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(54) **ONE-PIECE SPRAY CAP WITH MONOLITHICALLY FORMED LOCKING MEMBER AND ACTUATING MEMBER**

EINTEILIGE SPRÜHKAPPE MIT MONOLITHISCH GEFORMTEM VERRIEGELUNGSELEMENT UND BETÄTIGUNGSELEMENT

CAPUCHON DE PULVÉRISATION D'UN SEUL TENANT DOTÉ D'UN ÉLÉMENT DE VERROUILLAGE ET D'UN ÉLÉMENT D'ACTIONNEMENT FORMÉS DE FAÇON MONOLITHIQUE

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Description

[0001] The field of the invention relates to a spray cap with a locking member and actuating member.

[0002] Spray caps with a locking member to prevent accidental activation of an actuator are known and are readily available for use with an aerosol container. An aerosol container may be defined as a container adapted to contain a payload and a propellant which are to be expelled from the container through a dispensing mechanism; thereby forming an aerosol. Typically the container for such aerosol applications is found to be a metal cylinder, though containers made of glass and/or other shapes are also conceivable. The expelled aerosol may pertain to e.g. a hairspray, a deodorant or another similar product. In practice the dispensing mechanism on aerosol containers tends to comprise a valve stem. Pressing on the valve stem opens an associated valve and releases the aerosol from the container into the spray channel.

[0003] Such a spray cap with a locking member to prevent accidental activation of an actuator is for example known from WO2004/047998. In this document a spray cap is disclosed with a hinging nozzle locking member with two projections. One of these projections, when engaged with an actuator recess internal to the spray cap, prevents activation of the actuator, as a result of which pressing down on the actuator does not lead to discharge of the aerosol. The nozzle locking member is attached to a cap body by means of a hinge, such that the locking member itself can easily be inserted or removed from the cap body.

[0004] This known solution has the effect of preventing accidental discharge during e.g. transport of the aerosol containers, which may be either in a commercial or a personal capacity. However, the known spray caps with such locking members are currently complex products which require multiple parts and/or elaborate assembly procedures, like for example the locking member of WO2004/047998 which is a separate part connected to the spray cap. In producing large quantities of spray caps, this may pose a problem for facilities in that multiple production lines or e.g. complex multi-cavity moulds for said multiple parts, and/or elaborate assembly lines would be required.

[0005] Additionally, the known solution of WO2004/047998 provides a challenge for the consumer in that they have to open or close the locking mechanism before and after every use of the product. For everyday use this may be considered an unnecessary act, as then it is unlikely that one would need to prevent accidental discharge on a continuous basis. Hence it may be annoying for the consumer to have to repeatedly perform this act.

[0006] US 5918780 shows in Fig. 17 thereof a rotatable cap member having receiving parts with which a mode can be selected. The receiving parts determine the depressible depth of the actuator. One of the receiving parts

forms a locking member associated with a lock mode and corresponds to blocking a depression of the actuator.

[0007] EP 2060507, on which the preamble of claim 1 is based, discloses a spray cap having a blocking member that is pivotably connected to an annular base part.

[0008] It is an object of the invention to provide a spray cap that offers the advantage of preventing accidental discharge, yet in a manner simple and elegant for the manufacturer and/or the consumer.

[0009] This object is achieved by a spray cap for an aerosol container according to claim 1.

[0010] The spray cap according to the invention is monolithically formed, thus in one piece, including the locking member and the actuating member, wherein the locking member directly and solely engages with the actuating member to restrict movement of said actuating member, thereby preventing accidental discharge of the dispensing mechanism on the container.

[0011] The cap body comprises a snap member to hold the locking member when it is in its releasing position. This characteristic provides support to the locking member in its releasing state, which prevents the locking member from needlessly moving about. In addition it aids in the ease of operating the locking member in that it (1) provides a reliable feel on the locking member and (2) defines two distinct positions of the locking member either being engaged, or disengaged. In a more specific embodiment the snap member may be formed as a holding protrusion to hold the locking member when it is in its releasing position. This embodiment still providing an element simple to produce.

[0012] As a result of the one-piece spray cap no separate parts are needed for the actuating or locking mechanisms. This is advantageous in that only one part will have to be produced, and that no further assembly of the spray cap itself would be required. Only one single mould would be required for injection moulding the spray cap.

[0013] Also is noted that for the current one-piece solution there would not be any separate small plastic parts that could result in environmental pollution, as the consumer does not have to discard the locking member after first releasing it from its locking position. The spray cap according to the current invention hence has an advantage over a spray cap using e.g. a tear-off tamper-evident or otherwise expendable locking mechanism.

[0014] Another advantage is that the locking member is directly connected to the actuating member to restrict movement thereof. The spray nozzle can only be in fluid communication with the interior of the container when the actuating member is activated through pressing downward on the actuating member. As such, no further mechanisms or parts, like for example a cap or a lid for the spray nozzle, would be required to prevent accidental discharge.

[0015] In a possible embodiment, the spray nozzle and the first flexible connection are located on one side of the

spray cap, and the locking member engages with the actuating member substantially on an opposite side of the spray cap. This provides the advantage of the locking member, when in its locking position, having to withstand the smallest possible moment with respect to a downward pressing motion applied on the actuating member. This leads to a sturdy locking feature, even if the spray cap is made of a plastic material.

[0016] The first flexible connection may be a connection that is also elastic and/or resilient, thereby allowing the actuating member to not only pivot, but also to spring back once the consumer releases the actuating member after use.

[0017] In yet another possible embodiment, the engagement between the locking member and the actuating member is formed as a latching mechanism. This yields a locking engagement easy to operate and simple to produce, whilst also providing a sturdy engagement for potential repetitive use. Alternative embodiments may use e.g. a male-female connection or a snap connection.

[0018] In a further practical embodiment, the locking member is formed as a flap having a curved tongue. This leads to a structure with increased bending stiffness, which prevents deflection of the locking member due to the application of a downward pressing motion when operating the actuating member in the locking position. Other embodiments may include tongues with other suitable geometries, e.g. a straighter beam or a latch of a more round nature, provided that these tongues may be received within a latching recess of the latching mechanism.

[0019] In another practical embodiment, the actuating member defines a latching recess, such that the recess can receive the curved tongue, in a latching manner.

[0020] In an embodiment, the tongue has a tip region which - in the locking position of the locking member - is in engagement with an interior wall member extending downwardly from an upper side of the actuating member, such that bending of the tongue is counteracted. This provides additional stiffness to the structure in the locked position.

[0021] In another embodiment, the curved tongue has a summit region such that in receiving the curved tongue in a latching manner the summit region, at the tip region, forms a pre-guiding surface during movement of the tongue through the recess from the releasing position to the locking position.

[0022] In yet another embodiment, at an end of the flap an abutment ridge is formed, wherein the abutment ridge abuts - in the locking position of the locking member - a rear side surface of the actuating member above the recess such that a force of the locking member on the actuating member is perpendicular to the pushing-down direction of the actuating member. The rear side surface thus forms a stop for the swivelling movement of the locking member in a plane parallel to the axial movement of the spray tube and the stem. Thereby, if the locking member is pushed further inward, the force of the locking

member on the actuating member will be perpendicular to the pushing-down direction of the actuator, such that the actuator member will not be pushed down and inadvertent operation of the dispensing mechanism of the aerosol container is prevented, while locking the spray cap assembly.

[0023] In a practical embodiment the locking member comprises an exterior surface, which, when the locking member is in its locking position, is flush with - or lying recessed with respect to - an outer contour of the cap body. This is advantageous in that the locking mechanism cannot easily be affected - e.g. accidentally opened - by potential contact of the spray cap with other items during transport.

[0024] Similarly, in another embodiment, the actuating member is advantageously flush with - or lies recessed with respect to - an outer contour of the cap body. This may lead to preventing accidental pressure on the actuating member when e.g. stacking multiple aerosol containers with spray caps during transport.

[0025] In another embodiment the spray cap comprises a second flexible connection, formed between the locking member and the cap body, such that the locking member is able to pivot relative to the cap body.

[0026] In a further possible embodiment, the second flexible connection is formed as a living hinge. This is advantageous as it allows the locking member to be monolithically formed with the cap body, whilst also being simple to produce.

[0027] In a practical embodiment of the spray cap according to the invention, the spray cap is made by injection moulding from a plastic material, or another suitable material.

[0028] The invention also relates to a method for manufacturing the spray cap as described in the above, wherein the spray cap is injection moulded from a plastic material, in particular a thermoplastic resin comprising PE and/or PP.

[0029] These and other aspects of the invention will be more readily appreciated as these become better understood by reference to the following detailed description and considered in connection with the accompanying figures. In these figures like reference symbols designate like parts.

Fig. 1 shows a view in perspective of a spray cap according to the invention mounted on an aerosol container;

Fig. 2A shows a cross-section through the spray cap of Fig. 1 mounted on an aerosol container, with a locking member in a releasing position;

Fig. 2B shows a cross-section through the spray cap of Fig. 1 mounted on an aerosol container, with a locking member in a locking position;

Fig. 2C shows a cross-section through the spray cap

of Fig. 1 in an operated state;

Fig. 3A shows a view in perspective from a rear side the spray cap of Fig. 1 with a locking member in a releasing position; and

Fig. 3B shows a view in perspective from a rear side of the spray cap of Fig. 1 with a locking member in an intermediate position between a releasing and a locking position.

Fig. 4 shows in perspective a cross-section through the spray cap of Fig. 1 with a locking member in a further intermediate position between a releasing position and a locking position.

[0030] In Fig. 1 is shown a one-piece spray cap 110 mounted on an aerosol container 120. The aerosol container 120 in this specific embodiment is formed as a cylinder 121 with a tapered area 122 at the top. However other cross-sections and/or shapes of the aerosol container 120, such as rectangular, elliptical or spherical, may also be conceivable.

[0031] The spray cap 110 comprises a cap body 130, an actuating member 140 that is monolithically formed with the cap body 130 and a spray nozzle 150.

[0032] The cap body 130 comprises a skirt 180 and two radially opposing spaced apart side cheeks 131, 132. The side cheeks 131, 132 are integral with the skirt 180 and extend upwardly therefrom. The side cheeks 131, 132 define between them a space which is shielded laterally by the side cheeks 131, 132 and which is open at a front and rear side of the cap body 130.

[0033] The skirt 180 and the side cheeks 131, 132 define an outer contour of the cap body 130. The actuator member 140 is arranged in the space between the side cheeks 131, 132 in such a manner that the actuator member does not extend beyond the outer contour of the cap body 130. Thereby the risk that the actuator member 140 is unintentionally operated, during transport for example, is reduced. The actuator member 140 thus does not extend beyond the upper side of the side cheeks 131, 132. Furthermore, the actuator member 140 has a front side 135A and a rear side 135B, which do not extend beyond front and rear edges of the side cheeks 131, 132.

[0034] The spray nozzle 150 is arranged in the actuator member 140 at a front side thereof. In the embodiment shown in the figures the nozzle 150 is arranged in an upper end region 134 of the front side 135A of the actuator member 140.

[0035] It should be noted that the spray nozzle 150 does not necessarily have to be located at the upper end region 134 of the front side 135A. It may equally be located elsewhere along front side 135A.

[0036] In Figs. 2A - 2C is shown a cross-section through the spray cap 110 of Fig. 1. As can be seen in these figures, and also in Figs. 3A-3B, the spray cap 110 comprises a locking member 160 that is monolithically

formed with the cap body 130. The locking member 160 is formed as a flap 161 having a tongue 162 protruding from a flap inner side 161A.

[0037] The spray cap 110 has a first flexible connection C1 that is located between the cap body 130 and the front side 135A of the actuator member 140, and a second flexible connection C2 that is located between the locking member 160 and the cap body 130.

[0038] The side cheek 131 of the cap body 130 has an inner side 139, on which a holding protrusion 170 is formed. The holding protrusion 170 is located on the same side of the spray cap 110 as the locking member 160. The holding protrusion 170 is shown to be of a shape with a top part 171 of the holding protrusion 170 extending further outward from the cap body 130 in comparison with a bottom part 172 of the holding protrusion 170. It should be noted that many shapes, such as a rectangular, triangular, a rounded or an L-shaped protrusion may be conceivable.

[0039] The actuating member 140 includes a latching recess 141 formed at a rear side 144 of the actuating member 140. The latching recess 141 extends vertically from a lower edge 143 of the actuating member 140 upwardly and extends transverse thereto over a larger part of the width of the rear side 144 of the actuating member 140.

[0040] The actuating member 140 comprises an extra structural interior wall member 142 extending downwardly from the upper side of the actuating member 140 as can be seen in Figs. 2A and 2B.

[0041] A spray tube 146 is integrally formed on an inner side of the actuator member 140. The spray tube 146 partially extends, at least at a lower end thereof, coaxially with the centre axis of the skirt 180. In an upright position of the container 120, the spray tube 146 extends downwardly in a substantially vertical direction from the inner surface of the curved front side 135A of the actuator member 140.

[0042] The aerosol container 120 has a dispensing mechanism arranged at an upper end 123 of the container 120. The dispensing mechanism includes a commonly known valve stem 125. The lower end portion of the spray tube 146 is arranged in a fitting and sealing manner over an upper end portion 126 of the valve stem 125 when the spray cap is mounted on the aerosol container. The spray tube 146 defines a spray channel 145 which is in fluid communication with the spray nozzle 150 arranged at an upper end 147 of the spray channel 145.

[0043] The aerosol container 120 comprises a rim 185, arranged at an upper end 123 of the container 120. In the mounted state the skirt 180 of the cap body 130 is arranged over the rim 185 as is visible in Figs. 2A and 2B and engages the rim 185 from an outer side. At least at a front side of the cap body 130 an inner skirt portion 136 is formed which engages an inner side of the rim 185. The cap body 180 is at least fixed to the upper end 123 of the container 120 by one or more locking ribs 148 formed in the circumferential direction on the inner side of the skirt

180, which rib or ribs 148 engage under the rim 185 when the cap body 130 is pushed on the top side of the container 120. The rib or ribs 148 prevent easy removal of the cap body 130 from the container 120.

[0044] The first flexible connection C1 in Figs. 2A-2C is shown to comprise a connection wall 138 extending in a substantially lateral direction in between the inner skirt portion 136 and an inwardly extending rib 137 formed on the actuator member 140. The inner skirt portion 136 and the rib 137 provide a reinforcing effect on both ends of the connection wall 138, whereby, when the actuator member 140 is pressed down by a user, all or at least a major part of the deformation takes place in the connection wall 138 which thereby functions as a well-defined hinge. The actuator member 140 pivots with respect to the cap body 130 around this hinge, as depicted in the operated state in Fig. 2C. Alternatively this first flexible connection C1 could also be formed as a living hinge, or another suitable flexible connection.

[0045] The second flexible connection C2 in Figs. 2A-2C, i.e. the connection between the locking member 160 and the cap body 130 is formed as a living hinge. Alternatively this could be another suitable flexible connection. The locking member 160 is pivotally attached to the cap body 130 by means of the second flexible connection C2 between the locking member 160 and the cap body 130, on a side opposite to the spray nozzle 150, thus on the rear side of the spray cap 110. The locking member 160 has two distinct positions between which the locking member 160 can pivot with respect to the cap body 130 which may be explained with reference to Figs. 2A and 2B: a releasing position and a locking position.

[0046] In Fig. 2A the locking member 160 is shown in the releasing position in which the flap 161 lies on an exterior surface 182 of a rear wall portion 181 of the cap body 130. It is noted that there are embodiments conceivable in which the flap 161 does not lie flat on the exterior surface 182, but is maintained in another position. This forms an elegant embodiment of the releasing position. The rear wall portion 181 is inclined with respect to the skirt 180 and extends inwardly therefrom. When the flap lies flat on the surface 182 the locking member 160 does not extend beyond the cap body contour as determined by the skirt 180, when it is in the releasing position. This forms a practical and elegant solution, wherein a user is as less as possible hindered by the locking member 160 in the releasing position when he operates the actuator member 140.

[0047] Here, the locking member 160 is shown to be kept in its releasing position relative to the cap body 130 by the holding protrusion 170. The locking member 160 is clamped between the holding protrusions 170, or alternative may snap behind it in the releasing position. Multiple protrusions may also be used to keep the locking member 160 in its relative position with respect to the cap body 130, e.g. protrusions extending from the cap body 130 on either side of the locking member 160 when considering its horizontal direction. Alternatively, any

other suitable snap member could be used.

[0048] In Fig. 2B the locking member 160 is shown in the locking position. The tongue 162 of the locking member 160 engages the latching recess 141. In the locking position at least a part of the upper side of the tongue 162 engages an upper edge of the latching recess 141, whereby movement of the actuator member 140 in the downward direction is blocked without any play, such that actuating of the stem valve is prevented.

[0049] An exterior surface 163 of the locking member 160 in this embodiment is advantageously flush with the cap body 130, which gives the cap 110 a smooth visual appearance when it is in the unused state, which may make the combination of container and cap more attractive, e.g. when it is on display in retail. In another preferred embodiment the exterior surface 163 may also lie recessed with respect to cap body 130 in the locking position. In another possible embodiment the exterior surface 163 may extend outward from the contour as determined by the cap body 130 in the locking position.

[0050] The actuating member 140 is pivotally attached to the cap body 130 by means of the first flexible connection C1, such that the actuating member 140 can pivot relative to the cap body 130. The actuating member 140 can pivot with respect to the cap body 130 may be explained with reference to Figs. 2A, 2B and 2C.

[0051] In Figs. 2A and 2B the actuating member 140 is shown in a neutral state in which the actuating member 140 is unaffected and arranged such that the spray tube 146, extending from an inner side of the actuating member 140, does not press down on the valve stem 125.

[0052] In Fig. 2C is shown a cross-section through the spray cap of Fig. 1 mounted on an aerosol container, in an operated state. The locking member 160 is in its releasing position. The actuating member 140 is shown in an operated state in which it is pressed down. In this operated state the actuating member 140 is pivoted relative to the cap body 130 - at and by means of the first flexible connection C1 - by applying a downward pressing force P1 on the relatively flat operating surface of the actuating member 140. As a result the actuating member 140 and the spray tube 146 are displaced downwardly, i.e. in the direction of the aerosol container 120. The spray tube 146 then presses down the valve stem 125, which opens a valve in the dispensing mechanism of the aerosol container and releases the aerosol in a commonly known manner through the valve stem 125. The valve stem 125 dispenses the aerosol from the aerosol container 120 into the spray channel 145, and subsequently into and outward from spray nozzle 150.

[0053] Due to the actuating member 140 pivoting relative to the cap body 130 by means of the first flexible connection C1 the spray tube 146, the actuating member 140 and the inner portion 135 can be seen to tilt with respect to the cap body 130. This is in addition to the downward displacement. It should be appreciated that the tilting movement is not a necessary feature to operate the dispensing mechanism 125.

[0054] The interior wall member 142 provides additional stiffness which prevents that the actuator member will deform itself too much instead of that the deformation takes place at the connection C1. Moreover, the additional stiffness facilitates that when the actuator member 140 is locked by the locking member 160, and the actuating member 140 is inadvertently pressed down, the spray tube 146 does not move down, due to deformation of the actuating member 140 itself, to an extent in which it operates the valve stem 125.

[0055] In the locking position shown in Fig. 2B the engagement between the locking member 160 and the actuating member 140 is formed as a latching mechanism. The actuating member 140 defines the latching recess 141, such that the recess 141 can receive the curved tongue 162 of the locking member. It should be noted that this is only one embodiment for a latching mechanism. It is also conceivable for the locking member 160 to define a latching recess for the actuating member 140 to latch on to. Alternatively, other such connections, e.g. male-female connections or snap connections, may also be used to engage the locking member 160 and actuating member 140.

[0056] In an embodiment not shown a holding recess is provided at an upper end of the inner side 139 of the cheek 131 and/or at an upper end of the inner side of the cheek 132 such that the locking member 160 can snap into the holding recess. Thereby, the snap connection between the locking member 160 and the holding recess retains the locking member in its distinct locking position relative to the cap body 130. This snap connection may be used in addition to a latching mechanism as shown in Fig. 2B.

[0057] In the releasing position shown in Fig. 2A the locking member 160 and actuating member 140 can be seen to be disengaged. This allows movement of the actuating member 140 relative to the cap body 130, from the neutral state to the operated state.

[0058] In the locking position shown in Fig. 2B the locking member 160 engages with the actuating member 140. This restricts movement of the actuating member 140 relative to the cap body 130. In the current embodiment the locking member 160 engages with the actuating member 140 on a side opposite to the spray nozzle 150.

[0059] In this specific embodiment of the spray cap 110 the latching mechanism is located most remotely from the flexible connection C1. This leads to the locking member 160 having to withstand the smallest force possible, should the actuating member 140 accidentally be operated when in the locking position. It should be noted that this is not essential with respect to restricting movement of the locking member 160 when in the locking position. It should be appreciated that this location can be varied along the circumference of the cap body 130.

[0060] In Fig. 3A is shown a view in perspective of a spray cap 110 according to the invention, for which the locking member 160 is in its releasing position. The locking member 160 is shown to be formed as a flap

161 having a curved tongue 162 extending from an inner side of the flap. The curved geometry of the tongue 162 leads to increased bending stiffness, which prevents deflection of the tongue 162 due to the application of a downward pressing motion P1 on the actuating member 140 while the locking member 160 is in the locking position. This increased rigidity of the tongue 162 prevents, or at least limits, deformation of the tongue 162 when in a locked position the actuating member 140 is pressed down. This prevents that through deformation of the tongue 162 the actuating member 140 would still be able to operate the valve stem 125 and cause a release of the aerosol. Although the curved shape of the tongue is considered a simple and elegant solution to increase the rigidity of the locking member 160, also other features are conceivable which increase the rigidity of the locking member 160.

[0061] At an end of the flap 161 an abutment ridge 164 is formed. This abutment ridge 164 abuts, in the locking position of the locking member 160, the rear side surface 144 of the actuating member 140 above the latching recess 141 as can be seen in Fig. 2B. The rear side surface 144 thus forms a stop for the swivelling movement of the locking member in a plane parallel to the axial movement of the spray tube 146 and the stem 125. Thereby, if the locking member 140 is pushed further inward, the force of the locking member 160 on the actuating member 140 will be perpendicular to the pushing-down direction of the actuator, such that the actuator member 140 will not be pushed down and inadvertently operation of the dispensing mechanism of the aerosol container 120 is prevented, while locking the spray cap assembly.

[0062] A tip region 162A of the tongue 162 preferably engages the interior wall member 142, which provides additional stiffness to the structure in the locked position (cf. Fig. 2B). In particular bending of the tongue 162 is thereby counteracted. The curved shape of the tongue 162 has a summit region 162B, such that the summit region at the tip region 162A, functions as a pre-guiding surface during movement of the tongue 162 through the recess 141 from the releasing position to the locking position. The latter is shown in more detail in the intermediate position of the locking member 160 in the cross-section of Fig. 4. There, a cross-section through the spray cap 110 is shown in perspective, for which the locking member 160 is in an intermediate position between a releasing position and a locking position. In this intermediate position the summit region 162B abuts rear side surface 144 of the actuating member 140 at a lower end 144B thereof so as to pre-guide the tongue 162 during movement from the releasing position to the locking position through the recess 141. This aids in the ease of locking the tongue 162 into the locking position and/or releasing the tongue 162 from said locking position.

Claims

1. A spray cap (110) for an aerosol container (120) having a dispensing mechanism (125) at the top of the container, the spray cap comprising:

- a cap body (130) adapted to be mounted on the aerosol container;
- a duct defining a spray channel (145) and having a spray nozzle (150) at one end, and when the spray cap is mounted on the aerosol container, connected with the dispensing mechanism of the aerosol container;
- an actuating member (140) coupled with the duct, such that operation of the actuating member, when the cap body is mounted on the container, activates the dispensing mechanism to release the aerosol into the spray channel and towards the spray nozzle, wherein the actuating member (140) is monolithically formed with the cap body (130), and wherein the actuating member (140) is pivotably attached to the cap body (130) by means of a first flexible connection (C1), such that the actuating member (140) is able to pivot relative to the cap body (130), and
- a locking member (160) pivotably attached to the cap body, which locking member has a locking position in which it restricts movement of the actuating member relative to the cap body and a releasing position in which it allows movement of the actuating member relative to the cap body, wherein the locking member (160) is monolithically formed with the cap body (130), wherein, in the locking position, the locking member (160) and the actuating member (140) are in engagement, and in the releasing position the locking member (160) and actuating member (140) are disengaged,

characterised in that

- the cap body (130) comprises a snap member to hold the locking member (160) when it is in its releasing position.

2. The spray cap according to claim 1, wherein the spray nozzle and the first flexible connection (C1) are located on one side of the spray cap (110), and the locking member (160) engages with the actuating member (140) substantially on an opposite side of the spray cap (110).
3. The spray cap according to any of the preceding claims, wherein the snap member is formed as a holding protrusion (170) to engage the locking member (160) when it is in its releasing position.
4. The spray cap according to any of the preceding claims, wherein the engagement between the locking member (160) and the actuating member (140) is

formed as a latching mechanism.

5. The spray cap according to claim 4, wherein the locking member (160) is formed as a flap (161) having a curved tongue (162), wherein the actuating member (140) defines a latching recess (141), such that the recess (141) can receive the curved tongue (162) in a latching manner.
6. The spray cap according to claim 5, wherein the tongue (162) has a tip region (162A) which - in the locking position of the locking member (160) - is in engagement with an interior wall member (142) extending downwardly from an upper side of the actuating member (140), such that bending of the tongue (162) is counteracted.
7. The spray cap according to claim 6, wherein the curved tongue (162) has a summit region (162B) such that in receiving the curved tongue (162) in a latching manner the summit region (162B), at the tip region (162A), forms a pre-guiding surface during movement of the tongue (162) through the recess (141) from the releasing position to the locking position.
8. The spray cap according to any of the claims 5-7, wherein at an end of the flap (161) an abutment ridge (164) is formed, wherein the abutment ridge (164) abuts - in the locking position of the locking member (160) - a rear side surface (144) of the actuating member (140) above the recess (141) such that a force of the locking member (160) on the actuating member (140) is perpendicular to the pushing-down direction of the actuating member (140).
9. The spray cap according to any of the preceding claims, wherein the locking member (160) comprises an exterior surface (163) which, when the locking member (160) is in its locking position, is flush with - or lying recessed with respect to - an outer contour of the cap body (130).
10. The spray cap according to any of the preceding claims, wherein the actuating member (140) is flush with - or lies recessed with respect to - an outer contour of the cap body (130).
11. The spray cap according to any of the preceding claims, wherein the spray cap (110) comprises a second flexible connection (C2), formed between the locking member (160) and the cap body (130), such that the locking member (160) is able to pivot relative to the cap body (130).
12. The spray cap according to claim 11, wherein the second flexible connection (C2) is formed as a living hinge.

13. The spray cap according to any of the preceding claims, wherein the spray cap (110) is made by injection moulding from a plastic material.
14. A method for manufacturing the spray cap (110) according to any of the claims 1-13, wherein the spray cap (110) is injection moulded from a plastic material, in particular a thermoplastic resin comprising PE and/or PP.

Patentansprüche

1. Sprühkappe (110) für einen Aerosolbehälter (120) mit einem Abgabemechanismus (125) an der Oberseite des Behälters, wobei die Sprühkappe Folgendes umfasst:

- einen Kappenkörper (130), der dazu eingerichtet ist, am Aerosolbehälter montiert zu sein;
 - ein Kanal, die einen Sprühkanal (145) definiert und eine Sprühdüse (150) an einem Ende aufweist und, wenn die Sprühkappe am Aerosolbehälter montiert ist, mit dem Abgabemechanismus des Aerosolbehälters verbunden ist;
 - ein Betätigungselement (140), das mit dem Kanal gekoppelt ist, sodass der Betrieb des Betätigungselements, wenn der Kappenkörper am Behälter montiert ist, den Abgabemechanismus aktiviert, um das Aerosol in den Sprühkanal und zur Sprühdüse freizugeben, wobei das Betätigungselement (140) mit dem Kappenkörper (130) monolithisch ausgebildet ist und wobei das Betätigungselement (140) mittels einer ersten flexiblen Verbindung (C1) schwenkbar am Kappenkörper (130) befestigt ist, sodass das Betätigungselement (140) in Bezug zum Kappenkörper (130) schwenkbar ist, und
 - ein Verriegelungselement (160), das schwenkbar am Kappenkörper befestigt ist, wobei das Verriegelungselement eine Verriegelungsposition, in der es die Bewegung des Betätigungselements in Bezug zum Kappenkörper beschränkt, und eine Freigabeposition, in der es die Bewegung des Betätigungselements in Bezug zum Kappenkörper zulässt, aufweist, wobei das Verriegelungselement (160) mit dem Kappenkörper (130) monolithisch ausgebildet ist, wobei das Verriegelungselement (160) und das Betätigungselement (140) in der Verriegelungsposition miteinander in Eingriff sind und wobei das Verriegelungselement (160) und das Betätigungselement (140) in der Freigabeposition voneinander getrennt sind,
- dadurch gekennzeichnet, dass**
- der Kappenkörper (130) ein Einschnappelement umfasst, um das Verriegelungselement (160) zu halten, wenn es sich in der Freigabe-

position befindet.

2. Sprühkappe nach Anspruch 1, wobei die Sprühdüse und die erste flexible Verbindung (C1) auf einer Seite der Sprühkappe (110) angeordnet sind und das Verriegelungselement (160) im Wesentlichen auf der entgegengesetzten Seite der Sprühkappe (110) in das Betätigungselement (140) eingreift.
3. Sprühkappe nach einem der vorstehenden Ansprüche, wobei das Einschnappelement als Haltevor sprung (170) ausgebildet ist, um in das Verriegelungselement (160) einzugreifen, wenn es sich in der Freigabeposition befindet.
4. Sprühkappe nach einem der vorstehenden Ansprüche, wobei der Eingriff zwischen dem Verriegelungselement (160) und dem Betätigungselement (140) als Rastmechanismus ausgebildet ist.
5. Sprühkappe nach Anspruch 4, wobei das Verriegelungselement (160) als Klappe (161) mit einer gekrümmten Zunge (162) ausgebildet ist, wobei das Betätigungselement (140) eine Rastaussparung (141) definiert, sodass die Aussparung (141) die gekrümmte Zunge (162) einrastend aufnehmen kann.
6. Sprühkappe nach Anspruch 5, wobei die Zunge (162) einen Spitzenbereich (162A) aufweist, der - in der Verriegelungsposition des Verriegelungselements (160) - mit einem Innenwandelement (142) in Eingriff ist, das sich von einer Oberseite des Betätigungselements (140) abwärts erstreckt, sodass dem Biegen der Zunge (162) entgegengewirkt wird.
7. Sprühkappe nach Anspruch 6, wobei die gekrümmte Zunge (162) einen Scheitelbereich (162B) aufweist, sodass beim einrastenden Aufnehmen der gekrümmten Zunge (162) der Scheitelbereich (162B) am Spitzenbereich (162A) während der Bewegung der Zunge (162) durch die Aussparung (141) von der Freigabeposition zur Verriegelungsposition eine Vorführungsfläche ausbildet.
8. Sprühkappe nach einem der Ansprüche 5-7, wobei an einem Ende der Klappe (161) eine Anschlagrippe (164) ausgebildet ist, wobei die Anschlagrippe (164) - in der Verriegelungsposition des Verriegelungselements (160) - an einer Rückseitenfläche (144) des Betätigungselements (140) über der Aussparung (141) anschlägt, sodass eine Kraft des Verriegelungselements (160) auf das Betätigungselement (140) senkrecht zur Herunterdrückrichtung des Betätigungselements (140) ist.
9. Sprühkappe nach einem der vorstehenden Ansprüche, wobei das Verriegelungselement (160) eine

Außenfläche (163) umfasst, die, wenn sich das Verriegelungselement (160) in der Verriegelungsposition befindet, mit einer Außenkontur des Kappenkörpers (130) bündig ist - oder in Bezug dazu vertieft ist.

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10. Sprühkappe nach einem der vorstehenden Ansprüche, wobei das Betätigungselement (140) mit einer Außenkontur des Kappenkörpers (130) bündig ist - oder in Bezug dazu vertieft ist.

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11. Sprühkappe nach einem der vorstehenden Ansprüche, wobei die Sprühkappe (110) eine zweite flexible Verbindung (C2) umfasst, die zwischen dem Verriegelungselement (160) und dem Kappenkörper (130) ausgebildet ist, sodass das Verriegelungselement (160) in Bezug zum Kappenkörper (130) schwenkbar ist.

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12. Sprühkappe nach Anspruch 11, wobei die zweite flexible Verbindung (C2) als Filmscharnier ausgebildet ist.

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13. Sprühkappe nach einem der vorstehenden Ansprüche, wobei die Sprühkappe (110) durch Spritzgießen aus einem Kunststoffmaterial gefertigt ist.

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14. Verfahren zur Herstellung der Sprühkappe (110) nach einem der Ansprüche 1-13, wobei die Sprühkappe (110) aus einem Kunststoffmaterial spritzgegossen ist, insbesondere aus einem thermoplastischen Harz, das PE und/oder PP umfasst.

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Revendications

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1. Capuchon de pulvérisation (110) pour un récipient d'aérosol (120) ayant un mécanisme de distribution (125) au sommet du récipient, le capuchon de pulvérisation comprenant :

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- un corps de capuchon (130) conçu pour être monté sur le récipient d'aérosol ;
- un conduit délimitant un canal de pulvérisation (145) et comprenant une buse de pulvérisation (150) au niveau d'une extrémité, et lorsque le capuchon de pulvérisation est monté sur le récipient d'aérosol, relié au mécanisme de distribution du récipient d'aérosol ;
- un élément d'actionnement (140) accouplé au conduit, de sorte que l'actionnement de l'élément d'actionnement, lorsque le corps de capuchon est monté sur le récipient, active le mécanisme de distribution pour libérer l'aérosol dans le canal de pulvérisation et vers la buse de pulvérisation, l'élément d'actionnement (140) étant formé de façon monolithique avec le corps de capuchon (130), et l'élément d'actionnement

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(140) étant fixé de manière pivotant au corps de capuchon (130) au moyen d'un premier raccord flexible (C1), de sorte que l'élément d'actionnement (140) puisse pivoter par rapport au corps de capuchon (130), et

- un élément de verrouillage (160) fixé de manière pivotante au corps de capuchon, lequel élément de verrouillage ayant une position de verrouillage dans laquelle il limite le mouvement de l'élément d'actionnement par rapport au corps de capuchon et une position de libération dans laquelle il permet le mouvement de l'élément d'actionnement par rapport au corps de capuchon, l'élément de verrouillage (160) étant formé de manière monolithique avec le corps de capuchon (130), l'élément de verrouillage (160) et l'élément d'actionnement (140) étant en prise dans la position de verrouillage, et l'élément de verrouillage (160) et l'élément d'actionnement (140) étant séparés dans la position de libération,

caractérisé en ce que

- le corps de capuchon (130) comprend un élément d'encliquetage pour maintenir l'élément de verrouillage (160) lorsqu'il est dans sa position de libération.

2. Capuchon de pulvérisation selon la revendication 1, la buse de pulvérisation et le premier raccord flexible (C1) étant situés sur un côté du capuchon de pulvérisation (110), et l'élément de verrouillage (160) venant en prise avec l'élément d'actionnement (140) sensiblement sur un côté opposé du capuchon de pulvérisation (110).

3. Capuchon de pulvérisation selon l'une quelconque des revendications précédentes, l'élément d'encliquetage étant formé comme une saillie de maintien (170) pour venir en prise avec l'élément de verrouillage (160) lorsqu'il est dans sa position de libération.

4. Capuchon de pulvérisation selon l'une quelconque des revendications précédentes, la mise en prise entre l'élément de verrouillage (160) et l'élément d'actionnement (140) étant formée comme un mécanisme de verrouillage.

5. Capuchon de pulvérisation selon la revendication 4, l'élément de verrouillage (160) étant formé d'un volet (161) ayant une languette incurvée (162), l'élément d'actionnement (140) définissant un évidement de verrouillage (141), de sorte que l'évidement (141) puisse recevoir la languette incurvée (162) de manière verrouillée.

6. Capuchon de pulvérisation selon la revendication 5, la languette (162) ayant une région de pointe (162A) qui - dans la position de verrouillage de l'élément de

verrouillage (160) - est en prise avec un élément de paroi intérieure (142) s'étendant vers le bas à partir d'un côté supérieur de l'élément d'actionnement (140), de sorte que la flexion de la languette (162) soit contrecarrée.

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7. Capuchon de pulvérisation selon la revendication 6, la languette incurvée (162) ayant une région sommitale (162B) telle que lors de la réception de la languette incurvée (162) d'une manière verrouillée, la région sommitale (162B), au niveau de la région d'extrémité (162A), forme une surface de pré-guidage pendant le mouvement de la languette (162) à travers l'évidement (141) de la position de libération à la position de verrouillage. 10
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8. Capuchon de pulvérisation selon l'une quelconque des revendications 5 à 7, au niveau d'une extrémité du volet (161) une crête de butée (164) étant formée, la crête de butée (164) venant en butée - dans la position de verrouillage de l'élément de verrouillage (160) - contre une surface latérale arrière (144) de l'élément d'actionnement (140) au-dessus de l'évidement (141) de sorte qu'une force de l'élément de verrouillage (160) sur l'élément d'actionnement (140) soit perpendiculaire à la direction de poussée vers le bas de l'élément d'actionnement (140). 20
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9. Capuchon de pulvérisation selon l'une quelconque des revendications précédentes, l'élément de verrouillage (160) comprenant une surface extérieure (163) qui, lorsque l'élément de verrouillage (160) est dans sa position de verrouillage, affleure - ou est en retrait par rapport - à un contour extérieur du corps de capuchon (130). 30
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10. Capuchon de pulvérisation selon l'une quelconque des revendications précédentes, l'élément d'actionnement (140) affleurant - ou étant en retrait par rapport - à un contour extérieur du corps de capuchon (130). 40
11. Capuchon de pulvérisation selon l'une quelconque des revendications précédentes, le capuchon de pulvérisation (110) comprenant un second raccord flexible (C2), formé entre l'élément de verrouillage (160) et le corps de capuchon (130), de sorte que l'élément de verrouillage (160) puisse pivoter par rapport au corps de capuchon (130). 45
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12. Capuchon de pulvérisation selon la revendication 11, le second raccord flexible (C2) étant formé comme une charnière mobile.
13. Capuchon de pulvérisation selon l'une quelconque des revendications précédentes, le capuchon de pulvérisation (110) étant fabriqué par moulage par injection à partir d'une matière plastique. 55

14. Procédé de fabrication du capuchon de pulvérisation (110) selon l'une quelconque des revendications 1 à 13, le capuchon de pulvérisation (110) étant moulé par injection à partir d'une matière plastique, en particulier d'une résine thermoplastique comprenant du PE et/ou du PP.

Fig. 1

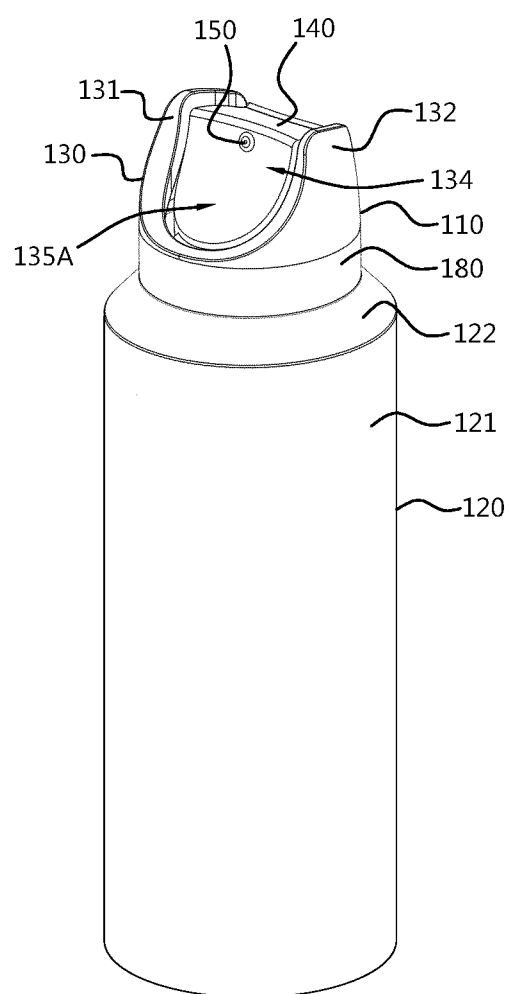


Fig. 2A

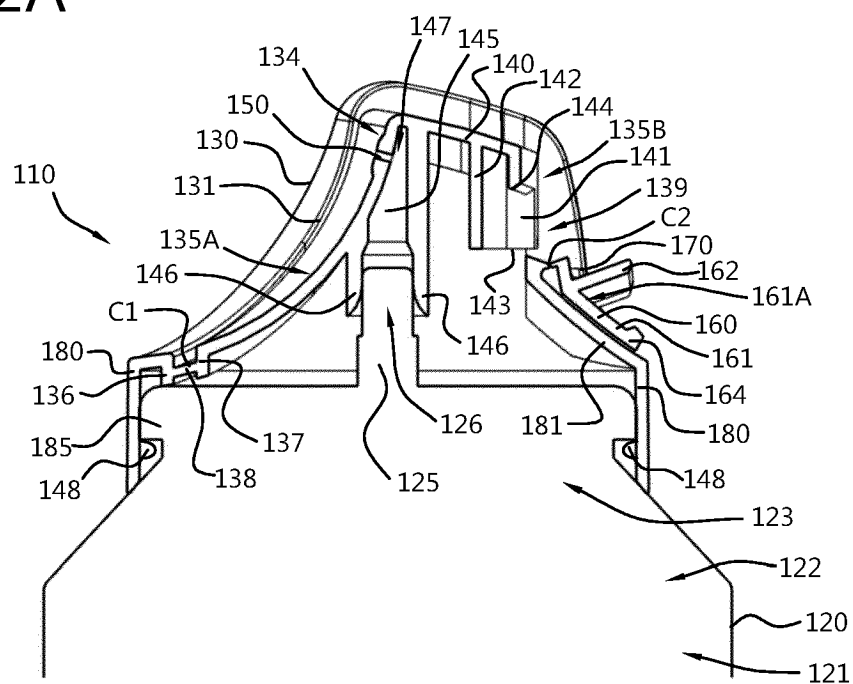


Fig. 2B

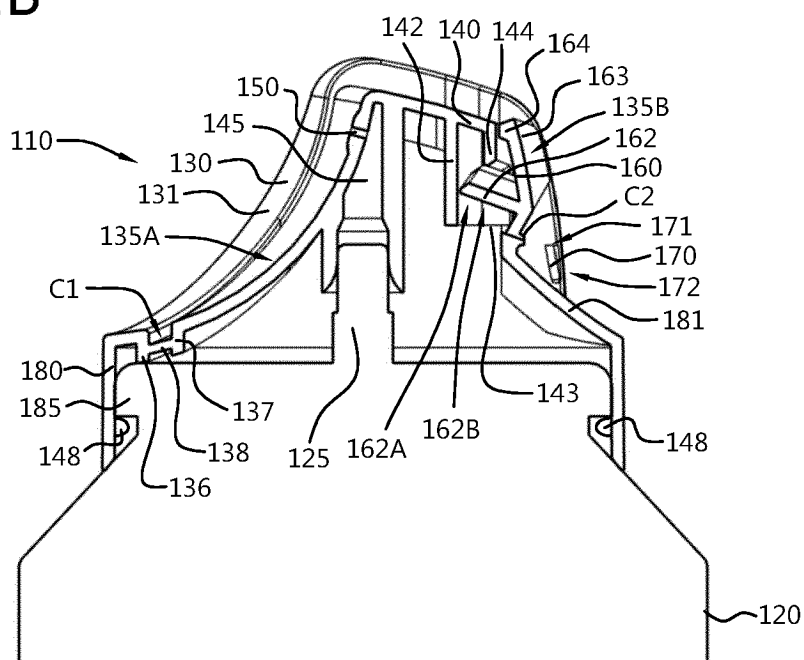


Fig. 2C

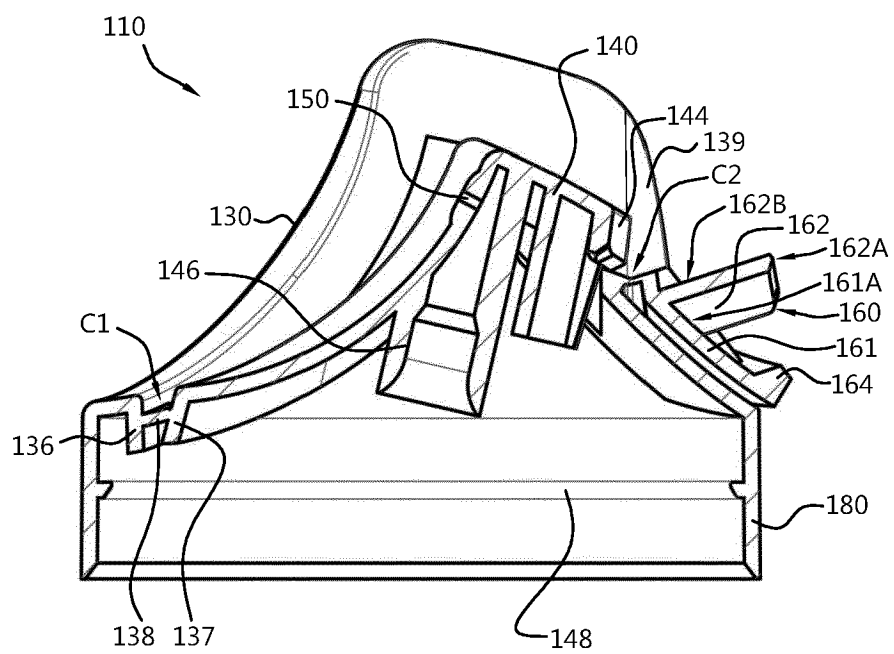


Fig. 3A

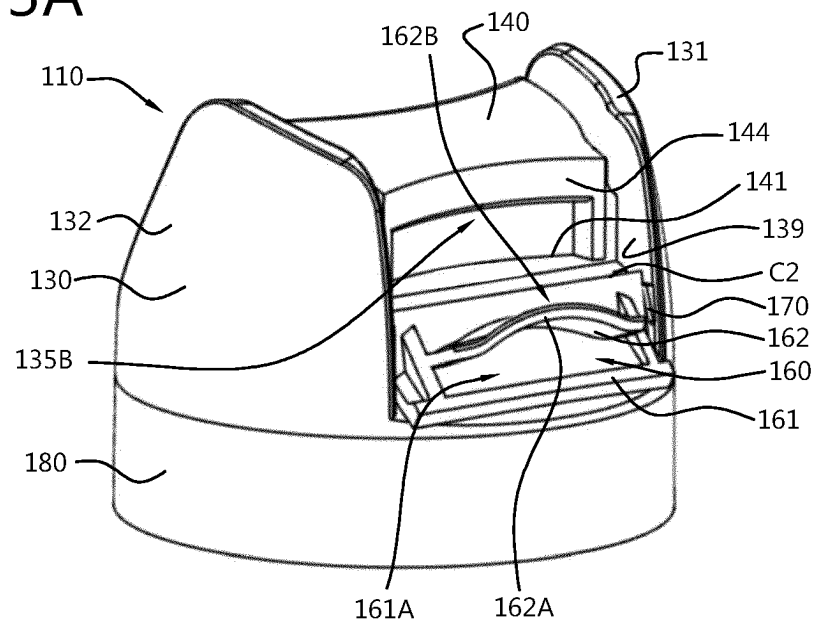


Fig. 3B

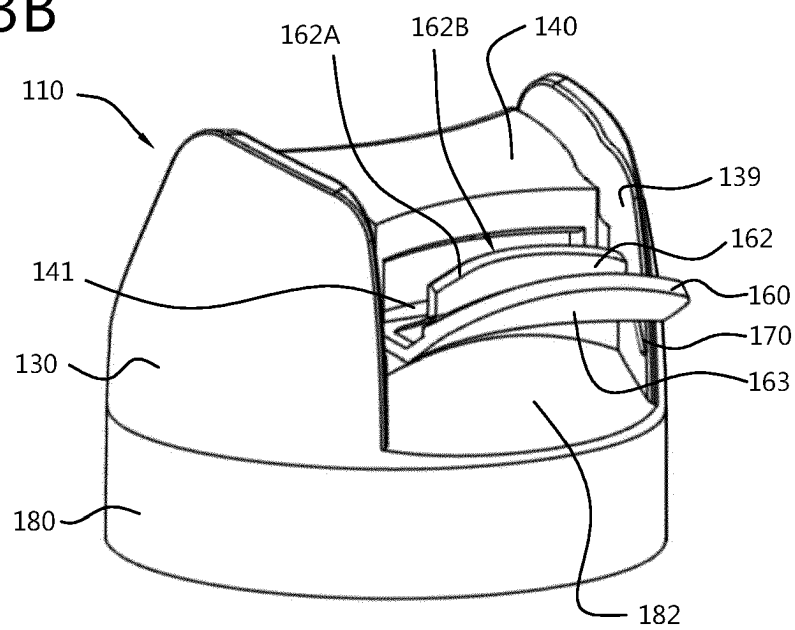
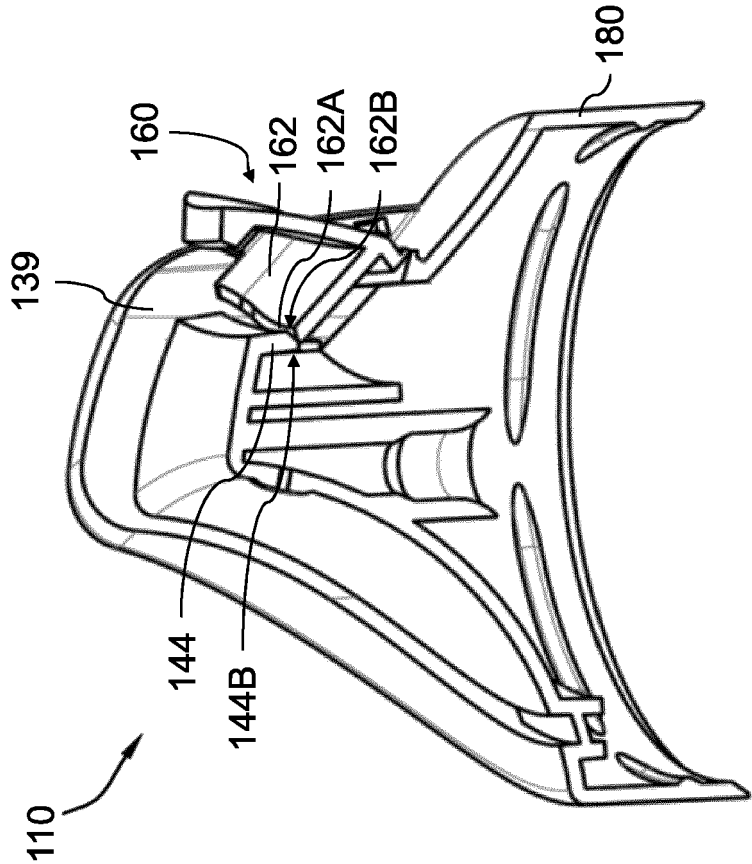


Fig. 4



REFERENCES CITED IN THE DESCRIPTION

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