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(54) **Container to store liquids, especially food liquids and especially for coffee cream**

(57) Container to store liquids, composed of the tank (1) and the membrane (2) closing the tank, and the bottom (3) provided with at least one redrawing (4) and with such a shape of redrawing (4), which enables deformation of the bottom (3) only towards the inside of the tank (1). The bottom (3) is provided with an additional element (5) formed as a rod, and in the membrane (3) closing the tank (1) there is an area (11) with lower thickness, which in respect of shape and size corresponds to section of the element (5) or in the membrane (2) closing the tank (1) at least one micro-hole is situated.

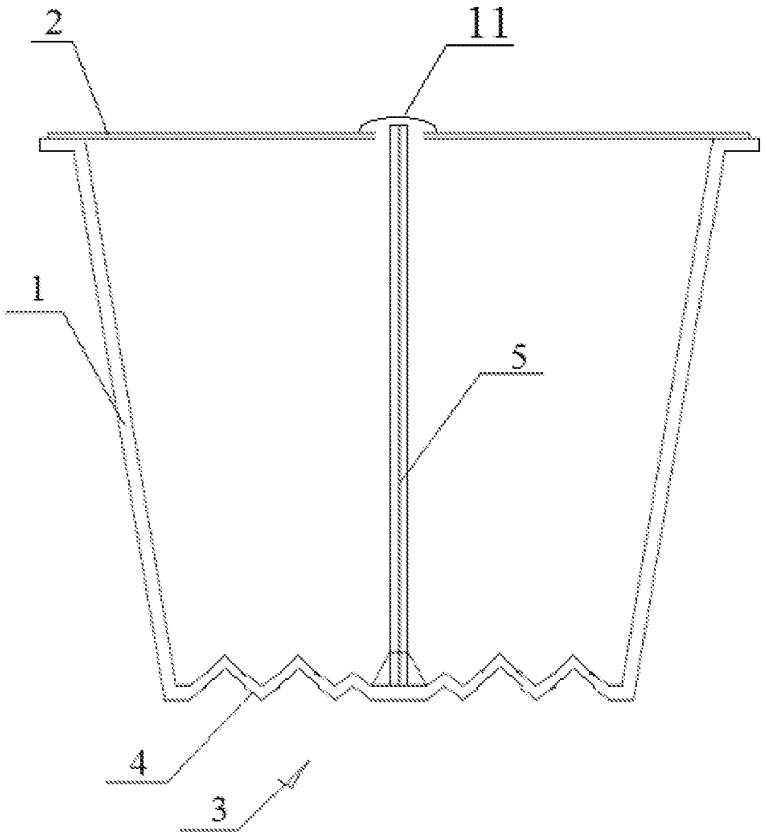

Fig.1

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Description

[0001] The invention refers to the container to be used for storage of liquid substances, especially foodstuffs, including coffee cream.

[0002] Commonly known and applicable are various containers to be used for storage of foodstuffs, including liquid ones. The common feature of such containers is that their essential part is a tank/ small tank for stored product as well as a lid protecting the stored product from being contaminated, spoiled or spilled.

[0003] According to the patent application JP 9142536, the solution is known i.e. a small cup made of plastic and closed with a lid to be torn off. In the point of tearing off, a kind of a lip is being formed through which the product contained in the container is being dosed.

[0004] The other example of solution used with reference to small cups applicable for storage of liquids such as coffee cream, is the patent application WO 0151382, disclosing the construction of the cup, in which around the container for liquid, a shallow groove connected with the main container provided with small recesses are amde, which in the moment of its opening and occasional pressing carry the air away towards the area of the "lip", through which then the content is being poured out.

[0005] On the other hand, the Japanese patent application with the assigned number JP 2003300557 discloses the construction of the cup for coffee cream, the lid of which has been provided with small holes preventing the content of the container from being splashed at the moment, the lid is being removed.

[0006] The solutions are also known, which refer to deformable surfaces of containers used for storage of liquid or semi-liquid substances, enabling squeezing of its content outside. The most popular solutions of this type are tubes for different kinds of pastes, including also tubes for foodstuffs.

[0007] The other method to avail of the container deformability is the method of changing the said container shape, as it has been disclosed in the patent DE 4332885. The bottle has been formed in such a way, that its body may be axially shifted towards the outlet, thanks to which its content is being squeezed outside. The other solutions disclose such construction of containers, in which side walls have been made as concertinaed ones, being folded under pressure.

[0008] According to the American patent application US 2003006240, the construction of the bottle has been disclosed, which has folded lateral surface. After complete or partial emptying of the bottle it is possible to press it as well as to squeeze a part provided with a thread into its inside.

[0009] The similar solution is the construction of the container as disclosed according to the patent application US 200404971, which is used among others, for milk. All its lateral surfaces are made as concertinaed ones, thanks to which it is possible to fold it so as to reach minimum dimensions.

[0010] The similar principle of operations is incorporated into the invention as disclosed in the patent NL 10163337. Accordingly, the cup has been made as concertinaed, and more precisely - its lateral surface is made as concertinaed. The hole to be found in one of the patents as previously referred to, has been eliminated and replaced with the opening to be torn off in the controllable manner. In the course of opening, only a fragment of the lid which is situated above the "lip" is being torn off, thanks to which probability that its content would splash on the person who is going to open the container - is minimized.

[0011] Unexpectedly, it has been stated that the solution incorporated into the said invention enables to completely eliminate a risk for the user of the container to get splashed both in the course of occasional as well as intended opening of the container.

[0012] The container according to the invention is composed of the tank and connected with it, preferably by fusion or welding, single-layer or double-layer membrane closing the container from the top. In the bottom of the tank there is at least one redrawing, allowing for the bottom deformation. Preferably, when a shape of redrawing enables deformation of the bottom only in one direction, i.e. towards the inside of the container. Preferably, the bottom is provided with an additional element manufactured uniformly along with the tank or permanently combined with it. Preferably, this element has a shape similar to a bar, preferably of the other than elliptic section. Preferably, this is a polygonal section with concave, arched sides. With the use of the additional element manufactured uniformly with the tank it is possible, after deformation of the bottom, to break through or remove a part of the membrane closing the container in such a way, that effluence of liquid contained in the container does not result from its churning up. Moreover, preferably in the membrane closing the container, there is an area characterized by lower thickness, the shape and size of which corresponds to a section of the element having a shape of the bar.

[0013] According to the other embodiment, the membrane has been provided with at least one micro-hole, and the size of the said hole has been adjusted accordingly to a value of surface tension of the liquid stored in the container in such a way that under conditions of pressure and temperature characteristic for the given kind of liquid, it would be not possible for the stored substance to be splashed off and/or be subjected to self-acting effluence. Preferably, the area with micro-hole is protected against unintended squeezing of the liquid by means of the additional, easy removable layer of the membrane. The surface and shape of the additional layer of the membrane correspond at least to the surface and shape of the smallest figure containing all micro-holes.

[0014] According to the other embodiment, the container in accordance with the invention, is composed of the tank and connected with it, preferably by fusion or welding, membrane closing the container from the top. Underneath the membrane, which has not been provided

with any additional holes, the string permanently connected with the lip being a part of the tank, has been situated. After breaking off the lip and its pulling out, the membrane is being cut and the simultaneous pressure on the deformable bottom causes effluence of the content of the said container. Preferably, in the bottom of the tank there is at least one redrawing, allowing for the bottom deformation. Preferably, when a method of redrawing enables deformation of the bottom only in one direction. Preferably, the deformation of the bottom is possible only towards the inside of the container.

[0015] The object according to the invention is presented diagrammatically in the figures, where the Fig. 1 presents the object according to the invention in the first example of making (with the additional element manufactured uniformly with the bottom), and Fig. 2 presents the manufactured product according to the invention in the second example of making. Fig. 3 presents the manufactured product according to the invention in the first example of making with the deformed bottom. Figure 4 presents the container according to the invention in a top view, with the hole made in the lid. Fig. 5 presents the container according to the invention in the third ex ample of making.

Example I

[0016] The container is composed of the tank 1 and connected with it membrane 2, closing the container from the top. In the bottom 3 of the tank there are redrawings 4, allowing for the bottom 3 deformation. The method of making redrawings 4 enables deformation of the bottom 3 only towards the inside of the container. The bottom 3 is provided with an additional element 5 manufactured uniformly along with the bottom 3 or permanently combined with it. This element 5 has a shape of the bar with quadrangular section and this quadrangle has concave, arched sides. The section of the element 5 results in that in the membrane 2 the hole 6 with edges, which do not adhere to the element 5, is made. With the use of the additional element 5 manufactured uniformly with the bottom 3 of the tank 1, it is possible, after deformation of the bottom 3, to break through or remove a part of the membrane 2 closing the tank 1 in such a way, that effluence of liquid contained in the container does not result from its churning up.

Example II

[0017] The container is composed of the tank 1 and connected with it membrane 2, closing the container from the top. The rim of the container is shaped with at least one flat spinning, forming the "lip" 9 moved outside the contour of the largest section through the lateral walls of the container. The shape of the membrane 2 corresponds to the shape of the container rim provided with the lip 9. In the bottom 3 of the container there are redrawings 4, allowing for the bottom 3 deformation. The method of making redrawings 4 enables deformation of the bottom 3 only towards the inside of the container. The membrane 2 closing the tank 1 from the top has been provided with the micro-hole 7, through which the liquid effluents. The size of the said hole 7 has been adjusted in such a way that it would be not possible for the stored substance to be subjected to self-acting effluence. The area of the micro-hole 7 is protected against unintended squeezing of the liquid by means of the additional, easy removable layer 10 of the membrane 2.

Example III

[0018] The container according to the invention is composed of the tank 1 and connected with it, preferably by fusion or welding, the membrane 2 closing the container from the top. The rim of the container is shaped with at least one flat spinning, forming the "lip" 9 moved outside the contour of the largest section through the lateral walls of the container. The shape of the membrane corresponds to the shape of the container rim including the spinning. Underneath the membrane 2, which has not been provided with any additional holes, the string 8 permanently connected with the spinning having a form of the lip 9, being a part of the tank, has been situated. After breaking off the lip 9 and its pulling out, the membrane 2 is being cut by means of spinning and the simultaneous pressure on the deformable bottom causes effluence of the content of the said container. In the bottom 3 of the tank 1 there are redrawings, allowing for the bottom 3 deformation. Preferably, when a method of redrawing enables deformation of the bottom only in one direction. The method of making redrawings 4 enables deformation of the bottom 3 only towards the inside of the container.

[0019] During the usage of the container according to the invention, within the membrane closing the tank from the top, through the micro-hole formed by means of the element manufactured uniformly with the bottom of the tank or by means of removal of the additional layer of the membrane or through the micro-hole formed in the membrane, the stored liquid is subjected to effluence.

Claims

1. The container to store liquids, composed of the tank (1) and the membrane (2) closing the said tank, **characterized in that** in the bottom (3) of the tank (1) there is at least one redrawing (4) .

2. The container according to the claim 1, **characterized in that** the form of the redrawing(4) enables deformation of the bottom (3) only towards the inside of the tank (1) .

3. The container according to the claims 1 or 2, **characterized in that** the bottom (3) is provided with the additional element (5) having a shape of the bar.

4. The container according to the claim 3, **characterized in that** the additional element (5) has a section different from the elliptic one.

5. The container according to the claim 4, **characterized in that** the additional element (5) has a polygonal section.

6. The container according to the claim 5, **characterized in that** the additional (5) has a quadrangular section.

7. The container according to the claims 4 or 5 or 6, **characterized in that** the additional element (5) has concave, arched sides.

8. The container according to the claims 3 or 4 or 5 or 6 or 7, **characterized in that** in the membrane (2) closing the tank (1) there is an area (11) **characterized by** lower thickness, the shape and size of which corresponds to a section of the element (5).

9. The container according to the claims 1 or 2, **characterized in that** in the membrane (2) closing the tank (1) at least one micro-hole (7) has been made.

10. The container according to the claim 9, **characterized in that** the size of the said hole (7) has been adjusted accordingly to a value of surface tension of the liquid stored in the container in such a way that under conditions of pressure and temperature characteristic for the given kind of liquid, it would be not possible for the stored substance to be splashed off and/or be subjected to self-acting effluence.

11. The container according to the claims 8 or 9 or 10, **characterized in that** the area with at least one micro-hole (7) is protected against unintended squeezing of the liquid by means of the additional, easy removable layer (10) of the membrane (2), and the surface and shape of the additional layer of the membrane (2) correspond at least to the surface and shape of the micro-hole (7).

12. The container to store liquids composed of the tank (1) and the membrane (2) closing the said tank, **characterized in that** underneath one layer of the membrane (2) closing the tank (1), the string (8) permanently connected with the lip (9) is situated.

13. The container according to the claim 11, **characterized in that** in the bottom (3) of the tank (1) there is at least one redrawing (4).

14. The container according to the claim 12, **characterized in that** form of the redrawing (4) enables deformation of the bottom (3) only towards the inside of the tank (1).

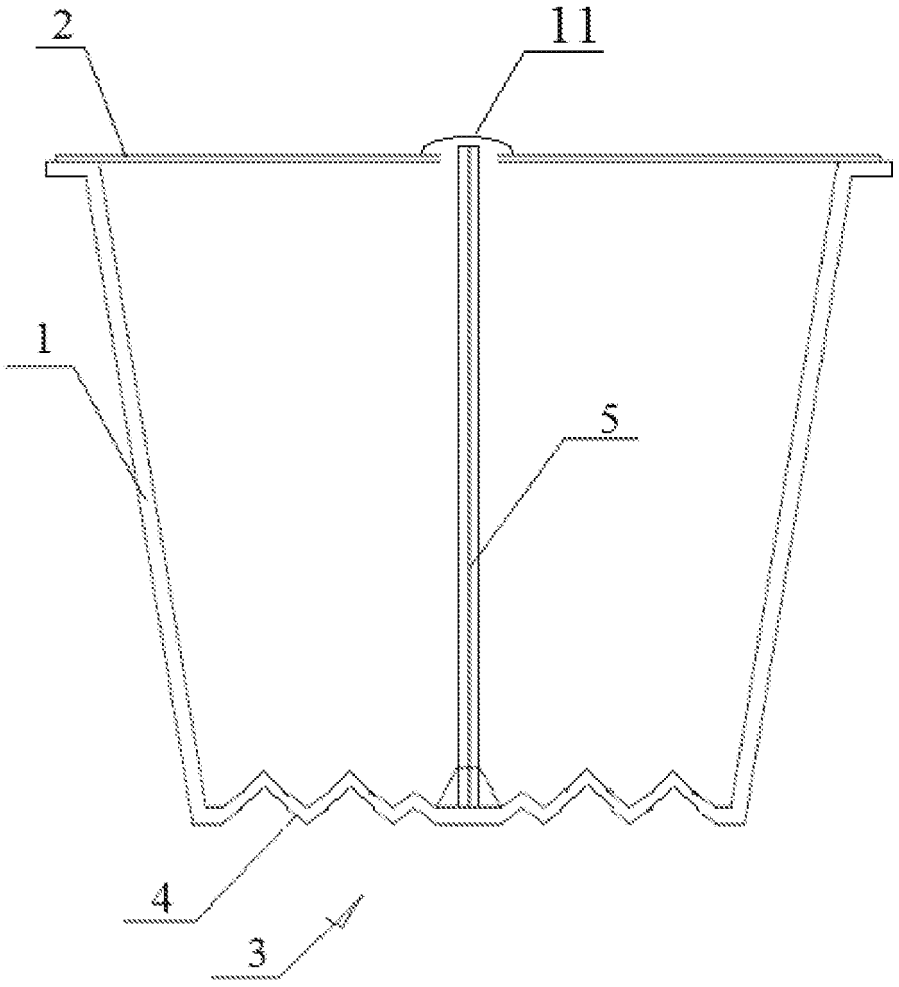

Fig.1

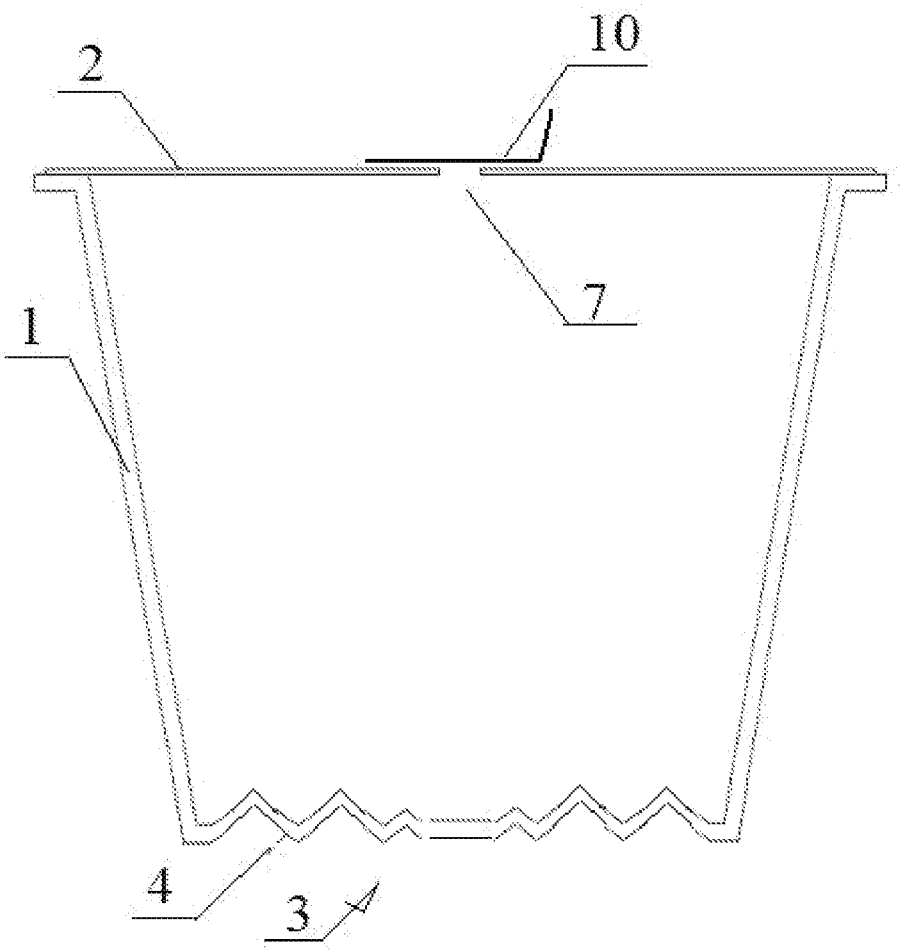

Fig.2

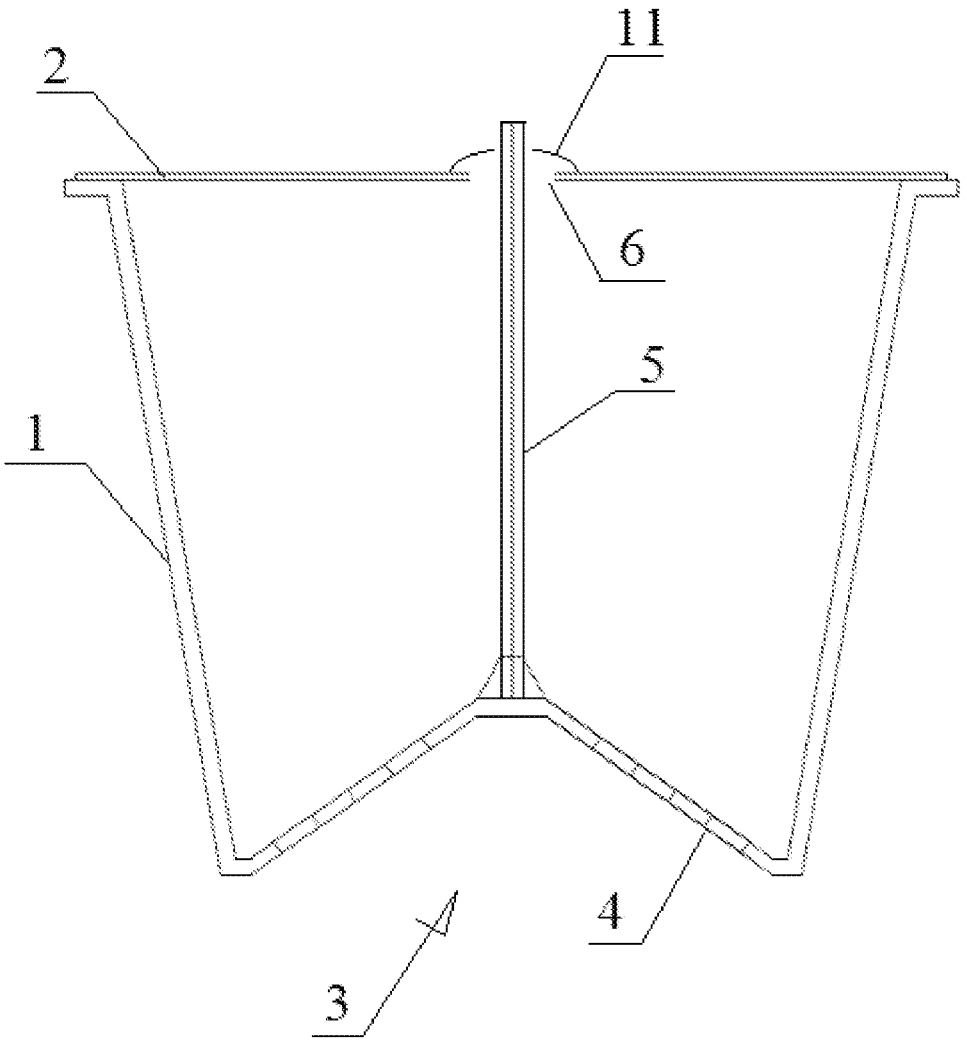

Fig. 3

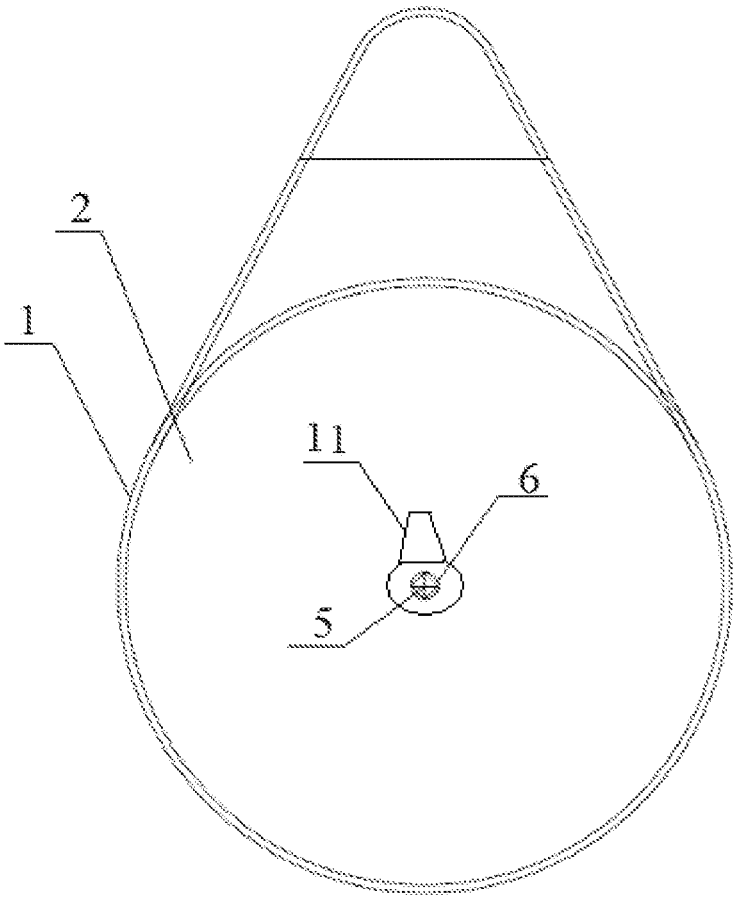

Fig. 4

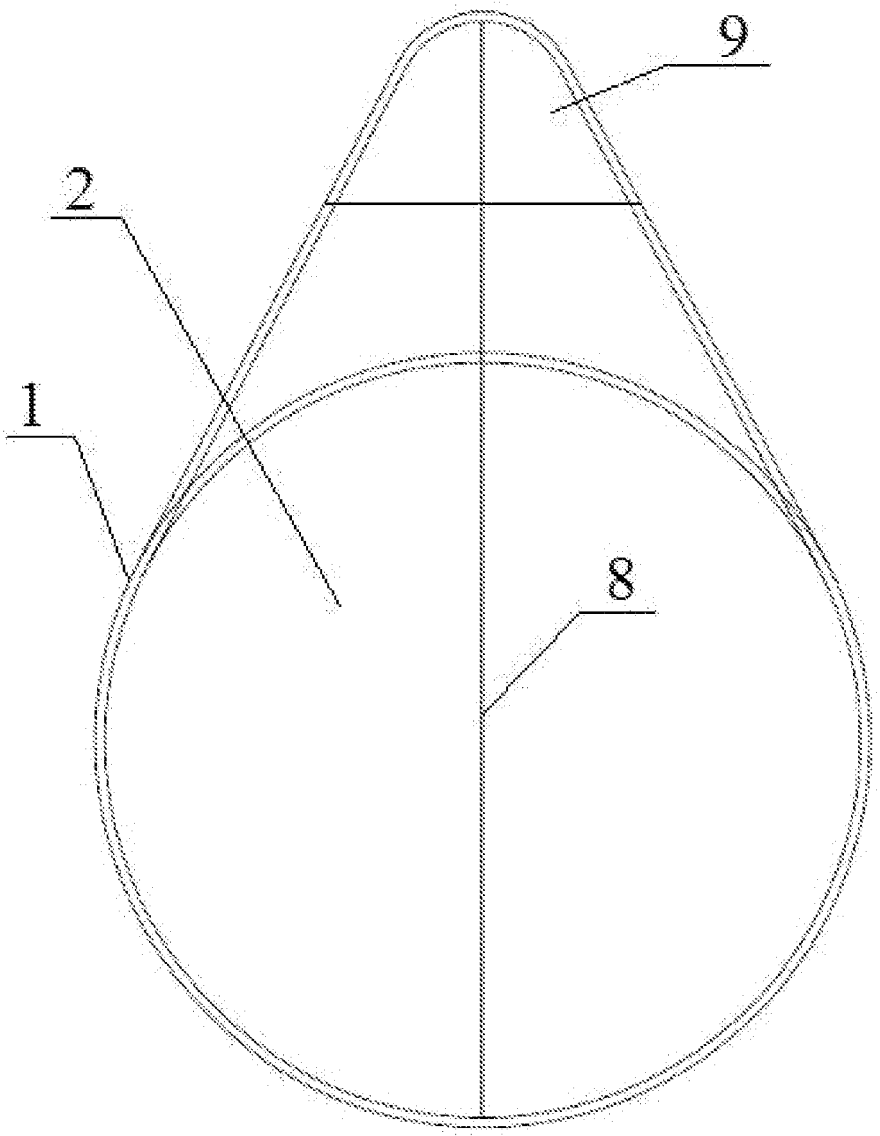

Fig. 5

Listing of Terms

1. tank
2. membrane closing the tank
3. bottom
4. redrawings
5. additional element of the bottom with a quadrangular section
6. hole made by means of the element 5
7. hole in the membrane
8. cutting string
9. lip
10. additional layer of the membrane
11. an area of the membrane with lower thickness

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EUROPEAN SEARCH REPORT

Application Number
EP 08 46 5006

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	DE 200 13 058 U1 (HUECK FOLIEN GMBH & CO KG [DE]) 16 November 2000 (2000-11-16) * the whole document *	1,2	INV. B65D1/02 B65D77/20
A		8-11	B65D77/30 B65D77/32
Y	FR 1 511 724 A (THIEL) 2 February 1968 (1968-02-02) * page 2, right-hand column, paragraph 4 - page 3, left-hand column, paragraph 2; figures 3,4 *	1,2	
A	WO 2008/004458 A (HOKKAI CAN [JP]; MIYAZAKI SHUNZO [JP]; SATO YASUHIRO [JP]; WATANABE AK) 10 January 2008 (2008-01-10) * abstract; figures *	1,2	
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A	US 3 730 336 A (FELDMAN A) 1 May 1973 (1973-05-01) * abstract; figures *	3-7	
A	WO 02/074655 A (RAPPARINI GINO [IT]) 26 September 2002 (2002-09-26) * abstract; figures *	3-7	

~~The present search report has been drawn up for all claims~~

Place of search	Date of completion of the search	Examiner
The Hague	12 November 2008	Gino, Christophe

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
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1 EPO FORM 1503 03.82 (P04C01)

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Application Number
EP 08 46 5006

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-11

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 08 46 5006

The Search Division considers that the present European patentapplication does not comply with the requirements of unity of invention and relates to severalinventions or groups of inventions, namely:

1. claims: 1-11

A container to store liquids, composed of a tank and a membrane closing said tank, the bottom of the tank having at least one redrawing.

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2. claims: 12-14

A container to store liquids, composed of a tank and a membrane closing said tank, said membrane comprising a string situated underneath one layer and permanently connected with a lip of the tank.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 08 46 5006

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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12-11-2008

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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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- WO 0151382 A **[0004]**
- JP 2003300557 B **[0005]**
- DE 4332885 **[0007]**
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- NL 10163337 **[0010]**