

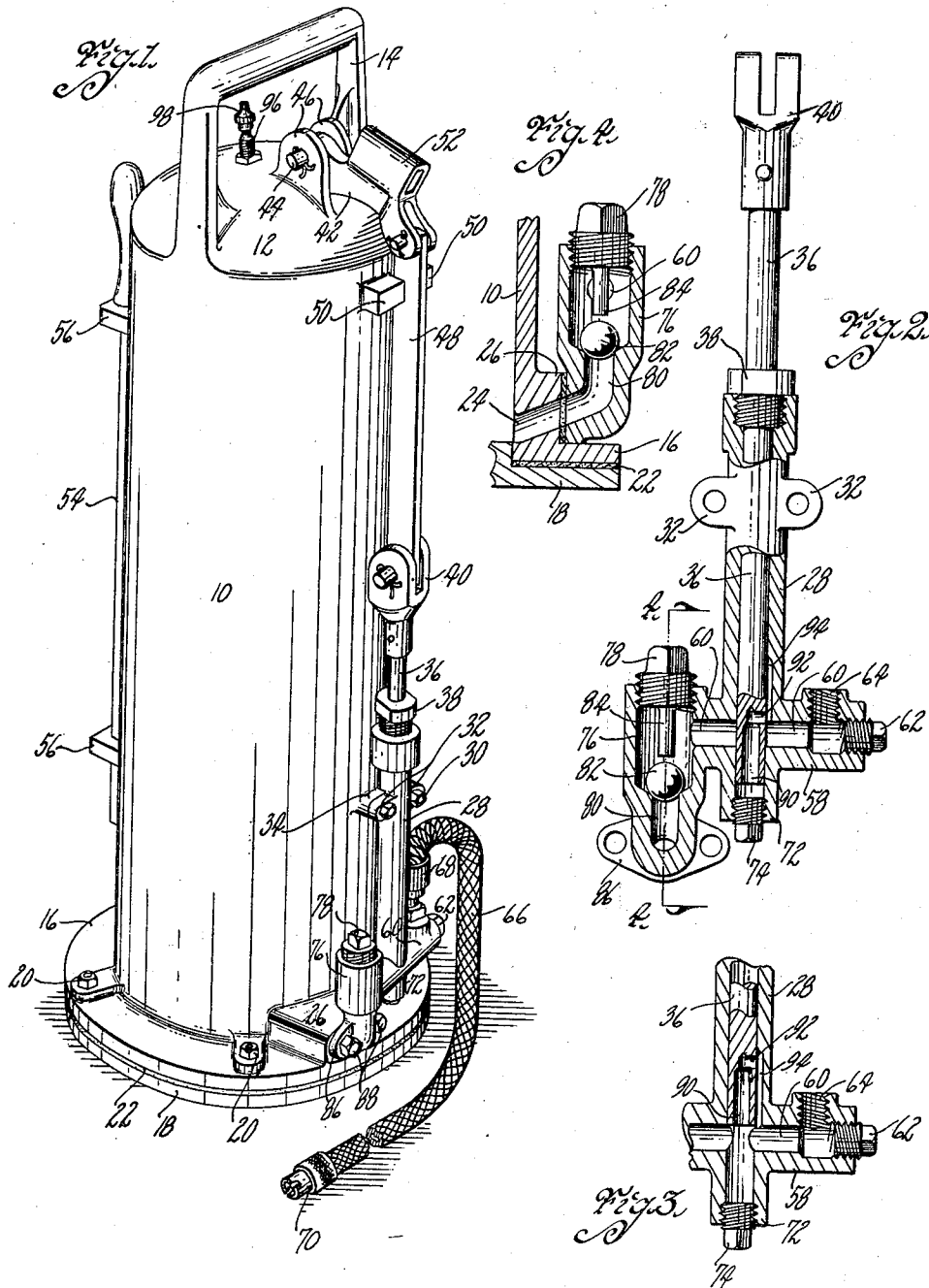
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GREASE GUN

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GREASE GUN

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The object of this invention is to provide an improved grease gun of the portable type which is capable of containing a considerable quantity of lubricant and which is equipped with means for dispensing the lubricant in small quantities under pressure and applying it to parts of a motor vehicle or other machines such as are usually equipped with lubricant supply connections.

A further object of the invention is to provide improved and highly efficient discharge means or means for dispensing the lubricant under pressure and so arranged as to eliminate loss of pressure or back pressure toward the grease container.

Still another object of the invention is to provide a grease gun which is simple of construction, highly efficient and which is relatively inexpensive to manufacture because it contains few moving parts and few parts which require machine work or other expensive operations and in which the operating parts are arranged so that they are easily accessible for assembly and repair.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a perspective view of the complete device.

Figure 2 is an enlarged longitudinal section of the dispensing apparatus or gun proper, the piston rod being shown in extended or depressed condition.

Figure 3 is a similar view of one of the same parts with the piston rod in partly retracted or elevated position.

Figure 4 is a vertical section on the line 4-4 of Figure 2, illustrating particularly the valve controlled communication between the container and the dispensing apparatus.

In the drawings I have employed the numeral 10 to designate the grease container. This member preferably is cylindrical and is formed at its upper end with an integral wall 12 and is also formed with a carrying handle

14 rising therefrom. At its lower end the container body 10 is formed with an outwardly projecting peripheral flange 16 and the lower end of the container is closed by a separate plate 18 attached to the flange 16 by means of a plurality of bolts 20. The bottom plate 18 preferably is shouldered so as to have a thickened portion fitting snugly within the wall of the container 10 as shown particularly in Figure 4, and an annular gasket 22 is mounted between the flange 16 and the marginal portion of said plate whereby a tight joint is procured.

A discharge port 24 is formed through the wall of the container 10 and through a boss 26 which projects outwardly from the lower part of said wall just above the flange 16. As shown in Figure 4 the discharge port 24 has a part which extends downwardly to the horizontal level of the upper surface of the bottom plate 18 so that substantially all of the contents of the container may readily be discharged through said port.

The dispensing apparatus includes an elongated cylinder 28 of relatively small diameter as compared with the diameter of the container 10 and also of considerably less length. The cylinder 28 is mounted in upright position of the outside of the container 10 with its lower end adjacent the boss 26 and is attached to the container by means of cap screws 30 extending through apertured ears 32 on the cylinder and seated in bosses 34 on the container wall.

A piston rod 36 is fitted snugly within the cylinder 28 and arranged for reciprocation. The piston rod projects from the upper end of the cylinder through a packing gland 38 and is provided with a clevis 40 on its upper end.

An operating lever 42 is fulcrumed on the top wall 12 of the container by means of a pin 44 carried by a pair of spaced apertured ears 46 on said top wall. The operating lever 42 is pivotally connected to the clevis 40 of the piston rod by means of a link 48 which, as here shown, is arranged for reciprocation between spaced lugs 50 formed on the wall of the container 10.

As here shown, the operating lever 42 is

relatively short and does not project a material distance beyond the margin of the container 10. However, it is formed with a longitudinally arranged bearing boss 52 adapted to receive a removable handle member 54 which provides the desired amount of leverage for manual operation of the dispensing apparatus. When the device is not in use the removable handle 54 may be carried by a pair of apertured ears 56 projecting laterally from the container wall.

Near the lower end of the cylinder 28 the dispensing apparatus is formed with a transversely arranged projection 58 having a cross bore 60 communicating with the lower end of the bore of the cylinder 28. The transverse projection 58 extends in both directions from the cylinder 28 and one end of the cross bore 60 is closed by means of a screw plug 62.

Adjacent its closed end the transverse extension 58 is provided with a threaded nipple 64 communicating with the bore 60 and adapted to receive attachment of a dispensing hose 66 which preferably is of the armored type. The hose 66 is equipped at one end with a coupling member 68 for attachment to the nipple 64 and at its opposite end with a coupling member 70 adapted to be applied to and communicate with a fitting, not shown, of the type commonly provided on spring shackles, parts of the steering gear and other parts of a motor vehicle to constitute lubricant supply connections.

The dispensing apparatus also is formed with a downward projection 72 below the transverse extension 58 and said downward extension is in line with the cylinder 28 and is bored to correspond therewith and to receive the lower end of the piston rod 36 as shown in Figure 2. The lower end of the downward extension 72 is normally closed by means of a screw plug 74.

The other end of the transverse projection 58 communicates with an inlet chamber 76 which has its upper end normally closed by means of a screw plug 78. The inlet chamber 76 communicates at its lower end with a substantially L-shaped inlet passage 80, the lower end of which communicates with the discharge port 24 of the container 10.

The shoulder formed between the inlet chamber 76 and the reduced inlet passage 80 constitutes a valve seat upon which a ball valve 82 normally rests. The ball 82 constitutes a check valve to prevent escape of the contents of the inlet chamber 78 and communicating passages toward the container and also to prevent loss of pressure in that direction of the pressure effect of the piston rod 36. Upward movement of the ball 82 is limited by a stud 84 projecting downwardly from the screw cap 78.

The lower part of the inlet chamber 76 is provided with external apertured ears or flanged portions 86 adapted to be secured to

the outer face of the boss 26 by means of cap screws 88, with a gasket 89 interposed.

The lower end portion of the piston rod 36 is formed with an end opening recess 90 and a relief port 92 extends laterally from the upper end of said recess and opens to the surface of the piston rod 36 at a point spaced a material distance above its lower end.

The bore of the cylinder 28 is formed with a relief bypass 94 which is vertically arranged and communicates at its lower end with the cross bore 60 on the side toward the nipple 64. The relief port 92 of the piston rod communicates at times with the relief bypass 94, such communication occurring during an intermediate portion of the stroke of the piston rod. At other times the relief port 92 of the piston rod communicates directly with the cross bore 60, such communication occurring during the lower portion of the stroke.

The container 10 is supplied with grease or other heavy lubricant by inverting the device and removing the bottom plate 18, after which the plate is replaced and the bolts 20 drawn up tight to prevent leakage of the contents.

Air under pressure may be introduced to the container 10 by means of a valve stem 96 extending through the top wall 12. The valve stem 96 is of the type commonly employed for receiving connection of an air hose or pump hose for inflating pneumatic tires and which contains a suitable check valve device, not shown, for preventing escape of the air pressure. When not in use the outer end of the valve stem 96 is closed by means of a screw cap 98.

The air pressure in the container 10 is employed for the purpose of exerting pressure on the lubricant within the container and facilitating the transfer of quantities of the lubricant through the discharge port 24 to the dispensing apparatus through the suction action of the piston rod 36.

When it is desired to use the grease gun for lubricating parts of an automobile or other machine, the removable handle 54 is placed in the socket 52 of the operating lever and the coupling 70 of the discharge hose is applied successively to the desired fitting to which grease is to be applied.

It will be understood that in the use of grease dispensers of this type a tight connection of the coupling 70 with the fitting is secured so that the lubricant may be supplied to the fitting and the part communicating therewith through the exercise of considerable pressure to attain the desired penetration of the lubricant.

The operating lever 42 is oscillated manually on its pivot 44 by up and down movement of the outer end of the handle 54, thus causing a reciprocation of the piston rod 36 through the link 48.

Upward movement of the piston rod 36,

after its lower end has moved out of the bore of the downward extension 72, or in other words into the horizontal plane of the cross bore 60, exerts a suction effect in the inlet chamber 76 through the inner end portion of the said bore. This suction raises the ball valve 82 and draws a quantity of grease from the container 10 through the discharge port 24 and inlet passage 80. This action is facilitated and assisted by the air pressure in the container so that the inlet chamber and parts communicating therewith are entirely filled with the lubricant.

Now when downward travel of the piston rod 36 commences, the recess 90 is caused to be filled with the grease which has entered the lower part of the cylinder bore and the cross bore 60. Thus the lower end of the piston rod becomes solid and presents to the underlying grease a pressure surface commensurate with the entire area of the piston rod.

The downward pressure thus exerted causes portions of the underlying grease to travel laterally through the outer portion of the cross bore 60 and into the nipple 64 and hose 66 so that it is caused to enter the fitting to which the coupling 70 is applied.

In the latter part of its downward travel the lower end of the piston rod 36 passes beyond the cross bore 60 and enters the bore of the downward extension 72 which is closed at its lower end. At about this time the relief port 92 comes into communication with the relief bypass 94, thereby permitting lubricant from the downward extension and from the recess 90 to pass laterally through said port and be expelled through the bypass 94 and into the outer part of the cross bore 60 and to be delivered as before.

The restricted area of the relief port 92 and relief bypass 94, taken with the fact that the piston rod is operating in a closed bore of the extension 72, has the effect of building up pressure in the latter part of the stroke of the piston rod. The additional pressure thus built up is suddenly relieved when the port 92 comes into registry with the outlet end of the bore 60, which is of greater diameter, thus resulting in delivery of the lubricant in a spurt to the fitting. This insures that sufficient pressure will be generated to cause effective penetration of the lubricant to the more remote and close fitting parts to be lubricated.

Thus comparatively simple and very efficient means is provided for supplying the lubricant under pressure to the desired parts.

It will be understood that as soon as the downward travel of the piston rod 36 commences, the check valve 82 will be caused to seat immediately and will thus prevent escape of the contents of the inlet chamber 76 and of the pressure toward the container 10 and making it possible to build up pressure

in the opposite direction for expulsion of the grease.

It will be observed that all of the parts of the dispensing apparatus are located exteriorly of the grease container, thus simplifying and facilitating the operation of assembly and also the making of repairs or replacement of parts.

The cylindrical container 10 with its closed top, carrying handle and other appurtenances may be made integrally by a comparatively simple and inexpensive die casting process so that the entire cost of the device for parts and labor may be kept within very reasonable limits.

I claim as my invention:—

1. A dispensing apparatus for grease guns and the like comprising a cylinder, a piston member arranged for reciprocation therein, a cross bore intersecting the cylinder bore at a point spaced from the outer end thereof, inlet means communicating with one end of said cross bore and outlet means communicating with its other end, said piston member being formed with an end-opening recess, a relief bypass formed in the cylinder wall communicating with the outlet end of said cross bore, said piston member being formed with a relief port at the inner end of said recess adapted to communicate with said bypass at times.

2. A dispensing apparatus for grease guns and the like comprising a cylinder, a piston member arranged for reciprocation therein, a cross bore intersecting the cylinder bore at a point spaced from the outer end thereof, an inlet chamber communicating with one end of said cross bore and outlet means communicating with its other end, check-valve-controlled inlet means to said inlet chamber whereby grease will be drawn into said chamber by retraction of the piston member, said piston member being formed with an end-opening recess, a relief bypass formed in the cylinder wall communicating with the outlet end of said cross bore, said piston member being formed with a relief port at the inner end of said recess adapted to communicate with said bypass at times.

3. A dispensing apparatus for grease guns and the like comprising a cylinder, a piston member arranged for reciprocation therein, a cross bore intersecting the cylinder bore at a point spaced from the outer end thereof, inlet means communicating with one end of said cross bore and outlet means communicating with its other end, said piston member being formed with a recess opening to its outer end, restricted means affording communication between said recess and the outlet portion of said cross bore during a portion of the forward travel of said piston member and affording enlarged communication means therebetween during a subsequent portion of such travel, whereby substance is delivered

to said outlet portion with a spurting action near the end of the piston travel.

4. A dispensing apparatus for grease guns and the like comprising a cylinder, a piston member arranged for reciprocation therein, a cross bore intersecting the cylinder bore at a point spaced from the outer end thereof, inlet means communicating with one end of said cross bore and outlet means communicating with its other end, said piston member being formed with a recess opening to its outer end, said piston rod being formed with laterally directed communicating means opening to said recess for permitting the discharge of a relatively small amount of substance from said recess to the outlet portion of said cross bore during a portion of the outward travel of the piston member and permitting the discharge of a greater amount of substance during a subsequent portion of such travel.

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