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54 **One-piece spray cap with monolithically formed locking member and actuating member**

57 A spray cap comprises a cap body for mounting on an aerosol container. A duct defines a spray channel having a spray nozzle at one end can be connected to a dispensing mechanism of the aerosol container. An actuating member, is monolithically formed with the cap body and coupled with the duct, to activate the dispensing mechanism. A locking member, monolithically formed with the cap body, is pivotable with respect to the cap body. The 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. In the locking position, the locking member and the actuating member are in engagement, and in the releasing position the locking member and actuating member are disengaged. The actuating member is pivotable with respect to the cap body by means of a flexible connection.

Title: one-piece spray cap with monolithically formed locking member and actuating member

- 5 The invention relates to a spray cap with a locking member and actuating member according to the preamble of claim 1.

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  
10 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  
15 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.

Such a spray cap with a locking member to prevent accidental activation of an actuator is for  
20 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  
25 member itself can easily be inserted or removed from the cap body.

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  
30 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.

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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.

- 5 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.

This object is achieved by a spray cap for an aerosol container having a dispensing  
10 mechanism at the top of the container, the spray cap comprising:

- a cap body adapted to be mounted on the aerosol container;
- a duct defining a spray channel and having a spray nozzle at one end, and, when the spray cap is mounted on the aerosol container, connected with the dispensing mechanism of the aerosol container;
- 15 - an actuating member 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; and
- a locking member pivotably attached to the cap body, which locking member has a  
20 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 is monolithically formed with the cap body, wherein, in the  
25 locking position, the locking member and the actuating member are in engagement, and in the releasing position the locking member and actuating member are disengaged; and
- the actuating member is monolithically formed with the cap body, wherein the actuating member is pivotably attached to the cap body by means of a first flexible  
30 connection, such that the actuating member is able to pivot relative to the cap body.

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  
35 solely engages with the actuating member to restrict movement of said actuating member, thereby preventing accidental discharge of the dispensing mechanism on the container.

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.

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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.

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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.

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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.

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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.

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In a further possible embodiment, 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.

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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.

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.

In another practical embodiment, the actuating member defines a latching recess, such that the recess can receive the curved tongue.

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.

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.

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.

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.

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.

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.

5 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.

10 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;

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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;

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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

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

30 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.

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.

35 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.

5 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  
10 front side 135A and a rear side 135B, which do not extend beyond front and rear edges of the side cheeks 131, 132.

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  
15 the front side 135A of the actuator member 140.

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  
20 side 135A.

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.  
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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.

30 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  
35 shapes, such as a rectangular, triangular, a rounded or an L-shaped protrusion may be conceivable.

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.

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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.

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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.

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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.

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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 130 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.

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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

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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.

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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.

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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.

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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.

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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.

5 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  
10 the cap body 130 in the locking position.

The actuating member 140 is pivotably 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  
15 explained with reference to Figs. 2A, 2B and 2C.

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.  
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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  
25 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  
30 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.

Due to the actuating member 140 pivoting relative to the cap body 130 by means of the first  
35 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.

5 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.

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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.

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20 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.

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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.

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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.

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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.

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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.

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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.

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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, functions as a pre-guiding surface during movement of the tongue 162 through the recess 141 from the releasing position to the locking position.

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## CONCLUSIES

1. Een spuitdop (110) voor een spuitbus (120) met een afgiftemechanisme (125) bovenop de bus, waarbij de spuitdop omvat:
  - 5 - een doplichaam (130) dat is ingericht om op een spuitbus te worden aangebracht;
  - een kanaal dat een spuitkanaal (145) definieert en een spuitmond (150) aan één uiteinde heeft, en dat als de spuitdop op de spuitbus is aangebracht, is verbonden met het afgiftemechanisme van de spuitbus;
  - 10 - een bedieningsorgaan (140) dat is gekoppeld met het kanaal, zodanig dat het bedienen van het bedieningsorgaan, als de spuitdop op de spuitbus is aangebracht, het afgiftemechanisme activeert om de aerosol vrij te geven in het spuitkanaal en naar de spuitmond toe; en
  - 15 - een grendelorgaan (160) dat zwenkbaar is aangebracht op het doplichaam, waarbij het grendelorgaan een gesloten toestand heeft waarin het een beweging van het bedieningsorgaan ten opzichte van het doplichaam beperkt en een vrijgevend toestand waarin het een beweging van het bedieningsorgaan ten opzichte van het doplichaam toestaat;  
**met het kenmerk, dat**
  - 20 - het grendelorgaan (160) monolithisch is gevormd met het doplichaam (130), waarbij, in de gesloten toestand, het grendelorgaan (160) en het bedieningsorgaan (140) gekoppeld zijn, en in de vrijgevend toestand het grendelorgaan (160) en het bedieningsorgaan (140) ontkoppeld zijn; en
  - 25 - het bedieningsorgaan (140) monolithisch is gevormd met het doplichaam (130), waarbij het bedieningsorgaan zwenkbaar is aangebracht op het doplichaam (130) door middel van een eerste flexibele verbinding (C1), zodanig dat het bedieningsorgaan (140) kan zwenken ten opzichte van het doplichaam (130)
- 30 2. De spuitdop volgens conclusie 1, waarbij het spuitstuk en de eerste flexibele verbinding (C1) zich aan een zijde van de spuitdop (110) bevinden, en het grendelorgaan (160) ingrijpt op het bedieningsorgaan (140) aan een in hoofdzaak andere zijde van de spuitdop (110).
- 35 3. De spuitdop volgens een van de voorgaande conclusies, waarbij het doplichaam (130) een klikelement omvat om het grendelorgaan (160) vast te houden als het in de vrijgevend toestand is.

4. De spuitdop volgens conclusie 3, waarbij het klikelement gevormd is als een vasthouduitsteeksel (170) om in te grijpen op het grendelorgaan (160) als het in de vrijgevende toestand is.
5. De spuitdop volgens een van de voorgaande conclusies, waarbij de koppeling tussen het grendelorgaan (160) en het bedieningsorgaan (140) is gevormd als een vergrendelingsmechanisme.
6. De spuitdop volgens conclusie 5, waarbij het grendelorgaan (160) is gevormd als een flap (161) met een gebogen tong (162), waarbij het bedieningsorgaan (140) een vergrendelingsuitsparing (141) definieert, zodanig dat de uitsparing (141) een gebogen tong (162) kan opnemen op een vergrendelende wijze.
7. De spuitdop volgens een van de voorgaande conclusies, waarbij het grendelorgaan (160) een buitenste oppervlak (163) omvat dat, als het grendelorgaan (160) in de gesloten toestand is, één vlak vormt met - of verzonken ligt ten opzichte van - een buitenste contour van het doplichaam.
8. De spuitdop volgens een van de voorgaande conclusies, waarbij het bedieningsorgaan (140) één vlak vormt met – of verzonken ligt ten opzichte van – een buitenste contour van het doplichaam.
9. De spuitdop volgens een van de voorgaande conclusies, waarbij de spuitdop (110) een tweede flexibele verbinding (C2) omvat, die is gevormd tussen het grendelorgaan (160) en het doplichaam (130), zodanig dat het grendelorgaan (160) kan zwenken ten opzichte van het doplichaam.
10. De spuitdop volgens conclusie 11, waarbij de tweede flexibele verbinding (C2) is gevormd als een filmscharnier.
11. De spuitdop volgens een van de voorgaande conclusies, waarbij de spuitdop (110) is vervaardigd door middel van het spuitgieten van een kunststofmateriaal.
12. Een werkwijze voor het vervaardigen van een spuitdop (110) volgens een van de conclusies 1-13, waarbij de spuitdop (110) is vervaardigd door spuitgieten van een kunststofmateriaal, in het bijzonder een thermoplastische hars omvattende PE en/of PP.

Fig. 1

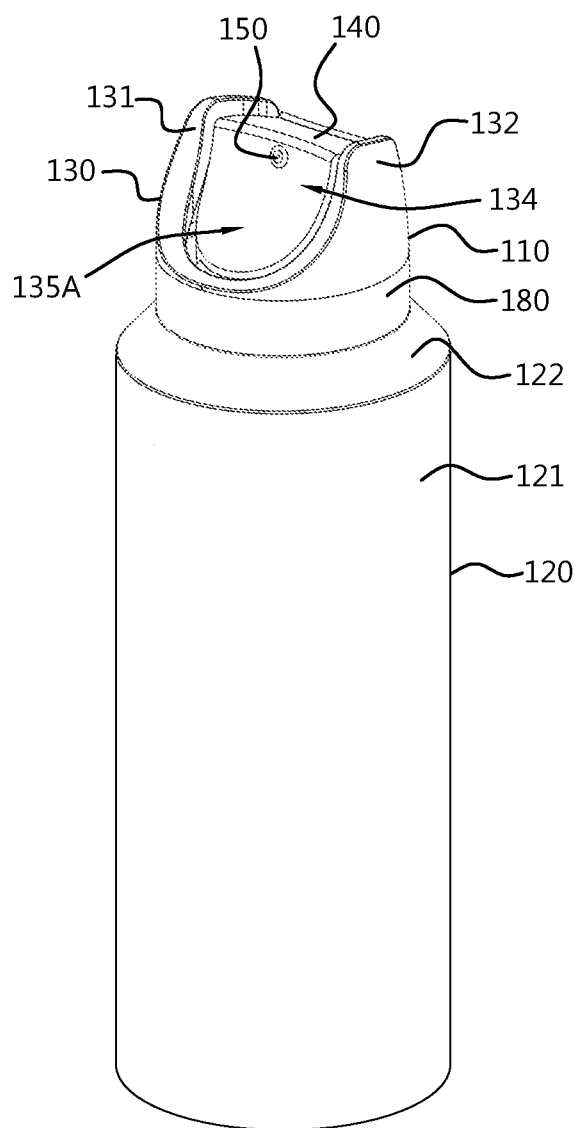


Fig. 2A

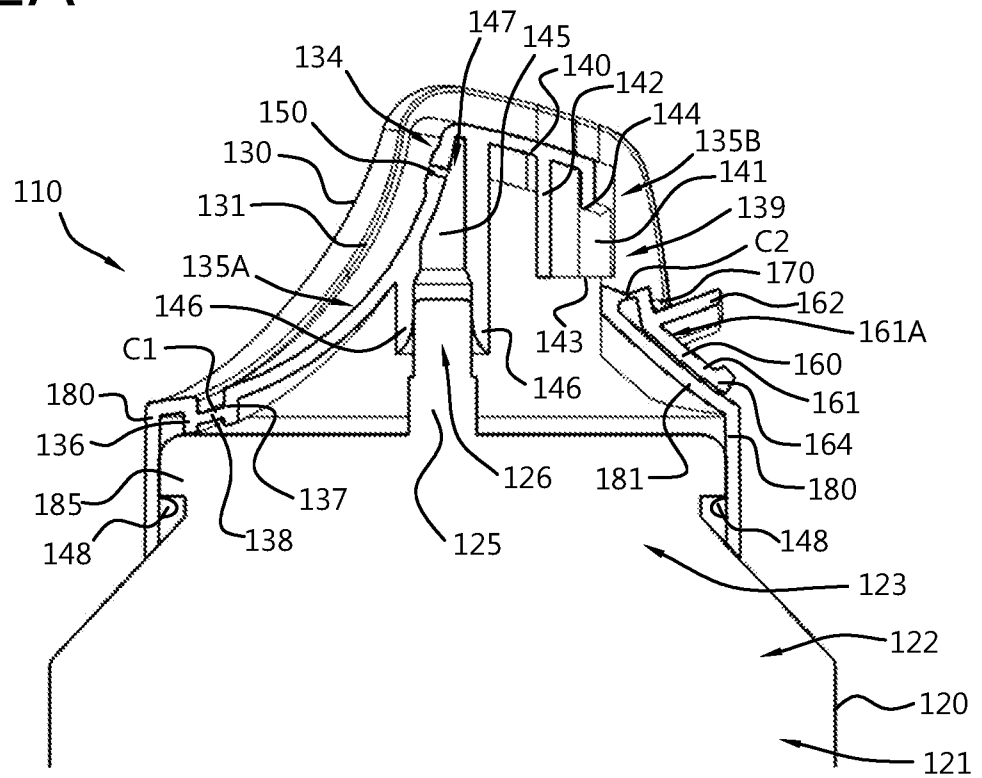


Fig. 2B

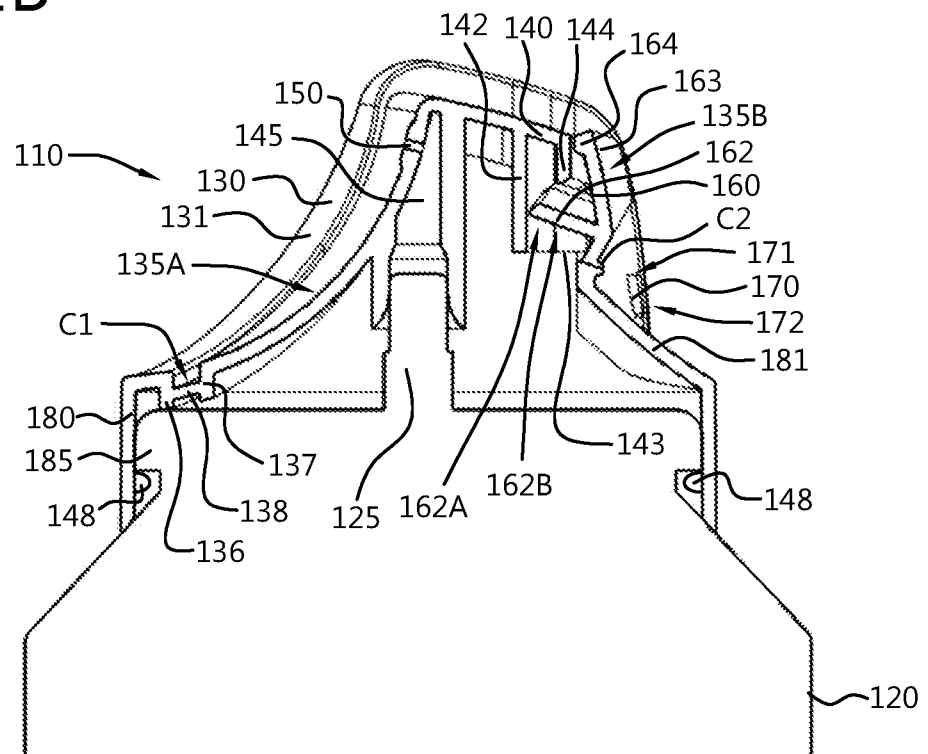




Fig. 2C

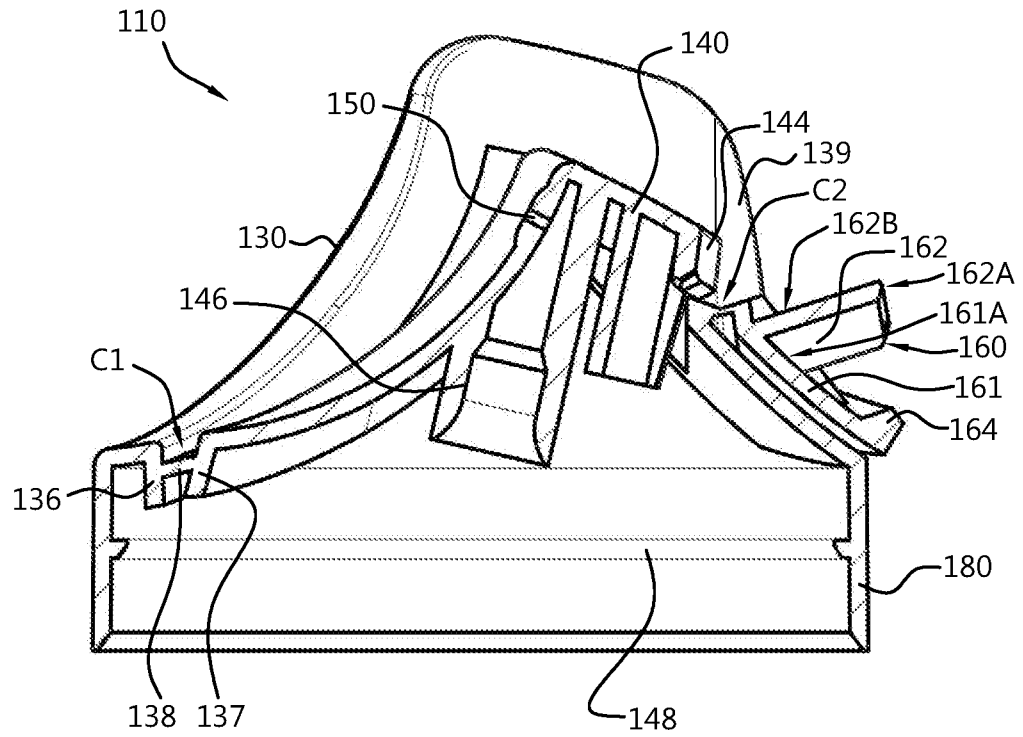


Fig. 3A

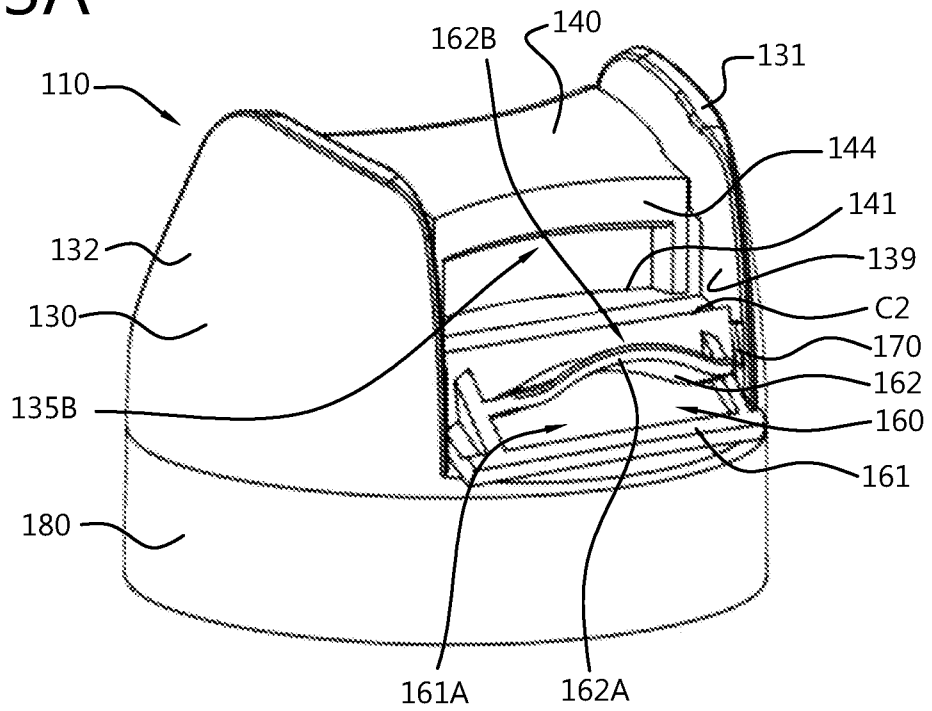
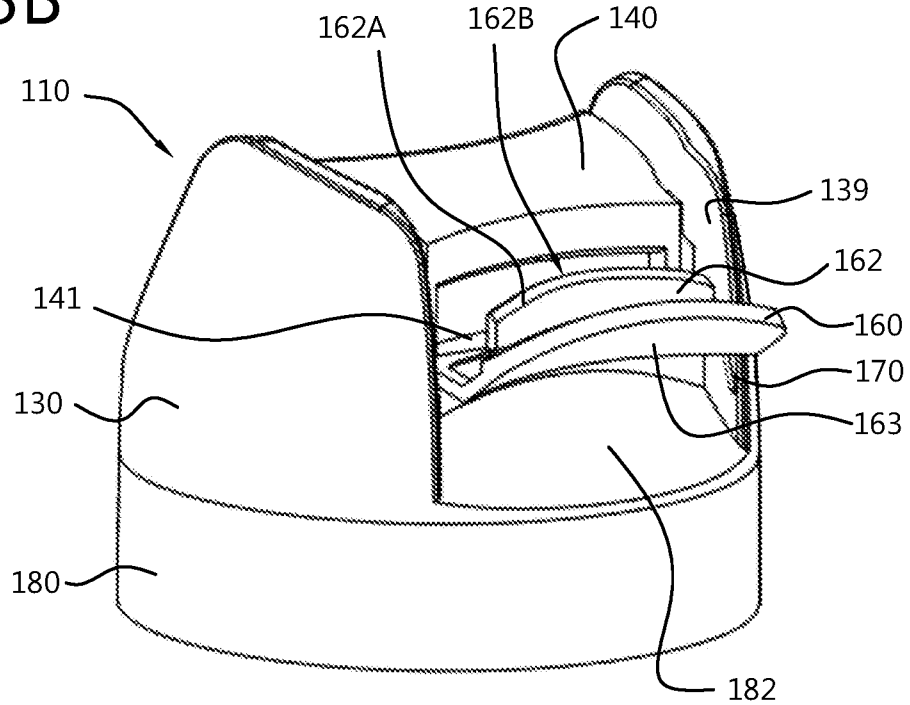


Fig. 3B



# SAMENWERKINGSVERDRAG (PCT)

## RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

IDENTIFICATIE VAN DE NATIONALE AANVRAGE	KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE  <b>P34107NL00/CHO</b>
Nederlands aanvraag nr.  <b>2024617</b>	Indieningsdatum  <b>07-01-2020</b>
	Ingeroepen voorrangdatum
Aanvrager (Naam)  <b>Weener Plastics Group B.V.</b>	
Datum van het verzoek voor een onderzoek van internationaal type  <b>28-03-2020</b>	Door de Instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr.  <b>SN75811</b>
<b>I. CLASSIFICATIE VAN HET ONDERWERP</b> (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven)	
Volgens de internationale classificatie (IPC)  <b>Zie onderzoeksrapport</b>	
<b>II. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK</b>	
Onderzochte minimumdocumentatie	
Classificatiesysteem	Classificatiesymbolen
<b>IPC</b>	<b>Zie onderzoeksrapport</b>
Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen	
III. <input type="checkbox"/>	<b>GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES</b> (opmerkingen op aanvullingsblad)
IV. <input type="checkbox"/>	<b>GEBREK AAN EENHEID VAN UITVINDING</b> (opmerkingen op aanvullingsblad)

**ONDERZOEKSRAPPORT BETREFFENDE HET  
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND  
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar  
de stand van de techniek

NL 2024617

<p>A. CLASSIFICATIE VAN HET ONDERWERP INV. B65D83/00 ADD.</p>		
<p>Volgens de Internationale Classificatie van octrooien (IPC) of zowel volgens de nationale classificatie als volgens de IPC.</p>		
<p>B. ONDERZOCHE TE GEBIEDEN VAN DE TECHNIEK</p>		
<p>Onderzochte minimum documentatie (classificatie gevolgd door classificatiesymbolen) B65D</p>		
<p>Onderzochte andere documentatie dan de minimum documentatie, voor dergelijke documenten, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen</p>		
<p>Tijdens het onderzoek geraadpleegde elektronische gegevensbestanden (naam van de gegevensbestanden en, waar uitvoerbaar, gebruikte trefwoorden) EPO-Internal, WPI Data</p>		
<p>C. VAN BELANG GEACHTE DOCUMENTEN</p>		
Categorie °	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
X	US 5 918 780 A (TANAKA SHIN [JP]) 6 juli 1999 (1999-07-06)	1,2,5-12
A	* kolom 7, regel 54 - kolom 8, regel 53; figuren 3-5 *	3,4
X	----- EP 2 060 507 A2 (OREAL [FR]) 20 mei 2009 (2009-05-20)	1,5-12
A	* alinea [0073] - alinea [0077]; figuren 9-11 *	
A	----- WO 2007/022422 A2 (SUMMIT PACKAGING SYST [US]; STRAND TORALF H [US]; LACEY THOMAS G [US]) 22 februari 2007 (2007-02-22)	1-12
A	* het gehele document *	
A	----- PL 2 125 549 T3 (LINDAL FRANCE SAS [FR]) 30 december 2011 (2011-12-30)	1-12
	* het gehele document *	
	----- -/--	
<input checked="" type="checkbox"/>	Verdere documenten worden vermeld in het vervolg van vak C.	<input checked="" type="checkbox"/>
	Leden van dezelfde octrooifamilie zijn vermeld in een bijlage	
<p>° Speciale categorieën van aangehaalde documenten</p> <p>"A" niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft</p> <p>"D" in de octrooiaanvraag vermeld</p> <p>"E" eerdere octrooi(aanvraag), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven</p> <p>"L" om andere redenen vermelde literatuur</p> <p>"O" niet-schriftelijke stand van de techniek</p> <p>"P" tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur</p>		<p>"T" na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvraag, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding</p> <p>"X" de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur</p> <p>"Y" de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht</p> <p>"&amp;" lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie</p>
<p>Datum waarop het onderzoek naar de stand van de techniek van internationaal type werd voltooid</p> <p>9 september 2020</p>		<p>Verzenddatum van het rapport van het onderzoek naar de stand van de techniek van internationaal type</p>
<p>Naam en adres van de instantie</p> <p>European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016</p>		<p>De bevoegde ambtenaar</p> <p>Lindner, Volker</p>

**ONDERZOEKSRAPPORT BETREFFENDE HET  
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND  
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar  
de stand van de techniek  
NL 2024617

C.(Vervolg). VAN BELANG GEACHTE DOCUMENTEN		
Categorie °	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
A	EP 2 127 760 A1 (OREAL [FR]) 2 december 2009 (2009-12-02) * het gehele document * -----	1-12

**ONDERZOEKSRAPPORT BETREFFENDE HET  
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND  
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Informatie over leden van dezelfde octrooifamilie

Nummer van het verzoek om een onderzoek naar  
de stand van de techniek

NL 2024617

In het rapport genoemd octrooigeschrift	Datum van publicatie	Overeenkomend(e) geschrift(en)	Datum van publicatie
US 5918780	A	06-07-1999	DE 19714275 A1 06-11-1997
			FR 2747653 A1 24-10-1997
			GB 2312478 A 29-10-1997
			US 5918780 A 06-07-1999
-----			
EP 2060507	A2	20-05-2009	EP 2060507 A2 20-05-2009
			FR 2923810 A1 22-05-2009
			US 2009127293 A1 21-05-2009
-----			
WO 2007022422	A2	22-02-2007	AU 2006279320 A1 22-02-2007
			CA 2618095 A1 22-02-2007
			DE 202006021269 U1 11-06-2014
			EP 1915299 A2 30-04-2008
			US 2007039979 A1 22-02-2007
			US 2010264167 A1 21-10-2010
			WO 2007022422 A2 22-02-2007
-----			
PL 2125549	T3	30-12-2011	AT 518774 T 15-08-2011
			AU 2008238147 A1 23-10-2008
			BR PI0807501 A2 27-05-2014
			CA 2681524 A1 23-10-2008
			CN 101600629 A 09-12-2009
			DK 2125549 T3 17-10-2011
			EP 2125549 A1 02-12-2009
			ES 2368665 T3 21-11-2011
			FR 2924097 A1 29-05-2009
			FR 2924098 A1 29-05-2009
			JP 2010522671 A 08-07-2010
			PL 2125549 T3 30-12-2011
			PT 2125549 E 06-10-2011
			RU 2010109912 A 27-09-2011
			SI 2125549 T1 30-11-2011
			US 2010155427 A1 24-06-2010
WO 2008125416 A1 23-10-2008			
ZA 200904734 B 28-04-2010			
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EP 2127760	A1	02-12-2009	BR PI0901644 A2 06-04-2010
			CN 101585437 A 25-11-2009
			EP 2127760 A1 02-12-2009
			FR 2931461 A1 27-11-2009
			US 2009289086 A1 26-11-2009
-----			

## WRITTEN OPINION

File No. SN75811	Filing date ( <i>day/month/year</i> ) 07.01.2020	Priority date ( <i>day/month/year</i> )	Application No. NL2024617
International Patent Classification (IPC) INV. B65D83/00			
Applicant Weener Plastics Group B.V.			

This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the application
- Box No. VIII Certain observations on the application

	Examiner Lindner, Volker
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**WRITTEN OPINION****Box No. I Basis of this opinion**

1. This opinion has been established on the basis of the latest set of claims filed before the start of the search.
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - a sequence listing
    - table(s) related to the sequence listing
  - b. format of material:
    - on paper
    - in electronic form
  - c. time of filing/furnishing:
    - contained in the application as filed.
    - filed together with the application in electronic form.
    - furnished subsequently for the purposes of search.
3.  In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

## 1. Statement

Novelty	Yes: Claims	3, 4
	No: Claims	1, 2, 5-12
Inventive step	Yes: Claims	3, 4
	No: Claims	1, 2, 5-12
Industrial applicability	Yes: Claims	1-12
	No: Claims	

## 2. Citations and explanations

**see separate sheet**



**Re Item V.**

1 Reference is made to the following documents:

D1 US 5 918 780 A (TANAKA SHIN [JP]) 6 juli 1999 (1999-07-06)

D2 EP 2 060 507 A2 (OREAL [FR]) 20 mei 2009 (2009-05-20)

**2 INDEPENDENT CLAIMS 1 and 12**

The present application does not meet the criteria of novelty, because **the subject-matter of claims 1 and 12 is not new.**

2.1 Document D1 discloses (the references in parentheses applying to this document):

Een spuitdop voor een spuitbus (B) met een afgiftemechanisme (5) bovenop de bus, waarbij de spuitdop omvat:

- een doplichaam (2) dat is ingericht om op een spuitbus te worden aangebracht;
- een kanaal dat een spuitkanaal (12) definieert en een spuitmond (11) aan één uiteinde heeft, en dat als de spuitdop op de spuitbus is aangebracht, is verbonden met het afgiftemechanisme van de spuitbus;
- een bedieningsorgaan (1) dat is gekoppeld met het kanaal, zodanig dat het bedienen van het bedieningsorgaan, als de spuitdop op de spuitbus is aangebracht, het afgiftemechanisme activeert om de aerosol vrij te geven in het spuitkanaal en naar de spuitmond toe; en
- een grendelorgaan (3) dat zwenkbaar is aangebracht op het doplichaam, waarbij het grendelorgaan een gesloten toestand heeft waarin het een beweging van het bedieningsorgaan ten opzichte van het doplichaam beperkt en een vrijgevende toestand waarin het een beweging van het bedieningsorgaan ten opzichte van het doplichaam toestaat; met het kenmerk, dat
- het grendelorgaan (3) monolithisch is gevormd met het doplichaam (2), waarbij, in de gesloten toestand, het grendelorgaan (3) en het bedieningsorgaan (1) gekoppeld zijn, en in de vrijgevende toestand het grendelorgaan (3) en het bedieningsorgaan (1) ontkoppeld zijn; en

- het bedieningsorgaan (1) monolithisch is gevormd met het doplichaam (2), waarbij het bedieningsorgaan zwenkbaar is aangebracht op het doplichaam (2) door middel van een eerste flexibele verbinding (14), zodanig dat het bedieningsorgaan (1) kan zwenken ten opzichte van het doplichaam (2).

Een werkwijze voor het vervaardigen van een spuitdop, waarbij de spuitdop is vervaardigd door spuitgieten van een kunststofmateriaal, in het bijzonder een thermoplastische hars omvattende PE en/of PP.

2.2 Document D2 discloses also the subject matter of claims 1 and 12:

D2: doplichaam (11), spuitkanaal (21), spuitmond (28), bedieningsorgaan (15), grendelorgaan (60), flexibele verbinding (61)

### 3 **DEPENDENT CLAIMS 2, 5-11**

The present application does not meet the criteria of novelty, because **the subject-matter of claims 2, 5-11 is not new.**

The document D1 discloses:

De spuitdop, waarbij het spuitstuk en de eerste flexibele verbinding (14) zich aan een zijde van de spuitdop bevinden, en het grendelorgaan (3) ingrijpt op het bedieningsorgaan (1) aan een in hoofdzaak andere zijde van de spuitdop, waarbij de koppeling tussen het grendelorgaan (3) en het bedieningsorgaan (1) is gevormd als een vergrendelingsmechanisme, waarbij het grendelorgaan (3) is gevormd als een flap (3) met een gebogen tong (3,32), waarbij het bedieningsorgaan (1) een vergrendelingsuitsparing (S) definieert, zodanig dat de uitsparing (S) een gebogen tong (3) kan opnemen op een vergrendelende wijze, waarbij het grendelorgaan (3) een buitenste oppervlak (3) omvat dat, als het grendelorgaan (3) in de gesloten toestand is, één vlak vormt met - of verzonken ligt ten opzichte van - een buitenste contour van het doplichaam, waarbij het bedieningsorgaan (1) één vlak vormt met - of verzonken ligt ten opzichte van - een buitenste contour van het doplichaam, waarbij de spuitdop een tweede flexibele verbinding (25) omvat, die is gevormd tussen het grendelorgaan (3) en het doplichaam (2), zodanig dat het grendelorgaan (3) kan zwenken ten opzichte van het doplichaam, waarbij de tweede flexibele verbinding (25) is gevormd als een filmscharnier, waarbij de spuitdop is

vervaardigd door middel van het spuitgieten van een kunststofmateriaal.

**4 DEPENDENT CLAIMS 3 and 4**

**The subject matter of claims 3 or 4 of the present application is considered as involving an inventive step.**