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(54) **Device for applying a liquid product**

(57) A device (14.1, 14.2) for applying a liquid product (16) by atomizing or spraying from a storage container (17.1, 17.2) by means of pressurized gas (18), wherein the application is carried out by an atomizing or spraying head (1) and the storage container (17.1, 17.2) is already filled with the product (16) or designed to be manually filled with an optional product (16). The pressurized gas (18) is stored in a separate pressurized gas container (7), wherein the pressurized gas container (7) is designed to be manually connectable to the storage container (17.1, 17.2) in such a way that after the pressurized gas container of (7) is connected to the storage container (17.1, 17.2), the product (16) is supplied with pressure by means of the pressurized gas (18) through an activated valve attachment (24.1, 24.2) (Fig. 1).

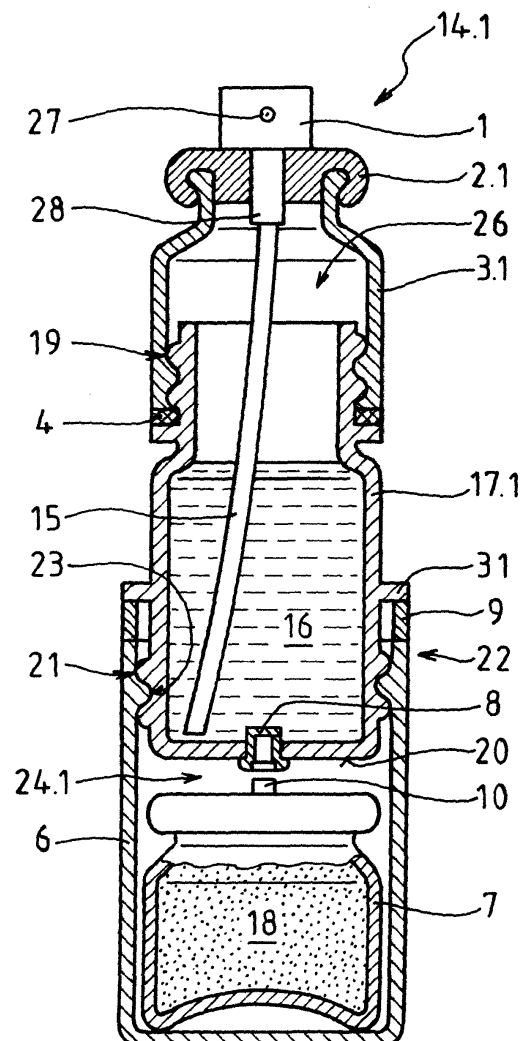


Fig. 1

Description

[0001] The present invention relates to a device for applying a liquid product according to the class of the generic term of Claim 1.

[0002] Such devices are known in the great variety of preferred embodiments.

[0003] It is the object of the invention to create a device of the same class, which is simple in its construction, allows for easy handling, is environmentally friendly, and optionally allows for the application of an individual, liquid product.

[0004] This object is achieved according to the features of the characterizing part of Claim 1. Additional designs of the invention according to the features of Claim 1 are found in the sub-claims.

[0005] The invention is described in more detail by means of two exemplary embodiments.

[0006] The following is shown:

- Fig. 1 shows an axial sectional view of a first exemplary embodiment before activation with pressurized gas;
- Fig. 2 shows the first exemplary embodiment according to Fig. 1; here though, in a state of activation with pressurized gas;
- Fig. 3 shows a detailed view of a fill valve with a valve stem according to Fig. 2;
- Fig. 4 shows a second exemplary embodiment in an axial sectional view in a state of activation with pressurized gas; and
- Fig. 5 shows an enlarged detailed view of the upper part of device 14.2 according to Fig. 4.

[0007] Fig. 1 shows, in a first exemplary embodiment, a first device 14.1 for applying a liquid product 16 through atomizing or spraying from a storage container 17.1 by means of pressurized gas 18, wherein the application is carried out with an atomizing or spraying head 1. The storage container 17.1 can be pre-filled with a liquid product 16 or is designed to be manually fillable with an individually chosen product 16. The pressurized gas 18 is stored in a separate pressurized gas container 7, wherein the pressurized gas container 7 is designed to be manually connectable to the storage container 17.1 in such a way that, after the pressurized gas container 7 is connected to the storage container 17.1, the product 16 is supplied with pressure by means of the pressurized gas 18 through an activated valve attachment 24.1. The valve attachment 24.1 is formed by a valve stem 10 and a fill valve 8, wherein the fill valve 8 used is a flutter valve. The storage container 17.1 is filled, for example, with a dye mass-particularly for changing the color of hair-as a liquid product 16.

[0008] The atomizing or spraying head 1 can be screwed to the storage container 17.1 to be liquid-tight and pressure-tight in the manner of a screw cap 3.1, the storage container 17.1 having an upper threaded neck

19. The screw cap 3.1 is connected with a valve disk 2.1, a head valve 28, and the atomizing or spraying head 1 as a single structural unit that is torque-proof and made pressure-tight by a sealing ring 4. The storage container 17.1 has a male thread 21 near a base 20, and the base 20 has a fill valve 8. The pressurized gas container 7 is held by a receptacle 6 having a female thread 23 at its upper end 22, the female thread 23 corresponding to the male thread 21 of the storage container 17.1. When the storage container 17.1 is screwed to the receptacle 6, the valve stem 10 of the pressurized gas container 7 is actuated by an opening edge 25 of the fill valve 8, causing pressurized gas 18 to flow from the pressurized gas container 7 into the storage container 17.1. By manually actuating the atomizing or spray head 1, the liquid product 16 is correspondingly applied by atomizing or spraying through the head valve 28.

[0009] The pressurized gas container 7 is filled with compressed air or carbon dioxide (CO₂) or nitrogen (N₂) at a pressure of 1 to 6 bar and is therefore not considered a hazardous material.

[0010] The pressurized gas container 7 has a volume of approximately 40 mL and is designed to be interchangeable with the device 14.1, 14.2. The pressurized gas container 7 can be designed to be refillable with pressurized gas 18 and therefore constitutes an environmentally friendly reusable container. The device 14.1, 14.2 can also be intended for multiple use in an environmentally friendly way.

[0011] Before an application of the product 16, the storage container 17.1, is filled, for example, with a mixed two-component product that has previously been kept separate. After the storage container 17.1 is filled and closed, the pressurized gas container 7 is activated. However, in a further design, an external pressurized gas supply with a corresponding connection can be provided instead of the pressure container 7. The pressurized gas container 7 of device 14.1 can optionally be provided as a disposable or reusable container.

[0012] Use of device 14.1:

- 1) With the screw cap 3.1 removed, fill a liquid product 16 into the storage container 17.1.
- 2) Screw the screw cap 3.1 with the atomizing or spray head 1 onto the storage container 17.1.
- 3) Remove the spacer ring 9.
- 4) Screw the receptacle 6 with the pressurized gas container 7 upwards, with the valve stem 10 dipping into the fill valve 8, wherein the pressurized gas 18 flows out of the pressurized gas container 7 into the storage container 17.1 and supplies the interior space 6 with pressurized gas 18. The fill valve 8 prevents a backflow of the product mass into the pressurized gas container 7.
- 5) By pressing the atomizing or spray head 1, it is now possible to apply the product 16.

[0013] Fig. 2 shows the exemplary embodiment ac-

cording to Fig. 1; here though, in a state of an activated valve attachment 24.1 when it is actuated by the stem 10 of the fill valve 8 of the opening edge 25 (Fig. 3), whereby any interior space of the storage container 17.1 is supplied with a pressure. In doing so, the liquid product 16 flows via the riser tube 15 from a nozzle 27 when the atomizing or spraying head 1 is pressed. After the spacer ring 9 is removed, the receptacle 6 is turned as far as a stop ring 31 (as also according to Fig. 4).

[0014] Fig. 3 shows a detailed view of the valve attachment 24.1 with the fill valve 8 with the valve stem 10 according to Fig. 2. This illustrates the interaction of an activation of the valve attachment 24.1 through the opening edge 25 with the valve stem 10. The fill valve 8 is made of a soft, elastic plastic (elastomer) having a bulge 5, whereby a securing to the base 20 and a sufficiently high actuation counterforce by the corresponding opening edge 25 with the valve stem 10 is made possible.

[0015] Fig. 4 shows a second device 14.2 in an axial sectional view as a second exemplary embodiment in a state of activation with pressurized gas 18. The device 14.2 consists of a pressurized gas container 7, an activation container 6 with the spacer ring 9 removed (corresponding to Fig. 2), a storage container 17.2, a screw cap 3.2, a valve disk 2.2, and an atomizing or spraying head 1.

[0016] The atomizing or spraying head 1 can be screwed to the storage container 17.1 to be liquid-tight and pressure-tight in the manner of a screw cap 3.2, the storage container 17.2 having an upper threaded neck 19. The storage container 17.2 has a male thread 21 near a base 20, with the base 20 having a centrally situated base opening 13. The storage container 17.2 has a deformable inner container 11. The pressurized gas container 7 is held by a receptacle 6, which has a female thread 23 at its upper edge 22 and which corresponds to a male thread 21 of the storage container 17.2, wherein a valve stem 10 of the pressurized gas container 7 is actuated by an edge area 30 of the base opening 13 when the storage container 17.2 is screwed to the receptacle 6. The valve attachment 24.2 is formed by the valve stem 10 and the edge area 30 of the base opening 13.

[0017] In this exemplary embodiment (Fig. 4), the pressurized gas 18 is separated from the product 16, whereby the pressure of the pressurized gas 18 exerts force only externally on the inner container 11. Therefore, a check valve (as in the exemplary embodiment according to Figs. 1 to 3) is not required, the base opening 13 with the edge area 30 being sufficient.

[0018] The flexible inner pouch 11 is placed into the storage container 17.2 before it is filled with a liquid product 16; then the threaded ring 12 is screwed to the threaded neck 19 with the valve disk 2.2 with the spraying head 1, whereby the inner container 11 is secured to be liquid-tight and pressure-tight. After use, the inner container 11 or the inner pouch is disposed of as a disposable container. Overhead spraying (spraying independent of the position in which the device 14.1 is held), minimal residual

product amounts, and minimized cleaning efforts are regarded to be advantages.

[0019] Fig. 5 shows in an enlarged detailed view the upper part of the device 14.2 according to Fig. 4. Here it becomes apparent that the screw cap 3.2 has an opening 29 in the manner of a union nut for the atomizing or spraying head 1, thereby securing the inner container 11 with a valve disk 2.2 over the threaded neck 19. The inner container 11 can optionally be inserted into the storage container 17.2 as a separate component, whereby an individual product 16 can be filled manually, or the inner container 11 can also be inserted into the storage container 17.2 containing a pre-filled product 16 with the atomizing or spraying head 1 and the valve disk 2.2 as a single joined structural unit, and can thus be easily disposed of as a disposable solution. To ensure a reliable application, a riser tube 15 can additionally be provided in the inner container 11.

[0020] The screw cap 3.1, 3.2, the storage container 17.1, 17.2, and the receptacle 6 are preferably made of plastic.

LIST OF REFERENCE NUMBERS:

[0021]

1	Atomizing or spraying head
2.1	First valve disk
2.2	Second valve disk
3.1	First screw cap
3.2	Second screw cap
4	Sealing ring
5	Bulge
6	Receptacle
7	Pressurized gas container
8	Fill valve
9	Spacer ring
10	Valve stem
11	Inner container or inner pouch
12	Threaded ring
13	Base opening
14.1	First device
14.2	Second device
15	Riser tube
16	Liquid product
17.1	First storage container
17.2	Second storage container
18	Pressurized gas
19	Threaded neck
20	Base
21	Male thread
22	End
23	Female thread
24.1	First valve attachment
24.2	Second valve attachment
25	Opening edge
26	Interior space
27	Nozzle

- 28 Head valve
- 29 Opening
- 30 Edge area
- 31 Stop ring

[0022] 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 device (14.1, 14.2) for applying a liquid product (16) by atomizing or spraying from a storage container (17.1, 17.2) by means of a pressurized gas (18), wherein the application is effected by an atomizing or spraying head (1), **characterized in that** the storage container (17.1, 17.2) is already filled with the product (16) or designed to be manually fillable with an optional product (16), and that the pressurized gas (18) is stored in a separate pressurized gas container (7), wherein the pressurized gas container (7) is designed to be manually connectable to the storage container (17.1, 17.2) in such a way that, after the pressurized gas container 7 is connected to the storage container (17.1, 17.2), the product (16) is supplied with pressure by means of pressurized gas (18) through an activated valve attachment (24.1, 24.2).
2. The device (14.1) according to Claim 1, **characterized in that** the atomizing or spraying head (1) can be screwed onto the storage container (17.1) in the manner of a screw cap (3.1) to be liquid-tight and pressure-tight, with the storage container (17.1) having an upper threaded neck (19), that the storage container (17.1) has a male thread (21) near a base (20), that the base (20) has a fill valve (8), that the pressurized gas container (7) is held by a receptacle (6), and that the receptacle (6) has a female thread (23) at the upper edge (22), which corresponds to the male thread (21) of the storage container (17.1), wherein a valve stem (10) of the pressurized gas container (7) is actuated by the fill valve (8) when this storage container (17.1) is screwed to the receptacle (6), wherein the valve attachment (24.1) is formed by the valve stem (10) and the fill valve (8).
3. The device (14.2) according to Claim 1, **characterized in that** the atomizing or spraying head (1) can be screwed onto the storage container (17.2) in the manner of a screw cap (3.2) to be liquid-tight and pressure-tight, with the storage container (17.2) having an upper threaded neck (19), that the storage

container (17.2) has a male thread (21) near a base (20), that the base (20) has a base opening (13), that the storage container (17.2) has a deformable inner container (11), that the pressurized gas container (7) is held by a receptacle (6), and that the receptacle (6) has a female thread (23) at the upper edge (22), which corresponds to the male thread (21) of the storage container (17.2), wherein a valve stem (10) of the pressurized gas container (7) is actuated by an edge area (30) of the base opening (13) when this storage container (17.2) is screwed to the receptacle (6), wherein the valve attachment (24.2) is formed by the valve stem (10) and the edge area (30) of the base opening (13).

4. The device (14.1, 14.2) according to Claim 1, **characterized in that** the pressurized gas container (7) contains compressed air or carbon dioxide (CO₂) or nitrogen (N₂) and is filled at a pressure of 1 to 6 bar.
5. The device (14.1, 14.2) according to Claim 1, **characterized in that** the pressurized gas container (7) has a volume of approximately 40 mL.
6. The device (14.1, 14.2) according to Claim 1, **characterized in that** the pressurized gas container (7) is designed to be interchangeable with the device (14.1, 42.2).
7. The device (14.1, 14.2) according to Claim 1, **characterized in that** the pressurized gas container (7) is designed to be refillable with pressurized gas.
8. The device (14.2) according to Claim 3, **characterized in that** the deformable inner container (11) corresponds to a riser tube (15).

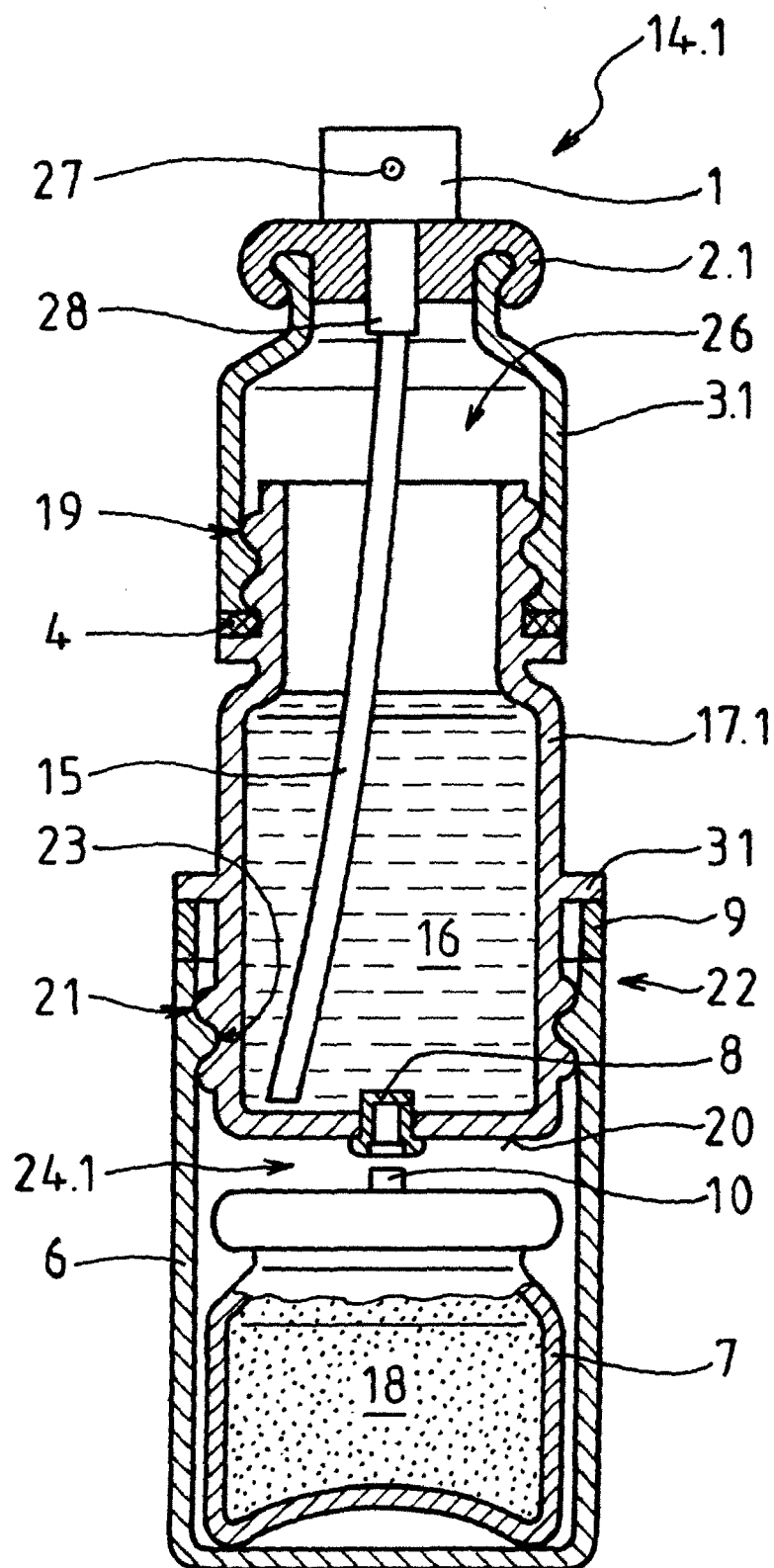


Fig. 1

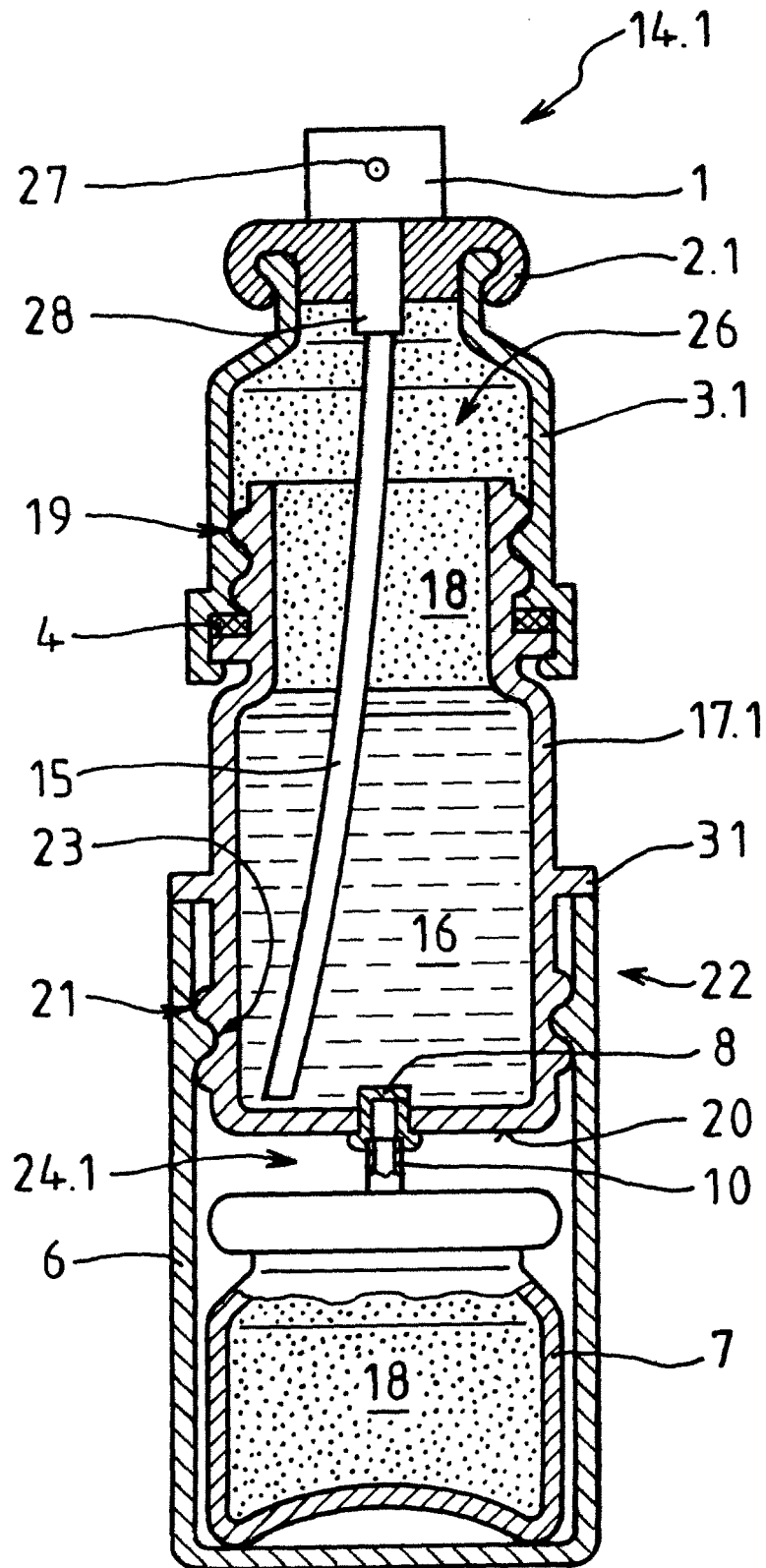


Fig. 2

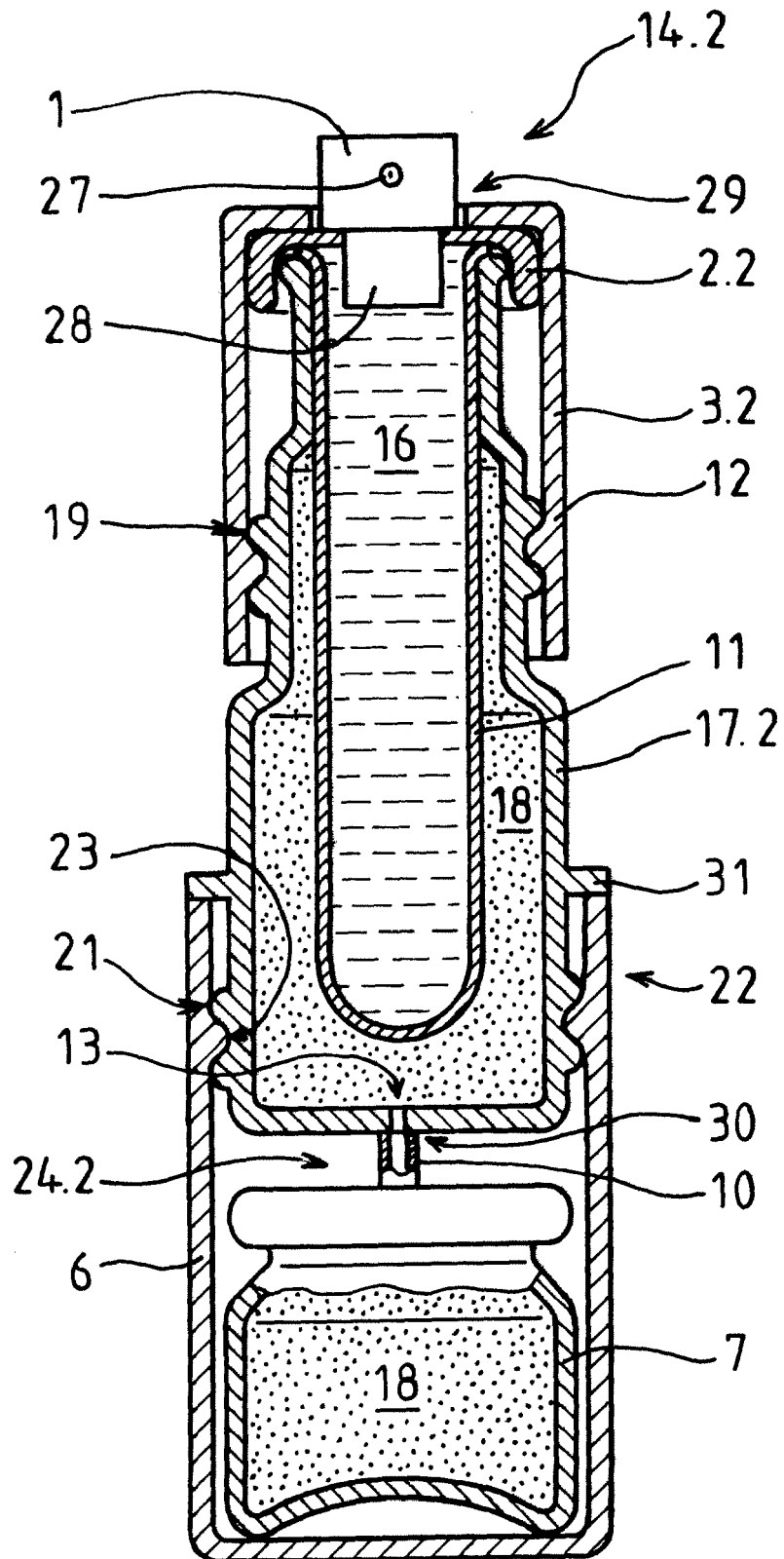
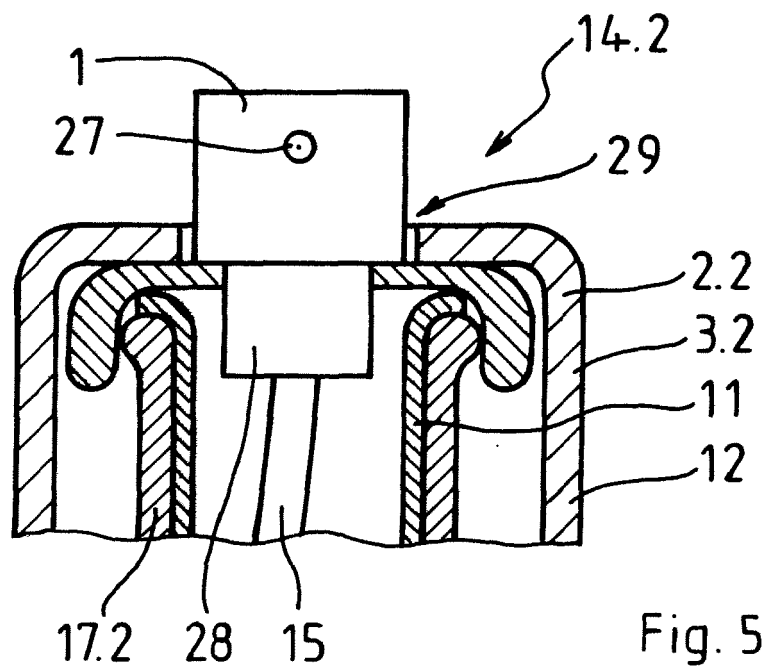
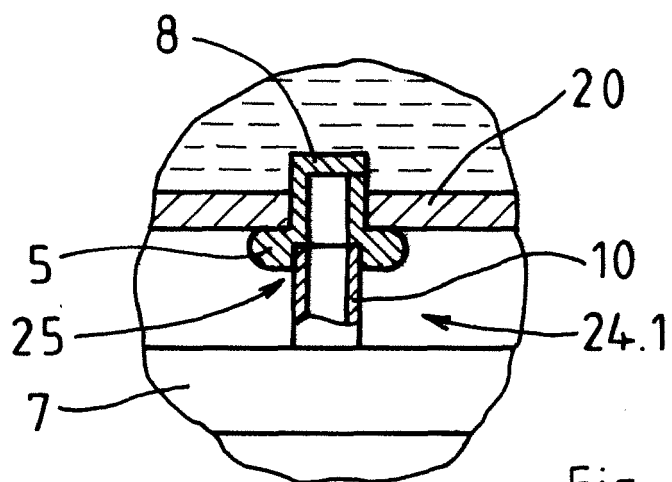


Fig. 4





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 08 15 4062

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 43 34 217 A1 (KLEMM STEPHAN [DE]; HALLMANN CORINA [DE]) 5 May 1994 (1994-05-05) * column 2, line 65 - column 3, line 31; figure 1 *	1-8	INV. B65D83/14
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			TECHNICAL FIELDS SEARCHED (IPC)
			B65D B65B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 2 September 2008	Examiner Rente, Tanja
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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 15 4062

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02-09-2008

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