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(54) **CONTAINER FOR CHEMICAL AGENTS WITH REPLACEABLE ELEMENT**

(57) A container for chemical agents with a replaceable element, preferably in the form of a bottle, comprising a main chamber designed to store a liquid, and the replaceable element (2) in the form of a dispensing cartridge, whereas the main chamber includes a body (1), a bottom part (6) with a female thread along with a sealing element, and a valve element, while the replaceable element (2) includes a chamber (3) that is ended at the top with a neck with a male thread, the replaceable element (2) comprises a pumping system including a base (4) and a movable pumping element (5).

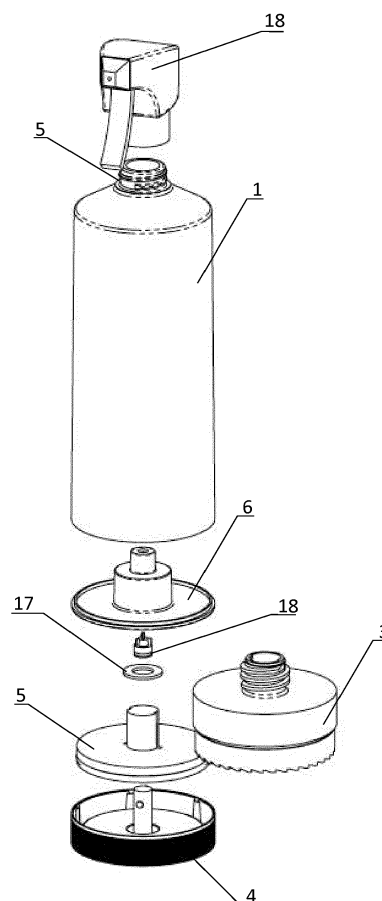


Fig. 2

Description

[0001] The invention relates to a container for chemical agents with a replaceable element in the form of a dispensing cartridge, in particular in the form of a bottle. In particular, the container for chemical agents according to the invention may be applied in the field of household and industrial chemistry. The container is designed both for business clients and mass retail market.

[0002] From European patent description EP1097882 a device is known, comprising a first container having a bottom end, provided at its bottom wall, in which is formed a through hole wherein are provided means for coupling with a second container, said second container being provided with a neck portion having an opening wherein are provided means for coupling with the said through hole of the first container. The coupling means comprise screw-threaded surfaces, while they can be provided with sealing means.

[0003] From European patent description EP2188205, a bottle is also known comprising two chambers and valve means between said chambers, where the liquids are mixed upon the application of pressure on the lower chamber. The valve means include a valve, a first notched snap-in connector for connecting the valve to the first chamber, and a second notched snap-in connector for connecting the valve to the replaceable second chamber.

[0004] From yet another international patent application WO9959895, a multi-chamber container is known, comprising a first container for receiving a first product component, and a second container for receiving a second product component, said containers being rotationally coupled with one another and each comprising a communication opening for the mutual exchange of liquids.

[0005] The known solutions do not allow strict and simple control of the volume of the agent introduced to the main container.

[0006] The purpose of the invention is to deliver a solution which eliminates this shortcoming and allows to gain a functional advantage resulting from a simpler and more precise dosage process and restriction of a possibility of refilling the replaceable element (cartridge) with undesirable chemical agent. Another purpose of the invention is to obtain durability ensuring full functionality of the cartridge over its entire life cycle.

[0007] A container for chemical agents with a replaceable element, preferably in the form of a bottle, according to the invention comprises a main chamber designed to store a liquid, and a replaceable element in the form of a cartridge. The main chamber has a body and a bottom part with a female thread which makes it possible to screw the replaceable element to the bottle. The inside of the main chamber features a gasket ensuring a leaktight connection of the container and the replaceable element, and a check valve which prevents the agent flowing from the bottle back to the cartridge's chamber. The container

according to the invention features the replaceable element comprising a chamber designed to hold the target volume of the chemical agent concentrate, and a pumping system comprising a base and a pumping element designed to dispense a specific volume of the concentrate placed in the chamber of the replaceable element.

[0008] Preferably, in the middle of the base being at the same a ring initiating the dosage process, there is a mandrel with a thread operating on a lipstick basis, onto which the mandrel of the pumping element is screwed. When the base is rotated against the chamber of the replaceable element, the pumping element is slid upwards and the liquid is pumped from the replaceable element's chamber to the main chamber of the container. The process is split into several identical steps that may be controlled by means of an adequate thread pitch (e.g. rotating the ring by an adequate angle is equivalent to one dose).

[0009] Preferably, the chamber of the replaceable element in its lower part has at least two tooth-shaped projections, while the base comprises at least two recesses that prevent the base from being rotated in the direction it is not intended. The tooth-like projections may be used to separate particular phases of the dosage process (the pumping system makes it possible to dispense several identical doses of a chemical agent to the bottle's chamber), e.g. on the basis of the number of "clicks" initiated by the tooth-like projections located in the lower part of the cartridge's chamber.

[0010] Preferably, the outside of the base has a fine vertical texture which provides for a firm grip by the user.

[0011] Preferably, on the side of the pumping element there is a recess wherein a gasket is placed which ensures leak-tightness between the piston and side walls of the main chamber of the replaceable element along which the piston moves during the dosage process.

[0012] Preferably, on the outside of the mandrel of the pumping element there are cut-outs designed to position the piston in the cartridge body's neck during dosage.

[0013] Preferably, the chamber of the replaceable element has at least one vertical protrusion along the inside of the neck, the said protrusion being designed to position the pumping element during the dosage process.

[0014] Preferably, the container is fitted with a sprayer connected with the main chamber of the container.

[0015] In another embodiment, the base is immovable against the chamber of the replaceable element, while the mandrel of the base may be rotated using a ring on the bottom of the base.

[0016] A cartridge dispensing liquid agents according to the invention has a chamber that is ended at the top with a neck with a male thread. The essence of the cartridge lies in a pumping system comprising a base and a movable pumping element, while the base has a mandrel with a male thread, and the pumping element has a mandrel with a female thread.

[0017] Preferably, the chamber of the cartridge has at least one vertical protrusion along the inside of the neck.

[0018] Preferably, the mandrel of the pumping element has at least one groove that corresponds to the vertical protrusion on the chamber's neck.

[0019] Preferably, the base is rotatable against the chamber which in its lower part has at least two tooth-shaped projections, while the base comprises at least two recesses that correspond to the said projections. The mandrel of the base is rotatable, and the base has a ring in its bottom part, while on the side of the pumping element, along its entire perimeter, there is a recess.

[0020] The use of the invention allows for simple multiple dispensing of an identical or repeated dose of the agent placed in the replaceable element. Due to the described solution, the volume of the agent introduced is predictable and adequate. Furthermore, dosage during rotation is dependent on the female thread pitch - as a result, thread replacement automatically changes dose volume.

[0021] These and other characteristics of the invention will be clear from the following description of a preferential form of embodiment, given as a non-restrictive example, with reference to the attached drawings, wherein: Fig. 1 - presents the view of the container after connecting the main chamber and the replaceable element, Fig. 2 - presents an exploded view of the container, Fig. 3 and 3a - present the view of the chamber of the replaceable element, Fig. 4 and 4a - present the view of the base of the replaceable element, Fig. 5 and 5a - present the view of the pumping element, Fig. 6 and 6a - present the top isometric view of the bottom of the main chamber of the container, and the cross-section of the bottom part of the main chamber of the container with the female thread.

[0022] The container according to the invention comprises a main chamber, including body 1 and bottom part 6 that is undetachably connected to body 1 of the container. Inside the bottom part 6 of the chamber there are: thread 19, gasket 17 and check valve 18. The replaceable element 2 (cartridge) comprises chamber 3, base 4 and pumping element 5. Chamber 3 of replaceable element 2 has in its upper part neck 7 with the male thread, and in its lower part - tooth-like projections 9. Inside neck 7, the replaceable element 2 has two vertical protrusions 8. Base 4 comprises recesses 10 and mandrel 11 with male thread 12 that corresponds to the female thread of mandrel 13 of pumping element 5. On the outside of mandrel 13 of pumping element 5, there are two grooves 16 that correspond to vertical protrusions 8 on neck 7 of chamber 3 of replaceable element 2. On the side of pumping element 5, along its entire perimeter, there is recess 15.

[0023] In another embodiment, cartridge 2 dispensing liquids or chemical agents comprises chamber 3, base 4 and pumping element 5. Chamber 3 of cartridge 2 has in its upper part neck 7 with the male thread, and in its lower part - tooth-like projections 9, essentially with a sharp angle of attack or a sharp clearance angle, which provides for rotation in one direction, and prevents from rotation to the other, by engaging against recesses 10.

Inside neck 7, cartridge 2 has two vertical protrusions 8. Base 4 comprises recesses 10 and mandrel 11 with male thread 12 that corresponds to the female thread of mandrel 13 of pumping element 5. On the outside of mandrel 13 of pumping element 5, there are two grooves 16 that correspond to vertical protrusions 8 on neck 7 of chamber 3 of cartridge 2. On the side of pumping element 5, along its entire perimeter, there is recess 15.

Claims

1. A container for chemical agents with a replaceable element, preferably in the form of a bottle, comprising a main chamber designed to store a liquid, and the replaceable element, whereas the main chamber has a body, a bottom part with a female thread along with a sealing element, and a valve element, while the replaceable element comprises a chamber that is ended at the top with a neck with a male thread, **characterised in that** the replaceable element (2) further comprises a pumping system including a base (4) and a movable pumping element (5).
2. The container according to claim 1, **characterised in that** the base (4) has a mandrel (11) with a male thread (12), while the pumping element (5) has a mandrel (13) with a female thread (14).
3. The container according to claim 1 or claim 2, **characterised in that** the chamber (3) of the replaceable element (2) has at least one vertical protrusion (8) along the inside of the neck (7).
4. The container according to claim 3, **characterised in that** on the outside of the mandrel (13) of the pumping element there is at least a groove (16) that corresponds to the vertical protrusion (8) on the neck (7) of the chamber (3) of the replaceable element (2).
5. The container according to any of the claims 1 - 4, **characterised in that** the base (4) is rotatable against the chamber (3) of the replaceable element (2), the said chamber (3) in its lower part having at least two tooth-shaped projections (9), whereas the base (4) comprises at least two recesses (10) that correspond to the said projections (9).
6. The container according to any of the claims 1 - 5, **characterised in that** the mandrel (11) of the base (4) is rotatable, while the base (4) has a ring in its bottom part.
7. The container according to any of the claims 1 - 6, **characterised in that** on the side of the pumping element (5), along its entire perimeter, there is a recess (15).

8. The container according to any of the claims 1 - 7, **characterised in that** inside the bottom part (6) of the container's main chamber there are: a gasket (17) and a check valve (18). 5
9. A cartridge dispensing liquid agents comprising a chamber that is ended at the top with a neck with a male thread, **characterised in that** it further comprises a pumping system including a base (4) and a movable pumping element (5), whereas the base (4) includes a mandrel (11) with a male thread (12), and the pumping element (5) has a mandrel (13) with a female thread (14). 10
10. The cartridge according to claim 9, **characterised in that** the chamber (3) has at least one vertical protrusion (8) along the inside of the neck (7). 15
11. The cartridge according to claim 9 or claim 10, **characterised in that** on the outside of the mandrel (13) of the pumping element there is at least a groove (16) that corresponds to the vertical protrusion (8) on the neck (7) of the chamber (3). 20
12. The cartridge according to any of the claims 9 - 11, **characterised in that** the base (4) is rotatable against the chamber (3), the said chamber (3) in its lower part having at least two tooth-shaped projections (9), and the base (4) comprises at least two recesses (10) that correspond to the said projections. 25 30
13. The cartridge according to any of the claims 9 - 12, **characterised in that** the mandrel (11) of the base (4) is rotatable, and the base (4) has a ring in its bottom part. 35
14. The cartridge according to any of the claims 9 - 13, **characterised in that** on the side of the pumping element (5), along its entire perimeter, there is a recess (15). 40

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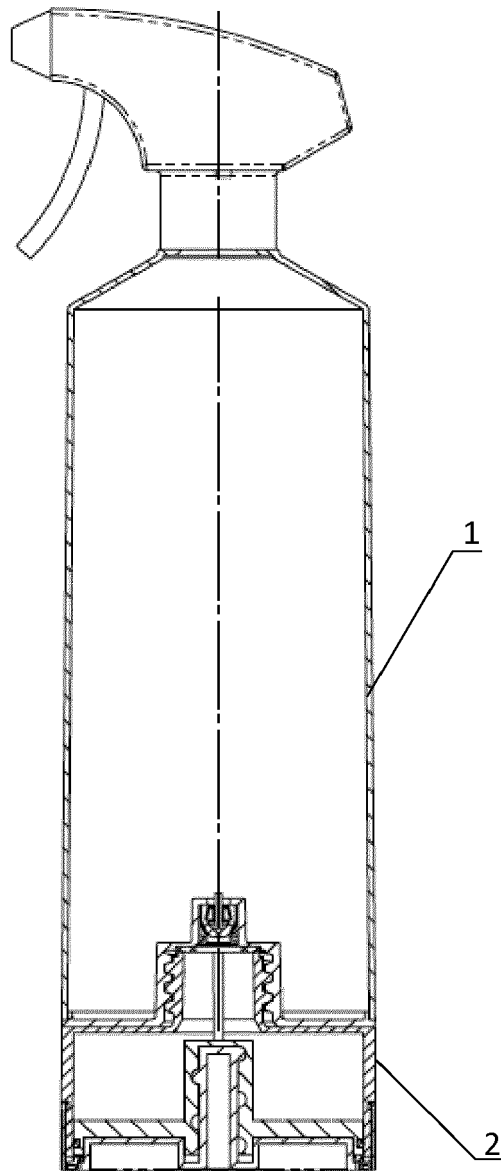


Fig. 1

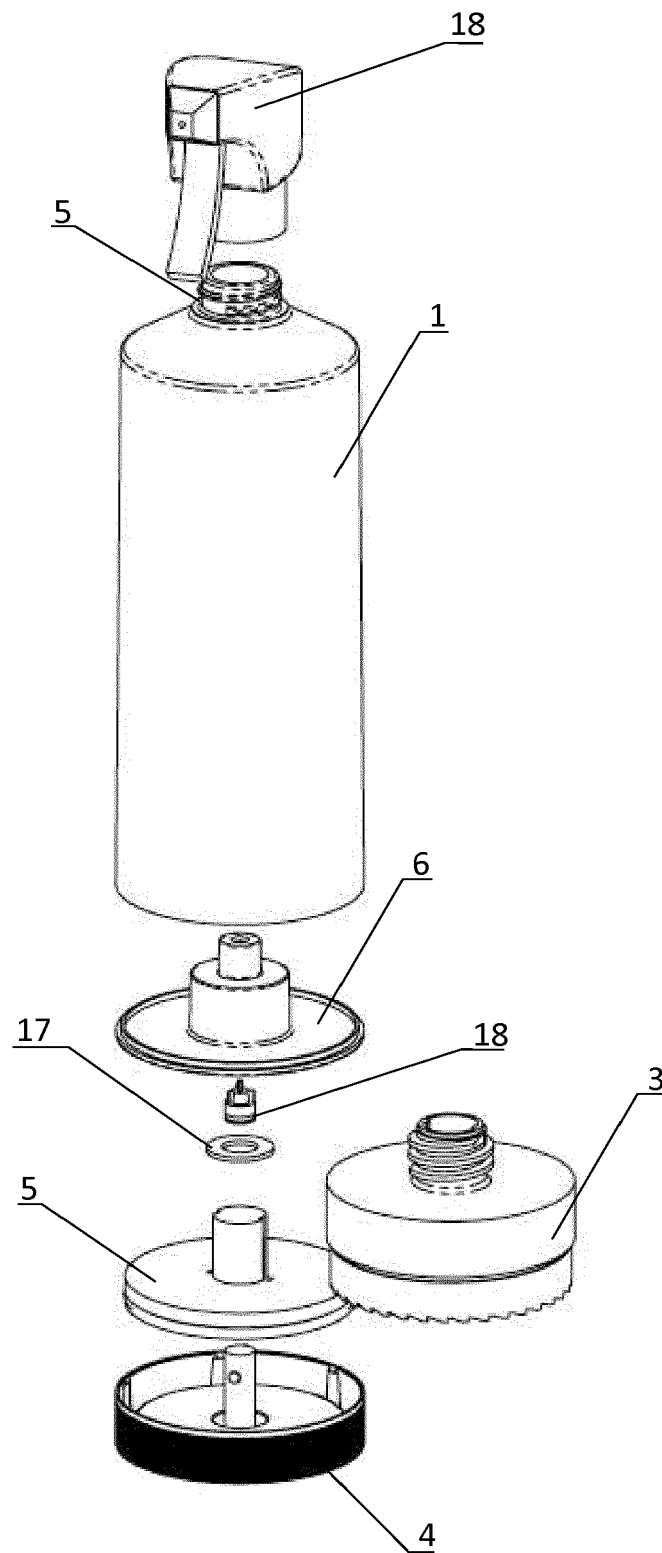


Fig. 2

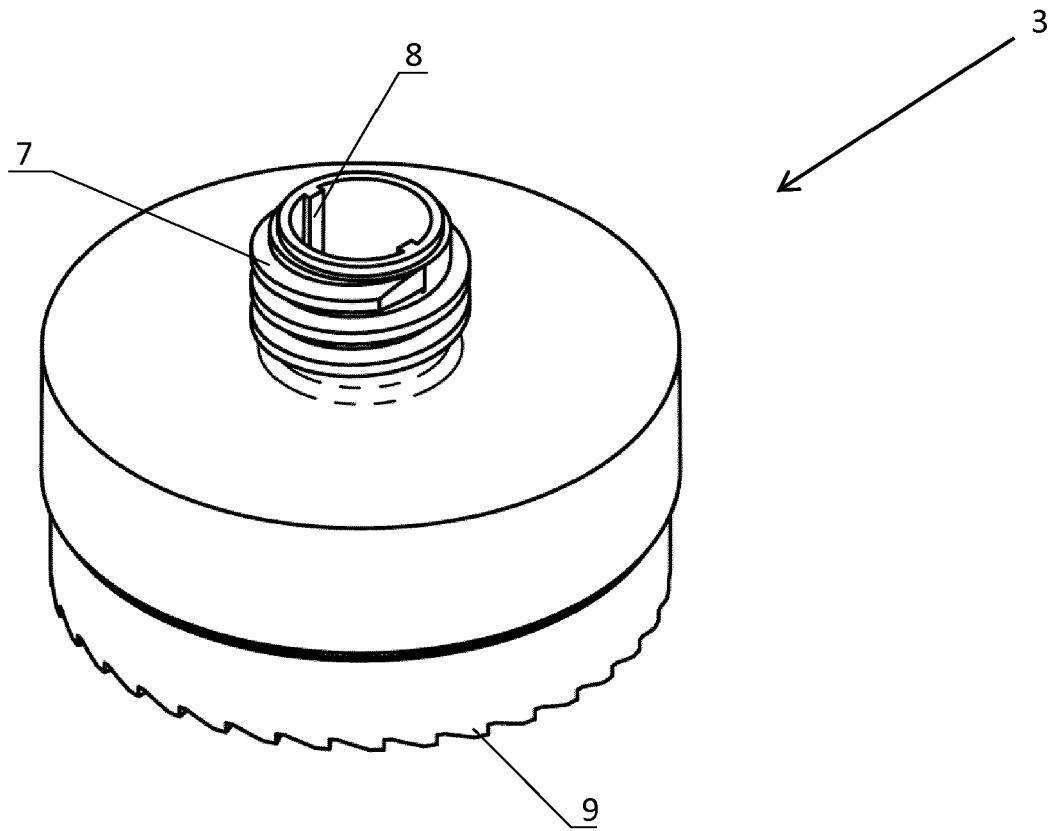


Fig. 3

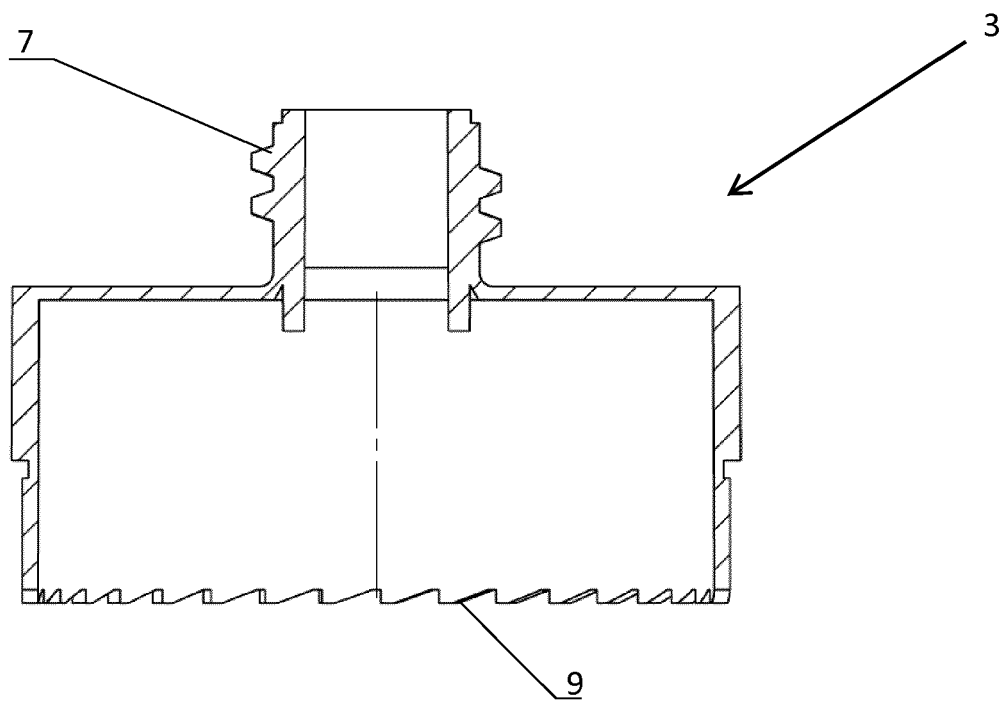


Fig. 3a

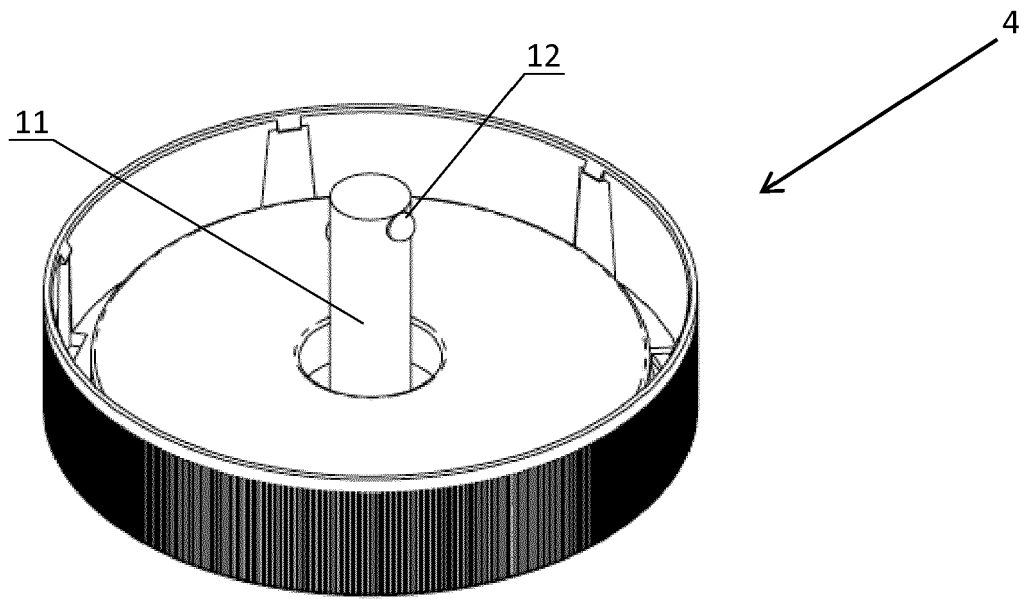


Fig. 4

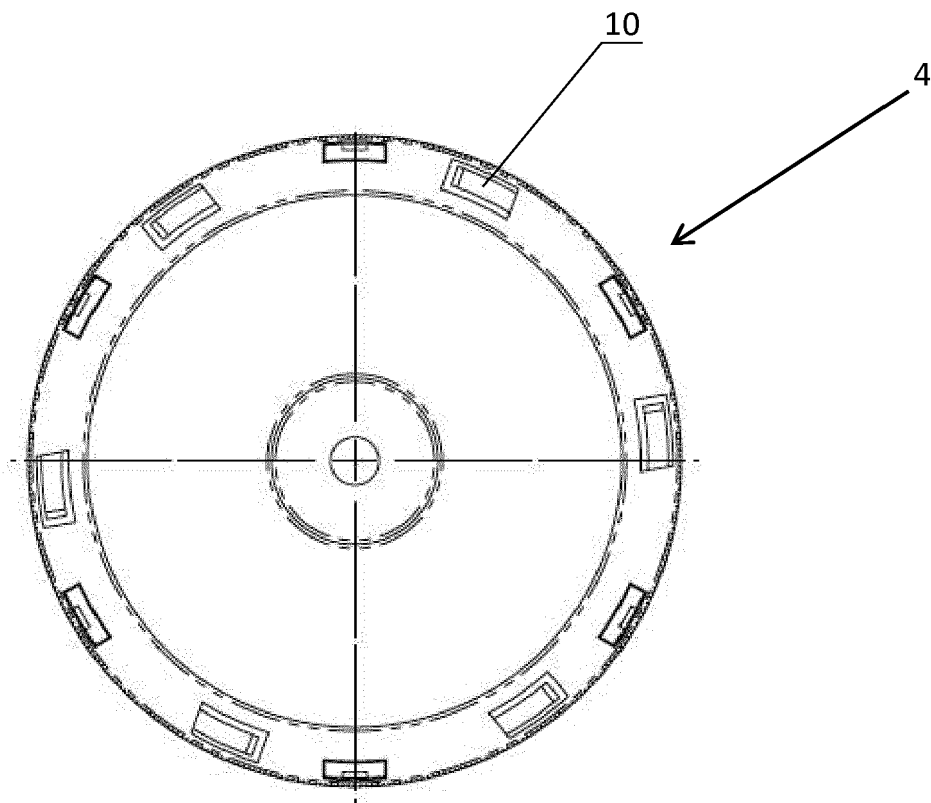


Fig. 4a

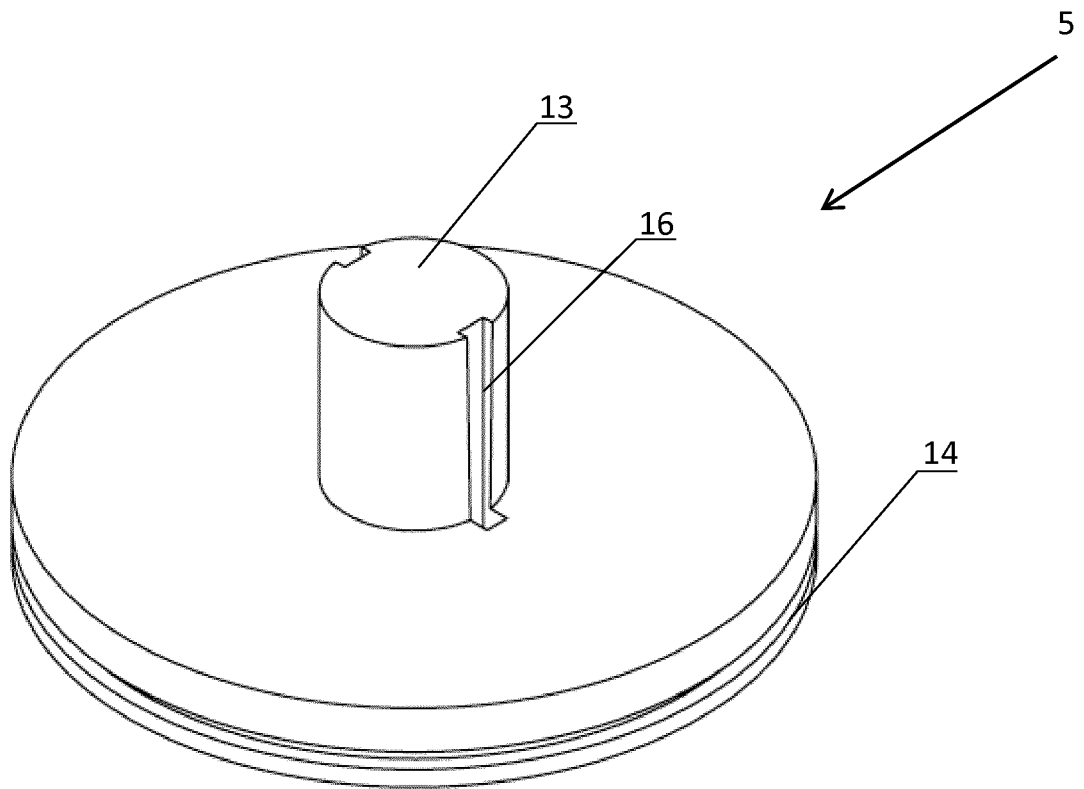


Fig. 5

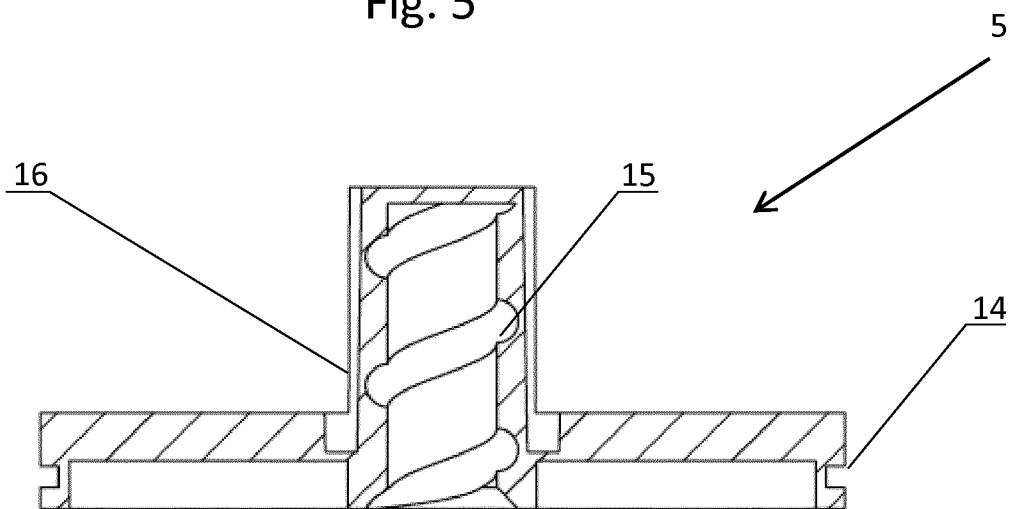


Fig. 5a

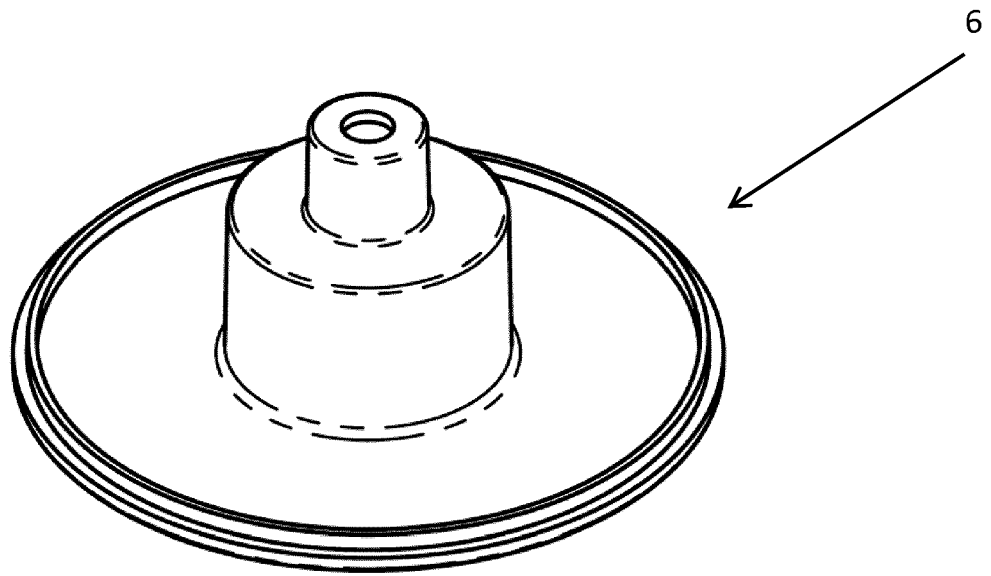


Fig. 6

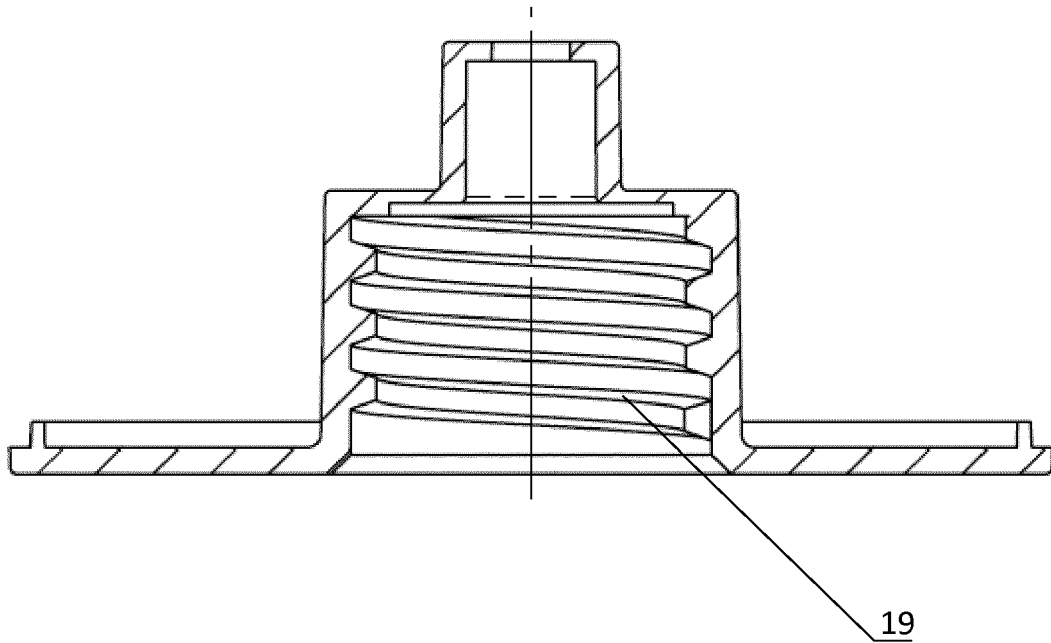


Fig. 6a



EUROPEAN SEARCH REPORT

Application Number
EP 16 18 2909

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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	US 2006/113201 A1 (MICIC MILOJKO [US] ET AL) 1 June 2006 (2006-06-01) * abstract; figure 2b * * paragraph [0038] - paragraph [0039] * -----	1-4, 6-11, 13, 14	INV. B65D81/32 B05B11/00
			TECHNICAL FIELDS SEARCHED (IPC) B65D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 14 December 2016	Examiner Moroncini, Alessio
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14-12-2016

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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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