Dec. 4, 1934. W. A. TANNER 1,982,887

PUMP

Filed May 24, 1933

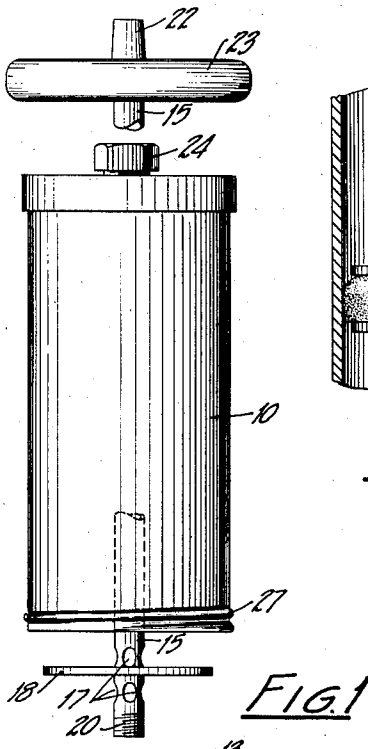


FIG. 1

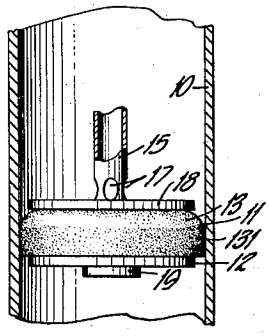


FIG. 4

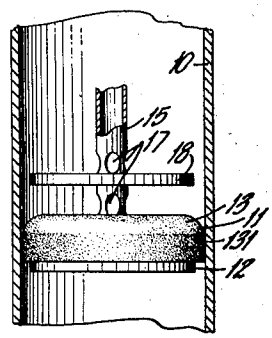
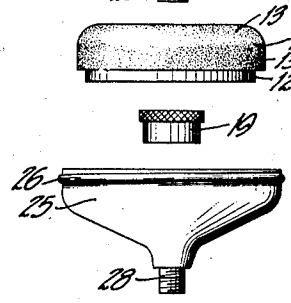


FIG. 5



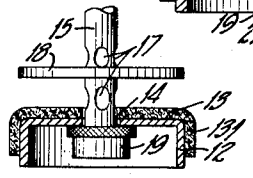


FIG. 3

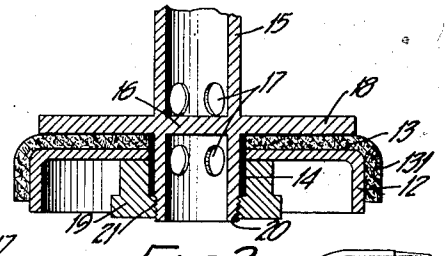


FIG. 2

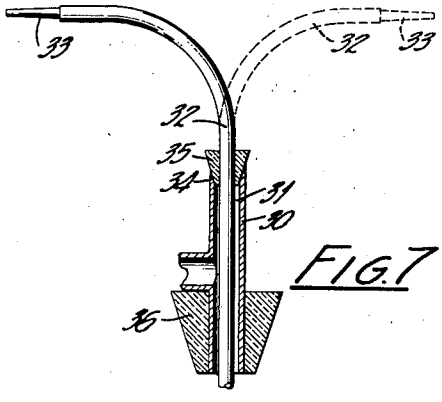


FIG. 7

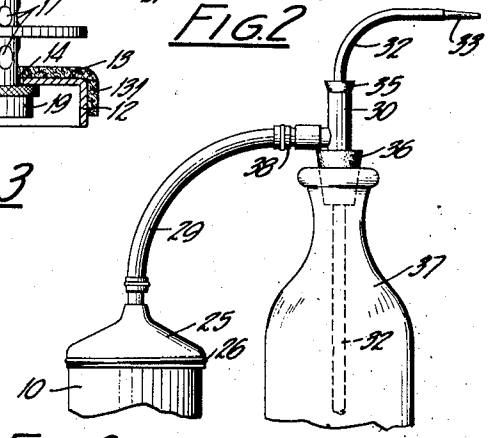


FIG. 6

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Warren A. Tanner, Albany, N. Y.

Application May 24, 1933, Serial No. 672,659

4 Claims. (Cl. 103—225)

One of the objects of my invention is a pump which may readily be converted to a variety of uses, and while not limited thereto is particularly useful as an accessory for an automobile. As such, it may be used as a siphon for drawing off gasoline or the like, as an air pump for creating pressure in a container and spraying oil or other liquid or as a grease gun.

Another object of my invention is a novel form of valve for use in a pump of the foregoing character.

Other objects of my invention will appear in the specification and the novel features thereof will be particularly pointed out in the claims.

My invention will best be understood by reference to the accompanying drawing in which I have illustrated certain embodiments thereof and in which—

Fig. 1 is a partially disassembled elevation of a pump embodying my invention;

Fig. 2 is a sectional view showing details of the valve mechanism and with the valve permanently closed;

Fig. 3 is a sectional view similar to Fig. 2 showing the valve member operative and in the open position;

Figs. 4 and 5 are fragmentary sectional views illustrating the valve member in the closed and in the open position, respectively, within the cylinder;

Fig. 6 is a side view illustrating the pump embodying my invention used in connection with a spray device; and

Fig. 7 is a detail of Fig. 6.

Like reference characters indicate like parts throughout the drawing.

Referring to the drawing, 10 is a cylindrical casing in which is seated a piston 11 comprising, in the embodiment illustrated, a dished metallic member 12 and a member 13 formed of flexible material such as rubber or leather which is seated against the dished member 12. The member 13 is provided with a flange 131 surrounding the dished member 12 and adapted to engage the interior of the casing 10 and form a close fit therewith. The piston is provided with a central opening 14 through which passes a hollow piston stem 15 provided, preferably near one end thereof, with a transverse partition 16 and an opening or openings 17 on opposite sides of the partition and preferably adjacent thereto. The openings provide communication between the upper interior portion of the piston stem above the partition and the chamber in the casing, and between said chamber and the lower interior portion of the stem, respectively. A valve member 18 preferably in the form of a metal disc is secured to the piston stem 15 and is preferably integral therewith as indicated. The disc is preferably of a less diameter than the interior of the casing, and engages the piston 11 when the stem and piston are moved in one direction, and is spaced from the piston in the manner illustrated in Figs. 3 and 5 when the stem is moved in the opposite direction due to the frictional engagement between the piston and the casing.

In the embodiment of my invention illustrated, the relative movement between the valve member 18 and the piston is limited by a stop member 19 which is secured to the inner end of the piston stem, and is constructed and arranged to permit relative movement between the valve member 18 and the piston in one position and to prevent relative movement between the two in the other position. In other words, when the stop member occupies the latter position the piston and the valve member become solid and act as a unit. In the embodiment of my invention illustrated, the extreme end only of the piston stem 15 is threaded as at 20 while one portion 21 only of a collar or nut 19 is threaded and engages the threads 20 on the end of the stem 15. The collar 19 is of such a width that, when it occupies the position illustrated in Fig. 2, it holds the piston 11 tightly against the valve member 18 thereby closing communication between the chamber within the casing 10 above the piston and the lower interior portion of the piston stem. On the other hand when the collar 19 is inverted and occupies the position illustrated in Fig. 3, the unthreaded portion of the collar is located beyond the end of the piston stem limiting the movement of the collar over the stem to the position indicated in Fig. 3, and when the collar occupies this position a limited relative movement between the piston and the valve member is permitted.

In the embodiment of my invention illustrated in Figs. 1 to 5 in which the device is applicable for use as a siphon, the upper end of the piston stem 15 is provided with a nipple 22 to which a flexible tube may be connected and is also provided with an operating handle 23. The piston stem passes through a suitable stuffing box 24 at one end of the casing. The opposite end of the casing is provided with a cap 25 which is preferably provided at its upper edge with screw threads 26 which engage complementary screw threads 27 on the end of the casing. The cap 25 in the embodiment illustrated is provided with a screw threaded nip-

ple 28 to which may be connected any desired character of pipe.

The operation of the device illustrated in Figs. 1 to 5 is as follows. The piston 11 is withdrawn by means of the handle 23 to the upper portion of the casing 10, the piston stem 15 and valve member 18 moving to the position relative to the piston indicated in Figs. 3 and 5 due to the friction of the periphery of the piston against the walls of the casing. The free end of the pipe which is attached to the nipple 22 is inserted in the liquid which is to be withdrawn. The piston stem 15 and with it the piston and valve member are forced forwardly, the valve member 18 at this time engaging the flexible portion 13 of the piston. A vacuum or partial vacuum is thereby created in the chamber of the casing above the piston and liquid is drawn through the pipe attached to the stem and through the piston stem and the opening 17 above the partition 16 and into the chamber of the casing. The liquid at this time, however, cannot flow into the hollow portion of the stem below the partition 16 because of the seating of the valve member 18 against the piston. When the piston has been moved forwardly and the desired amount of liquid withdrawn, the handle 23 is withdrawn sufficiently to unseat the valve member 18 from the piston and the liquid in the chamber thereby flows around the valve member 18 and through the opening 17 beneath the valve member and into the piston stem from which it is discharged through the nipple 28 or a suitable pipe attached thereto into a desired receptacle. It will, of course, be understood that while the valve member 18 is shown in the form of a disc and of less diameter than the internal diameter of a cylinder, it is only necessary that the area of the valve member should be less than the cross sectional area of the casing and that the valve member may be otherwise formed.

The device illustrated in Figs. 1 to 5 is also adapted for other purposes, as for example, a grease gun. When the device is to be used for this purpose, the nut or collar 19 is reversed to the position indicated in Fig. 2 in which case the valve member 18 is permanently closed against the piston 11. Then when the piston is withdrawn to the upper end of the casing as viewed in Fig. 1, the cap 25 may be removed, the casing filled with grease and the cap replaced. A suitable nozzle will be connected to the nipple 28 and then when the piston is forced forwardly the grease is forced from the casing through a suitable attachment connected to the nipple 28.

In the embodiment of my invention illustrated in Figs. 1 to 7, the pump embodying my invention is used as a force pump in connection with an atomizer and is used to create pressure within a receptacle from which liquid such as oil is to be forced and atomized. When the device is used in this manner, it will be understood that the operating handle 23 is located below the casing 10 as viewed in Fig. 6 and that no tube is connected to the nipple 22. The nipple 28, however, is connected by a pipe 29 to a sleeve 30, a space 31 being provided between the sleeve 30 and the atomizing pipe 32 which is provided with a nozzle 33. In the embodiment illustrated the inner edge of the sleeve 30 is tapered as at 34 and a stopper 35 of rubber or other suitable material forms a tight fit with a tube 32 passing therethrough and also forms a tight fit against the beveled portion of the sleeve 30. A stopper 36 is also provided with an opening in which the sleeve 30 is tightly received and which forms a tight fit with the mouth of the receptacle 37 in which oil or other material which is to be sprayed is contained.

When the device is used as a force pump in connection with an atomizer, the piston is made solid by arranging the nut or collar 19 in the position indicated in Fig. 2. Now when the piston is forced forwardly from the lower end of the cylinder as viewed in Fig. 6 to the upper end, air is forced from the chamber within the casing through the pipe 29 and into the space between the tube 32 and the sleeve 30 and into the receptacle 37 thereby building up pressure therein and forcing the liquid therefrom through the operating nozzle 33 in the manner usual in an atomizer. On the return stroke the flange 131 of the piston does not engage the walls of the casing as tightly as during the forward movement and air finds its way past the piston into the chamber of the casing above the piston. This air may be supplemented by air drawn through the atomizer itself. The device may be used for the purpose of spraying the springs and other parts of an automobile, or for any other desired purpose. A flexible joint 38 is preferably provided between the pipe 29 and the sleeve 30 so that the pump may be moved away from the receptacle 37, for example, at right angles thereto into a convenient position where it may be operated without interfering with the receptacle. The atomizing pipe 32 may be rotated within the stopper 35 and the atomizing nozzle thereby brought to a desired position without necessarily disturbing the position either of the pump or the receptacle 37 which further lends to the flexibility of the device.

The device embodying my invention affords a very convenient and useful device which is adapted for a variety of uses, and while it is not limited thereto, it is particularly useful as an accessory for an automobile in which the same pump may be used as a siphon for withdrawing gasoline or for other purposes, as a grease gun for the usual operation in connection with an automobile or as an atomizing device for spraying oil against the springs and other parts.

While I have described my invention in its preferred embodiments, it is to be understood that the words which I have used are words of description and not of limitation. Hence, changes within the purview of the appended claims may be made without departing from the true scope and spirit of my invention in its broader aspects.

What I claim is:

1. In a pump, a cylindrical casing, a hollow piston stem, a piston loosely mounted thereon, said piston stem being provided with an internal transverse partition and an external flange of a diameter less than that of said casing and with lateral openings on each side of said partition and flange, the upper side of said piston being covered with a flexible material forming a substantially fluid tight seal when seated against said flange.

2. In a pump, a cylindrical casing, a hollow piston stem, a piston loosely mounted thereon, said piston stem being provided with an internal transverse partition and an external flange of a diameter less than that of said casing and with lateral openings on each side of said partition and flange, the upper side of said piston being covered with a flexible material forming a substantially fluid tight seal when seated against said flange, and means cooperating with said piston and said piston stem whereby said piston may be made slidable on said piston stem thereby providing a

valve or may be permanently seated against the flange to form a solid piston.

3. In a pump, a cylindrical casing, a hollow piston stem, a piston loosely mounted thereon, said piston stem being provided with an internal transverse partition and an external flange of a diameter less than that of said casing and with lateral openings on each side of said partition and flange, the upper side of said piston being covered with a flexible material forming a substantially fluid tight seal when seated against said flange, said piston stem being provided on the side of the piston opposite to the flange with a member co-operating with said piston whereby said piston may be made slidable on said piston stem to form a valve or may be permanently seated against said flange to form a solid piston.

4. In a pump, a cylindrical casing, a piston stem threaded at its inner end, a piston loosely mounted thereon, said piston stem being provided with a stop member for limiting the movement of said piston relatively to said piston stem in one direction of movement, a valve comprising said piston, said piston stem being provided on the side of the piston opposite to the flange with a nut threaded for a portion only of its width and engaging the threaded end of the piston stem whereby said nut is reversible on said stem to provide play between said piston and said flange or to permanently seat the same against said flange.

WARREN A. TANNER.