July 29, 1930. G. V. GAVAZA 1,771,407

SIPHON PUMP

Original Filed March 2, 1927

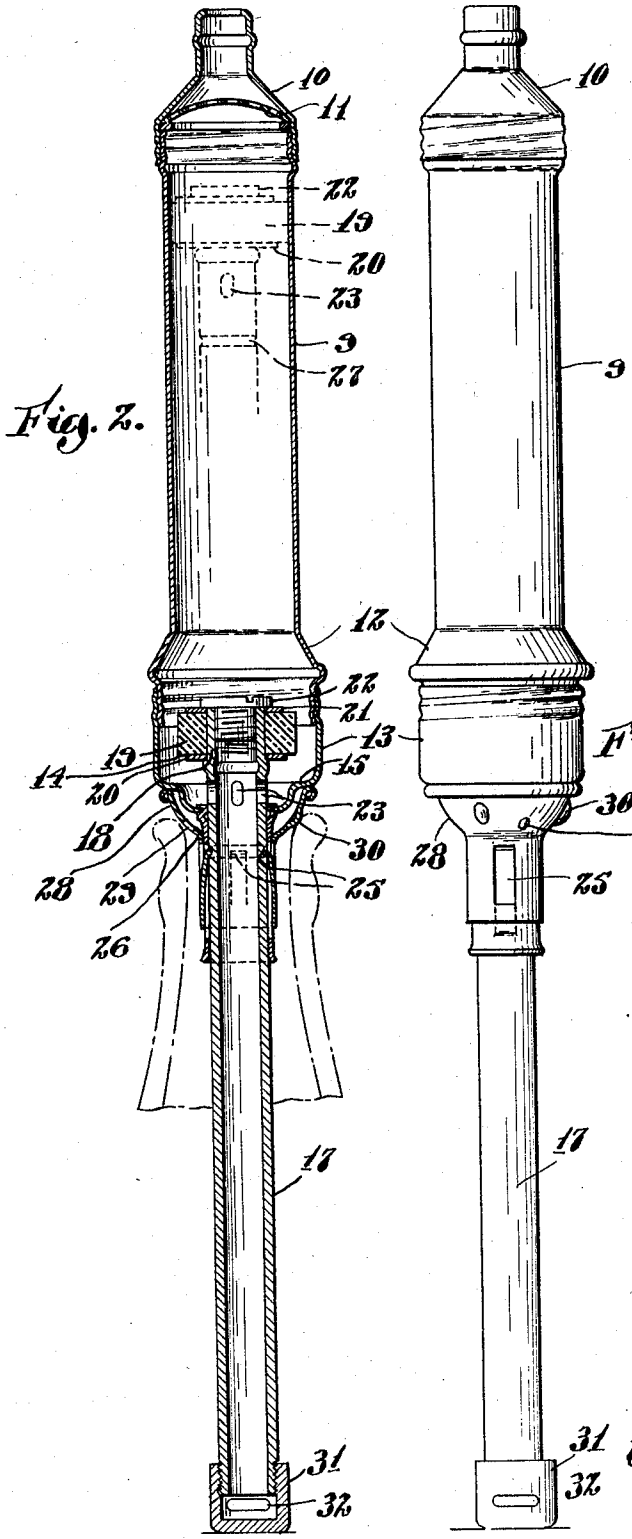


Fig. 2.

Fig. 1.

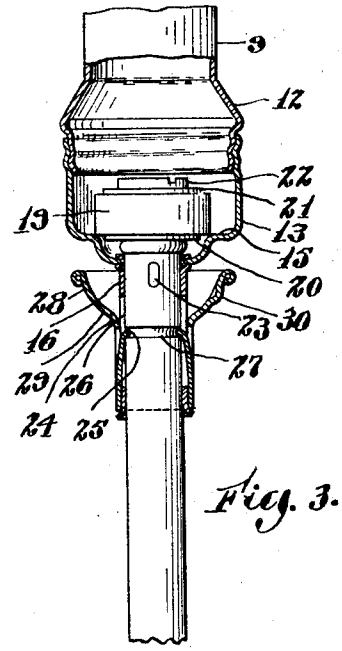
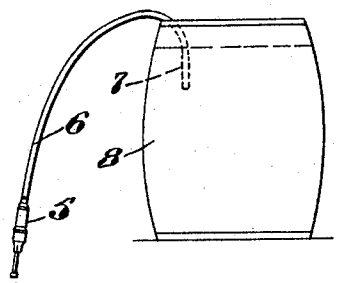


Fig. 3.

Fig. 4.



Inventor
George V. Gavaza
by Charles W. McDermott
his Attorney

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UNITED STATES PATENT OFFICE

GEORGE V. GAVAZA, OF QUINCY, MASSACHUSETTS

SIPHON PUMP

Original application filed March 2, 1927, Serial No. 171,984. Divided and this application filed October 11, 1927. Serial No. 225,487.

The present invention relates to pumps and more particularly to pumps which are used to draw liquid into the long legs of siphons.

The principal object of the present invention is to provide the hollow cylinder, which is generally used in pumps of this type, with a combined piston and valve whereby liquid may be drawn into the cylinder from the source of supply and held therein in readiness for use.

To the accomplishment of this object, a feature of the invention contemplates the provision, in a pump adapted to be connected to the long leg of a siphon provided with a cylinder having an inlet, an outlet, and a valve seat adjacent the outlet, of a piston rod, and a piston secured thereto movable from a position adjacent the inlet to a position adjacent the outlet to fill the cylinder with liquid from the source of supply and also movable into engagement with the valve seat to prevent the flow of liquid through the outlet.

Broadly considered the piston may be constructed of any suitable material. The use of a leather piston is disadvantageous, however, because it is not flexible enough to accommodate itself to restrictions in the hollow cylinder due to the dents caused by the accidental dropping of the cylinder and because it shrinks in size as it dries through disuse.

Accordingly, another object of the present invention is to provide the hollow cylinder with a piston which will be flexible enough to accommodate itself to restrictions in the cylinder caused by dents and which will not shrink in size through disuse.

To the accomplishment of this object, another feature of the present invention contemplates the provision, in a pump adapted to be connected to the long leg of a siphon provided with a hollow cylinder having an inlet, an outlet, and a piston rod, of a sponge-rubber piston secured thereto and movable within the hollow cylinder from a position adjacent the inlet to a position adjacent the outlet to fill the cylinder with liquid from the source of supply.

In the broader aspects of the invention, the sponge-rubber piston may be used merely to draw liquid into the cylinder, but it is preferred to also utilize the sponge-rubber piston as a valve in accordance with the principal object of the present invention.

Other features of the invention relate to certain devices, combinations and arrangements of parts hereinafter described and then set forth broadly in detail in the appended claims which possess advantages readily apparent to those skilled in the art.

The various features of the present invention will be readily understood from an inspection of the accompanying drawings showing the best form of the invention at present known to the inventor, in which,

Figure 1 is an elevation of the pump adapted to be connected to the long leg of a siphon;

Fig. 2 is a sectional elevation showing how the combined piston and valve is unseated from the valve seat through engagement with the mouth of a bottle to be filled;

Fig. 3 is a detail in sectional elevation showing the piston engaged with the valve seat; and

Fig. 4 is an elevation showing the pump connected to the long leg of a siphon.

This application is a division of my application filed March 2, 1927, Serial No. 171,984, Patent No. 1,666,850. Referring to the drawings, the pump 5 (Fig. 4) is adapted to be connected to the long leg 6 of a siphon, the short leg 7 of which is inserted into a source of liquid supply such as the barrel 8. Siphons of this type have a varied general use in bottling beverages, and in draining aquariums, fish-store tanks, wash boilers, washing machines, batteries, gasoline tanks on automobiles, etc.

The pump 5 comprises a cylindrical barrel 9 which is screw-threaded on one end to receive an inlet cap 10 which receives the rubber tube comprising the long leg 6 of the siphon. The inlet 10 carries a filter screen 11 in order to filter the liquid flowing into the cylinder.

The other end of the cylinder 9 is enlarged by means of a flange 12 and this flange is screw-threaded to receive the threads on an outlet cap 13. The outlet cap 13 is shaped

to form an enlarged chamber 14 having an annular valve seat 15 therein.

Secured to the outlet cap 13 is a depending tube 16 through which a hollow piston rod 17 is mounted to slide freely. The hollow piston rod 17, near its upper end, is provided with a shoulder 18 which carries a cylindrical block of sponge-rubber 19 interposed between two metal washers 20 and 21, smaller in diameter than the sponge-rubber. The block and washers are held in place on the shoulder 18 by a headed screw 22 which fits into the upper end of the hollow rod 17. The screw 22 closes the upper end of the hollow rod 17 so, in order to permit liquid to flow into the hollow rod 17, it is provided with four openings 23 (Figs. 2 and 3).

The piston 19 is movable from the dotted line position of Fig. 2, adjacent the inlet to the cylinder, to a position where the piston engages the valve seat 15 in the chamber 14 (Fig. 3). During this movement the piston creates a condition of unbalanced pressure between the interior of the cylinder and the surface of the liquid in the source of supply, thus causing liquid to flow through the siphon and fill the cylinder. The liquid is prevented from flowing out of the cylinder 9 by the piston 19 which acts as a valve engaged with the valve seat 15.

In order to unseat the piston 19 from the valve seat 15 and thus permit liquid to flow from the chamber 14 through the apertures 23 into the hollow rod 17 from which the liquid may be discharged into a bottle shown in construction lines in Fig. 2, the tube 16 carries a sliding sleeve 24 provided with a series of integral inturned prongs 25 which extend through elongated openings 26 in the tube 16 and engage the exterior of the hollow rod 17. The hollow rod 17 is provided with an annular groove 27 into which the prongs 25 spring (Fig. 3) when the piston 19 engages the valve seat 15. The sleeve 24 is provided with a bell-shaped portion 28 constructed to engage the mouth of the bottle to be filled and hold the pump upright thereon. The bell-shaped portion 28 is provided with a series of air holes 29 and a series of nodes 30 to insure the free exit of air from the bottle during the filling operation.

When the piston 19 has been drawn from the dotted line position of Fig. 2 into the position of Fig. 3, the cylinder is filled with liquid from the source of supply, but this liquid is prevented from flowing through the apertures 23 into the hollow piston rod 17 by the piston which acts as a valve engaged with the valve seat. When the sleeve 24 engages the mouth of the bottle, into which the hollow rod 17 extends, the weight of the parts causes the sleeve 24 to move relatively to the tube 16 from the position of Fig. 3 to the position of Fig. 2, thereby unseating the piston 19 from the valve seat 15 to permit the liquid to flow from the chamber 14 through the apertures 23 into the hollow rod 17 from which the liquid is discharged into the bottle. When the bottle is filled, the pump is removed from the mouth of the bottle. Immediately the sleeve 24, piston rod 17, and piston 19 drop into the position of Fig. 3, thus shutting off further discharge of liquid until the pump is again positioned on another bottle when the valve is reopened.

In order to prevent foaming in the bottle during the filling operation, the open end of the hollow rod 17 is provided with a discharge tip 31 having two slots 32 which discharge the liquid laterally of the hollow rod.

When it is desired to produce a continuous flow of liquid from the cylinder 9, the piston 19 is elevated slightly from its seat on the valve seat 15 and the sleeve 24 is positioned so that the prongs thereon, instead of engaging the annular groove 27, grip the exterior of the hollow rod 17 below the annular groove 27. This action causes the material of the sleeve 24 forming the bases of the prongs 25 to exert a frictional grip on the tube 16, thus holding the tube and sleeve from relative movement. When using the pump in the manner described to produce a continuous flow, the tip 31 may be removed to obtain an unrestricted flow from the open end of the hollow rod 17.

It will be readily understood by those skilled in the art that even though the cylinder is dented by accidents the sponge-rubber, being elastic, will yield enough to permit it to pass the restriction without sticking, and that the portion of the sponge-rubber projecting beyond the periphery of the washer 20 will co-operate with the valve seat 15 to shut off the discharge of liquid from the cylinder in a reliable and certain manner.

It will be clear also to those skilled in this class of devices and with the general objects of the present invention in view, that changes may be made in the details of structure, the described and illustrated embodiment thereof being intended as an exploitation of its underlying essentials, the features whereof are definitely stated in their true scope in the claims herewith.

What is claimed as new, is:

1. In a pump adapted to be connected to the long leg of a siphon, the combination with a cylinder having an inlet, an outlet, and a valve seat adjacent the outlet, of a piston rod and a piston secured thereto, movable from a position adjacent the inlet to a position adjacent the outlet into engagement with the valve seat to fill the cylinder with liquid from the source of supply and prevent the flow of liquid through the outlet.

2. In a pump adapted to be connected to the long leg of a siphon, the combination with a cylinder subject to malformation having an inlet and an outlet, of a piston rod,

and a sponge-rubber piston secured thereto, movable from a position adjacent the inlet to a position adjacent the outlet to fill the cylinder with liquid from the source of supply and automatically accommodate itself to the malformed cylinder during said movement.

3. In a pump adapted to be connected to the long leg of a siphon, the combination with a cylinder having an inlet, an outlet, and a valve seat adjacent the outlet, of a piston rod, and a sponge-rubber piston secured thereto and movable from a position adjacent the inlet to a position adjacent the outlet into engagement with the valve seat to fill the cylinder with liquid from the source of supply and prevent the flow of liquid through the outlet.

4. In a pump adapted to be connected to the long leg of a siphon, the combination with a cylinder having an inlet, an outlet, and an enlarged chamber adjacent the outlet, a valve seat in the chamber, of a piston rod, and a piston secured thereto, movable from a position adjacent the inlet into engagement with the valve seat to fill the cylinder with liquid from the source of supply and prevent the flow of liquid through the outlet.

5. In a pump adapted to be connected to the long leg of a siphon, the combination with a cylinder having an inlet, an outlet, and a valve seat interposed between the inlet and the outlet, and a piston rod, of a piston on the rod, movable in contact with the cylinder in one direction to fill the cylinder from the source of supply, and also movable at the limit of movement in said direction into engagement with the valve seat to prevent the flow of liquid through the outlet.

6. In a pump adapted to be connected to the long leg of a siphon, the combination with a cylinder having an inlet, an outlet, and a valve seat interposed between the inlet and the outlet, and a piston rod, of a cylindrical piston having its peripheral surface movable in contact with the cylinder to fill the cylinder with liquid from the source of supply and having one of its end faces movable into engagement with the valve seat to prevent the flow of liquid through the outlet.

In testimony whereof I have signed my name to this specification.

GEORGE V. GAVAZA.