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(54) **Fluid dispensing unit and method of producing the same**

(57) A dispensing mechanism (100) for a fluid dispenser is provided, wherein the dispensing mechanism comprises an actuating button (101) and a closing element (108) having an open state and a closed state, wherein the dispensing mechanism is adapted in such a way that the closing element is converted from the closed state into the open state when a user actuates the actuating button.

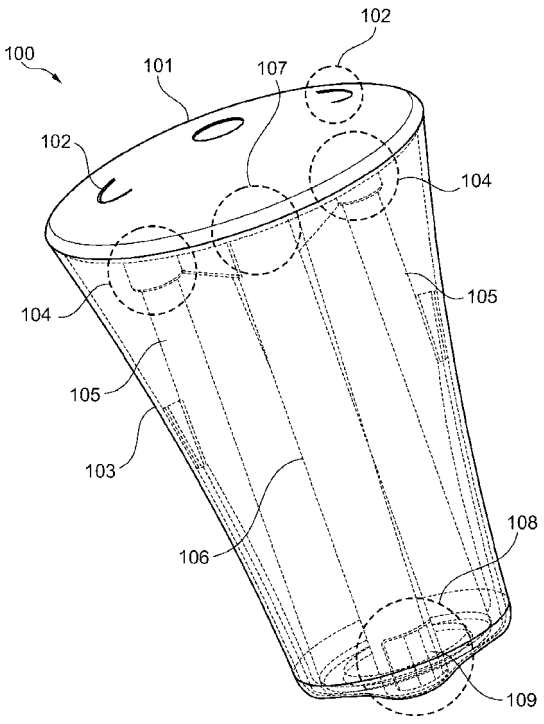

Fig. 1

EP 2 546 164 A1

Description

[0001] The inventions relates to a dispensing mechanism for a fluid dispensing unit, in particular to a fluid dispensing mechanism which is operable by one hand.

[0002] Further, the invention relates to a fluid dispensing unit.

[0003] Furthermore, the invention relates to a lid for a fluid dispensing unit.

[0004] Moreover, the invention relates to a motion link for a fluid dispensing unit.

[0005] Moreover, the invention relates to a resilient element for a fluid dispensing unit.

[0006] Additionally, the invention relates to a method of producing a fluid dispensing unit.

[0007] Fluid dispensing units or systems, e.g. for dispensing liquids are widely used in our times. In particular, fluid dispensing systems for dispensing juices or syrups are known. These dosing or dispensing systems are formed typically by a bottle like system or by beverage cartons. In general such beverage cartons or container have an opening which may be covered by a lid or a closure which itself forms part of the container or which is attached to the container.

[0008] An example of a container closure is known from EP 1 115 627 Bl. The respective closure is one that is actuated and opened indirectly. A force on a push pad causes a lid to open. There is no direct manual force applied to the lid to open the lid. The closure is comprised of a base section and a lid section. These are separate moulded sections. These separate moulded sections are attached after moulding. The base section has the attachment to a container, structural integrity, a spout, and a lid actuator mechanism. The lid actuator mechanism is comprised of a strap with a push pad with an actuator rod at the end adjacent an actuator wall. The lid section has a spout closing section for the spout of the base section and an attachment fitting for attachment to the base section. The spout closing section is attached to the attachment fitting by living hinges, and preferably, preloaded living hinges. Such living hinges reduce the force to actuate. The closure is opened by pushing on a push pad which in turn causes the living hinges to be actuated and the lid snap opened. The lid is manually closed.

[0009] However, the known closing and dispensing mechanisms for fluid dispensing units are quite complex and consists of a plurality of parts.

[0010] Thus, there may be a need to provide a dispensing mechanism for a fluid dispensing unit, a fluid dispensing unit, a lid for a fluid dispensing unit, a resilient element for a fluid dispensing unit and a method of producing a fluid dispensing unit wherein the fluid dispensing unit is simpler to manufacture or handle or is less complex than known systems or methods of manufacturing the same.

[0011] The object is solved by a dispensing mechanism, a fluid dispensing unit, a lid, a resilient element, and a method of manufacturing a fluid dispensing unit according to the independent claims. Advantageous embodiments are described by the dependent claims.

[0012] According to a first exemplary aspect a dispensing mechanism for a fluid dispenser is provided, wherein the dispensing mechanism comprises an actuating button and a closing element having an open state and a closed state, wherein the dispensing mechanism is adapted in such a way that the closing element is converted from the closed state into the open state when a user actuates the actuating button. Furthermore, the closing mechanism is further adapted in such a way that the closing element is converted from the open state into the closed state when the user releases the actuating button.

[0013] In particular, the conversion from the open to the closed state may be performed automatically, e.g. by adapting the closing mechanism that the closing element is converted or transferred automatically in the closed state when the actuating button is released by the user. In particular, the closing element may be adapted in such a way that the closed state may correspond to a state in which the closing element covers an opening of a fluid dispensing unit or fluid dispenser. Furthermore, the closing element may be adapted in such a way that the open state may correspond to a state in which the closing element does not cover the opening of the fluid dispenser. In particular, the actuating button is connected with a motion link (form closure) shutter or cover of the dispensing unit. According to some embodiments, the actuating button may be a push button, i.e. a button which is actuated by pushing the same, e.g. with one finger. For example, the actuating button may be adapted or configured to open a tear seam arranged around the closing element or a portion of the closing element which may form a rigid shutter, which may be connected to the fluid dispenser by a motion link. The opening or breaking of the tear seam may be performed or effected by a needle-shaped geometry. However, the breaking of the tear seam may spare the motion link by which the rigid shutter may be connected to the fluid dispenser. For example, a portion of the guiding mechanism may comprise the needle-shaped geometry. Furthermore, the actuator button may include ribs, ending at a further tear seam, to create and open an air-vent to ease the flow of a fluid out of the fluid dispenser through the closing element in the open state. For example, the air-vent may be formed in a lid or cover of the fluid dispenser.

[0014] According to a second exemplary aspect a fluid dispensing unit is provided which comprises a container adapted to accommodate a fluid, a dispensing mechanism according to an exemplary aspect, and a resilient unit coupled to the actuating button and connected with the container, wherein the dispensing unit is adapted in such a way that when the actuating button is actuated, e.g. by a user, the closing element is converted into its open state and when the actuating button is released the closing element is returned to its closed state by the resilient unit. According to some specific exemplary em-

bodiments of the fluid dispensing unit the same may be adapted in such a way that the first conversion of the closing element from the closed state to the open state may be accompanied or initiated by a breaking of a tear seam of or arranged around the closing element or a portion of the closing element, e.g. a rigid shutter. Additionally, the adaptation may be in such a way that tear seams for an air vent in the lid of the dispensing mechanism may be broken at the same time or substantially the same time as the tear seams of the shutter are broken. The conversion from the closed state to the open state may be performed by a movement of a motion link or a guiding element, for example and may be initiated by a portion of the guiding mechanism. In particular, the fluid dispensing unit or fluid dispenser may be further adapted in such a way that the air-vents in the lid are closed again when the actuation button is released again and/or that the closing element or shutter is converted into the closed state again by the motion link or guiding element.

[0015] For example, the fluid dispensing unit may be a single-use fluid dispensing unit, i.e. the fluid dispensing unit may be not refillable. But several dosing-procedures may be possible. In particular, the fluid dispensing unit may be adapted to accommodate liquids having different levels of viscosity, e.g. ranging from aqueous to syrup like. In particular, the form and or size of the opening in the fluid dispenser closed or covered by closing element or rigid shutter may be dependent on the viscosity and may be chosen or designed to achieve a laminar flow. The liquids may be beverages or aromatic liquids. The term "container" may particularly denote the complete structure which is adapted to accommodate the fluid. In particular, the container may comprise a lid or lid portion forming an upper part of the container, and a body or body portion forming a lateral surface and optional a lower part of the container. The lateral surface may form a concave or tapered portion of the container, i.e. the whole container may have a roughly conical shape or the shape of a truncated cone. However, the conical shape may have a curved outer surface, e.g. in the manner of a concave or convex surface. The two portions, i.e. lid and body, may be moulded or casted together as a single piece or as separate pieces. In this case the lid and the body are formed by separate pieces or physical elements, the pieces may be welded together, e.g. by ultrasonic welding, laser welding, mirror-imaged welding or friction welding.

[0016] Additionally or alternatively, the closing element or shutter may be moulded together with the body portion of the fluid dispenser or may be moulded separately and may form a lower shell of the fluid dispenser. After the separate moulding step the parts may be connected, e.g. welded, together. For example, the container or only the body, e.g. the container without the lid, may be formed by two half shells of moulded material, e.g. moulded via injection moulding. The two half shells may then be welded together to form the container. Alternatively, not two half shells may be used but the container may be formed by welding three, four or more sub shells together. According to some exemplary embodiments the body of the container may be formed by two (three, four, etc.) half shells while the lid, i.e. the upper portion of the fluid dispenser, is formed by a single piece. In this case the two half shells of the body are welded together to form the body and the lid is welded to the body. In case the closing element or rigid shutter is formed as a separate element the same is connected, e.g. welded, as well to the other parts or elements to form the fluid dispenser.

[0017] According to a third exemplary aspect a lid for a dispensing unit is provided, wherein the lid comprises an actuating button and a predetermined breaking point wherein the lid is adapted in such a way that when the actuating button is actuated the first time the predetermined breaking point breaks so that an opening through the lid is provided.

[0018] In particular, the predetermined breaking point may comprise a tear-off bar adjoined by a predetermined breaking line. The breaking line may end at a left and the right side of an integral hinge. In particular, the lid may comprise a coupling region which may form a rim of the lid. The lid itself may have a circular or elliptical form or shape and/or may have a circular or elliptical coupling region, for example. The rim region or peripheral region of the lid may have a circular or elliptical shape. The lid may be formed by casting and may be formed in a single moulding procedure or may be moulded together with a container. In case the lid and the container of a dispensing unit are moulded or moulded together the coupling region may be formed by a continuous transition between the lid the container, i.e. the term "coupling region" does neither describes that a specific delimitable region or portion is present nor excludes that such a specific delimitable region is present. The provision of a predetermined breaking point or alternatively a plurality of predetermined breaking points, e.g. two, three or four, may be an efficient measure to ensure that when using the lid as a lid of a fluid dispenser that a fluid is running smoothly out of the container after the predetermined breaking point is broken.

[0019] In particular, the lid may further comprise a joining region adapted to be coupled to a resilient element, wherein the lid is adapted in such a way that the resilient element moves back the lid to its initial position with respect to the container of the dispensing unit after the first actuating of the actuating button.

[0020] Additionally, the lid may have a further joining region or a coupling region adapted to connect to an actuating element. For example, the actuating element may be formed or may be a part of a guiding mechanism. In particular, the lid may comprise a first region in which the actuating button is formed and a second region in which the coupling region is formed. In particular, the first region and the second region are formed by different material. For example, the first region may have a rougher surface than the second region or vice versa.

[0021] In particular, the lid may further comprise a re-

silient element which comprises an elastic element and which is coupled to the joint region of the lid, wherein the resilient element is adapted in such a way that after an actuating of the lid by actuating the actuating element the lid is returned to its initial position.

[0022] According to another independent or combined exemplary aspect a rigid shutter for a fluid dispensing unit may be provided which may comprise a shutter coupling region which may form a rim of the shutter and which may be connectable to a bottom part of portion of a fluid dispensing unit or fluid dispenser. The shutter itself may have a circular or elliptical form or shape and/or may have a circular or elliptical coupling region, for example. The rim region or peripheral region of the shutter may have a circular or elliptical shape. The shutter may be formed by moulding and may be formed in a single moulding procedure or may be moulded together with a container. In case the shutter and the container of a dispensing unit are moulded together the coupling region may be formed by a continuous transition between the shutter the container, i.e. the term "coupling region" does neither describes that a specific definable region or portion is present nor excludes that such a specific definable region is present. The provision of a predetermined breaking point or alternatively a plurality of predetermined breaking points, e.g. two, three or four, may be an efficient measure to ensure that when using the shutter as a shutter of a fluid dispenser that a fluid is running smoothly out of the container after the predetermined breaking point is broken. The shutter forms a special geometry that a laminar flow is possible. The last and lowermost point, where the fluid is in contact with the shutter-geometry, may build a sharp edge.

[0023] In particular, the coupling region may include or may be formed by a motion link which may form an elastic member or a further resilient member. The shutter may be adapted in such a way that the further resilient element moves back the shutter to its initial position with respect to the container of the dispensing unit after the first actuating of the actuating button. That is, the further resilient element may be adapted in such a way that after an actuating of the shutter by actuating the actuating element the shutter is returned to its initial position.

[0024] According to a fourth exemplary aspect a resilient element for a fluid dispenser is provided, wherein the resilient element comprises a joining area which is adapted to be coupled to a lid of the fluid dispenser, a resilient element body which is adapted to be coupled to a container of the fluid dispenser and an elastic element, wherein the elastic element is adapted to move back the lid to an initial position after the lid is deflected out of its initial position. In particular, the elastic element of the resilient element may comprise an air cushion and/or a spring element. The air cushion may be formed or may be part a pressure piston, while the spring element may be formed by a coil spring, flat spring, compound spring, leaf spring or any other suitable spring element. By using air cushion for the resilient element, no further part is needed.

[0025] In particular, the resilient element may comprise one or more, e.g. two, three or four pressure pistons, which may form part of the elastic element. For example, the pressure pistons may enclose or may form an airtight volume. For example, the airtight volume may form an air cushion. The term airtight volume may particularly denote a volume which is substantially sealed in such a way that when the volume of air inside the volume is compressed by a force substantially no air or gas escapes out of the volume. Thus, a simple elastic element may be provided by using an airtight volume wherein the resilient force is provided by the compressing of the air in the volume when a force is applied to the airtight volume which may be formed by or in the pressure pistons. In case the force is removed the compressed air will expand again and the compressed volume will expand to its initial volume so that a resilient or resetting force is provided.

[0026] According to a fifth exemplary aspect a method of manufacturing a fluid dispensing unit is provided, wherein the method comprises forming two shells, filling the shells with fluid, and welding the two shells together.

[0027] In particular, the shells may be formed by casting or moulding, e.g. by injection moulding. In particular, the welding may be performed by ultrasonic welding and/or laser welding and/or mirror-imaged welding and/or friction welding. According to some exemplary embodiments the two shells may be two half shells. Additionally a third shell or third part, e.g. a lid portion, may be formed which may be connected to the other two shells as well by welding. The welding step may be performed before or after the filling step. For example, in case the two shells are two half shells which form a body of the fluid dispensing unit, in a first welding step the two half shells are welded together. Then the fluid is filled into the body of the fluid dispenser while in a second welding step the lid is welded to the filled body so that a closed container is formed which is filled with the fluid. In particular, the container may form an airtight depot. The method may be suitable to form in an efficient way a fluid dispenser according to an exemplar aspect.

[0028] It is mentioned that although the above described five aspect are described separated from each other the present invention encompass beside this distinct aspects also the combination of all described aspects. That is, features described only with respect to one of theses aspects also can be combined with the other described aspects.

[0029] According to the above described exemplary aspects a fluid or liquid dispensing unit can be provided which is simple to handle, e.g. may be operated by one finger actuating an actuating button in order to open an opening of the fluid dispensing unit while the opening may be automatically closed again by the closing element when the actuating button is released again. The automatically closing of the closing element may be performed by the resilient element according to an exemplary aspect, which comprises an elastic element gener-

ating the resetting force for the closing element.

[0030] Next, further exemplary embodiments of the dispensing mechanism are described. However, these embodiments also apply to the fluid dispensing unit, the lid, the resilient element and the method of manufacturing a fluid dispensing unit.

[0031] According to an exemplary embodiment of the dispensing mechanism the closing element comprises a pivotable closing shutter. The closing shutter may be a clip or flap, for example. The closing shutter may be guided by a guiding element which may form a part of a guiding mechanism of the dispensing mechanism. The closing shutter may be pivotable with respect to different directions.

[0032] According to an exemplary embodiment the dispensing mechanism further comprises a guiding mechanism comprising a guiding element and a guided element, wherein the guiding mechanism extends between the actuating button and the closing element. In particular, the guiding element may be a slotted guiding element, i.e. a guiding element comprising a slot which may be adapted to provide a guiding function, or a sliding guiding element. For example, the guiding mechanism may couple the actuating button and the closing element. For example, the coupling may be a mechanical coupling. Furthermore, the guiding mechanism, in particular the guiding element, may be pivotfree or hingefree, e.g. may comprise a straight guiding element or a curved guiding element, which each may comprise a slot or another form which is suitable or adapted for a guiding function.

[0033] Alternatively, also simple pivots or hinges may be part of the guiding mechanism. In particular, the guiding element and the guided element may be pivotable with respect to each other, e.g. the guided element may be pivotable with respect to the guiding element. A pivotfree design of the guiding element may be preferred since by this measure a simple and easy to produce guiding mechanism which may couple the actuating button and the closing element may be achievable. The guiding element and the guided element may be configured to match to each other, i.e. the guided element may be configured in such a way that it may be guided by the guiding element. For example, the guided element may be matched to an end or face portion of the guiding element so that a movement of the guiding element pivots the guided element around a pivot axis. For example the guiding element may comprise a curved front face which is matched with a corresponding surface of the guided element.

[0034] Examples for the guiding element may be a hollow tube defining an inner lumen having a circle, elliptical, square, rectangular, triangular or polygonal cross-section. According to another embodiment the guiding element may be an open profile like a U-profile or V-profile. In all the above examples the guided element may be formed by an element having a matching or complementary form to the cross-section of the guiding element.

[0035] According to an exemplary embodiment of the dispensing mechanism the guiding element and/or the guided element are formed by casting. That is, one or both elements may be formed by casting or moulding, e.g. injection moulding, which may be a suitable and simple way to manufacture or produce both elements. In particular, the whole guiding element may be formed by casting, e.g. may be moulded as one single piece or may be moulded as two pieces, i.e. the guiding element may be moulded as a single piece and the guided element may be moulded as another piece.

[0036] According to an exemplary embodiment of the dispensing mechanism the guiding mechanism may be comprise a cutting edge. In particular the cutting edge may be a blade. The cutting edge may particularly be adapted to cut a predetermined breaking point provided at the closing element. Thus, an easy and efficient way may be provided to open a one way sealing which is provided by a predetermined breaking point, i.e. a predetermined weakened point or line, which may be destroyed by the cutting edge. For example, the cutting edge may be a part of the guiding element, e.g. arranged at a front face of the guiding element. In particular, the closing element may comprise the predetermined breaking point or the closing element may be encircled by the predetermined breaking point or line such that in case the predetermined breaking point is broken or destroyed by the cutting edge the closing element, e.g. a closing shutter, is released and can be moved or pivoted. Thus, the predetermined breaking point or line may form an initial sealing and a support for the closing element which may be broken by an initial use of the fluid dispenser.

[0037] According to an exemplary embodiment the dispensing mechanism further comprises a resilient unit coupled to the actuating button, wherein the resilient unit is adapted to return the actuating button into an initial position after the actuating button is actuated. In particular, the resilient unit may be adapted to be coupled the dispensing unit, e.g. to a container of the dispensing unit. For example, the actuating button may be a push button and the actuating of the actuating button may be performed by pushing or pressing the pushing button. In particular, the resilient unit may comprise a spring element, which may be formed by a spring or just by an airtight volume comprising a gas or air which may be compressed when the actuating button is actuated. Such an airtight or substantially airtight volume may be a suitable and efficient way to provide a resilient force for returning the actuating button to its initial position.

[0038] Next, further exemplary embodiments of the dispensing unit are described. However, these embodiments also apply to the fluid dispensing mechanism, the lid, the resilient element and the method of manufacturing a fluid dispensing unit.

[0039] According to an exemplary embodiment of the fluid dispensing unit the actuating element is arranged on a first side of the dispensing unit and the closing element is arranged on a second side of the dispensing unit. In particular, the first side and the second side may be

different sides, e.g. opposite sides, of the dispensing unit. In particular, the first side may correspond to a first surface, e.g. the upper surface of the container of the dispensing unit, while the second side may correspond to a second surface, e.g. the bottom surface of the dispensing unit, in particular of the container of the dispensing unit. When providing the actuating button on the upper side and the closing element on the bottom side of the container an efficient closing and opening procedure for the dispensing unit may be achievable so that a pressure on the actuating mechanism opens the closing element on the bottom side so that the fluid in the fluid dispenser flows out of the container by gravity. However, any other side may be used as well, e.g. the actuating button and the closing element may not be arranged on opposite sides but on neighbouring or adjoining sides of the container.

[0040] In particular, the fluid dispenser may comprise a guiding mechanism which may form a connection between the actuating button and the closing element. For example, the fluid dispenser may be adapted in such a way that when the actuating button is actuated a force is applied via the guiding mechanism onto the closing element which operates the closing element so that it is converted or transferred from its closed state into its open state. The guiding mechanism, in particular a guiding element of the same, may form a straight element, e.g. leading from one side of the container, e.g. the upper side, to the opposite side, e.g. the bottom or lower side, of the container. However, the guiding mechanism, in particular the guiding element of the same, may also be formed by a curved element, leading from the upper side of the container to an adjacent side of the container.

[0041] According to an exemplary embodiment the fluid dispensing unit further comprises a lid, wherein the lid comprises a predetermined breaking point, and wherein the lid is adapted in such a way that when the actuating button is actuated the first time the predetermined breaking point breaks so that an opening through the lid is provided. In particular, the actuating button may be formed in or may form a portion of the lid or may be even form the whole lid, i.e. the lid and the actuating button may be formed by the same physical element. For example, the lid may be formed of a moulded material which has a sufficient flexibility so that the lid or at least a portion of the lid can be actuated, e.g. pressed down, by a user, so that the closing element is converted or transferred from its one state to its other state.

[0042] According to an exemplary embodiment of the fluid dispensing unit the fluid dispensing unit is adapted in such a way that the first actuating of the actuating button breaks the predetermined breaking point of the lid and the predetermined breaking point of the closing element. In particular, the breaking of the two predetermined breaking points may take place simultaneously or at least substantially simultaneously. In case the point in time of the breaking is slightly offset with respect to each other, it may be preferred that the predetermined breaking point of the lid is broken slightly after the one of the closing element. The timely sequence of the breaking of the two predetermined breaking points may at least partially be dependent on the materials used, the thickness of the material in the area of the predetermined breaking points, the local geometry at the opposite surface (groove) the used cutting blade (e.g. thickness, size, material sharpness) and the width of the predetermined breaking points. In this context the width may correspond to the diameter of a circular predetermined breaking point or to the width in case the predetermined breaking point is formed by a line.

[0043] A gist of an exemplary specific embodiment of the invention may be seen in providing a fluid dispensing unit or fluid dispenser comprising a body and a lid which may be connected or fixed, e.g. by welding, to each other so that a closed container is formed adapted to accommodate the fluid. The lid may be formed, e.g. moulded or casted, and may have a sufficient flexibility to be flexed when a force, e.g. a pressure is applied to the lid. Thus, the lid or a part of the lid may form an actuating button. The body of the fluid dispenser may have a surface which has a roughly conical form or the form of a truncated cone and may be as well formed by casting or moulding, e.g. injection moulding. Together or separate with the casting of the outer surface of the body a guiding mechanism may be provided which is arranged in the body of the fluid dispenser. The guiding mechanism may comprise a guiding element or actuating element which is connectable to the lid in such a way that an actuating, e.g. pressing down, of the lid moves the actuating element or guiding element in the same direction as the lid is moved. The movement of the guiding element may apply a force to a guided element which may be arranged at an opposite side to the lid. However, the guided element may be as well arranged at a lateral side of the container. The guided element may form or may be part of a closing shutter or a closing flap which closes the fluid dispenser. Thus the guided element may be a part of a closing element adapted to cover or close an opening of the fluid dispenser in a closing state and to uncover or open the opening of the dispenser in an open state of the closing element.

[0044] Additionally, the body of the fluid dispenser may comprise one, two or more optional resilient elements, e.g. a pressure piston, comprising or enclosing a gas volume or a spring element. The resilient element may be connected to the body of the fluid dispenser or may be monolithically with the body, e.g. may be moulded together with the body. Additionally, the resilient element may be in contact with the lid so that an actuating of the actuating button in the lid results in the fact that the resilient element is exposed to a force as well. Thus, an elastic element or part of the resilient element may be compressed and stores some amount of energy which may afterwards be used to return the lid back into its initial position.

[0045] The above described specific exemplary fluid

dispenser may be manufactured by producing, e.g. via injection moulding, two half shells for the body of the fluid dispenser. These half shells may as well include half of the guiding element(s) and/or half of the resilient element (s). These two half shells may then be welded together, e.g. by using ultrasonic welding, laser welding, mirror-imaged welding and/or friction welding. After the welding is performed a roughly conical container may be manufactured which can then be filled with the fluid. After the filling step the lid, e.g. a moulded lid, may be fixed to the body, e.g. by a welding step as well. Thus, a closed or sealed fluid dispenser may be achievable without the use of complex manufacturing steps. In principle, only casting steps and welding steps are necessary. In particular, all elements of the described fluid dispenser may be manufactured by injection moulding which is a well known and well controllable process. Furthermore, the process and thus the manufactured fluid dispenser or fluid dispensing unit is a low cost system so that it can be used as a single-use fluid dispenser, i.e. as a once filled fluid dispenser. However, it is not necessary that the fluid dispenser is emptied at one time, since the guided or closing element is suitable to close the fluid dispenser after the first use so that leftovers of the fluid are securely stored in the fluid dispenser.

[0046] When using the fluid dispenser the first time a user may press down the lid which leads to the fact that firstly the guiding element or actuating element is moved or pressed down as well. The guiding element may comprise a cutting edge on its lower portion which may thus be used to break a predetermined breaking point or line at the bottom of the container of the fluid dispenser and at the same time guides or pivots the guided element or closing element so that an opening of the container is uncovered. At the same time or slightly afterwards predetermined breaking points or lines in the lid are broken by pressing down the somewhat flexible lid. Thus, one or more openings are provided in the lid on the upper side of the fluid dispenser so that air can flow into the container leading to an improved dispensing of the fluid out of the fluid dispenser. Additionally, the pressing down of the lid as well exposes the resilient element(s) to a force compressing the elastic element so that when the user removes the pressure the lid is exposed to, the lid will return to its initial position returning or resetting as well the guiding element. By resetting the guiding element the guided element or closing element is as well returned to its initial closed position or closed state.

[0047] According to exemplary embodiments it may be possible to provide a shapely and/or trendy fluid dispenser which is easy to handle and/or to manufacture. The fluid dispenser may be suitable for different kinds of liquids ranging from aqueous to syrup like liquids. Due to the specific closing mechanism it may be possible to provide a non-drip opening and closing element or mechanism which may be suitable for a small fluid dispenser. Furthermore, it may be possible to provide a high quality fluid dispenser which is easy and convenient to use, while still an efficient and low complex manufacturing process is possible, which may be based on an injection moulding steps. In particular, polypropylene or other suitable materials may be used for the injection moulding process so that a sterile fluid dispenser and a sterile filling process may be enabled.

[0048] Thus, there may be provided a dispensing mechanism for a fluid dispensing unit, a lid for a fluid dispensing unit, wherein the lid may comprise a tear seam to create an air vent, a rigid shutter which may be surrounded by a tear seam and which may be connected with an integral hinge to a fluid dispensing unit. A specific geometry of the rigid shutter may allow for laminar flow out of the dispensing unit the rigid shutter is a part of. Furthermore, a guiding mechanism or guiding element to an integrated actuator unit and a resilient element for a fluid dispensing unit may be provided. In particular, a concept to integrate all these functions in a "two part"-product is described above and in the following.

[0049] The aspects defined above and further aspects of the invention are apparent from the examples of embodiment to be described hereinafter and are explained with reference to these examples of embodiment.

[0050] The invention will be described in more detail hereinafter with reference to examples of embodiment but to which the invention is not limited.

Fig. 1 schematically shows a fluid dispensing unit according to an exemplary embodiment;

Fig. 2 schematically shows a detail of the fluid dispensing unit of Fig. 1;

Fig. 3 schematically shows an opening and closing procedure of a fluid dispensing unit according to an exemplary embodiment;

Fig. 4 schematically shows a cross sectional view of a fluid dispensing unit of Fig. 1;

Fig. 5 schematically shows a drink set including a fluid dispensing unit;

Fig. 6 schematically shows a lid and a guiding element; and

Fig. 7 schematically shows a fluid dispensing unit according to an exemplary embodiment.

[0051] The illustration in the drawing is schematically. In different drawings, similar or identical elements are provided with the similar or identical reference signs.

[0052] Fig. 1 schematically shows a fluid dispensing unit 100 according to an exemplary embodiment. For illustration purposes Fig. 1 as well shows inner parts or portions of the fluid dispenser which cannot be seen in the normal use of the fluid dispenser. In particular, the fluid dispensing unit or fluid dispenser 100 comprises a lid 101 comprising two predetermined breaking points or lines 102. The lid 101 is fixed or connected to a body 103 of the fluid dispenser. The lid 101 and the body together form the container of the fluid dispenser 100. In the embodiment shown in Fig. 1 the fluid dispenser has a circular cross section. However, other possible cross sections,

e.g. elliptical or rectangular, may also be possible. Furthermore, the shown curved or concave outer surface of the body may have another suitable form, e.g. may be formed by a convex surface or by a straight surface. Alternatively, the body may have a spherical form or shape.

[0053] Furthermore, joining regions 104 of the lid 101 are schematically shown in Fig. 1 in which or to which resilient elements 105 of the fluid dispenser 100 may be joined. The joining elements 105 are schematically shown as comprising pistons. It should be mentioned that any other suitable number of resilient elements, e.g. one, three or four, may be used as well. Additionally, a guiding mechanism 106 is shown in Fig. 1 which may comprise a guiding element or an actuating element, schematically shown as a piston which is connected to the lid 101 at a coupling region 107. The guiding mechanism 106 further comprises a guided element or closing element 108 which is shown in Figs. 2 and 3 in more detail and which may form as well a portion or part of the body of the fluid dispenser 100. Thus, the guiding mechanism extends between the lid 101 and a bottom of the fluid dispenser, e.g. a closing element covering an opening of the fluid dispenser 100. In the lower portion of the guiding element one or several openings 109 may be formed which connect between the interior of the guiding element and the space formed by the container and into which the fluid may be filled.

[0054] The fluid dispenser 100 may be formed by moulded or moulded material. For example, the body including the guiding element 106 and the resilient elements 105 may be formed by using two half shells manufactured by injection moulding, which two half shells are then joined together, e.g. by welding. Afterwards, in particular after filling the welded half shells together, the lid 101 may be connected, e.g. welded as well, to the body. Alternatively, the guiding mechanism 106 and the resilient element 105 may not be part of the two half shells of the body, but may be part of the lid, i.e. may be either formed together with the lid 101, e.g. by moulding or casting as well, or may be formed separately to the lid 101 but may be fixed or connected to the lid 101 before the lid is connected to the body of the fluid dispenser 100. In particular, with respect to the resilient element and the guiding mechanism it may be as well possible that one portion of the resilient member is a part of the body and another portion is part of the lid.

[0055] Fig. 2 schematically shows a detail of the fluid dispensing unit of Fig. 1. In particular, Fig. 2 shows the lower portion of the guiding element 106 which comprises a cutting edge 210, e.g. a blade, which is formed at the face of the guiding element. In the lower portion the guiding element may also include some opening through which the fluid may enter an interior of the guiding element. The cutting edge 210 may correspond to a predetermined breaking point 211 or thinned region of the lower portion of the body of the fluid dispenser 100. Furthermore, a closing shutter or closing element 212 is shown in Fig. 2. According to the embodiment shown in Fig. 2 the guiding element comprises an inner piston 213 and an outer piston 214 wherein the cutting edge 210 is formed on the inner piston 213. As indicated in the context of Fig. 1 the outer piston 214 or outer tube of the guiding element 106 may be a portion of the body 103 of the fluid dispenser, e.g. may be formed in a single moulding step together with two half shells of the body, while the inner piston 213 or inner tube of the guiding element 106 may be a portion of the lid, e.g. may be formed together with the lid in a single moulding step or may be connected or coupled to the lid before the lid, together with the inner piston, is fixed to the filled body of the fluid dispenser.

[0056] Fig. 3 schematically shows an opening and closing procedure of a fluid dispensing unit according to an exemplary embodiment. In particular, Figs. 3A, 3B, 3C, and 3D schematically show the chronological sequence of the procedure.

[0057] Fig. 3A shows a cross sectional view of a fluid dispenser 100 having a lid 101 and a body portion 103. Additionally the guiding mechanism fixed or coupled to the lid is shown. In the lower portion of the fluid dispenser a closing element 320 which may form or may comprise a closing shutter is shown which matches to the lower portion of the guiding element. For clarity reasons no resilient members are depicted in Fig. 3. The double lined arrow 321 indicates a pressure force the lid is exposed to. The lid 101 is formed in such a way that it is flexible to some extend. In particular, it should be mentioned that the whole lid or a portion of the lid may form an actuating or pushing button. That is, when the pressure force is exerted to the lid the lid and the guiding mechanism are moved slightly down. As the guiding element, e.g. the inner piston 213 of the guiding mechanism moves down the cutting edge 210 of the inner piston breaks the predetermined breaking point 211 of the closing mechanism or of the container so that the closing element 320 or closing shutter is loosened from the bottom of the container. The closing element 320 of the embodiment shown in Fig. 3 is pivotable so that the moving of the inner piston of the guiding element not only looses the closing element but also tilts or pivots the closing element 320 as indicated by the double lined arrow 322. For example, the closing element may be fixed to or connected to the body of the fluid dispenser by a film hinge, hinge band, motion link or similar simple joints.

[0058] Fig. 3C schematically shows the open state of the closing shutter or rigid shutter in which state fluid of stored in the fluid dispenser 100 can flow out of the container as indicated by double lined arrow 323. Depending of the embodiment, the fluid may flow partially through a lower portion of the guiding element, e.g. by entering the interior of the inner piston through one or more openings included in the lower portion of the guiding element, or may flow around the lower portion of the guiding element.

[0059] Fig. 3D schematically shows the closing of the closing element. In particular when the pressure on the lid is released the lid moves back into its initial position as indicated in Fig. 3A and takes along the guiding ele-

ment, e.g. the inner piston 213. Due to the matching of the linking portion of the guiding element and the closing element 320 the closing element or closing shutter is turned into its closed state again. In particular, the guiding element may comprise a curved surface 324 along which a portion of the closing element 320 may be guided and which may result in a torsional moment operating on the closing element, e.g. a straight surface 325 of the closing element. That is, the curved surface of the guiding element and the corresponding straight surface of the closing element form a specific kind of guiding, e.g. slotted or sliding guiding, in which each position of the guiding element with respect to the container or closing element corresponds to a well defined corresponding opening angle of the closing element. That is, the shape of the closing element and the shape of the front portion of the guiding element are adapted in such a way that during the movement of the front portion of the guiding element it slides along the closing element or closing shutter and imposes a torsional moment onto the closing element. Thus, it may be possible to provide a well defined opening angle of the closing element depending on the relative position of the guiding element with respect to the closing element.

[0060] Fig. 4 schematically shows a cross sectional view of a fluid dispensing unit. In particular, Fig. 4A shows a fluid dispenser 100 including a lid 101, and resilient elements 105 comprising an upper portion 430 which is formed by an air cushion. Additionally, Fig. 4A shows the guiding element 106 and the opening 109 and the cutting edge 210 included at the front end of the guiding element. Furthermore, the resilient element(s) 105 may comprise piston(s) 431 on which the lid 101 is fitted in a substantially air tight manner. That is, a recess 432, which may form the joining region 104 of the lid, in the lid 101 and an outer diameter of the piston(s) 431 may match.

[0061] Fig. 4B shows the joining region in a state where the lid is not actuated, i.e. is not pressed down, in order to flex or bend the lid. Consequently the air cushion 430 has a greater volume or size than in Fig. 4C which shows the joining region after a user pushed the lid or an actuating buttons formed in or formed by the lid. When pushing the lid the lid is moved down with respect to the body of the fluid dispenser. In this second state which corresponds to the open state of the fluid dispenser the air cushion is smaller and thus the gas or air in the air cushion is compressed. When the lid is released by the user, the compressed air will expand again increasing the air cushion to its initial volume as shown in Fig. 4B. Thus, a mechanical simple mechanism may be provided which is suitable to automatically return the lid and thus the guiding element and the closing element or closing shutter into its initial position shown in Fig. 4B which corresponds to the closed state of the closing mechanism. Instead of or additionally to the air cushion the resilient element may also comprise a spring element, e.g. a coil spring, leaf or flat spring or the like, for providing the energy and force for returning the lid and thus the guiding element and the closing element into its initial position.

[0062] Fig. 5 schematically shows a design of a drinking set 500, including a carafe or decanter 501 having a "bellied" form, a glass 502 and a fluid dispenser 100. In particular, the fluid dispenser 100 and/or the glass may form a covering element covering the carafe. To achieve this covering function the outer shape of the fluid dispenser 100 is adapted to the spout of the carafe in such a way that it matches the curvature of the spout or outlet of the carafe at least in some portions. Furthermore, the carafe 501 may comprise a circumferential pedestal 504 which is adapted to match to a perimeter of the glass 502 so that the glass can be put over the outlet of the carafe 501.

[0063] Fig. 6 schematically shows a lid 101 which has a guiding element 106 attached thereto. Additionally, an actuating button 540 is shown which is seamlessly formed in the lid 101. Furthermore, two air-vents 102 are indicated. On the lower surface or lower side of the lid 101 the guiding element 106 is attached, e.g. welded into a needle valve nozzle 541, which is formed by a slider or pusher which includes a curved surface 324, already shown in Fig. 3, which is adapted to guide or push a guiding element, e.g. a closing shutter.

[0064] Fig. 7 schematically shows a body of a fluid dispensing unit 100 according to an exemplary embodiment. In particular, Figs. 7A, 7B and 7C show three perspective views of a body 103 of a fluid dispenser. In principle, Fig. 7A shows an exterior view of the body 103 which may be formed by several shells and including two resilient members 105 comprising an air cushion 430 each.

[0065] Fig. 7B shows the interior of the body of Fig. 7A so that a closing element or closing shutter 212 can be seen as well which may comprise a projection or ridge 750 which may interact with a curved surface 324 of the guiding element 106.

[0066] Fig. 7C shows a detail of the body 103 from the bottom side, i.e. depicts the closing shutter 212 which can be operated when the curved surface 324 of the guiding element is actuated so that the predetermined breaking lines initially sealing the closing shutter are broken.

[0067] It should be noted that the term "comprising" does not exclude other elements or features and the "a" or "an" does not exclude a plurality. Also elements described in association with different embodiments may be combined. It should also be noted that reference signs in the claims shall not be construed as limiting the scope of the claims.

Claims

1. Dispensing mechanism for a fluid dispenser, the dispensing mechanism comprising:

   a actuating button; and
   a closing element having an open state and a closed state;

wherein the dispensing mechanism is adapted in such a way that the closing element is converted from the closed state into the open state when a user actuates the actuating button; and
wherein the closing mechanism is further adapted in such a way that the closing element is converted from the open state into the closed state when the user releases the actuating button.

2. Dispensing mechanism according claim 1, wherein the closing element comprises a pivotable closing shutter.

3. Dispensing mechanism according to claim 1 or 2, further comprising:

a guiding mechanism comprising a guiding element and a guided element,
wherein the guiding mechanism extends between the actuating button and the closing element.

4. Dispensing mechanism according to claim 3, wherein the guiding element and/or the guided element are formed by casting.

5. Dispensing mechanism according to claim 3 or 4, wherein the guiding mechanism comprises a cutting edge.

6. Dispensing mechanism according to any one of the claims 1 to 5, further comprising:

a resilient unit coupled to the actuating button,
wherein the resilient unit is adapted to return the actuating button into an initial position after the actuating button is actuated.

7. A fluid dispensing unit comprising:

a container adapted to accommodate a fluid;
a dispensing mechanism according to any one of the claims 1 to 5; and
a resilient unit coupled to the actuating button and connected with the container,
wherein the dispensing unit is adapted in such a way that when the actuating button is actuated the closing element is converted into its open state and when the actuating button is released the closing element is returned to its closed state by the resilient unit.

8. The fluid dispensing unit according to claim 7, wherein the actuating element is arranged on a first side of the dispensing unit and the closing element is arranged on a second side of the dispensing unit.

9. The fluid dispensing unit according to claim 7 or 8, further comprising:

a lid,
wherein the lid comprises a predetermined breaking point,
wherein the lid is adapted in such a way that when the actuating button is actuated the first time the predetermined breaking point breaks so that an opening through the lid is provided.

10. The fluid dispensing unit according to claim 9, wherein the fluid dispensing unit is adapted in such a way that the first actuating of the actuating button breaks the predetermined breaking point of the lid and the predetermined breaking point of the closing element.

11. A lid for a dispensing unit, the lid comprising:

an actuating button; and
a predetermined breaking point,
wherein the lid is adapted in such a way that when the actuating button is actuated the first time the predetermined breaking point breaks so that an opening through the lid is provided.

12. A resilient element for a fluid dispenser, the resilient element comprising:

a joining area which is adapted to be coupled to a lid of the fluid dispenser;
a resilient element body adapted to be coupled to a container of the fluid dispenser; and
an elastic element,
wherein the elastic element is adapted to move back the lid to an initial position after the lid is deflected out of its initial position.

13. The resilient element of claim 12, wherein the elastic element comprises an air cushion and/or a spring element.

14. Method of manufacturing a fluid dispensing unit, the method comprising:

forming two shells;
welding the two shells together; and
filling the shells with fluid.

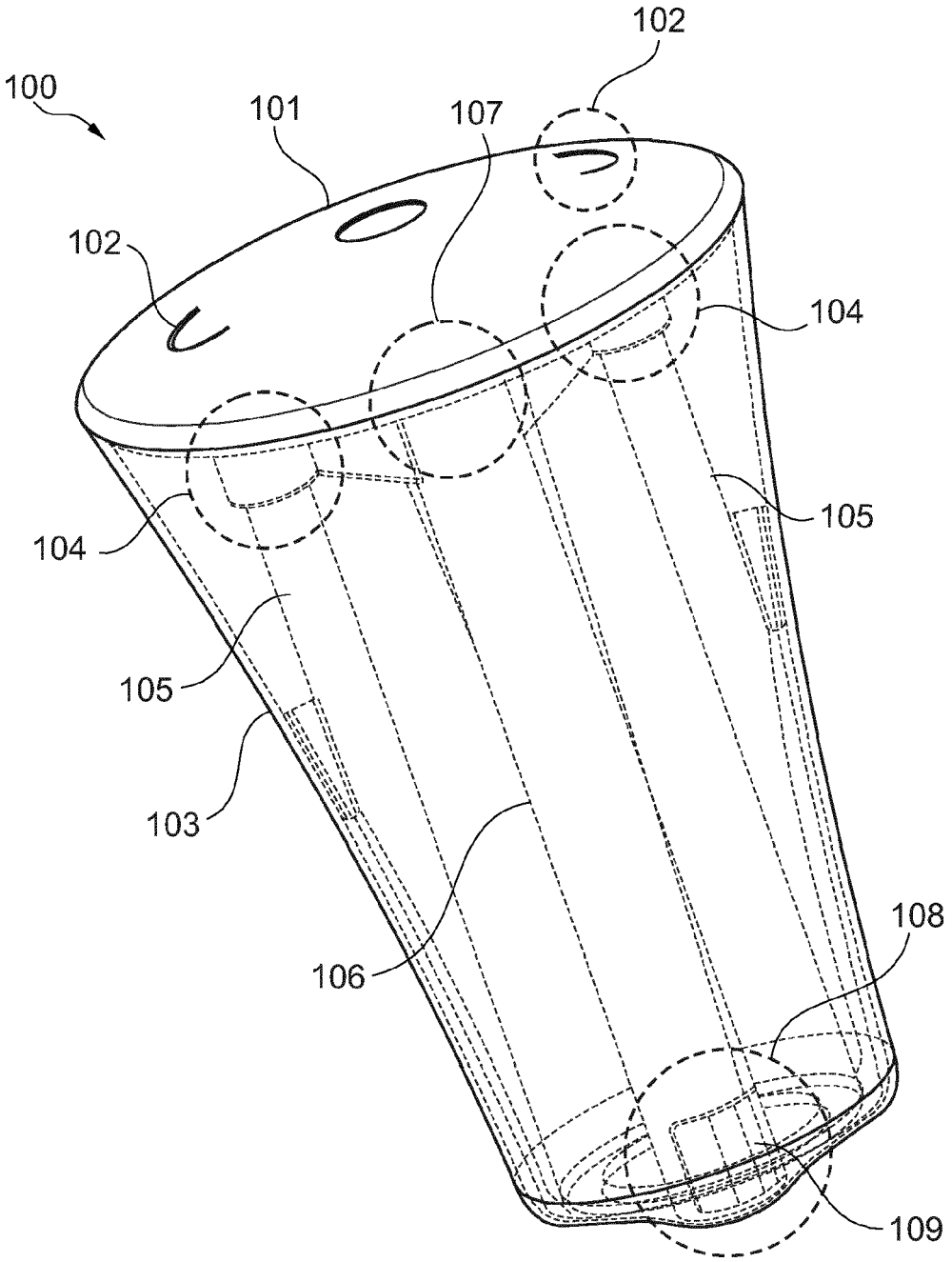

Fig. 1

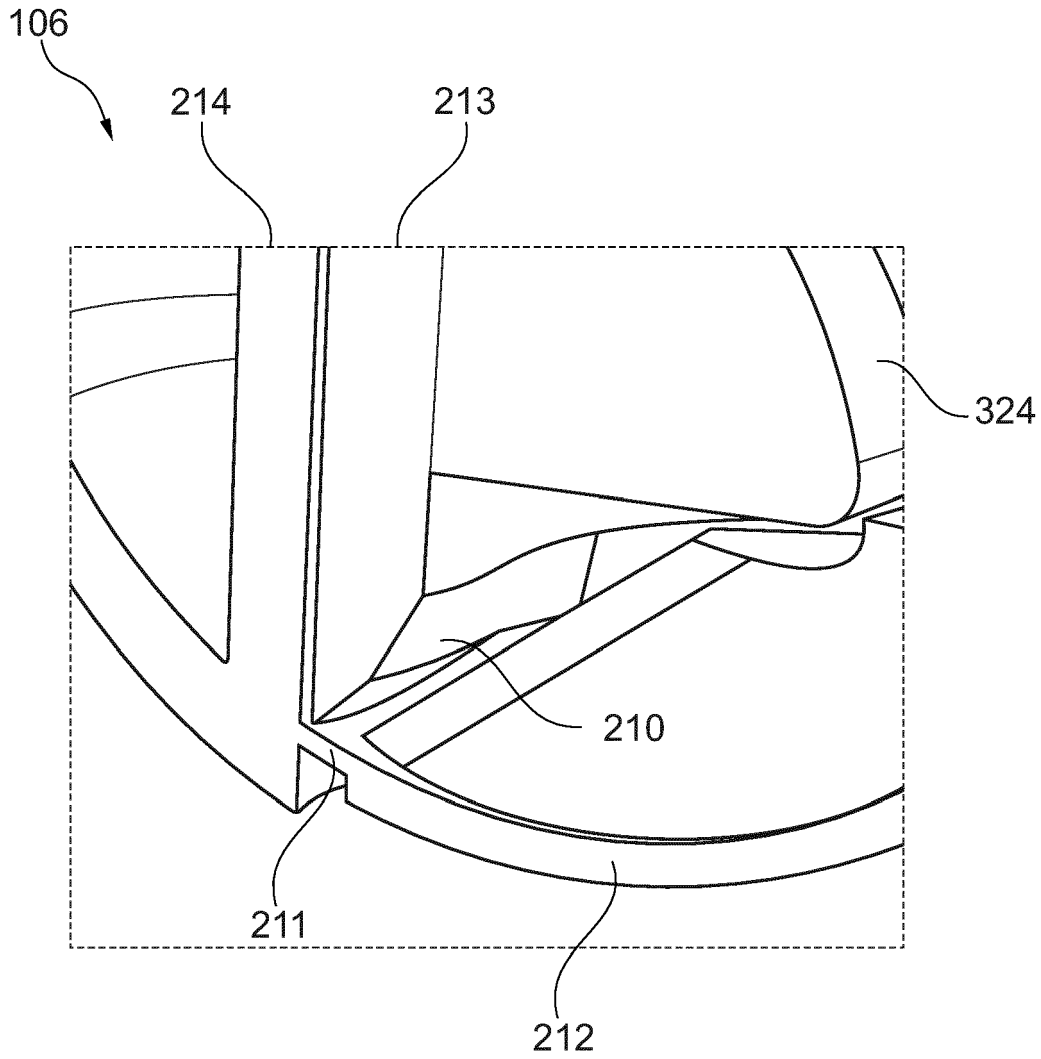

Fig. 2

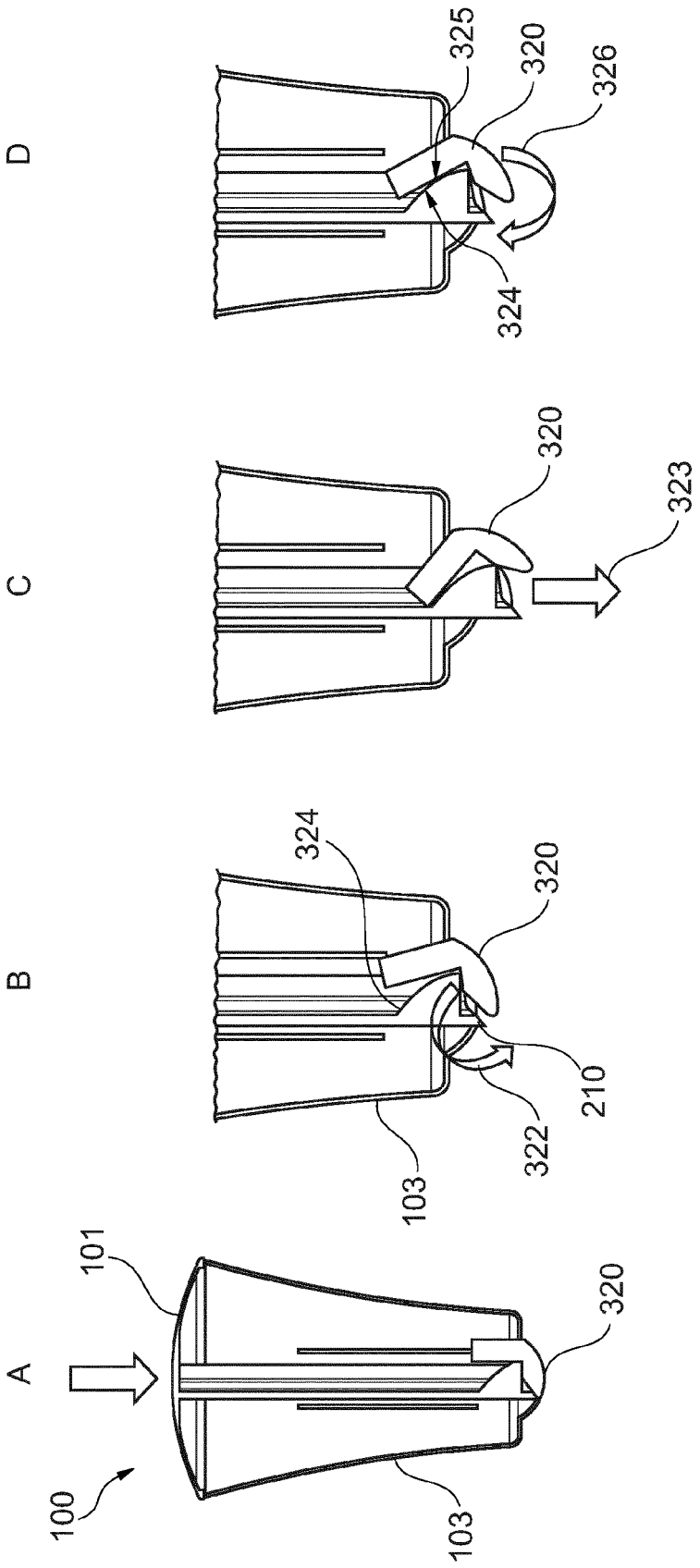

Fig. 3

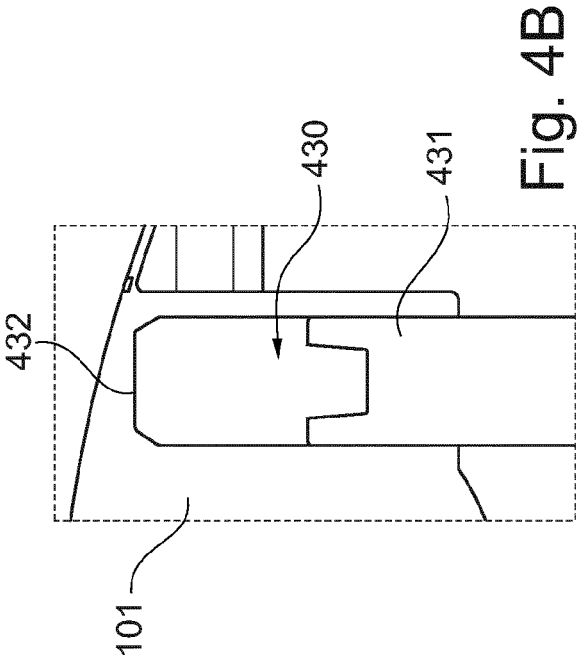

Fig. 4B

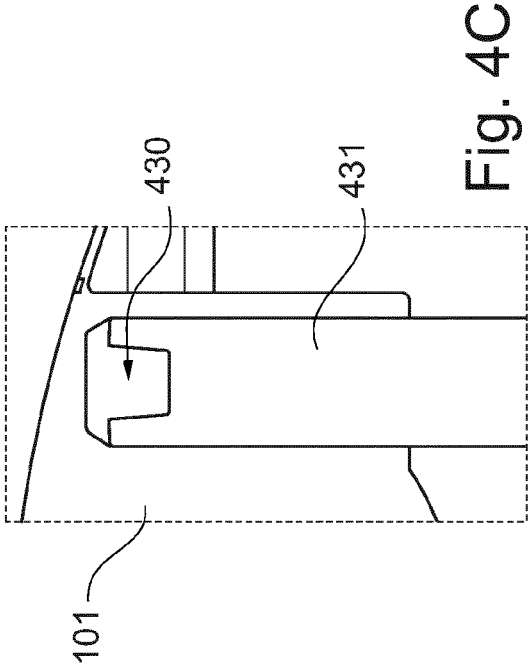

Fig. 4C

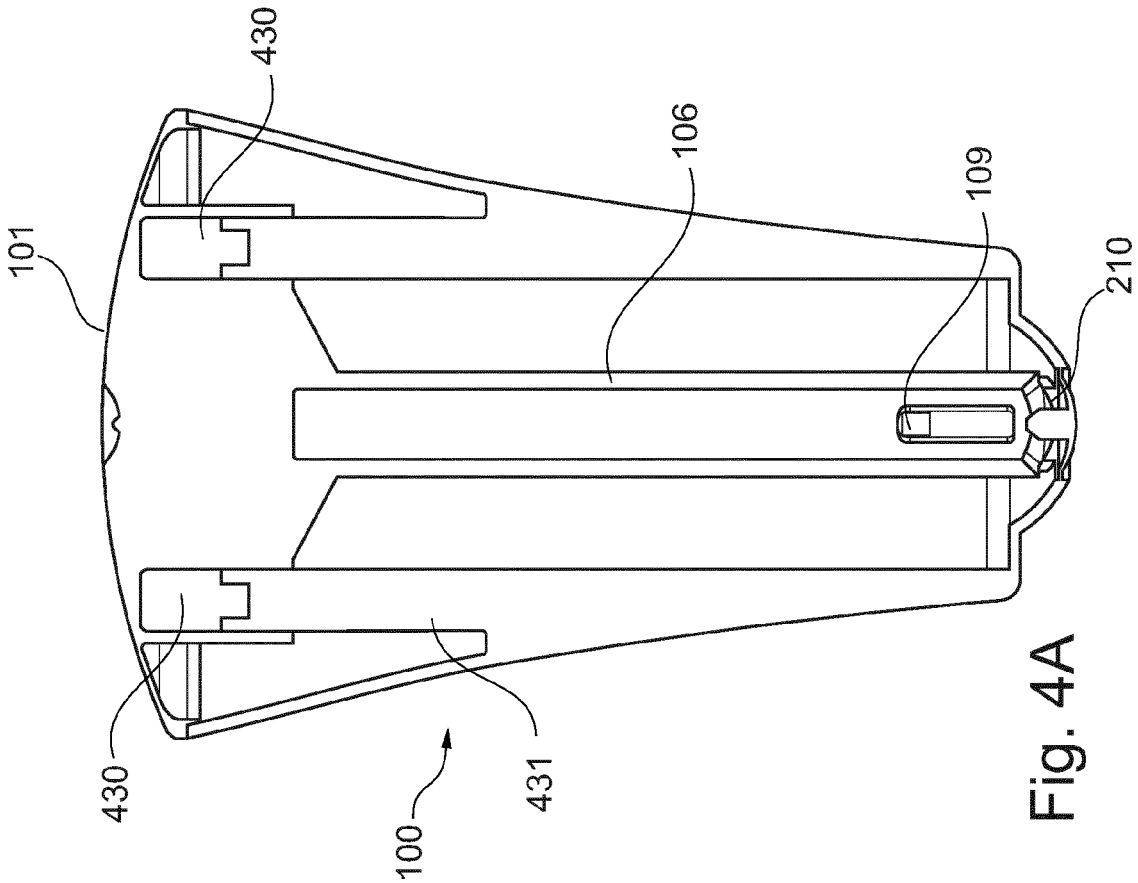

Fig. 4A

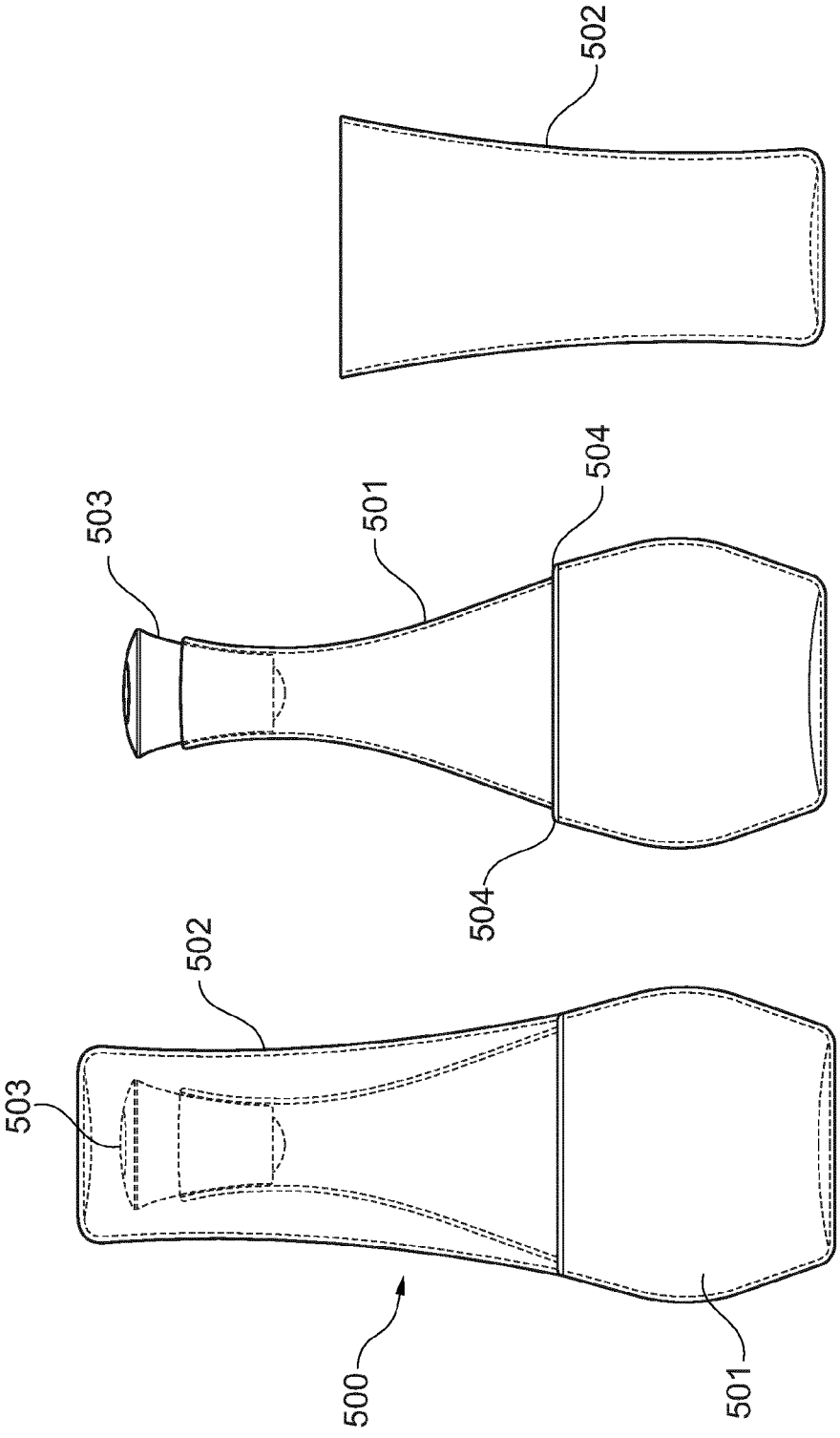

Fig. 5

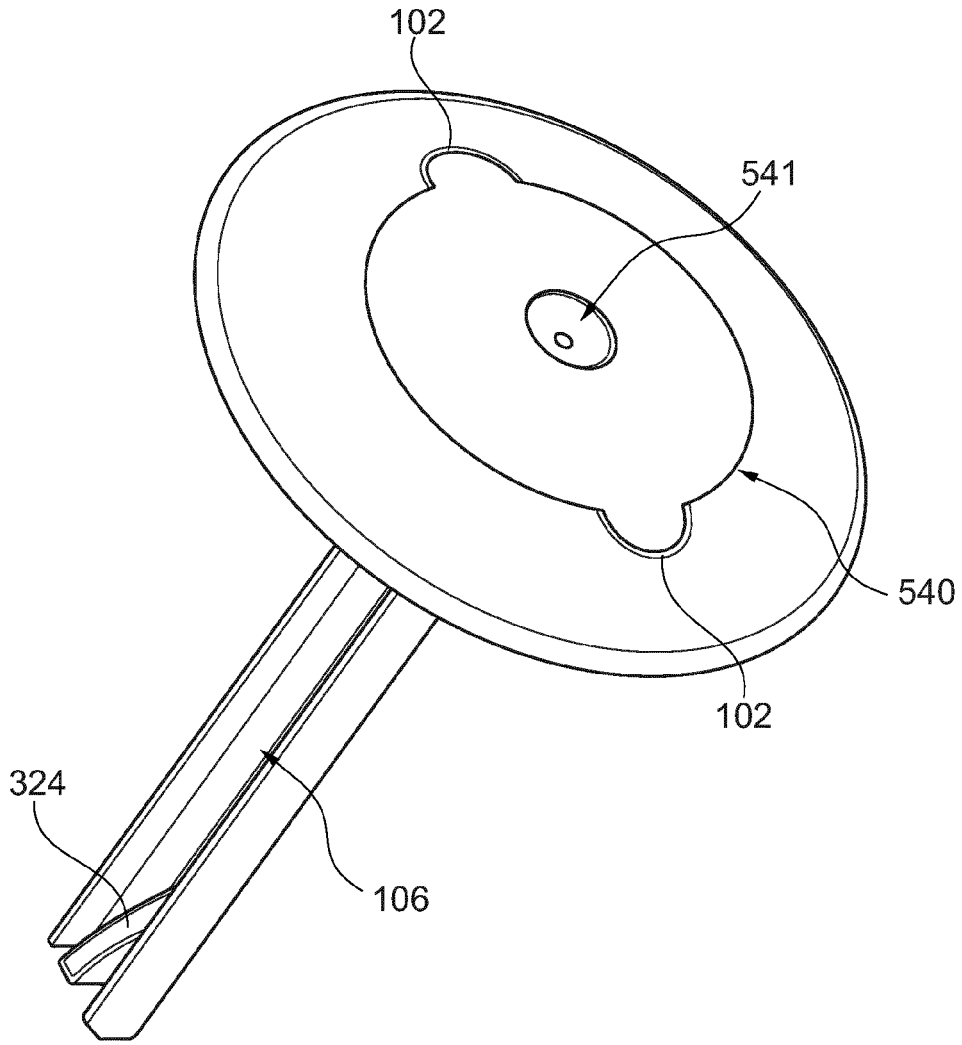

Fig. 6

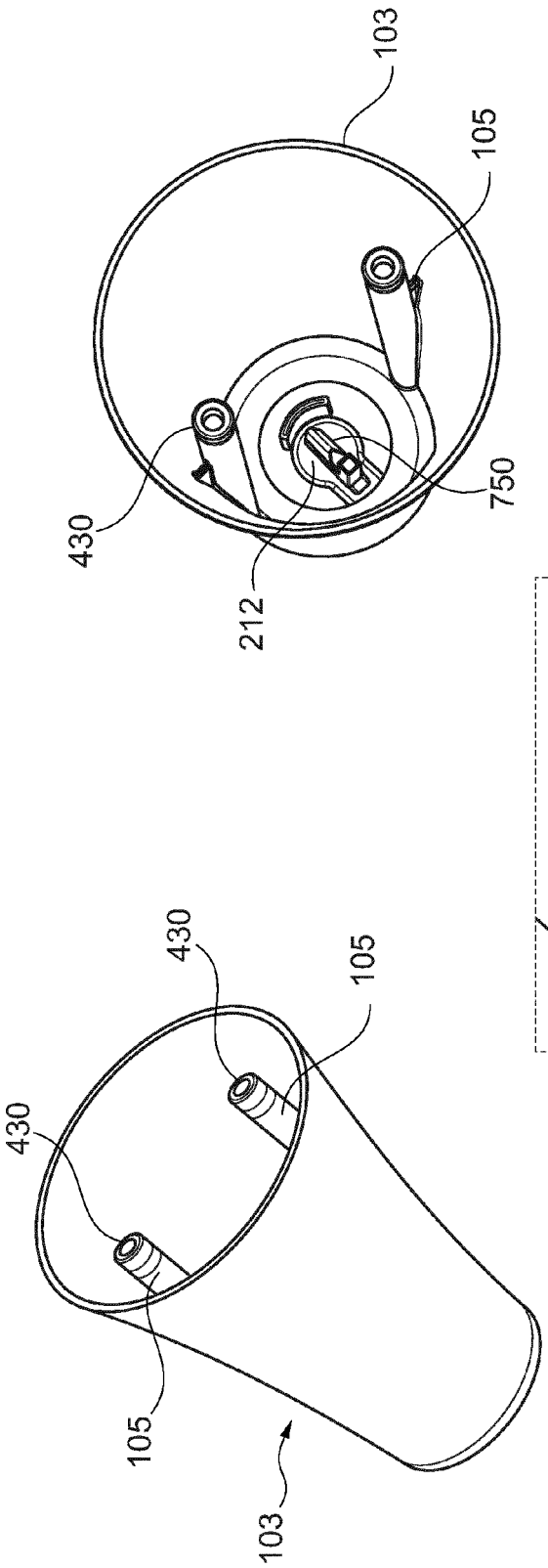

Fig. 7A

Fig. 7B

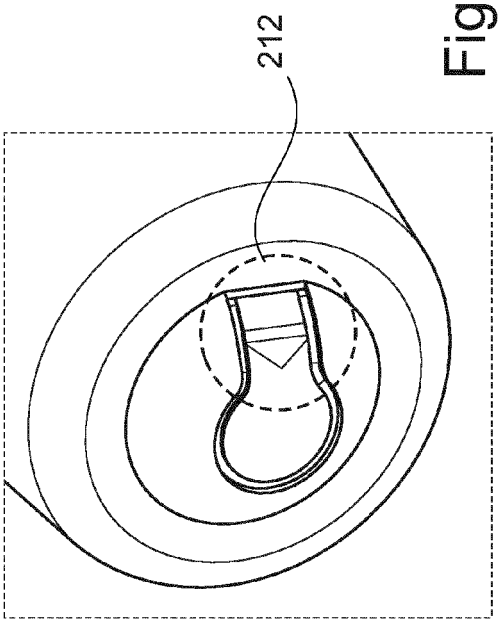

Fig. 7C

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EUROPEAN SEARCH REPORT

Application Number
EP 12 17 5736

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 4 570 826 A (FATTORI LAZZARO A [US]) 18 February 1986 (1986-02-18) * column 7, line 45 - column 8, line 7; figures 13,14 *	1-8, 11-13	INV. B65D51/28
A	WO 2007/006414 A1 (LITECO S R L [IT]; SAULLE LORENZO [IT]) 18 January 2007 (2007-01-18) * the whole document *	1	
A	US 2004/200742 A1 (CHO YOUNG KOOK [US]) 14 October 2004 (2004-10-14) * paragraph [0029]; figures 2,3 *	1,9,10	
A	US 2003/222102 A1 (CHO YOUNG KOOK [US]) 4 December 2003 (2003-12-04) * paragraph [0051]; figures 1-8 *	1,9	
			TECHNICAL FIELDS SEARCHED (IPC) B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	10 October 2012	Newell, Philip

CATEGORY OF CITED DOCUMENTS

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10-10-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4570826 A	18-02-1986	NONE	
WO 2007006414 A1	18-01-2007	NONE	
US 2004200742 A1	14-10-2004	NONE	
US 2003222102 A1	04-12-2003	KR 20030093938 A US 2003222102 A1	11-12-2003 04-12-2003

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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Patent documents cited in the description

- EP 1115627 B1 **[0008]**