Jan. 26, 1954 B. W. FOSS ET AL 2,667,125

PUMP

Filed April 9, 1949

Fig. 1

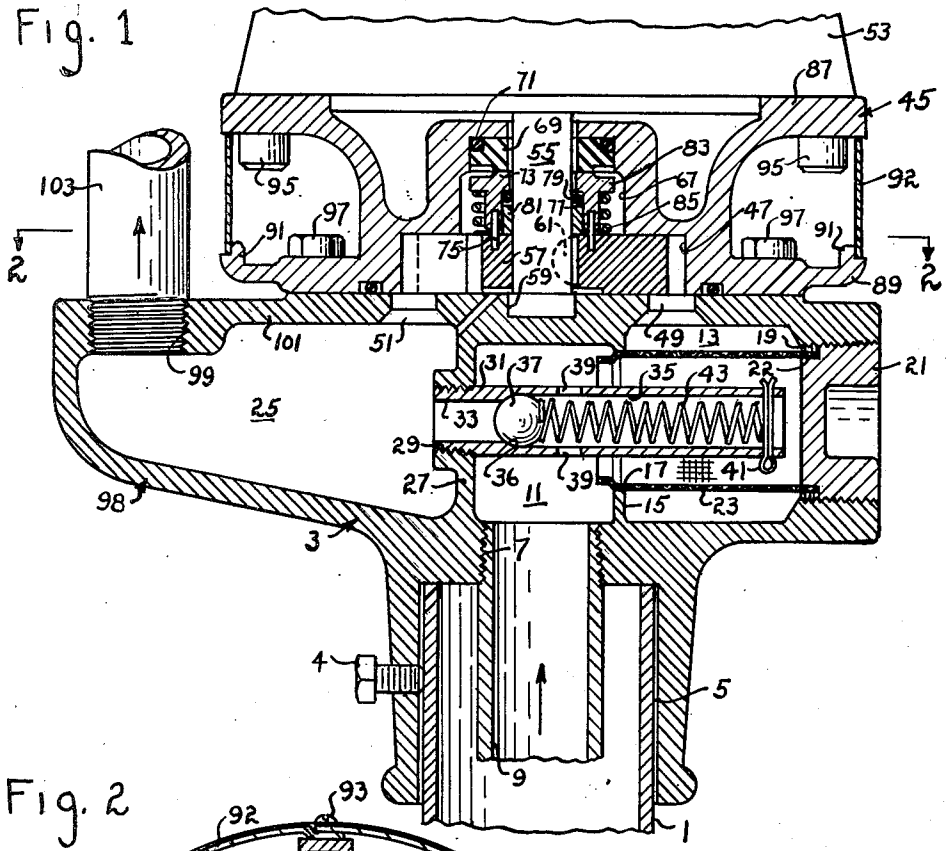
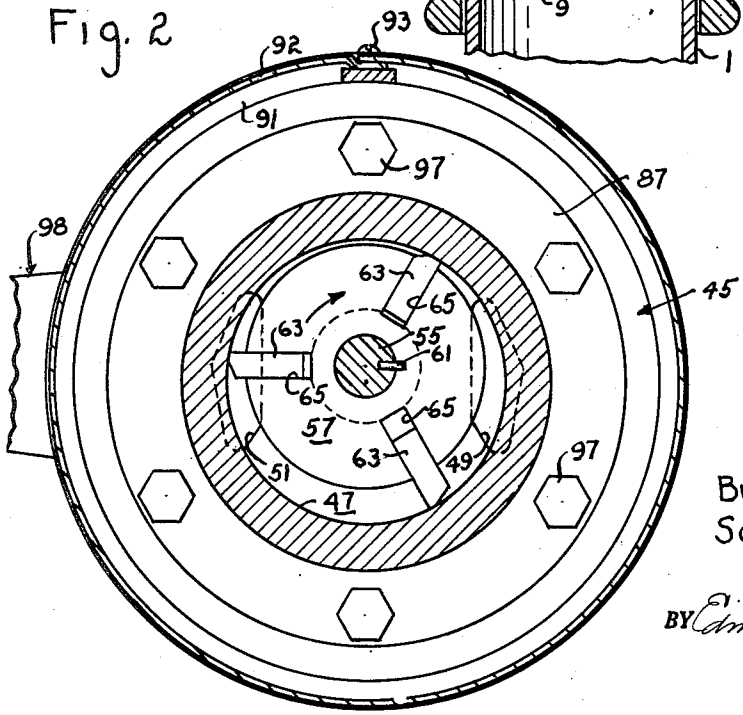


Fig. 2



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Patented Jan. 26, 1954 2,667,125

UNITED STATES PATENT OFFICE

2,667,125

PUMP

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Application April 9, 1949, Serial No. 86,566

8 Claims. (Cl. 103—42)

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This invention relates to liquid dispensers. More especially it relates to a pump for dispensing fuel from underground tanks. It is particularly adapted for the tanks used to store fuel for farm machinery.

It is an object of the invention to produce a dispenser which is simple and easy to manufacture.

Another object of the invention to provide a dispenser which is small and compact.

Yet another object is to provide a simple yet effective strainer and by-pass arrangement.

These and other objects will become apparent from a study of the drawing which is attached hereto and made a part hereof and in which:

Figure 1 is an elevation partly in section showing the pump, suction and discharge conduits, screen and by-pass valve.

Figure 2 is a sectional view taken substantially on the line 2—2 of Figure 1.

Referring now to the drawing, the numeral 1 represents a pipe which is fixed at its lower end to the discharge connection on the storage tank (not shown), or to a slab or other base.

The manifold body 3 of the dispenser is provided with a downwardly open socket 5 which slidably receives the pipe 1 and thus supports the receiver.

An inlet or suction opening 7 is formed in the body and is threaded to deceive the suction pipe 9 which extends to a point adjacent the bottom of the tank and may be supplied with the usual foot valve not shown.

A suction chamber 11 is formed in the body and is separated from a screen chamber 13 by a wall 15 in which is formed a circular opening 17. A threaded opening 19 is formed in an outer wall of chamber 13 and coaxially with the opening 17.

A plug 21 is screwed into 19 and carries a boss 22 on which is mounted a cylindrical screen 23 which enters opening 17 and fits snugly therein. Thus all liquid passing from chamber 11 to chamber 13 must pass through the screen.

A discharge chamber 25 is also formed in the body 3 and has a wall 27 which is common to the suction chamber. A threaded opening 29 is formed in this wall and a by-pass tube 31 is mounted therein from the suction chamber. The opening 29 and tube 31 are substantially coaxial with openings 17 and 19 so that the tube may be inserted through them and screwed into place.

The tube 31 has a small bore 33 at the discharge chamber end and a large counterbore 35 at the other end, the junction of which form a seat 36 for a ball valve 37. A number of lateral holes 39 are formed in the tube 31 so as to intersect the counterbore 35 beyond the seat. A pin 41 is fixed transversely of the outer end of a counterbore 35 and a compression spring 43 is confined between the pin and valve to hold the latter on its seat.

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A pump body 45 is fixed in sealing relation on the manifold and has a cylindrical pump chamber 47 on its lower side. An inlet port 49 formed in body 3 connects the screen chamber 13 with the chamber 47 which is in turn connected through discharge port 51 with the discharge chamber 25.

An explosion proof electric motor 53 is mounted on the upper side of the pump body and the shaft 55 thereof passes through the pump body 45, chamber 47, the rotor 57 and may enter a clearance hole 59 in the manifold body if the shaft happens to be long enough. A key 61 transfers torque from the shaft to the rotor.

The rotor is eccentrically mounted in the bore 47 and blades 63 enter radial slots 65 in the rotor. These blades may be of metal, carbon, plastic or other material.

The pump body is recessed at 67 concentrically with the shaft 55 and the carbon disc 69 of a rotary seal is mounted therein on a rubber sealing torus 71. A complementary metal ring 73 is loosely mounted over the shaft and is connected to the pump rotor by pins 75. The latter ring is counterbored at 77 to receive a rubber torus 79 which forms a seal between it and the motor shaft. A sleeve 81 enters the counterbore to hold the torus 79 in place.

A radial flange 83 is formed on ring 73 and a spring 85 is compressed between the rotor and the flange to hold the contacting faces of the rings 69 and 73 in sealing relation on each other. These faces are, of course, smooth so as to provide a good seal.

The pump body 45 is provided with a top flange 87 on which the motor 53 is mounted and with a bottom flange 89 which has an axial bead 91. A circular metal band 92 rides between the flanges 87, 89 and is supported by the bead. The ends of the band are held in place by a screw fastener 93. The motor and pump body mounting screws 95 and 97 are thus enclosed by the band.

The discharge chamber 25 extends laterally beyond the pump body and motor as at 98. A tapped hole 99 is formed in the top wall 101 of the chamber and a discharge pipe 103 is screwed into the opening and rises vertically therefrom. A suitable hose, having a nozzle provided with a nozzle valve (not shown) is connected to the pipe. If desired, the hose may be connected directly in the hole 101.

Operation

The pipe 1 is installed on the tank and suction pipe 9 with the foot valve is installed in hole 7 and inserted in pipe 1. The upper end of pipe 1 is fitted in the socket 5. When the power connection is made the outfit is ready for operation.

The motor drives the pump rotor in clockwise direction as shown in Figure 2 and pulls a vacuum in the suction system. Liquid rises into

chamber 11 passes through the strainer 23 into chamber 13. From there the liquid passes through port 49, is pressurized and discharged through port 51, chamber 25 and, if the nozzle valve is open, up through pipe 103, hose and nozzle.

If the nozzle valve is closed or throttled the pressure differential applied to the ball valve 37 will overcome spring 43 and the ball will move to the right in Figure 1 until it clears ports 39. Liquid will thus circulate from the pressure to the suction side of the pump to prevent stalling the motor.

Should the screen 23 become dirty, it is necessary merely to unscrew plug 21 and the screen will be removed with it and can be cleaned. The bypass valve can likewise be removed through this opening if required.

The pump can also be primed through this opening by attaching an elbow and a nipple to the opening 19 and pouring liquid into the screen and suction chambers.

The rotary seal is conventional in its operation.

It will be seen that by removing the band 92, the screws 95 and 97 are accessible for removing the motor or pump body for repairs.

The body 3 is freely mounted on pipe 1 for adjustment and is clamped by set screws 4 thereon so that the dispenser may be rotated on the pipe to selected position and then fixed.

It is obvious that various changes may be made in the form, structure and arrangement of parts without departing from the spirit of the invention. Accordingly, applicants do not desire to be limited to the specific embodiment disclosed herein primarily for purposes of illustration; but instead, they desire protection falling fairly within the scope of the appended claims.

What we claim to be new and desire to protect by Letters Patent of the United States is:

1. In a liquid dispenser, a manifold body having a suction opening, a suction chamber communicating therewith, a screen chamber adjacent thereto, a port connecting said chambers, an opening in said screen chamber in alignment with said port, a plug for said opening, a cylindrical screen mounted thereon and extending through said port and in sealing relation therewith.

2. In a liquid dispenser, a manifold body having a suction chamber, a screen chamber and a discharge chamber, a first port connecting the suction and discharge chambers, a second port connecting the suction and screen chambers and a third port in the screen chamber, said ports being in substantial alignment, a relief valve mounted in the first port and a screen mounted in said second and third ports.

3. In a liquid dispenser, a manifold body having a suction chamber, a screen chamber and a discharge chamber, a first port connecting the suction and discharge chambers, a second port connecting the suction and screen chambers and a third port in the screen chamber, said ports being in substantial alignment, a relief valve mounted in the first port and a screen mounted in said second and third ports and a plug in said third port.

4. In a liquid dispenser, a manifold body having a suction chamber, a screen chamber and a discharge chamber, a first port connecting the suction and discharge chambers, a second port connecting the suction and screen chambers and a third port in the screen chamber, said ports being in substantial alignment, a relief valve mounted in the first port and a screen mounted in said second and third ports and a plug in said third port, said screen being attached to the plug.

5. In a liquid dispenser, a manifold body having a suction chamber, a screen chamber and a discharge chamber, a first port connecting the suction and discharge chambers, a second port connecting the suction and screen chambers and a third port in the screen chamber, said ports being in substantial alignment, a relief tube mounted in said first port and extending through the second port, a screen sealingly mounted in said second and third ports, a valve seat in the tube, a valve movable in said tube toward said first port to contact said seat, and yieldable means for urging the valve toward the seat.

6. In a liquid dispenser, a manifold body having a suction chamber, a screen chamber and a discharge chamber, a first port connecting the suction and discharge chambers, a second port connecting the suction and screen chambers and a third port in the screen chamber, said ports being in substantial alignment, a relief valve means removably mounted in said first port and insertable therein through the second and third ports.

7. In a liquid dispenser the combination of a manifold body having a suction chamber, a discharge chamber, a strainer in one chamber and a valve controlled by-pass connecting said chambers, a port formed in the upper part of each chamber, a pump body attached to said manifold body above the chamber, a bore in said pump body communicating with said ports and adapted to be closed on one side by said manifold body, a pump mechanism in said bore disposed between said ports and in sealing relation with said manifold body, a motor mounted on the pump body and means connecting the motor to drive the pump mechanism.

8. In a liquid dispenser the combination of a manifold body having a suction chamber, a discharge chamber, and a valve controlled by-pass connecting said chambers, a port formed in the upper part of each chamber, a pump body attached to said manifold body above the chamber, an open pump bore in the body disposed substantially parallel with the manifold body and closed thereby, said bore being in communication with said ports, and a pump rotor mounted in the bore in sealing relation with said manifold body which forms one of the pump heads.

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