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(54) DEVICE FOR MIXING IN A HERMETICALLY SEALED MANNER SUBSTANCES STORED IN AT LEAST TWO CONTAINERS

(57) The present invention displays a device capable of mixing one or more substances contained in one or more containers which are interconnected. One embodiment of the present invention is the coupling of the inventive device, containing liquid-concentrated juice or powder to a bottle containing ice-cold mineral water. Upon the coupling of the device to the bottle of mineral water a sealing film is ruptured, releasing the contents comprised in the device to be mixed with the mineral water.

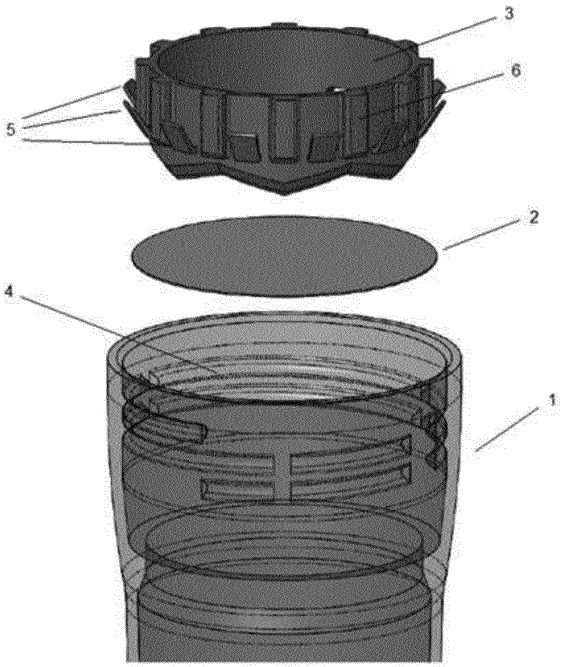

Figure – 1

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Description

Field of the invention

[0001] The present invention refers to the transport, storage and mixing of substances. More specifically this invention discloses a device capable of mixing two or more substances hermetically contained in at least two containers.

Background of the invention

[0002] Most of the beverages and other products destined to the final consumer at retail points have a high proportion of water in their composition. The low cost of water results in lower prices for these products. Besides that, the weight of water considerably increases the transportation costs of these substances, especially when displaced at long distances. Rationalization in transport, reduction of costs and packaging easiness could make these products more competitive in the market

[0003] Most of the time, these products are packed in bags, cans or glasses and added in water, milk or any other liquid and then solubilized with a mixer. Other granular products such as, for example, cleaning products, have the same problems described for the foods. The invention disclosed herein may be applied to a multitude of substances and to any of their physical states: solid, liquid or gaseous.

[0004] In this sense, products packaged in small containers, in which the consumer breaks the seal and adds the liquid for dilution, have become more common nowadays. A large number of solutions to this technical problem have already been proposed as mentioned below.

Prior art

[0005] USPatent US6367622 describes a container with separate storage spaces for receiving a first substance and a second substance to be mixed with the first substance by means of a simple sequence of steps. Although the solution proposed in this invention is similar to the invention disclosed herein, its complexity in construction and manufacturing makes it costly for an industrial scale application.

[0006] USPatent **6527110** presents a storage device which is engaged to a container, such as a bottle and distributes the substance stored inside. This device includes a housing for storing the substance and a seal that will be ruptured by a protruding portion when engaging the container. The rupturing device may be a piston slidably disposed at the end of the housing. The way that the seal is ruptured differs greatly from the present invention, since a pointed cone device is used to break the sealing seal.

[0007] Brazilian Patent PI 0314563-8 refers to bottles having two compartments. These bottles can be used in various appliances i.e. industrial, household and even medical appliances where the mixture of substances need to be controlled. Despite the similar objectives of this invention with the objectives of the invention disclosed herein, the way of the rupture seal takes place is quite different, as well as the constitution of other components.

[0008] Despite the large number of solutions to the problem presented and exemplified here according to the above mentioned documents, It can be seen from the reading of the present invention that none of the documents contained in the prior art anticipates the solution disclosed herein. The present invention has the advantage of simplicity in the constitution of its main elements compared to the achieved technical effect.

Summary of the invention

[0009] The present invention discloses a device capable of mixing one or more substances contained in one or more containers which are interconnected. An embodiment of the present invention is the use of the device in at least one of the containers capable of mixing the two substances contained in aforementioned containers.

[0010] An example of embodiment of the present invention is the use of the device disclosed herein for mixing particulate products which are soluble in water., such as soft drink powder, soups, cleaning products, milk powder, medicines, teas, etc., using a second container containing water or any substance to be mixed with the first. Thus, the present invention allows, for example, to conveniently dilute soft drink powder contained in a container equipped with the device disclosed herein. The second container (15) may be a bottle containing chilled mineral water which will be mixed to the soft drink powder contained in the first container, resulting in a cold drink ready for consumption.

Brief description of the drawings

[0011] In the description of the following figures, it is displayed the preferred embodiment of the present invention, containing its essential parts, references, in addition to exposure in various views and sections.

Figure 1 shows the three main components of the invention: the capsule, the disk-shaped sealing film, and the crown with its appropriately designed blades for cutting the referred sealing film.

Figure 2 shows the sealing film inside the capsule which is supported on its outermost part on the sealing platform, moreover, this figure shows the crown inserted inside the capsule in its transport position, that is, the position before the rupture of the sealing film.

Figure 3 shows the crown in perspective view of the

top and bottom. In this figure are shown the blades, the flaps, a groove at the top part, besides the shoulders.

Figure 4 shows the main components and compartments of the capsule, namely the compartment for the storage of powder, liquid or any other substance that is desired to be mixed to the substance of the second compartment (15), the sealing platform, the crown chamber, the fillets and the inlet compartment.

Figure 5 shows merely illustrative examples of suitable shapes to the amount of substance contained in each capsule.

Figure 6 shows the vertical and horizontal cuts of the assembly capsule, crown and sealing film at the time prior to the rupture of said film.

Figure 7 shows the vertical and horizontal sections of the assembly capsule, crown and sealing film at the time of initial rupture of said film, when the crown blades begin the cutting process of the sealing film.

Figure 8 shows the vertical and horizontal sections of the assembly capsule, crown and sealing film at the final moment of the rupture of said film, when the crown blades completely ruptured the sealing film, allowing the mixture of the content of the capsule with the content of the bottle. The film is not ruptured only in the portion where groove 8 is located to ensure that the sealing film does not become loose and mixes with the new formed substance.

Figures 9, 10 and 11 show the vertical section of the assembly capsule, crown and sealing film in the breaking process, with the detail of the way in which the crown blade penetrates the sealing film. Furthermore, these figures show the recess (13) which, after the film breaking process allows more freedom of movement of the sealing film, thus avoiding obstruction of the passage of the substance contained in the capsule and in the bottle. If the substance contained in the capsule is powder, the referred recess prevents clogging at the beginning of the mixture between the powder and the liquid contained in the bottle.

Detailed Description of the Invention

[0012] The present invention discloses a device for hermetically mixing substances stored in at least two containers having a disruption mechanism of specific and different sealing film, capable of mixing two or more substances contained in containers in a practical and safe manner

[0013] The main components of the present invention are the capsule (1), the crown (3) and the sealing film (2). Said crown (3) is inserted into the cap (1) and is positioned in the housing (11) until the moment of insertion of the male nozzle into said cap.

[0014] Figure 1 shows the main components of the invention: the capsule (1), the crown (3) and the sealing film (2). The capsule (1) disclosed at the present invention has fillets (4) in which is screwed a bottle or any other container (15) compatible with the diameter and the standard of the fillets (4) and shoulders (6) of the referred capsule.

[0015] The crown has a set of blades (7) which are used for proper disruption of the sealing film (2). The crown further has a plurality of flaps (5) which are responsible for supporting and sustain the crown within the capsule (1). The crown is then positioned in the compartment (11) of the capsule (1) wherein said flaps (5) play an important role in avoiding unwanted vibration of the crown, which can occur during transportation of the capsule (1).

[0016] The crown further has a plurality of shoulders (6) which are to be compatible in the positioning, thickness and height of the guides (14) contained in the nozzle of the capsule (1). The shoulders (6) which are inserted inside the guides (14), cause the crown (3) to move in the axial direction, avoiding its displacement and especially the rotation on its own axis when the bottle is inserted into the capsule (1).

[0017] The crown (3) further has a groove (8) positioned at its top which interrupts the sequence of blades. The groove (8) is responsible for holding the sealing film (2) attached to a small portion of said film which is not ruptured by the blades (7) due to the space provided by the groove (8) .

[0018] In order to give freedom of movement to the sealing film (2) after its rupture by the blades (7), the crown (3) is further equipped with a recess (13) in its inner part. This recess facilitates the passage of the substances between the two compartments, i.e. between the capsule (1) and a bottle, for example.

[0019] The capsule (1) is formed by several compartments, the main one is the storage (9), in which are stored the substances to be mixed with the other compartment, a bottle, for example. This compartment may assume a plurality of sizes, colors and shapes appropriate to the type and quantity of the substance to be stored. The storage compartment (9) may also assume a plurality of ornamental shapes suitable for the target audience or occasion The storage compartment may assume, for example, animal shapes or characters of children's drawings as the case may be.

[0020] The capsule (1) further has a narrow sealing platform (10), which has the purpose of properly fastening the sealing film (2). Said fixing must be properly held at the outer edge of the sealing film (2) so that it is sufficiently secured to the sealing platform (10) not to come off due to the pressure of the blades (7) during the sealing film breakup process (2).

[0021] The crown compartment (11) is intended to

house the crown during transport and exposure at the point of sale of the capsule (1) until the time of the sealing film disruption (2).

[0022] The capsule of the present invention further has fillets which are responsible for attaching the capsule (1) to the second compartment by rotating said capsule around its own axis. The capsule (1) further has an inlet compartment, which is sized to match most of the bottle threads on the market.

[0023] The process of mixing the substances contained in the capsule (1) and the other compartment occurs with the introduction of, for example, a bottle into the capsule (1). This introduction is given by the inlet compartment (12) which has standard depth for most types of already existing market threads.

[0024] After the introduction of the second compartment, the capsule (1) is threaded around the axis of its own axis. As the cap is screwed to the capsule (1) into the crown compartment (3) is being pushed in the axial direction by the edge of the nozzle of the second compartment towards the sealing film (2).

[0025] Figures 6, 7 and 8 illustrate the dynamics of the rupture of the sealing film (2). Figure 6 shows the moment when the blades (7) touch the sealing film (2) without cutting it. As the capsule (1) is screwed into the other compartment, the laminates (7), suitably designed for this purpose, penetrate the sealing film (2) and the cutting process is started, as shown in figure (7).

[0026] As the capsule (1) is screwed into the second compartment the blades (7) continue to penetrate the sealing film (2) until it is completely disrupted, as shown in figure-8. In the sequence, the crown (3) encounters the capsule stop (1) terminating the process of rupturing the sealing film (2).

[0027] Figures 9, 10 and 11 illustrate the process of rupturing the sealing film (2) with the prominence of the blade (7). These blades are designed, as disclosed in those figures, to produce a suitable cut, reducing friction between the sealing film (2) and the blade (7). A suitable smooth cut is provided by the blades as shown in detail in Figures 9, 10 and 11. The figures further show the recess (13), positioned in the inner portion of the crown (3), which aims to provide a larger space to accommodate the sealing film (2) after its rupture. The space created by the recess (13) also has the function of avoiding the friction of the sealing film (2) ruptured with the crown walls, preventing clogging thereof, especially in the case that the capsule (1) contains any particulate substance.

[0028] The small portion of the sealing film (2) which is not ruptured by the groove (8), ensures the connection of said film to the capsule, preventing it from mixing with the new formed substance.

[0029] After complete rupture of the sealing seal the assembly formed of the capsule (1) with the second compartment can then be shaken so as to provide a better mixing or dilution of the substances contained in the containers.

[0030] The present invention may also be composed by a plurality of capsules (1) which can bind to one or more compartments to produce mixtures with one or more substances. The blends may further contain some predetermined sequence according to the desired application.

[0031] The figures disclosed in the present invention are merely a preferred embodiment of this invention and should not be interpreted as limiting the scope of protection of the present invention. The scope of protection of this invention should have the limits set forth in the claims which will be presented as follows.

Claims

1. A device for the hermetically mixing of substances comprising a capsule (1) containing fillets (4), a storage compartment (9), a sealing platform (10), a crown compartment (11) and an inlet compartment (12), Sealing film (2) **wherein** it further comprises a crown (3) containing a set of blades (7), a plurality of flaps (5) and shoulders (6), a groove (8) and a recess (13).

2. A device for hermetically mixing substances according to claim 1, **wherein** alternatively, a plurality of capsules (1) are rotated to one or more containers, and there may still be a sequence for coupling the capsules (1).

3. A device for hermetically mixing substances according to claim 1, **wherein** the crown (3) is positioned in the compartment (11) of the capsule (1).

4. A device for hermetically mixing substances according to claim 3, **wherein** the flaps 5 are able of mantaining the crown (3) fixed in the compartment (11).

5. A device for hermetically mixing substances according to claim 1, **wherein** the crown (3) has a groove (8) capable of holding the sealing film (2) connected to said device.

6. A device for hermetically mixing substances according to claim 1, **wherein** the crown (3) has a recess (13) capable of giving freedom of movement to the sealing film (2) after its cut.

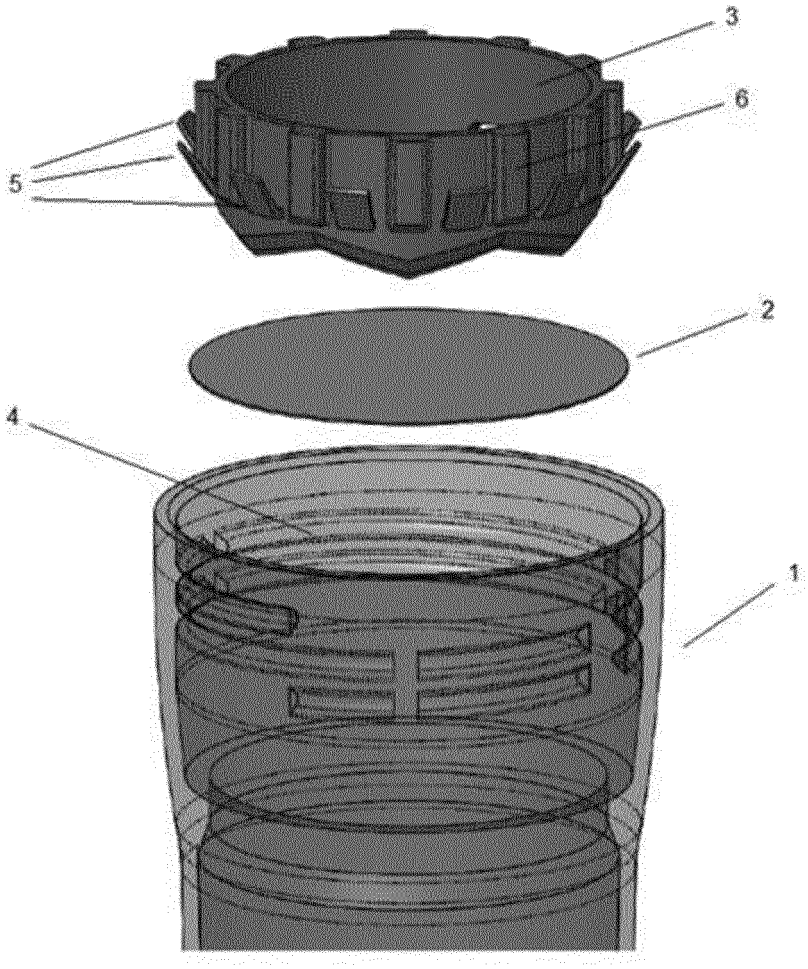

Figure – 1

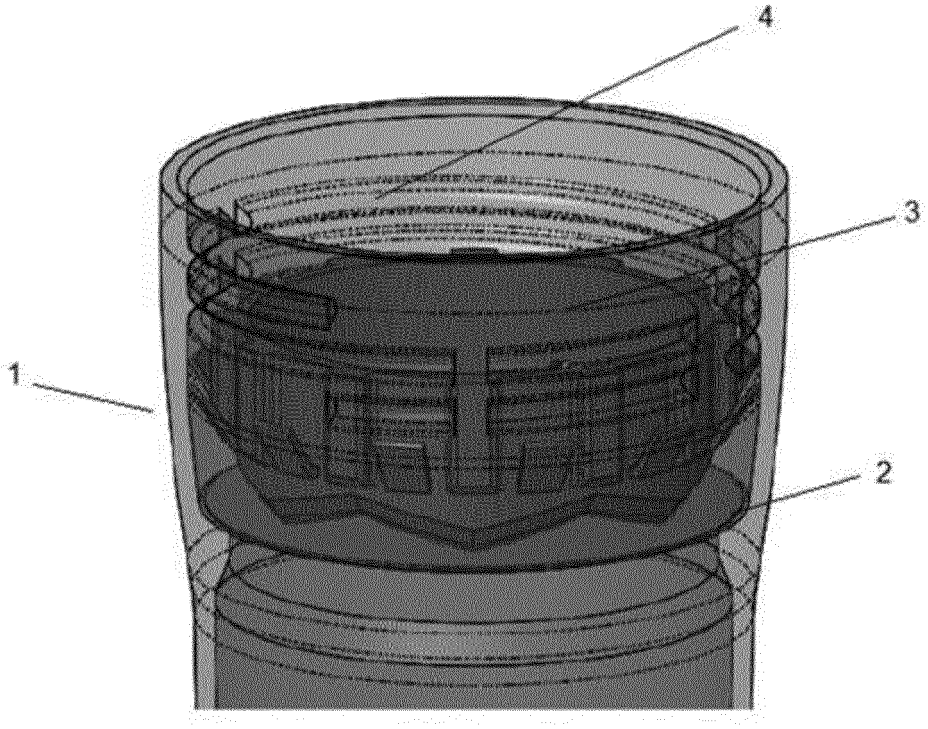

Figure – 2

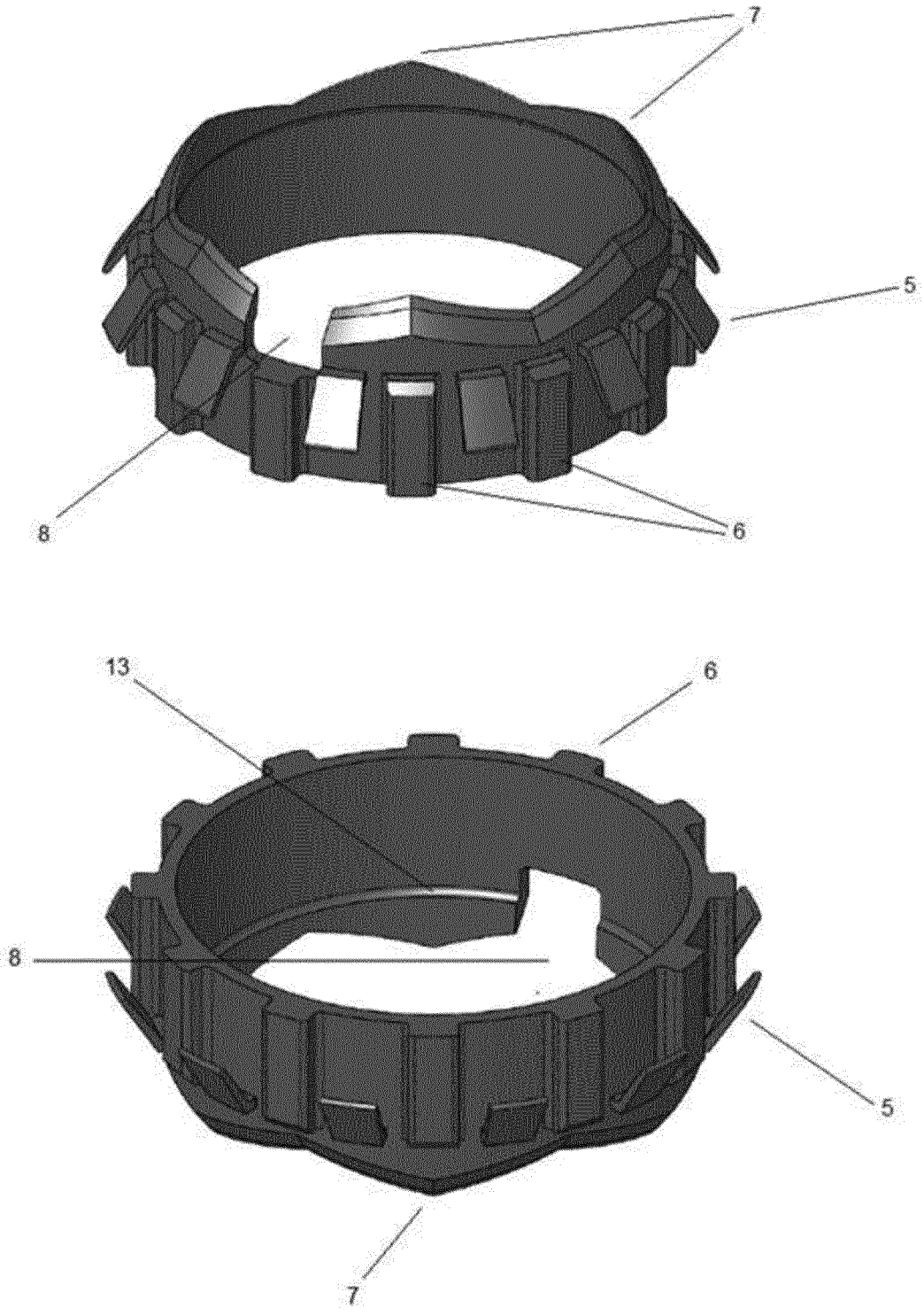

Figure – 3

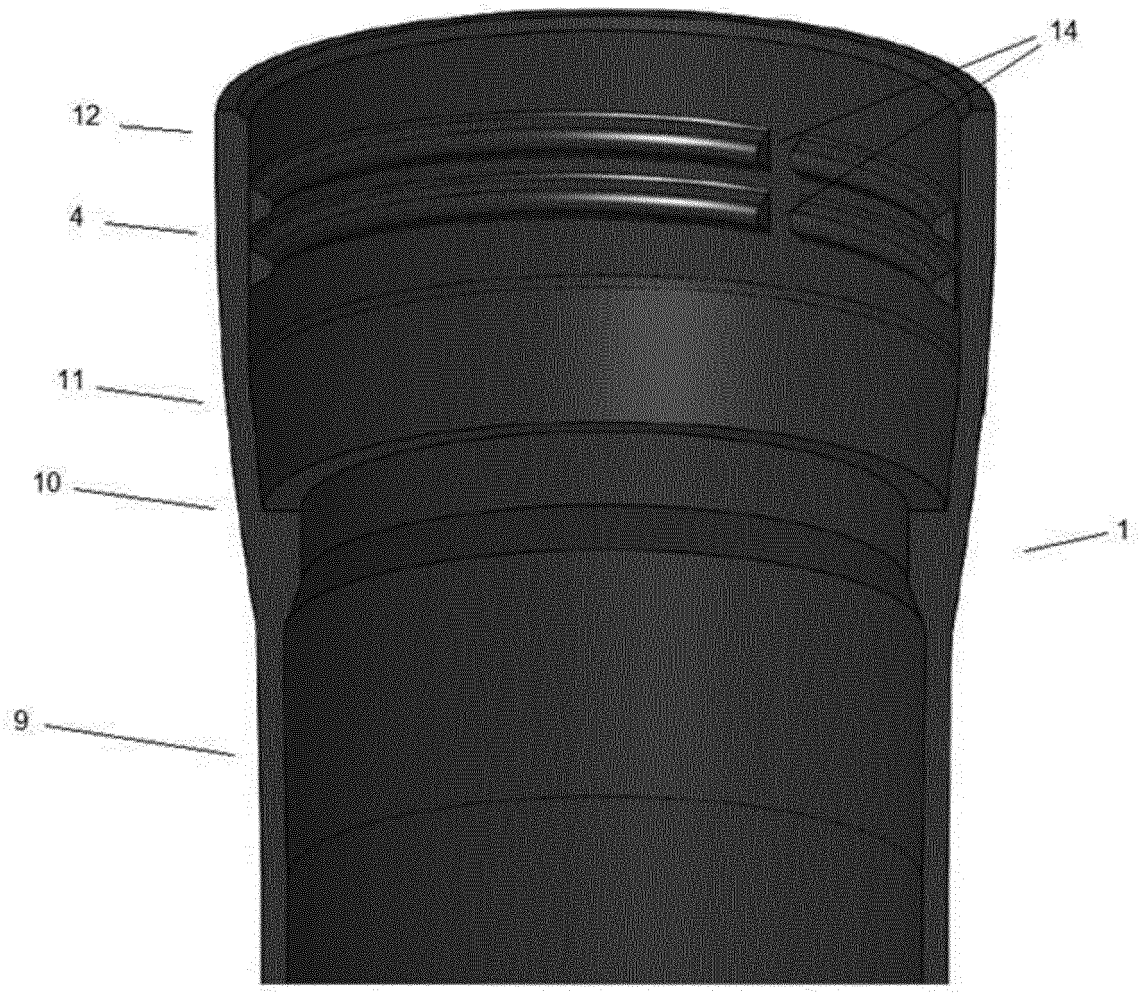

Figure – 4

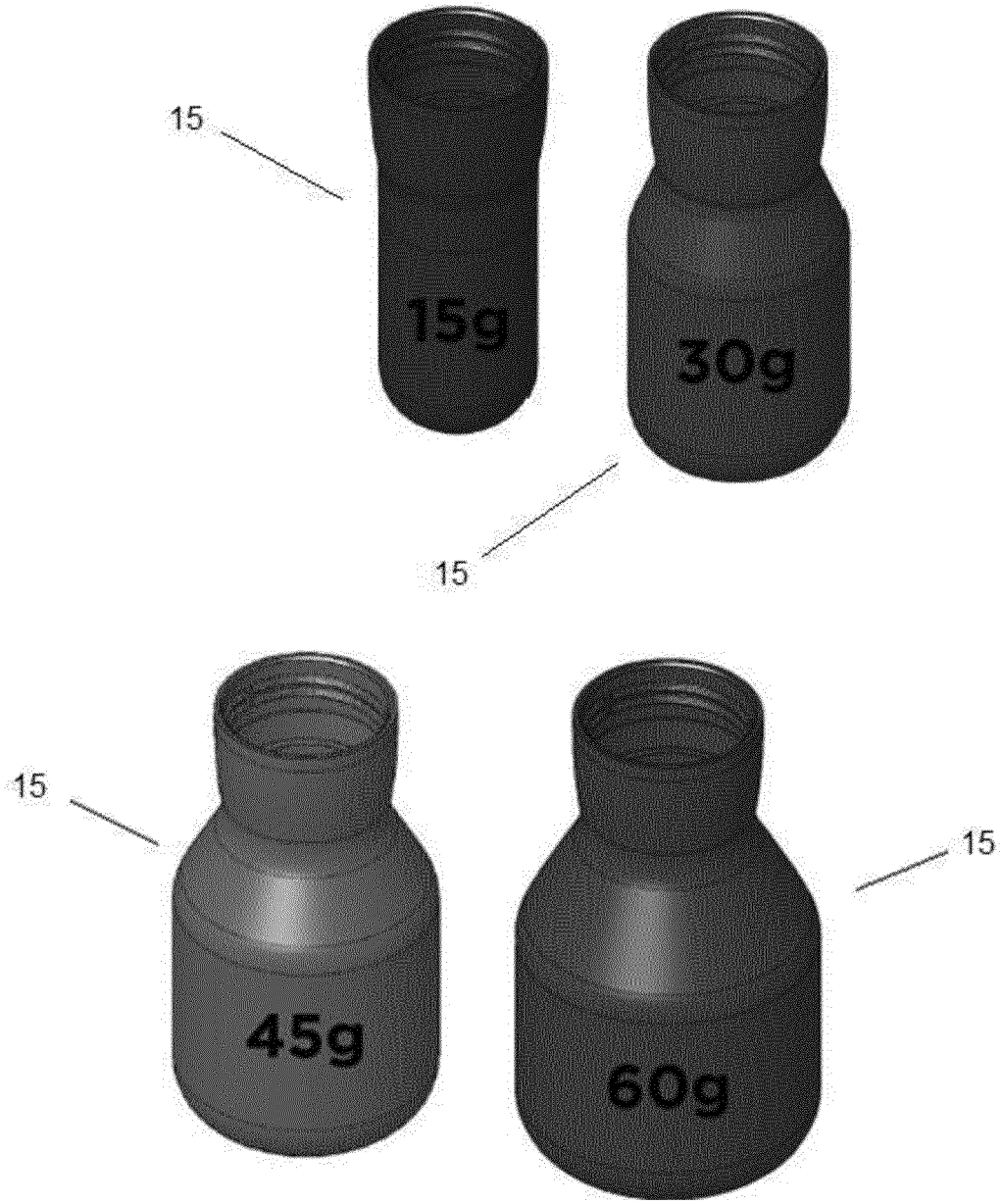

Figure – 5

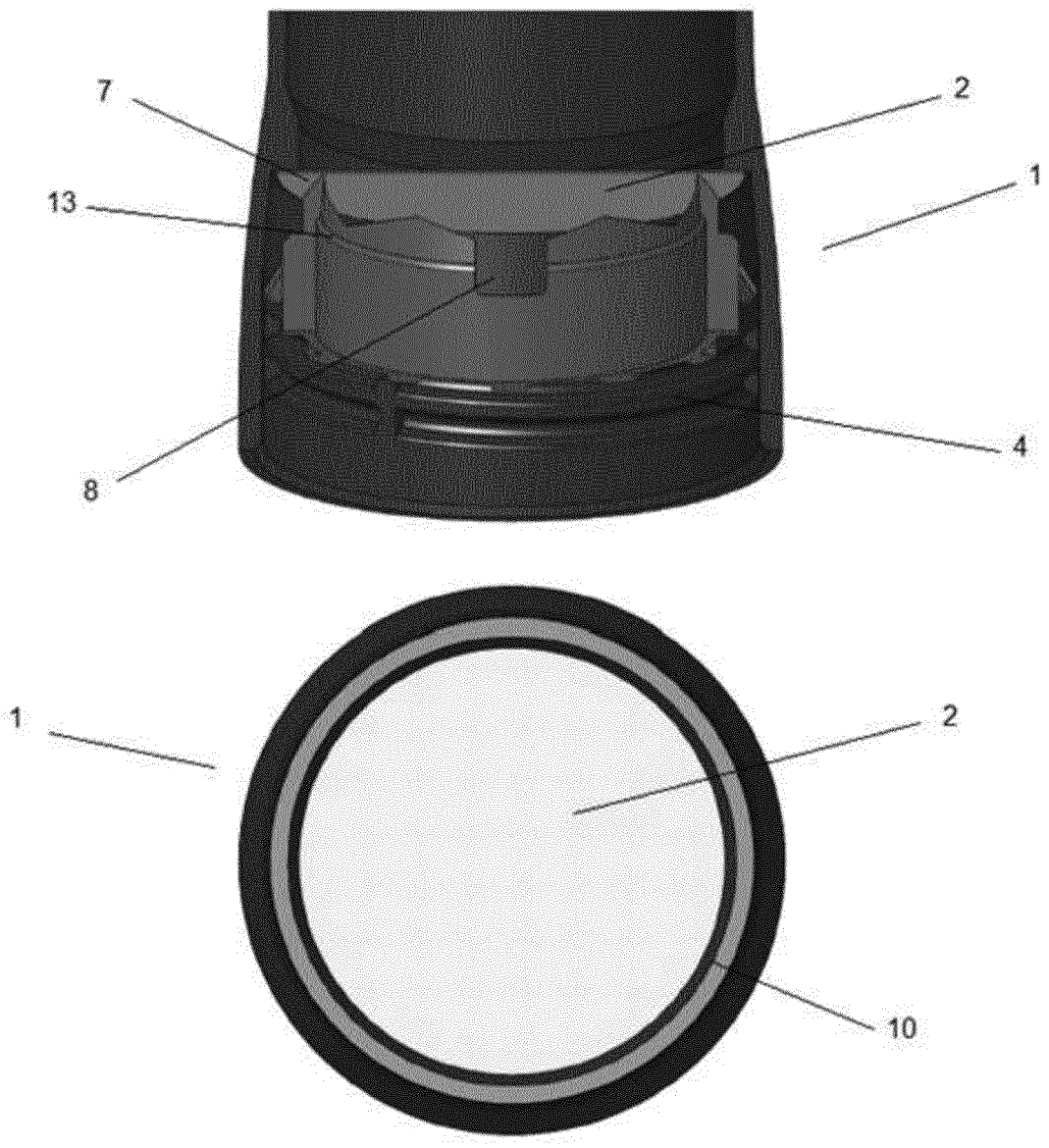

Figure – 6

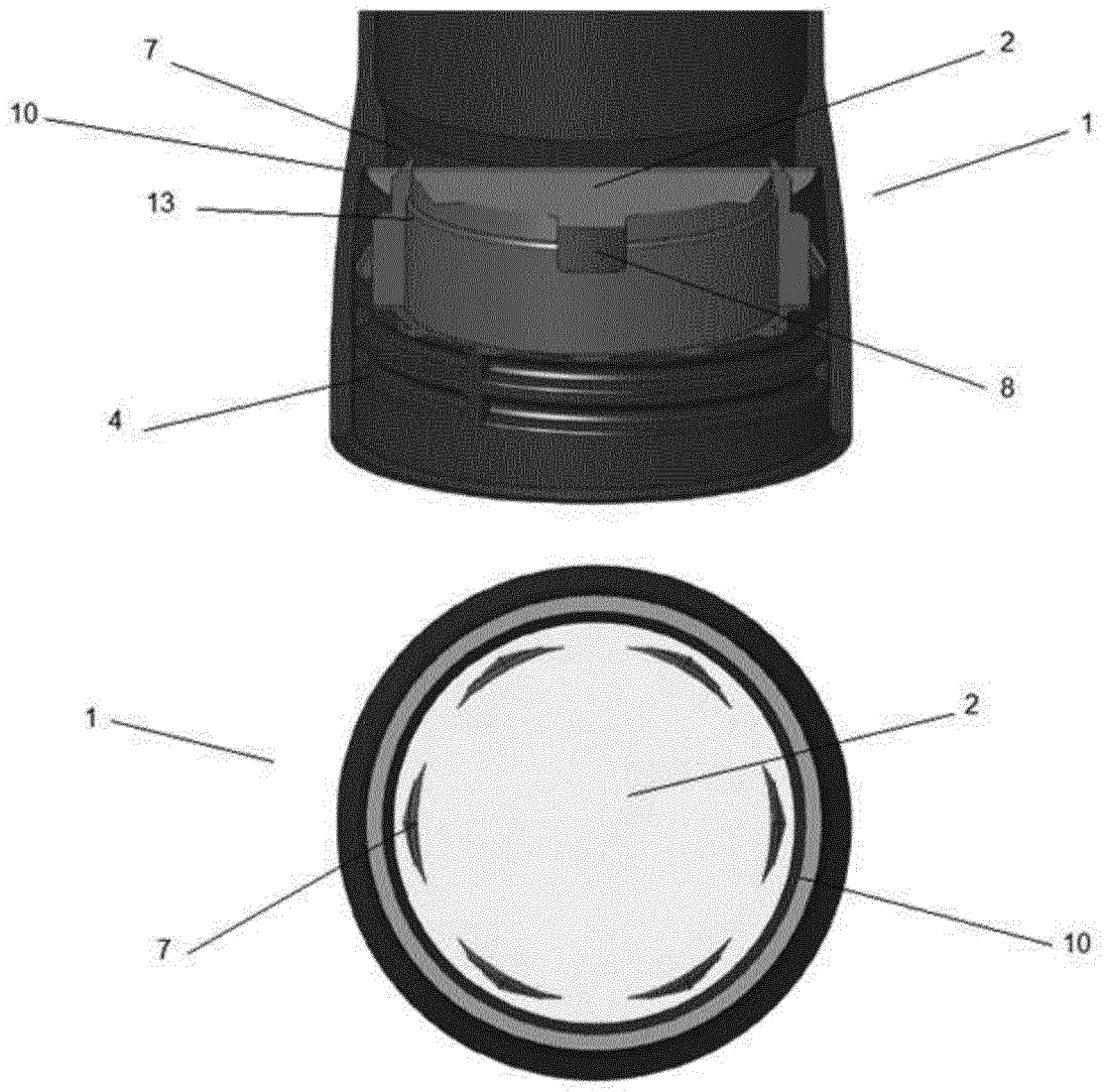

Figure – 7

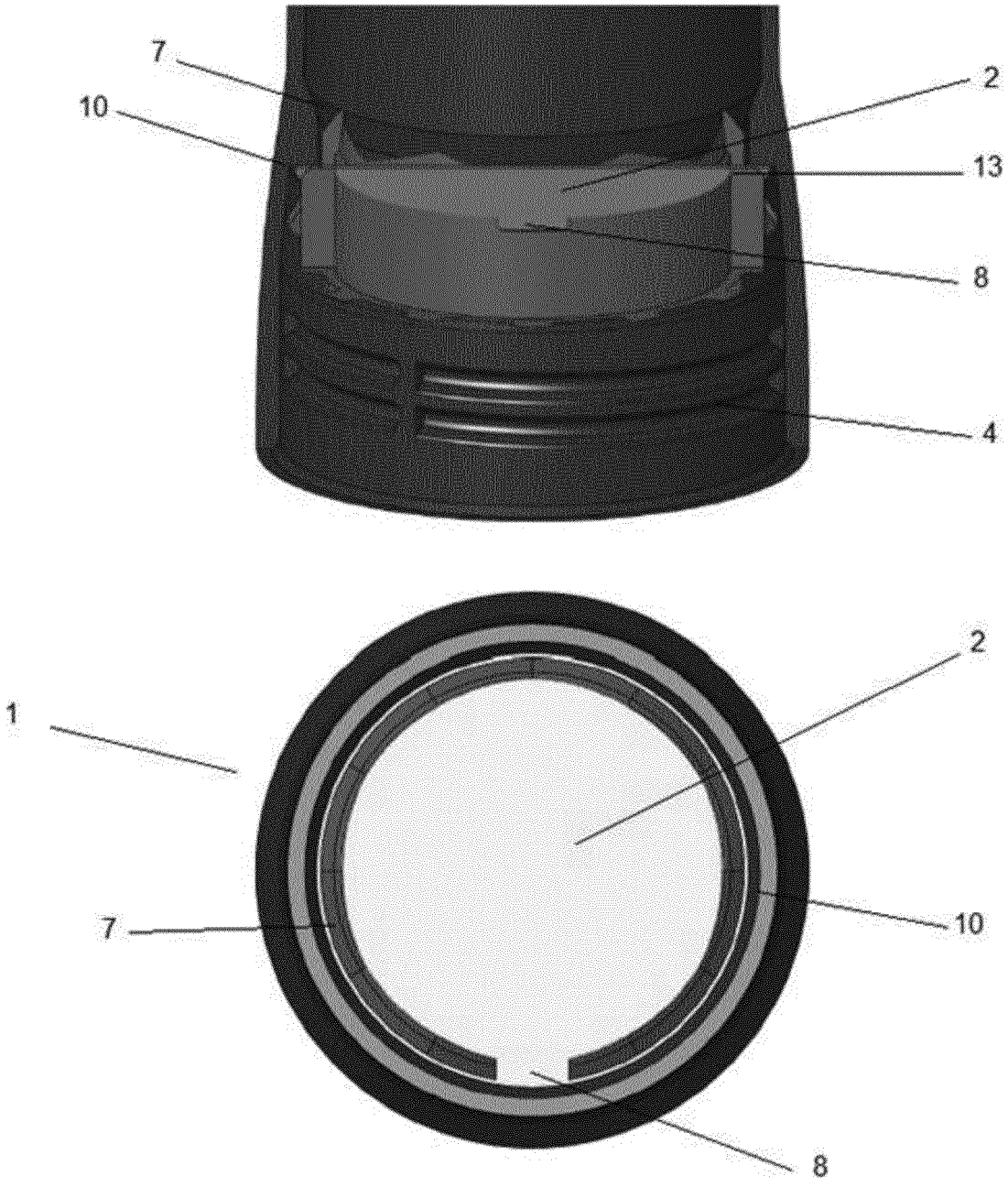

Figure – 8

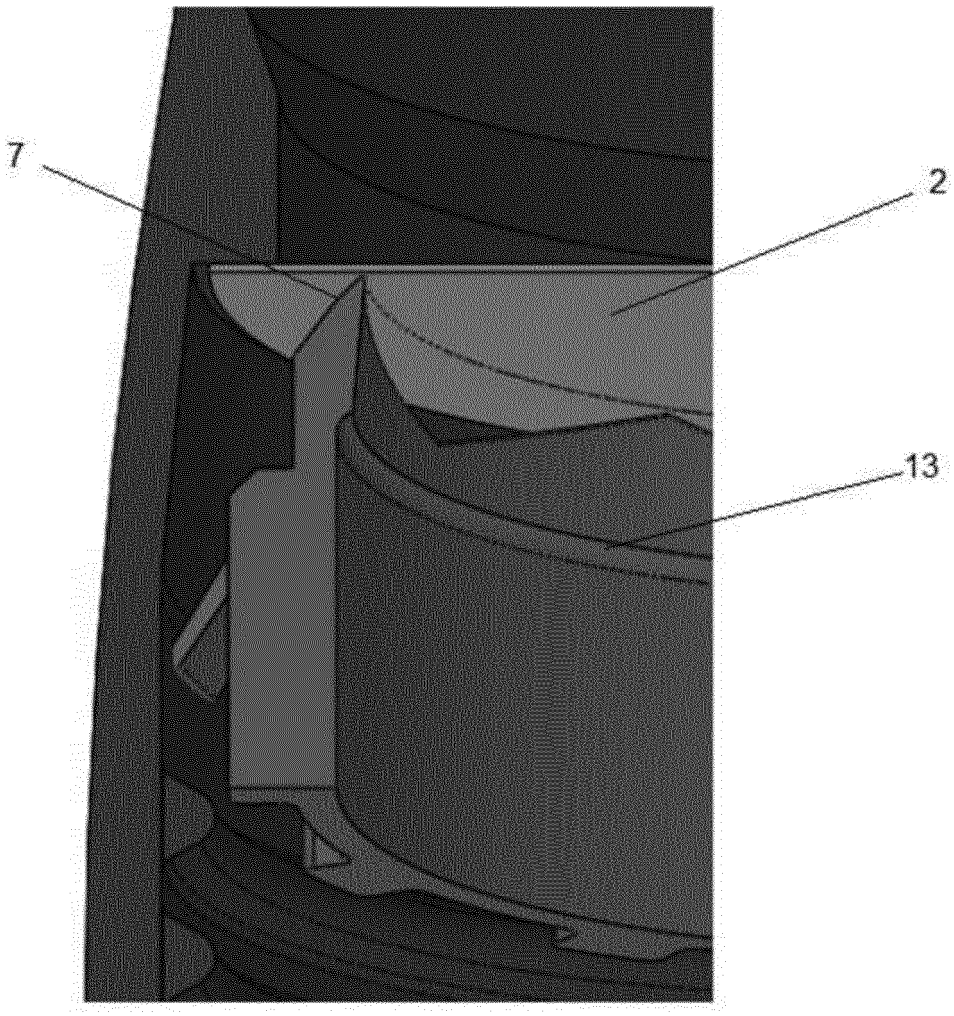

Figure – 9

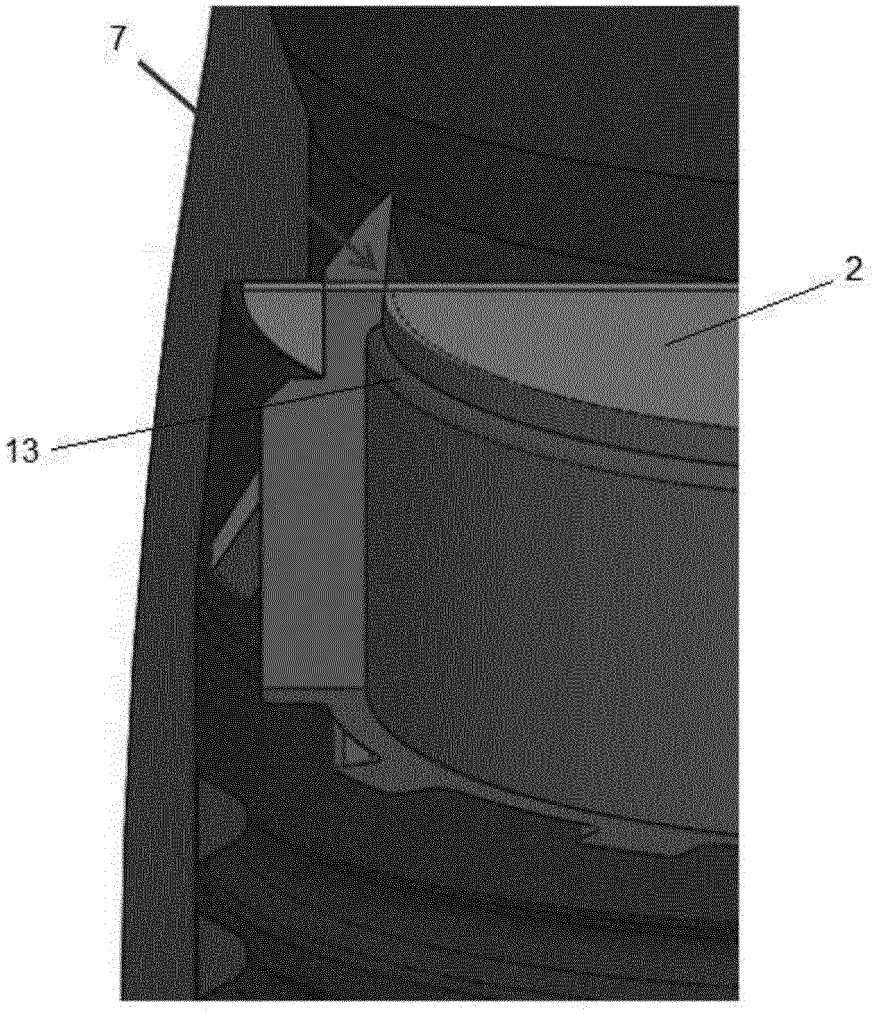

Figure – 10

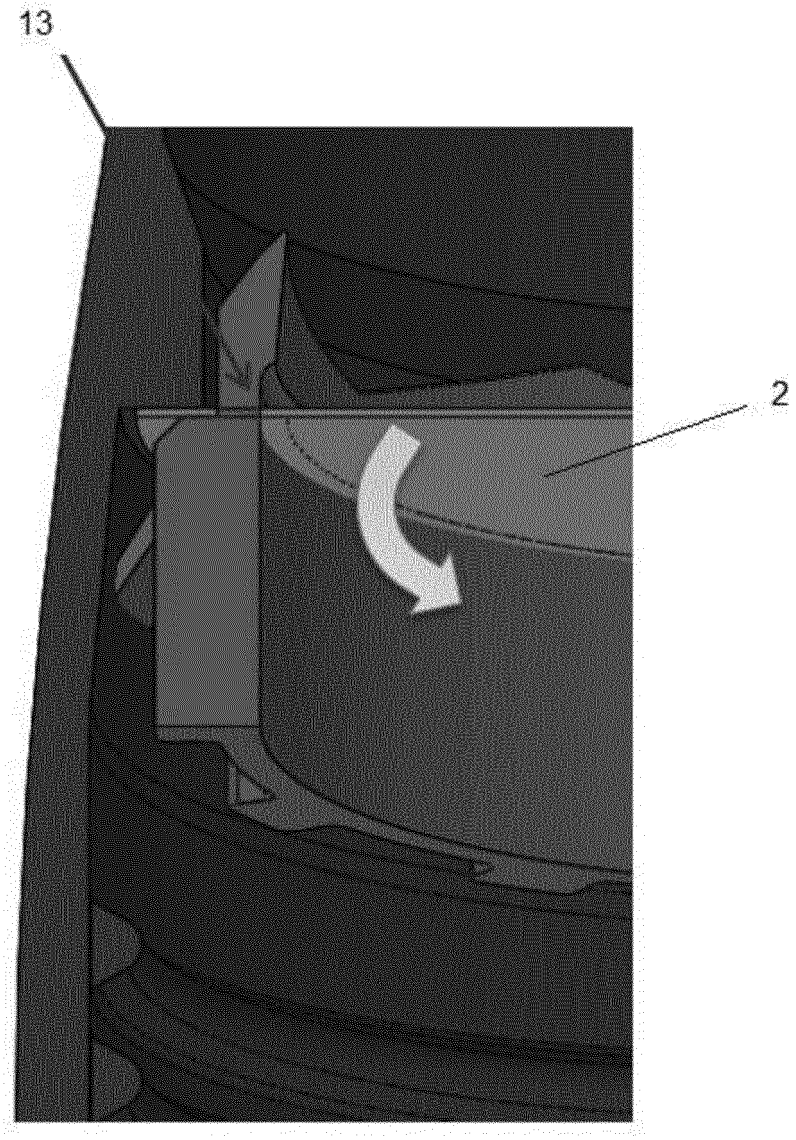

Figure – 11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/BR2015/050190

A. CLASSIFICATION OF SUBJECT MATTER

B65D 51/28 (2006.01), B65D 51/22 (2006.01), B65D 25/08 (2006.01), B65D 1/24 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Base de patentes INPI-BR (SINPI)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Epodoc

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	BR 0314563 A (SEAQUIST CLOSURES FOREIGN INC [US]) 16 August 2005 (2005-08-16)	1, 2, 6
A		3, 4, 5, 7, 8
X	US 20080124432 A1 (PORTOLA PACKAGING INC [US]) 29 March 2008 (2008-03-29)	1, 2, 6
A		3, 4, 5, 7, 8
X	US 20020030056 A1 (HSU LILY [TW]) 14 March 2002 (2002-03-14)	1, 2, 6
A		3, 4, 5, 7, 8

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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"A" document defining the general state of the art which is not considered to be of particular relevance

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Date of the actual completion of the international search	Date of mailing of the international search report
22/01/2016	**26/02/2016**
Name and mailing addr: INSTITUTO NACIONAL DA PROPRIEDADE INDUSTRIAL Rua Sao Bento nº 1, 17º andar cep: 20090-010, Centro - Rio de Janeiro/RJ Facsimile No. +55 21 3037-3663	Authorized officer **Francisco Fabio Cavalcante Barros** Telephone No. +55 21 3037-3493/3742

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/BR2015/050190

BR 0314563 A	2005-08-16	BR 0314563 B1	2013-12-24
		AT 432227 T	2009-06-15
		AU 2002951977 D0	2002-10-24
		AU 2003266848 A1	2004-05-04
		CA 2501210 A1	2004-04-22
		CN 1703354 A	2005-11-30
		CN 1328127 C	2007-07-25
		DE 60327799 D1	2009-07-09
		EP 1562839 A1	2005-08-17
		ES 2325493 T3	2009-09-07
		JP 2006502051 A	2006-01-19
		MX PA05003816 A	2005-06-03
		PL 375022 A1	2005-11-14
		PL 205281 B1	2010-03-31
		RU 2005114003 A	2006-01-20
		RU 2331559 C2	2008-08-20
		US 2007017830 A1	2007-01-25
		US 7584842 B2	2009-09-08
		WO 2004033336 A1	2004-04-22
---	---	---	---
		US 8016159 B2	2011-09-13
		WO 2009100274 A1	2009-08-13
US 20080124432 A1	29/05/08	EP 2244955 A1	2010-11-03
		EP 2244955 A4	2011-06-29
		CA 2714306 A1	2009-08-13
---	---	---	---
		US 6367622 B1	2002-04-09
		DE 20110108 U1	2001-09-27
		TW 453329 U	2001-09-01
		JP 2002059933 A	2002-02-26
		JP 3515545 B2	2004-04-05
		FR 2812621 A1	2002-02-08
US 20020030056 A1	14/03/02	FR 2812621 B1	2004-01-23
		GB 2365405 A	2002-02-20
		GB 2365405 B	2004-03-10
		DE 10129416 A1	2002-04-25
		AU 5188101 A	2002-02-07
		AU 771912 B2	2004-04-08
---	---	---	---

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 6367622 B **[0005]**
- BR 03145638 **[0007]**