May 6, 1924. 1,493,049

M. E. MITCHELL

PRESSURE LUBRICATOR

Filed March 8, 1922 2 Sheets-Sheet 1

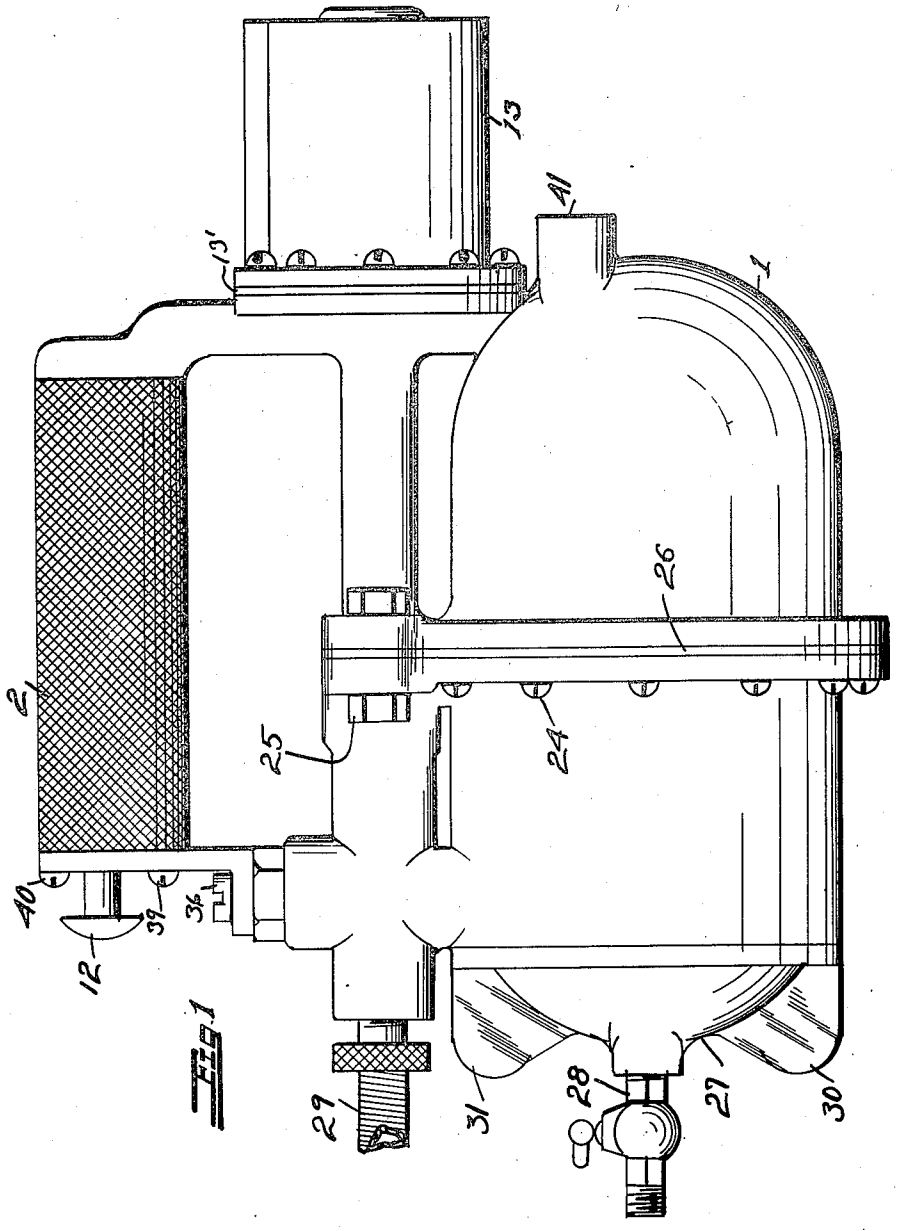


Fig. 1

INVENTOR.
Malcolm E. Mitchell.
BY
Carlos P. Griffin
ATTORNEY.

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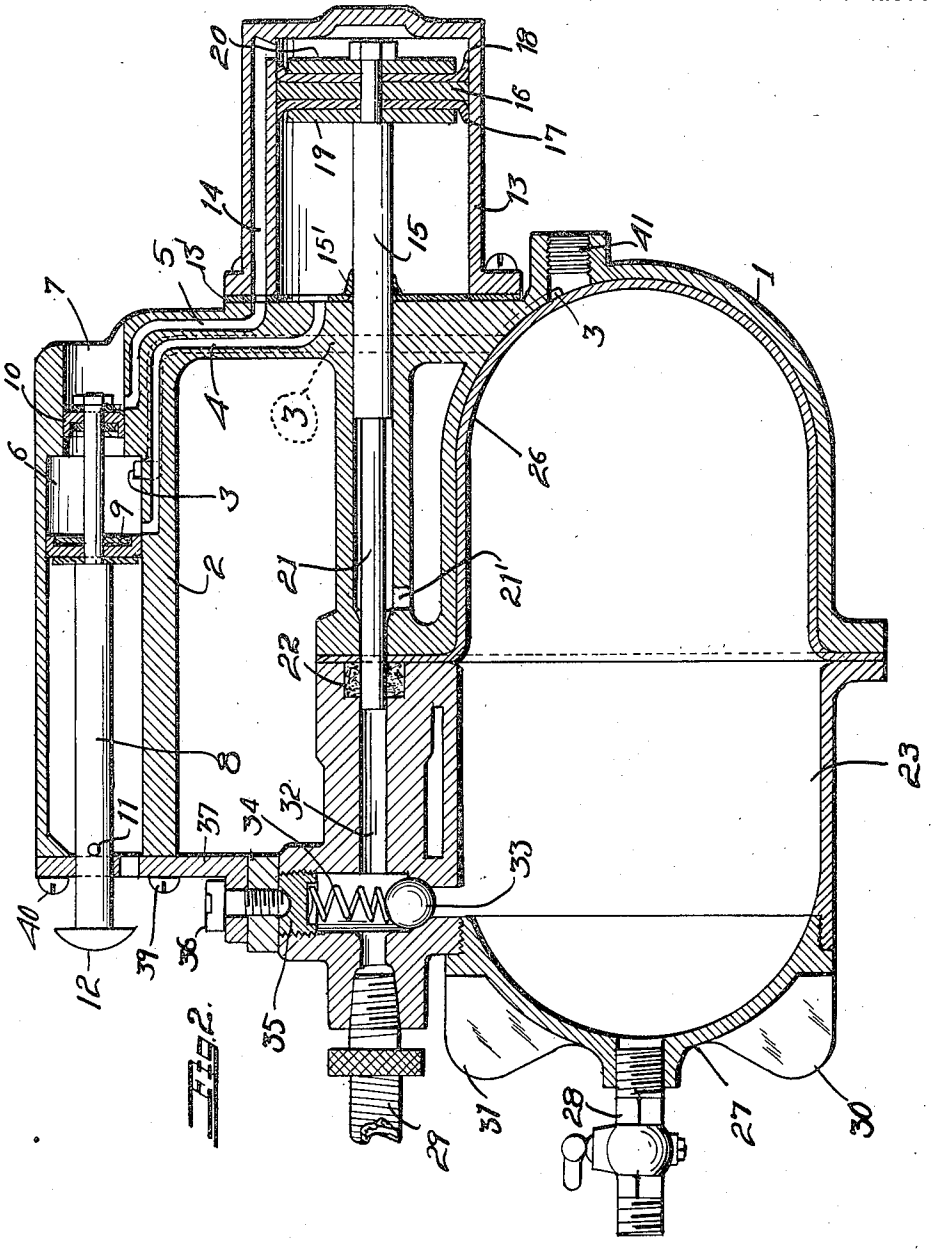


Fig. 2.

INVENTOR.
Malcolm E. Mitchell
BY
Carlos P. Griffin
ATTORNEY.

Patented May 6, 1924. 1,493,049

UNITED STATES PATENT OFFICE.

MALCOLM E. MITCHELL, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO BEST LUBRICATING CO., INC., A CORPORATION OF CALIFORNIA.

PRESSURE LUBRICATOR.

Application filed March 8, 1922. Serial No. 541,906.

To all whom it may concern:

Be it known that I, MALCOLM E. MITCHELL, a citizen of the United States, residing at San Francisco, in the county of San Francisco, State of California, have invented a new and useful Pressure Lubricator, of which the following is a specification, in such full and clear terms as will enable those skilled in the art to construct and use the same.

This invention relates to a grease gun intended to make use of compressed air in supplying the grease cups of any type of machinery with lubricant.

It will be understood by those skilled in the art that it is common to provide some sort of high pressure gun for forcing grease into bearings. These guns usually take the form of a pump cylinder with a piston therein, the piston having a rod with a very fine thread to give the necessary pressure when the rod is turned. Such grease guns are somewhat difficult to fill because of the fact that the grease entraps a quantity of air in the cylinder and they necessitate a considerable amount of turning of the piston rod to restore the piston to its initial position, since to produce the pressure required it is necessary to have a very fine thread.

With the present invention any desired pressure may be attained and a given charge of grease may be ejected from the gun as rapidly as may be required, or if a high pressure is not desired the entire contents of the storage receptacle may be ejected therefrom into a gear case or other grease receptacle by the opening of a valve on the low pressure side of the gun.

Another object of the invention is to provide the grease receptacle with a septum which will be air tight and which will not permit the escape of any grease into the space at the back of the septum, thus dispensing with the ordinary form of piston for pushing the grease out of the storage receptacle.

Another object of the invention is to provide means for maintaining a continuous supply of grease in the high pressure chamber, thereby making the apparatus ready for operation at any moment.

Another object of the invention is to provide means whereby the operating valve will be substantially automatic in resetting itself, an unbalanced pair of valves being used so that a mere pressure of the thumb on the end of the valve will cause the grease to be expelled from the gun, and upon releasing the pressure on said valve the valve will be restored to its initial position and the gun reset to deliver another charge of grease therefrom.

Other objects of the invention will appear as the description proceeds.

An embodiment of the invention is shown in the accompanying drawings in which the same reference numeral is applied to the same portion throughout, but I am aware that there may be modifications thereof.

Fig. 1 is a side elevation of the gun complete, and

Fig. 2 is a vertical sectional view of the gun.

The gun consists of the storage receptacle 1 to which the handle 2 is connected, said handle having three air passageways 3, 4 and 5, extending therethrough. The passageway 3 extends from the grease storage receptacle 1 to and terminates in a smaller opening 6 in the handle 2. The passageway 4 extends from a position on the outside of the handle to and terminates in the hole 6 at one side of the termination of the port 3. The passageway 5 extends from a position at the outside of the handle to and terminates in a smaller hole 7 in the handle 2.

A pin 8 carries the piston 9 and the smaller piston 10. These pistons are slidable in the holes 6 and 7 respectively, and the pin 8 has a pin 11 to prevent it from being pushed out of the position it should occupy. This pin also terminates in a button 12 for the operator to push the pin in with.

A flanged cylinder 13 is bolted on the back of the depending portion of the handle to cover the lower openings of the two ports 4 and 5, the port 4 being covered by the open front of the cylinder, while the port 5 coincides with the front opening of a port 14 formed in the walls of the cylinder 13 and extending to the back of said cylinder.

A piston rod 15 carries a suitable piston 16 with double packing gaskets 17 and 18. These gaskets 17 and 18 are held in place by means of the two washers 19 and 20. At the other end the rod 15 is somewhat

reduced as indicated at 21 and passes through a packing at 22 in the upper portion of the front part of the grease receptacle 23.

The grease receptacle 23 is secured to the storage receptacle 1 by means of a series of screw bolts 24 and by two heavy cap screws 25. A suitable septum 26 is bolted between the two flanges of the grease receptacle and normally fits against the bottom of the receptacle 1. This septum is of any suitable material such as leather or specially prepared fabric to cause the grease in the storage receptacle to be forced into the high pressure chamber without any of the grease passing to the back of the septum.

The chamber 23 is closed with a screw cap 27, which screw cap carries a small plug valve 28 to permit it to have the flexible grease pipe 29 secured thereto, whenever it may be desired to use the grease at a pressure of from fifty to seventy five pounds which is the ordinary low pressure used. This cap has wings 30, 31 to permit it to be readily turned by hand.

The upper portion of the grease receptacle 23 has a chamber 32 in which the rod 21 is slidable, and there is an opening from said chamber into the grease receptacle 23, this opening being closed by means of the ball valve 33. A spring 34 holds the ball valve normally seated, and the plug 35 holds said spring in place.

The plug 35 is threaded to receive a cap screw 36 adapted to hold an L-shaped member 37 which is fastened to the end of the handle 2 to prevent the pin 8 from being blown out of place. Screws 39, 40 connect the handle end to the member 37.

In operation the flexible tube 29 will be normally connected as shown in the figures. A suitable air pressure pipe will then be connected to the threaded boss 41 at the back of the grease receptacle 1, and as the valve 28 is normally closed the pressure will cause the grease to be forced up into the chamber 32. This air pressure has free access through the port 3 to the two pistons 9 and 10, but as the piston 9 is larger than the piston 10 they will normally occupy the position shown in Figure 2. When the tube 29 is connected to the lubricating cup on the machine to be lubricated, pressure on the end of the button 12 will shift the pistons 9 and 10 so that the compressed air in the cylinder 13 will escape therefrom through the port 4, and at the same time the compressed air will pass through the port 5 into the back of said cylinder and force the piston 16 forward delivering from the gun a charge of grease under a pressure proportionate to the size of the piston 21 as related to the piston 16 and pressure used therein. As soon as the pressure on the button 12 is released the air pressure will cause it to be restored to the position shown in Figure 2, which will at once restore the piston 15 and pin 21 to the position shown in Figure 2 and force a fresh supply of grease into the chamber 32.

In order to prevent any escape of air from the cylinder 13, a gasket 13′ is inserted between the cylinder and the handle portion 2. This gasket has a small hole at the center to receive the piston rod 15 so that the leather stands up as indicated at 15′ to act as a packing for the opening through which the piston rod 15 extends.

In order to prevent the formation of a vacuum in the space surrounding the rod 21 there is a hole 21′ to allow the atmosphere to have access to that chamber.

What I claim is as follows, but various modifications may be made in the construction shown in the drawings and above particularly described form, within the purview of my invention.

1. In a lubricator, a storage receptacle, a flexible partition therein, means to apply air pressure to one side of the partition to expel lubricant in the receptacle on the other side of the partition, a secondary pressure chamber with which the lubricant chamber is connected, a valve to retain the lubricant in said secondary chamber, a large piston, a small piston operated thereby and means to apply the air pressure in the storage receptacle to the large piston to increase the discharge pressure of the lubricant as it is forced from the secondary chamber.

2. In a lubricator, a storage receptacle, a flexible partition therein, means to apply pressure to one side of said partition to expel the lubricant from the receptacle, a secondary pressure chamber to which the first receptacle is connected, a pressure raising piston in the secondary chamber, a larger piston for operating the pressure raising piston, a valve for operating said piston at a predetermined moment, and means to automatically supply the lubricant to the secondary chamber after each operation of the piston therein.

3. In a lubricator, a storage receptacle, a flexible partition therein, means to supply air pressure on one side of the partition, a secondary pressure chamber connected to the storage receptacle, a plunger extending into said secondary chamber, a larger piston to operate the plunger from the air pressure in the storage receptacle and means to apply the air pressure from the storage receptacle to either side of the larger piston at will.

4. In a lubricator, a storage receptacle, means to apply pressure thereto, a flexible partition against which the pressure is applied to expel the lubricant in said receptacle, a secondary pressure chamber connected therewith, a plunger therein, a larger piston connected to the plunger, means to cause the

movement of said plunger from the pressure in the storage receptacle, and an automatically returned valve for causing the operation of the plunger at will.

5. In a lubricator, a storage receptacle, a flexible partition secured in the middle of the storage receptacle and capable of being pushed into contact with either end of the storage receptacle, means to apply pressure at the back of the partition to expel the lubricant from the storage receptacle, a secondary chamber, means whereby the lubricant may be expelled from said secondary chamber, there being connecting passageways between the storage receptacle and said secondary chamber, and means to restore the operating mechanism to its initial position through the pressure in the storage receptacle at the back of the flexible partition therein.

6. In a lubricator, a storage receptacle, a flexible partition secured therein adjacent the middle of the same capable of being pushed into contact with either end of said receptacle, means to apply fluid pressure at the back of the partition to expel the lubricant from the storage receptacle, a secondary chamber into which the lubricant is forced from the storage receptacle, a piston to expel the lubricant from the secondary chamber, means to operate said piston to increase the pressure at which the lubricant may be expelled from the secondary chamber, and means operatively connected with the storage receptacle whereby the fluid pressure therein may be used to restore the plunger to its initial position after each operation thereof.

7. In a lubricator, a storage receptacle, a secondary chamber, means whereby fluid under pressure will force lubricant in the storage receptacle into the secondary chamber, a plunger to expel the lubricant from the secondary chamber, a fluid operated piston to reciprocate the plunger, and a valve adapted to normally permit access of pressure to the plunger operating mechanism to retract the plunger, other means being provided to move the plunger forward at will when lubricant is to be expelled from the apparatus.

8. In a lubricator, a storage receptacle, a flexible partition therein, a secondary chamber into which lubricant is expelled from the storage receptacle, a check valve to prevent the return of the lubricant to the storage receptacle, a plunger for expelling the lubricant from the secondary chamber, fluid operated means to increase the pressure of expulsion of the lubricant from the secondary chamber over that of the storage receptacle, and means for alternately applying pressure to opposite sides of the plunger operating mechanism to expel lubricant from the apparatus and to restore the plunger to its normal position at will.

In testimony whereof I have hereunto set my hand this 24th day of February A. D. 1922.

MALCOLM E. MITCHELL.