



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**18.09.2013 Bulletin 2013/38**

(51) Int Cl.:  
**B67D 3/04 (2006.01)**

(21) Application number: **12188637.8**

(22) Date of filing: **16.10.2012**

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**  
 Designated Extension States:  
**BA ME**

(72) Inventor: **Castaldi, Gabriele**  
**300384 Tianjin (CN)**

(74) Representative: **Zanellato, Gianluca**  
**Giambrocono & C. S.p.A.**  
**Via Rosolino Pilo, 19/B**  
**20129 Milano (IT)**

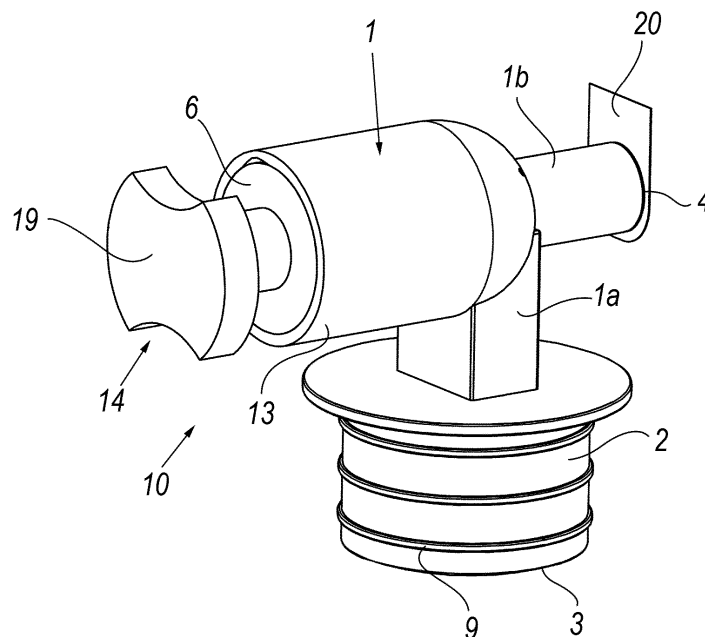
(30) Priority: **13.03.2012 CN 201220092397 U**

(71) Applicant: **FLEXBO (TIANJIN) LOGISTIC SYSTEM HI-TECH CO., LTD**  
**Jinnan District**  
**300357 Balitai Town Tianjin (CN)**

(54) **Valve for discharging liquids from containers**

(57) A valve for discharging liquids from containers comprises a valve body (1) having an inlet opening (3) and an outlet opening (4) to define a transit conduit (12) for a liquid; an adjustment element (15) operatively positioned

along said transit conduit (12) to maintain it selectively open or closed; the adjustment element (15) is automatically switchable from an open configuration of the transit conduit (12) to a closed configuration of the transit conduit (12).



**Fig. 1**

## Description

**[0001]** The present invention relates to a valve for discharging liquids from containers.

**[0002]** In particular, the present invention finds application in containers of "bag-in-box" type or of rigid type.

**[0003]** More generally, the present invention can also relate to rigid containers, usually used for water or similar liquids, or to other container types.

**[0004]** Valves for discharging liquids from bag-in-box or other container types are known characterised by a large number of parts, some constructionally costly, in particular to ensure air passage without container perforation.

**[0005]** Valves with air passage also exist consisting of numerous parts and with a cylindrical gasket, which are opened by rotation.

**[0006]** The valves of known type present certain drawbacks.

**[0007]** Firstly, known valves have to be opened and closed manually by a user. This makes them uncomfortable to use.

**[0008]** If the user has reduced manipulable capacity, for example in the case of a handicapped or elderly person, their use becomes extremely difficult.

**[0009]** Moreover, known valves are costly and difficult to produce as they are composed of a large number of parts.

**[0010]** In this context, an object of the present invention is to propose a valve for discharging liquids from a container which overcomes the drawbacks of the known art.

**[0011]** A particular object of the present invention is to propose a valve for discharging liquids from a container which is of simple and economical construction.

**[0012]** A further object of the present invention is to propose a valve for discharging liquids from a container which is easy and comfortable to use.

**[0013]** The stated technical aim and the specified objects are substantially attained by a valve for discharging liquids from a container comprising the technical characteristics expounded in one or more of the accompanying claims.

**[0014]** Further characteristics and advantages of the present invention will be more apparent from the indicative and therefore non-limiting description of a preferred but non-exclusive embodiment of a valve for discharging liquids from a container, as illustrated in the accompanying drawings, in which:

- Figure 1 is a perspective view of a valve for discharging liquids from a container in accordance with the present invention;
- Figure 2 is a perspective view of the valve of Figure 1 mounted on a container;
- Figure 3 is a lateral section through the valve of Figure 1;
- Figure 4 is a partly sectional view of the valve of Figure 1;

- Figure 5 is a lateral section through a variant of the valve according to the present invention.

**[0015]** With reference to the accompanying figures, the reference numeral 10 indicates a valve for discharging liquids from a container 11 in accordance with the present invention.

**[0016]** The valve 10 discharges the liquid by the force of gravity. However, the valve 10 can also operate when the container is subjected to positive pressure generated by forces other than gravity. The valve 10 can evidently be constructed in different shapes, geometries and dimensions, and be used for different types of containers.

**[0017]** As shown in Figure 1, the discharge valve 10 comprises a valve body 1 presenting a fluid inlet opening 3 and a fluid outlet opening 4.

**[0018]** In greater detail, a fluid transit channel 12 is defined from the inlet opening 3 to the outlet opening 4 in the valve body 1. This transit channel 12 is substantially of L-shape.

**[0019]** In this respect, the valve body 1 presents a first tubular portion 1 a and a second tubular portion 1 b which are connected together perpendicularly.

**[0020]** The valve body 1 also comprises a tube piece 2 coaxially fixed to the first tubular portion 1 a and required for coupling the valve 1 to the container 11.

**[0021]** The first tubular portion 1 a, the second tubular portion 1 b and the tube piece 2 present respective cross-sections which are substantially circular. In alternative embodiments, the cross-sections can be of oval, square or generally polygonal shape.

**[0022]** According to that illustrated, the diameter of the tube piece 2 is greater than the diameter of the first tubular portion 1 a.

**[0023]** The inlet opening 3 is defined on the tube piece 2, while the outlet opening 4 is defined on the second tubular portion 1 b.

**[0024]** The transit conduit 12 is defined at least by the tube piece 2, by the first tubular portion 1 a and by the second tubular portion 1 b.

**[0025]** The valve body 1 comprises fixing rings 9 such that the discharge valve 10 can be firmly fixed to the container 11 or to other liquid containers such that the inlet opening 2 of the body 1 of the valve 10 communicates with the fluid to be discharged.

**[0026]** For this reason, the fixing rings 9 are disposed on the outside of the tube piece 2.

**[0027]** In particular, those particular fixing rings 9 shown in the figures consist of protuberances located close to the inlet opening 3. These rings are formed such as to ensure sealing capacity between the outside of the valve body and the inside of the container discharge neck when mounted by pressing.

**[0028]** There are other possible ways of mounting and sealing in addition to or as an alternative to those described. For example, O-rings or gaskets can be applied to the valve 10 or to a discharge neck of the container 11.

**[0029]** The valve 10 also comprises an adjustment el-

ement 15 operatively positioned along the transit conduit 12 to maintain it selectively open or closed. In other words, the adjustment element 15 is positioned between the first tubular portion 1 a and the second tubular portion 1 b.

**[0030]** The adjustment element 15 can be switched between a closed configuration in which it closes the port of the transit conduit 12, so preventing fluid exit, and an open configuration in which it opens the port of the transit conduit 12, so enabling fluid exit. In detail, the adjustment element 15 automatically switches from the open configuration to the closed configuration. In other words, once a user opens the adjustment element 15, this latter returns to the closed configuration without any action by the user.

**[0031]** The adjustment element 15 comprises a valving element 16 movable at least in part along a direction substantially coinciding with a longitudinal axis of the second tubular portion 1b. In detail, the valving element 16 is a cylindrical piece which moves into and out of the second tubular portion 1 b to define respectively the closed configuration and open configuration of the adjustment element 15. Specifically, the diameter of the valving element 16 coincides with the inner diameter of the second tubular portion 1 b.

**[0032]** The adjustment element 15 also comprises a deformable portion 7 fixed to the valving element 16.

**[0033]** The deformable portion 7 is switchable between an undeformed configuration, assumed when the adjustment element 15 is in the closed configuration, and a deformed configuration, assumed when the adjustment element 15 is in the open configuration.

**[0034]** In other words, when the adjustment element 15 is closed, the deformable portion 7 is undeformed. When the user opens the adjustment element 15, the deformable portion 7 deforms because of the displacement of the valving element 16. Subsequently, the deformable portion 7 tends to return to its undeformed configuration by elastic return. In this manner, the adjustment element 15 automatically switches from the open configuration to the closed configuration, as stated above.

**[0035]** It should be noted that when the deformable portion 7 is in the undeformed configuration, it presents a rigidity such as to maintain the valving element 16 stably within the second tubular portion 1b. In other words, when in the undeformed configuration the deformable portion 7 presents a rigidity sufficient to maintain the adjustment element 15 in the closed configuration.

**[0036]** The user must therefore overcome this residual rigidity to open the valve, by bringing the adjustment element into the open configuration.

**[0037]** The deformable portion 7 is disposed within a cylindrical jacket 13 formed in one piece with the first tubular portion 1 a and second tubular portion 1 b.

**[0038]** In detail, the deformable portion 7 is substantially of cup shape and is coaxially fixed to the valving element 16. The deformable portion 7 is disposed such that its concavity faces in the opposite direction to the

second tubular portion 1 b.

**[0039]** The deformable portion 7 presents a peripheral annular sidepiece 7a which is housed in an annular groove 17 provided on the inside of the cylindrical jacket 13. In this manner, the sidepiece 7a remains fixed while the remainder of the deformable portion 7 deforms when the valving element 16 is extracted from the second tubular portion 1 b.

**[0040]** An actuator 6 is connected to the adjustment element 15 for its movement. In particular, the actuator 6 is connected to the valving element 16. Advantageously, the actuator 6 is integral with the valving element 16. The actuator 6 is inserted into the cylindrical jacket 13.

**[0041]** In detail, the actuator 6 is substantially of cylindrical shape and is coupled to the cylindrical jacket 13 by a screw thread. In particular, Figure 4 shows the thread 18 formed on the outer surface of the actuator 6.

**[0042]** In other words, the actuator 6 rotates within the cylindrical jacket 13, advancing or retracting.

**[0043]** In a non-illustrated embodiment, the adjustment element 15 can assume a further stable open configuration. In other words, in this configuration the adjustment element 15 remains open without user intervention being required.

**[0044]** Stabilization means are therefore provided to enable this further configuration.

**[0045]** By way of example, these stabilization means can comprise a projection provided on the actuator 6 to interfere with a corresponding groove provided on the inside of the cylindrical jacket 13, or vice versa.

**[0046]** Operationally, to achieve this configuration, the user rotates the actuator as far as an end position in which the projection engages the groove. To return the adjustment element 15 to the closed configuration, the protuberance has merely to be forcibly disengaged from the groove, for the adjustment element 15 to then automatically assume the closed configuration.

**[0047]** Advantageously, the deformable portion 7, the valving element 16 and the actuator 6 are formed in one piece to define the adjustment element 15. Consequently, these components can be produced simultaneously by an injection moulding process with positive economic advantages.

**[0048]** The adjustment element 15 can be formed of PP, PE, PA, POE or other thermoplastic material. This enables high flexibility in determining the valve closure force, as its geometry and thickness have merely to be slightly modified in order to achieve a greater or lesser closure force.

**[0049]** Moreover preferably, the deformable portion 7 is formed of the same material as the valve body 1 to enable the product to be more easily recycled.

**[0050]** A gripping member 14 is rigidly connected to the actuator 6 to enable a user to rotate the actuator 6.

**[0051]** In the embodiment shown in Figures 1-4, the gripping member 14 is formed in one piece with the actuator 6.

**[0052]** In a modified embodiment, not shown, the grip-

ping member is connected to the actuator 6 by a screw thread.

[0053] According to that illustrated, the gripping member 14 is an ergonomic disc 19 of substantially circular shape.

[0054] The shape of the ergonomic disc 19 can be changed to adapt it to the requirements of different users.

[0055] A seal 20 is attached to the valve body 1 to close the outlet opening 4.

[0056] In an alternative embodiment illustrated in Figure 5, elastic means 21 positioned between the cylindrical jacket 13 and the actuator 6 are operative to urge the actuator 6 towards the second tubular portion 1 b. This aids and increases the action of the deformable portion 7 to enable automatic passage of the adjustment element 15 from the open configuration to the closed configuration.

[0057] In particular, the elastic means 21 comprise a spring 22 positioned between the actuator 6 and an abutment shoulder 23 provided on the cylindrical jacket 13.

[0058] In this case, the ergonomic disc 19 comprises a shaft 24 connecting to the actuator 6 and coupled thereto by a screw thread.

[0059] In a variant (not illustrated) of the embodiment of Figure 5, the valve 1 does not comprise elastic means interposed between the abutment shoulder 23 and the actuator 6.

[0060] Again in this case, the ergonomic disc 19 comprises a shaft 24 connecting to the actuator 6 and coupled thereto by a screw thread.

[0061] The invention so described attains the proposed objects.

[0062] In this respect, the valve according to the present invention is composed of a small number of parts. It is therefore easy and economical to construct. Moreover, it should be noted that once the valve is open, it returns to its closed configuration automatically without any other action being required.

## Claims

1. A valve for discharging liquids from containers, comprising:

- a valve body (1) having an inlet opening (3) and an outlet opening (4) to define a transit conduit (12) for a liquid;

- an adjustment element (15) operatively positioned along said transit conduit (12) to maintain it selectively open or closed;

**characterised in that** the adjustment element (15) is automatically switchable from an open configuration of the transit conduit (12) to a closed configuration of the transit conduit (12).

2. A valve as claimed in claim 1, **characterised in that** said adjustment element (15) comprises a deform-

able portion (7) switchable between an undeformed configuration, when the adjustment element (15) is in the closed configuration, and a deformed configuration, assumed when the adjustment element (15) is in the open configuration.

3. A valve as claimed in claim 2, **characterised in that** said valve body (1) presents a first tubular portion (1 a) and a second tubular portion (1 b) which are connected together perpendicularly; said adjustment element (15) further comprising a valving element (16) fixed to said deformable portion (7) and movable into and out of the second tubular portion (1 b).

4. A valve as claimed in any one of the preceding claims, **characterised by** further comprising an actuator (6) connected to said adjustment element (15) for its movement; said actuator (6) being associated with said valve body (1) by a screw thread.

5. A valve as claimed in any one of the preceding claims, **characterised in that** said deformable portion (7) when in the undeformed configuration presents a rigidity sufficient to maintain the adjustment element (15) in the closed configuration.

6. A valve as claimed in claim 4 or 5, **characterised in that** said actuator (6) and said adjustment element (15) are formed in one piece.

7. A valve as claimed in claim 6, **characterised by** also comprising a gripping member (14) connected to the actuator (6) to enable a user to rotate it; said gripping member (14) preferably comprising an ergonomic disc (19).

8. A valve as claimed in claim 7, **characterised in that** said gripping member (14) is connected to said actuator (6) by a screw thread.

9. A valve as claimed in any one of the preceding claims, **characterised by** further comprising a seal (20) fixed to the valve body (1), to close said outlet opening (4).

10. A valve as claimed in any one of claims from 3 to 9, **characterised in that** said deformable portion (7) presents a cup shape and is fixed coaxially to said valving element (16).

11. A valve as claimed in claim 10, **characterised in that** said valving element (16) presents a substantially cylindrical shape with a diameter substantially equal to the inner diameter of the second tubular portion (1 b).

12. A valve as claimed in any one of the preceding claims, **characterised in that** said valve body (1)

also comprises a cylindrical jacket (13) in which said actuator (6) is housed.

13. A valve as claimed in claim 12, **characterised by** comprising elastic means (21) operatively disposed between said cylindrical jacket (13) and said actuator (6) to urge said actuator (6) towards said second tubular portion (1b).
14. A valve as claimed in any one of the preceding claims, **characterised in that** said adjustment element (15) can also be switched from said open configuration to a further stable open configuration.

5

10

15

20

25

30

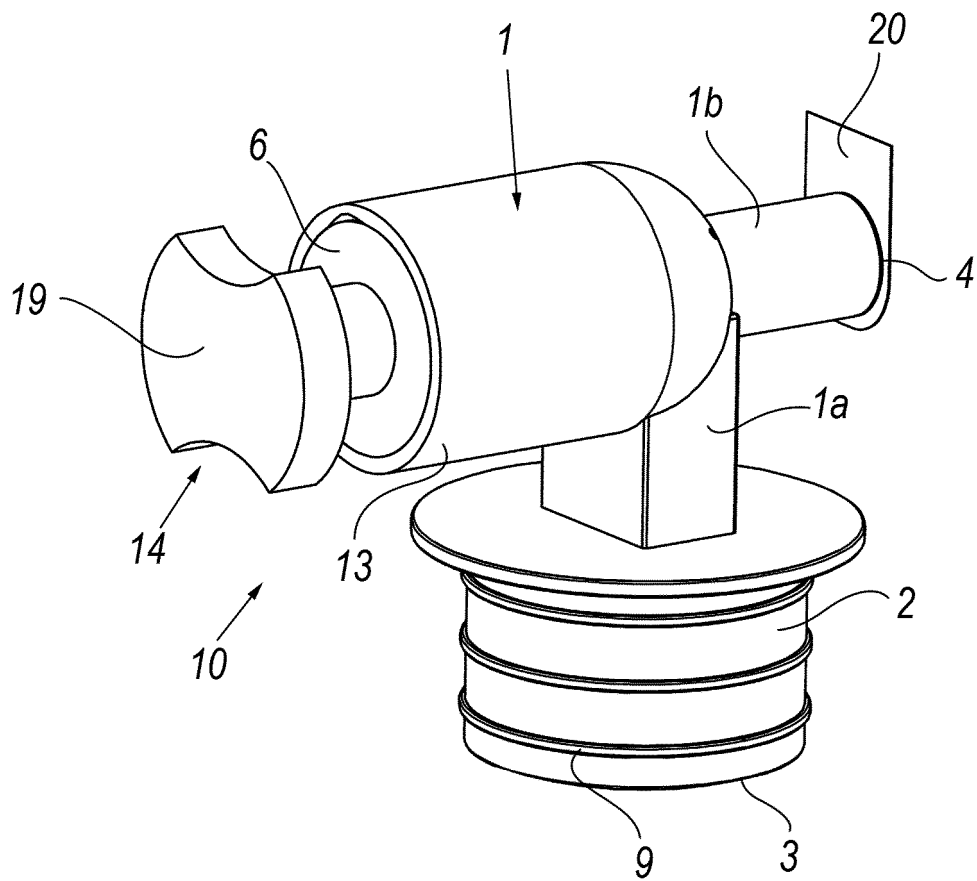
35

40

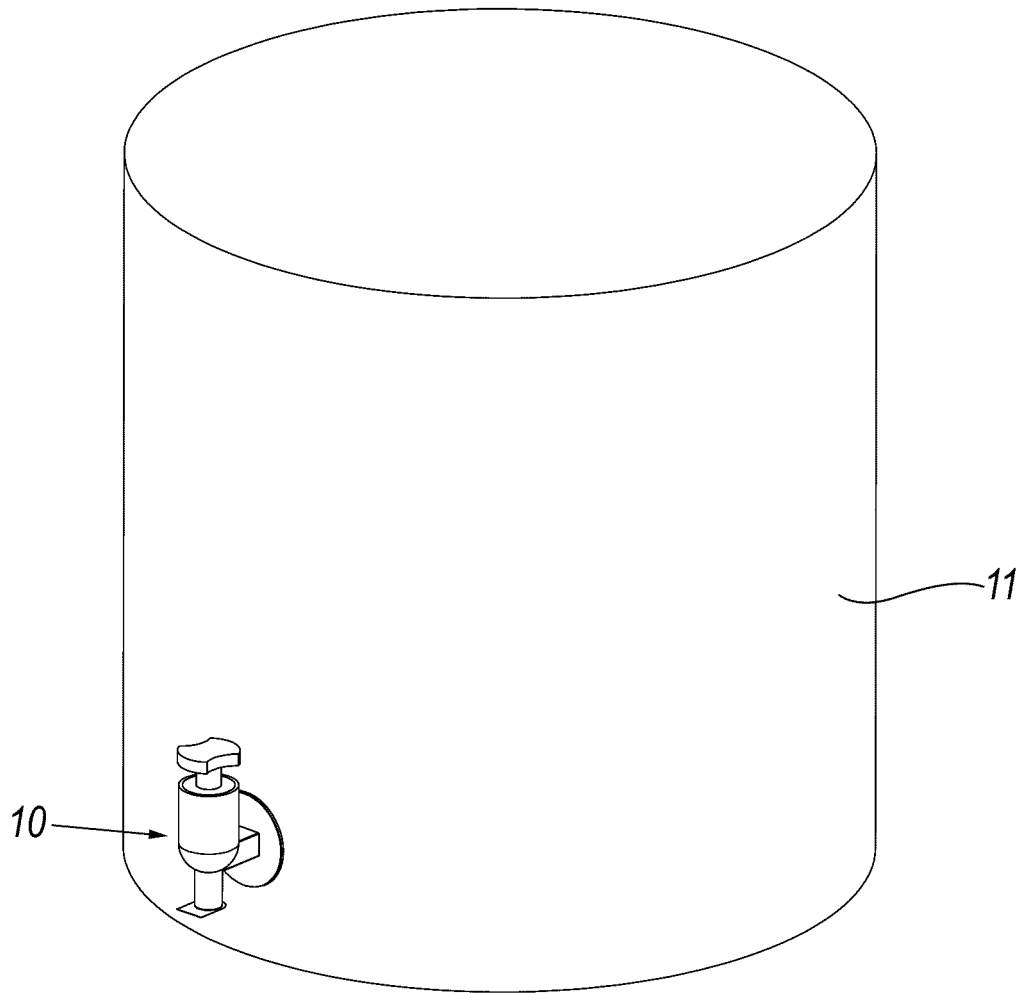
45

50

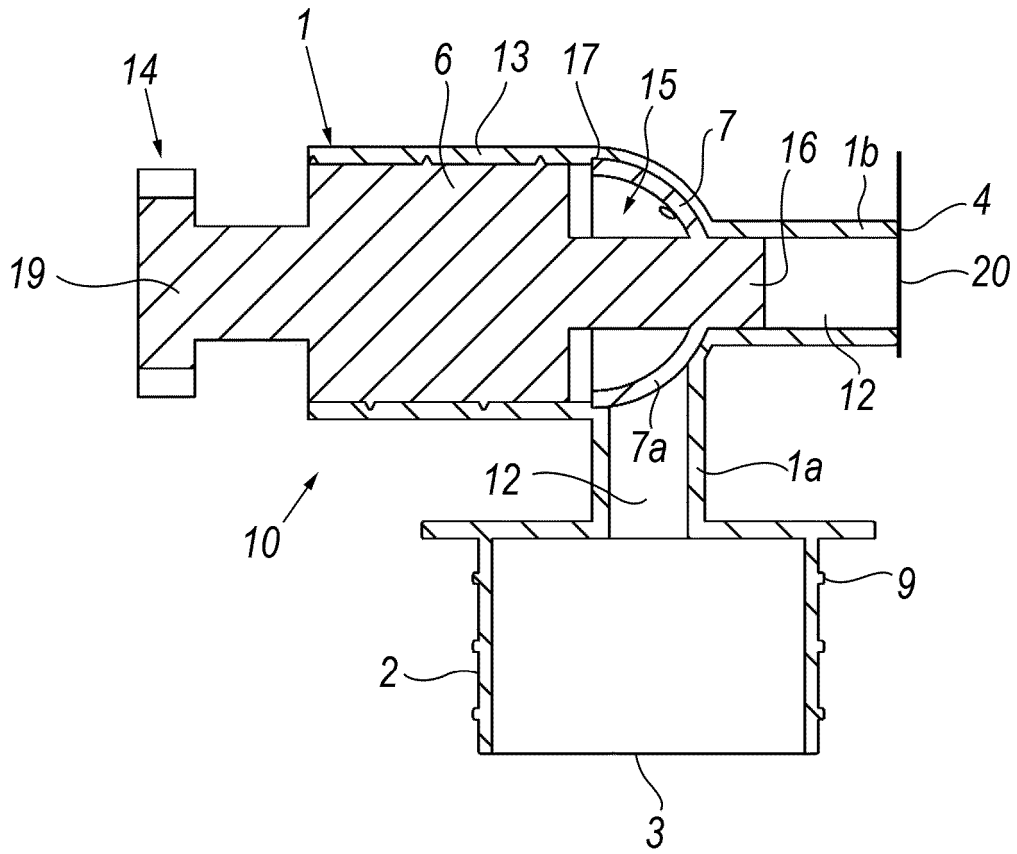
55



**Fig. 1**

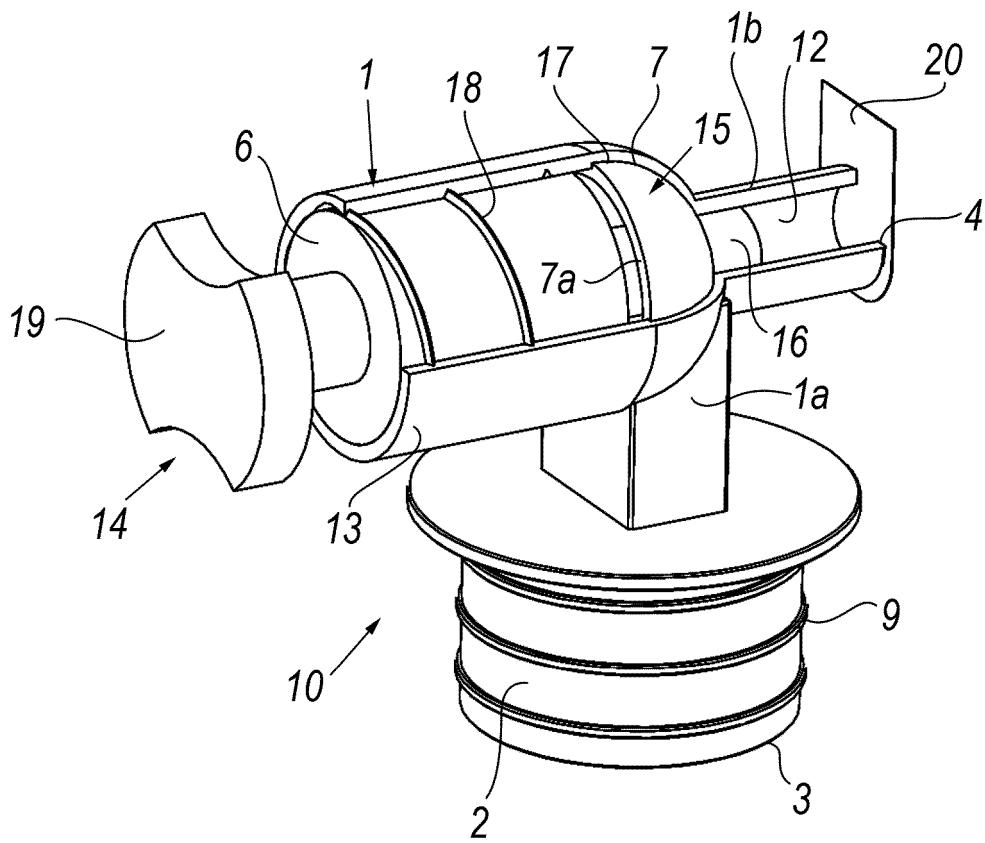


***Fig. 2***

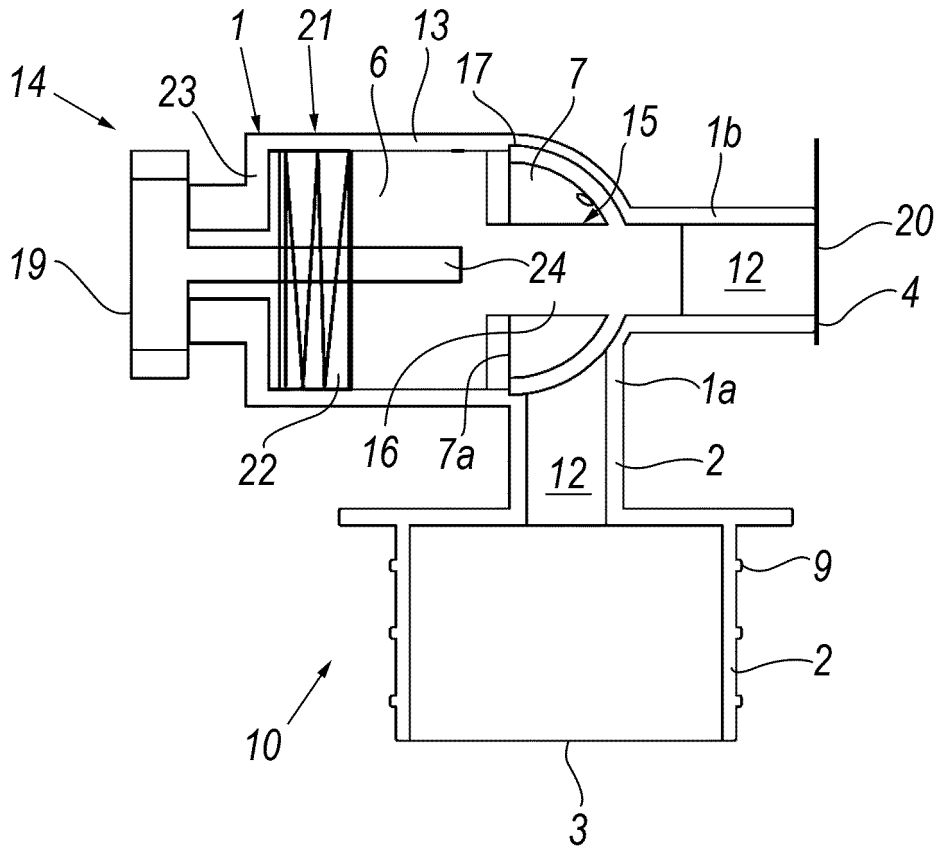


**Fig. 3**





**Fig. 4**



**Fig. 5**



EUROPEAN SEARCH REPORT

Application Number  
EP 12 18 8637

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 6 045 119 A (ERB RENE [FR]) 4 April 2000 (2000-04-04)	1-8, 10-14	INV. B67D3/04
Y	* the whole document *	9	
X	EP 0 432 070 A1 (FLEXTAINER S A R L [FR] WICOTOP [FR]) 12 June 1991 (1991-06-12) * abstract; figures 1-4 *	1-3,13	
X	US 549 678 A (J. A. MILLER) 12 November 1895 (1895-11-12) * the whole document *	1	
Y	GB 2 169 061 A (CORRUGATED PROD LTD) 2 July 1986 (1986-07-02) * page 2, line 38 - line 40; figures 1-2 *	9	
			TECHNICAL FIELDS SEARCHED (IPC)
			B67D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		1 February 2013	Ferrien, Yann
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

1  
EPO FORM 1503 03.82 (P04C01)

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

EP 12 18 8637

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

01-02-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6045119 A	04-04-2000	AT 186035 T	15-11-1999
		AU 724099 B2	14-09-2000
		AU 2512397 A	17-10-1997
		CA 2261333 A1	02-10-1997
		DE 69700703 D1	02-12-1999
		DE 69700703 T2	27-04-2000
		EP 0889846 A1	13-01-1999
		ES 2140229 T3	16-02-2000
		FR 2746890 A1	03-10-1997
		JP 3519741 B2	19-04-2004
		JP 2000515461 A	21-11-2000
		NZ 332335 A	25-02-1999
		US 6045119 A	04-04-2000
		WO 9735802 A1	02-10-1997
		EP 0432070 A1	12-06-1991
DE 69010465 T2	23-02-1995		
EP 0432070 A1	12-06-1991		
ES 2060119 T3	16-11-1994		
FR 2655403 A1	07-06-1991		
US 549678 A	12-11-1895	NONE	
GB 2169061 A	02-07-1986	NONE	

EPO FORM P0459

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