle and a covering liner divided into a top portion and a bottom portion joined together along a

predetermined breaking line. The cap comprises at least one closing tab joined to the top portion of the cap, which can take up a first position, of assembly of said closing device, in which said closing tab does not interfere with the coupling between the cap and the pourer. The cap has a second security position following the first time the device is opened, in which the closing tab interferes with the pourer preventing the device from being completely closed again.

[0007] EP1679268 A1 discloses a non-refillable stopper with double security device according to the preamble of claim 1. A special tubular closing element forming a tubular body which is connected to and surrounds the upper portion of the bottle neck has an upper projecting flange and a lower projecting flange respectively which are pressed inwards by the action of the external laminar covering. The external laminar covering may be displaced vertically during the stopper opening operation, so that said flanges, in view of their compressed disposition, thus protrude resiliently outwards when they are released by the laminar covering, and prevent said external laminar covering from descending again. The flanges are permanently visible and demonstrate the prior opening of the bottle stopper.

[0008] It is a known that various methods have been proposed so far for providing a tamper evident closure system for bottles. Most of these methods rely on formation of a gap in between the cap and the outer sleeve surrounding the neck of a bottle upon first opening of the closure system. These closure systems still suffer from a number of problems such as complexity of manufacturing, the large number of parts for mantling and high costs associated with the production of the large number of parts.

[0009] A major drawback of the existing closure systems arise from the need of forming breakable bridges in between the indicator ring and the cap. These parts are manufactured by injection molding plastic material and the breakable bridges are usually formed by cutting in part the periphery of the indicator ring and the cap. The cutting process however produces fine plastic particulates which may pollute the closure system, eventually resulting in pollution of the beverage poured out of the bottle during use. While the cutting or perforating process results in fine plastic particulates among the bridges, these fine particulates are usually not noticed by the manufacturer or the end user owing to their small size. It is also known that the cutting process may produce very fine spikes usually named as angel hair in the industry. The spikes are very thin plastic fibers formed when the cutting element cannot be precisely oriented onto a cap to be cut for forming bridges. A further drawback occurs when the cutting element eventually loses its sharpness in a mass production process. Once the cutting element becomes less sharp, the bridges become thicker and more difficult to break.

[0010] During the first opening, the breakable bridges of the grooved indicator ring are broken by tensional and

shear stress occurring due to rotation of the cap. The number and thickness of the breakable bridges identify the desired breaking strength. The number and thickness of the breakable bridges also alter the amount of fine plastic particulates which are generated during the perforation or cutting step. Normally, the amount of fine plastic particulates is higher if the perforation or the breakable bridges has a lower breaking strength since more material shall be cut out of the wall connecting the indicator ring to the cap.

[0011] The bridges may also be formed during the injection molding process where the mold comprises very thin channels for forming the bridges. However, it is well known in the art that the precision of manufacturing decreases substantially in time as the molds moves after each injection. Therefore, it is another problem known in the industry that bridges formed by the injection molding process are not identical to each other in a mass production and get thicker or coarser in time as the molding process proceeds in time. Evidently, thicker bridges are more difficult to break and resulting closure system is likely to receive complaints from the user as being hardly openable.

[0012] The present invention provides simple and cost-effective closure system which eliminates the need of forming breakable bridges in between the cap and tamper indicator ring.

[0013] Therefore, an object of the present invention is to eliminate formation of fine plastic particulates incurred during the cutting step of breakable bridges or perforations in between the cap and the indicator ring. To this end, the present invention provides a separate annular ring overcoming the aforementioned drawbacks of the existing closure systems.

[0014] The present invention discloses a novel tamper evident closure system comprising a cap having a flat top portion and a tubular side portion provided with a threaded inner surface; a pourer suitable for engaging with the neck of a bottle at one end where said pourer has outer threads at its other end for connection with threaded inner surface of said cap. An outer sleeve circumferentially covers the outer periphery of the closure system and is divided into an upper sleeve and a lower sleeve separated by a breaking line. The closure system further comprises an indicator ring placed annularly partly behind the outer sleeve and partly behind the lower sleeve in the longitudinal direction of the bottle. The closure system according to the present invention have means for providing a gap, upon first opening of the cap, in between said upper and lower sleeves in the longitudinal direction of the bottle. The indicator ring is attached to the pourer and is separate from the tubular side portion of the cap such that no breakable bridges exist in between the ring and said tubular side portion.

[0015] The means for means for providing a gap, upon first opening of the cap, in between said upper and lower sleeves in the longitudinal direction of the bottle comprise an abutment groove located annularly around the pourer.

The cap is equipped with a plurality of flaps which are attached to the top portion of the cap and which are pushed inwardly under the peripheral pressure of the upper sleeve in the radial direction of the cap. The cap further comprises a plurality of abutment arms under radial pressure of said plurality of flaps. The abutment arms are able to take up a first position in which said abutment arms do not interfere with the abutment groove and upon the cap is opened for the first time, a second security position in which said abutment arms abut against said abutment groove such that a gap is formed in the longitudinal direction in between the neighboring circumferential edges of the upper and lower sleeves when the cap is re-closed.

[0016] The annular ring may have a hook-shaped protrusion for engaging with a corresponding surface on the pourer. In this case, the annular ring may be rotatable around the primary axis of the bottle to which the closure system is attached. Alternatively, the annular ring may be sized to establish a tight fit connection with the pourer. The annular ring may be fixedly attached to the pourer even with an adhesive or through ultrasonic welding. The pourer of the closure assembly may be equipped with a bottom diffuser. The diffuser may comprise a valve member for avoiding re-filling of the bottle.

[0017] According to the method of the present invention, the indicator ring is manufactured in a bi-injection process in which the ring and the pourer are injection molded simultaneously using varying types or colors of plastic material. The ring may have a circumferential groove into which the neighboring edges of the upper and lower sleeves may be bent and the slit line is contained.

[0018] Accompanying drawings are given solely for the purpose of exemplifying a closure system whose advantages over prior art will be explained in detail hereinafter. The scope of protection is defined by the appended claims and cannot be considered as limited to the appended drawings which are given solely for the purpose of exemplifying the embodiments of the present invention.

Fig. 1 is a cross-sectional view of a closure system of the prior art.

Fig. 2a is a cross-sectional view of the closure system before first opening according to the first embodiment of the present invention. The annular ring of the first embodiment is shown to have a circumferential hook-shaped protrusion for engaging with a corresponding surface of the pourer.

Fig. 2b shows the closure system of Fig. 2a where the cap is removed.

Fig. 2c shows the closure system of Fig. 2b where the cap is reclosed after first opening.

Fig. 3a is a cross-sectional view of the closure system according to the second embodiment of the present invention where the closure is depicted before first opening. The annular ring of the second embodiment is depicted as tightly fit on the pourer.

Fig. 3b shows the closure system of Fig. 3a where the cap is removed.

Fig. 3c shows the closure system of Fig. 3b where the cap is reclosed after first opening.

Fig. 4a is a cross-sectional view of the closure system of according to the third embodiment of the present invention before first opening. The ring of the third embodiment is formed by bi-injection process simultaneously with the pourer.

Fig. 4b is a shows the closure system of Fig. 4a where the cap is removed.

Fig. 4c shows the closure system of Fig. 4b where the cap is reclosed after first opening.

Fig. 5a is a cross-sectional view of the closure system according to the fourth embodiment of the present invention where the closure is depicted before first opening. The annular ring of the fourth embodiment is depicted as tightly fit on the pourer and has a circumferential groove for containing the neighboring circumferential edges of the upper and lower sleeves.

Fig. 5b shows the closure system of Fig. 5a where the cap is removed.

Fig. 5c shows the closure system of Fig. 5b where the cap is reclosed after first opening.

Fig. 6 is an exploded view of a closure system depicted in Fig. 2a to 2c.

[0019] A tamper-evident closure system of pertaining to the prior art is shown in Fig. 1. This closure system has an indicator ring which is attached to a closure member by means of a plurality of breakable bridges (41), which break at the time of first opening. The breakable bridges (41) of this existing closure system are broken during the first opening of the cap by the rotational movement of the cap resulting in displacement of the cap in the longitudinal direction of the bottle. In order to form the plurality of bridges, the manufacturer shall first injection mold the pourer and then cut the periphery of the pourer in parts so as to form empty volume among the plurality of bridges.

[0020] A major drawback of this method is that the plastic material emptied among the bridges stay in powder form within the plurality of volumes among the bridges

(41). This excess powder may potentially pollute the closure system and subsequently the beverage contained in the bottle. The powder may be accompanied by spikes or angel hairs in fibrous form. The fact that the indicator ring becomes visible only after breaking the bridges is therefore a major technical problem to which the present invention aims to provide a solution. This aim is achieved by preventing use of the indicator ring which is attached to a pourer by breakable bridges and instead, providing a separate indicator ring which does not require breaking bridges in order to become visible after the initial opening of a cap.

[0021] The closure system (10) according to the present invention comprises a top portion (13), a pourer (15) and an outer sleeve having an upper sleeve (30) portion and a lower sleeve (31) portion. Distinguishingly the closure system (10) has an indicator ring (14) located circumferentially around the outer periphery of the pourer (15) at a position which overlaps partly with the upper sleeve (30) and partly with the lower sleeve (31) in the longitudinally direction of the bottle. The indicator ring (14) is however attached to the pourer (15) such that it remains stationary in its place before, during and after the initial opening of the closure system (10). While the indicator ring (14) overlaps partly with the upper sleeve (30) before the first opening, it needs not overlap with the upper sleeve (30) after the first opening as the upper sleeve (30) is prevented from contacting the lower sleeve (31) due to inevitable formation of a gap (16) in the longitudinal direction of the bottle after the first opening.

[0022] The cap (40) comprises a substantially flat top portion (13) and a tubular side portion (17) having threaded inner surface suitable for engaging with a corresponding threaded outer surface of the pourer (15). The pourer (15) may further have a diffuser (23) containing a ball type valve member (19) for preventing re-filling of the bottle after initial opening of the cap (40). The ball type valve member (19) sits in its place in the diffuser (23) with the gravitational effect such that the passage to the inside of the bottle is blocked when the bottle is standing upright. The valve member (19) would permit flow of the contained beverage only when the bottle is turned at least partly upside down. A pourer outlet (22) is provided in fluid communication with the upper part of the diffuser (23). The closure system (10) has means suitable for attaching the same on the neck (24) of a beverage bottle.

[0023] The outer sleeve (11) consists of the upper sleeve portion (30) and the lower sleeve portion (31) separated by a breaking line (32). The breaking line (32) may, upon desire, have breakable bridges or perforations which would generate an indicative audible sound when broken during the first opening. The breaking line (32) shown in the attached drawings have no bridges for visual simplicity and shown as formed by radially inwardly bent neighboring circumferential edges of the lower sleeve (31) and the upper sleeve (30). The outer sleeve (11) is typically manufactured by drawing a thin folio usually made of a metal alloy for ease of processing. It is however

possible to manufacture the outer sleeve (11) also from various polymers.

[0024] During the assembly of the closure system (10), the top portion (13) is mounted together with the remaining components of the closure system (10) so that the free end of each abutment arm (18) abuts against the side of the pourer (15). The flaps (36) are free to take up their rest position after the cap (40) is removed by the user. After assembly between the top portion (13) and the pourer the first portion of the outer sleeve (30) is assembled on the closure system. This pushes on the elastic flaps (36) causing them to contract.

[0025] The cap (40) according to the present invention has means for preventing full closure of the cap (40) upon initial opening. The cap (40) has flaps (36) that are constantly pressed inwards in the radial direction by the upper sleeve (30) as shown in Figs. 2a, 3a and 4a. Before the initial opening, one or more abutment arm (18) is constantly pressed and trapped in between the upper sleeve (30) and the pourer (15). Once the cap (40) is opened for the first time, the abutment arms (18) are released from their trapped position and are bent radially towards to the inside of the cap as shown in Figs. 2b, 3b and 4b. The bending results in radial inward displacement of the tips of the abutment arms (18) and eventually, when the cap is reclosed upon first opening, the plurality of abutment arms (18) are trapped on the annular abutment groove (34) of the pourer (15) as shown in Figs. 2c, 3c and 4c. The outer radius of the annular abutment groove (34) is larger than the distance of the tip of a abutment arm (18) to the center of the cap (40) in the longitudinal direction. Therefore, each and every time the cap is re-closed upon first opening, the tips of the abutment arms would lean on the annular abutment groove (34) and thereby prevent the cap (40) from being further rotated until its first position before the initial opening.

[0026] Fig. 2b depicts cross-sectional view of the closure system (10) where the cap (40) is opened, said action of opening not only causes the breaking line (32) to become spaced apart, but also moving the pourer (15) from the position of abutment against the free end of each abutment arm (18). Afterwards abutment arms (18) interferes on the top with an annular abutment groove (34) made on the outer surface of the pourer (15), and prevents the pourer to reach the upper limit switch and consequently prevent the closure system (10) to close completely.

[0027] The means (18, 34, 36) for preventing full closure of the cap (40) provide that the lower circumferential edge of the upper sleeve (30) would never touch the upper circumferential edge of the lower sleeve (31) and there will always be a gap (16) in between the two neighboring circumferential edges of the lower and upper sleeves (30, 31) as shown in Figs. 2c, 3c and 4c. This gap (16) is the gap where the ring (14) shows itself to its user evidencing that the cap (40) has been opened before. Preferably, the ring (14) would have a color which contrasts with the outer colors of the upper and lower

sleeves (30, 31).

[0028] Since upon the first opening of the cap (40), a gap (16) is maintained in between the upper circumferential edge of the lower sleeve (31) and the lower circumferential edge of the upper sleeve (30), the present invention proposes that a ring (14) which is fixedly attached to the pourer (15) would remain in its position for evidencing of the first opening. As was mentioned earlier, the size and position of the indicator ring (14) in the longitudinal direction of the bottle is set to overlap partly with the upper sleeve (30) and also with the lower sleeve (31) before the first opening. The part of the indicator ring (14) remaining within the lower sleeve (31) always remains fixed and invisible to the outside whereas the part of the indicator ring (14) remaining within the upper sleeve (30) become visible to the outside after the first opening. The visibility of the upper part of the ring (14) is maintained by the gap (16) formed in between the circumferential edges of the upper and lower sleeves (30,31) by the use of the abutment arms (18) engaging with the annular abutment groove (34) of the pourer (15) during re-closure of the cap (40).

[0029] It is shown in Fig 2a-2c that the indicator ring (14) has a hook-shaped protrusion (37) for engaging with a corresponding catch surface (39) formed on the pourer (15). The indicator ring (14) is manufactured separately from the pourer (15) and then is mounted on the pourer such that the hook-shaped protrusion (37) of the ring (14) snugly fits with the corresponding catching surface (39) of the pourer (15). This engagement eliminates the need for forming or cutting breakable bridges on the pourer. The ring (14) having the hook-shaped protrusion (37) may be mounted on the pourer in a typical press on process. Once the cap (40) is opened for the first time, the upper part of the ring (14) remaining under the upper sleeve (30) would become constantly visible to the outside and indicate the first opening has taken place. Once the cap (40) is re-closed the gap (16) would be formed in between the upper and lower sleeves (30,31) in the longitudinal direction of the bottle.

[0030] Fig. 2a shows a closure system (10) equipped with an indicator ring (14) having hook-shaped protrusions (37) for fixing the ring on the pourer (15). The closure (10) in Fig. 2a is shown in a state before the first opening of the cap (40). Fig. 2b shows the closure (10) is a state where the cap (40) is fully opened. The indicator ring (14) is attached to the pourer (15) with the help of the hook-shaped protrusions (37) in engaged form with the corresponding catch surface of the pourer (15). While the upper part of the ring (14) is fully visible to the outside, the lower part of the ring is retained annularly under the lower sleeve (31).

[0031] Fig. 2c shows the closure system where the cap (40) is re-closed upon first opening. The abutment arms (18) prevent the cap from being further rotated to its initial position before the first opening, thereby forming a gap (16) in between the neighboring circumferential edges of the lower and upper sleeves (30, 31) and hence making

the indicator ring (14) visible to the outside.

[0032] While the indicator ring (14) is shown to have a hook shaped protrusion (37) for attaching the same to the pourer (15) in the first embodiment of the invention as shown in Figs. 2a - 2c, the second embodiment proposes that the indicator ring (14) may be attached to the pourer with a substantially tight fit connection. In order to establish a tight fit connection of the ring (14) with the pourer (15), the inner diameter of the ring may be slightly less than the outer diameter of the corresponding peripheral surface on the pourer (15). Alternatively, an adhesive may be added in between the two surfaces in order to fixedly attach said ring. A further alternative is attaching the ring (14) to the pourer (15) using ultrasonic welding. The second embodiment where the ring (14) is tightly fit on the pourer (15) is already depicted in Fig. 3a to 3c. While Fig. 3a shows the cross-sectional view of the closure system before first opening, Fig. 3b shows the same where the cap is in fully opened position. As clearly seen, the annular ring (14) of the second embodiment is depicted as tightly fit on the pourer (15). The closure (10) is depicted in Fig. 3c upon the cap (40) is reclosed after the first opening. While the tight fit connection of the ring (14) may be accomplished by properly adjusting the dimensions of said ring (14), it may also be tightly fit on the pourer (15) by applying adhesives or by sonic welding the same.

[0033] While the indicator ring (14) has been proposed as an individual part which is manufactured separately from the pourer (15) and then mounted on the same, the present invention proposes a third embodiment where the indicator ring (14) is manufactured simultaneously with the pourer (15). In order to realize this third embodiment, a special manufacturing method called "bi-injection process" shall be utilized. As it is highly preferable to have the ring (14) in a color which contrasts with the colors of the pourer (15) and the outer sleeve (11), manufacturing of the ring (14) may be accomplished within the same injection mold and simultaneously with the injection process of the pourer (15). The bi-injection process allows for injecting two different types or colors of plastic within the same mold where two parts having varying colors may be injection molded simultaneously. A ring (14) molded simultaneously with a pourer (15) and having a color or material which is different than the color or material of the pourer is shown in Figs. 4a to 4c. While Fig. 4a shows the closure system (10) before the first opening, Fig. 4b shows the same when the cap (40) is fully removed and Fig. 4c shows the cap (40) as re-closed upon initial opening. The bi-injection process is particularly useful since the ring (14) may be formed of stiff polymers like polycarbonate or polystyrene which is very hard to cut during a tampering attempt. There are various polymer materials which would firmly attach to the surface of the pourer making the ring (14) hardly removable from the surface of the pourer (15). The bi-injection process may be used also in the manufacture of the rings as shown in Figs. 3a-3c and Figs. 5a - 5c.

[0034] The ring (14) depicted in Figs. 4a to 4c shows a T-shaped ring which is symmetric along its half line in the longitudinal direction. This symmetric shape is particularly useful as it does not require sorting during the manufacturing process of the closure system. Otherwise, a sorting step would be required to properly place a non-symmetric shaped ring (14) onto the pourer (15) during mass production. The symmetric T-shaped ring may be fixed on the pourer (15) by a dimensional tight fit connection, by sonic welding, by applying adhesives or alternatively in a bi-injection process.

[0035] The indicator ring (14) may have a circumferential groove (28) as shown in Fig. 5a to Fig. 5c. The neighboring circumferential edges of the upper sleeve (30) and the lower sleeve (31) may be contained in the groove (28). Formation of a circumferential groove (28) on the ring (14) is particularly useful in that the neighboring circumferential edges of the upper and lower sleeves (30, 31) may be easily bent radially inwardly during manufacturing of the closure system and further in that, the thin folio of the sleeve (11) may be easily and precisely cut within the groove (28). The indicator ring (14) having a circumferential groove (28) may be fixed on the pourer (15) by a dimensional tight fit connection, by sonic welding, by applying adhesives or alternatively in a bi-injection process.

[0036] It is an option to manufacture the ring in a color such as red, which potentially reminds a warning or a cautionary condition to the user. A further option is to provide a text on the ring (14) for indicating the first opening of the closure system. A typical text would read a simple warning message such as "opened before".

Claims

1. A closure system (10) for bottles adapted to be applied to a bottle neck, (24) said closure system (10) comprising;
 - a cap (40) having flat top portion (13) and a tubular side portion (17) provided with a threaded inner surface,
 - a pourer (15) suitable for engaging with the neck (24) of a bottle at one end, said pourer (15) having outer threads at its other end for connection with said threaded inner surface of the cap (40),
 - an outer sleeve (11) which circumferentially covers the outer periphery of the closure system and which is divided into an upper sleeve (30) and a lower sleeve (31) separated by a breaking line (32), means for providing an irreversible gap (16), upon first opening of the cap (40), in between said upper and lower sleeves (30, 31) in the longitudinal direction of a bottle
- characterized in that,** the closure system further comprises an indicator ring (14) covered annularly partly behind the lower sleeve (31) and partly behind the upper sleeve (30) in the longitudinal direction of

- a bottle,
 said indicator ring (14) being attached to the pourer (15) and being separate from said tubular side portion (17) of the cap (40, wherein said means for providing an irreversible gap (16) comprises;
 an abutment groove (34) located annularly around the pourer (15),
 a plurality of flaps (36) which are attached to the top portion (13) of said cap and which are pushed inwardly under the peripheral pressure of the upper sleeve (30) in the radial direction of the cap (40),
 a plurality of abutment arms (18) under radial pressure of said plurality of flaps (36), said abutment arms (18) being able to take up a first position in which said abutment arms (18) do not interfere with the abutment groove (34) and upon the cap (40) is opened for the first time, a second security position in which the abutment arms (18) abut against said abutment groove (34) such that a gap (16) is formed in the longitudinal direction in between the neighboring circumferential edges of the upper and lower sleeves (30, 31) when the cap (40) is re-closed.
2. A closure system (10) as claimed in claim 1, wherein said annular ring (14) has a hook-shaped protrusion (37) for engaging with a corresponding surface (39) on the pourer (15).
 3. A closure system (10) as claimed in claim 1, wherein said annular ring (14) is sized to establish a tight fit connection with the pourer (15).
 4. A closure system (10) as claimed in claim 1, wherein said annular ring (14) is fixedly attached to the pourer (15) through ultrasonic welding.
 5. A closure system (10) as claimed in claim 1, wherein said annular ring (14) is fixedly attached to the pourer (15) with an adhesive.
 6. A closure system (10) as claimed in claim 1, wherein said annular ring (14) has a circumferential groove (28) for containing the neighboring circumferential edges of said upper and lower sleeves (30, 31).
 7. A closure system (10) as claimed in claim 1, wherein said annular ring (14) has a warning text readable around its outer periphery.
 8. A closure system (10) as claimed in claim 1, wherein said annular ring (14) is symmetric in shape along its half line in the longitudinal direction so as to avoid sorting during manufacture of the closure system.
 9. A closure system (10) as claimed in claim 1, wherein said annular ring (14) is rotatable around the primary axis of the bottle.

10. A closure assembly (10) as claimed in claim 1, wherein said pourer (15) is further equipped with a bottom diffuser (23).

11. A closure assembly (10) as claimed in claim 10, wherein said diffuser (23) comprises valve member (19).

12. A method of manufacturing a closure assembly (10) as claimed in claim 1 comprising the step of forming the annular ring (14) in a bi-injection process in which the ring (14) and the pourer (15) are injection molded simultaneously using varying types or colors of plastic material.

Patentansprüche

1. Verschlussystem (10) für Flaschen, welches dafür ausgelegt ist, auf einem Flaschenhals (24) angebracht zu werden, wobei das Verschlussystem (10) aufweist:

eine Kappe (40) mit einem flachen oberen Teil (13) und einem rohrförmigen Seitenabschnitt (17), der mit einer inneren Gewindefläche versehen ist,

ein Ausgießteil (15), welches an einem Ende für den Eingriff mit dem Hals einer Flasche geeignet ist, wobei das Ausgießteil (15) ein Außengewinde an seinem anderen Ende für die Verbindung mit der inneren Gewindefläche der Kappe (40) hat,

eine äußere Hülse (11), die den äußeren Umfang des Verschlussystems in Umfangsrichtung abdeckt und welche aufgeteilt ist in eine obere Hülse (30) und eine untere Hülse (31), die durch eine Bruchlinie (32) getrennt sind, Einrichtungen zum Bereitstellen einer irreversiblen Lücke (16) beim ersten Öffnen der Kappe (40) zwischen den oberen und unteren Hülsen (30, 31) in Längsrichtung einer Flasche,

dadurch gekennzeichnet, dass das Verschlussystem weiterhin aufweist:

einen Indikatorring (14), der ringförmig umlaufend teilweise hinter der unteren Hülse (31) und teilweise hinter der oberen Hülse (30) in Längsrichtung einer Flasche abgedeckt ist, wobei der Indikatorring (14) an dem Ausgießteil (15) angebracht und von dem rohrförmigen Seitenabschnitt (17) der Kappe (40) getrennt ist, wobei die Mittel zum Bereitstellen einer irreversiblen Lücke (16) aufweisen:

eine Anschlagnut (34), die ringförmig

um das Ausgießteil (15) herum angeordnet ist,
eine Mehrzahl von Laschen (36), die an dem oberen Abschnitt (13) der Kappe angebracht sind und welche unter dem vom Umfang her aufgebrachten Druck der oberen Hülse (30) nach innen in radialer Richtung der Kappe (40) gedrückt werden,
eine Mehrzahl von Anschlagarmen (18), welche unter radialem Druck der Mehrzahl von Laschen (36) steht, wobei die Anschlagarme (18) in der Lage sind, eine erste Position einzunehmen, in welcher die Anschlagarme (18) nicht in die Anschlagnut (34) eingreifen und welche dann, wenn die Kappe (40) zum ersten Mal geöffnet wird, eine zweite Sicherheitsposition einnehmen, in welcher die Anschlagarme (18) in der Anschlagnut (34) anschlagen, sodass ein Spalt (16) in Längsrichtung zwischen den einander benachbart in Umfangsrichtung verlaufenden Rändern der oberen und unteren Hülse (30, 31) gebildet wird, wenn die Kappe (40) erneut geschlossen wird.

2. Verschlussystem (10) nach Anspruch 1, wobei der umlaufende Ring (14) einen hakenförmigen Vorsprung (37) für den Eingriff mit einer entsprechenden Fläche (39) an dem Ausgießteil (15) hat.
3. Verschlussystem (10) nach Anspruch 1, wobei der umlaufende Ring (14) so bemessen ist, dass er eine enge Passungsverbindung mit dem Ausgießteil (15) bereitstellt.
4. Verschlussystem (10) nach Anspruch 1, wobei der umlaufende Ring (14) durch Ultraschallschweißen fest an dem Ausgießteil (15) angebracht ist.
5. Verschlussystem (10) nach Anspruch 1, wobei der umlaufende Ring (14) mit Hilfe eines Klebemittels an dem Ausgießteil (15) fest angebracht ist.
6. Verschlussystem (10) nach Anspruch 1, wobei der umlaufende Ring (14) eine umlaufende Nut (28) für die Aufnahme der benachbarten in Umfangsrichtung verlaufenden Ränder der oberen und unteren Hülse (30, 31) aufweist.
7. Verschlussystem (10) nach Anspruch 1, wobei der umlaufende Ring (14) einen entlang seines äußeren Umfangs lesbaren Warntext aufweist.
8. Verschlussystem (10) nach Anspruch 1, wobei der umlaufende Ring (14) entlang seiner Halbierungsli-

nie in Längsrichtung von symmetrischer Form ist, um auf diese Weise während der Herstellung des Verschlussystems ein Sortieren zu vermeiden.

9. Verschlussystem (10) nach Anspruch 1, wobei der umlaufende Ring (14) um die primäre Achse der Flasche drehbar ist.
10. Verschlussaufbau (10) nach Anspruch 1, wobei das Ausgießteil (15) weiterhin mit einem unteren Diffusor (23) ausgestattet ist.
11. Verschlussaufbau (10) nach Anspruch 10, wobei der Diffusor (23) ein Ventiltteil (29) aufweist.
12. Verfahren zum Herstellen eines Verschlussaufbaus (10) nach Anspruch 1, welches den Schritt aufweist, dass der umlaufende Ring (14) in einem Doppelspritzprozess gebildet wird, bei welchem der Ring (14) und das Ausgießteil (15) durch Spritzguss hergestellt werden, wobei gleichzeitig verschiedene Typen oder Farben eines Kunststoffmaterials verwendet werden.

Revendications

1. Système de fermeture (10) pour bouteilles destiné à être appliqué sur un goulot de bouteille (24), ledit système de fermeture (10) comprenant :

un capuchon (40) ayant une partie supérieure plate (13) et une partie latérale tubulaire (17) pourvue d'une surface intérieure filetée,
un bec verseur (15) adapté pour venir en prise avec le goulot (24) d'une bouteille à une extrémité, ledit bec verseur (15) ayant des filets extérieurs sur son autre extrémité pour la connexion avec ladite surface intérieure filetée du capuchon (40),
un manchon extérieur (11) qui recouvre la circonférence de la périphérie extérieure du système de fermeture et qui est divisé en un manchon supérieur (30) et un manchon inférieur (31) séparés par une ligne de rupture (32),
des moyens pour fournir un intervalle irréversible (16), lors de la première ouverture du capuchon (40), entre lesdits manchons supérieur et inférieur (30, 31) dans la direction longitudinale d'une bouteille

caractérisé en ce que, le système de fermeture comporte en outre une bague d'indication (14) en forme d'anneau recouverte en partie derrière le manchon inférieur (31) et en partie derrière le manchon supérieur (30) dans le sens longitudinal d'une bouteille,
ladite bague d'indication (14) étant fixée sur le bec verseur (15) et étant séparée de ladite partie

tubulaire latérale (17) du capuchon (40), dans lequel lesdits moyens pour fournir un espace irréversible (16) comprennent :

une rainure de butée (34) disposée de manière annulaire autour du bec verseur (15),
une pluralité de volets (36) qui sont fixés à la partie supérieure (13) dudit capuchon et qui sont poussés vers l'intérieur sous la pression périphérique du manchon supérieur (30) dans la direction radiale du capuchon (40),
une pluralité de bras de butée (18) sous une pression radiale de ladite pluralité de volets (36), lesdits bras de butée (18) pouvant prendre une première position dans laquelle lesdits bras de butée (18) ne gênent pas la rainure de butée (34) et lorsque le capuchon est ouvert pour la première fois, une deuxième position de sécurité dans laquelle les bras de butée (18) viennent en butée contre ladite rainure de butée (34) de telle sorte qu'un espace (16) est formé dans la direction longitudinale entre les bords circonférentiels voisins des manchons supérieur et inférieur (30, 31) lorsque le capuchon (40) est refermé.

2. Système de fermeture (10) selon la revendication 1, dans lequel ladite bague annulaire (14) présente une saillie (37) en forme de crochet pour venir en prise avec une surface correspondante (39) sur le bec verseur (15). 30
3. Système de fermeture (10) selon la revendication 1, dans lequel ladite bague annulaire (14) est dimensionnée pour établir une connexion avec ajustement serré avec le bec verseur (15). 35
4. Système de fermeture (10) selon la revendication 1, dans lequel ladite bague annulaire (14) est attachée de manière fixe au bec verseur (15) par soudage par ultrasons. 40
5. Système de fermeture (10) selon la revendication 1, dans lequel ladite bague annulaire (14) est attachée de manière fixe au bec verseur (15) avec un adhésif. 45
6. Système de fermeture (10) selon la revendication 1, dans lequel ladite bague annulaire (14) présente une rainure circonférentielle (28) pour contenir les bords circonférentiels voisins desdits manchons supérieur et inférieur (30, 31). 50
7. Système de fermeture (10) selon la revendication 1, dans lequel ladite bague annulaire (14) comporte un texte d'avertissement lisible autour de sa périphérie externe. 55

8. Système de fermeture (10) selon la revendication 1, dans lequel ladite bague annulaire (14) est symétrique en forme le long de sa demi-ligne dans la direction longitudinale de manière à éviter le tri lors de la fabrication du système de fermeture. 5
9. Système de fermeture (10) selon la revendication 1, dans lequel ladite bague annulaire (14) peut tourner autour de l'axe principal de la bouteille. 10
10. Ensemble de fermeture (10) selon la revendication 1, dans lequel ledit bec verseur (15) est en outre équipé d'un diffuseur inférieur (23). 10
11. Ensemble de fermeture (10) selon la revendication 10, dans lequel ledit diffuseur (23) comprend un élément de soupape (19). 15
12. Procédé de fabrication d'un ensemble de fermeture (10) selon la revendication 1, comprenant l'étape consistant à former la bague annulaire (14) dans un procédé de bi-injection, dans lequel la bague (14) et le bec verseur (15) sont moulés par injection simultanément à l'aide de types ou de couleurs de matière plastique différents. 20

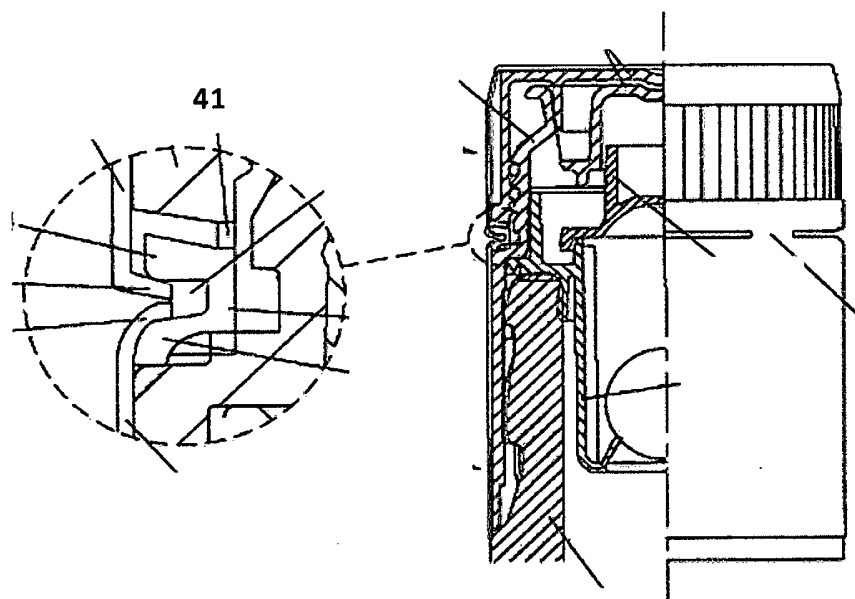


Fig. 1 (Prior Art)

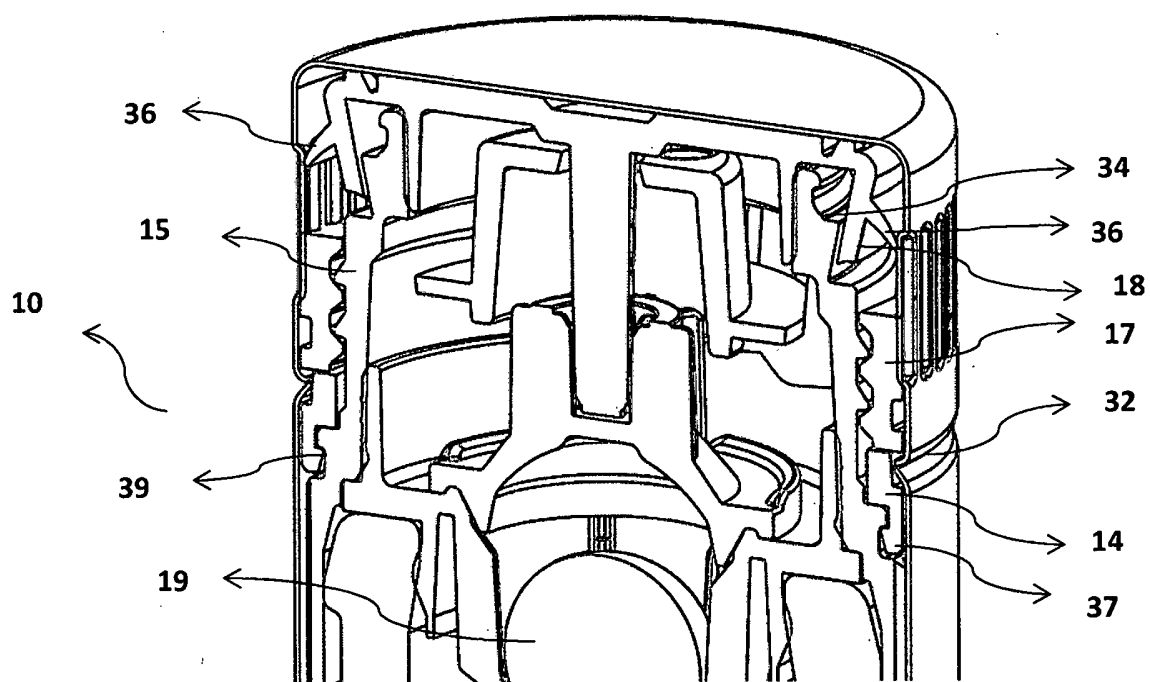
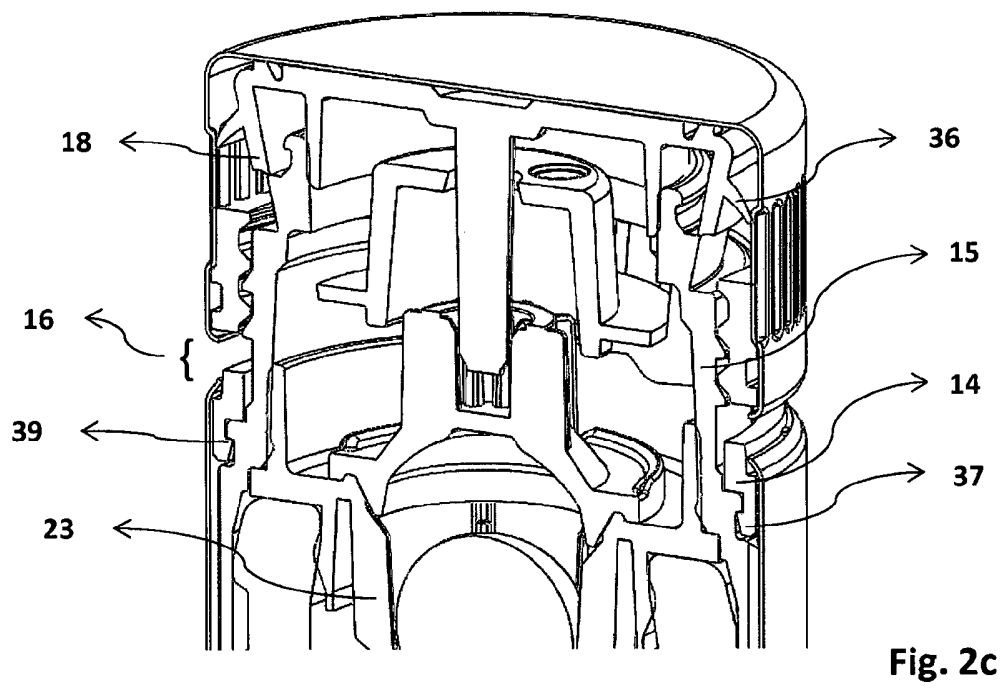
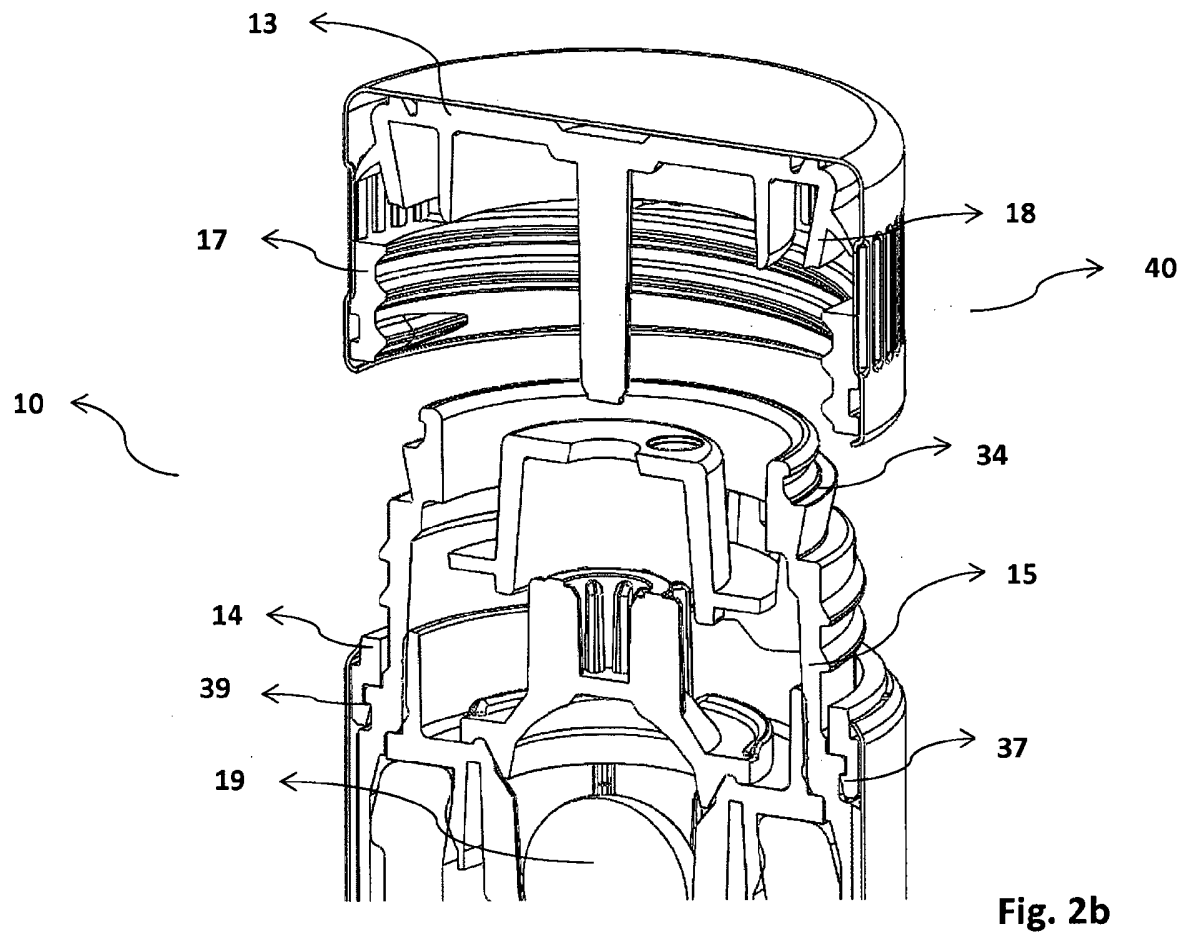


Fig. 2a



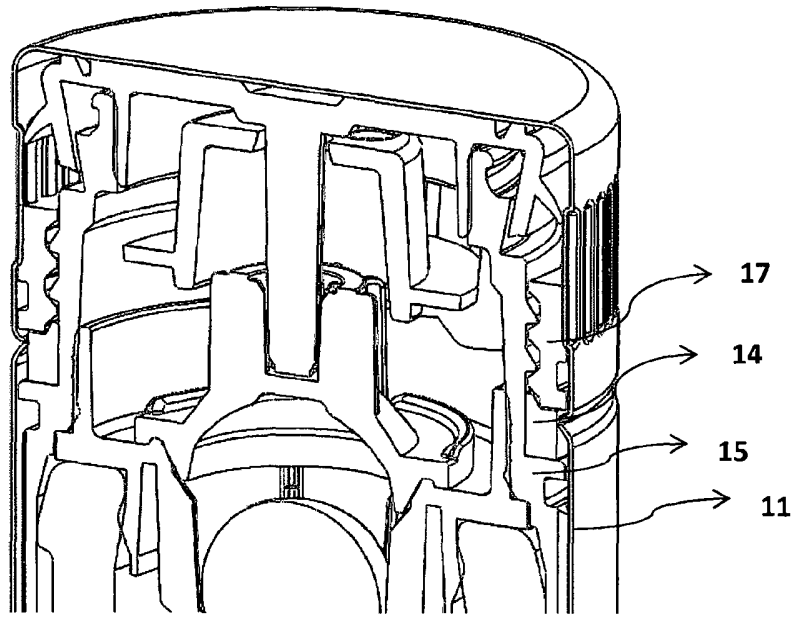


Fig. 3a

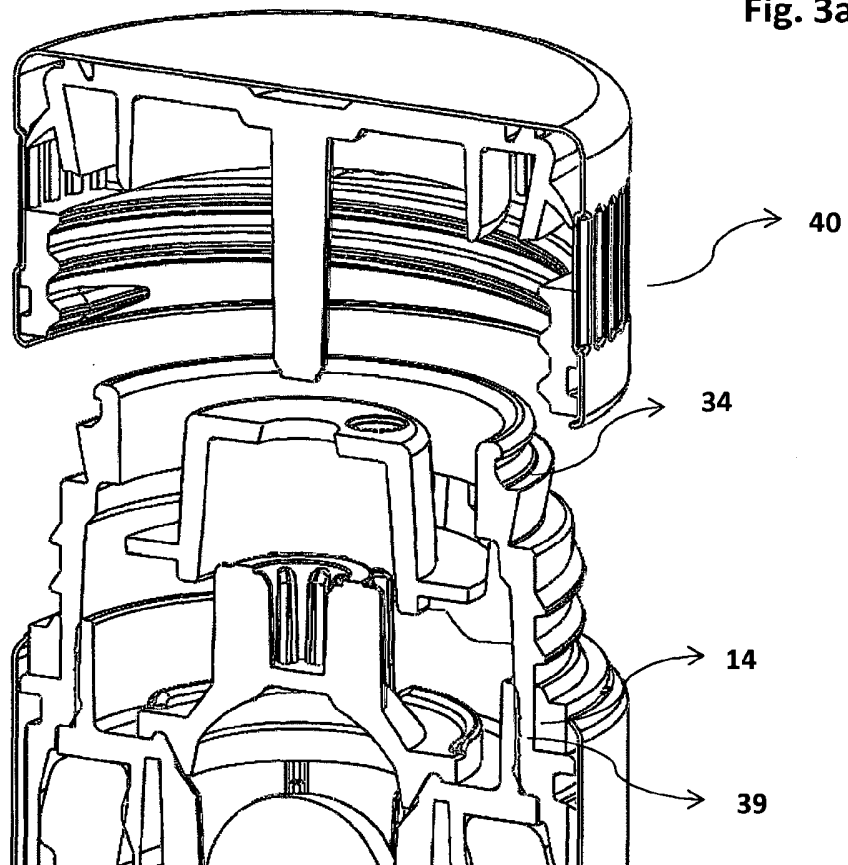


Fig. 3b

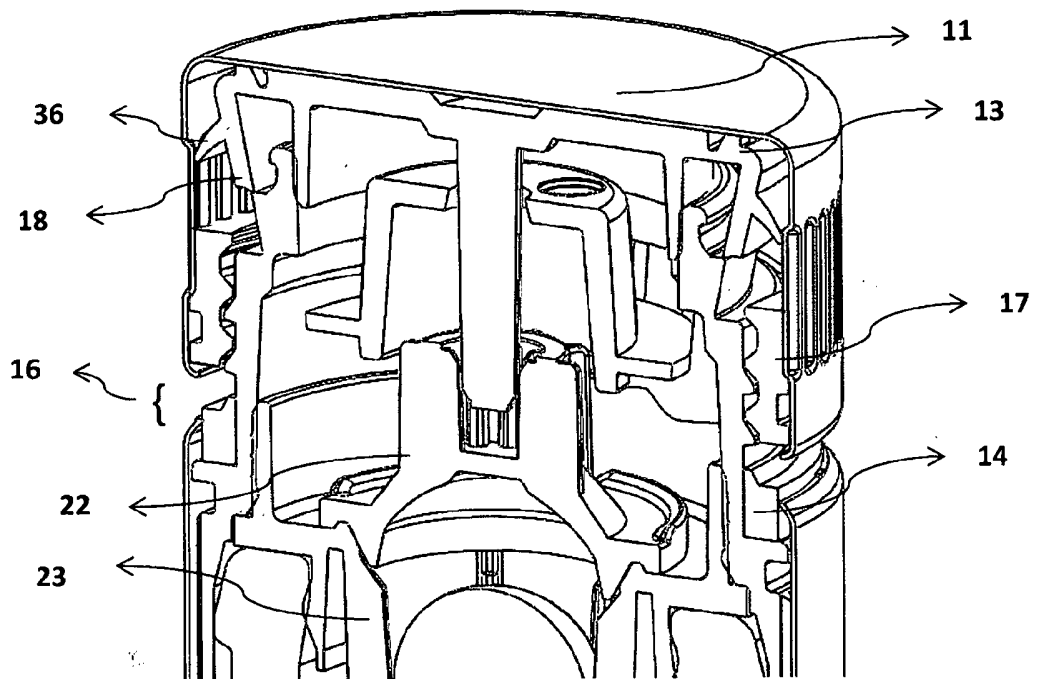


Fig. 3c

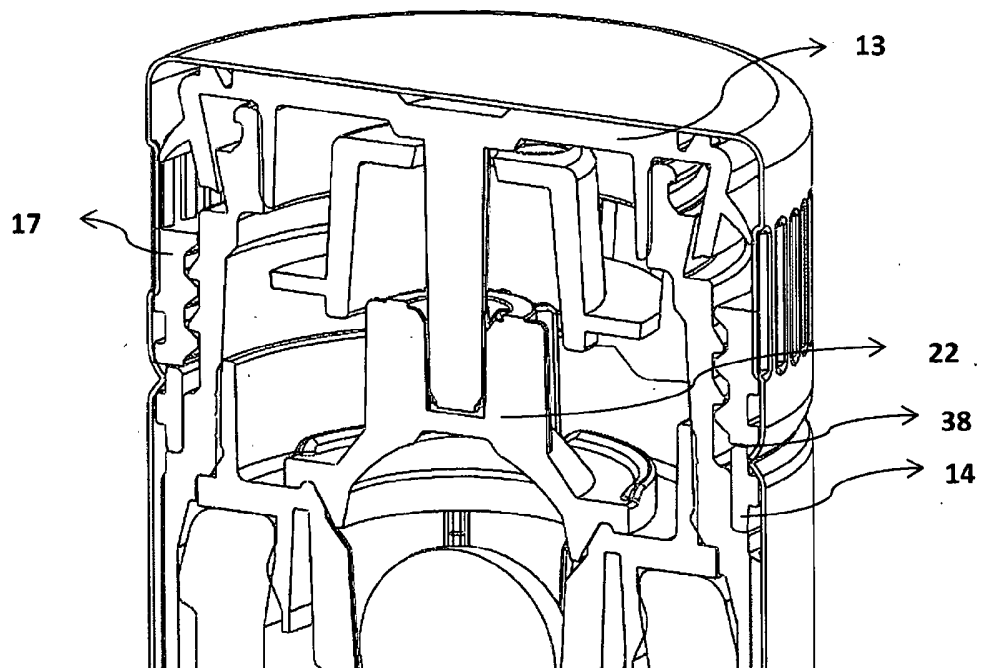


Fig. 4a

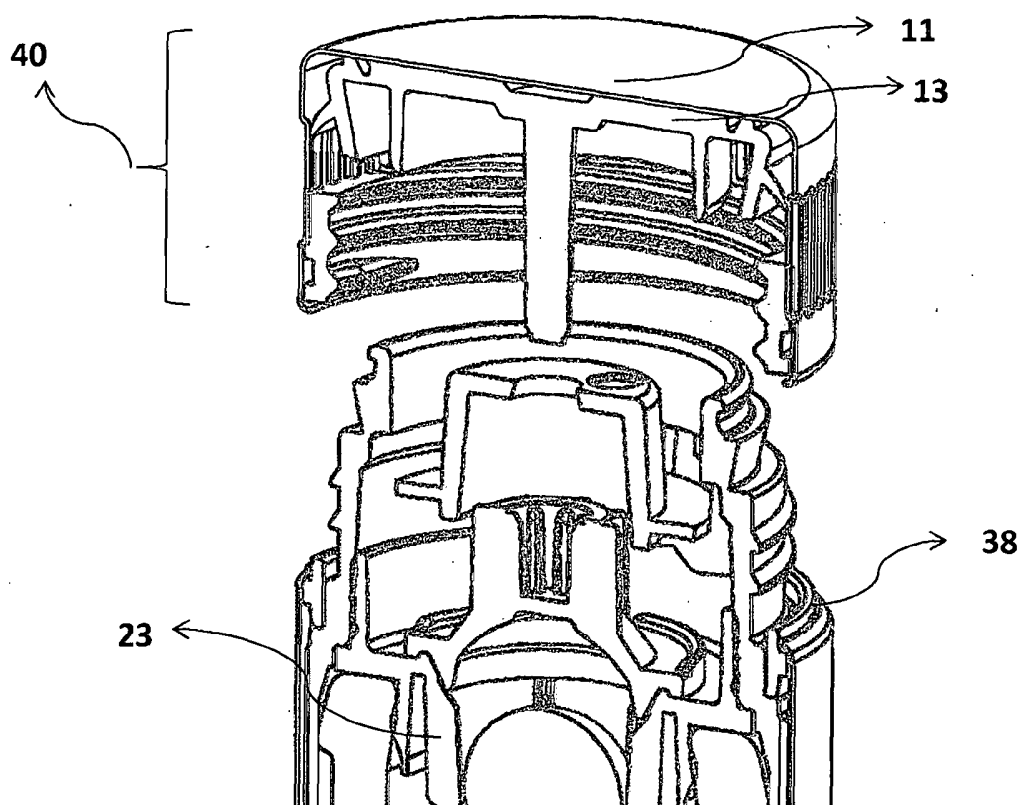


Fig. 4b

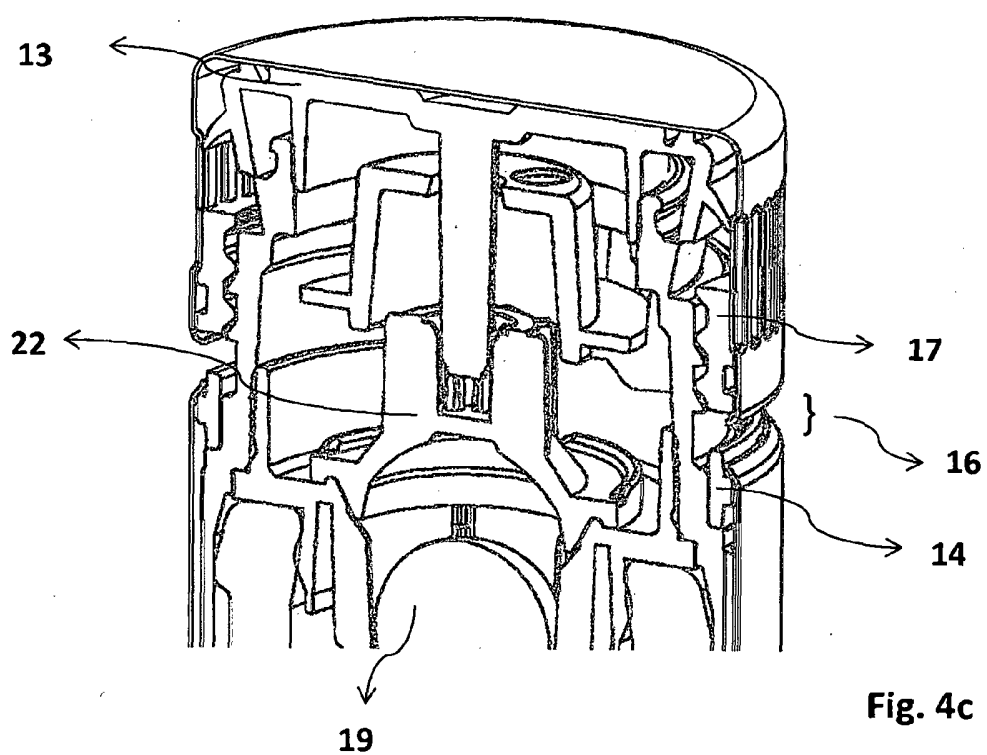


Fig. 4c

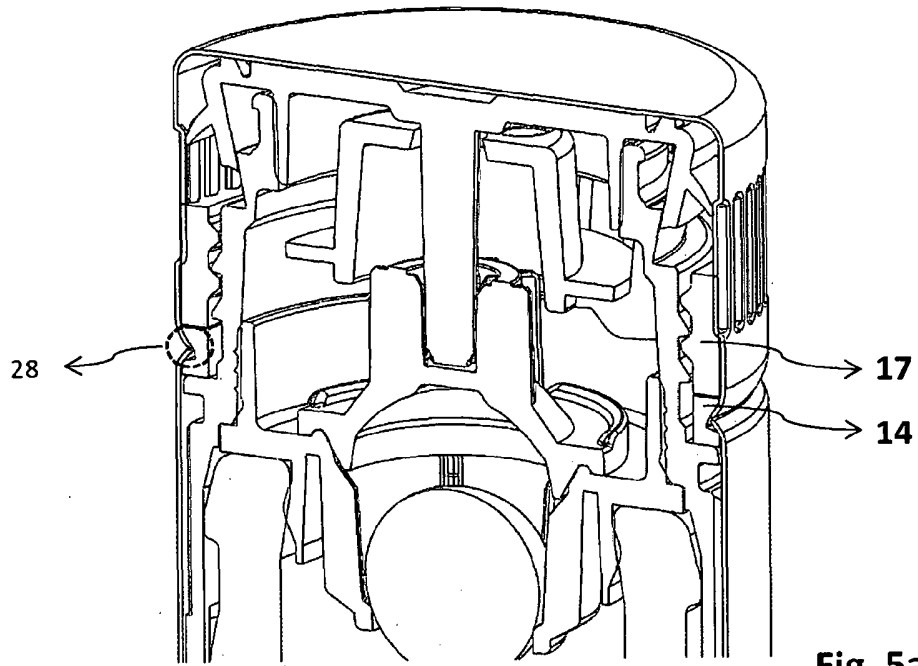


Fig. 5a

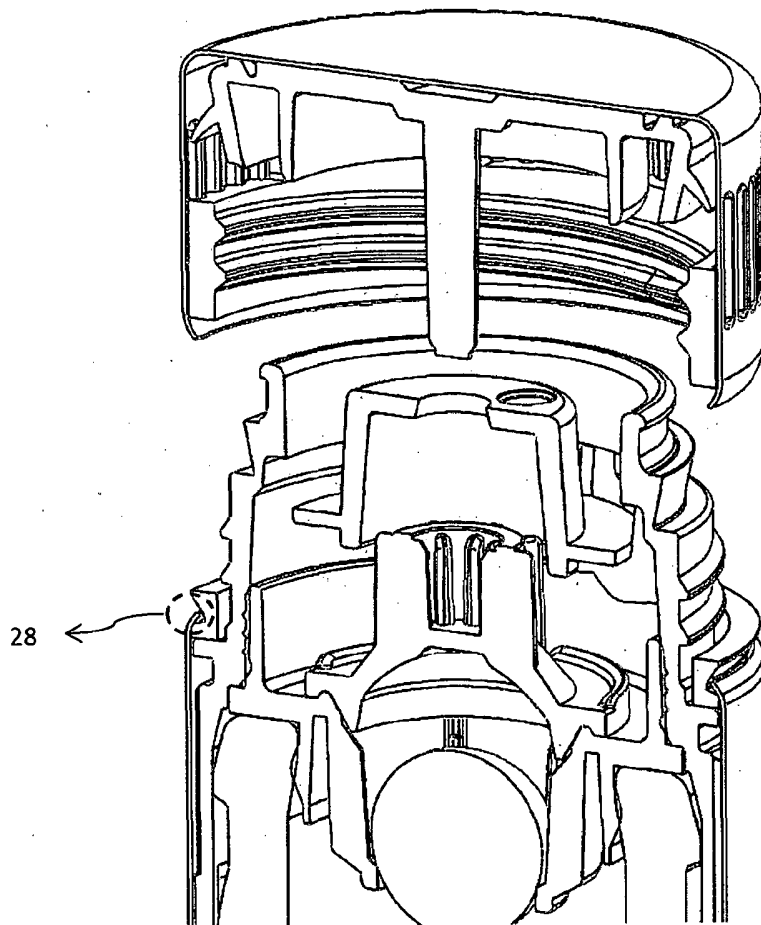


Fig. 5b

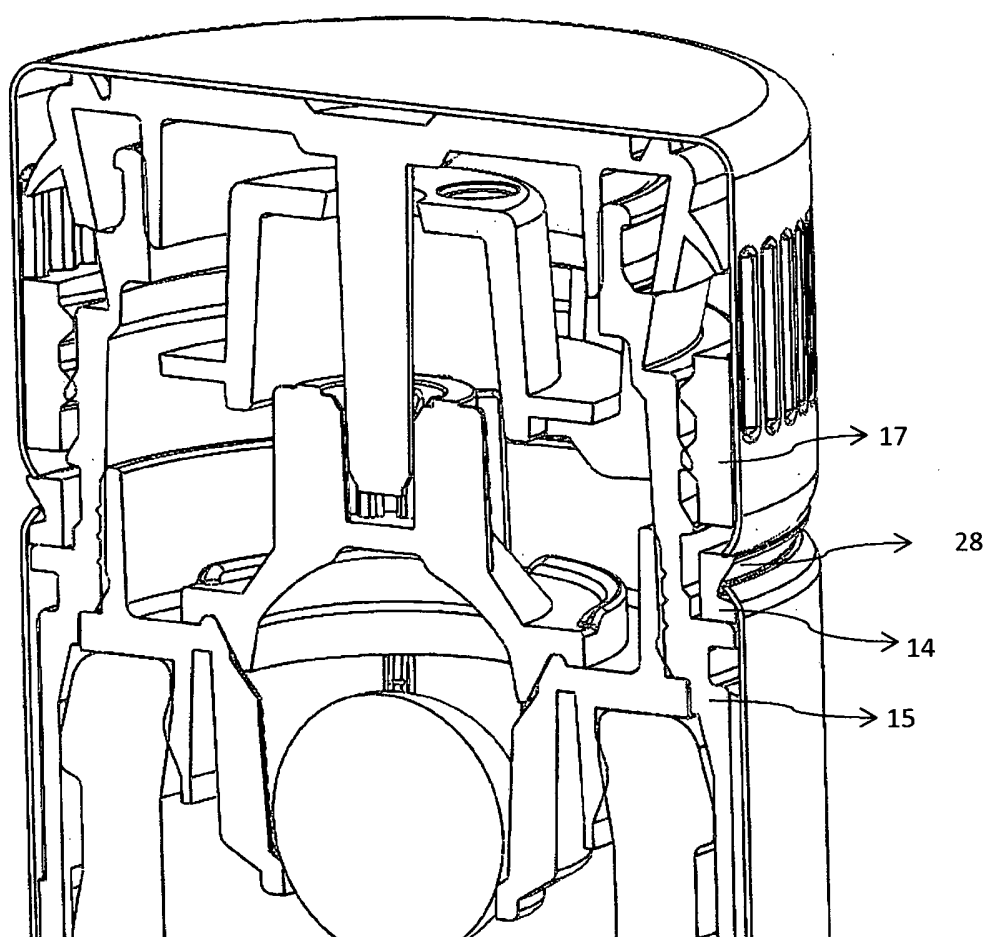


Fig. 5c

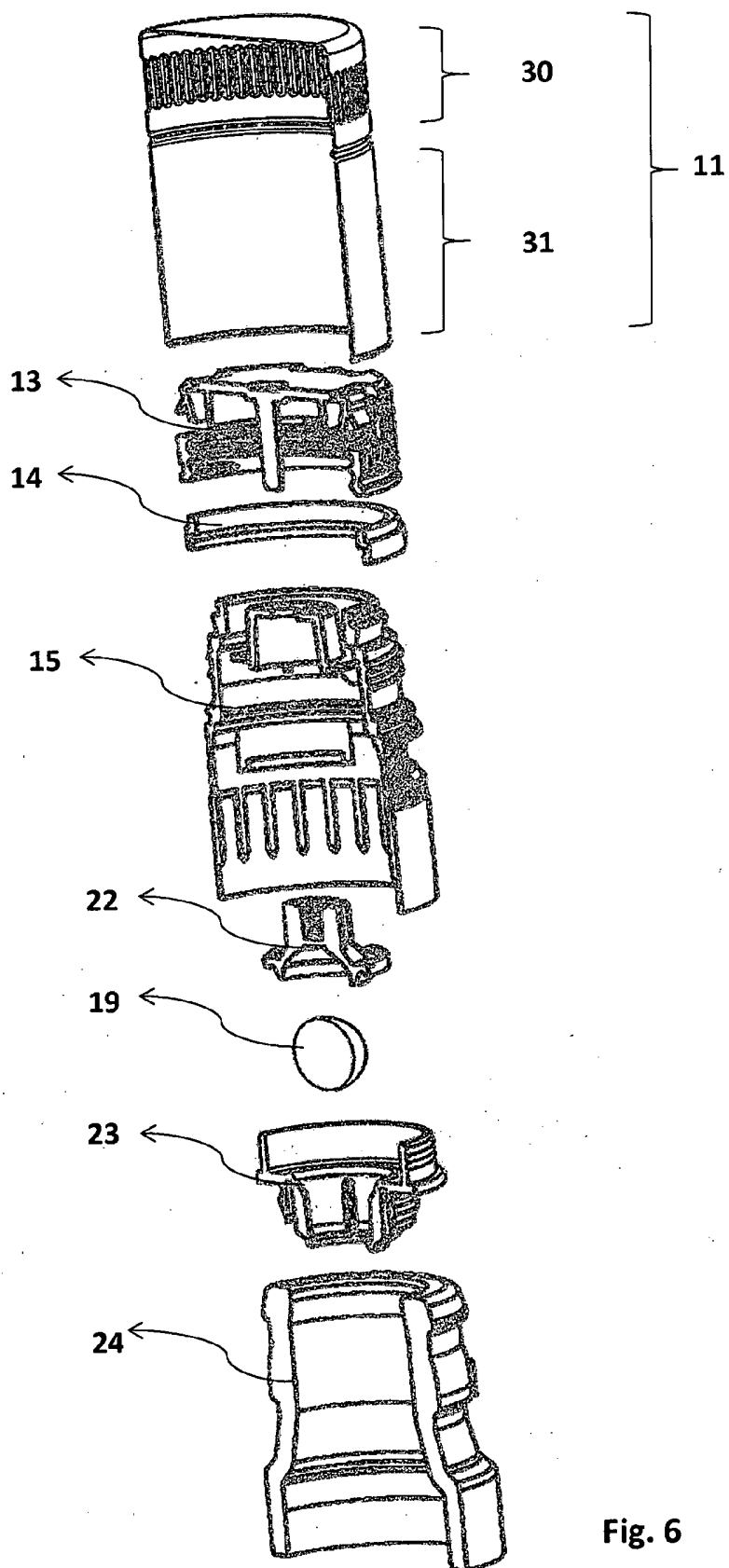


Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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DÉZSMÁLÁSJELZŐ ZÁRÓRENDSZER PALACKOKHOZ

SZABADALMI IGÉNYPONTOK

1. Palack nyakára (24) felhelyezhető, a palackot lezáró zárórendszer (10), amely tartalmaz: sík felső résszel (13) és csőszerű oldalsó résszel (17) rendelkező, menetes belső felülettel ellátott kupakot (40),

egyik végén a palack nyakához (24) csatlakoztatható kiöntőelemet (15), amely kiöntő elem (15) másik végén a kupak (40) belső menetes felületéhez csatlakoztatható külső menettel van ellátva,

a zárórendszer külső palástfelületét beborító külső hüvelyt (11), amely külső hüvely (11) egymástól szakítóvonallal (32) elválasztott felső hüvelyrészre (30) és alsó hüvelyrészre (31) van felosztva, és

a kupak (40) első felnyitásakor a felső és alsó hüvelyrész (30, 31) között a palack hosszirányában visszavonhatóan módon rést (16) kialakító eszközt,

azzal jellemezve, hogy a zárórendszer továbbá a palack hossziránya mentén részben az alsó hüvelyrész (31), részben a felső hüvelyrész (30) mögött gyűrűszerűen elhelyezkedő jelzőgyűrűvel (14) van ellátva,

a jelzőgyűrű (14) a kiöntőelemhez (15) van csatlakoztatva és a kupak (40) csőszerű oldalsó részétől (17) el van választva, ahol a palack hosszirányában visszavonhatóan módon rést (16) kialakító eszköznek:

- a kiöntőelem (15) körül elhelyezkedő, gyűrűszerűen kialakított támasztóhornya (34),
- több, a kupak felső részéhez (13) csatlakoztatott, a felső hüvelyrész (30) által kifejtett, a kupak (40) sugarának irányába irányuló kerületi nyomóerő által befelé eltolható füle (36),
- több, a fülek (36) sugárirányú nyomásának kitétt támasztókarja (18) van, ahol a támasztókarok (18) a támasztóhoronnyal (34) nem érintkező első helyzetet, illetve a kupak (40) első felnyitása után második biztonsági helyzetet vehetnek fel, amelyben a támasztókarok (18) a támasztóhoronyra (34) felfekszenek oly módon, hogy az alsó és felső hüvelyrész (30, 31) szomszédos kerületi peremei között a kupak (40) visszazárásakor a palack hosszirányában egy rés (16) alakul ki.

2. Az 1. igénypont szerinti zárórendszer (10), amelynél a gyűrű (14) a kiöntőelem (15) megfelelő felületével (39) egybekapcsolódó horog alakú nyúlvánnyal (37) van ellátva.

3. Az 1. igénypont szerinti zárórendszer (10), amelynél a gyűrű (14) úgy van méretezve, hogy a kiöntőelemmel (15) szoros illesztéssel kapcsolódjon össze.

4. Az 1. igénypont szerinti zárórendszer (10), amelynél a gyűrű (14) a kiöntőelemhez (15) ultrahangos hegesztéssel fixen van rögzítve.

5. Az 1. igénypont szerinti zárórendszer (10), amelynél a gyűrű (14) a kiöntőelemhez (15) ragasztóanyaggal fixen van rögzítve.

6. Az 1. igénypont szerinti zárórendszer (10), amelynél a gyűrű (14) a felső és alsó hüvelyrész (30, 31) szomszédos kerületi peremét befogadó kerületi horonnyal (28) van ellátva.

7. Az 1. igénypont szerinti zárórendszer (10), amelynél a gyűrű (14) külső palástfelülete mentén figyelmeztető szöveg olvasható.

8. Az 1. igénypont szerinti zárórendszer (10), amelynél a gyűrű (14) hosszanti irányban a felezővonalára szimmetrikusan van kialakítva annak érdekében, hogy a zárórendszer gyártásakor kihagyható legyen az alak szerinti rendezési lépés.

9. Az 1. igénypont szerinti zárórendszer (10), amelynél a gyűrű (14) a palack elsődleges tengelye körül elfordítható.

10. Az 1. igénypont szerinti zárószerezervény (10), amelynél a kiöntőelem (15) még alsó diffúzorral (23) is el van látva.

11. Az 10. igénypont szerinti zárószerezervény (10), amelynél a diffúzornak (23) szelepeleme (19) van.

12. Eljárás az 1. igénypont szerinti zárószerezervény (10) előállítására, amelynek során az alábbi lépést hajtjuk végre: a gyűrűt (14) kettős fröccsöntéssel alakítjuk ki, ahol a gyűrűt (14) és a kiöntőelemet (15) egyszerre, de eltérő típusú vagy eltérő színű műanyagból hozzuk létre fröccsöntéssel.

A meghatalmazott:

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