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Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

— *of inventorship (Rule 4.17(iv))*

[Continued on next page]

(54) **Title:** FITMENT FOR CONNECTING A CONTAINER TO A DISPENSING APPLIANCE

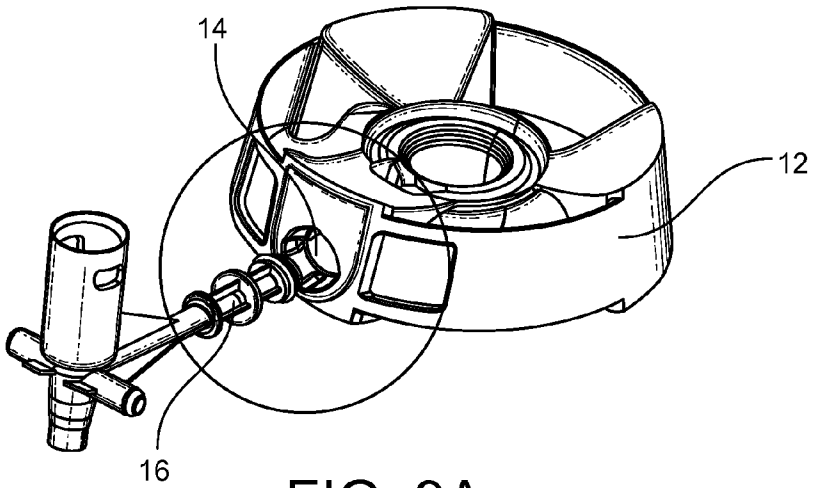


FIG. 9A

(57) **Abstract:** The present invention relates to a fitment for establishing a leak-tight fluid communication between a support having means for generating compressed gas, and at least one container containing an edible product that is to be connected to said support, characterized in that said fitment comprises: (i) at least one cylindrical, conical or frusto-conical orifice located on the container or on the support, said orifice having an ovoid cross-section and comprising at least one groove or protrusion disposed parallel the longitudinal axis of said orifice, (ii) a one-way valve to allow compressed air only in the way from said support to the container, (iii) at least one corresponding plug located on the support, or respectively on the container, for removably fitting said orifice in a leak-tight manner.

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FITMENT FOR CONNECTING A CONTAINER TO A DISPENSING APPLIANCE

Field of the invention

The present invention relates to a fitment for connecting a container to a dispensing appliance. It further relates to a dispensing device comprising a container and dispensing means, having an improved fitment system between said container and said means.

Background of the invention

Solutions for dispensing edible products in a convenient way, for instance at home, have been developed in the recent years.

In order to dispense viscous edible products such as eg. soft ice cream, a system was developed recently which comprises a support with pump means for generating compressed air, and a container for storing and dispensing the said ice cream.

Once correctly connected to the support in a removable manner, the container can then receive compressed air that is used to push the product outside. The pump means present on the support are operated preferably manually by the consumer at the time of dispensing.

The container preferably comprises multi-layer walls, i.e. walls having at least two layers, which are not bound to each other, so that compressed air pumped from the support pumplugg means, is directed in between the said unbound layers. Product to

dispense is contained inside the most internal wall layer. Thus, product is pushed outside by deformation of the inner wall layer, as compressed air fills the space in between the wall layers of the container.

Furthermore, in such dispensing systems, it was made necessary to be able to remove the container from the support once emptied, so as to replace it by a new one.

Such a dispensing system however presents several aspects which may constitute a risk if not properly addressed by a proper technical structure for the fitment in between the support and the container.

Firstly, there is a risk that for any reason, a consumer tries to fill compressed air into a bottle with another pump means than that specifically designed for use in the original dispensing system. For instance, a consumer could use a compressed gas cartridge such as those used generally for preparing whipped cream, or gas water, a bicycle pump, an electric compressor, or similar, which would deliver a much higher pressure in between the container wall layers. This would not only damage the container, but would present a risk of explosion of the said container, that could harm the consumer. Alternatively, the consumer could be tempted to connect a bottle filled with a product, that is not intended for use (i.e. was not designed to be used) with the original support and pump means, leading to the same damages and risks as described above, which are clearly undesirable to the consumer.

Secondly, it is necessary to ensure a very good positioning of the container onto the support, so that the connection is air-tight and no compressed air leaks during the pumping operation.

Summary of the invention

The present invention addresses the technical requirements as listed above, with A dispensing device for the delivery of at least one edible product, preferably at least one viscous frozen edible product, the device comprising:

- a support having means for generating compressed gas, and
- at least one container containing said edible product, said container having walls with at least two layers such that when said container is connected to said support and said means are operated to generate compressed gas, said compressed gas fills the space between said layers so as to press said product out of said container.

According to the present invention, the dispensing device is characterized in that it comprises fitment means for establishing a fluid connection between said container and said support in a removable and leak-tight manner, said fitment means comprising:

- at least one cylindrical, conical or frusto-conical orifice located on the container or on the support, said orifice having an ovoid cross-section and comprising at least one groove or protrusion disposed parallel the longitudinal axis of said orifice,

- a one-way valve to allow compressed air generated by the gas-compression means only in the way from said support to the container,

- at least one corresponding plug located on the support, or respectively on the container, for removably fitting said orifice in a leak-tight manner.

In another important aspect, the present invention is directed to a fitment for establishing a leak-tight fluid communication between a support having means for generating compressed gas, and at least one container containing an edible product that is to be connected to said support, characterized in that said fitment comprises:

(i) at least one cylindrical, conical or frusto-conical orifice located on the container or on the support, said orifice having an ovoid cross-section and comprising at least one groove or protrusion disposed parallel the longitudinal axis of said orifice,

(ii) a one-way valve to allow compressed air generated by the gas-compression means only in the way from said support to the container,

(iii) at least one corresponding plug located on the support, or respectively on the container, for removably fitting said orifice in a leak-tight manner.

In a preferred embodiment, said orifice comprises at least three grooves, or at least three protrusions.

Also in a highly preferred embodiment of the present invention, said orifice is located on the container bottom, and the plug is located onto the support.

Finally, said orifice or said plug can advantageously comprise at least one O-ring made of rubber or similar sealing material, said O-ring being disposed inside said orifice, respectively around said plug, such that the space between the inner walls of the orifice and the outer walls of the plug is gas-tight when said plug is fully inserted into said orifice.

Brief description of the drawings

Additional features and advantages of the present invention are described in, and will be apparent from, the description of the presently preferred embodiments which are set out below with reference to the drawings in which:

Figure 1 is a perspective front view of a dispensing device ;

Figure 2 is a perspective back view of a dispensing device ;

Figure 3 is a perspective front view of a container for use with a fitment according to the present invention ;

Figure 4 is a side cut view of a container as shown in figure 3 ;

Figure 5 is a bottom view of the base of a container as shown in figure 3, with the plug of a dispensing device's support that is inserted into the fitment's orifice of the container base ;

Figure 6 is a side cut view along E-E in figure 5 ;

Figure 7A is a perspective front view of the base of a container for use with the present invention, and figure 7B is a an enlarged partial view of the fitment orifice of the base as shown in figure 7A ;

Figure 8 is an enlarged front perspective view of a fitment plug according to the invention ;

Figure 9A is a perspective split view of plug and orifice in a fitment according to the invention, and figure 9B is a an enlarged partial view of the fitment shown in figure 9A.

Detailed description of the invention

The fitment according to the present invention is intended for use in a dispensing device 1 as illustrated in figures 1 or 2. The dispensing device 1 is suitable for the delivery of at least one edible product (not shown in the drawing), preferably at least one viscous frozen edible product, like for instance a soft ice cream composition.

As illustrated in figure 1, the device 1 comprises a support 2 having means 3 for generating compressed gas. These compression means comprise a handle 3, linked to a pump (not shown in the drawing) that is disposed inside a casing 4.

The support 2 further comprises a recess shaped so that a container 5 can be assembled to the support in a removable manner, as illustrated in figures 1 and 2.

The container 5 is for containing said edible product, and as illustrated in figure 4, it has walls with two layers, one inner layer 6 containing said edible product, and an outer layer 7. It further comprises a dispensing opening 8 shown for instance in figure 3. In operation, the dispensing opening 8 of the container 5 is closed by a tap 9, or similar closing device that allows a consumer to manually open or close said opening to dispense a given volume of ice cream, into a portion container (cup, edible cone, etc.).

When said container 5 is connected to said support 2, a fluid communication is established between these two parts of the dispensing device 1, as will be described in detail hereafter. When the compression means 3 are then operated by the consumer to generate compressed gas, said compressed gas fills the space between said inner 6 and outer 7 layers of the container walls, such that a gas pressure is generated in the space between said inner 6 and outer 7 layers of the container 5.

Once the container inner space is pressurized, the consumer can then open the tap 9 so that said inner layer 6 deforms under gas pressure, and is displaced towards the container opening 8. The said inner layer 6 therefore presses onto said product that is pushed out of said container through said dispensing opening 8 and tap 9.

According to the present invention, the dispensing device is characterized in that it comprises fitment means 10 for establishing a fluid connection between said container 5 and said support 2 in a removable and leak-tight manner.

The said fitment means 10 comprise firstly, one frusto-conical orifice 11 located on the container, more particularly, on a base portion 12 of the container 5. The said base 12 is particularly well represented in figures 3 to 6.

The base 12 is assembled as a separate element to the bottom side of the container 5. Like the container 5, it is preferably made out of a thermoplastic, food-grade, material. The base 12 comprises a channel 13 to conduct compressed air from the compression means to the space in between the inner 6 and outer 7 layers of the container walls. Towards the outside, the channel 13 of the base 12 is opened through the orifice 11, as illustrated in figure 6. On the other end, the channel 13 is connected to the inside of the container 5 in a leak-tight manner. In its median portion, the channel 13 comprises a one-way valve 14 made out of a synthetic flexible material, for instance an umbrella valve as illustrated in figure 6, that allows compressed air generated by the compression means of the support 2, to pass through said channel 13 towards the inside of the space between said inner 6 and outer 7 layers of the container walls, said valve 14 being deformable and/or movable inside said channel, such that it prevents compressed air to pass through said channel from said container 5, back to the support 2. Alternatively to an umbrella valve, the present invention could be structured with a ball-valve, duckbill valve, or equivalent one-way valve.

As illustrated in figures 7A and 7B, the fitment orifice 11 has an oval cross-section and comprises four grooves 15 disposed parallel the longitudinal axis of said orifice. Two consecutive grooves are spaced apart from one another along the circumference of the orifice 11, by a 90° angle, as cam be seen in detail in figures 7B and 9B. The grooves extend from the outside edge of the orifice 11, into at least half of the depth of the latter, as can be seen in figure 7B. These grooves have a width and depth of at least 0.5 mm, preferably of at least 1 mm each.

The specific oval shape of the orifice prevents the introduction of a pipe or other similar tool having a round cross-section, that could be used for introducing compressed air into the orifice 11 and channel 13, and that could lead to damages to the whole device or even create a risk of explosion of the container which would be clearly unacceptable to the consumer.

Moreover, the grooves 15 ensure that even though a consumer would manage to introduce a flexible pipe or oval-shaped pipe into the orifice 11, compressed air will leak through the grooves back to the atmosphere, so that the container cannot be inflated by another air-compression system than that specifically designed for use with the multi-layer container described hereinabove, thus reducing the risk of explosion or otherwise damage of the container as hereinbefore mentioned.

The support 2 of the dispensing device 1 further comprises one plug 16 that substantially corresponds in shape and dimensions to the orifice 11 of the container base portion 12. In figures 5, 6 8 and 9, the plug 16 of the fitment means 10 is shown separate from the compression means of the support 2, however, the said plus in normally part of the whole support 2, and in fluid connexion with the outlet of the pump compression means (not shown in the drawing). The fitment means 10 is therefore made of orifice 11 and plug 16. More specifically, and as illustrated in figure 8, the plug 16 has an oval shape that corresponds to that of the orifice 11, so that said plus can fit perfectly in said orifice as shown in figures 9A and 9B.

When said plug 16 is fully inserted into said orifice, a fluid, leak-tight communication is established between the pump means of the support and the space that is between the inner 6 and outer 7 layer walls of the container 5.

Finally, said plug 16 comprises an O-ring 18 made of rubber or similar sealing material, said O-ring 18 being disposed around said plug 16, such that the space between the inner walls of the orifice and the outer walls of the plug is gas-tight when said plug is fully inserted into said orifice.

It should be understood that various changes and modifications to the presently preferred embodiments described herein will be apparent to those skilled in the art. Such changes and modifications can be made without departing from the spirit and scope of the present invention and without diminishing its attendant advantages. It is therefore intended that such changes and modifications be covered by the appended claims.

Claims

1. A dispensing device for the delivery of at least one edible product, preferably at least one viscous frozen edible product, the device comprising:

- a support having means for generating compressed gas, and
- at least one container containing said edible product, said container having walls with at least two layers such that when said container is connected to said support and said means are operated to generate compressed gas, said compressed gas fills the space between said layers so as to press said product out of said container,

characterized in that said dispensing device further comprises fitment means for establishing a fluid connection between said container and said support in a removable and leak-tight manner, said fitment means comprising:

(i) at least one cylindrical, conical or frusto-conical orifice located on the container or on the support, said orifice having an ovoid cross-section and comprising at least one groove or protrusion disposed parallel the longitudinal axis of said orifice,

(ii) a one-way valve to allow compressed air generated by the gas-compression means only in the way from said support to the container,

(iii) at least one corresponding plug located on the support, or respectively on the container, for removably fitting said orifice in a leak-tight manner.

2. A fitment for establishing a leak-tight fluid communication between a support having means for generating compressed gas, and at least one container containing an edible product that is to be connected to said support, characterized in that said fitment comprises:

(i) at least one cylindrical, conical or frusto-conical orifice located on the container or on the support, , said orifice having an ovoid cross-section and comprising at least one groove or protrusion disposed parallel the longitudinal axis of said orifice,

(ii) a one-way valve to allow compressed air generated by the gas-compression means only in the way from said support to the container

(iii) at least one corresponding plug located on the support, or respectively on the container, for removably fitting said orifice in a leak-tight manner.

3. A dispensing device, or a fitment according respectively to claims 1 or 2, wherein said orifice comprises at least three grooves, respectively at least three protrusions.

4. A dispensing device, or a fitment according to any of the preceding claims 1 to 3, wherein said orifice is located on the container bottom, and the plug is located onto the support.

5. A dispensing device, or a fitment according to any of the preceding claims, wherein said orifice or said plug comprises at least one O-ring made of rubber or similar sealing material, said O-ring being disposed inside said orifice, respectively around said plug, such that the space between the inner walls of the orifice and the outer walls of the plug is gas-tight when said plug is fully inserted into said orifice.

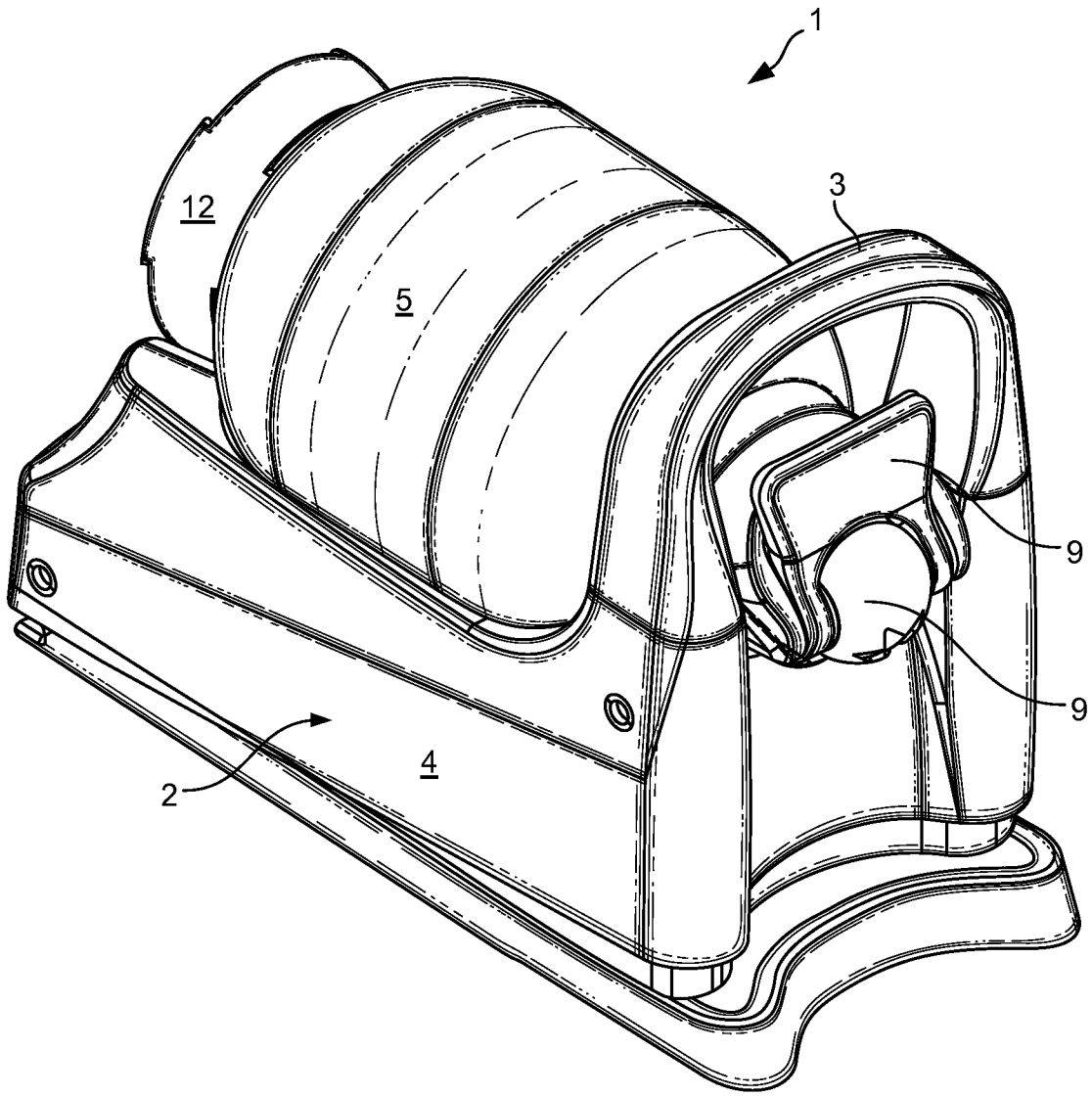


FIG. 1

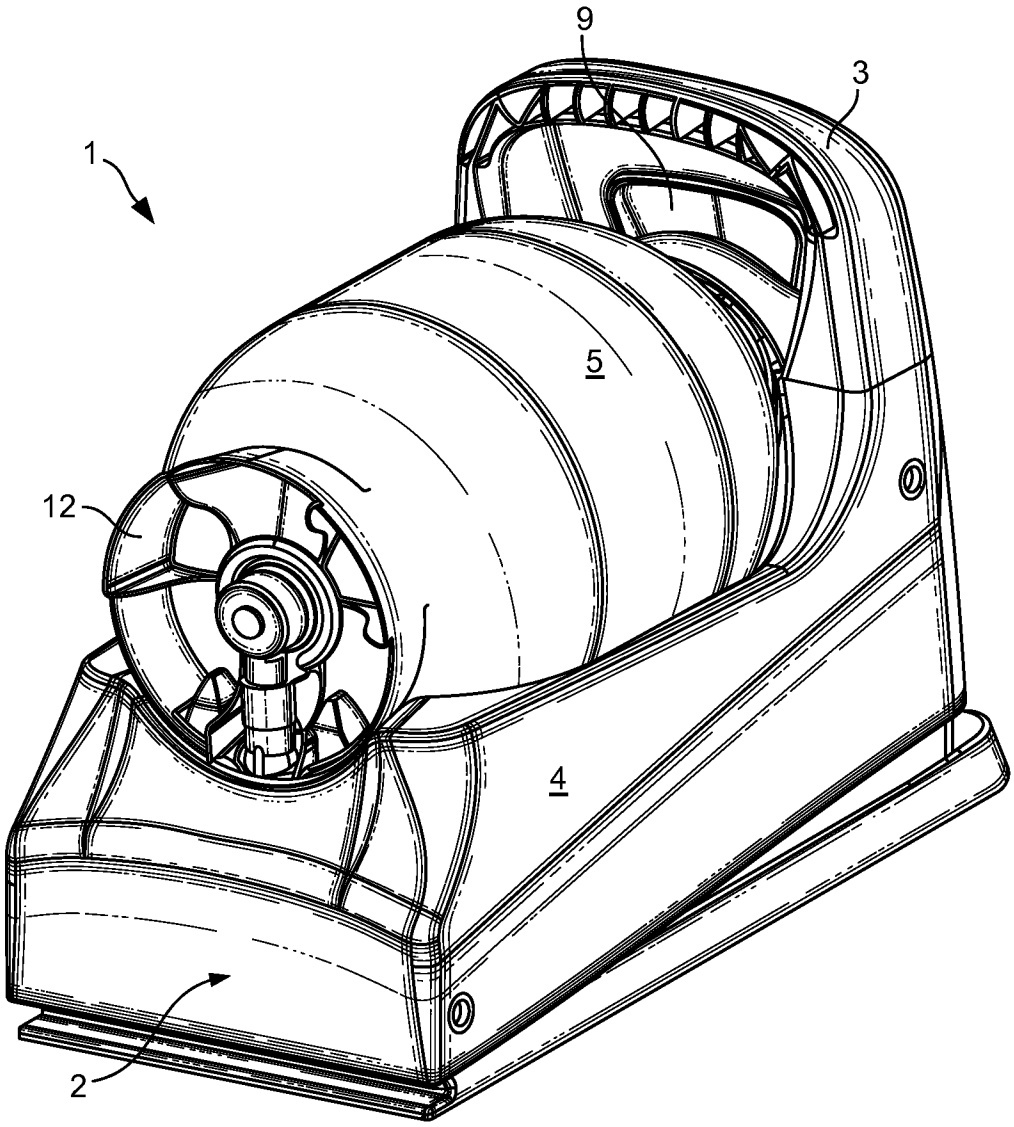


FIG. 2

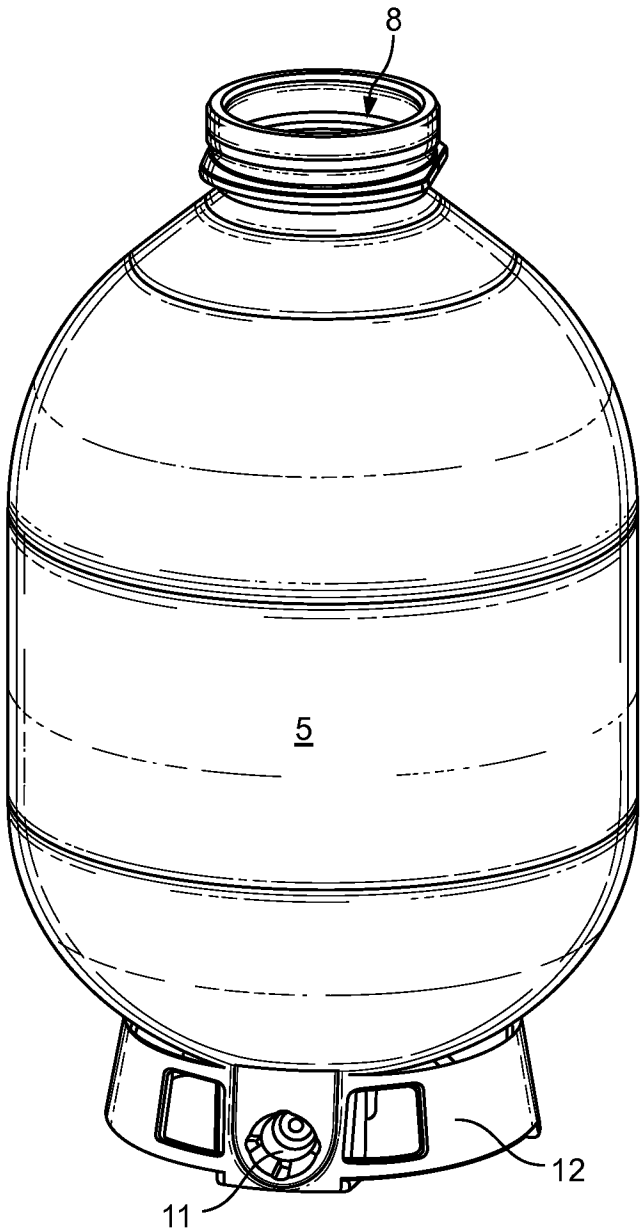


FIG. 3

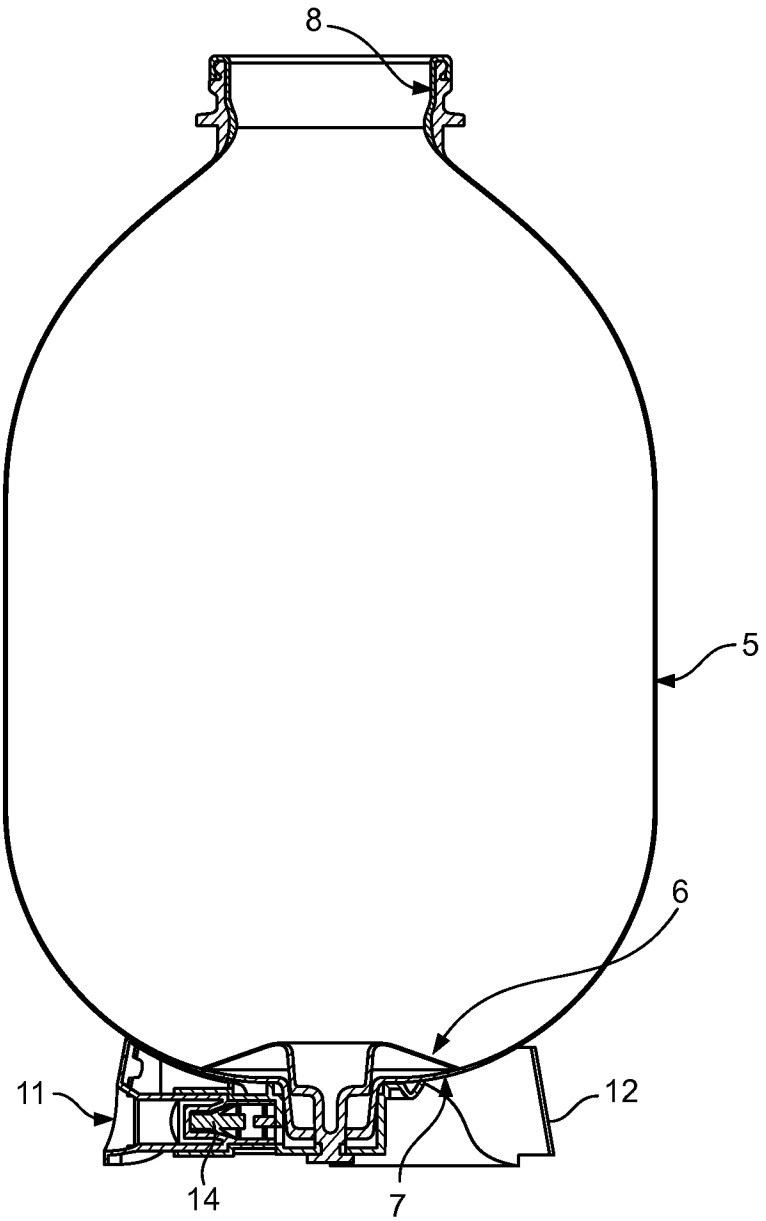


FIG. 4

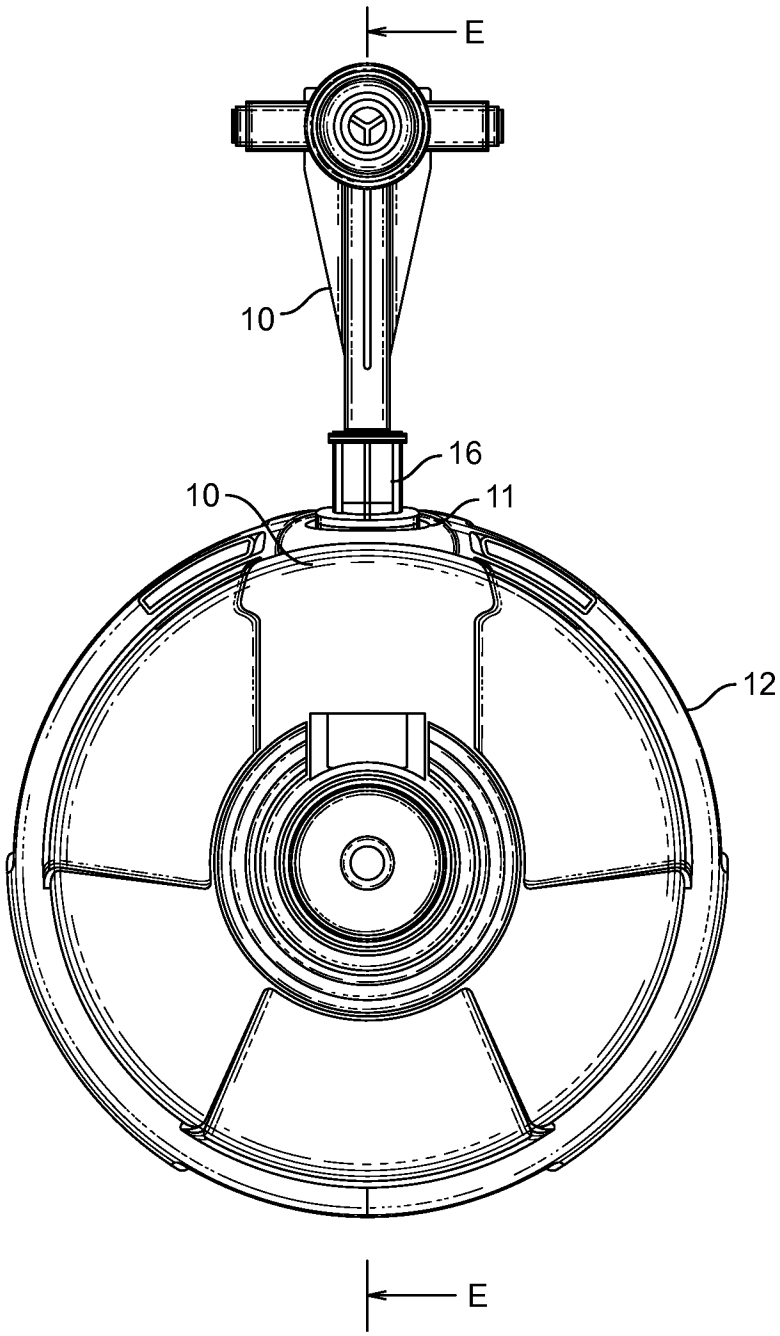


FIG. 5

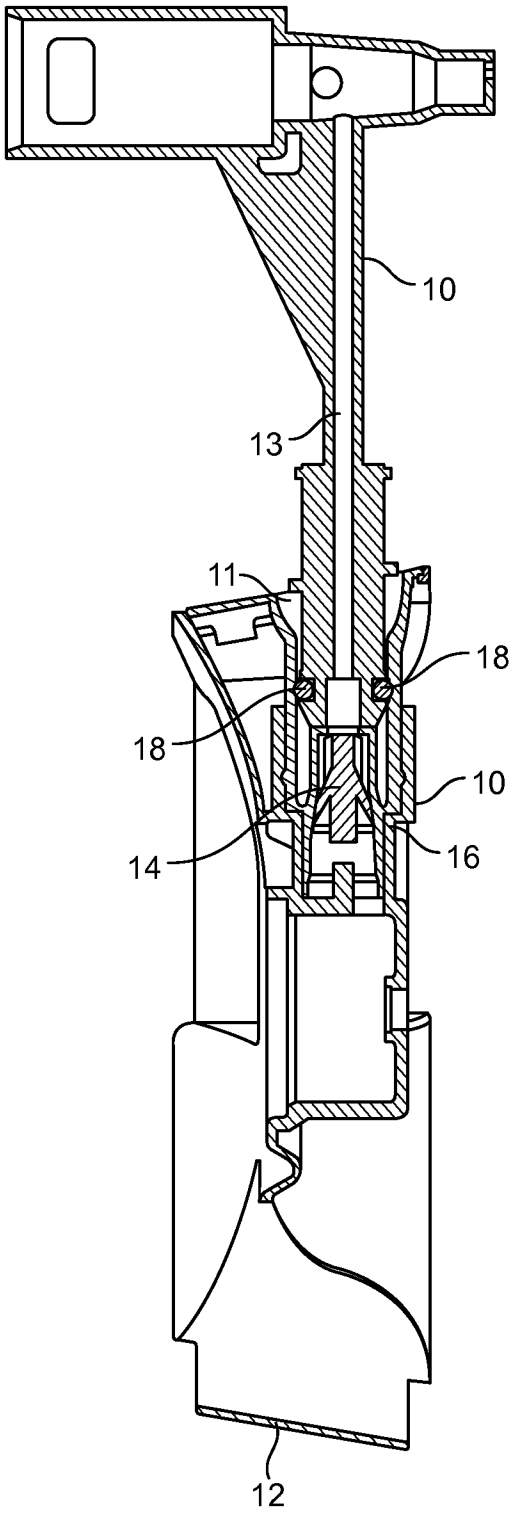


FIG. 6

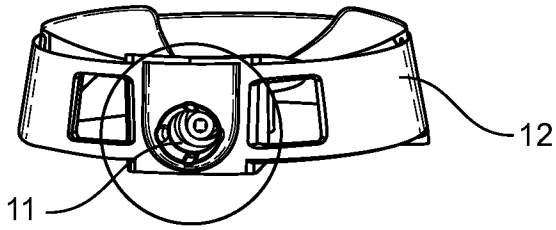


FIG. 7A

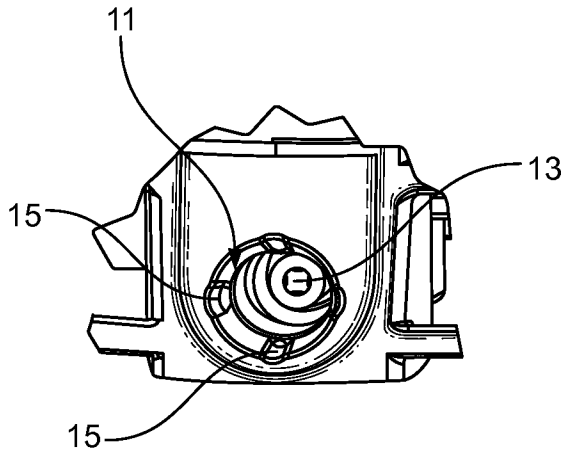


FIG. 7B

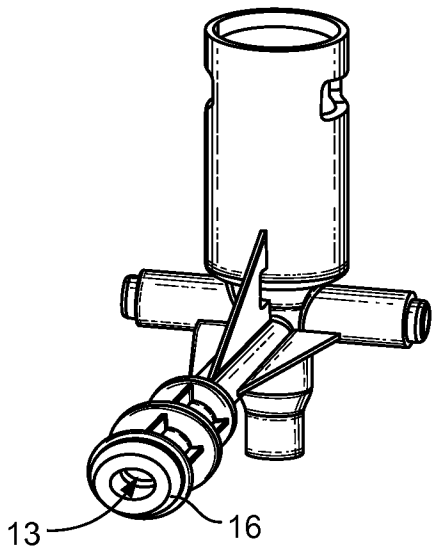


FIG. 8

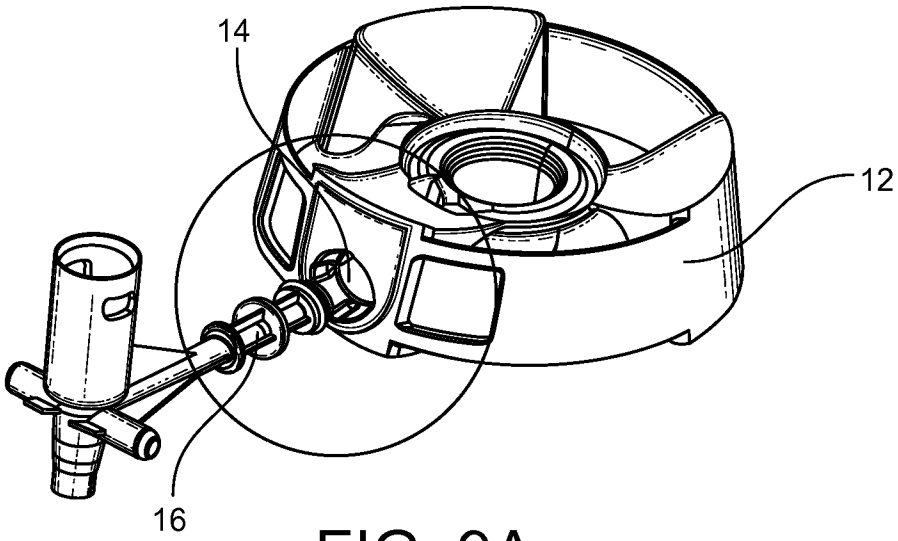


FIG. 9A

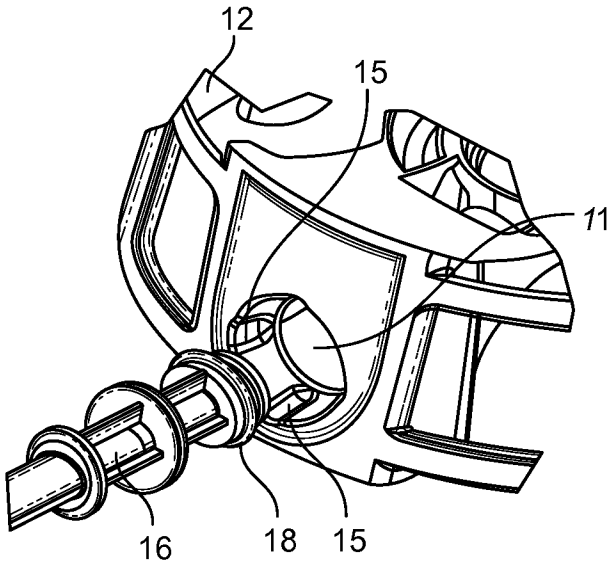


FIG. 9B

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2008/065022

A. CLASSIFICATION OF SUBJECT MATTER
INV. A23G9/28 B65D83/14 B65D85/78 B67D5/32

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)
A23G B65D B67D

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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2007/039167 A (AFA POLYTEK BV [NL]; MAAS WILHELMUS JOHANNES JOSEPH [NL]; HURKMANS PET) 12 April 2007 (2007-04-12) page 4, lines 13-4 figures 3,7,10,17	1-5
A	US 6 390 156 B1 (HETHERINGTON MICHAEL [CA] ET AL) 21 May 2002 (2002-05-21) figure 1 column 13, line 9	1-5
A	US 2007/108224 A1 (CAMPBELL IAIN J [GB] ET AL) 17 May 2007 (2007-05-17) paragraph [0020]; claim 1; figure 4	1-5
A	EP 0 509 967 A (CIABATTI ALDO DESIGN [IT] CIABATTI ALDO DESIGN [LI]) 21 October 1992 (1992-10-21) claim 1	1-5

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
9 February 2009	13/02/2009

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Groh, Björn

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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