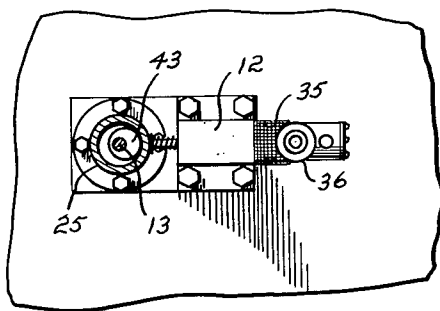
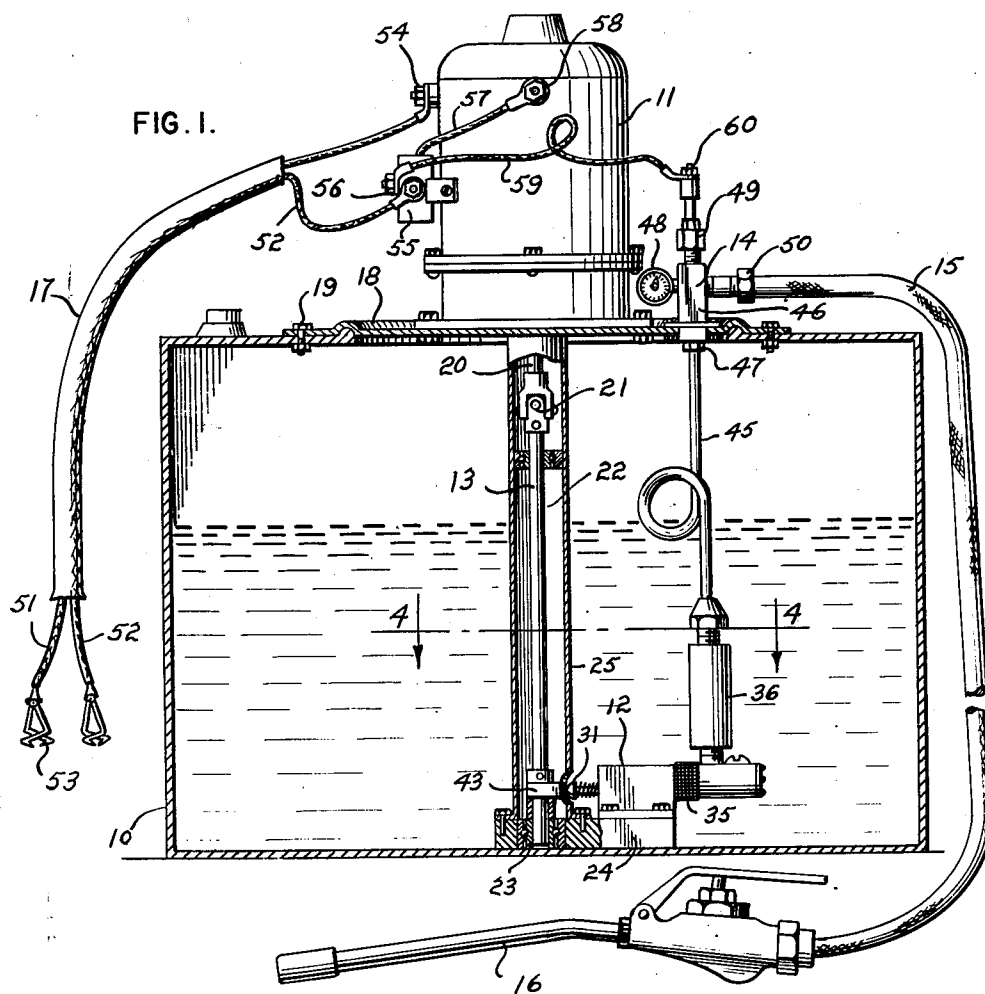


Filed Oct. 19, 1949

LUBRICATING APPARATUS

2 SHEETS--SHEET 1



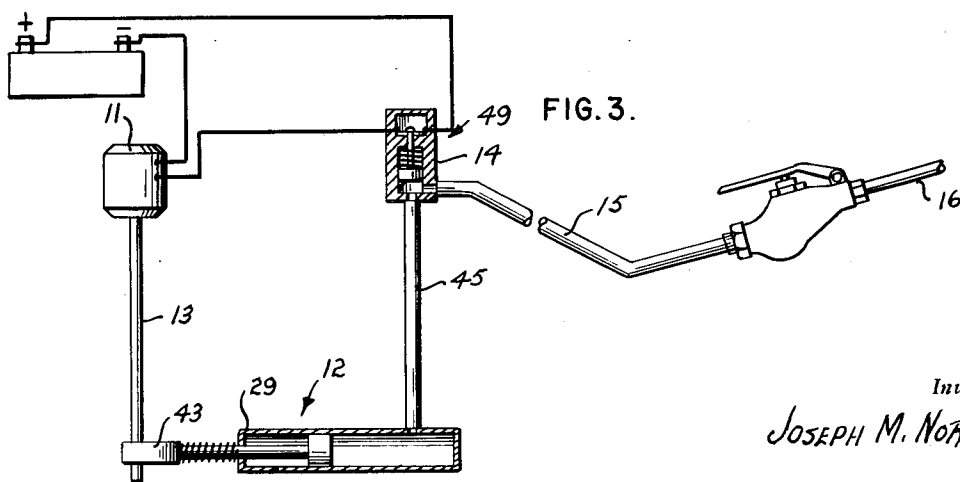
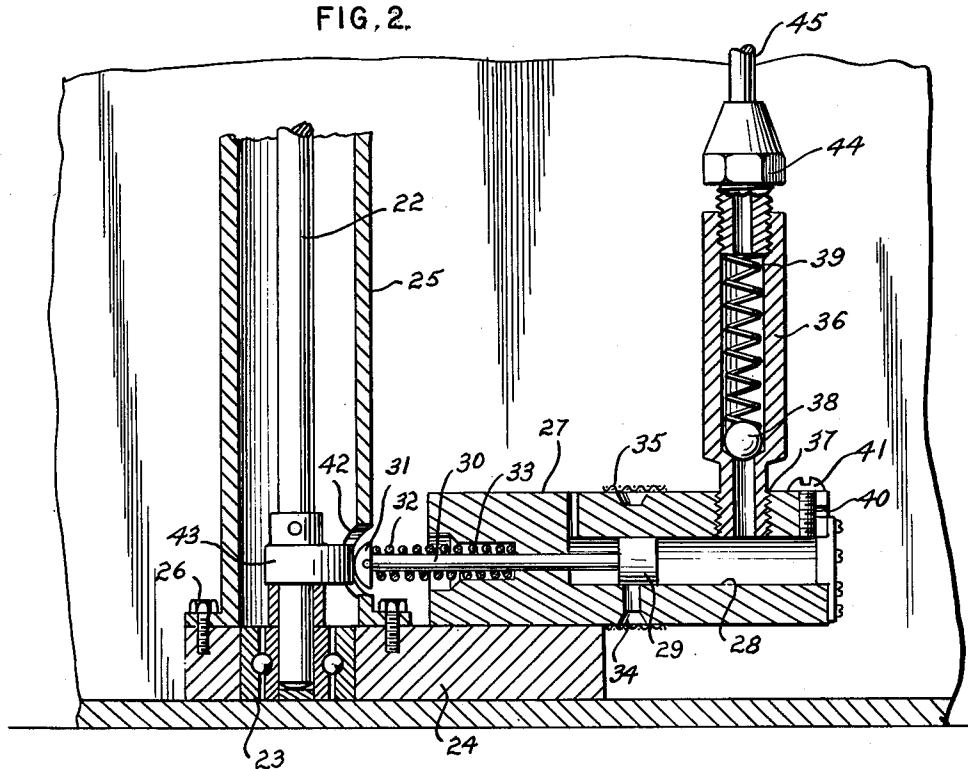
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LUBRICATING APPARATUS

2 SHEETS--SHEET 2



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UNITED STATES PATENT OFFICE

2,634,885

LUBRICATING APPARATUS

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Application October 19, 1949, Serial No. 122,328

3 Claims. (Cl. 222-63)

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The present invention relates to lubricating apparatus, and more particularly to a portable power operated pumping assembly adapted to be attached to a lubricant container for forcing the lubricant from the container under the desired pressure to a lubricant gun or suitable discharge point. It has been a problem, particularly in remote areas, such as farms and the like, to grease or lubricate farm machinery where there is no source of air pressure. Consequently, the machinery has been lubricated by hand operated grease guns which, of course, requires that the gun be placed upon each fitting and then manually operated to force the grease into the fitting. Manifestly, this is a very laborious task which is not only time-consuming but also is quite expensive. While certain power operating equipment has been proposed for solving the problem, such equipment has not been entirely satisfactory, since these units have been rather complex in structural detail, which makes the cost of manufacture comparatively high and, in addition, the power plant operates continuously, the lubricant being by-passed when the gun is not actually supplying lubricant to the fitting or bearing. This places a considerable drain on the battery or source of electrical energy employed for driving the motor, which also is most undesirable.

Accordingly, an important object of the present invention is to provide a portable motor driven unit for pumping or forcing the lubricant from the container to the nozzle or gun, wherein means are provided to render the motor inactive when the gun or nozzle is not in use, thereby conserving the energy employed for driving the motor.

Another object is to provide a lubricating apparatus wherein the weight of the motor and its drive connection to the pumping assembly is centrally balanced with respect to the lubricant container, thus making the unit easy to transport and operate.

A further object of the invention is to provide a lubricating apparatus of the character described wherein a pressure operated switch is interposed in the conduit between the pumping means and the gun and operatively connected with the motor, whereby the switch will break the motor circuit when the conduit is filled with lubricant and will restore the circuit when pressure is released by actuating the gun to initiate the pump action.

And yet another object of the invention is to provide a portable lubricating apparatus of the

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character described which is relatively simple in constructional detail, positive and efficient in operation, and capable of being easily and inexpensively manufactured.

With the foregoing and other objects in view, the invention consists in the details of construction, and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail, reference will be had to the accompanying drawings forming part of this application, wherein like characters denote corresponding parts in the several views, and in which:

Figure 1 is an elevational view, partly in section, showing the lubricant dispensing means in position within a lubricant container.

Figure 2 is a fragmental vertical sectional view of the pumping unit and check valve assembly.

Figure 3 is a diagrammatic representation of the electrical circuit, and

Figure 4 is a horizontal sectional view taken along the line 4-4 of Figure 1, the view looking in the direction of the arrows.

With reference to Figure 1, I have indicated a lubricant container 10 of conventional type, which may be of 75 to 100 pounds capacity, a 6 volt electric motor is adapted to be supported by the top of the container, a pump unit 12 located within the container is operatively connected with the motor 11 by a drive connection 13, a pressure operated switch 14 is interposed in conduit 15 between the pump 12 and a gun or nozzle 16, and an electrical connection 17 is adapted to be attached to a 6 volt battery for supplying energy for operating the motor 11.

The motor 11 is suitably bolted to cover 18 for the container 10 and it can be seen that the motor is centrally located with respect to the container, thus providing proper balance for the assembly. The cover 18 may be attached to the container by nut and bolt assemblies or the like 19.

The motor drive shaft 20 is coupled, as indicated at 21, to drive shaft 22 of the pump, indicated generally 12. The lower end of the drive shaft 22 is journaled in bearing 23 provided in base 24 of the pump, and a supporting sleeve 25 for holding the pump 12 in proper relation with respect to the motor surrounds the shafts 20 and 22, and the lower end thereof may be bolted to the base 24, as indicated at 26. The sleeve 25 may be replaced by strap braces suitably connected to the base and cover plate 18.

A housing 27 is carried by the upper face of

the base 24 and is formed with a horizontally extending cylinder 28 therein, in which a piston or plunger 29 is mounted for longitudinal reciprocatory movement. The plunger or piston 29 has a rod 30 of reduced diameter which terminates in a head 31, and a helical spring 32 surrounds the rod with one end bearing against the head while the opposite end bears against the base of recess 33 formed in the housing 27.

The housing 27 is provided with an inlet port 34 extending upwardly from the lower wall thereof and merging with the cylinder 28. A filter screen 35 surrounds the housing to prevent any foreign matter from entering the cylinder, and the screen may be attached to the housing in any convenient manner. A check valve body 36 is threaded into a tapped opening 37 in the upper wall of the housing 27, and a ball 38 is maintained against its seat by a helical spring 39 disposed within the body. A bleed orifice 40 is formed in the end wall of the housing 27 and a screw 41 is lodged in a threaded aperture in the body to control the bleed orifice.

In order to reciprocate the plunger 29 to admit lubricant into the cylinder through the opening 34, it will be noted that head 31 projects through an opening 42 in the sleeve 25 and is maintained against the face of a cam 43 eccentrically mounted on the shaft 22. Manifestly, as the cam rotates, the plunger will reciprocate in opposite directions, thereby creating the necessary pump action for the lubricant.

A coupling 44 is threaded into the upper end of the valve body 36 in order to secure an outlet tube 45 to the pump assembly 12. The opposite end of the tube 45 is connected to pressure operated electric switch denoted generally 14. The unit 14 includes a body 46 which, in effect, is a four-way coupling. The tube 45 is connected to one of the outlets, as indicated at 47, a high pressure gauge 48 is connected to another outlet, automatic electric shut-off switch 49 of conventional design is connected with the outlet diametrically opposed to the connection 47, and one end of the conduit 15 is secured to the other outlet, as indicated at 50. It should be mentioned that the switch 49 may be set for any pressure desired from 500 to 7500 pounds which, of course, should take care of any lubricating problems which should arise.

The electrical connection 17 includes leads 51 and 52 and each lead is provided with a clip 53 adapted to be detachably connected to the posts of a 6 volt battery, depending upon the particular equipment which is being employed for the source of power. The opposite end of lead 51 is attached to ground post 54 on the motor casing, while lead 52 is attached to a solenoid switch 55 of suitable type, as indicated at 56, and the switch may be secured in any convenient manner to the motor housing. Lead 57 of the switch 55 is connected to field post 58 of the motor 11, while lead 59 extends from the switch 55 and is connected to the pressure operated switch 49, as shown at 60.

While the operation of the unit is believed to be fully apparent from the foregoing, it may be summarized as follows:

Assuming that the motor 11 and the pump 12 have been installed in proper relation with respect to the container and the cover 18 bolted thereto, the clips 53 are attached to the battery. The pressure operated switch is, of course, set for the desired pressure and actuation of the motor will cause the cam 44 to reciprocate the

plunger 29 in opposite directions to force the lubricant from the cylinder 28 through the check valve 36, tubing 45, coupling 46, connection 50, conduit 15 and thence to the gun 16. As soon as the line between the pump and the gun is filled with lubricant, the lubricant will be forced into the pressure operated switch 49 which will, of course, break the circuit to the motor 11, thereby stopping the drain on the battery. The operator then applies the gun 16 to the desired fitting and by operating the control handle the lubricant will pass into the fitting, thus releasing the pressure, which means that the switch 49 will again close the circuit to the motor, whereupon the pump 12 will again force lubricant into the conduit to the gun, and when the pressure has been restored, the switch 49 will cut off the circuit, thus stopping the motor until the pressure is released by further operation of the gun 16.

It will be appreciated from the above description that I have provided a portable properly balanced motor driven pumping unit for lubricant containers which will effectively lubricate machinery in areas where a source of air pressure is not available. By virtue of the direct drive and the 6 volt motor, the unit may be employed in situations where 110 volt current is not available, and the pressure operated electric switch 49 will break the motor circuit as soon as the conduit between the pump and the nozzle is charged with lubricant. This arrangement is particularly efficacious in that it not only prevents an excessive drain on the battery or source of electrical energy but likewise will increase the life of the motor per se.

The invention is not to be confined to any strict conformity with the showing in the drawing but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

I claim:

1. A portable lubricating apparatus comprising a lubricant container, a top member therefor, a prime mover carried by the top member, a bearing block positioned on the bottom of the container, a vertical driveshaft connected at its upper end to the prime mover and having its lower end journaled in the bearing block, means associated with the bearing block and the top member to prevent displacement of the bearing block, a horizontal pump cylinder secured to the upper surface of the said block with its axis generally radial to said shaft, said cylinder projecting beyond the edge of said block so that the projecting portion thereof is in spaced relation to the said bottom of the container, said last portion having an inlet port and an outlet port, said inlet port extending downwardly from the bore of the cylinder and opening through the wall of the cylinder at a point beside said block, a piston in the bore of the cylinder having a piston rod extending toward the shaft, spring means biasing the piston toward the shaft, a cam on the shaft effective upon rotation of the shaft through activation of the prime mover to reciprocate the piston thereby to force lubricant through said cylinder from the inlet port to said outlet port, a check valve associated with one of said ports to prevent flow of the lubricant through said cylinder in the reverse direction and a discharge conduit connected at one end to said outlet port and having its other end outside of said container.

2. A portable lubricating apparatus as defined

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in and characterized by claim 1 wherein said discharge conduit includes a valved discharge means at the end outside the said container and a pressure-responsive device in the conduit controlling means to automatically disable the prime mover whenever the pressure in the conduit reaches a predetermined maximum value.

3. A portable lubricating apparatus as defined in and characterized by claim 1 wherein a sleeve surrounds the vertical drive shaft and extends from the top member to the bearing block and constitutes the means to prevent displacement of the bearing block, the said sleeve having an opening therein through which the piston rod projects to contact the cam on the drive shaft.

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