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(71) Applicant: **The Procter and Gamble Company**
Cincinnati, Ohio 45202 (US)

(72) Inventors:
- **Vangeel, Filip**
  1800 Vilvoorde (BE)
- **Orchard, Alex James**
  1030 Brussels (BE)

(74) Representative: **Kellenberger, Jakob**
NV Procter & Gamble Services Company SA
IP Patent Department
100 Temselaan
1853 Strombeek-Bever (BE)

(54) **Dispensing closure for containers**

(57) The present invention relates to a dispensing closure suitable for dispensing pourable product from a container. More specifically, the present invention is directed to a "flip-top" type closure operated by an actuating means.

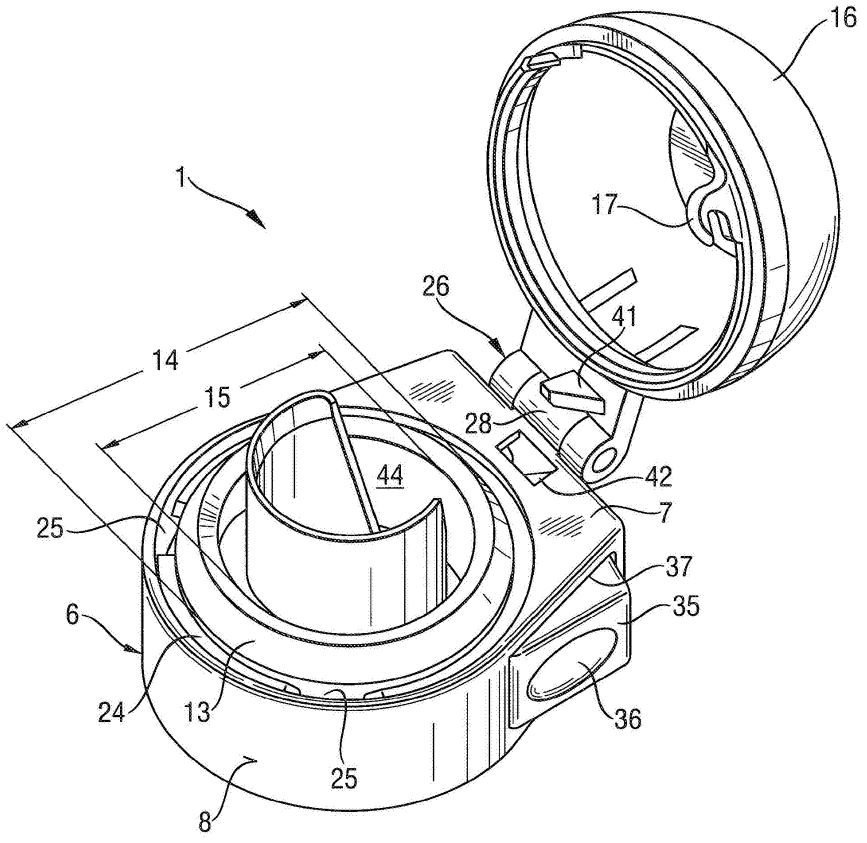

Fig. 3

EP 1 780 141 A1

Description

Technical field

[0001] The present invention relates to a closure suitable for dispensing pourable product from a container. More specifically, the present invention is directed to a "flip-top" type closure operated by an actuating means.

Background of the invention

[0002] Dispensing closures for containers are commonly known in the art and may be based on various opening mechanisms such as "push and turn", "twist and turn", "twist to open" or "push and pull". Those closures are commonly used in combination with containers designed to contain products such as food, beverages, personal care products, pharmaceutical or cosmetic products. Typical types of dispensing closures are for example described in EP-B1-0378488 (turn open), US-A-5305932 (snap-on), US-A-2004015507 (push and pull) or WO 03/050033 (twist to open). The specific type of flip-top closures is described for example in WO 2004/110889, EP-A1-0 567 374, EP-A1-0 379 775, US 5,551,607 or US 5,762,216.

[0003] Although the above-types of closures will generally function satisfactorily in the applications for which they are designed, they typically only permit slow dispensing of limited amount of fluids. However, in certain circumstances, it is required to dispense the contained products much faster and in a relatively large quantity. This is typically the case in the context of liquid detergent containers. It has indeed been discovered that the users of containers equipped with the corresponding dispensing closures primarily seek for the fastest possible delivery of the contained liquid detergent into an appliance or receptacle. Most commonly used closures for containers adapted for delivering liquid detergent compositions, which are typically viscous liquids by nature, are described e.g. in EP-B1-0 109 704. Those dispensing closures typically consist of two separate parts: a spouted transition piece and a screw-type cap. Although the spouted piece allows for precise pouring of the viscous liquid into the intended receptacle, the cap is however often seen as difficult and/or too long to open and may easily get lost.

[0004] Another drawback associated with the use of the above dispensing system is that under usage, liquid detergent compositions may be spilled in the area where liquid detergent is consumed and/or on the user's hands which may lead to skin irritation or even bums. This often occurs when the above-mentioned cap is also used as a dosing means.

[0005] It is therefore an objective of the present invention to provide a dispensing closure suitable for dispensing pourable product from a container which provides fast dispensing of the contained product, which is easy-to-use, mess-free and which overcomes the above-mentioned drawbacks.

[0006] It has now been found that the above objective can be met by providing a dispensing closure 1 according to the present invention.

[0007] Advantageously, the dispensing closure 1 according to the present invention exhibits improved opening/closing ergonomics. It is therefore possible, in a preferred embodiment of the invention, to operate the dispensing closure 1 using a single finger of the hand used to hold the container 2 to which the dispensing closure 1 is attached.

[0008] A further advantage associated with the dispensing closure 1 according to the present invention is that due to the relatively large pouring opening, the container 2 in combination to which the dispensing closure is used, is easily refillable.

It is still another advantage that the dispensing closure 1 of the present invention requires a minimum number of components, which greatly facilitates its manufacture and assembly, and substantially reduces the associated production costs.

[0009] Other advantages and more specific properties of the dispensing closure 1 according to the present invention will be clear after reading the following description of the invention in combination with the attached drawings.

Summary of the invention

[0010] The present invention relates to a dispensing closure **1** suitable for being mounted on a container **2,** the container **2** having a dispensing opening **3** and being suitable for containing a pourable product in its interior volume, wherein the dispensing closure **1** comprises:

(a) a base member **6** comprising a means for attachment **9** to the container **2,** a draining canal **11** adapted to communicate with the interior volume of the container **2,** and a discharging means **12;**

(b) a cap **16** comprising a sealing means **17** for securing said cap **16** onto said base member **6** thereby covering said discharging means **12** in a tight manner vis-à-vis the content of said container **2;**

(c) a means of articulation **26** of the cap **16** with respect to the base member **6** between a open position whereby the discharging means **12** is uncovered and a closed position whereby the discharging means **12** is covered by said cap **16;** the means of articulation **26** joining the cap **16** to the base member **6;**

(d) a flexible member **30** lodged within the base member **6** and comprising a locking means **34** adapted to inter-engage the sealing means **17** so as to maintain the cap **16** in its closed position; the flexible member **30** further comprising an actuating means **35** which under actuation is capable of disengaging the locking means **34** from the sealing means **17;**

(e) complementary means **40,41** located in the cap **16** and in the flexible member **30** capable of releasing

the cap **16** back towards its open position once the locking means **34** have been disengaged from the sealing means **17.**

[0011] In another embodiment, the present invention is directed to a container closure assembly, comprising:

(a) a container **2** having a body portion **4** for holding the container content, a lower closed end for supporting the container **2,** an upper end including a means of attachment **10** thereon adapted to receive and affix a dispensing closure for containers;
(b) a dispensing closure **1** as above-indicated, mounted on the container **2.**

[0012] The present invention further encompasses a method of dispensing the content of a container 2 comprising the steps of:

(a) providing a container closure assembly as above-described, wherein the cap **16** is in its closed position;
(b) actuating the actuating means **35** so as to release the cap **16** back towards its open position;
(c) pouring the required amount of the container content through the discharging means **12;**
(d) mechanically closing the cap **16** back towards its closed position.

Brief description of the drawings

[0013]

FIG.1 is a cross-section view of a container closure assembly according to the present invention. The assembly comprising a container **2** onto which is mounted a dispensing closure **1** according to another embodiment of the invention.
FIG.2 is a top perspective view of a dispensing closure **1** according to the invention in its closed position.
FIG.3 is a top perspective view of a dispensing closure **1** according to the invention in its open position.
FIG.4 is an exploded perspective view of a dispensing closure **1** according to the invention in its open position, which shows the base member **6,** the cap **16** and the flexible member **30** separately.
FIG.5 is a top perspective view of a dispensing closure **1** according to another embodiment of the present invention in its open position.
FIG.6 is a bottom view of a dispensing closure **1** according to the invention in its open position.
FIG.7 is a top perspective view of a dispensing closure **1** according to the invention from which the base member **6** has been removed and which represents the flexible member **30** and the cap **16** in its closed position.
FIG.8 is a top view of a dispensing closure **1** according to the invention in its open position.
FIG.9 is a bottom perspective view of a dispensing closure **1** according to the invention in its closed position.
FIG.10 is a bottom perspective view of a dispensing closure **1** according to the invention from which the base member **6** has been removed and which represents the flexible member **30** and the cap **16** in its closed position.
FIG.11 is a bottom view of **FIG.7.**

Detailed description of the invention

[0014] For the purposes of promoting and understanding the principles of the present invention, reference will be made to the embodiment illustrated in the drawings and specific language will be used to describe the same. While this invention is susceptible of embodiments in many different forms, this specification and the accompanying drawings discloses specific forms as examples of the invention. However, the invention is not intended to be limited to the embodiment so described.
[0015] In a first embodiment, the present invention is directed to a dispensing closure **1** suitable for being mounted onto a container **2** having a dispensing opening **3.**
[0016] Referring now to **FIG.1,** a dispensing closure **1** according to a first embodiment of the invention is represented which is mounted onto a container **2.**

CONTAINER 2

[0017] In a preferred embodiment, the container **2** comprises a body portion **4** for holding container content, a lower closed end for supporting said container **2,** an upper end including a neck **5** delimiting a dispensing opening **3.** The dispensing closure **1** of the present invention may be securely mounted onto said container **2,** via its base member **6,** using any means of attachment commonly know to those skilled in the art including co-operative threads, crimping, clipping means, heat sealing force fitting, clasp elements, snap-fit bead, groove arrangements, and mixtures thereof.
[0018] Preferably, the dispensing closure **1** of the invention is provided with an inner female thread **9** typically located in the base member **6,** as described hereinafter, and the container neck **5** is provided with a male thread **10** formed adjacent its dispensing opening **3.** Typically, the dispensing closure **1** is mounted onto the container **2** with the female thread **9** of the base member **6** screwed on the male thread **10** of the container **2.**
[0019] Alternatively, the container **2** may not need having a neck **5.** Instead the container **2** may consist of a just a body portion **4** with a dispensing opening **3.** The dispensing closure **1** of the present invention is suitable for use with a variety of conventional or special containers having various designs, the details of which, although not illustrated or described, would be apparent to those

skilled in the art. The container **2** may have a rigid wall or walls, or may have a somewhat flexible wall or walls.

[0020] In a preferred aspect of the invention, the dispensing closure **1** is a separate element which is adapted to be removably or non-removably mounted, via its base member **6,** to a previously manufactured container **2** which has a dispensing opening **3** to the container interior. In an alternative execution, the dispensing closure **1** may be formed as a unitary part, or extension, of the container **2.** The dispensing closure **1** is adapted to be used with a container **2** having a dispensing opening **3** to provide access to the container interior volume and to a product contained therein, which is preferably a pourable product. However, the dispensing closure **1** of the invention may be used with many products, including but not limited to, relatively low or high viscosity liquids, creams, gels, suspensions, mixtures, lotions, pastes, particulates, granular products, and mixtures thereof. Typical products for use in the present invention may be those constituting a food product, a personal care product, an industrial or household cleaning product, or other compositions of matter for use in activities involving manufacturing, commercial or household maintenance, construction, agriculture.

[0021] Preferably, said pourable product is a liquid composition, more preferably a viscous liquid composition, most preferably a laundry liquid detergent composition.

BASE MEMBER 6

[0022] The dispensing closure **1** according to the present invention comprises as a first element, a base member **6. FIG.2** shows a top perspective view of the dispensing closure **1** according to the invention comprising a base member **6** with a cap **16** in its closed position.

[0023] The base member **6** is intended to be mounted onto a container **2** using any suitable means of attachment as indicated above. Suitable means of attachment are designed so as to provide secure sealing between the dispensing closure **1** and the container **2** vis-à-vis its content.

[0024] The base member **6** may have any suitable configuration, form or dimension for accommodating an upwardly projecting neck **5** or portion of a container **2.** In a preferred execution of the present invention, the base member **6** has a substantially trapezoidal shape when seen from the top, as represented in **FIG.8.** The base member **6** is comprised of two distinct parts: a skirt **8** and a deck **7.** The skirt **8** generally forms the external and surrounding wall of the base member **6** and extends substantially towards the container direction, typically parallel to the neck **5** of the container **2.** The deck **7** which typically extends substantially transversely to the longitudinal axis of the container **2** is generally substantially flat and horizontal.

[0025] More specifically, and as shown in **FIG.9,** the means for attachment **9** is preferably located onto the inner wall of the base member **6.**

[0026] As shown in **FIG.9** and **FIG.8,** the base member **6** further comprises a draining canal **11** adapted to communicate with the interior volume of the container **2** such as to dispense the container content via the discharging means **12,** when the cap **16** is in its open position.

[0027] Discharging means **12** for use herein may be readily recognized and selected by those skilled in the art. Preferably, said discharging means **12** is a pouring spout. In a more preferred execution, the discharging means **12** is a beveled spout which extends upwardly from the base member **6,** preferably from the deck **7.** Such preferred spout allows better control and more precise dispensing of the container content, especially viscous liquids such as liquid detergents. It is preferred that said discharging means **12** has a substantially annular shape.

[0028] In a further preferred embodiment of the present invention, said discharging means **12** is surrounded by a deflecting stem **13** which projects upwardly from the base member **6.** Preferably, the height of the deflecting stem **13** is lower than that of the discharging means **12** so as not to affect the dispensing function of said discharging means **12.** Also, it is preferred that the shape and dimension of the deflecting stem **13** cooperates with the cap **16** so as to ensure improved sealing of said cap **16** vis-à-vis the content of the container **2.** Typically, the deflecting stem **13** is of annular shape and has an outer diameter **14** and an inner diameter **15.** Preferably, the outer diameter **14** of said deflecting stem **13** is flush with that of the cap **16.** The deflecting stem **13** also centers the cap **16** and support said cap **16** from radial deflection.

[0029] In a highly preferred execution, the deflecting stem **13** is located in such a way as to form spacing between said discharging means **12** and said deflecting stem **13.** Said spacing may preferably take the form of a circular drainer ***44** adapted to recuperate any pourable product contained within the container **2,** preferably viscous liquid product, which would not have been properly dispensed from said discharging means **12.** Also, said spacing is preferably provided with apertures (not represented) communicating with the interior of the container **2** so as to permit the recuperated product to be drained back into the container **2.** Additionally, said apertures will also constitute air intake means adapted to allow air to penetrate into the container **2** in response to the evacuation of its content and thereby contribute to a better dispensing of the container content, preferably viscous liquids.

[0030] The constituting parts of the base member **6** are formed from any suitable material commonly known in the art. Preferably, said parts are all formed from heat sealable thermoplastic materials such as polyethylene or polypropylene single piece. Accordingly, and in a preferred execution of the invention, the base member **6** is a monolithic piece.

CAP 16

[0031] The dispensing closure **1** according to the present invention is further provided with a cap **16,** the role of which is to cover the discharging means **12** in a tight manner vis-à-vis the content of the container **2. FIG. 2** and **FIG.3** show a top perspective view of a cap **16** respectively in its closed and open position.

[0032] The cap **16** for use herein may have any suitable configuration, form or dimension for accommodating the discharging means **12** comprised in the dispensing closure **1** of the present invention. Suitable caps **16** for use herein will easily be recognized by those skilled in the art. In a preferred execution, the cap **16** has a substantially rounded shape which will allow proper covering of said discharging means **12.** Preferably, the cap **16** has a concave form with the concavity turned towards the direction of the base member deck **7.** The cap **16** for use in the present invention may optionally, but preferably, comprise a transition piece **19** which makes the junction between said cap **16** and said means of articulation **26.** Typically, said transition piece **19** comprises an inner surface **20** and an outer surface 21.

[0033] The cap **16** for use herein, preferably possesses a lip assembly including a lip portion **22** and a preferably annular lip stem **23** which projects downwardly from the lip portion **22** and extends around the perimeter of the lip portion **22.** In that preferred embodiment, the base member **6,** and preferably the deck **7** is provided with a receiving recess **24** adapted to tightly fit the lip stem **23** so as to achieve a further improved sealing of said cap **16** onto the base member **6.** According to a preferred embodiment, said receiving recess **24** is of annular shape so as to conform to the preferred annular lip stem **23** and tightly circumvents said deflecting stem **13.** According to an even more preferred embodiment, said cap **16** is provided with an additional plug seal in the form of a secondary annular wall **43** extending downwardly from the inner surface **18** of the cap **16.** It is preferred that the dimensions of said secondary annular wall **43** are adapted so that it can fit into said circular drainer **44** and the diameter of said secondary annular wall is slightly inferior to that of the inner diameter of said deflecting stem **13.** According to this other preferred execution of the present invention, a further improved sealing of said cap **16** vis-à-vis the content of the container **2** is obtained.

[0034] The cap **16** comprises a sealing means **17** for securing said cap **16** onto said base member **6** thereby providing secure sealing vis-à-vis the content of the container **2.**

[0035] Said sealing means **17** is designed so as to inter-engage locking means **34** comprised in the flexible member **30** as described hereinafter. In a highly preferred embodiment, the sealing means **17** is at least one hook, preferably two hooks.

[0036] In a preferred execution of the present invention, said sealing means **17** is located in the lip stem **23** at selected locations. In such a preferred execution, the above-described receiving recess **24** may be provided with apertures **25** adapted to permit said sealing means **17** to traverse through said base member **6,** preferably said deck **7** and thereby inter-engage said locking means **34** located in said flexible member **30.** Preferably, said sealing means **17** is positioned in the lip stem **23** at the opposite side with respect to the hinge assembly which will be described hereinafter. More preferably, said sealing means **17** are located diametrically opposite to the means of articulation **26,** as will be described below.

[0037] The cap **16** for use in the present to the present invention may be formed from any suitable material commonly known in the art. Preferably, said cap **16** is formed from heat sealable thermoplastic materials such as polyethylene or polypropylene single piece.

MEANS OF ARTICULATION 26

[0038] According to the present invention, and as represented in particular in **FIG.3, FIG.4** and **FIG.5,** the cap **16** is mounted via a means of articulation **26** onto the base member 6, preferably onto the deck **7** of said base member **6,** between a closed position whereby said discharging means **12** is completely covered by said cap **16** and a open position whereby said discharging means **12** is completely uncovered. According to a preferred execution of the present invention, when the cap **16** is in its completely open position, the cap **16** forms an angle of at least 180° with respect to the substantially horizontal plan formed by the base member deck **7.** Accordingly, the user is allowed to watch and control the discharging means **12** during the whole course of the dispensing operation.

[0039] The means of articulation **26** joins the cap **16** to the base member **6** and is typically designed so as to permit said cap **16** to pivot around a pre-determined axis. Suitable means of articulation **26** for use herein will easily be recognized by those skilled in the art. According to a preferred embodiment of the present invention, the means of articulation **26** is a hinge-type assembly which may be conventionally known hinges selected from the group of pivot-hinge, "butterfly-hinge" and "three-legged-hinge" also known as living hinge.

[0040] In one preferred execution, and as represented in **FIG.3** and **FIG.4,** the means of articulation **26** is in the form of a pivot-hinge comprising a pivotation piece **27** and a pivot **28.** According to another preferred embodiment of the present invention, the means of articulation **26** is a three-legged hinge comprising three articulation legs. In still another preferred embodiment, the means of articulation **26** is butterfly-hinge **29,** as represented in **FIG.5.**

[0041] In another aspect of the invention, said means of articulation **26** may be adapted so as to elastically force the cap **16** back towards its open position. More specifically, the means of articulation **26** shall be designed such that the energetically stable position is the open position. Also, when said cap **16** is mechanically pivoted towards

the closed position, the means of articulation **26** is subjected to bending and/or compressive deformation which in response creates an elastic restoring force which forces said cap **16** back towards its open position, in particular to its completely open position.

[0042] A suitable means of articulation **26** according to this other aspect of the invention is described e.g. in WO 2004/110889. However, other suitable configurations may be easily recognized by those skilled in the art.

[0043] The means of articulation **26** for use herein may be formed from any suitable material commonly known in the art. Preferably, said means of articulation **26** is formed from the same material as that used to form the cap **16** and/or the base member **6.** According to one embodiment, the base member **6,** the cap **16** and the means of articulation **26** may be formed as a single piece, preferably from the same thermoplastic material such as polyethylene or polypropylene. According to this specific embodiment, the different parts may be advantageously molded within a single injection molding operation which therefore involves both a simple and economical manufacturing process.

FLEXIBLE MEMBER 30

[0044] The dispensing closure **1** according to the present invention further comprises a flexible member **30. FIG.4** is an exploded perspective view of the dispensing closure **1** according to the invention in its open position, wherein are represented the base member **6,** the cap **16,** the means of articulation **26** and the flexible member **30** separately. As for **FIG.7,** this is a top perspective view of the dispensing closure 1 according to the invention from which the base member **6** has been removed and which represents the flexible member **30** and the cap **16** in its closed position.

[0045] The flexible member **30** is lodged within the base member **6** in a suitable housing **31.** The flexible member **30** may have any suitable configuration, form or dimension for accommodating the configuration of the base member **6** and in particular the internal volume of the base member **6.** In a preferred execution of the present invention, wherein the base member **6** has a substantially cylindrical shape fused with a substantially square shape, as represented in the accompanying drawings, the flexible member **30** is provided with a similar overall shape as represented in **FIG.11.** In such a preferred execution, the flexible member **30** is in the form of a substantially thin strap having substantially the same height as that of the skirt **8** and which is provided with an upper lip **32** and lower lip **33.**

[0046] The flexible member **30** for use herein comprises as a first element a locking means **34** which is adapted to inter-engage said sealing means **17.** Suitable locking means **34** for use herein will be readily apparent to those skilled in the art. Examples of suitable locking means **34** include but are not limited to hooks, clasp elements, protrusions, apertures, spigots or plugs.

[0047] Sealing means **17** and locking means **34** shall imperatively be selected so as they cooperate to form a locking system. Such locking systems are well within the competence of the skilled person.

[0048] The locking systems for use in the present invention, allow said locking means **34** to securely inter-engage said sealing means **17** in such a way that the cap **16** is efficiently maintained in its closed position onto the base member **6** even when the container **2** on which the dispensing closure **1** of the present invention is mounted, is involuntarily dropped on the floor.

[0049] According to a preferred embodiment of the present invention, said locking means **34** is a clasp element as represented in particular in **FIG.7** and **FIG.10.** This specific locking means **34** is particularly well adapted to inter-engage the hooks located in the preferred cap **16** for use in the present invention.

[0050] The flexible member **30** further includes an actuating means **35** which is an integral part of said flexible member **30.** The actuating means **35** may have any suitable configuration, form or dimension for accommodating the configuration of the flexible member **30.** As will be easily appreciated by those skilled in the art, multiple configurations may be suitably used for such an actuating means **35.**

[0051] The actuating means **35** is, when actuated, capable of disengaging said locking means **34** from said sealing means **17** thereby causing said cap **16** to be released back towards its open position due to the antagonist restoring force generated by the elastic deformation of said means of articulation **26** when said cap **16** is mechanically forced towards its closed position.

[0052] According to a preferred embodiment of the present invention, said actuating means **35** is in the form of a pushing button, as represented in the accompanying drawings. Said pushing button may be of any shape commonly known in the art, including but not limited to circular, square, rectangular, ovoid or triangular. More preferably, said pushing button has a square shape, preferably provided with a centrally positioned cavity **36** so as to facilitate the pushing action by a finger of the user.

[0053] The actuating means **35** may be located at any suitable position provided it is easily accessible by the user's fingers. Such suitable positions may be readily identifiable by the person skilled in the art. However, according to a preferred execution of the invention, the actuating means **35** advantageously projects out from the skirt **8** via an opening **37** created into the skirt **8** for that purpose. According to a more preferred embodiment, said actuating means **35** is located at a specific position (see e.g. **FIG.3)** nearby the means of articulation **26** so as to provide improved opening/closing ergonomics. Preferably, said actuating means **35** is operated by using one finger of the same hand that is used to hold the container **2** during the dispensing operation. Furthermore, it is preferred that said actuating means **35** be fixed to a pivot stem **38** so that said actuating means **35** is allowed to pivot around a fictive axis when said actuating means

35 is under actuation without said actuating means **35** being unfavourably displaced during actuation.

[0054] In a preferred aspect, the flexible member **30** is provided with a resiliently deformable portion **39** which is temporarily and elastically stressed when said actuating means **35** is mechanically actuated and which provides a restoring force back towards the normal position of said actuating means **35** once said actuation operation is removed.

[0055] Preferably, the resiliently deformable portion **39** is an accordion-like spring as represented for example in **FIG.7.** The flexible member **30** for use herein may be optionally provided with an additional spring means (not represented) suitably located and which is designed such as to provide a further improved restoring force, as above described.

[0056] In the normal course of a closing/opening operation, while said cap **16** is in its closed position, the actuating means **35** is mechanically actuated so as to make said flexible member **30** translating within the housing **31** thereby disengaging said locking means **34** from said sealing means **17.** Due to the restoring force created into the resiliently deformable portion **39** during actuation of the actuating means **35,** said flexible member **30** is resiliently forced back towards its initial position into the housing **31.**

[0057] The flexible member **30** for use herein may be formed from any suitable material commonly known in the art. Preferably, said flexible member **30** is formed from the same material as that used to form the cap **16** and/or the base member **6** and/or the means of articulation **26.** According to preferred embodiment, the flexible member **30** may be formed as a single piece, preferably from the same thermoplastic material such as polyethylene or polypropylene. According to this specific embodiment, the different parts of the flexible member **30** may be advantageously molded within a single injection molding operation which involves therefore a both simple and economical manufacturing process.

COMPLEMENTARY MEANS 40,41 CAPABLE OF RELEASING SAID CAP 16 BACK TO ITS OPEN POSITION

[0058] The dispensing closure **1** of to the present invention further comprises complementary means **40,41** capable of releasing said cap **16** back towards its open position once said locking means **34** have been disengaged from said sealing means **17.**

[0059] Complementary means **40,41** for use in the present invention are located in said cap **16** and in said flexible member **30.** Suitable complementary means **40,41** for use herein will easily be recognized by those skilled in the art, as this is well within the common practice in the field. Typically, said complementary means **40,41** are based on a spring-like effect.

[0060] According to a preferred embodiment of the present invention, said complementary means **40,41,** take the form of a cooperative combination of a flexible piece **40** and a corresponding fixed structural element **41.** Preferably, said flexible piece **40** is elastically stressed when compressed by said structural element **41.**

[0061] In a very preferred execution, said flexible piece **40** is located in the flexible member **30,** preferably on its upper lip **32** and nearby the actuating means **35.** As for the corresponding structural element **41** it is preferably located on the cap **16,** even more preferably located on the inner surface **20** of the transition piece **19.** According to such a preferred execution, the deck **7** may preferably be provided with an aperture **42** adapted such as said structural element **41** is able to traverse through the deck **7** and come into contact with the flexible piece **40,** such as shown in **FIG.4.**

[0062] In a highly preferred embodiment of the present invention, the flexible piece **40** is a flexible arm, preferably an inclined flexible arm, and the structural element **41** is in the form of a flange, preferably a sharp flange, more preferably a sharp and beveled flange, as represented in **FIG.4.** However, the present invention is not so limited. The flexible piece **40** and the structural element **41** shall be configured so as they cooperate to form a dynamic spring-like system. Such dynamic spring-like systems are well within the competence of the skilled person.

[0063] The complementary means **40,41** are aimed at releasing, preferably pushing, said cap **16** back towards its open position and are preferably able to quickly flip open said cap **16** over an angle of preferably at least 180° with respect to the horizontal plan formed by the deck 7.

[0064] According to a highly preferred execution of the present invention and in the normal course of an opening operation, while said cap **16** is in its closed position, the structural element **41** does not put any elastic stress on the flexible piece **40.** However, when the actuating means **35** is mechanically actuated, said flexible member **30** translates within the housing **31.** Concurrent to said translation motion, and due the particular shapes and configurations of the structural element **41** and the flexible piece **40,** the structural element **41** increasingly compresses said flexible piece **40** downwardly, putting an increasing elastic stress on it. When said flexible member **30** has translated enough to disengage said locking means **34** from said sealing means **17,** the cap **16** is pushed back towards its open position due to the energy stored when said flexible piece **40** is compressed thereby creating an upwardly restoring force parallel to a fictive vertical axis. Also, due to the restoring force created into the resiliently deformable portion **39** during actuation of the actuating means **35,** said flexible member **30** is resiliently forced back towards its initial position into the housing **31** when said mechanical actuation is discontinued.

[0065] In the context of the present invention, it is preferred that said complementary means **40,41** are integrally part of the specific elements they are located in.

More specifically and according to a highly preferred embodiment, said flexible piece **40** is preferably integrally part of said flexible member **30** and said structural element **41** is preferably integrally part of said cap **16.**

Container closure assembly

[0066] In another embodiment, the present invention is directed to a container closure assembly, comprising:

(a) a container **2** having a body portion **4** for holding the container content, a lower closed end for supporting the container **2,** an upper end including a means of attachment thereon adapted to receive and affix a dispensing closure for containers;
(b) a dispensing closure **1** according to the invention, mounted on the container **2.**

A method of dispensing the content of a container **2**

[0067] The present invention further encompasses a method of dispensing the content of a container **2** comprising the steps of:

(a) providing a container closure assembly according to the invention, wherein said cap **16** is in its closed position;
(b) actuating said actuating means **35** so as to release said cap **16** back towards its open position;
(c) pouring the required amount of the container content through said dispensing means;
(d) mechanically closing said cap **16** back towards its closed position.

Use of a container closure assembly according to the invention, for dispensing a liquid composition.

[0068] In a further embodiment, the present invention is directed to the use of a closure assembly according to the present invention for dispensing a liquid composition, preferably a liquid detergent composition, most preferably a liquid laundry detergent composition.

[0069] The dimensions and values disclosed herein are not to be understood as being strictly limited to the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as "40 mm" is intended to mean "about 40 mm".

Claims

1. A dispensing closure **(1)** suitable for being mounted on a container **(2),** said container **(2)** having a dispensing opening **(3)** and being suitable for containing a pourable product in its interior volume, wherein said dispensing closure **(1)** comprises:

(a) a base member **(6)** comprising a means for attachment **(9)** to said container **(2),** a draining canal **(11)** adapted to communicate with the interior volume of said container **(2),** and a discharging means **(12);**
(b) a cap **(16)** comprising a sealing means **(17)** for securing said cap **(16)** onto said base member **(6)** thereby covering said discharging means **(12)** in a tight manner vis-à-vis the content of said container **(2);**
(c) a means of articulation **(26)** of said cap **(16)** with respect to said base member **(6)** between a open position whereby said discharging means **(12)** is uncovered and a closed position whereby said discharging means **(12)** is covered by said cap **(16);** said means of articulation **(26)** joining said cap **(16)** to said base member **(6);**
(d) a flexible member **(30)** lodged within said base member **(6)** and comprising a locking means **(34)** adapted to inter-engage said sealing means **(17)** so as to maintain said cap **(16)** in its closed position; said flexible member **(30)** further comprising an actuating means **(35)** which under actuation is capable of disengaging said locking means **(34)** from said sealing means **(17);**
(e) complementary means **(40,41)** located in said cap **(16)** and in said flexible member **(30)** capable of releasing said cap **(16)** back towards its open position once said locking means **(34)** have been disengaged from said sealing means **(17).**

2. A dispensing closure **(1)** according to claim 1, wherein said base member **(6)** is substantially cylindrical.

3. A dispensing closure **(1)** according to claim 1 or 2, wherein said means for attachment **(9)** is a cooperative thread.

4. A dispensing closure **(1)** according to any of the preceding claims, wherein said base member **(6)** further comprises a deflecting stem **(13)** projecting upwardly from the base member **(6)** and preferably surrounding said discharging means **(12).**

5. A dispensing closure **(1)** according to any of the preceding claims, wherein said discharging means **(12)** is a pouring spout, preferably a beveled spout.

6. A dispensing closure **(1)** according to any of the preceding claims, wherein said sealing means **(17)** is a hook, preferably two hooks.

7. A dispensing closure **(1)** according to any of the preceding claims, wherein said cap **(16)** possesses a lip portion **(22)** and a lip stem **(23)** projecting downwardly from said lip portion **(22)** and extending

around the perimeter of said lip portion **(22).**

8. A dispensing closure **(1)** according to claim 7, wherein said base member **(6)** further comprises a receiving recess **(24)** adapted to tightly fit said lip stem **(23).**

9. A dispensing closure **(1)** according to any of the preceding claims, wherein said means of articulation **(26)** is a hinge-type assembly.

10. A dispensing closure **(1)** according to claim 9, wherein said hinge-type assembly is selected from the group of pivot-hinge, butterfly-hinge and three-legged-hinge.

11. A dispensing closure **(1)** according to any of the preceding claims, wherein said actuating means **(35)** is a pushing button.

12. A dispensing closure **(1)** according to any of the preceding claims, wherein said flexible member **(30)** is a strap.

13. A dispensing closure **(1)** according to any of the preceding claims, wherein said locking means **(34)** is a clasp element.

14. A dispensing closure **(1)** according to any of the preceding claims, wherein said flexible member **(30)** further comprises a resiliently deformable portion **(39),** which is preferably an accordion-like spring.

15. A dispensing closure **(1)** according to any of the preceding claims, wherein said complementary means **(40,41)** take the form of a cooperative combination of a flexible piece **(40)** and a corresponding fixed structural element **(41),** wherein said flexible piece **(40)** is elastically stressed when compressed by said structural element **(41).**

16. A dispensing closure **(1)** according to claim 15, wherein said flexible piece **(40)** is located on the upper lip **(32)** of said flexible member **(30),** and said structural element **(41)** is located on said cap **(16).**

17. A dispensing closure **(1)** according to claim 15, wherein said flexible piece **(40)** is a flexible arm, preferably an inclined flexible arm, and said structural element **(41)** is in the form of a flange, preferably a sharp flange, more preferably a sharp and beveled flange.

18. A dispensing closure **(1)** according to claim 16, wherein said base member **(6)** comprises a skirt **(8)** and a deck **(7)** and wherein said deck 7 is further provided with an aperture **(42)** adapted such as to permit said structural element **(41)** to traverse through said deck **(7)** and come into contact with said flexible piece **(40).**

19. A dispensing closure **(1)** according to any of the preceding claims, wherein said pourable product is liquid, preferably a viscous liquid.

20. A container closure assembly, comprising:

(a) a container **(2)** having a body portion **(4)** for holding container content, a lower closed end for supporting said container **(2),** an upper end including a means of attachment **(10)** thereon adapted to receive and affix a dispensing closure for containers; and
(b) a dispensing closure **(1)** according to any of the preceding claims mounted on said container **(2).**

21. A method of dispensing the content of a container **(2)** comprising the steps of:

(a) providing a container closure assembly according to claim 20 wherein said cap **(16)** is in its closed position;
(b) actuating said actuating means **(35)** so as to release said cap **(16)** back to its open position;
(c) pouring the required amount of the container content through said discharging means **(12);**
(d) mechanically closing said cap **(16)** back towards its closed position.

22. Use of a dispensing closure **(1)** according to any of the preceding claims for dispensing a liquid laundry detergent composition.

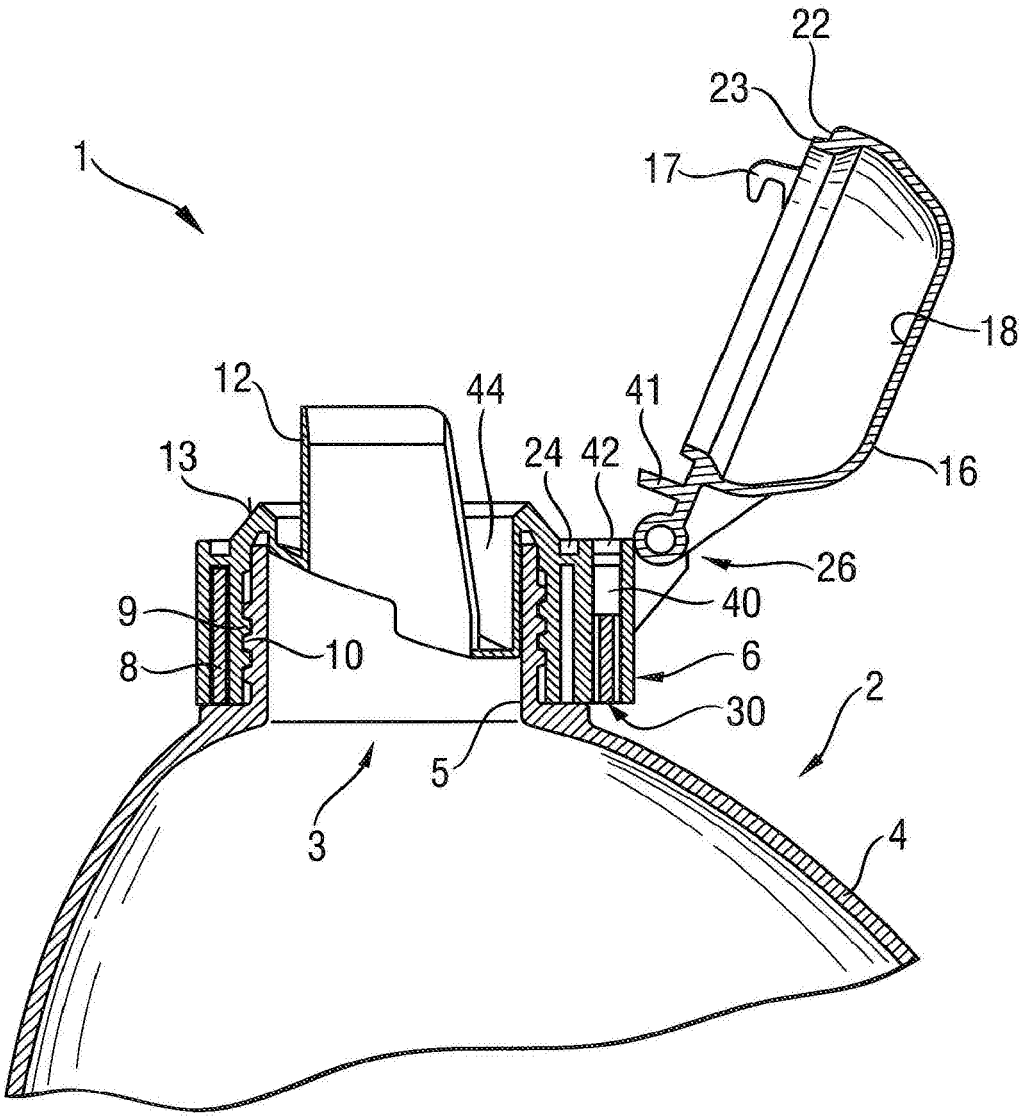

Fig. 1

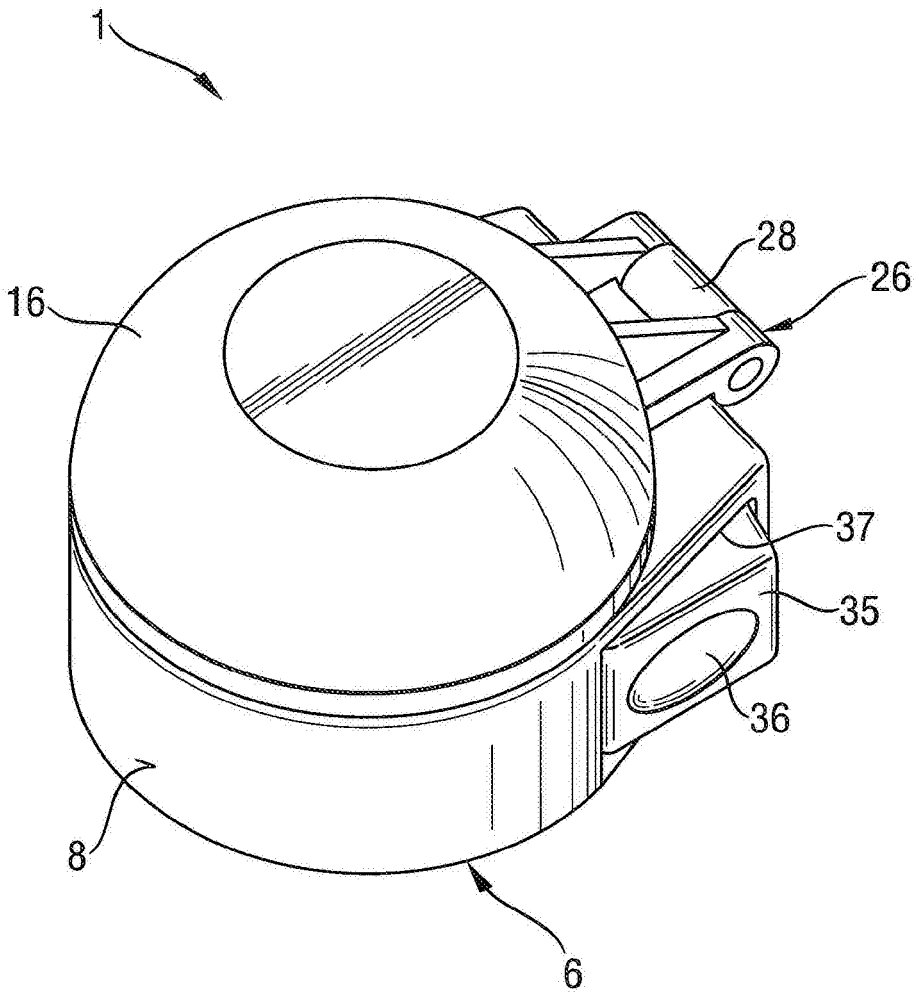

Fig. 2

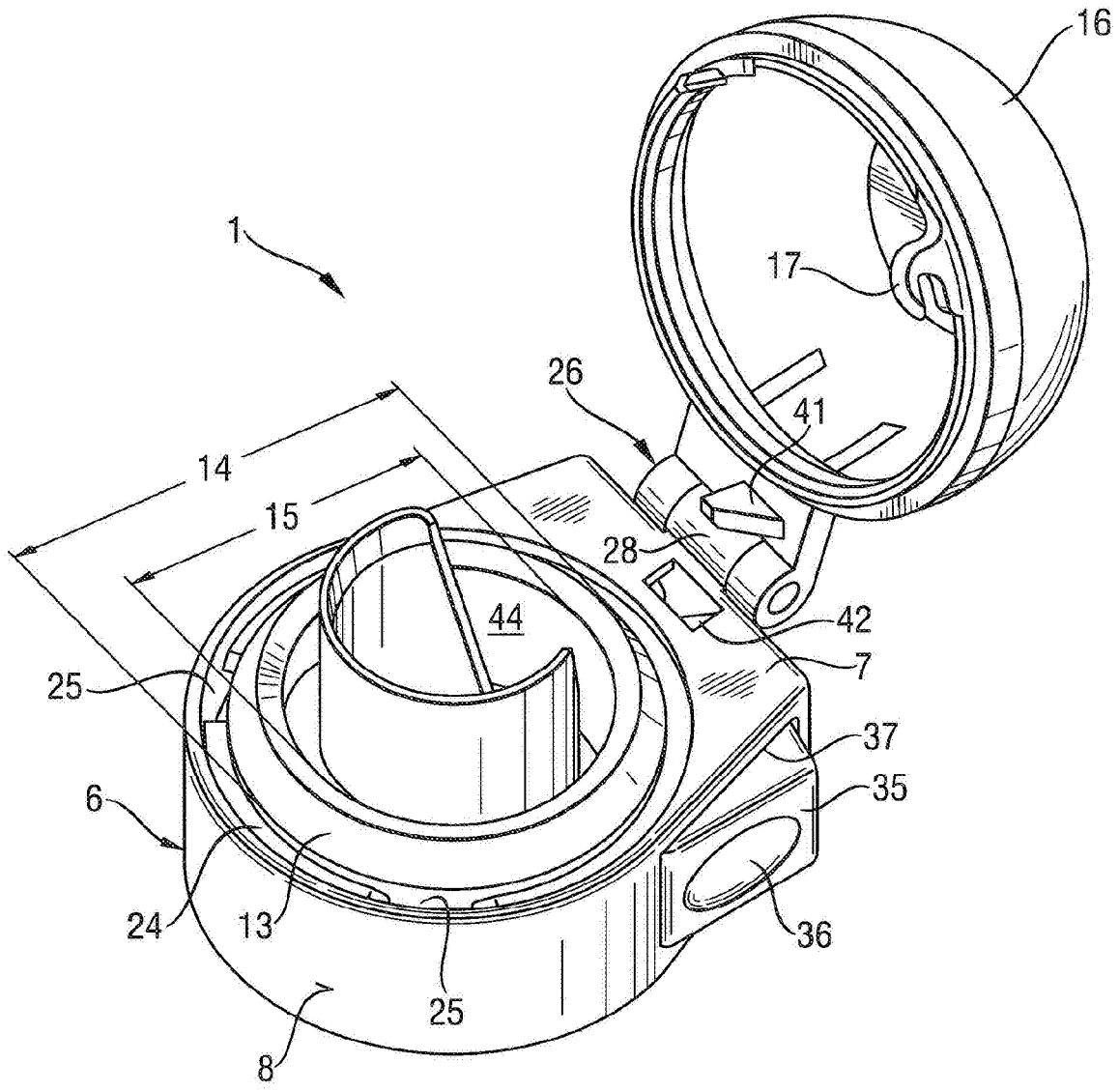

Fig. 3

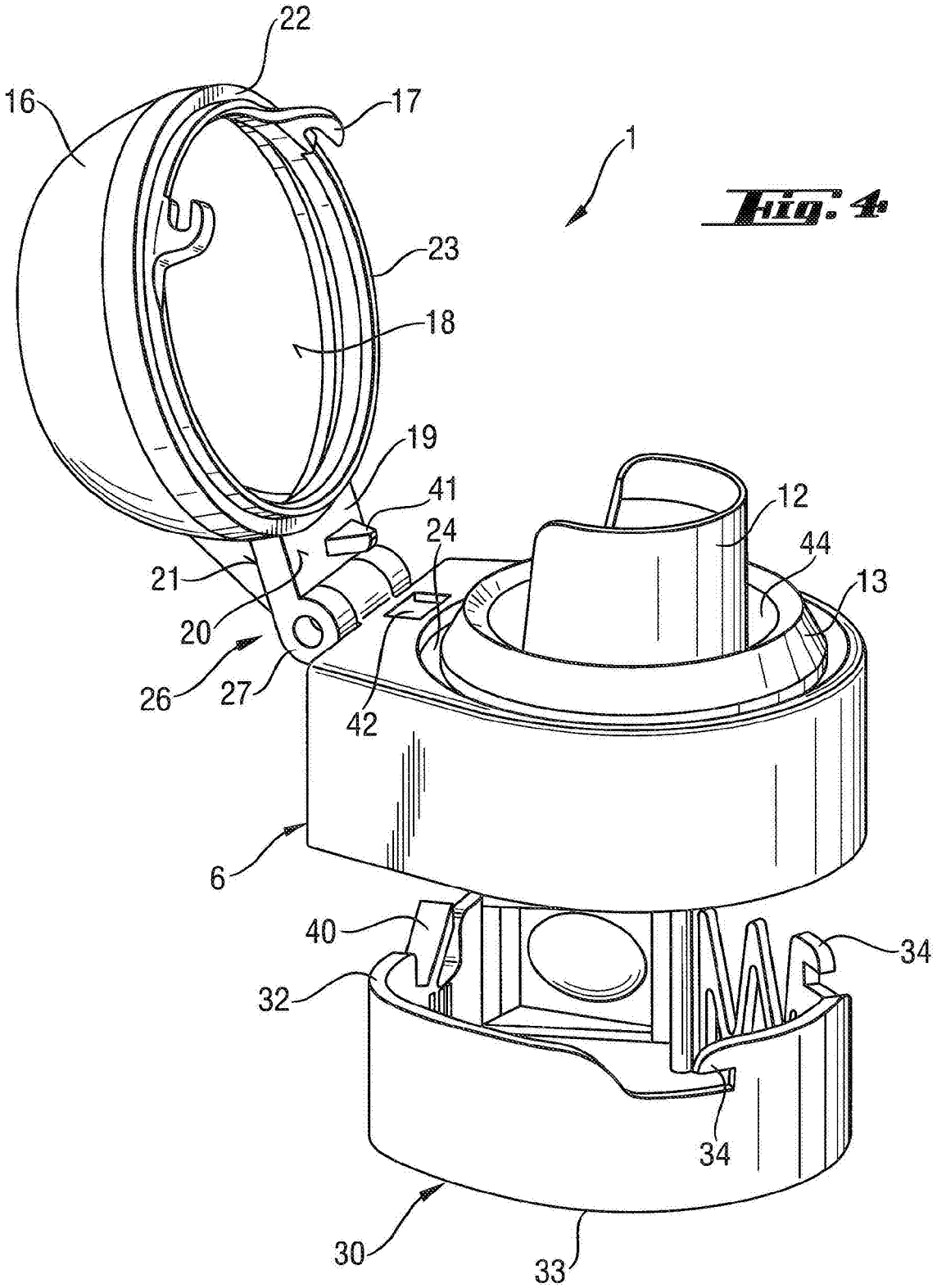

Fig. 4

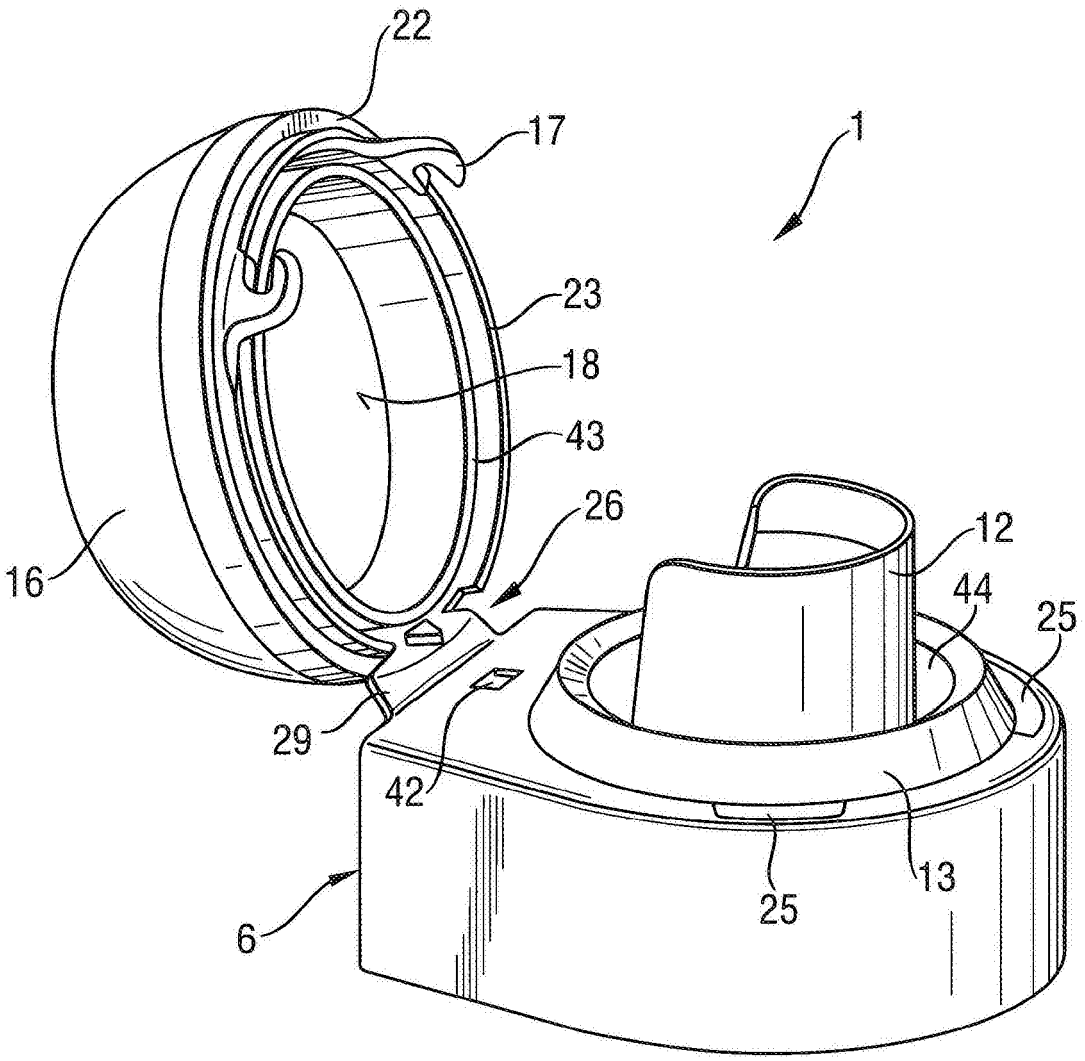

Fig. 5

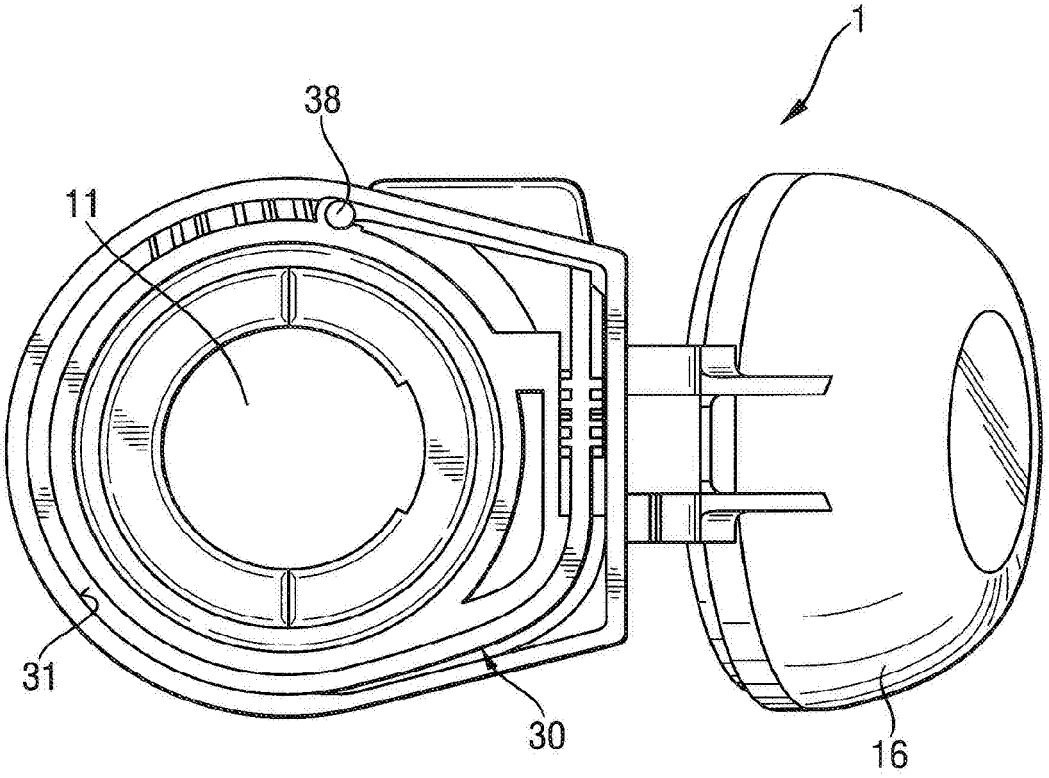

Fig. 6

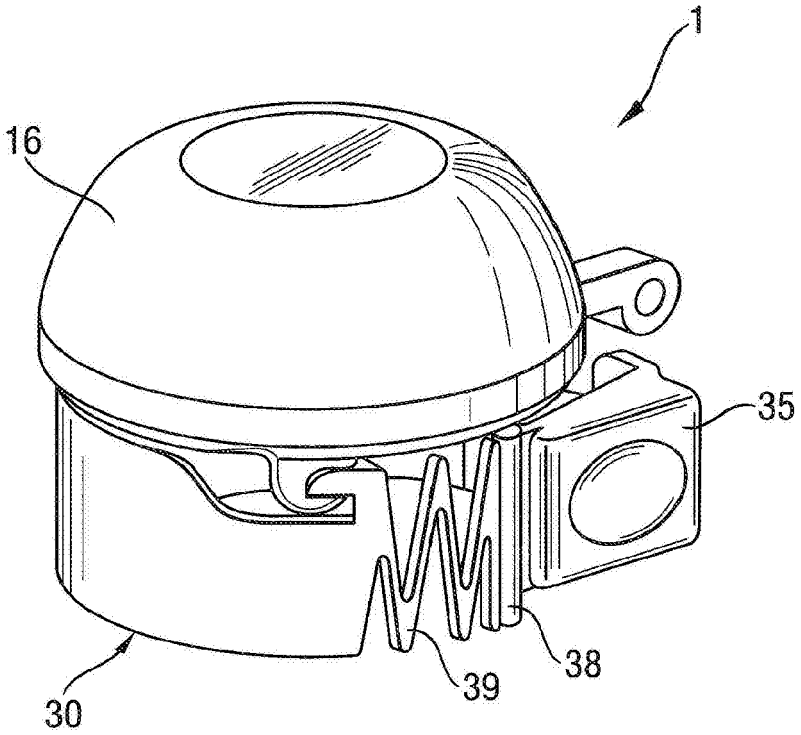

Fig. 7

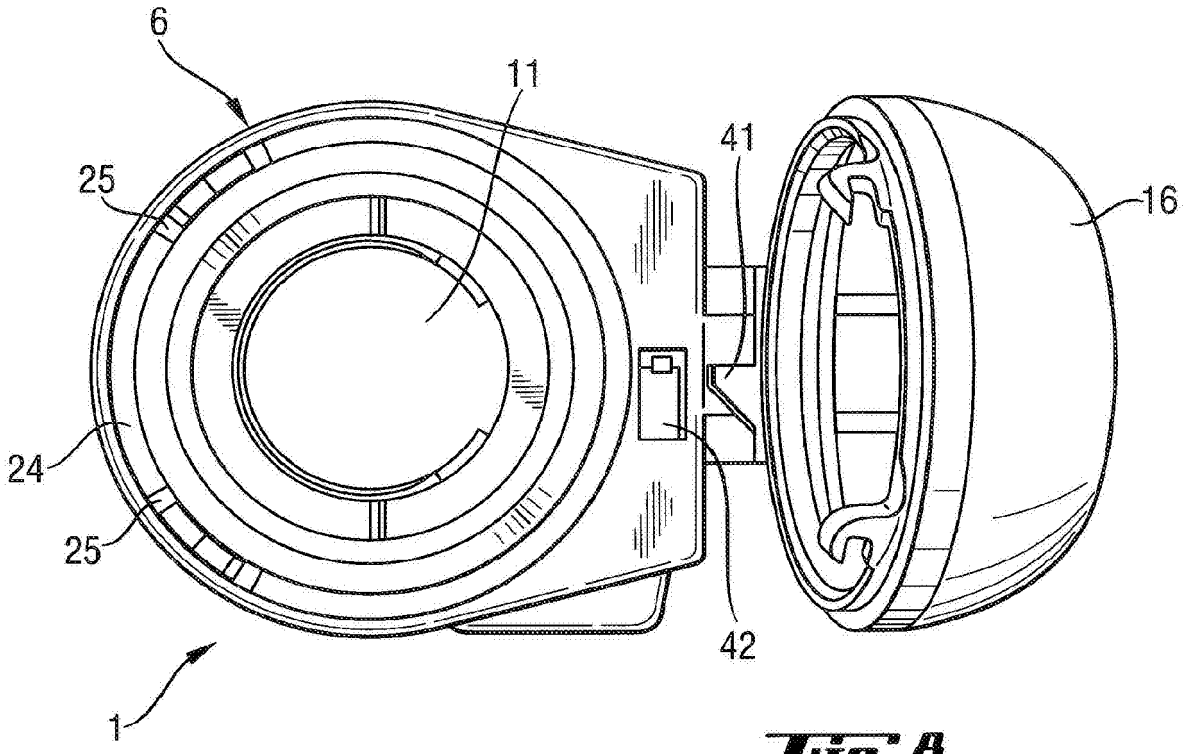

Fig. 8

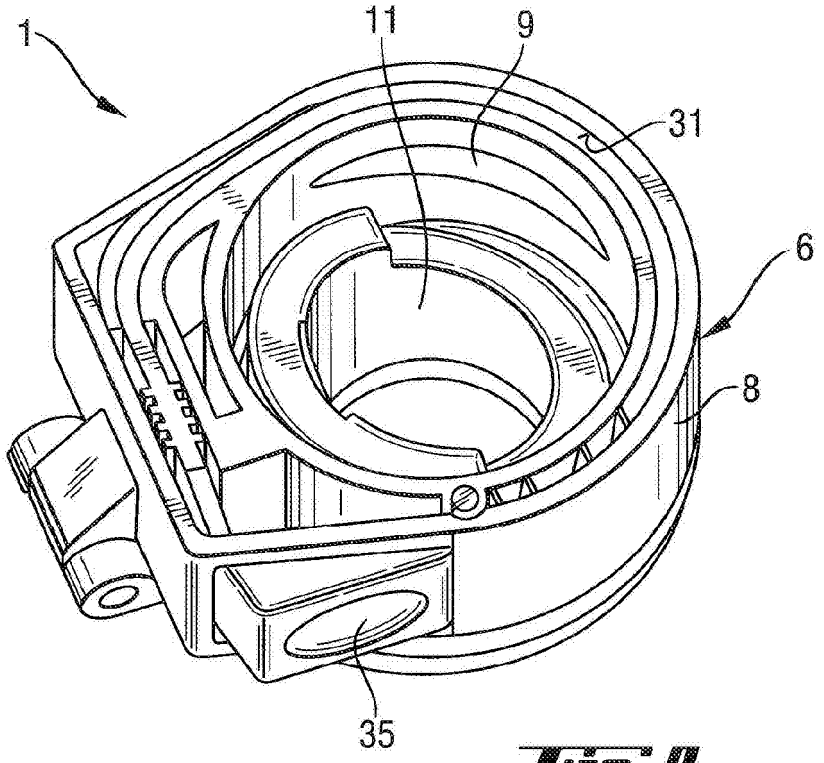

Fig. 9

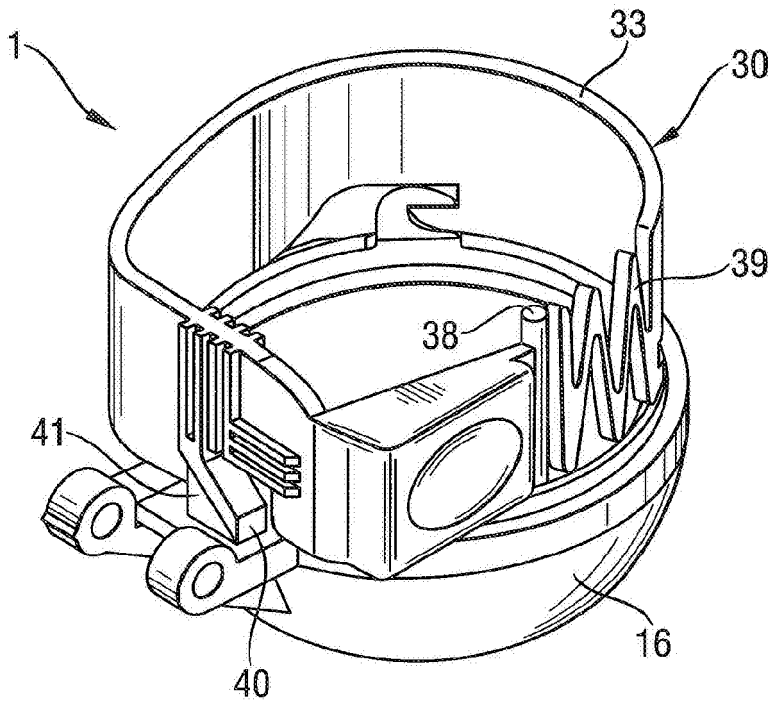

Fig. 10

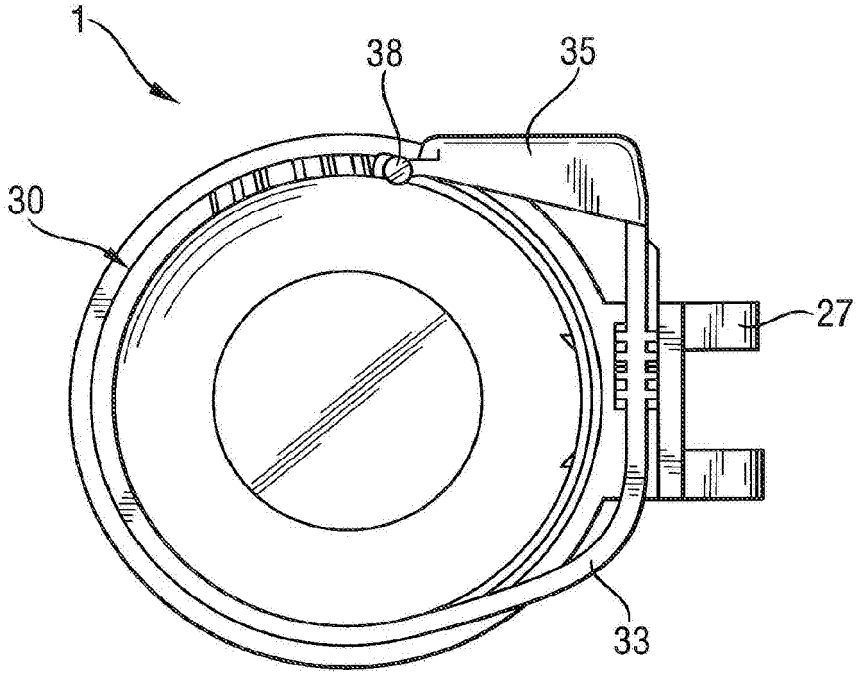

Fig. 11

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 12 2493

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	5 February 2007	Grondin, David

CATEGORY OF CITED DOCUMENTS

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3

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