United States Patent

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[54] **CONCAVO-CONVEX SIPHONING PUMP**
3 Claims, 5 Drawing Figs.

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[51] Int. Cl. F04b 43/00, F16l 43/00
[50] Field of Search ..... 417/479, 472, 437 (X); 222/416 (X), 204 (X), 209; 137/150 (X), 147

[56] **References Cited**

UNITED STATES PATENTS

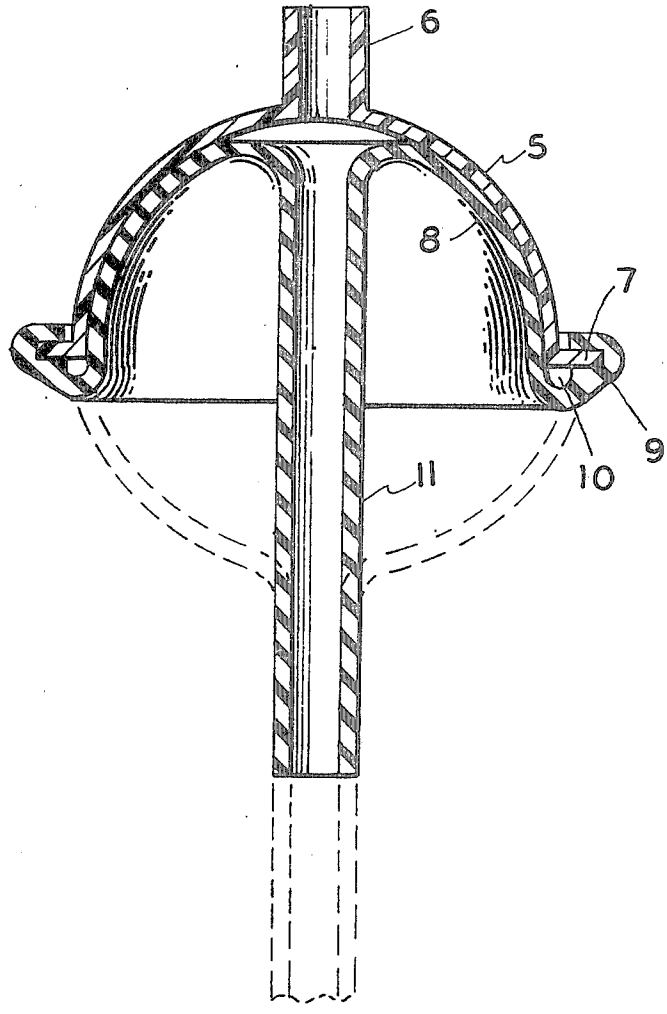
840,986	1/1907	Ackley	137/150X
1,799,023	3/1931	Peters	137/147

FOREIGN PATENTS

443,540	3/1936	Great Britain	137/150
466,120	7/1927	Germany	137/150
485,713	10/1953	Italy	222/204

Primary Examiner—Carlton R. Croyle
Assistant Examiner—R. E. Gluck
Attorney—Wenderoth, Lind and Ponack

ABSTRACT: A siphoning pump having a semispherical rigid plastic cup with a circular exterior flange at its open end. A nipple on the cup extends exteriorly and a flexible hose has one end attached thereto. A concavo-convex rubber diaphragm has a marginal edge portion attached to the flange and the concavo-convex body portion extends into the cup with its convex bottom side depending into the upper portion of the cup and the concave side facing outwardly. The central portion of the concave side has a vertically elongated nipplelike fingergripping pull to be bodily lifted up with the fingers to invert the diaphragm, and then released to permit the diaphragm to be returned to its normal starting position within the confines of the cup. The hose has a length to permit a container to be placed on the ground at a level below the level of a tank from which liquid is to be siphoned. A socket and groove are formed in the diaphragm at the marginal edge portion.



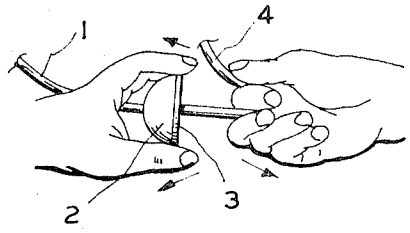


FIG. 1

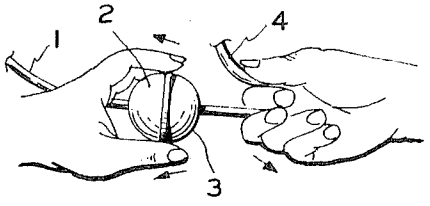


FIG. 2

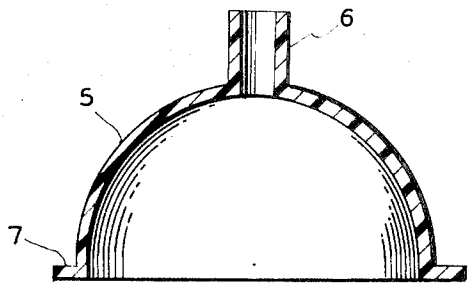


FIG. 3

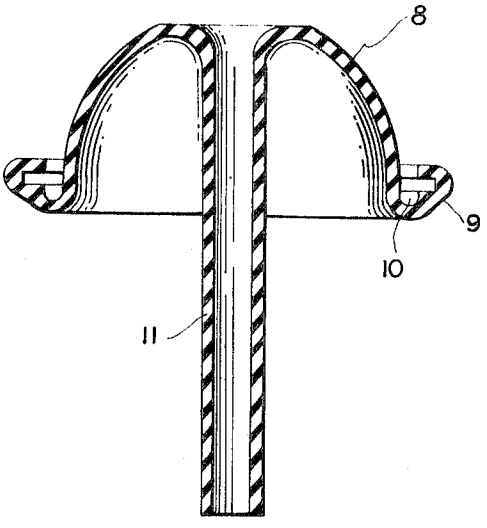


FIG. 4

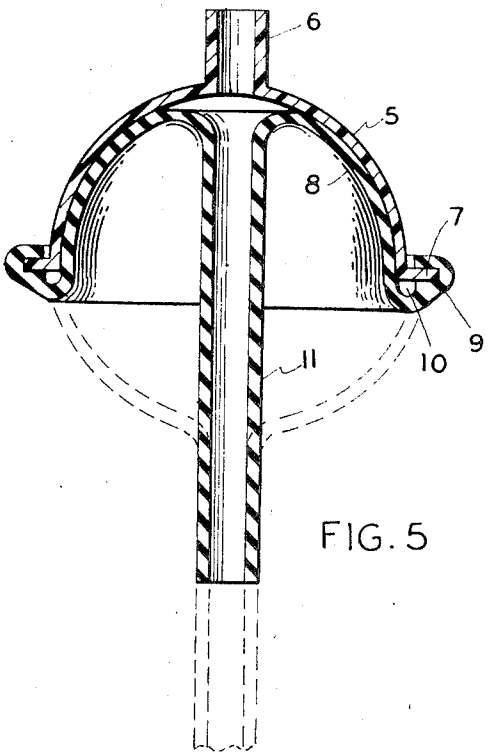


FIG. 5

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CONCAVO-CONVEX SIPHONING PUMP

This invention relates to a siphoning pump.

An object of the invention is to improve the siphoning pump shown in my U.S. Pat. No. 3,109,563 granted Nov. 5, 1963.

A further object of the invention is to provide an elastic diaphragm for such pump which is constructed so as to be protected by a plastic rigid cup and which also has a construction which will aid in the inversion of the diaphragm.

With the above and other objects in view will become apparent from the detailed description below, a preferred embodiment of the invention is shown in the drawings in which:

FIG. 1 is an elevation showing the elements prior to producing suction.

FIG. 2 is a similar view illustrating the position of the elements when suction is applied.

FIG. 3 is a cross-sectional view of the rigid plastic cup forming one of the elements of the pump.

FIG. 4 is a cross-sectional view of the elastic diaphragm which cooperates with the elements shown in FIG. 3, and

FIG. 5 is a cross-sectional view of the elements of FIG. 3 and FIG. 4 assembled and shows in dotted lines the position taken by the elastic diaphragm when suction is applied.

Referring to FIG. 1 and 2 wherein the invention is shown generically, a long hose is indicated at 1 which has one end designed to be inserted into a vessel from which it is desired to siphon the liquid. The other end of the hose 1 is designed to be connected to a nipple provided upon the rigid plastic cup 2. The cup 2 is hollow and of semispherical shape. Cooperating with the cup 2 is an elastic diagram 3 having at its center a short flexible hose 4 preferably of rubber.

When the hose 4 is clamped as shown in FIG. 2 and pulled outwardly the diaphragm 3 is inverted thereby producing a vacuum in the cup 2 which is transmitted through the hose 1 for creating a suction of the liquid in a tank. If the level of the pump is below the level of the liquid in the tank then such suction will create a siphoning action to a container. A reverse action from the container to the tank can also be accomplished.

In FIGS. 3,4 and 5 a specific form of the elements indicated generally in FIGS. 1 and 2 is shown. In FIG. 3 the cross section of the rigid plastic cup corresponding to 2 is shown at 5. The nipple on such cup is indicated at 6 to which the hose 1 is connected. On the cup 5 there is provided a circular flange 7 to which the elastic diaphragm shown in FIG. 4 is to be attached as indicated in FIG. 5.

The elastic diaphragm preferably of rubber comprises the concavo-convex portion 8 to which is attached the flexible hose 11 which corresponds to the hose 4 shown in FIG. 2. The flexible rubber diaphragm 8 is provided with a circular border 9 which is turned so as to provide a socket for the flange 7. In addition the border 9 is provided with a circular groove 10 to facilitate the inversion of the diaphragm as shown in dotted lines in FIG. 5.

FIG. 5 shows the rigid plastic cup and the elastic semispherical diaphragm as in normal position in full lines. When the short hose 11 corresponding to hose 4 is clamped as shown in FIG. 2 and pulled outwardly to the desired dotted line position as shown in FIG. 5, a vacuum is created which is transmitted through the nipple 6 to the hose 1 for securing the requisite suction action and also when the pump is located below the level of the liquid to which the suction is applied a siphoning action is created.

I claim:

1. A siphoning pump preferably for use with a portable container for a reverse supply of liquid comprising a semispherical rigid plastic cup having a circular exterior flange at its open end, a nipple on said cup extending exteriorly thereof, a flexible hose having one end attached to said nipple, a concavo-convex rubber diaphragm having a marginal edge portion attached to said flange, the concavo-convex body portion of said diaphragm extending into said cup with its convex bottom side facing outwardly, the central portion of said concave side having a vertically elongated nipplelike fingergripping pull having a bore which can be caught hold of by the user's fingers, then squeezed in a manner to close said bore and bodily lifted up with the fingers to invert said diaphragm, and then released to permit the diaphragm to be returned to its normal starting position within the confines of said cup, said hose being of a length to permit a container to be placed on the ground at a level below the level of liquid in a tank from which liquid is to be siphoned.

2. A pump as set forth in claim 1, wherein said marginal edge portion extends outwardly from said diaphragm and then inwardly to form a socket for said flange.

3. A pump as set forth in claim 2, wherein a circular groove is provided in said diaphragm adjacent said socket to facilitate inversion of said diaphragm.