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(54) FLUID PRODUCT DISPENSER WITH FLEXIBLE POUCH AND METHOD FOR PRODUCING ONE SUCH FLEXIBLE POUCH

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(57) ABSTRACT

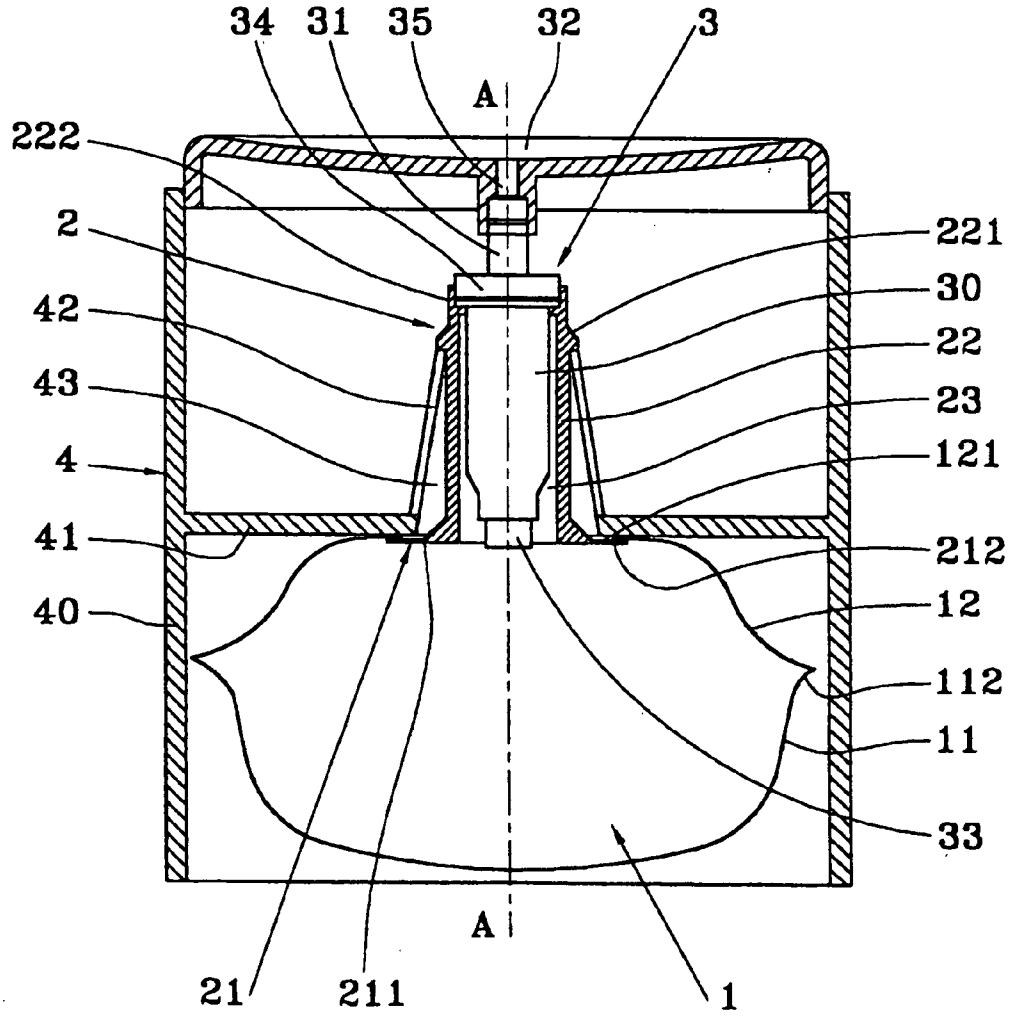
A fluid dispenser comprising:

a variable-capacity deformable flexible pouch (1) provided with an opening (121);

a flexible pouch support (2) to which the opening (121) in the flexible pouch (1) is fixed, said support having a fixing surface (212) at which the flexible pouch is fixed to the support; and

a dispensing member (3) such as a pump or a valve, mounted on the pouch support (2) for drawing fluid from the pouch;

said dispenser being characterized in that the fixing surface (212) is substantially plane, so that it extends in one plane.



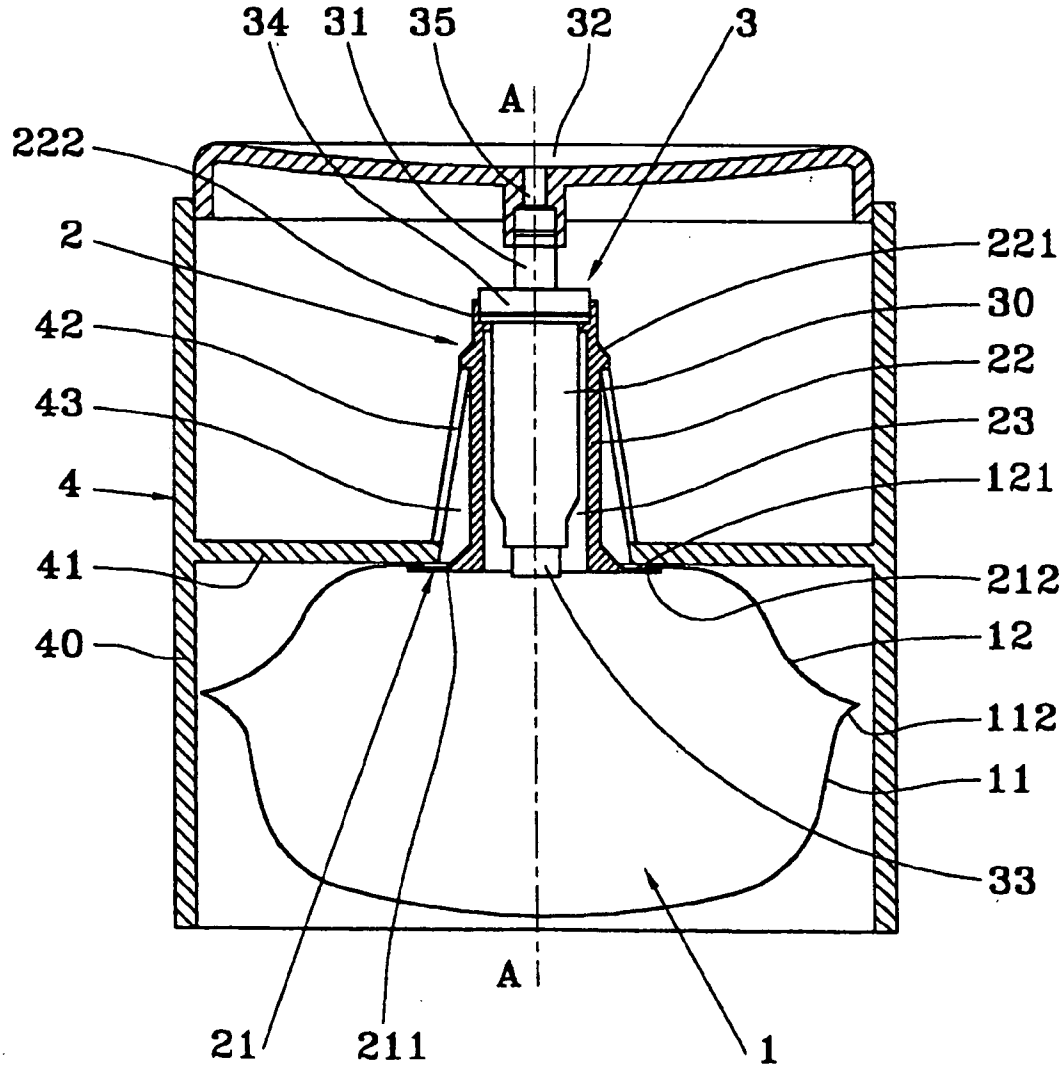

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FIG. 1

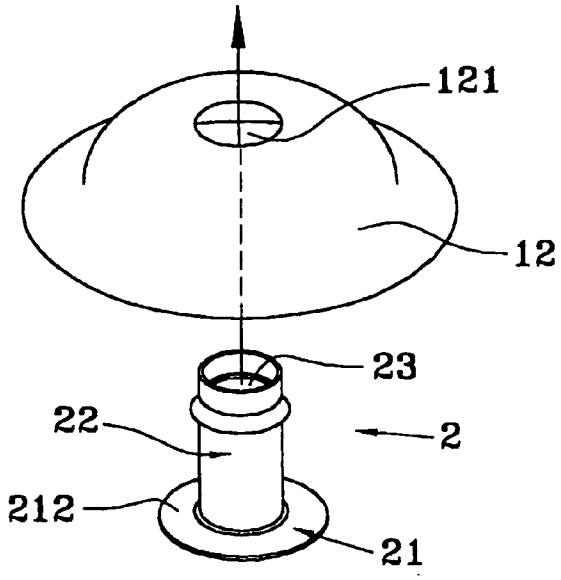

FIG.2

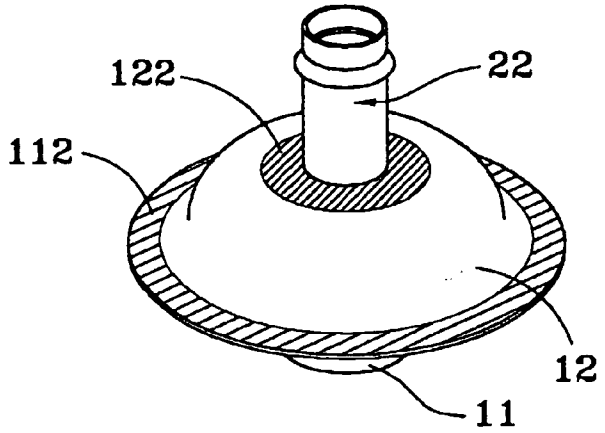

FIG.4

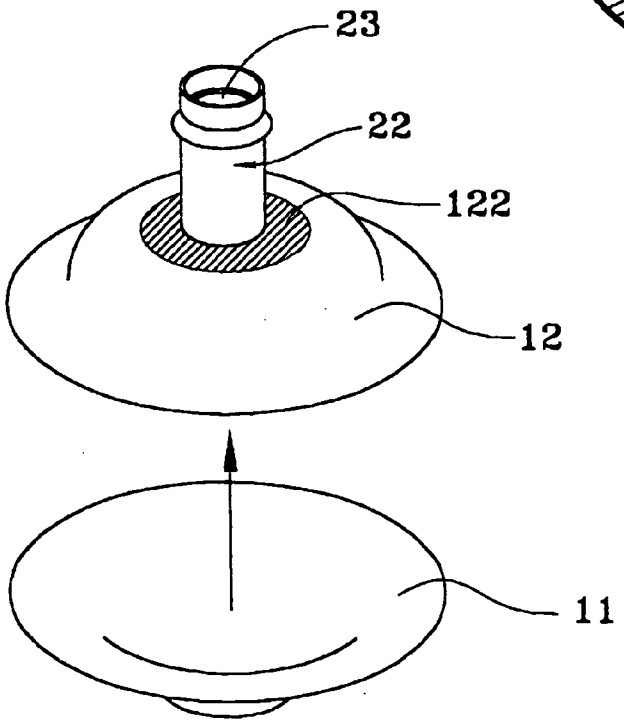

FIG.3

FLUID PRODUCT DISPENSER WITH FLEXIBLE POUCH AND METHOD FOR PRODUCING ONE SUCH FLEXIBLE POUCH

[0001] The present invention relates to a fluid dispenser comprising a variable-capacity deformable flexible pouch provided with an opening, a pouch support having a fixing surface at which the opening in the flexible pouch is fixed to it, and a dispensing member such as a pump or a valve, mounted on the pouch support for drawing off fluid through the opening in the flexible pouch. This an entirely conventional design for a fluid dispenser such as can be encountered in the field of cosmetics, perfumes, or indeed pharmaceuticals. Flexible pouches are, in general, used to protect the fluid from the ambient air, and thus to avoid any degradation of the fluid by oxidation or by drying out. In order to use the dispenser, the user presses on the pusher of the dispensing member, thereby delivering a dose of fluid which is drawn from the flexible pouch by the pump or the valve. In order to prevent the fluid from coming into contact with air in the flexible pouch, said pouch collapses, thereby reducing its volume, as the fluid is extracted from it by the pump or the valve.

[0002] In general, the flexible pouch is fixed, often by heat-sealing, to the pouch support to which the pump or the valve is fitted. For this purpose, the pouch forms a fixing appendage which is often diamond-shaped or eye-shaped. More precisely, the heat-sealing fixing surfaces of the fixing appendage are constituted by the outside walls of a cylinder that is not circular, but rather that is diamond-shaped or eye-shaped.

[0003] In addition, the pouch is in general made up of two flexible sheets sealed together around their peripheries, except at the opening, so that the opening is formed by a zone in which the two sheets are not sealed together. In the initial state, when the support is not yet fixed to the pouch, the two sheets making up the pouch are in contact with each other, and the opening is closed in non-leaktight manner. When the support is to be fitted to the pouch, it is necessary to cause the opening to open up or gape in order to insert the eye-shaped or diamond-shaped fixing appendage. Then, the opening of the pouch is sealed to the appendage.

[0004] That type of flexible pouch is advantageous for dispensers having a vertical elongate shape. In order to have a certain amount of capacity, the flexible pouch must be sufficiently long, given that its height does not vary very much between its full state and its empty state.

[0005] It is therefore not advantageous to use that type of pouch for a dispenser that is tub-shaped, i.e. that has a diameter that is relatively large compared with its height.

[0006] An object of the present invention is to remedy that drawback of the prior art by defining a fluid dispenser whose flexible pouch is particularly well suited to being used in a tub-shaped dispenser.

[0007] The present invention solves this problem by proposing a fluid dispenser comprising:

[0008] a variable-capacity deformable flexible pouch provided with an opening;

[0009] a flexible pouch support to which the opening in the flexible pouch is fixed, said support having a fixing surface at which the flexible pouch is fixed to the support; and

[0010] a dispensing member such as a pump or a valve, mounted on the pouch support for drawing fluid from the pouch;

[0011] said dispenser being characterized in that the fixing surface is substantially plane, so that it extends in one plane. By providing a fixing surface that is plane rather than cylindrical, the height of the pouch is reduced considerably. In an advantageous embodiment, the fixing surface is annular. Preferably, the support comprises a substantially tubular sleeve having a longitudinal axis, the dispensing member extending in said sleeve, the plane of the fixing surface being perpendicular to said longitudinal axis. In a practical embodiment, the fixing surface is formed by one face of an annular, plane, thin flange disposed inside the pouch around the opening therein.

[0012] According to another advantageous characteristic of the invention, the flexible pouch is made up of two flexible pouches that are sealed together over their peripheries, along a sealing line, the opening in the flexible pouch being situated in one of the sheets. Advantageously, the opening is situated substantially at the center of one of the sheets. Preferably, the sealing line along which the two sheets are sealed together extends in a plane substantially parallel to the plane of the fixing surface of the pouch support. Thus, the empty flexible pouch has a thickness that is almost zero along the longitudinal axis. By disposing the two sealing lines in two parallel planes which are perpendicular to the axis of the support and of the dispensing member, the height of the pouch is reduced considerably, the variations in the volume of the pouch generating a difference in the height of the pouch, as measured along the longitudinal axis of the support of the dispensing member.

[0013] The present invention also defines a method of manufacturing a flexible pouch provided with a flexible pouch support, said method comprising the following steps:

[0014] cutting out two substantially identical sheets, each of which has a periphery;

[0015] cutting an opening through one of the two sheets advantageously at its center;

[0016] fixing the pouch support to the sheet provided with the opening so that it extends through the opening; and

[0017] fixing the other flexible sheet to the sheet provided with the opening around their peripheries.

[0018] Advantageously, the support serves to cut the opening through the sheet, advantageously by punching out.

[0019] The invention is described more fully below with reference to the accompanying drawings which give non-limiting examples of an embodiment of the invention.

[0020] In the figures:

[0021] **FIG. 1** is a vertical section view through a fluid dispenser of the invention; and

[0022] FIGS. **2** to **4** are diagrammatic views of the various stages in manufacturing a fluid pouch equipped with a pouch support of the invention.

[0023] The fluid dispenser shown in **FIG. 1** comprises a flexible pouch **1**, a flexible pouch support **2**, a dispensing member **3** and a shell **4**.

[0024] The dispensing member **3** shown is a pump, but it may also be a valve. The pump **3** comprises a pump body **30** defining a bottom end **33** forming the inlet and a top end forming a projecting collar **34**. The pump **3** further comprises an actuating rod **31** which is mounted to move inside the pump body **30** along a longitudinal axis A. The end of the actuating rod **31** underlies a pusher **32** which defines a dispensing orifice **35**. In this example, the pusher **32** is in the form of a dished cap with a dispensing orifice **35** placed at its center so as to receive the fluid dispensed by the pump. Once the fluid has been dispensed onto the pusher **32**, the user merely scoops it up with one or more fingers. It can be understood that such a pump **3** is particularly suitable for dispensing creams or semi-liquid cosmetics in general.

[0025] The pump **3** is advantageously an airless pump, i.e. it does not allow air to be taken into the pump from the outside as the fluid is being dispensed.

[0026] The pump **3** is received in a pouch support **2** which comprises a substantially tubular sleeve **22** and an annular flange **21** which extends radially outwards from the bottom end of the sleeve **22**. The inside of the sleeve **22** is hollow and thus forms a through passageway **23**. At its top end **222**, the sleeve **22** forms a recess for receiving the projecting collar **34** of the pump body **30** advantageously by snap-fastening. The pump **3** is thus fixed in the sleeve **22** with the pump body **30** extending in the passageway **23**. The bottom end **33** of the pump body **30** that forms the inlet of the pump is advantageously situated at the bottom end of the sleeve **22**, as can be seen in **FIG. 1**. The sleeve **22** and the pump **3** have the same longitudinal axis A. Below the recess **222**, the sleeve **22** forms one or more anchoring profiles **221** whose functions are given below. The flange **21** that extends radially outwards from the bottom end of the sleeve **22** has an annular fixing surface that is substantially plane and that extends over one of the faces of the flange **21**. Advantageously, said plane fixing surface is situated on the top face **212** of the flange **21**, i.e. on the face facing towards the sleeve **22**. Although it lies in a single plane, said annular fixing surface may be provided with pieces in relief that do not affect the generally plane configuration of the surface. Such pieces in relief may, for example, be heat-sealing ribs serving to melt at least in part when the flexible pouch is sealed to the pouch support. The bottom face **211** of the flange **21** may also serve as a fixing surface in place of the top face **212**. However, when said bottom face **211** does not serve as a fixing surface, it is not necessarily plane, and can thus have a non-negligible amount of relief. However, the bottom face **211** is preferably also plane, and the thickness of the flange **21** is preferably relatively small, so that the flange is in the form of a flat annular disk of small thickness provided with a through passageway **23** in its center.

[0027] The pouch **1** is fixed to the pouch support **2** at the fixing surface which, in this example, is the top face **212**. Since the fixing surface **212** is annular, plane, and perpendicular to the longitudinal axis A, the flexible pouch **1** at its opening **121** is disposed in a manner such that it is plane and perpendicular to the longitudinal axis A. That portion of the flexible pouch **1** which flanks its opening **121** thus extends in plane manner over the flange **21** around the sleeve **22** which projects through the opening **121**. The flange **21** is thus disposed inside the flexible pouch **1** while the sleeve **22** extends outwards. Therefore, the passageway **23** through the sleeve **22** puts the pump **3** into communication with the inside of the flexible pouch via the opening **121** therein. More precisely, as can be seen in **FIG. 1**, the inlet **33** of the pump **3** is situated at the opening **121** in the pouch **1**.

[0028] Advantageously, the opening **121** in the pouch **1** is formed in a flexible sheet **12** and advantageously at the center thereof. Said sheet **12** is connected to another sheet **11** along a peripheral bonding line **112**. It should be noted that the opening **121** is formed by the sheet **12** only, and that the sheet **11** therefore does not participate in forming said opening **121**. In the invention, the peripheral bonding line **112** common to the two sheets **11** and **12** extends in a plane parallel to the plane of the fixing surface **212** of the pouch support **2** and perpendicular to the longitudinal axis A. Therefore, increasing the volume of the pouch **1** is achieved to a large extent by increasing its height along the axis A. Conversely, when the flexible pouch **1** is empty, the flexible sheet **11** can come into contact with the bottom face **211** of the flange **21** so that the thickness of the pouch corresponds to the combined thicknesses of the two flexible sheets **11** and **12** and of the flange **21** which is extremely thin. This applies particularly when the flexible sheets are plane. Therefore, the thickness of the pouch **1** in the empty state along the axis A may be approximately in the range 1 mm to 3 mm. By means of this characteristic, said flexible pouch **1** is particularly suitable for use in fluid dispensers which are in the form of tubs rather than bottles. It is possible to have a relatively large capacity for the flexible pouch **1** with a pouch height that is relatively small along the axis A.

[0029] The dispenser also includes a shell **4** which comprises an outer casing **40** which is cylindrical in **FIG. 1**. Naturally, the outside shape of the shell **40** can vary considerably as a function of the appearance that is to be given to the dispenser. In the example shown in **FIG. 1**, the dispenser is tub-shaped, so that the outer casing **40** is not very high relative to its diameter, so as to impart the appearance of a tub to it. The outer casing **40** extends to the level of the pusher **32** of the pump **3**, which pusher can advantageously move inside the casing **40**. At its bottom end, the casing **40** may be provided with a bottom (not shown). Inside the casing **40**, an annular plate **41** extends that is substantially plane in this example. The plate **41** could also be shaped differently, e.g. it could be frustoconical. Said plate **41** extends inwards and, at its center, defines a hole **43** through which the sleeve **22** of the pouch support **2** extends. In order to fix the pouch support **2** to the plate **41**, said plate is provided with retaining means **42** which co-operate with the anchoring profiles **221** formed in the vicinity of the top end of the sleeve **22**. For example, the retaining means **42** may be in the form of a frustoconical split bushing which can be elastically deformed outwards to a certain extent to allow the anchoring profiles **221** to pass at the top end of the bushing **42**. The anchoring profiles **221** coming into engagement at the top end of the bushing **42** corresponds to the flange **21** coming into abutment under the plate **41**, at the edge of the hole **43**. However, since the pouch **1** is fixed to the top face of the flange **21**, it is the pouch **1** that comes into bearing contact against the bottom face of the plate **41**. The edge of the opening **121** in the flexible pouch **1** is thus wedged between the flange **21** and the plate **41**. Although heat-sealing is the preferred mode of fixing to the flange **21**,

it is also possible to envisage fixing the pouch **1** to the pouch support **2** in leaktight manner merely by wedging the pouch **1** between the flange **21** and the plate **41**. In any event, even with fixing by heat-sealing, wedging the pouch between the flange **21** and the plate **41** can but improve the fixing of the pouch and the leaktightness of the fixing. Naturally, it is possible to imagine other modes of anchoring the pouch support **2** in the shell **4**, which modes nevertheless enable the pouch to be wedged between the flange and the plate **41**. In other words, the frustoconical retaining bushing **42** does not constitute a is limiting embodiment.

[**0030**] In the prior art, flexible pouches fixed to pouch supports are generally made up of two sheets sealed together around their peripheries except at the opening into which the pouch support is inserted before final sealing is performed. In the present invention, the pouch is manufactured differently in that the pouch support is fixed prior to sealing together the two sheets. More precisely, firstly an opening **121** is provided in a flexible sheet **12**. The sleeve **22** of a pouch support **2** is then inserted through the opening **121** until said sheet **12** comes into contact with the fixing top face **212** of the flange **21**. Then the sheet **12** is fixed to the flange **21**, preferably by heat-sealing, along a sealing line **122**. The flexible sheet **12** is thus fixed to a pouch support whose sleeve **22** projects through the opening **121** and whose flange **21** is situated on the bottom face of the sheet **12**. The final step consists in fixing another flexible sheet **11** (advantageously of the same size as the sheet **12**) to the sheet **12**, e.g. by heat-sealing, along a peripheral bonding line **112**. The sheet **11** is sealed to the sheet **12** on that side on which the flange **21** extends, so that the flange **21** is situated inside the flexible pouch with its sleeve **22** projecting outwards through the opening **121**. All of the manufacturing steps are shown in **FIGS. 2, 3**, and **4**. According to another characteristic of the invention, it is possible to use the pouch support **2**, and more particularly its sleeve **22**, to form the opening **121** in the sheet **12**. Thus, the opening **121** may be punched out by the pouch support **2** which is then immediately inserted through the opening **121**.

[**0031**] The flexible sheets **11** and **12** may be plane, but they may also be domed, as shown in FIGS. **2** to **4**, e.g. by thermoforming.

1/ A fluid dispenser comprising:

a variable-capacity deformable flexible pouch (**1**) provided with an opening (**121**);

a flexible pouch support (**2**) to which the opening (**121**) in the flexible pouch (**1**) is fixed, said support having a fixing surface (**212**) at which the flexible pouch is fixed to the support; and

a dispensing member (**3**) such as a pump or a valve, mounted on the pouch support (**2**) for drawing fluid from the pouch;

said dispenser being characterized in that the fixing surface (**212**) is substantially plane, so that it extends in one plane.

2/ A dispenser according to claim 1, in which the fixing surface (**212**) is annular.

3/ A dispenser according to claim 1 or **2**, in which the support (**2**) comprises a substantially tubular sleeve (**22**) having a longitudinal axis (A), the dispensing member (**3**) extending in said sleeve (**22**), the plane of the fixing surface (**212**) being perpendicular to said longitudinal axis (A).

4/ A dispenser according to any preceding claim, in which the fixing surface (**212**) is formed by one face of an annular, plane, thin flange (**21**) disposed inside the pouch (**1**) around the opening (**121**) therein.

5/ A dispenser according to any preceding claim, in which the flexible pouch (**1**) is made up of two flexible pouches (**11, 12**) that are sealed together over their peripheries, along a sealing line (**112**), the opening (**121**) in the flexible pouch being situated in one of the sheets (**12**).

6/ A dispenser according to claim 5, in which the opening (**121**) is situated substantially at the center of one of the sheets (**12**).

7/ A dispenser according to claim 5, in which the sealing line (**112**) along which the two sheets (**11, 12**) are sealed together extends in a plane substantially parallel to the plane of the fixing surface (**212**) of the pouch support (**2**).

8/ A dispenser according to claim 3, in which the empty flexible pouch (**1**) has a thickness that is almost zero along the longitudinal axis (A).

9/ A dispenser according to claim 1, in which the flexible pouch (**1**) is wedged in leaktight manner between the pouch support (**2**) and a bearing element (**41**).

10/ A method of manufacturing a flexible pouch (**1**) provided with a flexible pouch support (**2**), said method comprising the following steps:

cutting out two substantially identical sheets (**11, 12**), each of which has a periphery;

cutting an opening (**121**) through one of the two sheets (**12**) advantageously at its center;

fixing the pouch support (**2**) to the sheet (**12**) provided with the opening (**121**) so that it extends through the opening; and

fixing the other flexible sheet (**11**) to the sheet (**12**) provided with the opening around their peripheries.

11/ A method according to claim 10, in which the support (**2**) serves to cut the opening (**121**) through the sheet (**12**), advantageously by punching out.

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