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(54) **DISPENSING DEVICE HAVING FITTING SHAPES FOR ASSEMBLING A SLEEVE TO COLLAR, RECEPTACLE, AND METHOD FOR ASSEMBLING A SLEEVE TO A COLLAR**

(57) The invention relates to a dispensing device, especially for cosmetically product, comprising a dispensing member (12), an actuator (10) configured to actuate the dispensing member (12) when the actuator (10) is pressed, a collar (14) able to maintain the dispensing member (13) on a reservoir (2), the dispensing device further comprising a jacket sleeve (15) assembled on the collar (14), the sleeve (15) and the collar (14) being assembled by fitting shapes arranged on the collar (14) and on the sleeve (15), said fitting shapes forming angular abutments, said fitting shapes either of the collar (14) or of the sleeve (15) being obtained by creep welding.

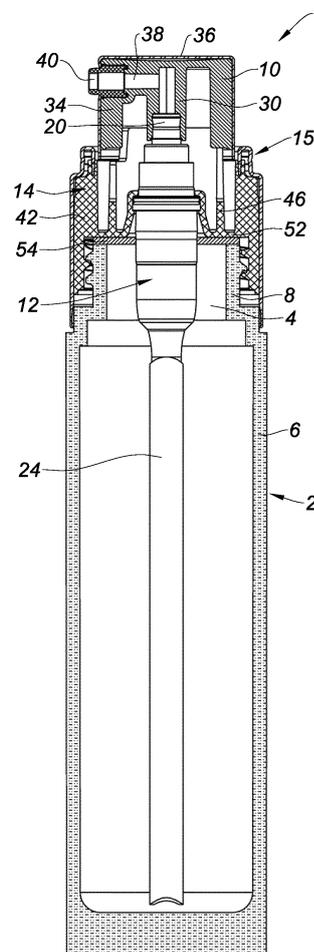


Fig. 1

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Description

[0001] The invention relates to a dispensing device having fitting shapes for assembling a sleeve to a collar. The invention further relates to a receptacle comprising said dispensing device. The invention also relates to a method for assembling a sleeve to a collar.

[0002] The dispensing device according to the invention is configured for dispensing a fluid product. In a particular application, the fluid product has a cosmetic or pharmaceutical use, especially in the form of liquid, gel or cream.

[0003] In the prior art, dispensing devices comprise a dispensing member, like a pump, an actuator, a push button for example, of which the body has a well for mounting on a tube for a pressurised supply of the product and a path for dispensing said product as far as a discharge passage.

[0004] Therefore, by pressing the push button, the tube is actuated to move over a dispensing/suction course of the product by the pump, in order to be able to retrieve the product through the discharge passage in a small amount or as a continuous stream.

[0005] In order to prevent the dispensing device from being involuntarily actuated by the push button being accidentally pressed, it is known to equip said device with a cap that covers said push button between two uses. It is also proposed to equip the dispensing device with means for reversibly locking the actuation thereof to prevent the movement of the push button over its actuating course.

[0006] In order to arrange the dispensing device on a receptacle neck, dispensing devices are conventionally equipped with a collar configured to hold firmly the pump to the neck, preferably in an airtight manner. Generally, at least one part of the pump is arranged inside the receptacle neck and the collar abuts a top part of the pump, the collar being connected to the neck through fixing means that could be removable or not. For actuation, the push button is axially movable at least partly in the collar over the actuating course of the pump tube.

[0007] Moreover, it is well known to arrange a sleeve on the collar in order to hide the collar for aesthetic reasons, as well as protecting the collar. In general, the neck, the collar and the sleeve are tube shaped. The sleeve can be connected to the collar by force coupling assembly.

[0008] Nevertheless, when the collar and the sleeve are made of dissimilar material, a reliable interlocking is difficult to reach, especially in the case of a plastic collar, used for its light weight and easy to mould, assembled to a metal sleeve, used for aesthetic reason and its skill to resist against worsening.

[0009] US 4 984 702 proposes, in particular, a dispensing device comprising a pushbutton, a pump, a metal sleeve and a plastic collar. The plastic collar is able to keep the pump on a receptacle neck thanks to fixing means. The metal sleeve has a bent rim on the interior

side that can be inserted into an annular groove arranged on the collar upper edge. The assembling is reached thanks to interlocking the rim in the groove, the rim being larger than the groove. As the metal sleeve is harder than the plastic collar, the rim is embedded in the groove. Consequently, the metal sleeve is resiliently assembled to the plastic collar against axial forces separating one from the other.

[0010] Nevertheless, this assembling is not sufficiently strength to avoid rotational movement of the metal sleeve relating to the plastic collar while this kind of rotational actuation is often needed, especially in case of pushbutton locking systems. Furthermore, a rotational movement induces worsened wear of the connection assembly between the two elements, and could lead to the separation of one from the other.

[0011] The invention aims to improve the assembling reliability between a jacket sleeve and a collar.

[0012] For this purpose, the invention relates to a dispensing device, especially for cosmetically product, comprising a dispensing member, an actuator configured to actuate the dispensing member when the actuator is pressed, a collar able to maintain the dispensing member on a reservoir, the dispensing device further comprising a jacket sleeve assembled on the collar, the sleeve and the collar being assembled by fitting shapes arranged on the collar and on the sleeve, said fitting shapes forming angular abutments, said fitting shapes either of the collar or of the sleeve being obtained by creep welding.

[0013] Thanks to angular abutments, the invention prevents the collar and the sleeve from rotationally moving one relatively to the other. Consequently, such fitting shapes perform the connecting reliability of the sleeve to the collar, as they avoid worsening due to rotational movement of the sleeve around the collar. Moreover, according to the invention, such kind of fitting shapes area easily produced thanks to creep welding.

[0014] According to different embodiments, which can be taken together or separately:

- the dispensing device comprises a wall, said fitting shapes including on one hand one or several excrescences and on the other hand one or several notches provided in said wall, one of said excrescences being arranged in one of said notches,
- said notches are holes,
- the wall has teeth, one of said notches being defined between two of said teeth,
- said teeth comprise holes forming further fitting shapes in order to form axial abutments,
- said teeth form hooks in the notches, said fitting shapes forming axial abutments thanks to said hooks,
- the dispensing device comprises a groove said wall being at least partly inserted in the groove,
- the fitting shapes are arranged in the groove,
- the wall belongs to the sleeve, whereas the excrescences and the groove belong to the collar,

- the groove is set on the upper edge of the collar,
- the wall is hidden by the sleeve,
- the wall is metal built,
- the excrescences are plastic built,
- the sleeve is metal built,
- the collar is plastic built,
- the excrescences are obtained by said creep welding,
- the creep welding is preferably operated by ultrasound means,
- the dispensing device comprises a multiplicity of fitting shapes,
- the dispensing device comprises at least five of said fitting shapes,
- the dispensing device comprises at least ten of said fitting shapes,
- the fitting shapes are hidden by an external skirt of the sleeve,
- the fitting shapes are arranged on an internal skirt of the sleeve,
- the internal skirt is a bent part of the sleeve,
- the collar and the sleeve are tubular shaped,
- the pushbutton is movable at least partly in the collar.

[0015] The invention also provides a receptacle comprising a reservoir and a dispensing device as described above. Said receptacle further comprises a neck able to receive said dispensing member, the collar of the dispensing device being able to be fixed on the neck.

[0016] The invention further relates to a process for manufacturing a dispensing device, especially for cosmetically product, comprising a dispensing member, an actuator configured to actuate the dispensing member when the actuator is pressed, a collar able to maintain the dispensing member on a reservoir, said dispensing device further comprising a jacket sleeve assembled on the collar, the sleeve and the collar being assembled by fitting shapes arranged on the collar and on the sleeve, said fitting shapes forming angular abutments, said process comprising the step of obtaining said fitting shapes either of the collar or of the sleeve by creep welding, preferably operated by ultrasound means. Moreover, the fitting shapes usefully produced by said creep welding are excrescences.

[0017] Other objects and advantages of the invention will become apparent in the following description, given with reference to the accompanying drawings, in which:

- Fig. 1 is a sectional side view of a receptacle comprising a dispensing device according to the invention,
- Fig. 2(a) is a perspective view of a sleeve and a collar of a dispensing device according to the invention, the sleeve and the collar being assembled together,
- Fig. 2(b) is a sectional side view of a sleeve and a collar of a dispensing device according to the invention, the sleeve and the collar being assembled together,

- Fig. 3 is an enlarged view of the connection between the sleeve and the collar of Fig. 2(a) and 2(b),
- Fig. 4 shows a perspective view of a first embodiment of a sleeve of a dispensing device according to the invention,
- Fig. 5 shows a perspective view of a second embodiment of a sleeve of a dispensing device according to the invention,
- Fig. 6 shows a perspective view of a third embodiment of a sleeve of a dispensing device according to the invention,
- Fig. 7 shows a perspective view of a fifth embodiment of a sleeve of a dispensing device according to the invention.

[0018] In the description, the terms relating to positioning in space are understood with reference to the position of the receptacle shown in the drawings.

[0019] As illustrated on figures 1 and 2, the invention relates to a dispensing device 1 for dispensing a viscous or liquid fluid located in a fluid reservoir 2 of a receptacle. Said reservoir 2 may comprise a body 6 packaging the product and a neck 4, which is formed in one piece with said body. The body 6 may be made of rigid material, in particular of glass or plastics material. The body 6 of the reservoir can be cylindrical, polygonal or any other shape. The reservoir is intended to contain a fluid product. In particular examples, the product may be a liquid, a gel or a cream, for a cosmetic use or for pharmaceutical treatments. The dispensing device is able to dispense said fluid product out of the reservoir. Advantageously, the dispensing device 1 is designed to be reversibly connectable to the neck 4 of said reservoir. The dispensing device 1 can be fastened, for example by screwing, on the neck 4 of said reservoir 2. In this case, an external surface 8 of the neck 4 is threaded.

[0020] The dispensing device 1 comprises an actuator 10, a dispensing member 12 configured to be actuated by said actuator 10 and a collar 14 configured to be linked to the reservoir 2 and to support said dispensing member 12. The dispensing member 12 can be a pump mechanism or a valve mechanism. Here, the dispensing member 12 is a pump mechanism. Said pump mechanism 12 advantageously comprises an actuator rod 20, a pump body 22 and a feed tube 24. The actuator 10 and the actuator rod 20 are coupled in translation along a longitudinal axis of the dispensing device, here a vertical axis, meaning that they move simultaneously in translation along such longitudinal axis, which causes an actuation of the pump mechanism and a distribution of product. The actuator 10 has a cylindrical general shape and substantially extends along said longitudinal axis. The actuator comprises an internal ring 30 defining a housing in which the actuator rod 20 abuts. Said internal ring 30 comprises a lateral wall defining a bottom opening passed through by said actuator rod 20.

[0021] The actuator 10 may be a push button. It comprises an external ring 34 and a thrust side 36. Said ex-

ternal ring 34 defines an external lateral wall of said actuator 10. Said thrust side 36 is located at the upper end of the actuator 10 and configured to be actuated by a user. Said internal ring 30 and said external ring 34 both extend longitudinally and coaxially from said thrust side 36. Said thrust side 36 comprises an exit channel 38 for the product to be distributed. Said exit channel 38 is here oriented transversally to said longitudinal axis. Said exit channel 38 communicates at one end with an upper opening of said internal ring 30 and is provided at the other end with an orifice 40 for dispensing said product. Said thrust side 36 can be pressed by the user in a pushing direction, said pushing direction being parallel to said longitudinal axis. By doing so the actuator rod 20 is actuated downwardly and the pump is actuated. The product exits the actuator rod 20, passes through the upper opening of said internal ring 30, flows in said exit channel 38 and is distributed externally through said orifice 40.

[0022] The collar 14 is configured to allow the actuator 10 to slide along said longitudinal axis when pressed. The collar 14 is short tube-shaped and comprises an external ring 42 surrounding a part of the external ring 34 of said actuator 10, and an internal ring 46 surrounded by a part of the external ring 34 of said actuator 10. Said external and internal rings 42, 46 both extend longitudinally and concentrically relative to the longitudinal axis. Said external ring 46 has on a lower part 47 toward the neck a thread to engage with the thread provided on the receptacle neck 4. More generally, said collar 14 is configured to be reversibly fastened to the reservoir 2. It could also be clamped on the reservoir 2.

[0023] The collar 14 further comprises a flange 52 oriented perpendicularly to said longitudinal axis of said dispensing device. It radially extends from the external ring 42 to a lower edge of said internal ring 46. A sealing gasket 54 is here provided between said flange 52 and an upper edge of said neck 4. The thread defined by said external ring 46 is located between said flange 52 and a free end of external ring 46. Furthermore, the collar is plastic built, in order to make it easy to shape, by moulding for example.

[0024] Moreover, the dispensing device 1 comprises a jacket sleeve 15 for hiding and protect the collar 14 and/or to garnish the dispensing device 1. In another embodiment, the sleeve is configured to maintain the collar on the neck of the receptacle, by means of forced interlocking for example, when the collar is not able to be fixed by himself to the receptacle.

[0025] The jacket sleeve 15 is short tube shaped having a thin foil, by preference metal built in order to be reliable and protective. The jacket 15 surrounds at least partially the collar 14, the collar 14 and the sleeve 15 having fitting dimensions in order to be close contacting. Here, the whole part of the collar 14 is surrounded by the sleeve 14, as showed on figures 1 and 2.

[0026] The jacket 15 and the collar 14 are assembled by fitting shapes 16 arranged on one part on the collar 14 and on the other part on the sleeve 15.

[0027] According to the invention, said shapes 16 form angular abutments. Thanks to the angular abutments, the sleeve 15 is rotationally locked around the collar 14, in order to avoid worsening of the connection.

5 **[0028]** More particularly, the dispensing device 1 comprise a groove 21 arranged on the collar 14 and a wall 23 belonging to the sleeve 15, the wall 23 being at least partly inserted in the groove 21 when the sleeve 15 is connected to the collar 14. The wall 23 is metal built as the sleeve 15, and the groove 21 is plastic built as the collar 14. In the following embodiments, the wall 23 is an annular skirt of the sleeve 15, the wall 23 being placed in an internal volume defined by a remaining part of the sleeve 15 for hiding the fitting shapes 16.

10 **[0029]** The groove 21 belongs to the upper edge of the external ring 42 of the collar 14, and forms an annular loop in order to allow the wall 23 to fit therein. The interlocking of the sleeve 15 on the collar 14, is obtained when the wall 23 is arranged at least partly in the groove 21, whereas an external skirt of the sleeve 15 surrounds the external ring 42 of the collar 14 in close contact manner, as showed on figures 2b and 3.

[0030] The fitting shapes 16 belong on one part to the wall 23 and on the other part to the groove 21.

20 **[0031]** In a first embodiment, represented on figure 4, the wall 23 is a rim 25 of the sleeve 15. More precisely the wall 23 is a bent upper rim 25 toward the internal volume of the sleeve 15. Then the rim 25 forms an annular loop that is inserted in the groove 21.

25 **[0032]** In order to form said angular abutments, the rim 25 has at least one hole 26, preferably several holes, at least 5 or 10 for example. As represented on fig.4, a multiplicity of holes 26 are spread along the rim 25. The holes 26 are the first part of the fitting shapes 16, that are arrange on the sleeve 15.

30 **[0033]** The second part of the fitting shapes 16 are excrescences belonging to the collar and being arranged in the groove, the excrescences being not showed on the figures. The excrescences have roughly the shape needed to fill in the holes 26, meaning that they join the opposite side of said groove 21. The groove 21 has one excrescence for each hole 26, one excrescence being inserted in one hole 26. The excrescences and the holes 26 are here the fitting shapes 16 forming angular abutments. The excrescences lock the holes 26 in the groove 21. Consequently the sleeve 15 can't rotationally move relative to the collar 14. Furthermore, the excrescences and holes 16 form axial abutments, as the holes have closed circumferences. Then, the fitting shapes 16 of this embodiment also increases the axial force of the sleeve to the collar.

35 **[0034]** In a second embodiment, illustrated on fig. 5, instead of the holes, the wall comprises several teeth 27, formed at the bent rim 25 of the sleeve 15, said teeth 27 being metallic built as a part of the sleeve 15. A tooth 27 has one free edge 31 on the opposite side of the main part of the sleeve 15, and two transverse edges 33 linking the free edge 31 to the main part of the sleeve 15. The

alternative presence of teeth 27 forms crenel rim 25 of the wall, and consequently induces notches 35 between two teeth 27.

[0035] As in the preceding embodiment, excrescences belonging to the groove are inserted in the notch in order to form angular abutments with the transverses edges 33 of the teeth 27. The excrescences have preferably the same shape as the notches 35 and fill in said notches 35. They define with the teeth 27 the fitting shapes 16. Here, the teeth 21 and the notches 35 are inserted in the groove 21.

[0036] The third embodiment, illustrated on fig. 6, relates to similar fitting shapes as those of the second embodiment relating to teeth 27. But here, the teeth 27 comprise additional holes 37 extending through their thickness, said holes being configured to cooperate with additional excrescences of the groove 21. As in the first embodiment, said excrescences and holes forms angular and axial abutments, and then avoid both rotational and axial movements of the sleeve 15 around the collar 14.

[0037] A fifth embodiment showed on fig.7 relates to similar fitting shapes 16 as the second embodiment. Moreover, free edge 31 of the teeth 27 form hooks 39 in a dovetail way in order to avoid axial movement of the sleeve 15 relating to the collar 14. For that goal, free edges 31 are longer than the joint side belonging both to the main part of the sleeve 14 and to the tooth 27. Then, a tooth 27 can have two hooks 39, one on each transverse edge 33, as can be seen on figure 7. Hooks 39 are angularly prominent toward the notches 35, and their function is to lock axially the sleeve 15 on the collar 14.

[0038] In an embodiment not shown, the opposite sides of the groove 21 may have different height. Providing the collar 14 with a single shoulder is also possible.

[0039] According to the invention the fitting shapes 16 provided on the collar 14 are obtained by creep welding. Here, for each embodiment, the excrescences are obtained by creep welding of the plastic material of the collar 14, when the sleeve 15 is mounted on the collar 14, i.e. when the wall 23 and the notches 26, 35 are inserted in the plastic groove 21. During welding, plastic of the collar flows in the notch because of temperature increasing, and excrescences are created. After cooling, the excrescences become harder, and are trapped in the notches 26, 35. Consequently, the sleeve 15 is locked rotationally and axially on the collar 14.

[0040] The invention further relates to a method for assembling a sleeve to a collar of a dispensing device. The method comprises a step consisting in locating the fitting shapes of the sleeve in the groove of the collar, and in a second step to create excrescences thanks to creep welding. Preferably the creep welding is operated by use of ultrasound system that is efficient to use for welding plastic and metal material together in order to have a reliable assembling.

Claims

1. Dispensing device, especially for cosmetically product, comprising a dispensing member (12), an actuator (10) configured to actuate the dispensing member (12) when the actuator (10) is pressed, a collar (14) able to maintain the dispensing member (13) on a reservoir (2), the dispensing device further comprising a jacket sleeve (15) assembled on the collar (14), the sleeve (15) and the collar (14) being assembled by fitting shapes (16) arranged on the collar (14) and on the sleeve (15), said fitting shapes (16) forming angular abutments, said fitting shapes either of the collar (14) or of the sleeve (15) being obtained by creep welding.
2. Dispensing device according to claim 1, comprising a wall (23), said fitting shapes (16) including on one hand one or several excrescences and on the other hand one or several notches (26, 35) provided in said wall (23), one of said excrescences being arranged in one of said notches (26, 35).
3. Dispensing device according to claim 2, wherein said notches are holes (26).
4. Dispensing device according to claim 2, wherein the wall (23) has teeth (27), one of said notches (35) being defined between two of said teeth (27).
5. Dispensing device according to claim 4, wherein said teeth (27) comprise holes (37) forming further fitting shapes (16) in order to form axial abutments.
6. Dispensing device according to claim 4, wherein said teeth (27) form hooks (39) in the notches (35), said fitting shapes (16) forming axial abutments thanks to said hooks (39).
7. Dispensing device according to any of claims 2 to 6, comprising a groove (21), said wall (23) being at least partly inserted in the groove (21).
8. Dispensing device according to claim 7, wherein the fitting shapes (16) are arranged in the groove (21).
9. Dispensing device according to any of claims 2 to 8, wherein the wall (23) belongs to the sleeve (15), whereas the excrescences and the groove (21) belong to the collar (14).
10. Dispensing device according to any of claims 2 to 9, wherein the wall (23) is hidden by the sleeve (15).
11. Dispensing device according to any of claims 2 to 10, wherein the wall (23) is metal built and the excrescences are plastic built.

12. Dispensing device according to any of claims 2 to 11, wherein the excrescences are obtained by said creep welding, preferably operating by ultrasound means. 5
13. Dispensing device according to any of preceding claims comprising a multiplicity of fitting shapes (16), preferably at least five or ten.
14. Receptacle comprising a reservoir (2) and a dispensing device (1) according to any of preceding claims. 10
15. Process for manufacturing a dispensing device (1), especially for cosmetically product, comprising a dispensing member (12), an actuator (10) configured to actuate the dispensing member (12) when the actuator (10) is pressed, a collar (14) able to maintain the dispensing member (12) on a reservoir (2), said dispensing device further comprising a jacket sleeve (15) assembled on the collar (14), the sleeve (15) and the collar (14) being assembled by fitting shapes (16) arranged on the collar (14) and on the sleeve (15), said fitting shapes (16) forming angular abutments, said process comprising the step of obtaining said fitting shapes (16) either of the collar (14) or of the sleeve (15) by creep welding. 15
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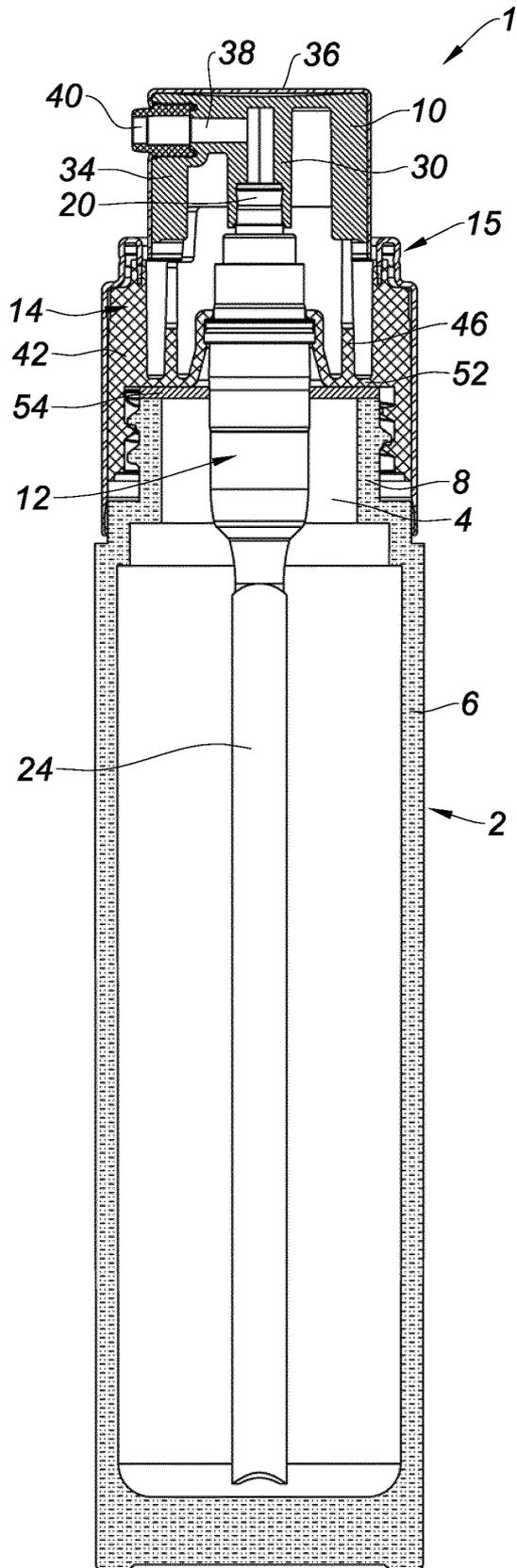
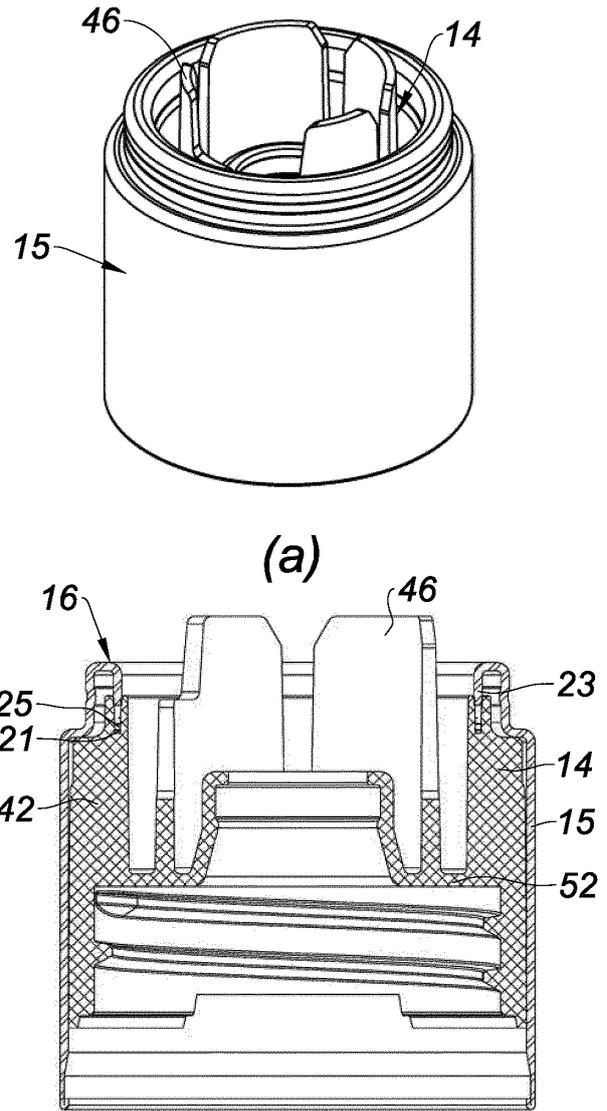


Fig. 1



(b)
Fig. 2

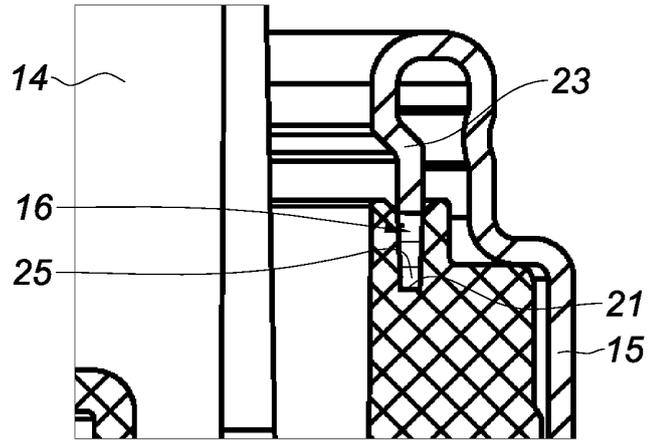


Fig. 3

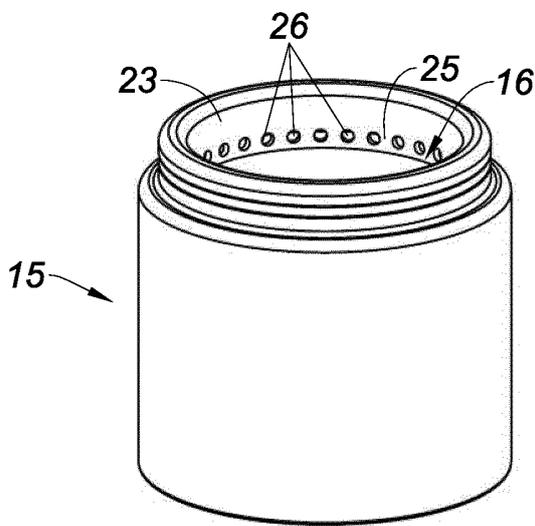


Fig. 4

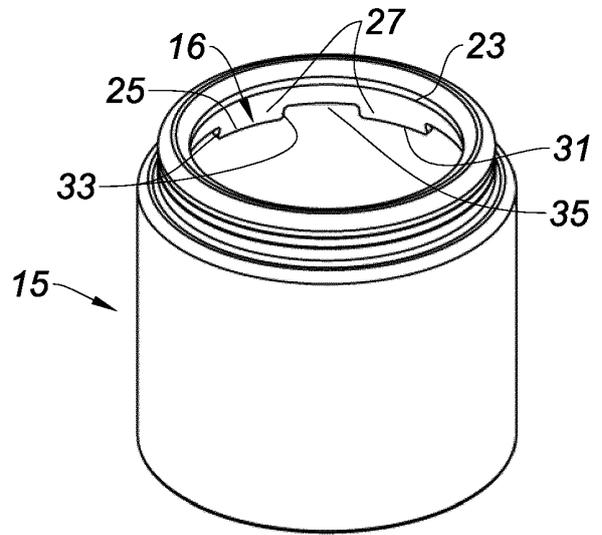


Fig. 5

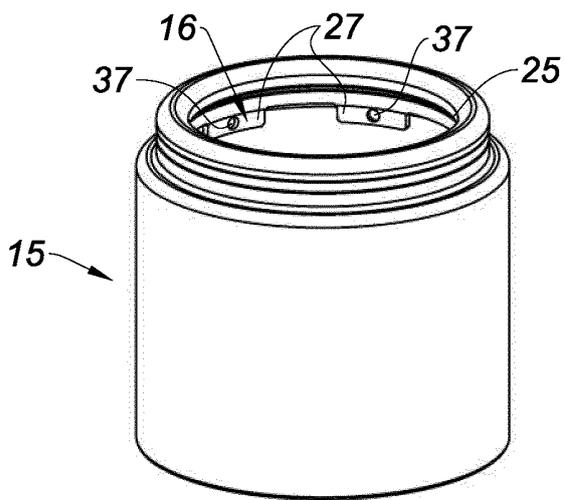


Fig. 6

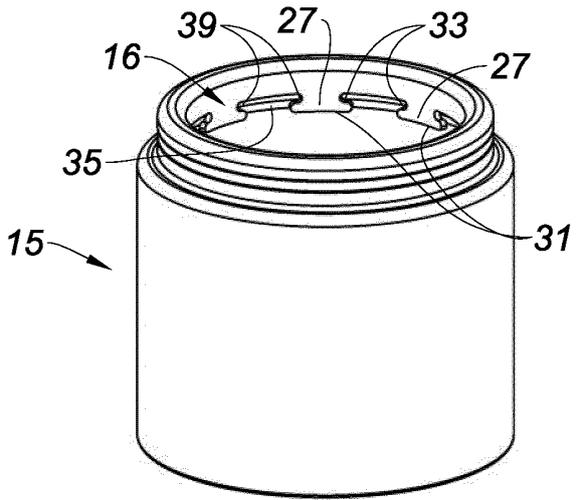


Fig. 7



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