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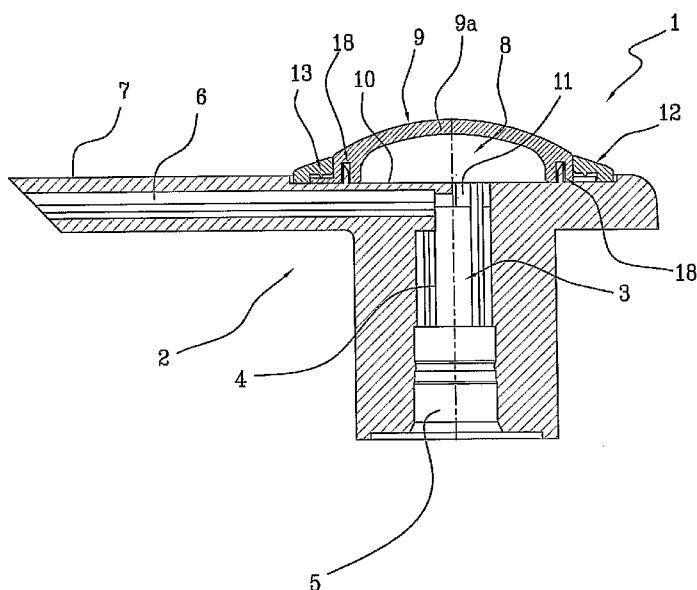
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(54) **Title:** DISPENSING HEAD FOR DISPENSERS OF LIQUID PRODUCTS

FIG 4



(57) **Abstract:** A dispensing head (1) can be stably fastened to the dispensing conduit of a dispenser of liquid products, of the type comprising a suction pump and a ring nut that enables its fastening on the bottle for containing the liquid product. The dispensing head (1) comprises an outlet channel (3) selectively placed in fluid communication with the suction pump to dispense the liquid drawn from the interior of the bottle. The dispensing head (1) further comprises a collecting chamber (8) for the fluid having a collecting volume that is variable between a configuration of minimum volumetric capacity when the pump is in fluid communication with the output channel (3) and a configuration of maximum volumetric capacity when the pump is not in fluid communication with the outlet channel (3). The collecting chamber (8) is permanently placed in fluid communication with the outlet channel (3). [Figure 4]

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Dispensing Head for Dispensers of Liquid Products

Technical field

The present invention relates to a dispensing head for dispensers of liquid products. In particular, the present invention relates to a dispensing head to be applied to a device for dosing and dispensing viscous liquid products, such as liquid soaps, lotions or the like contained in appropriate containers.

Background Art

Usually, said dispensing devices are associated to the collar of a bottle and comprise a dispensing conduit provided with appropriate suction means, e.g. plunger pumps, to draw the liquid from the interior of the bottle and dispense it outside the bottle.

The liquid is usually dispensed through an outlet conduit, e.g. a spout, placed in fluid communication with the dispensing conduit of the dispenser.

In particular, a user pressing the dispensing head, to which the outlet conduit is associated, pushes the plunger of the pump, enabling the liquid contained in the bottle to be drawn and dispensed.

Frequently, during the return travel of the dispensing head to its original position or when the head is at rest, part of the liquid contained in the outlet conduit accidentally leaks out by effect of the suction action exercised by the ejected liquid or by simple gravity. Moreover, part of the liquid contained in the outlet conduit, placed in fluid communication with the outside environment, may dry out, thereby having its characteristics altered, and possibly occluding the outlet conduit.

Dispensers for liquid products that avoid such drawbacks are known.

In particular, from the document WO 03/051735 a dispenser provided with a movable wall is known, which leaves in fluid communication the outlet conduit with the outside environment during the compression of the plunger allowing the liquid to be dispensed, and which moves simultaneously with the return travel of the dispensing head closing the outlet conduit interrupting the fluid communication between said conduit and the exterior. This solution avoids the drawback described above, but it requires considerable

construction and design complexity linked to the actuation of the movable wall and to its integration in the dispensing head.

Also known from the documents US 5839617 and EP 1136135 are dispensers having check devices positioned inside the dispensing conduit, able to prevent the escape of liquid during the return travel of the dispensing head. However, these dispensers also require considerable construction and design complexity, linked to the presence of said check devices integrated within the dispensing conduit and hence integrated and co-operating with the plunger pump.

Disclosure of Invention

In this context, the technical task of the present invention is to propose a dispensing head for dispensers of liquid products that is free of the aforementioned drawbacks.

In particular, an object of the present invention is to propose a dispensing head for dispensers of liquid products that prevents accidental escapes of product during or after the return travel of the dispenser, or the subsequent drying of the liquid product, when the dispenser is at rest.

Moreover, an object of the present invention is to provide a dispensing head, with the functions described above, that is applicable to various types of dispensers, regardless of their characteristics and principles of operation.

In accordance with the present invention, the technical task and the object described are achieved by a dispensing head for dispensers of liquid products comprising the technical characteristics set out in one or more of the accompanying claims.

Description of the Drawings

Additional features and advantages of the present invention shall become more readily apparent from the indicative, and therefore not limiting, description of a preferred but not limiting embodiment of a dispensing head for dispensers of liquid products, as illustrated in the accompanying drawings in which:

- figure 1 shows a perspective view of a detail of the dispensing head for dispensers of liquid products in accordance with the present invention with some parts removed, the better to highlight others;

- figure 2 shows a perspective view of a detail of the dispensing head for dispensers of liquid products of figure 1;
- figure 3 shows an additional perspective view of the detail of figure 2;
- figure 4 shows a lateral sectioned view of an alternative embodiment of the dispensing head for dispensers of liquid products of figure 1;
- figure 5 shows a perspective view of a first detail of the dispensing head for dispensers of liquid products of figure 4; and
- figure 6 shows a perspective view of a second detail of the dispensing head for dispensers of liquid products of figure 4.

Description of the Illustrative Embodiment

With reference to the accompanying figures, the number 1 indicates in its entirety a dispensing head for dispensers of liquid products in accordance with the present invention.

The dispensing head 1 can be associated to a dispenser of liquid products (not shown) which in turn can be associated, through a ring nut, to the collar of a bottle containing a fluid product to be dispensed.

The dispenser comprises a dispensing conduit (not shown) connected to a suction pump able to draw fluid from the interior of the bottle.

The pump is provided with one or more intake valves and one or more delivery valves whose function shall be more readily apparent from the remainder of the present description.

The ring nut is stably associated to the bottle through a thread, obtained on an inner surface of a cylindrical wall of the ring nut itself, which engages a corresponding thread of the bottle, or, alternatively, through a circular undercut that is engaged in a groove obtained on the bottle.

It should be stressed that the dispensing head 1 can be associated to any dispenser of the type just described, without any need to modify the dispenser in any way.

The dispensing head 1 comprises a dispensing body 2 (figures 1 and 4) in which is obtained an outlet channel 3 that can be selectively placed in fluid communication with the suction pump to dispense the liquid contained in the bottle.

The outlet channel 3 comprises a first segment 4, substantially vertical, provided with a connector 5 for connection to the dispensing conduit and a second segment 6, substantially horizontal, that traverses a spout 7 of the dispensing head.

The second segment 6 of the outlet channel 3 has an open end for dispensing the fluid.

As mentioned above, the outlet channel 3 can selectively be placed in fluid communication with the dispensing channel, in particular with the suction pump.

For this purpose, the dispensing head 1 can be translated, together with the dispensing conduit integral therewith, coaxially relative to the fixed ring nut. In particular, when the dispensing head 1 is lowered by a user, i.e. it is pressed towards the ring nut, a dosing chamber of the suction pump reduces its own volume, thereby causing an overpressure. In this configuration, the intake valve is shut, closing off fluid communication between suction pump and interior of the bottle. In this configuration, the delivery valve is open, allowing the liquid present in the dosing chamber of the pump to flow up in the dispensing conduit and to enter the outlet channel 3. Through the opening in the horizontal portion 6 of the outlet channel 3, the liquid is then dispensed. When, on the contrary, the dispensing head 1 rises relative to the fixed ring nut, e.g. because the user stops exerting pressure on the dispensing head 1, the volume of the dosing chamber of the suction pump expands. In this configuration, the delivery valve is shut, closing off fluid communication between dispensing conduit, and in particular suction pump, and outlet channel 3. In this configuration, the intake valve is open allowing, through the vacuum that is generated within the dosing chamber, the filling of the chamber with fluid contained in the bottle.

Advantageously, the dispensing head 1 comprises a collection chamber 8 for the fluid having a collection volume that is variable between a configuration of minimum capacity when the pump is in fluid communication with the outlet channel 3 and a configuration of maximum capacity when the pump is not in fluid communication with the outlet channel 3. The collection chamber 8 is also permanently placed in fluid communication with the outlet channel 3.

In particular, the collecting chamber 8 during the "forward" travel of the dispensing head 1, i.e. during its approach to the fixed ring nut, assumes a configuration of minimum volumetric capacity.

On the contrary, the collecting chamber 8 during the return travel of the dispensing head 1, i.e. during its movement away from the fixed ring nut, assumes a configuration of maximum volumetric capacity.

In this way, during the "forward" travel of the dispensing head 1 the liquid contained within the collecting chamber 8 (which, as stated, is in fluid communication with the suction pump) merges with the liquid drawn by the suction pump and flows out of the outlet channel 3.

Advantageously, during the return travel the increase in volumetric capacity of the collection chamber 8 creates a vacuum that causes the aspiration of the liquid present in the outlet channel 3, thereby emptying the outlet channel 3 of the liquid present therein. It should be noted that the liquid is aspirated from the outlet channel 3 because during the return phase there is no fluid communication between the collecting chamber 8 and dosing chamber of the pump (as stated above).

Preferably, the collecting chamber 8 is at least partly defined by a deformable membrane 9 positioned on the top of the dispenser body 2 and the shift from the configuration of maximum capacity to the configuration of minimum capacity of the collecting chamber 8 is performed directly by the user who presses and releases the dispensing head 1 to dispense the liquid product.

Preferably, the deformable membrane 9 comprises a portion 9a substantially cap shaped (as shown in figures 2, 4 and 6).

It should be noted that the term "substantially", referred to the geometric characteristics of parts of the dispensing head 1, including those that recall the cap shape, is to be construed as "approximately" or "roughly", and not in Pythagorean sense.

In particular, in the present context and in the claims that follow the term "cap" means a rounded, concave open surface, preferably substantially entirely concave, and presenting an opening whose profile is defined by a base line which delimits an ideal base surface of the cap.

The cap 9a, i.e. the deformable membrane 9 is fastened to the dispensing body 2.

In particular, the dispensing body 2 comprises a top surface 10 having a hole 11 that places in fluid communication the collecting chamber 8 with the outlet channel 3 and, hence, with the connector 5 for the dispensing conduit of the first portion 4 of the outlet channel 3 and with the second horizontal portion 5 of the outlet channel 3.

The collecting chamber 8 is defined by the space between the yielding membrane 9 and the top surface 10 of the dispensing body 2.

Therefore, the shift between configuration of maximum volumetric capacity and maximum volumetric capacity and vice versa of the collecting chamber 8 is carried out by elastically deforming the cap-shaped portion 9a of the elastic membrane 9.

The deformation of the cap-shaped portion 9a of the elastic membrane 9 takes place pressing thereon to approach the dispensing head 1 to the ring nut to dispense the liquid product contained in the bottle.

The dispensing head 1 comprises retaining members 12 to retain and fasten the collecting chamber 8 to the dispensing body 2.

The retaining members 12 (figures 4, 5 and 6) comprise a ring 13 having a plurality of serrations 14 engaged in corresponding retention seats 15 obtained on the top surface 10 of the dispensing body 2.

In particular, the serrations 14 are positioned peripherally to the ring 13 and are mutually equidistant (figure 5). The serrations 14 comprises a substantially hook-shaped portion 16, i.e. an inclined portion provided with a retaining shoulder, destined permanently to engage the retention seat 15. In other words, when the serrations 14 are engaged in the retention seats 15, they can no longer be removed therefrom, in such a way as to prevent any tampering with the collection chamber 8 or disassembly thereof.

The ring 13 fastens the removable membrane 9 to the top surface 10 of the dispensing body 2.

For this purpose, the deformable membrane 9 comprises a substantially planar, annular peripheral portion 17 that develops around the cap-shaped portion of the membrane itself (figure 6).

Said peripheral portion 17 presents two opposite surfaces whereof one is destined to be contacted by the ring 13 and the other one is destined to contact the top surface 10 of the dispensing body 2.

Therefore, the peripheral portion 17 of the membrane 9 is "sandwiched" between the ring 13 and the top surface 10 of the dispensing body 2, stably fastening the yielding membrane 9 to the dispensing body 2.

In an alternative embodiment (figures 2 and 3), the retaining members 12 are, at least in part, directly positioned on the deformable membrane 9.

In particular, the peripheral portion 17 of the membrane 9 comprises the aforementioned serrations 14 that engage the retention seats 15 of the top surface 10 of the dispensing body 2.

The serrations 14 are positioned peripherally on the peripheral portion 17 and comprise the aforementioned substantially hook shaped portion 16, i.e. inclined and provided with a retaining shoulder, destined permanently to engage the retention seat 15.

Preferably, the cap-shaped portion 9a of the deformable membrane 9 is elastically deformable, whilst the retaining members 12 present greater rigidity. This different rigidity of the deformable membrane 9 can for example be obtained through a diversification of the thicknesses in the different parts or through bi-injection methods or other methods suited for the purpose.

Independently of the specific conformation of the retaining member 12, the dispensing head 1 comprising sealing members 18 to assure the fluid tightness of the collecting chamber 8.

The sealing members 18 comprise a collar 19 (figure 1) that develops concentrically to the hole 11 in the top surface 10 of the dispensing body 2.

The collar 19 is substantially ring shaped and completely surrounds the hole 11.

The collar 19 is engaged by an annular throat 20 (figure 3) present in the deformable membrane 9.

In particular, the annular throat 20 develops substantially at the base of the cap-shaped portion 9a of the deformable membrane 9 from the side oriented towards the top surface 10 of the dispensing body 2.

The annular throat 20 is fitted on the collar 19 creating a meatus that seals the collecting chamber 9 on the top surface 10 of the dispensing body 2.

Preferably, the annular throat 20 is fitted with interference on the collar 19.

In this way, the fluid that fills the collecting chamber 8, flowing through the hole 11, can only flow out of the collecting chamber 8 from the same hole 11.

Claims

1. A dispensing head (1) for dispensers of liquid products comprising a dispensing body (2) able to be stably connected to the dispensing conduit of a dispenser of liquid products able to be associated, by means of a ring nut, to a bottle containing the liquid product to dispense, the dispenser body (2) comprising an outlet channel (3) selectively placed in fluid communication with a suction pump to dispense the liquid drawn from the interior of the bottle;

characterised in that said dispensing head (1) comprises a collecting chamber (8) for the fluid having a collection volume variable between a configuration of minimum volumetric capacity when the pump is in fluid communication with the outlet channel (3) and a configuration of maximum volumetric capacity when the pump is in fluid communication with the outlet channel (3) and a configuration of maximum volumetric capacity when the pump is not in fluid communication with the outlet channel (3); said collecting chamber (8) being permanently placed in fluid communication with said outlet channel (3).

2. Dispensing head as claimed in claim 1, characterised in that said collecting chamber (8) is at least partly defined by a deformable membrane (9) placed on the top of the dispensing body (2); the shift from the configuration of maximum volumetric capacity to the configuration of minimum volumetric capacity of the collecting chamber (8) being performed by a user.

3. Dispensing head as claimed in claim 2, characterised in that said deformable membrane (9) comprises an elastically deformable portion (9a) substantially cap shaped; said deformable membrane (9) being fastened to said dispensing body (2).

4. Dispensing head as claimed in claim 2 or 3, characterised in that said dispensing body (2) comprises a top surface (10) having a hole (11) that places in fluid communication said collecting chamber (8) with said outlet channel (3).

5. Dispensing head as claimed in claim 4, characterised in that said collecting chamber (8) is positioned on said top surface (10) of the dispensing body (2).

6. Dispensing head as claimed in any of the previous claims, characterised in that it comprises retaining members (12) for fastening said deformable membrane (9) to said dispensing body (2).

7. Dispensing head as claimed in claims 4 and 6, characterised in that said retaining members (12) comprise a ring (13) having a plurality of serrations (14) engaged in corresponding retention seats (15) obtained on the top surface (10) of the dispensing body (2); said ring (13) fastening said deformable membrane (9) to said dispensing body (2).
8. Dispensing head as claimed in claim 6, characterised in that said deformable membrane (9) comprises a substantially planar and annular peripheral portion (17); said peripheral portion (17) being engaged by said ring (13).
9. Dispensing head as claimed in claim 6, characterised in that said retaining members (12) are at least partly defined by said deformable membrane (9).
10. Dispensing head as claimed in claim 9, characterised in that said retaining members (12) comprise a plurality of serrations (14) engaged in corresponding retention seats (15) obtained on the top surface (10) of the dispensing body (2); said serrations being positioned in a peripheral portion (17) of the deformable membrane (9).
11. Dispensing head as claimed in any of the previous claims, characterised in that it comprises sealing members (18) to assure fluid tightness between dispensing body (2) and deformable membrane (9).
12. Dispensing head as claimed in claims 4 and 11, characterised in that said sealing members (18) comprise a collar (19) that develops concentrically to said hole (11) in the top surface (10) of the dispensing body (2); said collar (19) being engaged by an annular throat (20) present in the deformable membrane (9).
13. Dispensing head as claimed in any one of the previous claims, characterised in that said dispensing head (1) is able to slide coaxially and along a vertical direction relative to said ring nut to actuate said pump.
14. Dispensing head as claimed in any one of the previous claims, characterised in that said pump comprises at least one intake valve and at least one delivery valve to selectively place in fluid communication said pump with said outlet channel (3) and said collecting chamber (8).
15. Bottle containing a liquid product and a dispensing head (1) as claimed in one of the previous claims.

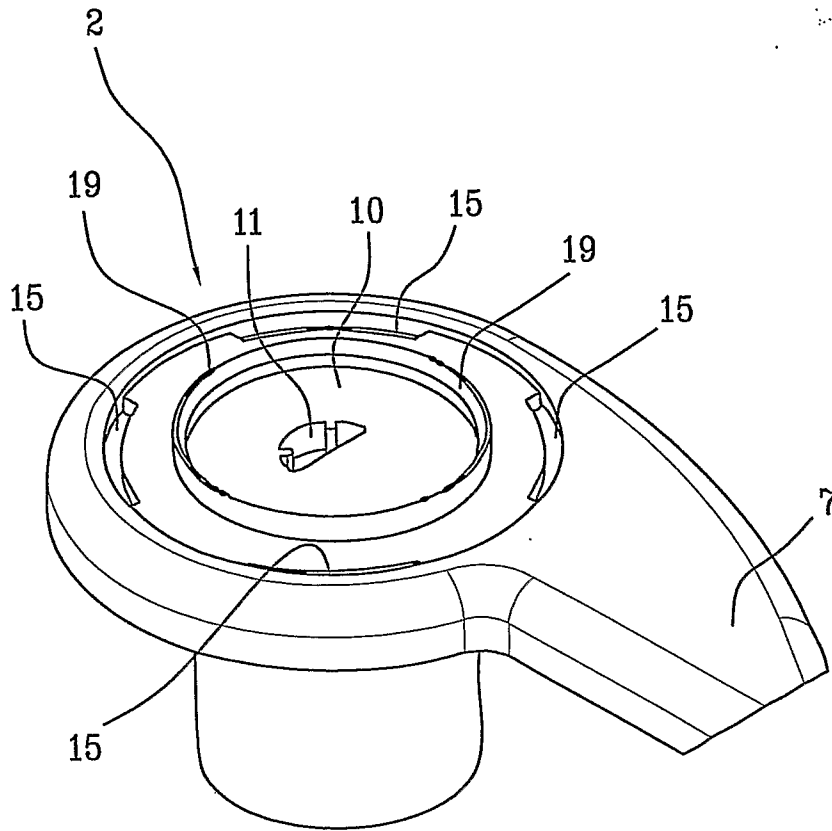


FIG 1

FIG 2

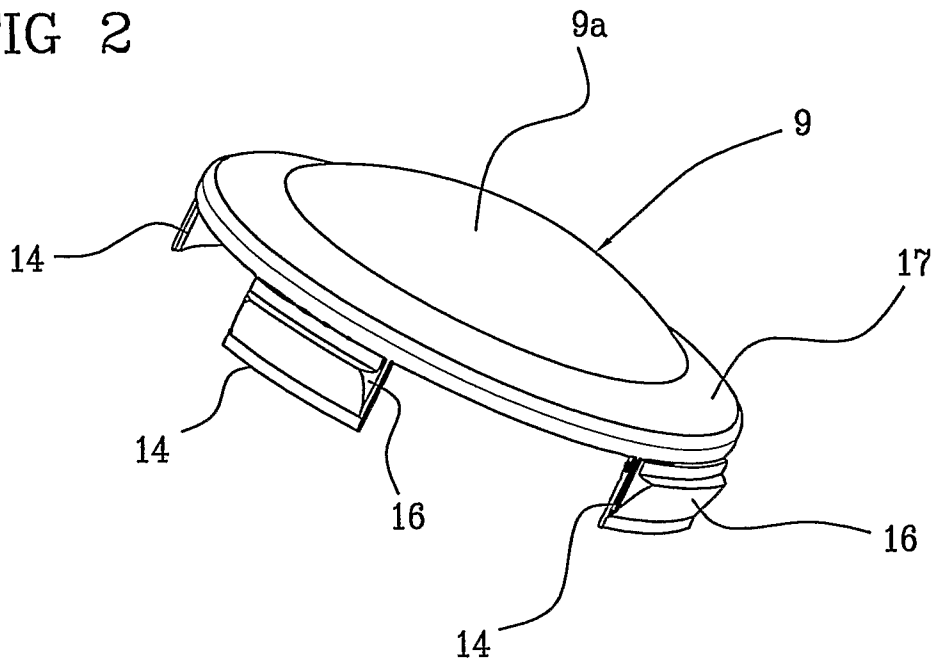


FIG 3

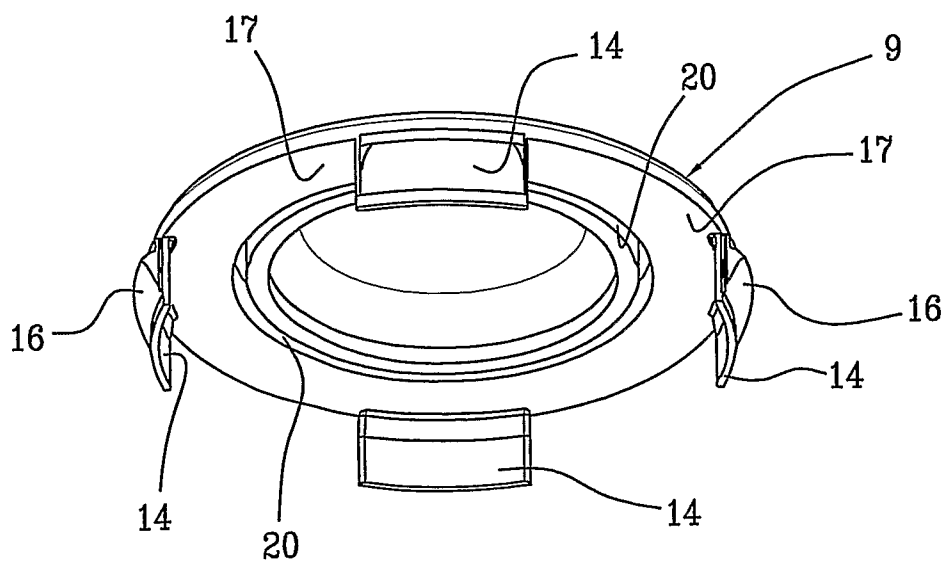


FIG 4

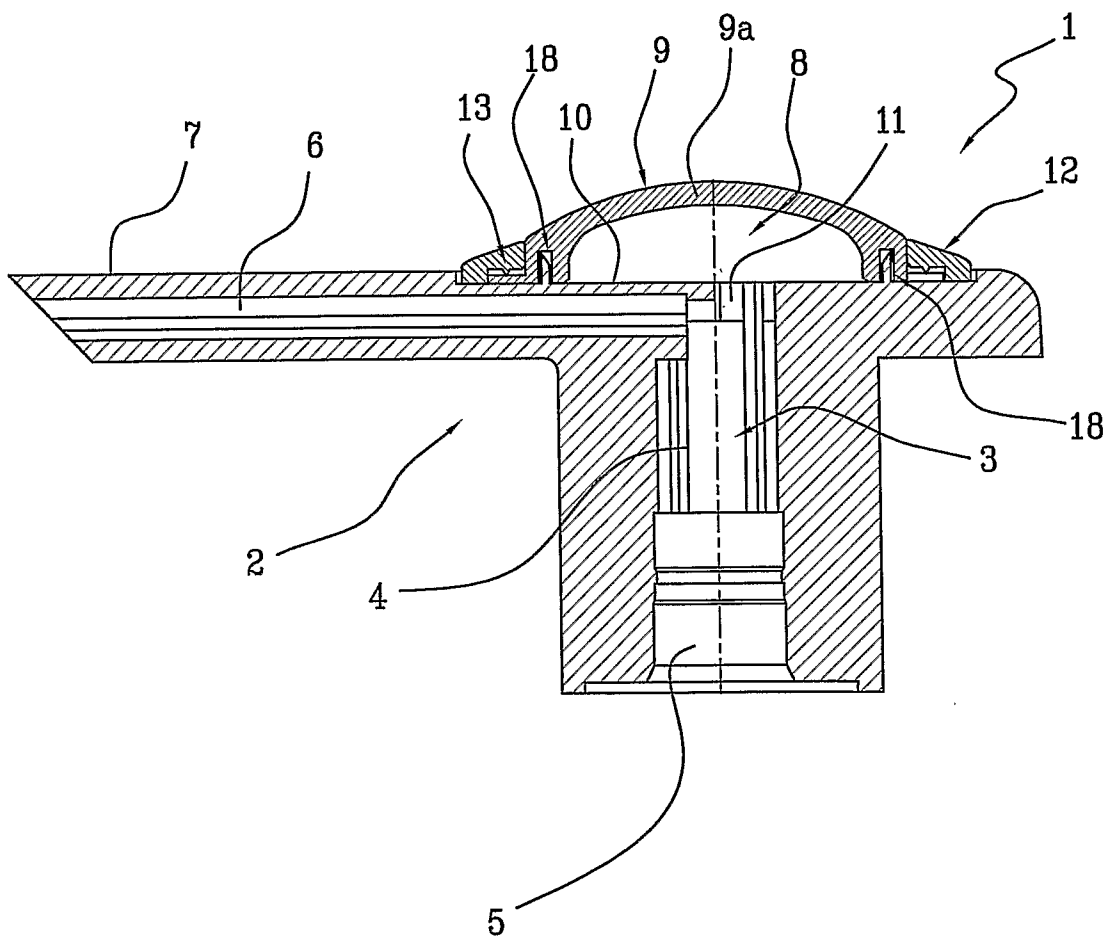


FIG 5

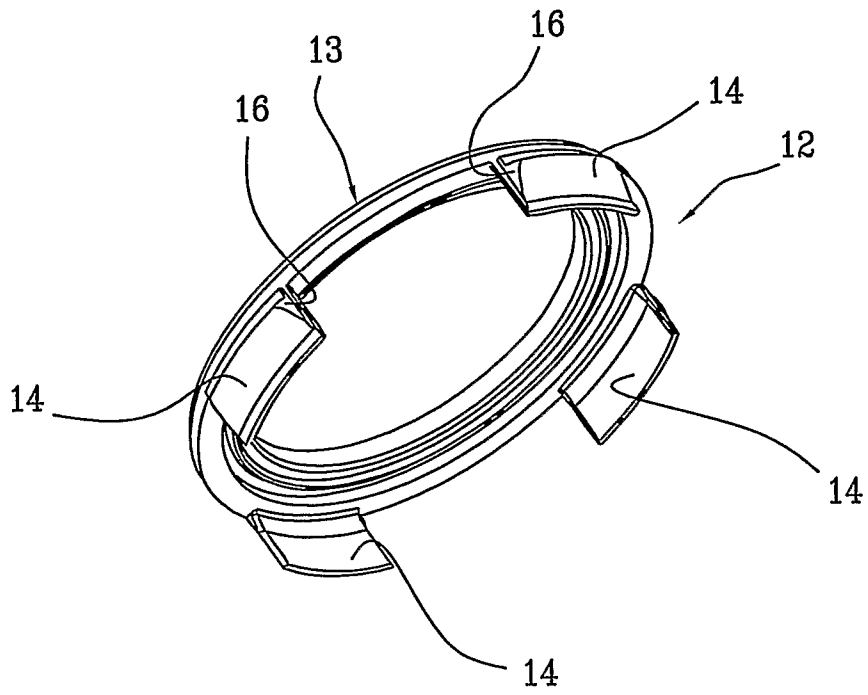
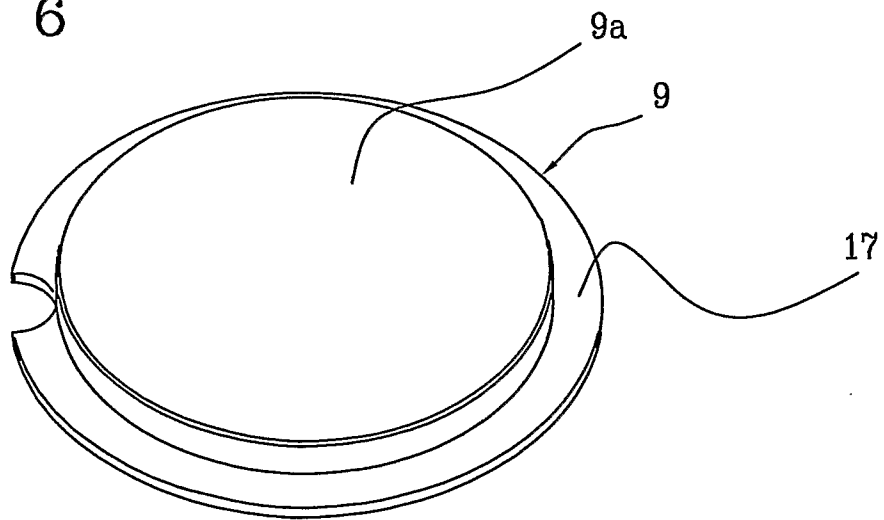


FIG 6



INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
 INV. B05B11/00
 ADD. B65D83/16

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)
 B05B

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
 EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	JP 10 296144 A (KITABAYASHI SEIICHI; MARUICHI KK) 10 November 1998 (1998-11-10) the whole document	1-9, 13-15
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INTERNATIONAL SEARCH REPORT

International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/IT2009/000095

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