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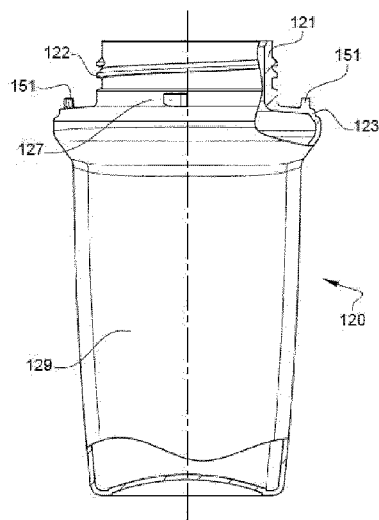
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(54) Title: MOULDED PLASTIC RECIPIENT COMPRISING A HOLLOW MAIN BODY INTENDED TO CONTAIN A PRODUCT

[Fig. 3]



(57) Abstract: The present invention relates to a moulded preform for the manufacture of a recipient of thermoplastic material using a blow moulding process, said preform comprising a main part or preform body configured to be blown to form a hollow main body of the recipient and a head part that is not intended to be deformed by blow moulding and is configured to form at least one neck of the recipient, characterized in that the head part also comprises at least one portion of a shoulder of the recipient joining the main body to the neck, said shoulder bearing at least one locking lug projecting, at a non-zero distance from the neck, from an outer upper surface of the shoulder in a direction substantially parallel to a longitudinal direction of the neck.



Description

Title of Invention: Moulded plastic recipient comprising a hollow main body intended to contain a product

- [0001] The present invention relates to a moulded preform for the manufacture of a recipient from a thermoplastic material using a blow moulding process, as well as such a recipient. The present application relates more specifically to recipients intended to receive and dispense a cosmetic product, such as bottles, and applicator assembly reservoirs, such as roll-on applicators.
- [0002] There are numerous techniques for manufacturing moulded recipients from thermoplastic material. A particularly advantageous technique is manufacturing by blow moulding a preform previously made by moulding the thermoplastic material, for example PET, PE, PP, PS, POM, PVC. The preform may notably be manufactured using an injection or extrusion process.
- [0003] In general, a preform comprises a preform body intended to be expanded by blow moulding to form a main body of the recipient, and a preform head that is intended to form a neck of the recipient and is not intended to be deformed by the blow moulding operation. More specifically, the preform head is intended to enable the preform body to be positioned and held inside the blow mould. The preform head is also intended to enable a blow moulding tube to be inserted into the preform body.
- [0004] Making the preform by injection is usually preferred if the recipient has to be manufactured with a neck provided with a thread or other means enabling a top such as a dispensing head or a closing cover (screw cap) to be attached.
- [0005] Said top is often designed to be removable, and it may be desirable to secure the unscrewing of said top to prevent accidental opening. This is particularly desirable if the dispensing head comprises several removable elements intended to be disconnected from the recipient separately and/or for different reasons. Thus, a dispensing head comprising on one hand a base intended to be disassembled from the recipient to enable refilling, and on the other hand a lid mounted on the base and intended to be removed with each use may be cited by way of example.
- [0006] For this purpose, child-safety systems are known, as described and illustrated for example in documents US11174081B2 and DE202021106745U1 for roll-on applicators, or US5865330A for a bottle top. In general, such systems comprise locking lugs that are disposed on a part of the neck of the recipient and are associated with deformable parts of the cap. In an idle position, the deformable parts butt against a corresponding surface of the lug to prevent the cap from being unscrewed. The user can press an appropriate zone of the cap to deform said deformable parts and thus to

separate them from the lug, thereby enabling the cap to be rotated and unscrewed.

[0007] In document US5865330A, the locking lugs are carried by a collar attached to the neck. The deformable zones are made in the form of flexible tabs able to cooperate directly with the locking lugs. The same is true in document US11174081B2, where the locking lugs are also attached to the recipient, either on a surface of a shoulder joining the body to the neck, or on a plate extending from a base of the neck.

[0008] In document DE202021106745U1, the locking elements are made on a wall of the neck, which may hinder the formation of the screw thread of the cap. Furthermore, the deformation zones are formed by the skirt of the cap and are deformed by bearing against the unlocking surfaces oriented at 90° from the lugs.

[0009] There is a need to facilitate the formation of such locking lugs and notably to enable them to be made integral with the recipient, from the time of manufacture of the preform by moulding to enable the finished recipient to be made using a blow moulding process.

[0010] To do so, the present application relates to a moulded preform for the manufacture of a recipient of thermoplastic material using a blow moulding process, said preform comprising a main part or preform body configured to be blown to form a hollow main body of the recipient and a head part that is not intended to be deformed by blow moulding and is configured to form at least one neck of the recipient.

[0011] According to the present application, the head part also comprises at least one portion of a shoulder of the recipient joining the main body to the neck, said shoulder bearing at least one locking lug projecting, at a non-zero distance from the neck, from an outer upper surface of the shoulder in a direction substantially parallel to a longitudinal direction of the neck.

[0012] Therefore, by making a preform in which at least one part of the shoulder of the recipient is integral with the preform head, which is not intended to be deformed during blow moulding of the preform body, it is possible to include locking lugs therein during moulding of the preform that will form a locking system with a top fitted with corresponding deformation zones.

[0013] In other words, unlike existing practice in which the preform body is blown and made integrally, with both the main body of the recipient and the shoulder thereof joining said main body to the neck, the shoulder of the recipient and the locking lugs thereof are injected into the preform head, in accordance with the desired final shape, without being integrated into a part of the preform intended to be deformed during blow moulding.

[0014] It should be noted that by integrating the shoulder into the preform head, additional plastic material has to be used. This results in the final mass of the recipient being greater than a recipient obtained by blow moulding a preform in which the shoulder is

formed exclusively by expansion of the body of the preform. This mass is nonetheless considerably less than if the recipient had had to be made directly in the final shape thereof by (injection) moulding without blowing, or by injection blow moulding with attached lugs or a part bearing the lugs. This also obviates the need to provide an additional collar on the head part to make the locking lugs.

[0015] During the blow moulding step, the body of the preform is deformed and a part of the material is rejoined beneath the injected shoulder, which is not deformed during blow moulding. The blow mould will advantageously be designed so that there is a continuous surface between the shoulder and an outer surface of the main body of the recipient.

[0016] It should be noted that the preform is understood to be the result of the moulding step shaping the preform before the blow moulding step. The preform may be a customized product that may notably be stored and/or moved between the moulding step and the blow-moulding step. This is notably the case in injection blow moulding processes conventionally comprising two separate steps. The preform undergoes the blow-moulding step sooner or later, including immediately after the moulding step, to transform it into the finished recipient. The preform may also be a non-customized temporary intermediate product. This is particularly the case in extrusion blow-moulding processes that may be used continuously in a single step, the preform then being formed by the parison part about which the blow mould is positioned, even if this part is not separated from the rest of the extruded material until after blow moulding.

[0017] According to one embodiment, the portion of the head of the preform intended to form the shoulder of the recipient is made in the form of a collar projecting from the preform at a join between the neck and the body of the preform.

[0018] Preferably, the collar intended to form the shoulder of the recipient projects in a direction substantially transverse to a longitudinal axis of the preform. Advantageously, the part intended to form the shoulder of the recipient has an essentially flat outer upper surface. "Upper" means that the surface is oriented towards an opening of the neck. "Lower" means a surface oriented towards a bottom of the recipient or of the body of the preform.

[0019] Again preferably, a longitudinal axis of the preform coincides with the longitudinal axis of the neck.

[0020] According to one embodiment, the locking lug has at least one downstream stop surface substantially transverse to an unscrewing direction of the thread of the neck, said downstream stop surface being configured to cooperate with a complementary locking element of a top in order to prevent it from being unscrewed in the absence of an elastic deformation radially separating said complementary locking element from

the lug.

- [0021] Preferably, the locking lug has an upstream profile configured to enable at least one complementary locking element of the top to pass by elastic deformation in a screwing direction. "Upstream" means a position further along the thread in the opening direction of the neck, i.e. closer to the opening of the neck. Reciprocally, "downstream" refers to a position closer to the preform body or the body of the recipient along the thread.
- [0022] Again preferably, the head part of the preform intended to form the shoulder has at least two diametrically opposed locking lugs.
- [0023] The present invention also relates to a moulded recipient made of thermoplastic plastic material that can be obtained by blow moulding a preform according to the present application. The recipient comprises a hollow main body intended to contain a product and surmounted by a shoulder bearing a threaded neck. The shoulder has at least one locking lug projecting, at a non-zero distance from the neck, from an outer upper surface of the shoulder in a direction substantially parallel to a longitudinal direction of the neck. The recipient is characterized in that said lug is formed as one piece with the shoulder.
- [0024] According to one embodiment, the shoulder has a material rejoining surface between an unblown moulded outer upper part and a blown inner lower part.
- [0025] The present application also relates to an assembly for packaging and dispensing a product, characterized in that it comprises a top that is able to cooperate removably with the neck of a recipient according to the application. The top has at least one locking element that is movable elastically between an idle position in which the locking element butts against the locking lug of the recipient in an unscrewing direction, and a separated position in which the locking element is separated from the corresponding locking lug of the recipient and enables said top to be unscrewed.
- [0026] According to a preferred embodiment, the top is a ball holder, the assembly being able to form a roll-on applicator. Advantageously and additionally, the top, and notably the ball holder, has an outer thread able to cooperate with a closing lid of said top.
- [0027] The invention is further explained in the detailed description given below of a non-limiting example embodiment of the invention and the attached drawings, in which:
- [0028] [Fig.1] shows a packaging and dispensing assembly according to the present application,
- [0029] [Fig.2] is a longitudinal cross-section view of the assembly in [Fig.1],
- [0030] [Fig.3] is a schematic side view of a recipient making up the assembly in [Fig.1],
- [0031] [Fig.4] is a schematic top view of the recipient in [Fig.3],
- [0032] [Fig.5] is a schematic longitudinal cross-section view of a ball-holder top making up

the assembly in [Fig.1],

[0033] [Fig.6] is a schematic top view of the ball-holder top in [Fig.5],

[0034] [Fig.7] is a schematic view of a preform disposed inside a blow mould to make the recipient in [Fig.3].

[0035] [Fig.1] shows an example packaging and dispensing assembly 100 according to the present application in the form of a roll-on applicator assembly.

[0036] It should be noted that, although illustrated by a refillable roll-on applicator assembly, the present invention is not limited to a specific type of dispensing assembly and may notably be used in pump bottle assemblies or other assemblies.

[0037] The applicator assembly comprises a recipient 120 on a neck 121 of which a dispensing head 130 is mounted to form a top. The dispensing head 130 comprises a base formed by a ball holder 131 mounted removably on the neck 121, and a lid 132 mounted removably on the ball holder 131.

[0038] The assembly 100 forms a refillable roll-on applicator as described generally for example in documents DE202021106745U1, ES2413163B1 or even WO2021155454A1.

[0039] Thus, the ball holder 131 forming the base of the top is intended to be disassembled from the recipient 120 to enable refilling or replacement with a full recipient, the ball holder 131 being then mounted on the neck 121 of another recipient 120. The lid 132 is intended to be disassembled from the ball holder 131 during a more frequent use of the applicator assembly 100.

[0040] The assembly and disassembly of the ball holder 131 forming the base of the top and of the lid 132 is notably executed by screwing. To do this, the neck 121 of the reservoir has an outer thread 122 able to cooperate with a complementary inner thread 134 of an inner skirt 133 of the ball holder. Similarly, the lid 132 has an inner thread 136 that is able to cooperate with a complementary outer thread 135 carried by an outer peripheral surface 137 of the ball holder 131. Additionally, the neck 121 has end-of-travel screwing stops 127 intended to cooperate with complementary stops carried by the inner skirt 133 of the ball holder 131.

[0041] As indicated above, it is desirable to secure the disassembly of the ball-holder base 131 to prevent any accidental disassembly, notably during disassembly of the lid 132. A first solution is to provide screw threads in different directions. By doing so, the lid is disassembled in a first direction of rotation, whereas the user has to unscrew in the other direction to disassemble the top. However, this is counter-intuitive for the user. Furthermore, if the user, or the factory during an initial assembly, overtightens the lid, the ball holder may be unscrewed (and vice versa).

[0042] Another solution is to design assembly threads on the base of the top and of the lid so that they have different unscrewing forces, the force required to unscrew the

ball-holder top having to be significantly greater than the force required to unscrew the lid. Such threads are complex to design and make since the intended unscrewing forces must remain acceptable for the user while being sufficiently different and outside the manufacturing tolerances.

[0043] It is therefore preferable for the lid 132 and the base 131 of the top to be able to unscrew in the same direction as in the present example, in particular in the conventional anticlockwise direction and preferably with similar unscrewing forces.

[0044] The removable fastening of the base is secured by a child-safety mechanism. Thus, the top formed by the ball holder 131 has at least one locking element that is movable elastically between an idle position in which the locking element butts against a corresponding locking lug of the recipient in an unscrewing direction, and a separated position in which the locking element is separated from the locking lug of the recipient and enables said top to be unscrewed.

[0045] More specifically, the movable locking element is formed in an outer skirt 137 of the ball-holder top 131. In this case, the movable locking element is a flexible tab 138, the separated position being a position in which the flexible tab 137 is pushed radially towards the inside of the top.

[0046] The top has two diametrically opposed movable locking elements, i.e. two flexible tabs 138.

[0047] The locking elements of the ball-holder top 131 are intended to cooperate with locking lugs 151 disposed on the recipient 120 described below.

[0048] The recipient 120 is a moulded recipient of thermoplastic material that can be obtained by blow moulding a preform 10 ([Fig.7]). The recipient 120 comprises a hollow main body 129 intended to contain the cosmetic product to be dispensed through the ball-holder top 131, the hollow main body being surmounted by a shoulder 123 bearing the threaded neck 121 of the recipient.

[0049] According to the present application, the shoulder 123 bears the locking lugs 151, said lugs projecting, at a non-zero distance from the neck 121, from an outer surface of the shoulder 123 in a direction substantially parallel to a longitudinal direction of the neck 121.

[0050] The recipient 120 is characterized in that the lugs 151 are formed as one piece with the shoulder 123. More specifically, as explained above, the lugs 151 are provided directly in a moulded preform head, including at least an upper part of the shoulder bearing said lugs, and not intended to be deformed during the blow moulding operation. The upper part of the shoulder bearing the lugs 151 is made in the form of a collar 151b projecting radially in relation to a longitudinal axis of the preform and located substantially at a join between the preform head (forming the neck 121, which is not deformed during blow moulding) and the preform body (forming the body 122

of the recipient 120, which is deformed during blow moulding).

- [0051] Each locking lug 151 has at least one downstream stop surface substantially transverse to an unscrewing direction of the thread 122 of the neck 121 that is able to cooperate with a complementary locking element of the ball-holder base 131 of the top 130 in order to prevent it from being unscrewed in the absence of an elastic deformation radially separating the associated locking tab 138 from the ball-holder top 131.
- [0052] Each locking lug 151 also has an upstream profile configured to enable the associated locking tab 138 to pass in a screwing direction by elastic deformation.
- [0053] The preform 10 intended to be blown to obtain the final recipient comprises a main part or preform body configured to be blown to form the hollow main body 122 of the recipient 120 and a head part that is not intended to be deformed by blow moulding and is configured to form the neck 121 of the recipient 120. According to the present application, the head part also comprises a portion of a shoulder 123 of the recipient 120 joining the main body 122 to the neck 121 and said shoulder 123 bears the locking lugs 151. As with the final recipient, the locking lugs project, at a non-zero distance from the neck, from an outer upper surface of the shoulder in a direction substantially parallel to a longitudinal direction of the neck.
- [0054] The portion of the head of the preform 10 intended to form a part of the shoulder 123 of the recipient 120 is made in the form of a collar 10b projecting from the preform at a join between the neck and the body of the preform to be blown. The collar 10b projects in a direction substantially transverse to the longitudinal axis of the preform 10 that coincides with the longitudinal axis of the neck.
- [0055] Thus, during the blow moulding operation, the preform 10 is disposed in the blow mould M2, the shoulder part being located at the interface between a holding part M2a of the mould and a blow moulding part M2b of the mould.
- [0056] More specifically, the blow mould M2 is made with a first volume in which the body of the preform is disposed to be deformed therein by blow moulding, thereby adopting the shape of said first volume of the blow mould. The blow mould comprises an upper second volume intended to hold the preform in the mould via the preform head. Since the head of the preform is not intended to be deformed by blow moulding, this second volume positively engages the head of the preform, unlike the first volume, which does not positively engage the body of the preform before it is blown, but has the final shape of the main body 122 of the recipient 120.
- [0057] The first and second volumes evidently communicate with one another at the join between the preform head and the preform body.
- [0058] Thus, when the preform is disposed in the blow mould, the neck is held in the second volume, of the same shape, while the preform body projects into the first volume. An

upper part of the shoulder bearing the lugs is also located in the second volume, while a lower surface of this part is flush with the first volume.

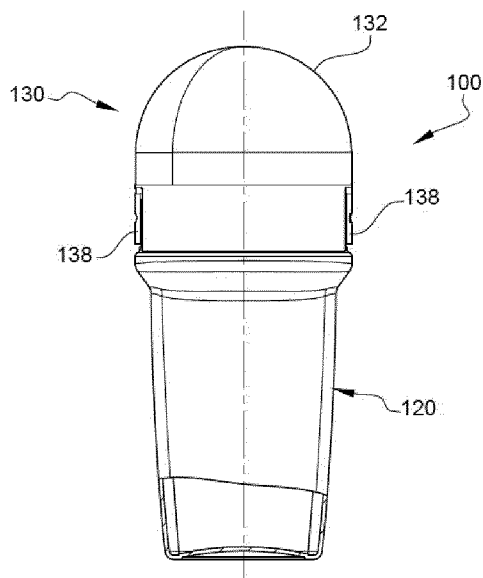
- [0059] When blow moulding the preform body, the preform body is deformed and expands to fit the internal shape of the mould. By doing so, a part of the blown plastic material is rejoined to the lower surface of the shoulder part located at the interface between the first (blow moulding) volume and the second (holding) volume. Consequently, the shoulder of the final recipient may have a material rejoining surface between an unblown moulded outer upper part (belonging to the preform head) and a blown inner lower part (belonging to the preform body).
- [0060] [Fig.7] shows, on the right-hand side, the preform 10 compared to its injection mould M1 enabling its initial manufacture, and, on the left-hand side, as disposed in its blowing mould M2 to obtain the recipient by blow moulding the body of the preform.

Claims

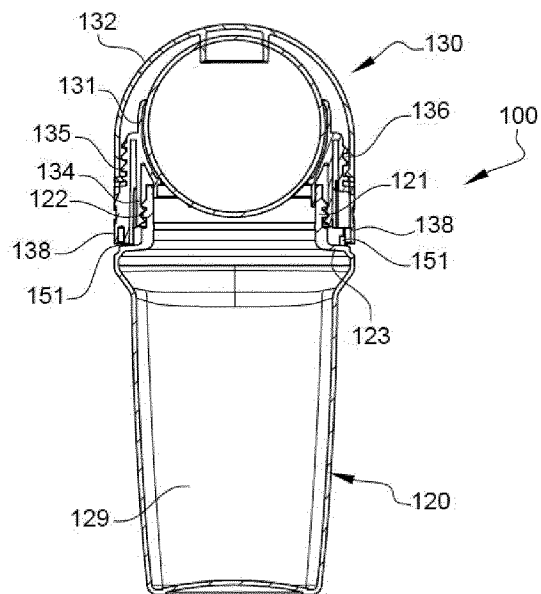
- [Claim 1] Moulded preform (10) for the manufacture of a recipient (120) of thermoplastic material using a blow moulding process, said preform comprising a main part or preform body configured to be blown to form a hollow main body (129) of the recipient and a head part that is not intended to be deformed by blow moulding and is configured to form at least one neck (131) of the recipient, characterized in that the head part also comprises at least one portion of a shoulder (123) of the recipient joining the main body to the neck, said shoulder bearing at least one locking lug (151) projecting, at a non-zero distance from the neck, from an outer upper surface of the shoulder in a direction substantially parallel to a longitudinal direction of the neck.
- [Claim 2] Preform (10) according to Claim 1, characterized in that the portion of the head of the preform intended to form a part of the shoulder (123) of the recipient (120) is made in the form of a collar (10b) projecting from the preform at a join between the neck and the body of the preform to be blown.
- [Claim 3] Preform (10) according to Claim 2, characterized in that the collar (10b) intended to form a part of the shoulder (123) of the recipient (120) projects in a direction substantially transverse to a longitudinal axis of the preform.
- [Claim 4] Preform (10) according to any one of Claims 1 to 3, characterized in that a longitudinal axis of the preform coincides with the longitudinal axis of the neck (121).
- [Claim 5] Preform (10) according to any one of Claims 1 to 4, characterized in that the locking lug (151) has at least one downstream stop surface substantially transverse to an unscrewing direction of the thread (122) of the neck (121), said downstream stop surface being able to cooperate with a complementary locking element (138) of a top (130) in order to prevent it from being unscrewed in the absence of an elastic deformation radially separating said complementary locking element from the lug.
- [Claim 6] Preform (10) according to any one of Claims 1 to 5, characterized in that the locking lug (151) has an upstream profile configured to enable at least one complementary locking element (138) of a top (131) to pass by elastic deformation in a screwing direction.

- [Claim 7] Preform (10) according to any one of Claims 1 to 6, characterized in that the head part of the preform intended to form the shoulder has at least two diametrically opposed locking lugs (151).
- [Claim 8] Moulded recipient (120) made of thermoplastic material obtained by blow moulding a preform according to any one of Claims 1 to 7, the recipient comprising a hollow main body (129) intended to contain a product and surmounted by a shoulder (123) bearing a threaded neck (121), the shoulder having at least one locking lug (151) projecting, at a non-zero distance from the neck, from an outer upper surface of the shoulder in a direction substantially parallel to a longitudinal direction of the neck, the recipient being characterized in that said lug is formed as one piece with the shoulder.
- [Claim 9] Recipient (120) according to Claim 8, characterized in that the shoulder (123) has a material rejoining surface between an unblown moulded outer upper part and a blown inner lower part.
- [Claim 10] Assembly (100) for packaging and dispensing a product, characterized in that it comprises a top (130) that is able to cooperate removably with the neck (121) of a recipient (120) according to either of Claims 8 and 9, the top having at least one locking element (138) that is movable elastically between an idle position in which the locking element butts against the locking lug (151) of the recipient in an unscrewing direction, and a separated position in which the locking element is separated from the locking lug of the recipient and enables said top to be unscrewed.
- [Claim 11] Assembly (100) according to Claim 10, characterized in that the top (130) is a ball holder (131), the assembly being able to form a roll-on applicator.
- [Claim 12] Assembly (100) according to either of Claims 10 and 11, characterized in that the top (130), notably the ball holder, has an outer thread able to cooperate with a closing lid (132) of said top.

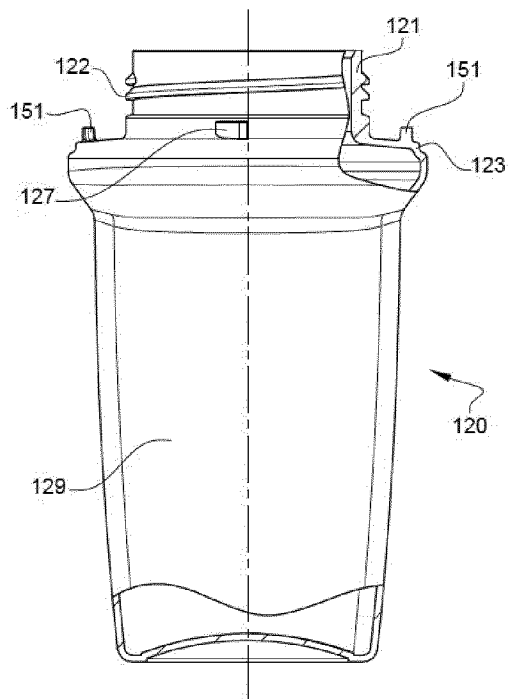
[Fig. 1]



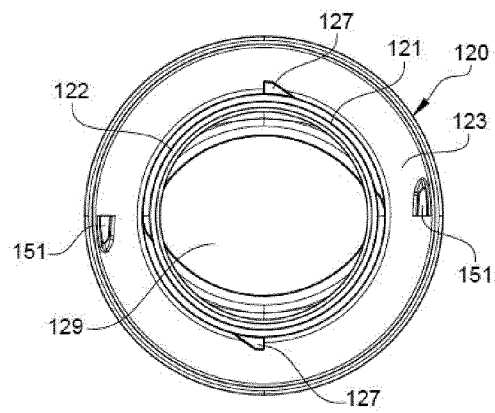
[Fig. 2]



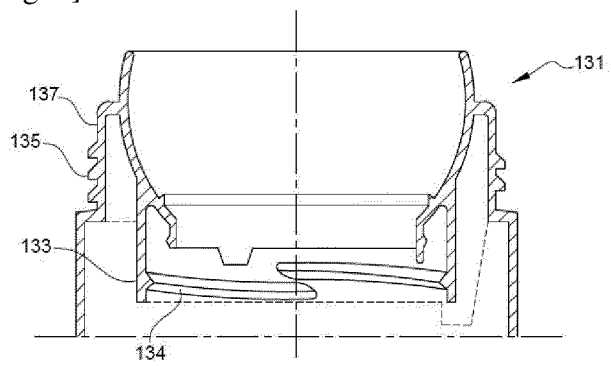
[Fig. 3]



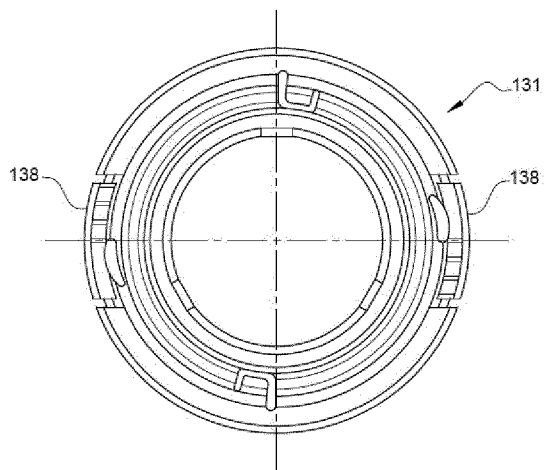
[Fig. 4]



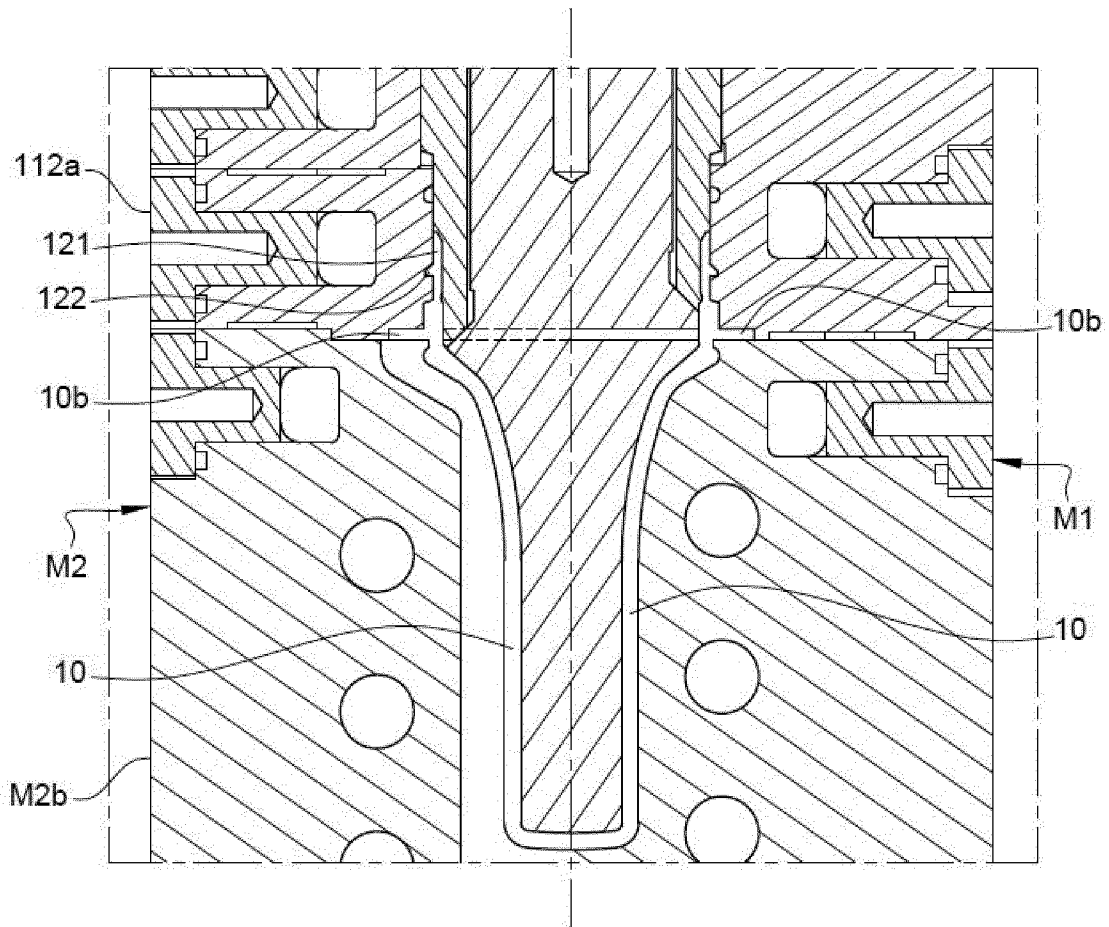
[Fig. 5]



[Fig. 6]



[Fig. 7]



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2024/064039

A. CLASSIFICATION OF SUBJECT MATTER		
INV.	B29B11/14	B29C49/00
	A45D34/04	B65D6/00
	B65D50/04	B65D47/42
ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
B29B B29C B65D		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 865 330 A (BUONO CAETANO [US]) 2 February 1999 (1999-02-02)	1-10
Y	column 3, line 66 - column 5, line 9; claims 1,4; figures 1-6a -----	11,12
Y	ES 2 413 163 B1 (COLLS LLOBET JOSEFA [ES]) 13 May 2014 (2014-05-13) page 3, lines 43-46; figure 2 -----	11,12
A	EP 0 780 318 B1 (PROCTER & GAMBLE [US]) 23 January 2002 (2002-01-23) paragraphs [0033], [0037]; claims 1-3; figures 2a,2c -----	1-12
A	CH 706 926 A1 (ALPLA WERKE [AT]) 14 March 2014 (2014-03-14) figures 2a, 2c ----- -/-	1-12
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Date of the actual completion of the international search		Date of mailing of the international search report
13 June 2024		24/06/2024
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Foulger, Caroline

INTERNATIONAL SEARCH REPORT

International application No

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