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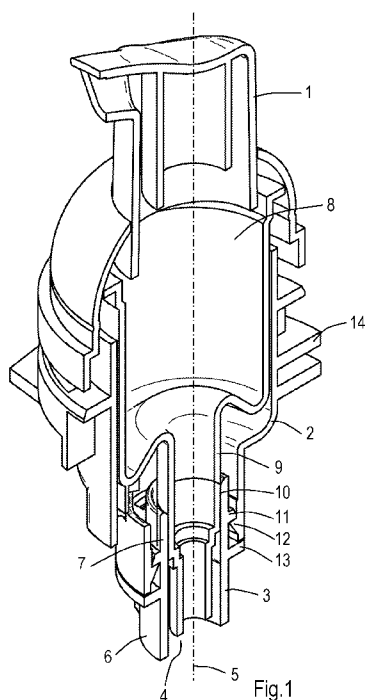
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(54) Title: STORAGE HOLDER FOR A DISPENSER



(57) Abstract: The invention is directed to a storage holder, destined for placement in a liquid or foam dispenser, comprising a liquid reservoir, a pump and a plug extension. The liquid reservoir is provided with a plug having a cylindrical opening and an oval shaped exterior surface. The pump is connected to the plug by a clamping connection between pump suction tube and the plug opening. The plug extension comprises means to couple the storage holder to the liquid or foam dispenser and is connected to the plug outer surface of the plug by means of a snap connection or a clamping connection. Furthermore any rotational movement of pump relative to the plug extension is avoided by making use of male and female members.

STORAGE HOLDER FOR A DISPENSER

Field of the invention

The invention is directed to a storage holder, destined for placement in a liquid or
5 foam dispenser. The invention is also directed to a liquid or foam dispenser.

Background of the invention

US2005/0006408 describes a storage holder destined for placement in a foam
dispenser. The storage holder described in this publication consists of a liquid reservoir, a
foam pump and a coupling piece. The liquid reservoir has an opening provided with a plug.
10 The coupling piece connects the foam pump to the plug, wherein the foam pump is screwed
to the coupling piece. The coupling piece in turn is provided with a connecting element to
connect the storage holder to the foam dispenser.

A disadvantage of the storage holder of US2005/0006408 is that it is difficult to
accurately position the foam pump to the coupling piece by means of screwing. It is
15 important that the outlet for foam of the foam pump and the means to connect the storage
holder to the foam dispenser are correctly positioned relative to each other. If this is not
performed accurately the outlet for foam may not be in its operational position once the
storage holder is placed in the foam dispenser.

The present inventions aims to provide a storage holder which does not have this
20 disadvantage.

Summary of the invention

The invention is directed to a storage holder, destined for placement in a liquid or
foam dispenser, comprising a liquid reservoir, a pump and a plug extension,

wherein the liquid reservoir has an opening, which opening is provided with a tubular
25 plug which plug is provided with a cylindrical opening having an axis and which cylindrical
opening fluidly connects the interior space of the liquid reservoir with the exterior of the
liquid reservoir, which plug further has an outer surface having an oval cross-section at its
end part extending from and facing away from the liquid reservoir,

the pump is provided with a pump section and a tubular inlet part extending from the
30 pump section and having a smaller cross section than the pump section, which tubular inlet
part is fixed into the cylindrical opening of the plug by a clamping connection,

wherein the pump is provided with a female or male part and

the plug extension comprises an opening for the pump and means to couple the storage holder to the liquid or foam dispenser and is connected to the outer surface of the plug by means of a snap connection or a clamping connection, and wherein

the plug extension is provided with a female or male part suited to receive the respective male or female part of the pump such that a rotational displacement of the pump relative to the plug and plug extension is avoided.

The invention is also directed to a liquid or foam dispenser comprising a housing and a storage holder according to the invention, wherein the storage holder is fastened to the housing with the means to couple the storage holder to the liquid or foam dispenser.

In the storage holder according to the invention the pump is not connected to a coupling piece as in the prior art design. Instead the pump is directly connected to the plug. Because of the oval outer surface of the plug and because of the presence of the female and male members an assembly results wherein the pump can only be positioned in a well-defined position or positions relative to the plug extension and to the plug. This simplifies the assembly of such a storage holder and avoids positioning issues when placing the storage holder in a foam or liquid dispenser.

Brief description of the Figures

Figure 1 shows part of the storage holder according to the invention.

Figure 2 shows part of another storage holder according to the invention.

Figure 3 shows how the storage holder can be fastened into a dispenser

Figure 4 shows the storage holder according the invention.

Detailed description of the invention

The storage holder according to the invention will be described in more detail below. The plug extension is provided with an opening for the pump. The opening in the plug extension is such that the pump can enter said opening and is suitably free to move in an axial direction within said opening. The plug extension is provided with a female or male part suited to receive the respective male or female part of the pump such that a rotational displacement of the pump relative to the plug and plug extension is avoided. Such a female or male part is suitably present in said opening of the plug extension.

The plug extension comprises means to couple the storage holder to the liquid or foam dispenser. Such means may be surfaces present at the exterior of the plug extension and suited to couple the storage holder to a liquid or foam dispenser. The plug extension

may be one structural part or be separate connected parts. The separate parts may be the means to couple the storage holder to the liquid or foam dispenser and the part connected to the plug. These separate parts may be assembled by for example a snap connection. The advantage of using separate parts is that the assembled storage holder can be easily

5 adapted for different designs of liquid or foam dispensers. For example by adding the required surfaces at a later stage or by replacing already assembled surfaces with a different design of surfaces suited to couple the storage holder to another liquid or foam dispenser.

The plug extension suitably has an end for connecting to the outer surface of the plug. The plug extension will have an oval formed opening which enables a clamping or snap
10 connection with the outer surface of the plug. Preferably the plug extension is connected to the outer surface of the plug by means of a snap connection. Such a connection is advantageous because it avoids that the plug extension can disengage from the plug, even when a pulling force is exercised on the plug extension.

A problem when using a clamping connection between the tubular inlet part of the
15 pump and the cylindrical opening of the plug is that this connection may fail due to relaxation of the material of the plug. This especially occurs when the plug is made of a thermoplastic polymer, like polyethylene or polypropylene. These materials are however preferred because these materials are compatible with the materials typically used for the liquid containers. To avoid such relaxation it is preferred that at least part of the inner
20 surface of the cylindrical opening of the plug where the inlet tube of the pump is fixed by a clamping connection is at the same axial position as where the plug extension is connected to the outer surface of the plug.

For example when the plug extension is connected by a clamping connection more material at the same axial position will be present. This will result in less radial enlargement
25 of the cylindrical opening of the plug. This may be even enhanced by choosing a material for the plug extension which is less prone to relaxation than the material of the plug itself.

When a snap connection is used to connect the plug extension to the plug a rim extending from the outer surface may be present for enabling such a connection. This rim will avoid or at least minimise relaxation at that axial position of the plug.

30 The pump may be any liquid or foam pump provided it is provided with a pump section and a inlet tube extending from the pump section and having a smaller cross section than the pump section. Such pumps are well known for hand soap dispensers and hand

foam dispensers as positioned on top of a bottle. The pump is suitably operated by the muscular energy of the operator or by means of an electro motor at the moment of use. It may be a liquid pump or a pump which combines liquid and air to create a foam.

The pump is suitably a piston pump wherein the pump comprises a pump section
5 comprising a moveable operating part comprising a liquid piston, an optional air piston and a nozzle for dispensing a liquid or foam and a fixed part comprising of the inlet tube fluidly connected to a liquid chamber and optional air chamber positioned around the liquid chamber, wherein the fixed part further comprises of a cap through which the nozzle
10 extends from the liquid or foam pump and which cap has a larger cross section than the inlet tube and which cap has a side which may or may not rests on the plug extension . Preferably pumps are used which are manufactured in large series for use on top of bottles. Such pumps will be provided with a cap with which the pump can be fixed to the bottle. Connection between the cap and bottle is typically achieved by means of a screw connection or by means of a snap connection. In the storage holder according to the
15 invention no use is made of such connection means even if they are present in the commercially available and used pumps.

The pump may be a liquid pump or a foam pump. Examples of suitable liquid and foam pumps are described in US3359917, US5271530, EP0544549, US5443569, US2002000452, US6290145, US2003082243, US2001042761, US2002070238,
20 US2004069807, US2004000567, US2004084481, US2006151538, US2005067435, US7004356B, US2006283887, US2006246013, US2007045350, US2011168739, WO07083206, US2008093386, US2008118368, US2008268188, US2009062176, US2010314417, US2011297700, GB2484092, US2012104048, US2014097209, WO14119102, US6053364, US5110271, US5190192, US5176296, US6053364, US5725128,
25 US2003197034, US2010038383.

The pump is provided with a male or female part and the plug extension is provided with a corresponding female respectively male part. Male and female part are such that when assembled the male part sits within the female part and avoids rotation of the pump relative to the plug extension. The plug extension is non-rotatably connected to
30 the plug because of the oval outer surface of the plug. Thus also a rotational displacement of the pump relative to the plug is avoided.

In a preferred embodiment the pump is a foam pump. Such a foam pump suitably comprises a pump section comprising a moveable operating part comprising a liquid piston, an air piston and a nozzle for dispensing a foam and a fixed part comprising of the inlet tube fluidly connected to a liquid chamber and an air chamber positioned around the liquid chamber. The fixed part further comprises of a cap through which the nozzle extends from the liquid or foam pump and which cap has a larger cross section than the inlet tube. If the pump is a foam pump it is preferred that air can be sucked in by the air piston. For this reason the plug extension is preferably provided with openings which fluidly connect the exterior of the storage holder with the inlet of the air piston. The opening of the plug extension suitably encompasses part of the inlet tube and part of the air chamber of such a foam pump.

The liquid reservoir may be any container suitably to hold a liquid. Preferably the liquid reservoir is a reservoir having a flexible wall. This is advantageous because when liquid is discharged from the reservoir via the pump no replacement air is required to be added to the reservoir in order to avoid a vacuum. The reservoir having a flexible wall is preferably made of a thermoplastic polymer such as polypropylene or polyethylene.

The plug has a tubular opening in which the inlet tube of the pump is fixed by a clamping connection. The exterior surface of the plug is suitably provided at its exterior with a rim having a larger diameter than the plug and wherein at least part of the inner surface of the cylindrical opening of the plug where the inlet tube of the pump is fixed is at the same axial position as the rim. When the plug extension is connected by means of a snap connection it may be preferred to have at least two rims to be provided at the exterior of the plug. A first rim allows a snap connection with the plug extension and a second rim, located nearer to the fluid reservoir, avoids that these means further move towards said reservoir.

The plug may also be provided with two extension surfaces extending radially outward at either side of the tubular body of the plug. These two surfaces are in one plane and form an anchor for the plug when connected with the flexible fluid reservoir. Preferably the plug and its extension surfaces are positioned in a larger opening of a reservoir having a flexible wall. By sandwiching the extension surfaces and tubular plug body within two surfaces of the flexible reservoir and welding the resulting sandwiched layers a closed reservoir may be obtained provided with the plug in the opening of the reservoir. Preferably the plug and

fluid reservoir are made of the same material, for example both made of polyethylene or both made of polypropylene to obtain a strong welded connection.

The invention is also directed to a fluid or foam dispenser comprising a housing and a storage holder according to the invention. Suitable dispensers have a housing comprising a rear body which is suited to be fixed to a vertical wall and a front cover. The front cover may be pivotally engaged to the rear body along a horizontal axis or provided with a push pad which is pivotally engaged to the front cover. Between the rear body and the front cover a space is defined for the storage holder according to this invention. The storage holder is fastened to the housing with the means to couple the storage holder to the liquid or foam dispenser. Preferably the storage holder is engaged with the fluid or foam dispenser at the lower end of the above referred to space. The dispenser will at that position be provided with means for engaging with the means to couple the storage holder to the liquid or foam dispenser. Suitable storage holders will have some sort of means to actuate the liquid or foam pump by muscular energy and preferably some resilient means to bring the pump back to its closed position. The latter to avoid leakage. Examples of suitable fluid and foam dispensers are described in US7611033, US5445288, US5638989, US6082586, US2002005414, US2005205608, US2011127290 and US2013105519.

Detailed description of the Figures

Figure 1 shows part of the storage holder according to the invention. Figure 1 shows a pump 1, a plug extension 2 and a plug 3. The plug 3 as provided in an opening of a liquid reservoir is not shown in this Figure. The plug 3 is provided with a cylindrical opening 4 having an axis 5. This opening 4 fluidly connects the interior space of the liquid reservoir with the exterior of the liquid reservoir. The plug 3 has a outer surface 6 at its end part 7 extending from and facing away from the liquid reservoir. The pump 1 is provided with a pump section 8 and a tubular inlet part 9 extending from the pump section 8 and having a smaller cross section than the pump section 8. The tubular inlet part 9 is fixed into the cylindrical opening 4 of the plug 3 by a clamping connection.

Figure 1 also shows a snap connection between the plug extension 2 and the plug 3. Plug 3 is provided with a rim 11 for enabling the snap connection and a rim 13 avoiding that the plug extension 2 moves towards the liquid reservoir. Rims 11 is at the same axial position as where the tubular inlet part 9 of the pump 1 is fixed by a clamping connection with the part 10 of the inner surface of the cylindrical opening 4 of the plug 3.

The plug extension 2 is provided with surfaces 14 suited to couple the storage holder to a foam or liquid dispenser. In Figure 1 an embodiment is shown wherein these surfaces 14 is a separate part which may be connected to plug extension 2 by a snap connection as shown. The end of plug extension which is connected to the plug 3 is provided with a
5 corresponding oval opening provided with inwardly directed inclined rim 19 which rim 19 can move outwardly when the plug extension is forced onto the plug enabling that rim 11 can be passed. The same rim 19 avoids that plug extension 2 can disengage from plug 3, even under a pulling force as will be clear from Figure 1.

Figure 1 also shows a male part 17 as part of the pump 1. This male part 17 fits in
10 female part 18 which is provided in plug extension 2. When assembled the male part 17 fits in female part 18 and avoids a rotational movement between pump 1 and plug extension 2 as is more clearly shown in Figure 2b.

Figure 2a-2c show the same plug extension 15 combined with pump 1. The surfaces 16, suited to couple the storage holder to a foam dispenser, form one structural part with
15 the plug extension 15. No plug is shown in Figure 2. The other numbers have the same meaning as in Figure 1.

Figure 3 shows how the plug extension 15 and plug 3 is coupled with a dispenser 20. Only half of dispenser 20 is shown as a cut through along a vertical plane. Liquid reservoir is not shown in Figure 3. Dispenser 20 is provided with a housing 21 comprising a rear body 22
20 which is suited to be fixed to a vertical wall and a front cover 23. Figure 3 further shows a push pad 24, pivotally engaged to the housing 21 along a horizontal axis. Push pad 24 when pressed by muscular energy by a user will push the pump 1 towards the plug extension 15 resulting in discharge of liquid or foam from the liquid reservoir. A resilient part 25 will bring push pad 24 and pump 1 back to its starting position. The dispenser 20 is provided with a
25 sleeve 26 into which surface 16 of plug extension 15 fits. In this manner the storage holder is fastened to the dispenser.

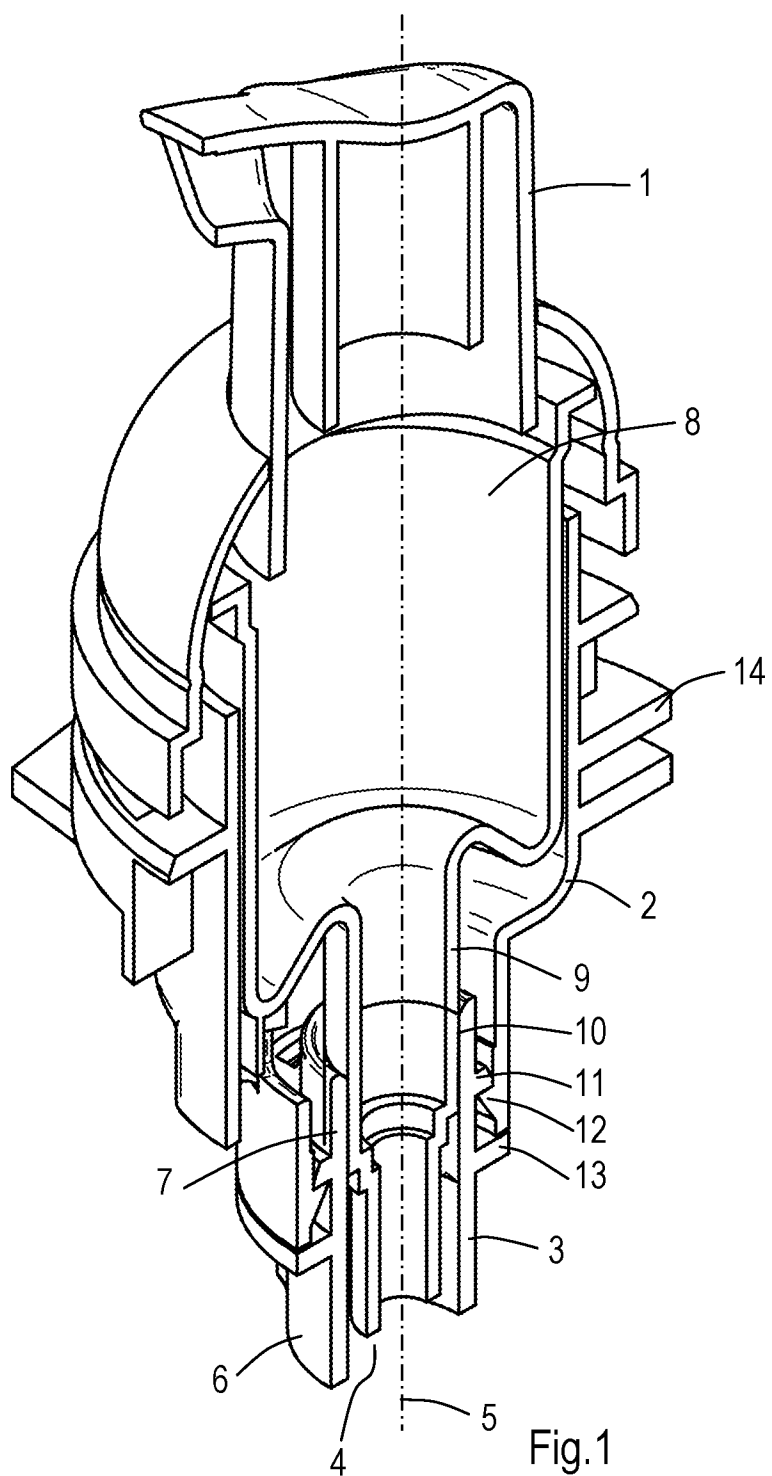
Figure 4 shows the assembled storage holder 28 wherein the pump 1, plug extension 15 and fluid reservoir 27 is shown.

CLAIMS

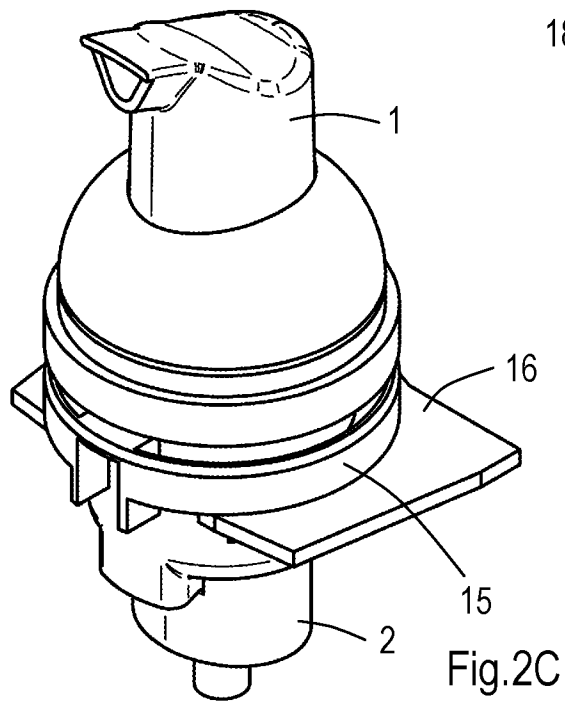
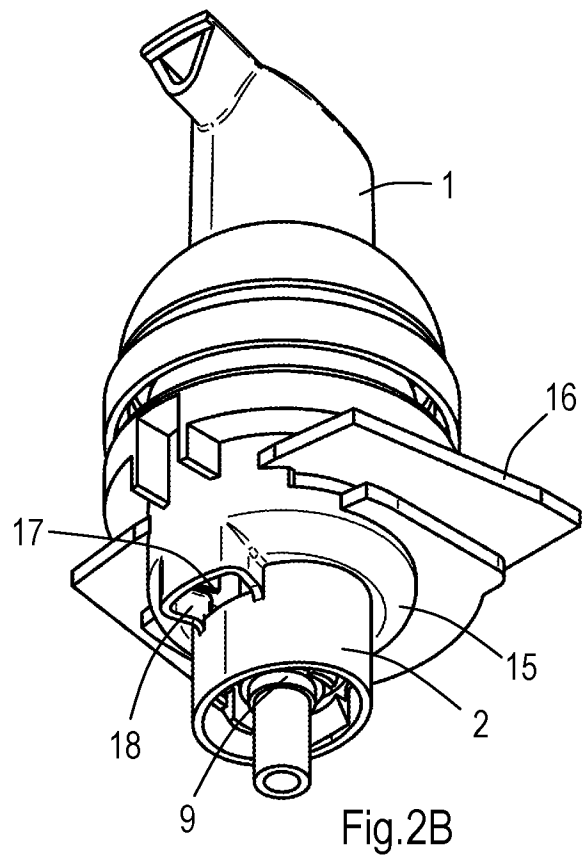
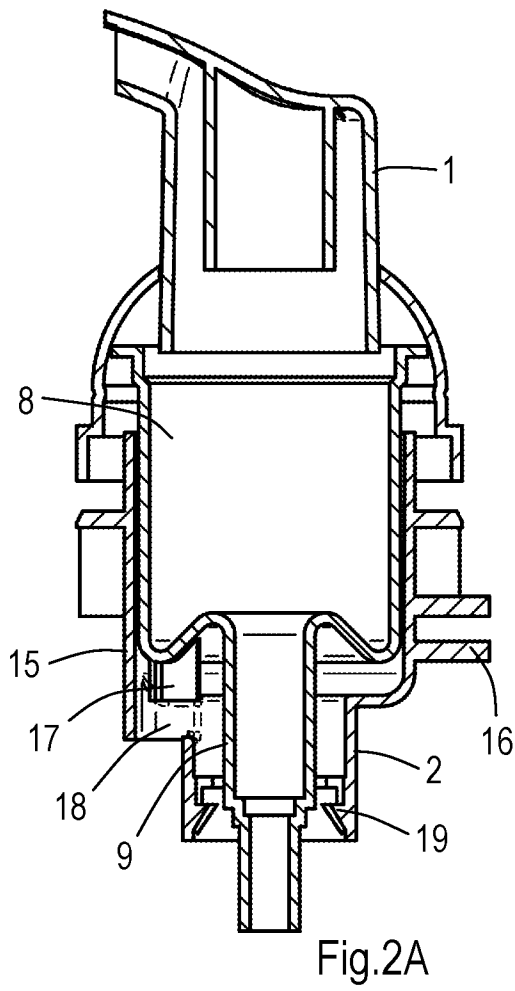
1. Storage holder, destined for placement in a liquid or foam dispenser, comprising a liquid reservoir, a pump and a plug extension,
5 wherein the liquid reservoir has an opening, which opening is provided with a plug which plug is provided with a cylindrical opening having an axis and which cylindrical opening fluidly connects the interior space of the liquid reservoir with the exterior of the liquid reservoir, which plug further has an outer surface having an oval cross-section at its end part extending from and facing away from the liquid reservoir,
10 the pump is provided with a pump section and a tubular inlet part extending from the pump section and having a smaller cross section than the pump section, which tubular inlet part is fixed into the cylindrical opening of the plug by a clamping connection,
wherein the pump is provided with a female or male part and
15 the plug extension comprises an opening for the pump and means to couple the storage holder to the liquid or foam dispenser and is connected to the outer surface of the plug by means of a snap connection or a clamping connection, and wherein the plug extension is provided with a female or male part suited to receive the respective male or female part of the pump such that a rotational displacement of
20 the pump relative to the plug and plug extension is avoided.
2. Storage holder according to claim 1, wherein the plug extension is connected to the outer surface of the plug by means of a snap connection.
- 25 3. Storage holder according to any one of claims 1-2, wherein at least part of the inner surface of the cylindrical opening of the plug where the inlet tube of the pump is fixed by a clamping connection is at the same axial position as where the plug extension is connected to the outer surface of the plug.
- 30 4. Storage holder according to any one of claims 1-3, wherein the liquid reservoir and the plug are comprised of the same type of thermoplastic polymer.

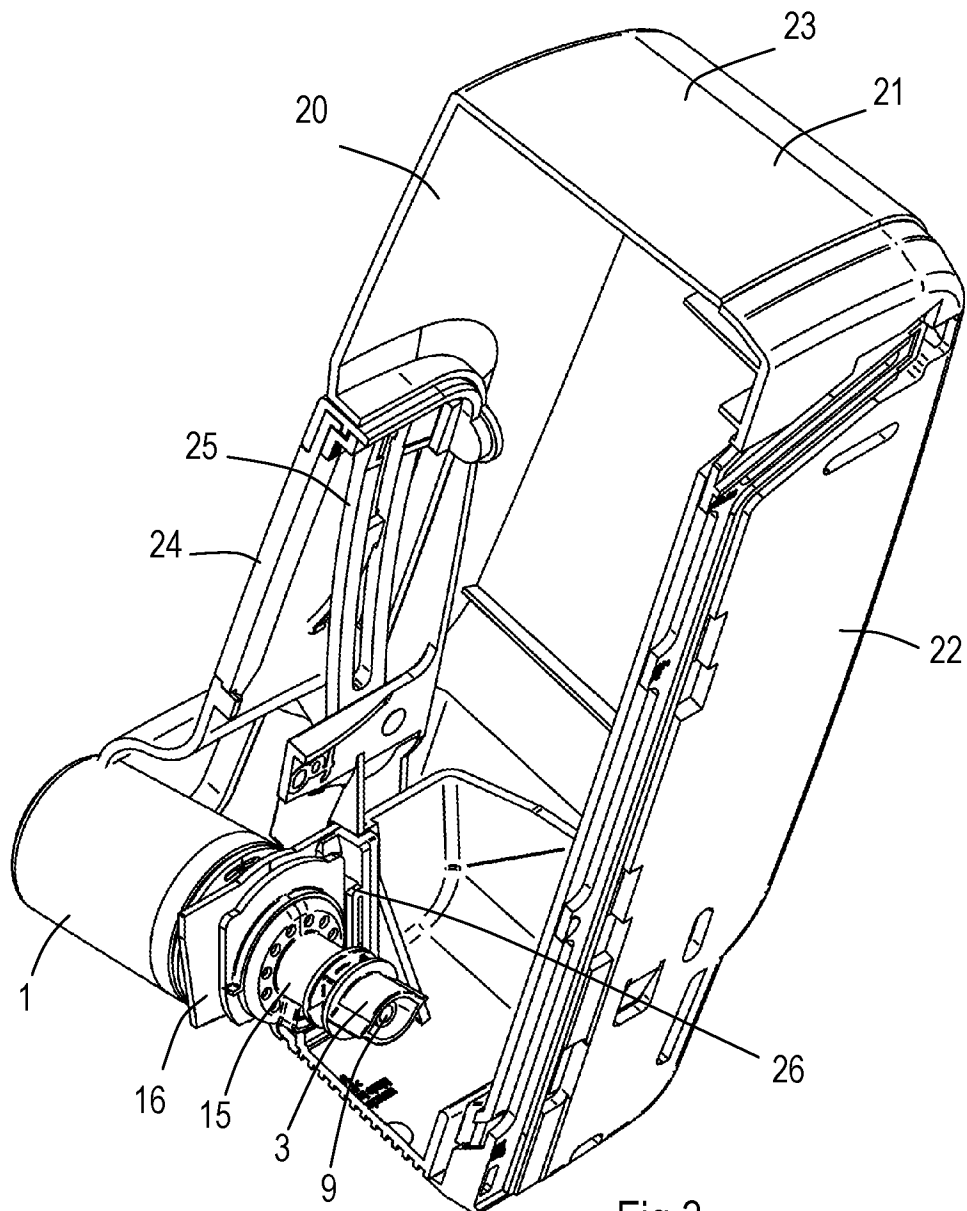
5. Storage holder according to claim 4, wherein the thermoplastic polymer is polyethylene or polypropylene.
- 5 6. Storage holder according to any one of claims 1-5, wherein the pump is a foam pump provided with a liquid piston and an air piston and wherein the plug extension is provided with openings fluidly connecting the exterior of the storage holder with the air piston.
- 10 7. Storage holder according to any one of claims 1-6, wherein the exterior surface of the plug is provided at its exterior with a rim having a larger diameter than the plug and wherein at least part of the tubular inlet part of the pump is fixed is at the same axial position as the rim.
- 15 8. Storage holder according to any one of claims 1-7, wherein the pump section of the pump comprises
a moveable operating part comprising a liquid piston, an optional air piston and a nozzle for dispensing a liquid or foam and
a fixed part comprising of the inlet tube fluidly connected to a liquid chamber and optional air chamber positioned around the liquid chamber, wherein the fixed part
20 further comprises of a cap through which the nozzle extends from the foam pump and which cap has a larger cross section that the inlet tube.
- 25 9. Fluid or foam dispenser comprising a housing and a storage holder according to any one of claims 1-8, wherein the storage holder is fastened to the housing with the means to couple the storage holder to the liquid or foam dispenser.

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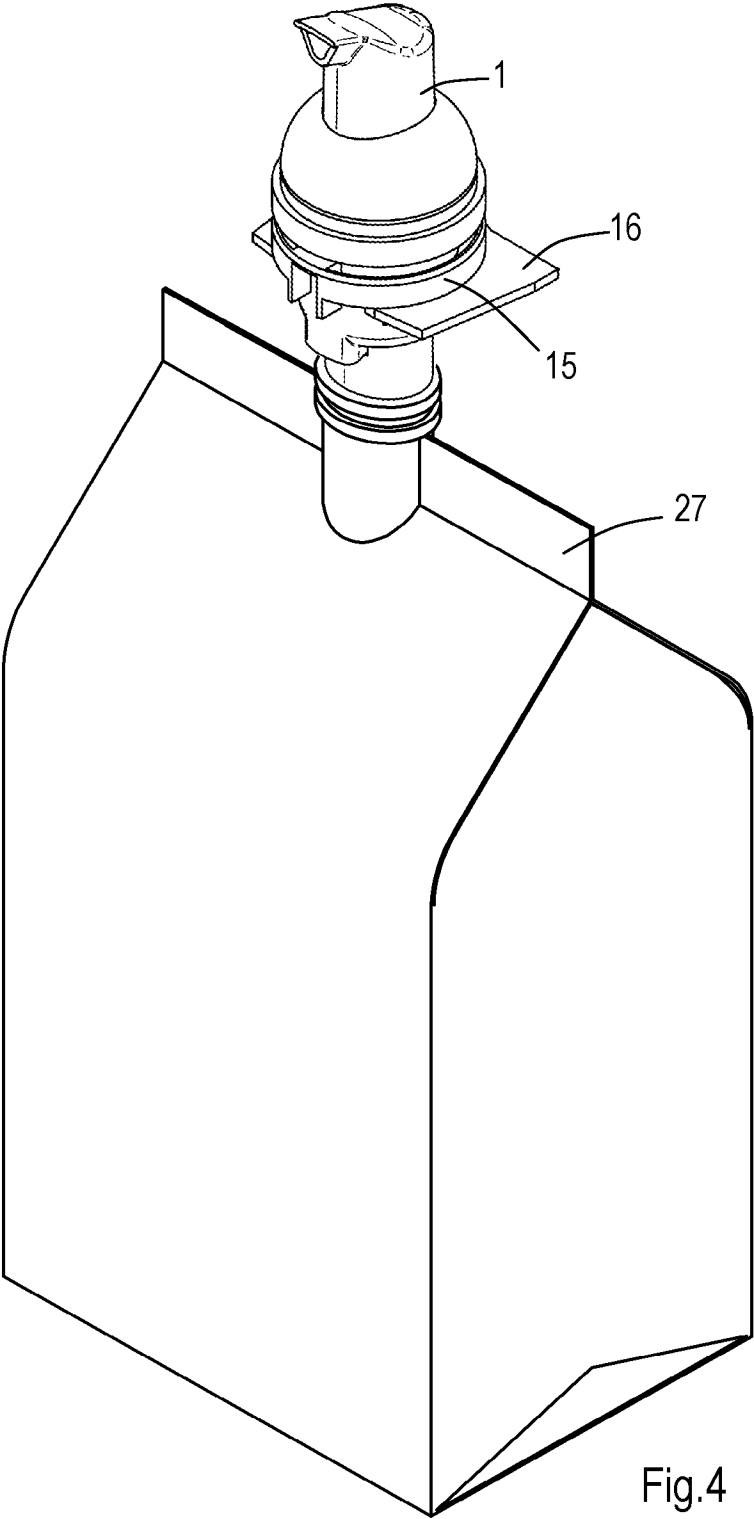


Fig.4

INTERNATIONAL SEARCH REPORT

International application No
PCT/NL2017/050250

A. CLASSIFICATION OF SUBJECT MATTER
INV. A47K5/12 B05B11/00
ADD.

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)
B05B B65D A47K

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 practicable, 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.
Y	US 2005/006408 A1 (GANZEBOOM WILHELMUS EVERHARDUS [NL]) 13 January 2005 (2005-01-13) cited in the application paragraphs [0042], [0047], [0049] - [0056], [0069], [0071]; figures 2-4,7,9 -----	1-9
Y	DE 20 2010 003949 U1 (GLAS HEINZ GMBH [DE]) 8 July 2010 (2010-07-08) cited in the application paragraphs [0012], [0021]; figures -----	1-9
A	EP 0 747 130 A2 (CALMAR INC [US]) 11 December 1996 (1996-12-11) column 5, line 58 - column 6, line 3; figures ----- -/--	1



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search

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07/08/2017

Name and mailing address of the ISA/

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Authorized officer

Fordham, Alan

INTERNATIONAL SEARCH REPORT

International application No
PCT/NL2017/050250

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2011/272432 A1 (BAUGHMAN GARY M [US]) 10 November 2011 (2011-11-10) paragraph [0050] - paragraph [0053]; figures -----	1
A	US 2013/105519 A1 (SUNDBERG ROBIN [SE] ET AL) 2 May 2013 (2013-05-02) paragraph [0078] - paragraph [0126]; figures -----	1,9

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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