

Description

The present invention relates to a combined container and pump, i.e., a pump assembly having a container for storing a liquid such as a chemical solution and air in isolated relation, and a pump for discharging the liquid from the container when required.

FIG. 4 of the accompanying drawings shows a conventional combined container and pump.

As shown in FIG. 4, the conventional combination container and pump, generally denoted at B, comprises a container a, a pump b, and a gasket c slidably disposed in the container a. The interior of the container a is sealed by the pump b at the top thereof and the gasket c at the bottom d thereof.

The pump b is of the type generally referred to as an airless pump, as disclosed in Japanese Laid-Open Patent Publication No. 61(1986)-263668. When a depressing member e of the pump b is depressed, the pump b operates to draw a stored liquid X from the container a and discharge the liquid X out of the container a.

More specifically, the liquid X filled in the container a is discharged out of the container a by the pump b when the depressing member e in the upper portion of the pump b is depressed with a finger. When the liquid X egresses out of the container a, the amount of the liquid X stored in the container a is reduced, allowing the gasket c to move upwardly in the direction indicated by the arrow in FIG. 4 while a pressing lip f of the gasket c being pressed against the inner wall surface of the container a in sealing relation. Since the liquid X filled in the container a is not exposed to ambient air, it can be stored in isolated condition.

The combined container and pump B may be filled with the liquid X as follows: The pump b is first mounted in the container a. Thereafter, in a vacuum, the liquid X is introduced into the container a through the open bottom d while the bottom d is being directed upwardly. Then, the gasket c is inserted into the bottom d, sealing the container a. This filling process, however, requires a large complex filling apparatus.

Alternatively, the gasket c may first be inserted into the bottom d and then the liquid X may be introduced into the container a through the top thereof, after which the pump b may be mounted in the top of the container a. One problem of this filling procedure is that air may be trapped in the container a when the pump b is inserted after the liquid X has been filled.

Air bubbles which have been included in the liquid X filled in the container a are responsible for oxidation of the liquid X in the container a and contamination of the filled liquid X with microorganisms contained in the air. To avoid such

drawbacks, therefore, it has been necessary to replace any air trapped when the liquid X is filled in the container a, with nitrogen.

The pressing lip f extends fully around the upper circumference of the gasket c. The pressing lip f is pressed against the inner wall surface of the container a, thereby sealingly retaining the liquid X in the container a. The gasket c is made of a relatively hard synthetic resin such as polyethylene or the like. Since the gasket c is slidable in the container a while sealing the interior of the container a, the pressing lip f is required to be relatively thin so that it is given a suitable degree of resiliency.

However, the thin pressing lip f made of a synthetic resin, e.g., polyethylene, cannot easily be shaped to a configuration which keeps the interior of the container a suitably sealed. The thin pressing lip f is usually shaped not with high accuracy. Moreover, the thin pressing lip f tends to be deformed as the temperature changes. The pressing lip f thus deformed allows the liquid X to leak from the container a past the gasket c.

In US-A-4657161, there is disclosed a dispensing container for cream-like fluids, including a cylindrical body having upper and lower closures. The lower closure is a piston which moves towards the upper closure as the fluid is dispensed from the container. Normally, the container is filled with fluid and then closed with the lower closure. The lower closure or piston is provided with a hole which permits air between the fluid and piston to escape when the lower piston is mounted in the container. The hole is sealed with a disc located at the lower inside portion of the container.

In WO-88/09483, there is disclosed a dispenser for pasty materials, intended to overcome the problems associated with other dispensers, namely the problem that the pump member does not always effectively return to its reset position and the problem that air remains in the container after filling. The dispenser has a diaphragm having radial grooves extending between hollow ridges which enhances the recovery of the diaphragm after a dispensing stroke. The piston thereof as an air-venting nozzle which is sealed after air is vented from the container.

In DE-A-3435576, there is disclosed a dispenser for pasty materials, having the features of the precharacterising portion of claim 1 herein, but having the disadvantage that the entire amount of pasty material in the container cannot be discharged from the container.

In view of the aforesaid shortcomings of the prior art, it is an object of the present invention to provide a combined container and pump which can hold a liquid such as a chemical solution in a reliably sealed fashion, which can also prevent air

from being trapped in the liquid when it is filled and sealed in the container, and from which virtually the entire amount of liquid in the container can be discharged.

According to the present invention, there is provided a combined container and pump comprising:

a container capable of storing a liquid;

a pump mounted in the container capable of drawing off liquid stored in the container and discharging the drawn liquid out of the container;

a seal slidably disposed in the container at a distance from the pump, the seal being capable of sealing liquid in the container and being movable toward the pump as the amount of liquid stored in the container is reduced due to liquid being discharged from the container by the pump, the seal having at least one slanted surface facing the pump capable of being in contact with liquid stored in the container, the seal also having a communication hole passing therethrough the inner end of which opens at the slanted surface, the communication hole providing communication between the interior and the exterior of the container; and

a cap comprising a cap body being inserted in the communication hole and a flange closing the outer end of the communication hole, wherein at least either the cap body or the seal where it surrounds the communication hole has at least one groove communicating with both the interior and the exterior of the container;

characterised in that the surface of the seal facing the pump is complementary in shape to the interior of the container in the region where the pump is mounted, and in that the communication hole is provided with a receiving region capable of accommodating an inlet port of the pump therein.

The liquid, such as a chemical solution, can be filled in the container as follows:

With the gasket (i.e. the seal) and the cap removed, the second axial end of the container is directed upwardly with the pump down, and the liquid is charged into the container through the communication hole. Thereafter, the gasket is inserted into the second axial end.

Air bubbles which may have been trapped with the liquid in the container are guided along the slanted surface of the gasket toward the communication hole. Thereafter, the cap is inserted into the communication hole. When the cap is inserted, the air bubbles in the communication hole are discharged out of the container through the grooves defined in the cap body or the walls which surround and thereby define the communication hole. The cap is fully inserted in the communication hole, thereby tightly sealing the outer end of the communication hole with the flange of the cap.

The slanted surface may extend fully or partly over an end thereof which faces the pump.

The gasket may be made of a soft resin such as synthetic rubber or natural rubber, and preferably has an annular ridge extending fully circumferentially around the slanted surface, the annular ridge having an axially flat surface slidably held against an inner wall surface of the container.

A gasket which is made of a soft resin is sufficiently resilient. The axially flat surface of the annular ridge of the gasket allows the gasket to be intimately and reliably held against the inner wall surface of the container.

Inasmuch as the annular ridge extends fully circumferentially around the slanted surface of the gasket, the annular ridge tends to be easily elastically deformed radially inwardly due to the presence of the space defined by the slanted surface. Even if the flat surface of the annular ridge is in contact with the inner wall surface of the container is relatively large, therefore, the gasket can easily slide along the inner wall surface of the cylinder.

Furthermore, the surface of the gasket facing the pump has a shape complementary to the shape of the inner surface of the first axial end of the cylindrical container, the communication hole including a receiving region for receiving the inlet port of the pump therein.

As the surface of the gasket facing the pump is complementary in shape to the inner surface of the first axial end of the container, when the gasket reaches the first axial end of the container, the surface of the gasket is substantially intimately held against the inner surface of the first axial end of the container. Therefore, almost the entire amount of the liquid stored in the container can be discharged from the container.

The above and other objects, features and advantages of the present invention will become more apparent from the following description when taken in conjunction with the accompanying drawings in which preferred embodiments of the present invention are shown by way of illustrative example, and in which:

FIG. 1 is a cross-sectional view of a combined container and pump according to an embodiment of the present invention;

FIG. 2 is a plan view of a gasket in the combined container and pump shown in FIG. 1;

FIG. 3 is a cross-sectional view showing the manner in which a liquid is filled in the combined container and pump shown in FIG. 1; and FIG. 4 is a cross-sectional view of a conventional combined container and pump.

FIGS. 1 and 2 show a combined container and pump, according to an embodiment of the present invention.

As shown in FIG. 1, the combined container and pump, generally denoted at A, comprises a cylindrical container 1 filled with a liquid X such as a chemical solution, a pump 2 mounted in an upper end thereof for drawing the liquid X in the container 1 through an inlet port 3 and discharging the drawn liquid X from an outlet port 4, and a gasket 31 slidably fitted in a lower end of the container 1 and sealing the liquid X filled in the container 1, the gasket 31 being movable axially in the container 1 toward the pump 2 as the amount of liquid X contained in the container 1 is reduced.

The container 1 has a mounting neck 6 substantially centrally in the upper end thereof, and the pump 2 is supported in the mounting neck 6. The lower end of the container 1 has a bottom 7 which is open for insertion of the gasket 31 thereinto.

With the pump 2 fixedly mounted in the mounting neck 6, the inlet port 3 projects into the container 1. The pump 2 has a pressing member 8 which can be pushed by a finger to actuate a pump mechanism (not shown) for thereby drawing the liquid X through the inlet port 3 and discharging the liquid X out of the outlet port 4.

A communication hole 35 is defined axially in the gasket 31. Through the communication hole 35, the interior and the exterior of the container 1 are held in communication with each other. A cap 12 for sealing the interior of the container 1 is fitted in the communication hole 35 at one end of the gasket 31 facing outside of the container 1. The gasket 31 has a plurality of axial grooves 13 defined in the wall which surround and which define the communication hole 35, the axial grooves 13 extending in a direction in which the cap 12 can be inserted into the communication hole 35. The cap 12 has a radially outwardly extending annular flange 14 on the outer rear end of a cap body 15, which flange 14 is held against the outer end of the communication hole 35.

Instead of the grooves 13, similar grooves may be defined in the outer cylindrical surface of the cap body 15 which is held against the walls surrounding and defining the communication hole 35. Alternatively, the grooves 13 may be defined in the walls of the gasket 31 which define the communication hole 35 and in the outer cylindrical surface of the cap body 15.

The gasket 31 is made of a hydrogenated SBS block copolymer, which is a thermoplastic elastomer which is of high mouldability and chemical resistance.

The gasket 31 has an upper surface 32 facing upwardly (in FIG. 1) in contact with the liquid X in the container 1, the upper surface 32 having a conical shape projecting upwardly in complementary relation to the inner surface of the upper end of the container 1.

The gasket 31 also has an annular ridge 33 projecting radially outwardly and extending fully circumferentially around the upper surface 32, the annular ridge 33 having an axially flat surface 34 held against the inner wall surface of the container 1. The flat surface 34 is sufficiently resilient since the material of the gasket 31 is a soft resin. The gasket 31 is therefore slidably inserted in the container 1 with the flat surface 34 being held in intimate sliding contact with the inner wall surface of the container 1 under the pressure exerted by the annular ridge 23.

The gasket 31 has the communication hole 35 defined axially therethrough, thereby providing communication between the interior and the exterior of the container 1. The communication hole 35 is composed of a receiving region 36 for receiving the inlet port 3 of the pump 2 disposed in the container 1, and an introducing region 37 communicating with the receiving region 36 and opening at the lower end of the gasket 31, for introducing the liquid X into the container 1.

As shown in FIG. 2, the gasket 31 has three equally angularly spaced, radial slots 36a defined therein and extending from the outer circumference of the upper surface 32 toward the communication hole 35. The slots 36a are open at upper portions thereof and have slanted lower surfaces 38 which are progressively inclined downwardly in the radial inward direction, as shown in FIG. 1. When the bottom 7 of the container 1 is directed upwardly as shown in FIG. 3, therefore, the ends of the slanted lower surfaces 38 near the outer circumference of the upper surface 32 are lower in position. With the slots 36a opening at upper portions thereof, the conical upper surface 32 extends partly over the end of the gasket 31 which faces the pump 2.

The liquid X can be filled in the container 1 as follows:

As shown in FIG. 3, the bottom 7 of the container 1 is directed upwardly, with the pump 2 directed downwardly. Then, the gasket 31 with the cap 12 not yet inserted therein is inserted in the bottom 7. The liquid X is now charged into the container 1 through the communication hole 35 in the gasket 31. Air bubbles Y, which may have been trapped in the container 1 when the liquid X is introduced into the container 1, move radially outwardly along the conical upper surface 32 of the gasket 31 toward the outer circumference of the upper surface 32. Thereafter, the air bubbles Y move radially inwardly in the slots 36a along the slanted surfaces 38 toward the communication hole 35. The slots 36a may also receive air bubbles which are displaced from the upper surface 32 before they reach the outer circumference of the upper surface 32, and guide the received air bubbles toward the communication hole 35.

Finally, the cap 12 is inserted into the communication hole 35. As the cap 12 is inserted, the air bubbles Y which are collected in the communication hole 35 are discharged out of the container 1 through the grooves 13. The cap 12 is fully inserted in the communication hole 35 until the outer ends of the grooves 13 are closed off by the flange 14, whereupon the container 1 is completely sealed.

The combined container and pump A which is filled with the liquid X, according to the above embodiment, operates in the following manner. When the pressing member 8 of the pump 2 is repeatedly depressed and released by the user, the pump mechanism of the pump 2 is actuated to draw the liquid X through the inlet port 3 and discharge the liquid X through the outlet port 4. As the liquid X is discharged out of the container 1, the amount of the liquid X in the container 1 is progressively reduced, and the gasket 31 moves upwardly while keeping the interior of the container 1 sealed as indicated by the imaginary lines in FIG. 1. When the gasket 31 reaches the upper end of the container 1, the upper surface 32 of the gasket 32 is substantially intimately held against the inner surface of the upper end of the container 1. Therefore, almost the entire amount of the liquid X stored in the container 1 can be discharged from the container 1.

Claims

1. A combined container (1) and pump (2) comprising:
 - a container (1) capable of storing a liquid (X);
 - a pump (2) mounted in the container (1) capable of drawing off liquid (X) stored in the container (1) and discharging the drawn liquid (X) out of the container (1);
 - a seal (31) slidably disposed in the container (1) at a distance from the pump (2), the seal (31) being capable of sealing liquid (X) in the container (1) and being movable toward the pump (2) as the amount of liquid (X) stored in the container (1) is reduced due to liquid (X) being discharged from the container (1) by the pump (2), the seal (31) having at least one slanted surface (38) facing the pump (2) capable of being in contact with liquid (X) stored in the container (1), the seal (31) also having a communication hole (35) passing therethrough the inner end of which opens at the slanted surface (38), the communication hole (35) providing communication between the interior and the exterior of the container (1); and
 - a cap (12) comprising a cap body being inserted in the communication hole (35) and a

flange (14) closing the outer end of the communication hole (35), wherein at least either the cap body or the seal (31) where it surrounds the communication hole (35) has at least one groove (13) communicating with both the interior and the exterior of the container (1);

characterised in that the surface (32) of the seal (31) facing the pump (2) is complementary in shape to the interior of the container (1) in the region where the pump (2) is mounted, and in that the communication hole (35) is provided with a receiving region (36) capable of accommodating an inlet port (3) of the pump (2) therein.

2. A combined container (1) and pump (2) according to claim 1, wherein the slanted surface (38) extends fully over the part of the seal (31) which faces the pump (2).
3. A combined container (1) and pump (2) according to claim 1, wherein the slanted surface (38) extends partially over the part of the seal (31) which faces the pump (2).
4. A combined container (1) and pump (2) according to claim 1, 2 or 3, wherein the seal (31) is made of a soft resin, and has an annular protrusion (33) extending circumferentially around the slanted surface (38).
5. A combined container (1) and pump (2) according to claim 4, wherein the annular protrusion (33) has an axially flat surface (34) capable of being slidably held against the interior surface of the container (1).
6. A combined container (1) and pump (2) according to any preceding claim, wherein the slanted surface (38) is inclined away from the pump (2).
7. A combined container (1) and pump (2) according to any preceding claim, wherein the interior of the container (1) has a substantially cylindrical portion in which the seal (31) is slidably disposed.
8. A combined container (1) and pump (2) according to claim 7, wherein the communication hole (35) extends through the seal (31) axially with respect to the cylindrical portion of the container (1).
9. A combined container (1) and pump (2) according to claim 7 or 8, wherein the at least one groove (13) extends through the cap body



Finally, the cap 12 is inserted into the communication hole 35. As the cap 12 is inserted, the air bubbles Y which are collected in the communication hole 35 are discharged out of the container 1 through the grooves 13. The cap 12 is fully inserted in the communication hole 35 until the outer ends of the grooves 13 are closed off by the flange 14, whereupon the container 1 is completely sealed.

The combined container and pump A which is filled with the liquid X, according to the above embodiment, operates in the following manner. When the pressing member 8 of the pump 2 is repeatedly depressed and released by the user, the pump mechanism of the pump 2 is actuated to draw the liquid X through the inlet port 3 and discharge the liquid X through the outlet port 4. As the liquid X is discharged out of the container 1, the amount of the liquid X in the container 1 is progressively reduced, and the gasket 31 moves upwardly while keeping the interior of the container 1 sealed as indicated by the imaginary lines in FIG. 1. When the gasket 31 reaches the upper end of the container 1, the upper surface 32 of the gasket 32 is substantially intimately held against the inner surface of the upper end of the container 1. Therefore, almost the entire amount of the liquid X stored in the container 1 can be discharged from the container 1.

Claims

1. A combined container (1) and pump (2) comprising:
 - a container (1) capable of storing a liquid (X);
 - a pump (2) mounted in the container (1) capable of drawing off liquid (X) stored in the container (1) and discharging the drawn liquid (X) out of the container (1);
 - a seal (31) slidably disposed in the container (1) at a distance from the pump (2), the seal (31) being capable of sealing liquid (X) in the container (1) and being movable toward the pump (2) as the amount of liquid (X) stored in the container (1) is reduced due to liquid (X) being discharged from the container (1) by the pump (2), the seal (31) having at least one slanted surface (38) facing the pump (2) capable of being in contact with liquid (X) stored in the container (1), the seal (31) also having a communication hole (35) passing therethrough the inner end of which opens at the slanted surface (38), the communication hole (35) providing communication between the interior and the exterior of the container (1); and
 - a cap (12) comprising a cap body being inserted in the communication hole (35) and a

flange (14) closing the outer end of the communication hole (35), wherein at least either the cap body or the seal (31) where it surrounds the communication hole (35) has at least one groove (13) communicating with both the interior and the exterior of the container (1);

characterised in that the surface (32) of the seal (31) facing the pump (2) is complementary in shape to the interior of the container (1) in the region where the pump (2) is mounted, and in that the communication hole (35) is provided with a receiving region (36) capable of accommodating an inlet port (3) of the pump (2) therein.

2. A combined container (1) and pump (2) according to claim 1, wherein the slanted surface (38) extends fully over the part of the seal (31) which faces the pump (2).
3. A combined container (1) and pump (2) according to claim 1, wherein the slanted surface (38) extends partially over the part of the seal (31) which faces the pump (2).
4. A combined container (1) and pump (2) according to claim 1, 2 or 3, wherein the seal (31) is made of a soft resin, and has an annular protrusion (33) extending circumferentially around the slanted surface (38).
5. A combined container (1) and pump (2) according to claim 4, wherein the annular protrusion (33) has an axially flat surface (34) capable of being slidably held against the interior surface of the container (1).
6. A combined container (1) and pump (2) according to any preceding claim, wherein the slanted surface (38) is inclined away from the pump (2).
7. A combined container (1) and pump (2) according to any preceding claim, wherein the interior of the container (1) has a substantially cylindrical portion in which the seal (31) is slidably disposed.
8. A combined container (1) and pump (2) according to claim 7, wherein the communication hole (35) extends through the seal (31) axially with respect to the cylindrical portion of the container (1).
9. A combined container (1) and pump (2) according to claim 7 or 8, wherein the at least one groove (13) extends through the cap body



or the seal (31) where it surrounds the communication hole (35) axially with respect to the cylindrical portion of the container (1).

Patentansprüche

1. Kombination aus Behälter (1) und Pumpe (2), umfassend einen Behälter (1), der eine Flüssigkeit (X) speichern kann;

eine in dem Behälter (1) montierte Pumpe (2), die im Behälter (1) gespeicherte Flüssigkeit (X) abziehen und aus dem Behälter (1) abgezogene Flüssigkeit (X) entfernen kann;

eine unter Abstand zur Pumpe (2) verschiebbar im Behälter (1) angeordnete Dichtung (31), wobei die Dichtung (31) dazu geeignet ist, Flüssigkeit (X) im Behälter (1) abzudichten und die Dichtung (31) auf die Pumpe (2) zu beweglich ist, wenn sich die im Behälter (1) gespeicherte Flüssigkeitsmenge (X) verringert, weil die Pumpe (2) Flüssigkeit (X) aus dem Behälter (1) fördert, und die Dichtung (31) mindestens eine geneigte, der Pumpe (2) gegenüberliegende Oberfläche (38) aufweist, dazu geeignet, mit der im Behälter (1) gespeicherten Flüssigkeit (X) in Berührung zu kommen, und die Dichtung (31) ferner ein durch sie hindurchgehendes Verbindungsloch (35) hat, dessen inneres Ende sich an der geneigten Oberfläche (38) öffnet, wobei das Verbindungsloch (35) die Verbindung zwischen dem Inneren und dem Äußeren des Behälters (1) herstellt; und

eine Kappe (12), umfassend einen in das Verbindungsloch (35) eingesetzten Kappenkörper und einen Flansch (14), der das äußere Ende des Verbindungslochs (35) verschließt, wobei mindestens entweder der Kappenkörper oder die Dichtung (31), dort wo sie das Verbindungsloch (35) umgibt, mindestens eine Nut (13) hat, die sowohl mit dem Inneren als auch mit dem Äußeren des Behälters (1) in Verbindung steht, dadurch gekennzeichnet,

daß die der Pumpe (2) gegenüberliegende Oberfläche (32) der Dichtung (31) im Bereich, in dem die Pumpe (2) montiert ist, komplementär zum Inneren des Behälters (1) geformt ist, und

daß das Verbindungsloch (35) mit einem Aufnahmebereich (36) versehen ist, dazu geeignet, eine Einlaßöffnung (3) der Pumpe (2) darin unterzubringen.

2. Kombination aus Behälter (1) und Pumpe (2) nach Anspruch 1, wobei die geneigte Oberfläche (38) vollständig über den Teil der Dichtung (31) verläuft, der der Pumpe (2) gegenüberliegt.

3. Kombination aus Behälter (1) und Pumpe (2) nach Anspruch 1, wobei die geneigte Oberfläche (38) teilweise über den Teil der Dichtung (31) verläuft, der der Pumpe (2) gegenüberliegt.

4. Kombination aus Behälter (1) und Pumpe (2) nach Anspruch 1, 2 oder 3, wobei die Dichtung (31) aus einem weichen Kunststoff besteht und einen ringförmigen Vorsprung (33) aufweist, der entlang des Umfangs der geneigten Oberfläche (38) verläuft.

5. Kombination aus Behälter (1) und Pumpe (2) nach Anspruch 4, wobei der ringförmige Vorsprung (33) eine axiale, ebene Oberfläche (34) aufweist, dazu geeignet, verschiebbar gegen die innere Oberfläche des Behälters (1) gedrückt zu werden.

6. Kombination aus Behälter (1) und Pumpe (2) nach irgendeinem der vorhergehenden Ansprüche, wobei die geneigte Oberfläche (38) von der Pumpe (2) weg geneigt ist.

7. Kombination aus Behälter (1) und Pumpe (2) nach irgendeinem der vorhergehenden Ansprüche, wobei das Innere des Behälters 1 einen im wesentlichen zylindrischen Teil aufweist, in dem die Dichtung (31) verschiebbar angebracht ist.

8. Kombination aus Behälter (1) und Pumpe (2) nach Anspruch 7, wobei das Verbindungsloch (35) bezogen auf den zylindrischen Teil des Behälters (1) axial durch die Dichtung (31) verläuft.

9. Kombination aus Behälter (1) und Pumpe (2) nach Anspruch 7 oder 8, wobei mindestens eine Nut (13) durch den Kappenkörper oder die Dichtung (31) verläuft, wo sie das Verbindungsloch (35) bezogen auf den zylindrischen Teil des Behälters (1) axial umgibt.

Revendications

1. Combinaison d'un réservoir (1) et d'une pompe (2), comprenant :

- un réservoir (1) capable de stocker un liquide (X) ;
- une pompe (2) montée dans le réservoir (1) et capable de soutirer du liquide (X) stocké dans le réservoir (1) et de décharger hors du réservoir (1) le liquide soutiré (X) ;
- un joint (31) disposé en coulissement dans le réservoir (1) à une distance de la



- pompe (2), le joint (31) étant capable de fermer de façon étanche du liquide (X) dans le réservoir (1), et pouvant être déplacé en direction de la pompe (2) tandis que la quantité de liquide (X) stocké dans le réservoir (1) est réduite en raison du fait que le liquide (X) est déchargé du réservoir (1) par la pompe (2), le joint (31) ayant au moins une surface inclinée (38) qui fait face à la pompe (2) et qui est capable d'être en contact avec le liquide (X) stocké dans le réservoir (1), le joint (31) étant également traversé par un trou de communication (35), dont l'extrémité intérieure s'ouvre au niveau de la surface inclinée (38), le trou de communication (35) assurant une communication entre l'intérieur et l'extérieur du réservoir (1) ; et
- un capuchon (12) comprenant un corps de capuchon qui est introduit dans le trou de communication (35) et une bride (14) qui referme l'extrémité extérieure du trou de communication (35), dans laquelle l'un au moins des deux éléments comprenant le corps de capuchon et le joint (31) où il entoure le trou de communication (35), comporte au moins une gorge (13) qui communique à la fois avec l'intérieur et avec l'extérieur du réservoir (1) ; caractérisée en ce que la surface (32) du joint (31) qui fait face à la pompe (2) a une forme complémentaire de l'intérieur du réservoir (1) dans la région où la pompe (2) est montée, et en ce que le trou de communication (35) est pourvu d'une région de réception (36) capable de loger un orifice d'entrée (3) de la pompe (2) dans celui-ci.
2. Combinaison d'un réservoir (1) et d'une pompe (2), selon la revendication 1, dans laquelle la surface inclinée (38) s'étend entièrement au-dessus de la partie du joint (31) qui fait face à la pompe (2).
 3. Combinaison d'un réservoir (1) et d'une pompe (2), selon la revendication 1, dans laquelle la surface inclinée (38) s'étend partiellement au-dessus de la partie du joint (31) qui fait face à la pompe (2).
 4. Combinaison d'un réservoir (1) et d'une pompe (2), selon l'une quelconque des revendications 1, 2 ou 3, dans laquelle le joint (31) est réalisé en une résine souple, et en ce qu'il comporte une saillie annulaire (33) qui s'étend circumférentiellement autour de la surface inclinée (38).
 5. Combinaison d'un réservoir (1) et d'une pompe (2), selon la revendication 4, dans laquelle la saillie annulaire (33) présente une surface axialement plane (34) capable d'être maintenue en coulissement contre la surface intérieure du réservoir (1).
 6. Combinaison d'un réservoir (1) et d'une pompe (2), selon l'une quelconque des revendications précédentes, dans laquelle la surface inclinée (38) est inclinée en éloignement de la pompe (2).
 7. Combinaison d'un réservoir (1) et d'une pompe (2), selon l'une quelconque des revendications précédentes, dans laquelle l'intérieur du réservoir (1) comporte une partie sensiblement cylindrique dans laquelle le joint (31) est disposé en coulissement.
 8. Combinaison d'un réservoir (1) et d'une pompe (2), selon la revendication 7, dans laquelle le trou de communication (35) s'étend à travers le joint (31) axialement par rapport à la partie cylindrique du réservoir (1).
 9. Combinaison d'un réservoir (1) et d'une pompe (2), selon l'une ou l'autre des revendications 7 et 8, dans laquelle ladite au moins une gorge (13) s'étend à travers le corps du capuchon ou à travers le joint (31) où il entoure le trou de communication (35) axialement par rapport à la partie cylindrique du réservoir (1).