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(54) **Cylinder assembly and dispensing pump using the same**

(57) A cylinder assembly (100) including a first body (10), a second body (20) and a coupling mechanism (30). The first body (10) is of a tubular shape and has a valve set (11) at a bottom end thereof. The valve set (11) includes a valve (111), an elastomer (112) and a passage (113). The second body (20) has a ring (21) with an outline fitting the valve (111). The coupling mechanism (30) includes a first coupling piece (31) disposed on the first body and a second coupling piece (32) disposed on the second body and is used for detachably coupling the first and second bodies. The valve (111) is located in an aperture of the ring (21), the elastomer (112) flexibly supports the valve (111) to abut against the ring and seal up the aperture or retracts to open the aperture for allowing liquid to flow into the first body through the passage (113).

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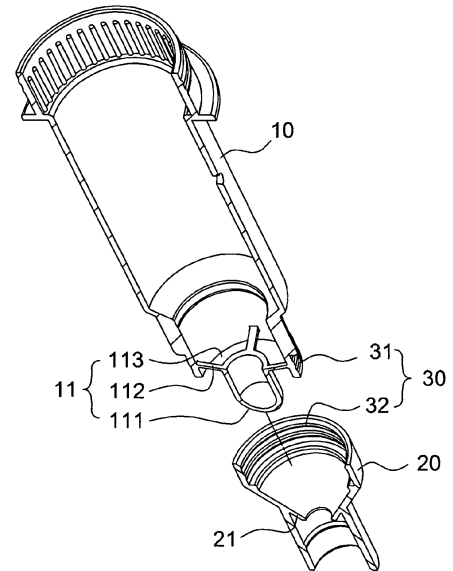


FIG.1A

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Description

BACKGROUND OF THE INVENTION

(1) FIELD OF THE INVENTION

[0001] The invention relates to dispensers for gels or viscous liquids, particularly to dispenser pumps for rigid bottles.

(2) DESCRIPTION OF THE PRIOR ART

[0002] Typical liquid dispenser pumps for bottles usually utilize vacuum suction resulting from a depressing action associating with restoration of a built-in spring to drain liquid from the bottle.

[0003] To generate a vacuum, the dispenser pump must be disposed with a steel ball. The steel ball can temporarily close the liquid passage while a pressing head is being depressed and open the liquid passage while the pressing head is elevated by the spring. As a result, the liquid can be drained out of the bottle.

[0004] A structure taught by U.S. patent No. 7,025,233 uses a flexible valve. But the flexible valve still needs to be inserted into the cylinder and must need a protrusion to fix in the cylinder. Due to a limited inner space of the dispenser pump, the insertion process of the flexible valve is so complicated. This is a real problem to be solved.

SUMMARY OF THE INVENTION

[0005] An object of the invention is to provide a cylinder assembly which can simplify the manufacturing process by means of elimination of a steel ball or any other independent valve.

[0006] To accomplish the above object, the cylinder assembly of the invention includes a first body, a second body and a coupling mechanism. The first body is of a tubular shape and has a valve set at a bottom end thereof. The valve set includes a valve, an elastomer and a passage. The second body has a ring with an outline fitting the valve. The coupling mechanism includes a first coupling piece disposed on the first body and a second coupling piece disposed on the second body and is used for detachably coupling the first and second bodies. The valve is located in an aperture of the ring, the elastomer flexibly supports the valve to abut against the ring and seal up the aperture or retracts to open the aperture for allowing liquid to flow into the first body through the passage.

[0007] The invention also provides a dispenser pump includes a cylinder assembly and a pump assembly. The cylinder assembly of the invention includes a first body, a second body and a coupling mechanism. The first body is of a tubular shape and has a valve set at a bottom end thereof. The valve set includes a valve, an elastomer and a passage. The second body has a ring with an outline

fitting the valve. The coupling mechanism includes a first coupling piece disposed on the first body and a second coupling piece disposed on the second body and is used for detachably coupling the first and second bodies. The valve is located in an aperture of the ring, the elastomer flexibly supports the valve to abut against the ring and seal up the aperture or retracts to open the aperture for allowing liquid to flow into the first body through the passage. The pump assembly for generating a siphon effect to drain a liquid is disposed in the cylinder assembly.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008]

FIG. 1A is an exploded sectional view of the cylinder assembly of the invention;

FIG. 1B is an assembled sectional view of the cylinder assembly of the invention;

FIGS. 2A-2D show different embodiments of the valve set;

FIGS. 2E-2H are sectional views of the cylinder assembly; and

FIGS. 3A-3B are sectional views of the dispenser pump.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0009] The invention provides a cylinder assembly and a dispenser pump using the same. The principle it uses is well-known by a person skilled in the art, so the following description will not repeat this principle. Meanwhile, objects shown in the figures are not and do not need to be illustrated by their actual sizes.

[0010] Please refer to FIGS. 1A and 1B, which show a preferred embodiment of the cylinder assembly 100 according to the invention. The cylinder assembly 100 includes a first body 10, a second body 20 and a coupling mechanism 30. The first body 10 is of a tubular shape and a valve set 11 is disposed at a bottom end thereof. The valve set 11 includes a valve 111, an elastomer 112 and a passage 113. The second body 20 has a ring 21 with an outline fitting the valve 111.

[0011] The coupling mechanism 30 includes a first coupling piece 31 disposed on the first body 10 and a second coupling piece 32 disposed on the second body 20 and is used for detachably coupling the first and second bodies 10, 20. An outline of the coupling mechanism 30 is not limited to the screwing type shown in the figures, other means for connecting two objects are also available, such as engagement. Additionally, the coupling mechanism 30 may further include an airtight ring between the first and second coupling pieces 31, 32 to enhance an airtight effect.

[0012] The valve 111 is located in an aperture of the ring 21, the elastomer 112 flexibly supports the valve 111 to abut against the ring 21 and seal up the aperture or

retracts to open the aperture for allowing liquid to flow into the first body 10 through the passage 113. The pump assembly for generating a siphon effect to drain a liquid is disposed in the cylinder assembly 100.

[0013] The valve 111 is located in an aperture of the ring 21 with elastic support from the elastomer 112. Thus the valve 111 may move down to abut against the ring 21 to close the aperture or move up to open the aperture for allowing a liquid to flow into the first body 10 through the passage 113.

[0014] Please refer to FIGS. 2A-2H, which show several embodiments of the valve 111 and elastomer 112. A cross section of the valve 111 may be geometric, arc-shaped, polygonal, semicircular or irregular, even a combination of polygon and arc. Any shapes which can close the aperture of the ring 21 are available. The elastomer 112 provides flexible support to make the valve 111 able to open or close the aperture of the ring 21. Thus, similarly, its shape may be arc-shaped polygonal, semicircular or irregular, even a combination of polygon and arc. As shown in FIGS. 2E-2H, the elastomer 112 is located in the passage 113 without closing. Further, the ring 21 may be formed with a guiding slant 211 or formed into a funnel shape for guiding the valve 111 to close the aperture more smoothly.

[0015] Accordingly, by means of the valve 111, the cylinder assembly 100 of the invention does not need a steel ball or any other independent valves so as to simplify the manufacturing process. The valve 111 can replace a steel ball to elastically close or open the aperture of the ring 21.

[0016] Please refer to FIGS. 3A-3B, which show a dispenser pump 1 composed of the abovementioned cylinder assembly 100, a pump assembly 200 and a pressing head assembly 300. The pump assembly 200 and pressing head assembly 300 are operably associated with the cylinder assembly 100. When the pressing head assembly 300 is depressed, the pump assembly 200 and cylinder assembly 100 will generate a siphon effect to drain a liquid through a nozzle 301.

[0017] The cylinder assembly 100 is the same as the abovementioned and includes a first body 10, a second body 20 and a coupling mechanism 30. The first body 10 is of a tubular shape and a valve set 11 is disposed at a bottom end thereof. The valve set 11 includes a valve 111, an elastomer 112 and a passage 113. The second body 20 has a ring 21 with an outline fitting the valve 111. The coupling mechanism 30 includes a first coupling piece 31 disposed on the first body 10 and a second coupling piece 32 disposed on the second body 20 and is used for detachably coupling the first and second bodies 10, 20.

[0018] It will be appreciated by persons skilled in the art that the above embodiments have been described by way of examples only and not in any limitative sense, and that various alterations and modifications are possible without departure from the scope of the invention as defined by the appended claims.

Claims

1. A cylinder assembly comprising:

5 a first body, being of a tubular shape, having a valve set at a bottom end thereof, and the valve set comprising a valve, an elastomer and a passage;
 10 a second body, having a ring with an outline fitting the valve;
 a coupling mechanism, comprising a first coupling piece disposed on the first body and a second coupling piece disposed on the second body, and being used for detachably coupling the first and second bodies;
 15 wherein the valve is located in an aperture of the ring, the elastomer flexibly supports the valve to abut against the ring and seal up the aperture or retracts to open the aperture for allowing liquid to flow into the first body through the passage.

2. The cylinder assembly of claim 1, wherein the first and second coupling pieces are coupled by screwing.

3. The cylinder assembly of claim 1, wherein the coupling mechanism further comprises an airtight ring between the first and second coupling pieces.

4. The cylinder assembly of claim 1, wherein a cross section of the valve is geometric or irregular in shape.

5. The cylinder assembly of claim 1, wherein a cross section of the valve is arc-shaped, polygonal or semicircular in shape.

6. The cylinder assembly of claim 1, wherein a cross section of the elastomer is geometric or irregular in shape.

7. The cylinder assembly of claim 1, wherein a cross section of the elastomer is arc-shaped, polygonal or semicircular in shape.

8. The cylinder assembly of claim 1, wherein the elastomer is located in the passage without closing.

9. The cylinder assembly of claim 1, wherein the ring is formed with a guiding slant.

10. The cylinder assembly of claim 1, wherein the ring is formed into a funnel shape.

11. A dispenser pump comprising:

a cylinder assembly, comprising:

a first body, being of a tubular shape, having
 a valve set at a bottom end thereof, and the
 valve set comprising a valve, an elastomer
 and a passage;
 a second body, having a ring with an outline 5
 fitting the valve;
 a coupling mechanism, comprising a first
 coupling piece disposed on the first body
 and a second coupling piece disposed on 10
 the second body, and being used for de-
 tachably coupling the first and second bod-
 ies;
 wherein the valve is located in an aperture
 of the ring, the elastomer flexibly supports 15
 the valve to abut against the ring and seal
 up the aperture or retracts to open the ap-
 erture for allowing liquid to flow into the first
 body through the passage; and

a pump assembly for generating a siphon effect 20
 to drain a liquid, disposed in the cylinder assem-
 bly.

12. A dispenser pump which includes a cylinder assem- 25
 bly as claimed in any one of Claims 1 to 10.

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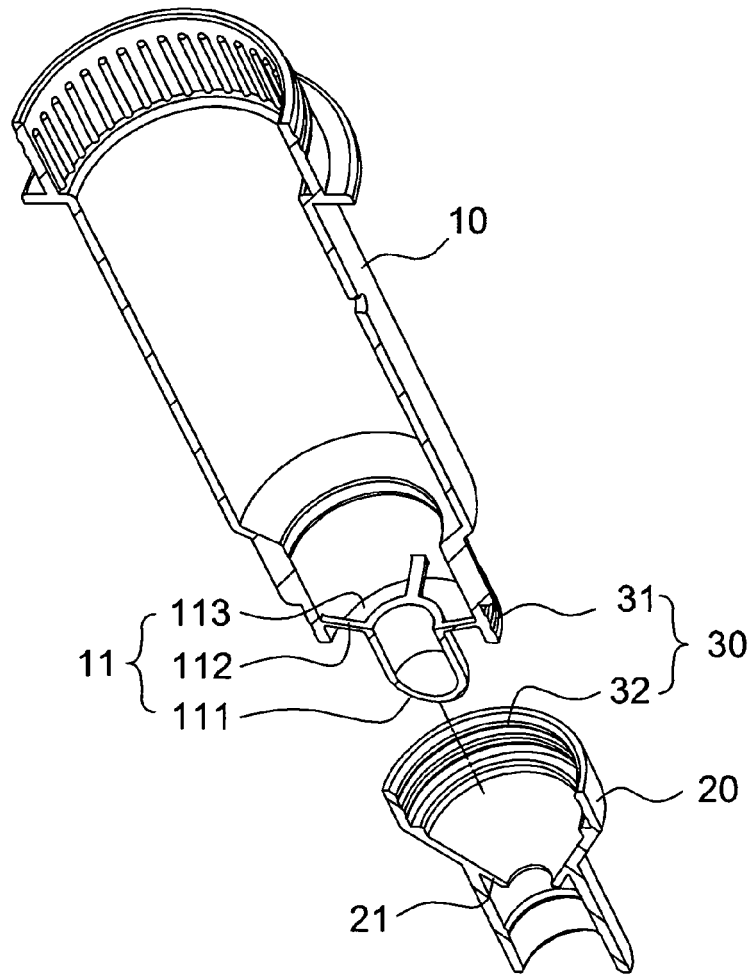


FIG.1A

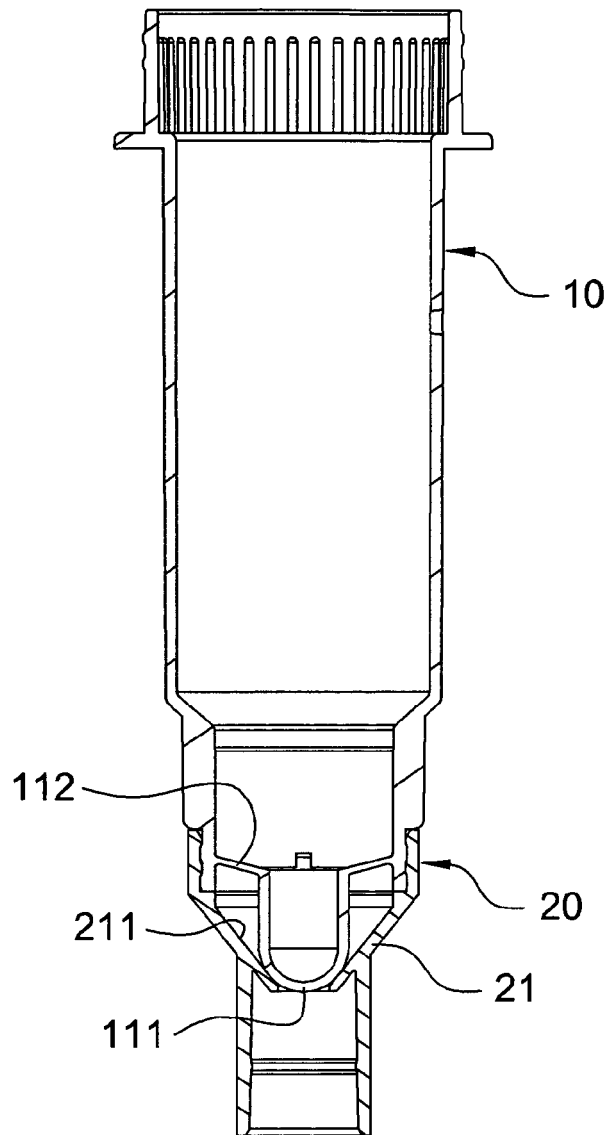


FIG.1B

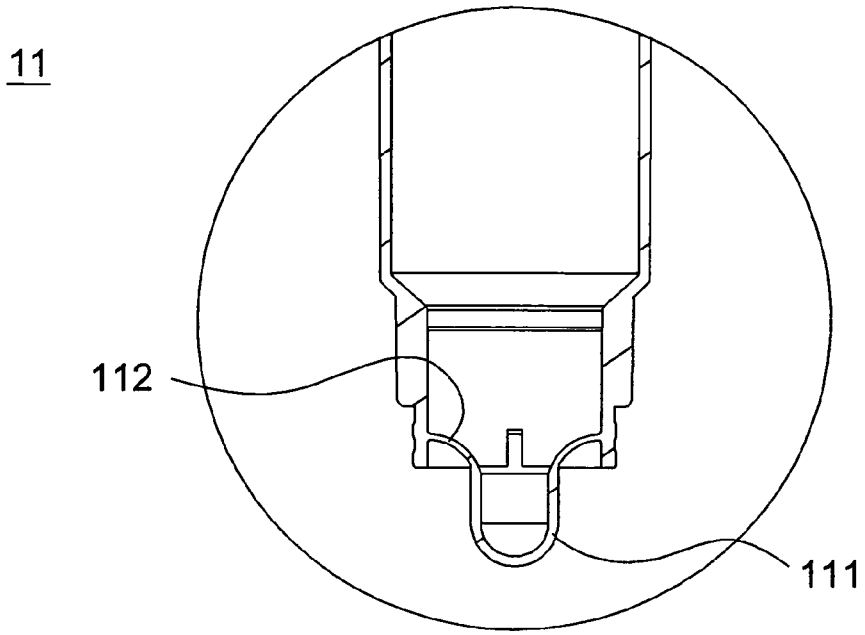


FIG.2A

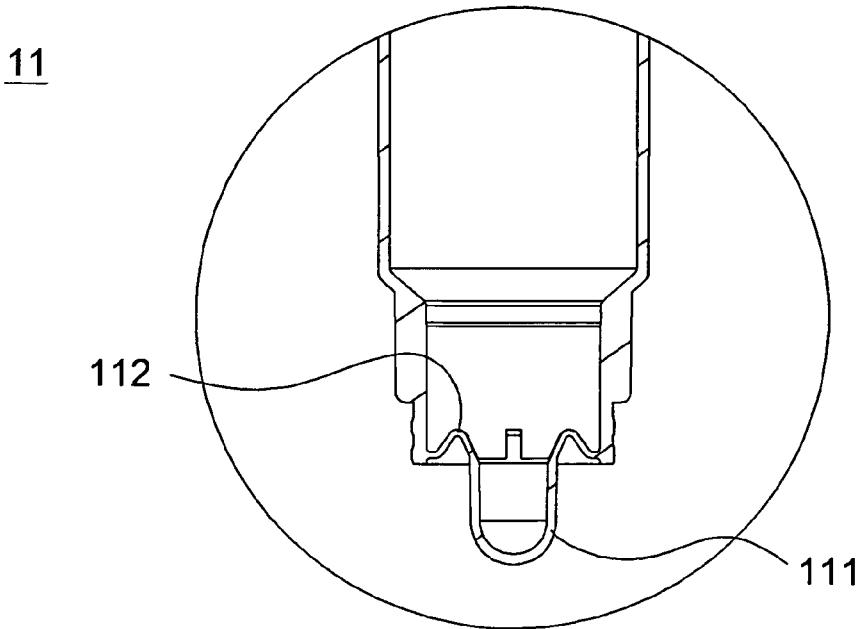


FIG.2B

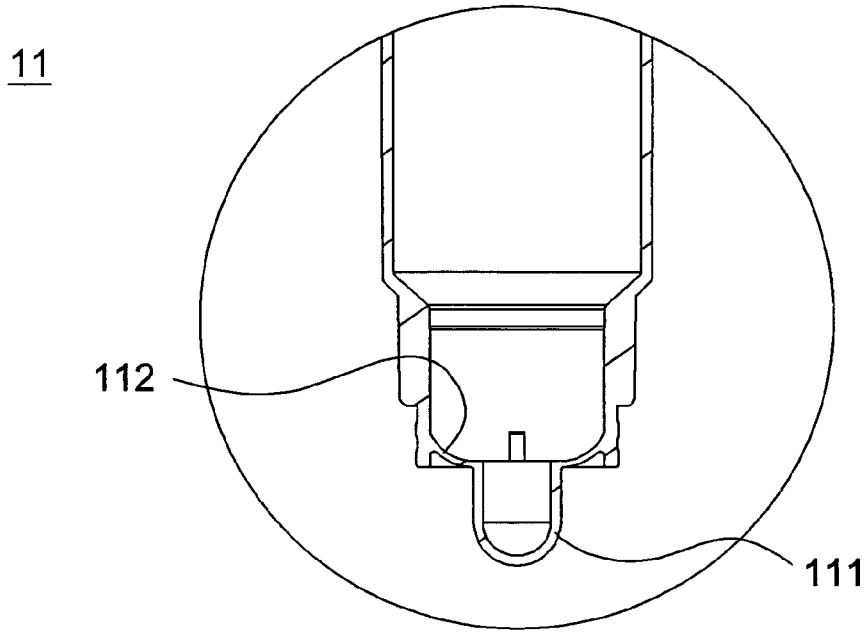


FIG.2C

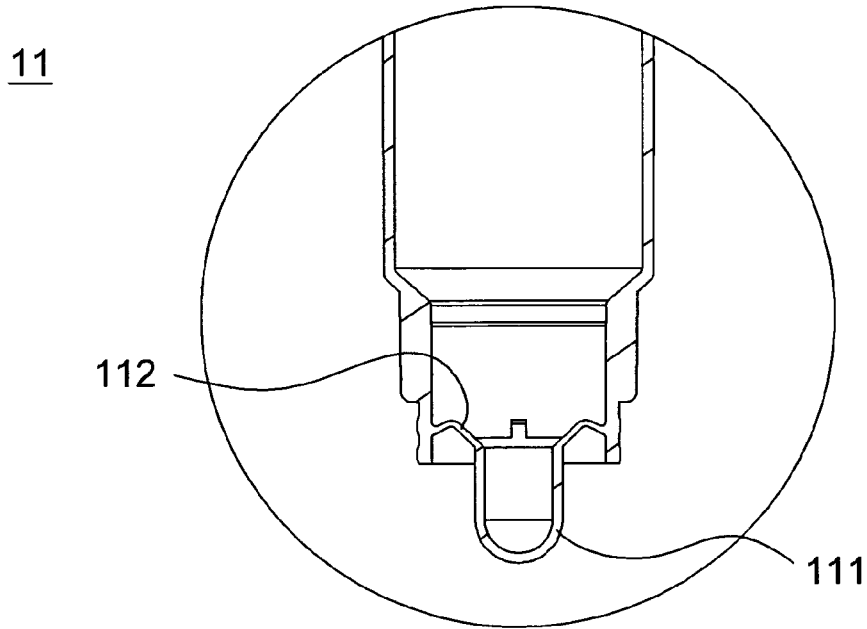


FIG.2D

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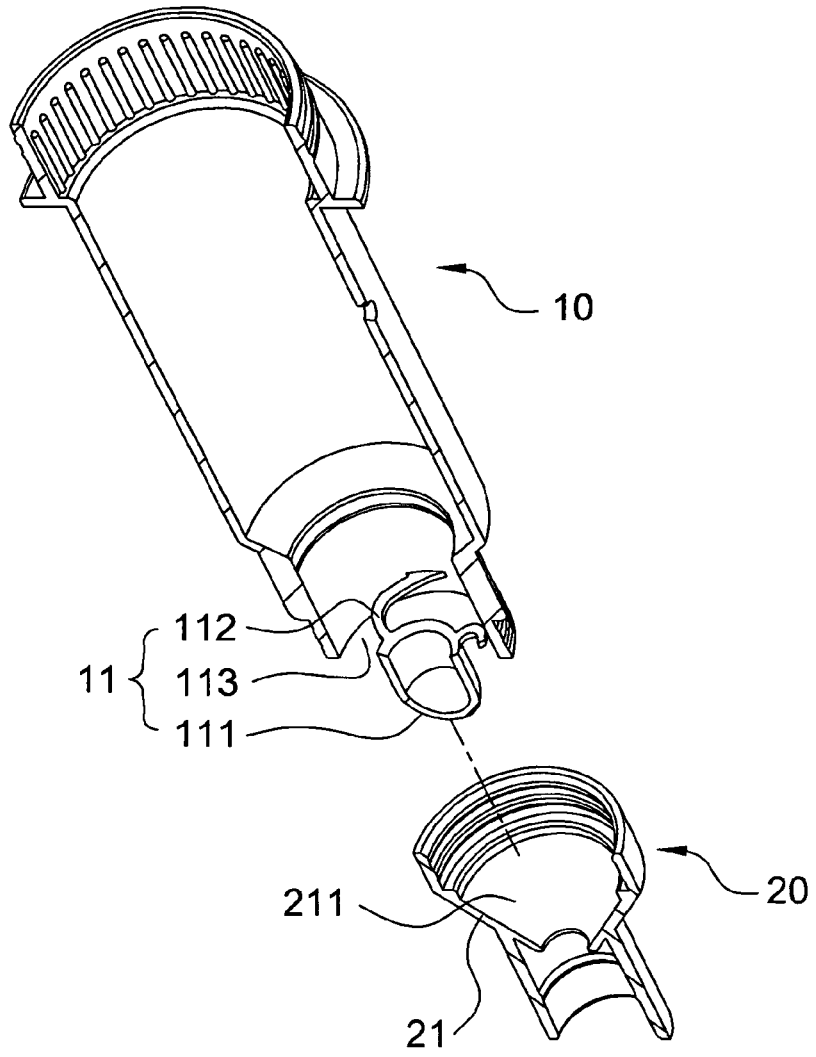


FIG.2E

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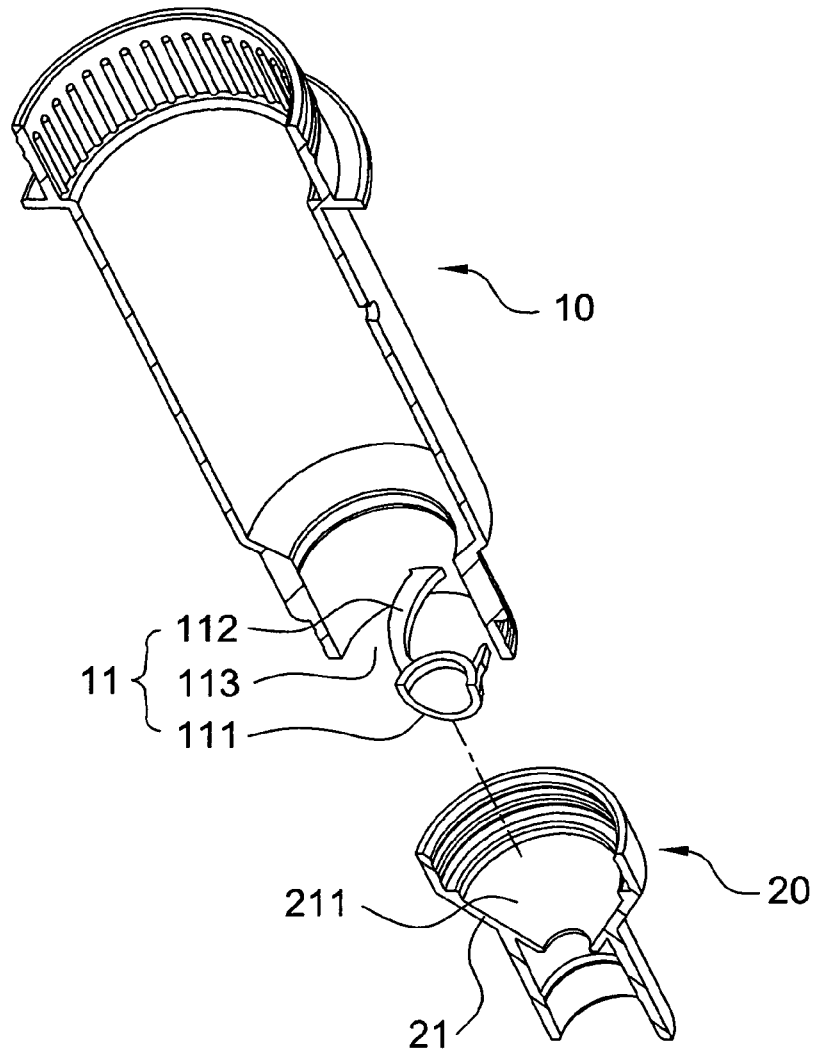


FIG.2F

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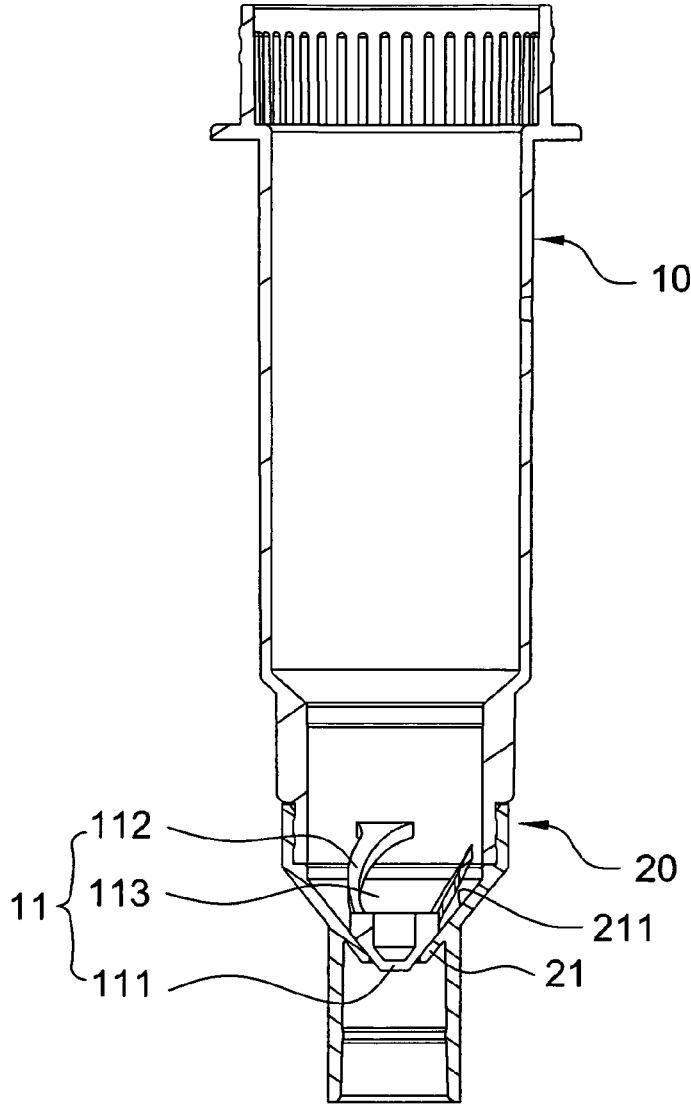


FIG.2G

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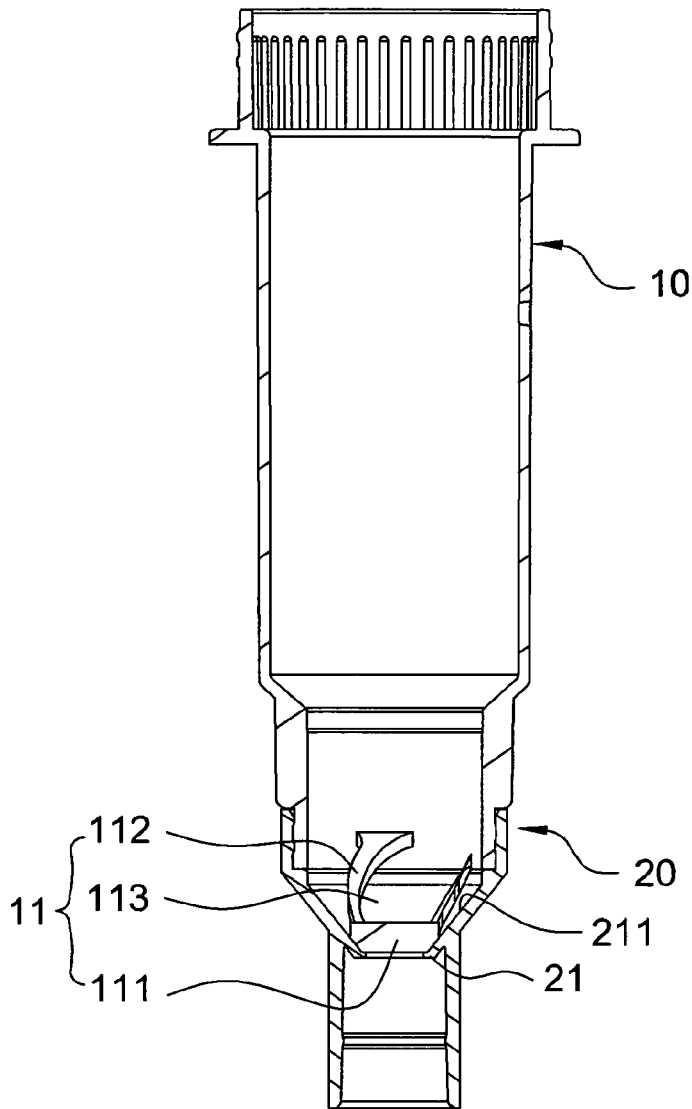


FIG.2H

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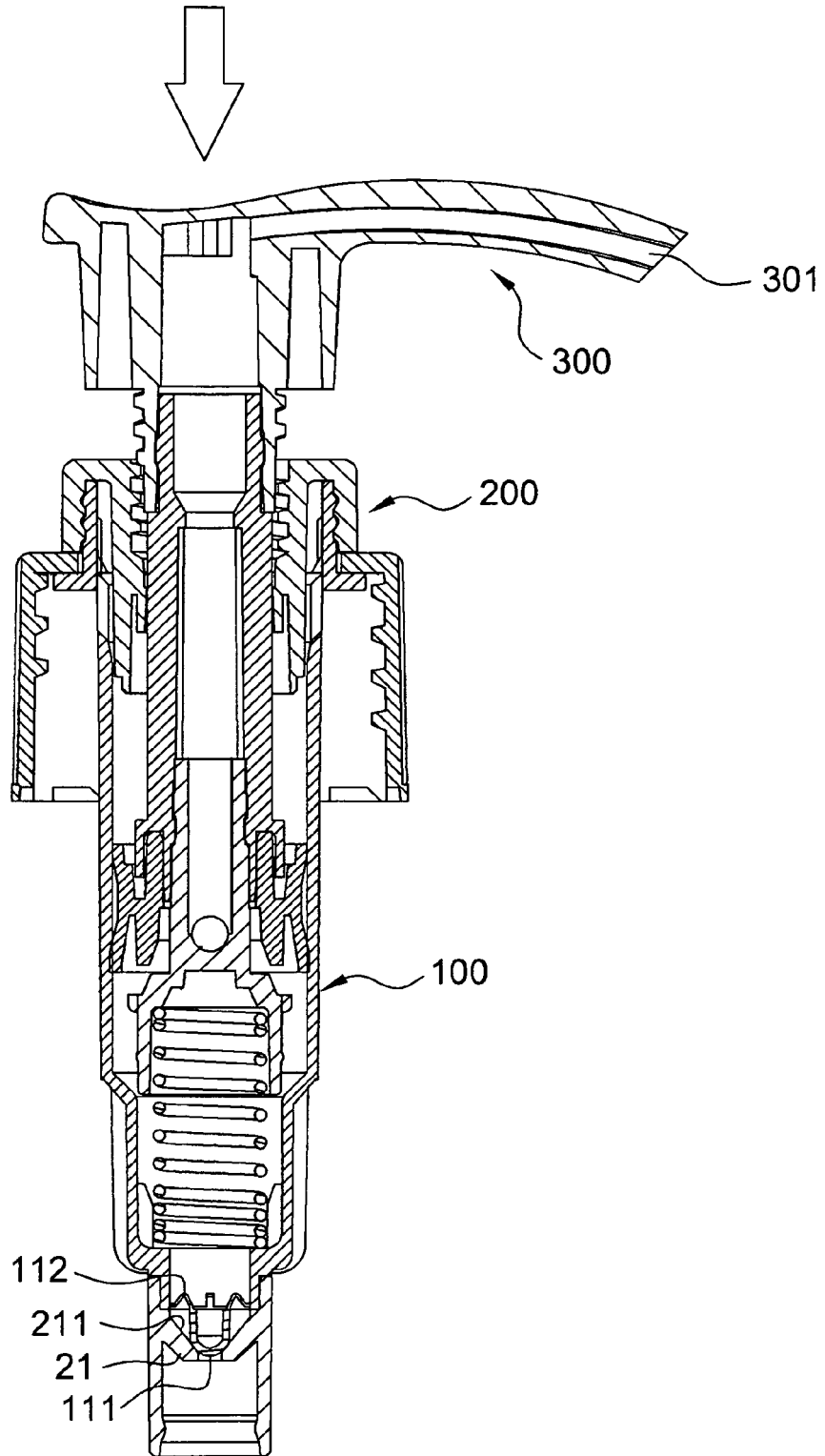


FIG.3A

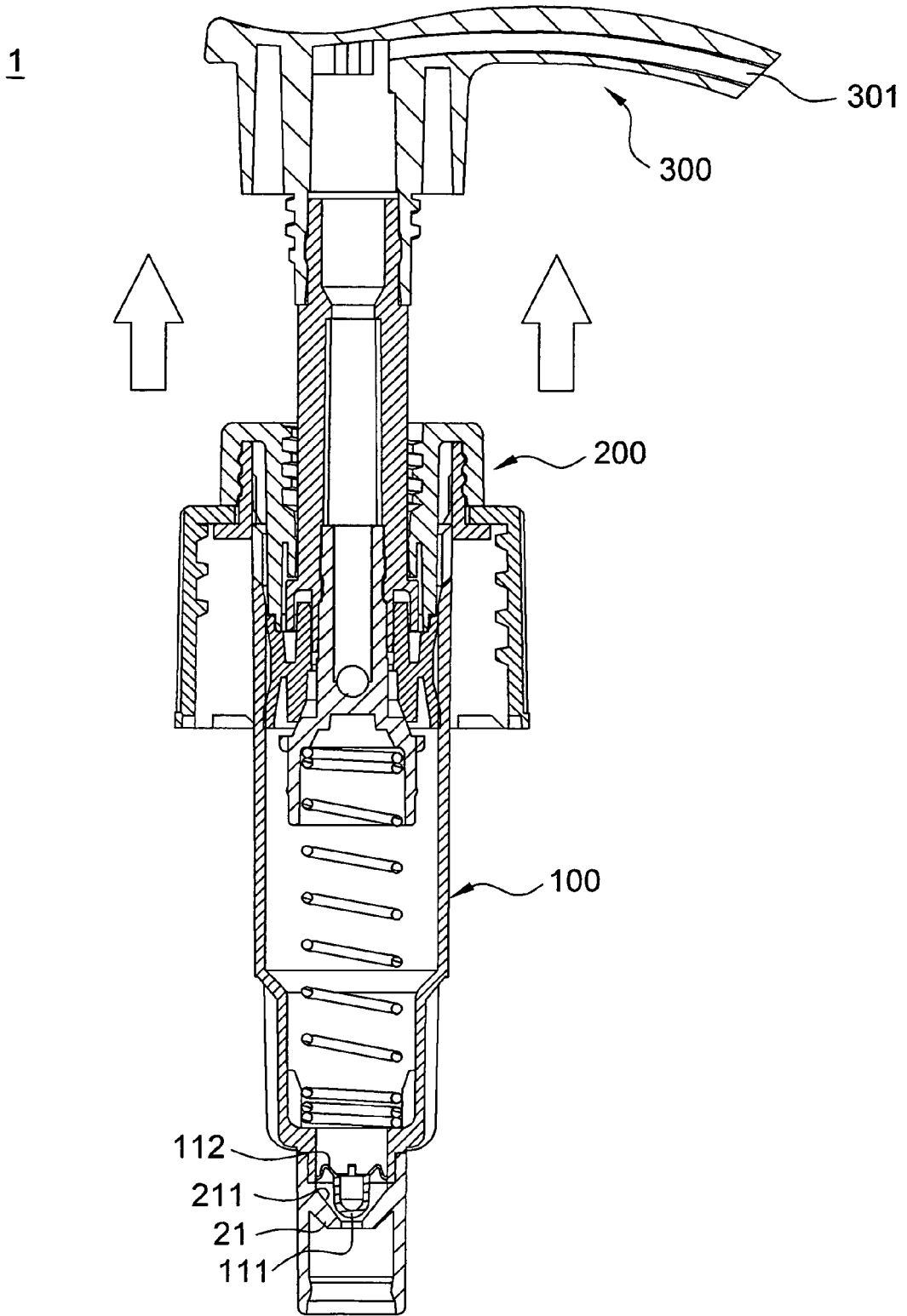


FIG.3B



EUROPEAN SEARCH REPORT

Application Number
EP 13 25 0009

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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	WO 2004/045778 A1 (JAYCARE LTD [GB]; RAYNER TIM [GB]) 3 June 2004 (2004-06-03) * page 8, paragraph 4 - page 10, paragraph 5; figures 1A, 1B, 2 *	1-4,8,9, 11,12	INV. B05B11/00
Y	-----	5,10	
X	US 5 307 962 A (LIN HUI-YU [TW]) 3 May 1994 (1994-05-03)	1,8,9, 11,12	
Y	* column 2, line 7 - line 23; figure 1 *	5,10	
X	EP 1 561 515 A2 (MASATOSHI MASUDA [JP] MASUDA MASATOSHI [JP]) 10 August 2005 (2005-08-10) * column 9, line 6 - column 10, line 6; figures 2, 6a, 6b, 7a, 7b, 7c *	1,4,8, 11,12	
X	FR 2 877 320 A1 (AIRLESSYSTEMS SOC PAR ACTIONS [FR] AIRLESSYSTEMS SAS [FR]) 5 May 2006 (2006-05-05) * page 7, line 19 - page 8, line 29; figure 2 *	1,4,5, 8-12	TECHNICAL FIELDS SEARCHED (IPC)
A	DE 20 2011 103508 U1 (WANG YA TSAN [TW]) 3 November 2011 (2011-11-03) * paragraph [0027]; figure 2 *	1-12	B05B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 24 June 2013	Examiner Daintith, Edward
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	

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

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24-06-2013

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2004045778 A1	03-06-2004	AU 2003294116 A1 WO 2004045778 A1	15-06-2004 03-06-2004
US 5307962 A	03-05-1994	NONE	
EP 1561515 A2	10-08-2005	CN 1651320 A EP 1561515 A2 JP 2005218946 A US 2005173460 A1	10-08-2005 10-08-2005 18-08-2005 11-08-2005
FR 2877320 A1	05-05-2006	BR PI0517994 A CN 101052472 A DE 602005005514 T2 EP 1814672 A1 ES 2303698 T3 FR 2877320 A1 US 2008110934 A1 WO 2006048578 A1	21-10-2008 10-10-2007 23-04-2009 08-08-2007 16-08-2008 05-05-2006 15-05-2008 11-05-2006
DE 202011103508 U1	03-11-2011	NONE	

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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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Patent documents cited in the description

- US 7025233 B [0004]