Oct. 23, 1945. L. C. ROTTER 2,387,684

PUMP MECHANISM

Filed July 11, 1942 2 Sheets-Sheet 1

FIG. 1.

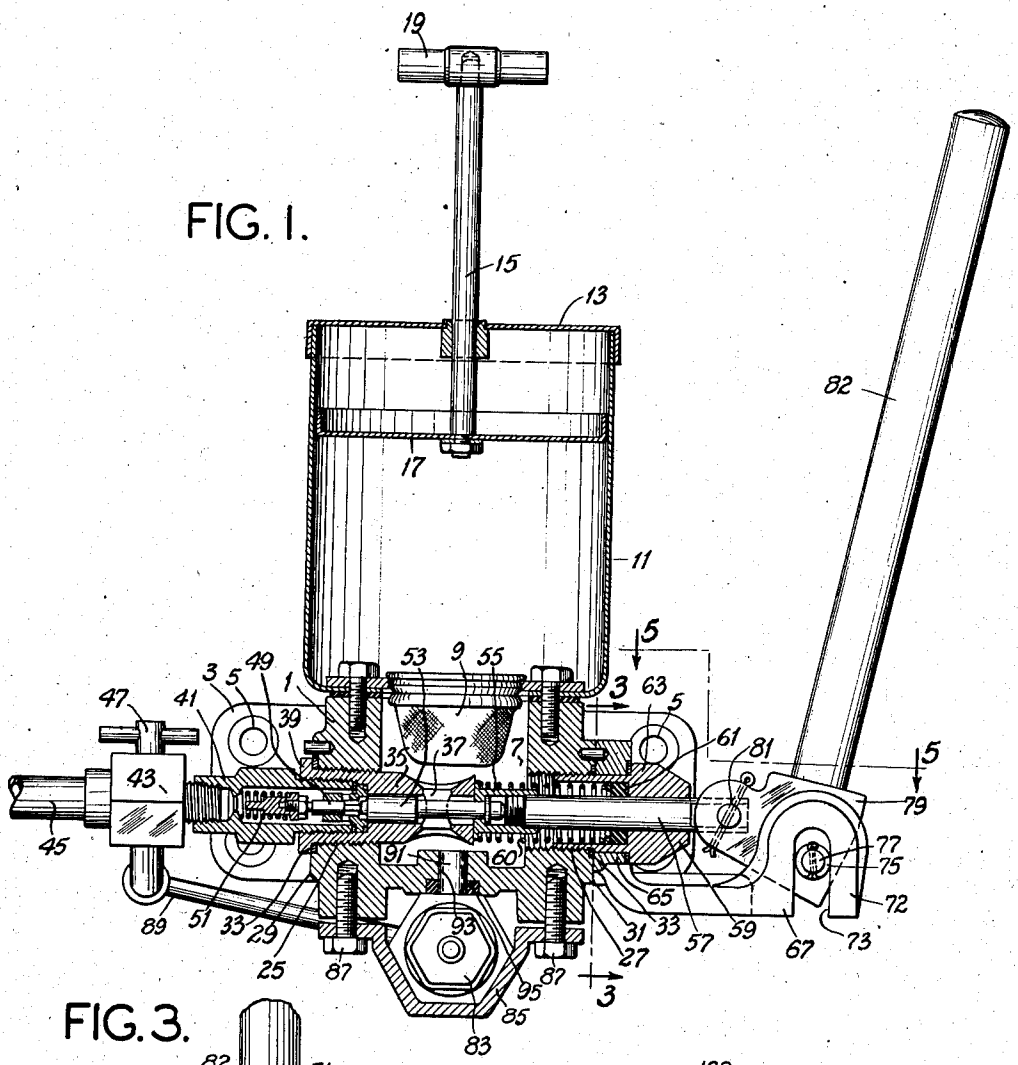



FIG. 3.

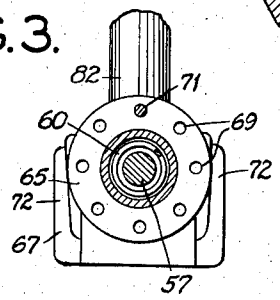
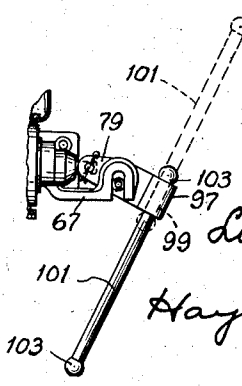



FIG. 6.




Lutwin C. Rotter,
Inventor.
Haynes and Koenig
attorneys.

Oct. 23, 1945. L. C. ROTTER 2,387,684

PUMP MECHANISM

Filed July 11, 1942 2 Sheets-Sheet 2

FIG. 2.

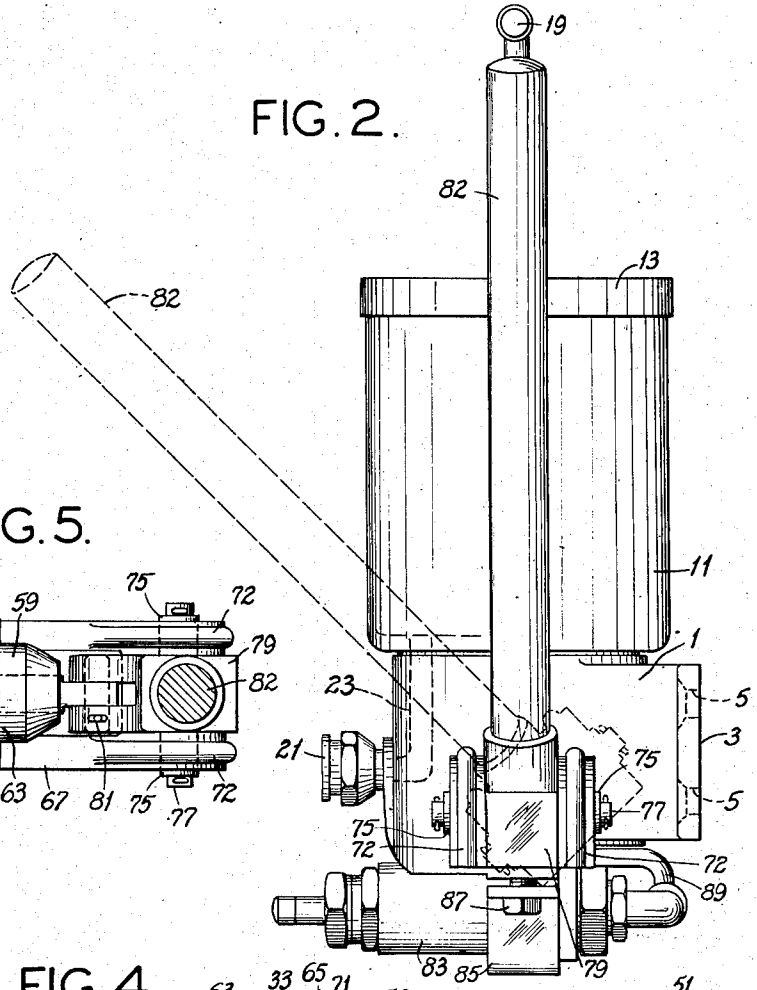
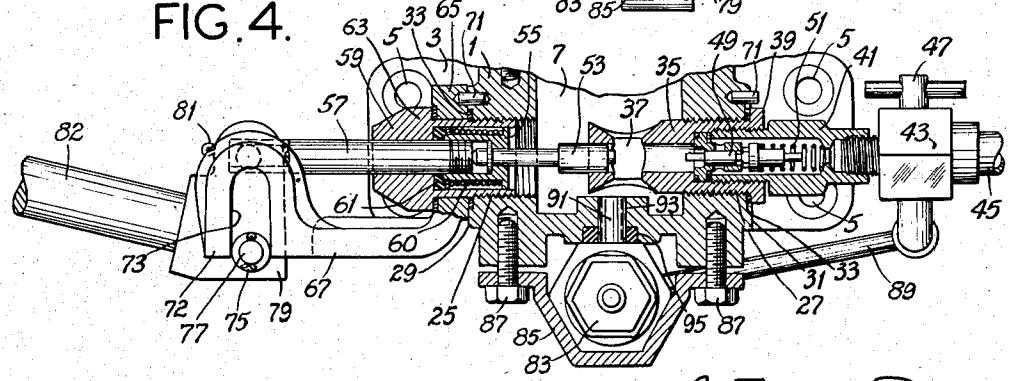



FIG. 5.




FIG. 4.




Ludwig C. Rotter,
Inventor.
Haynes and Koenig,
Attorneys.

Patented Oct. 23, 1945 2,387,684

# UNITED STATES PATENT OFFICE

2,387,684

## PUMP MECHANISM

Lutwin C. Rotter, Maplewood, Mo., assignor to Lincoln Engineering Company, St. Louis, Mo., a corporation of Missouri

Application July 11, 1942, Serial No. 450,539

4 Claims. (Cl. 184—28)

This invention relates to pump mechanisms, and with regard to certain more specific features, to a hand lubricant pump mechanism.

Among the several objects of the invention may be noted the provision of a pump mechanism which is universally adaptable to location on any of various machine frames, without interference to operation; the provision of a mechanism of the class described which will allow of positioning its operating handle upward, downward or sidewise, thus allowing said handle to be reached under all circumstances; and the provision of a device of the class described in which the handle and reciprocating elements of the pump may be exchanged in position with the cylinder and outlet elements of the pump, thereby enhancing the universality of application. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structures hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which is illustrated one of various possible embodiments of the invention,

Fig. 1 is a vertical longitudinal section, parts being shown in elevation;

Fig. 2 is a right end elevation of Fig. 1, the dotted lines showing one alternate position of reciprocating pump parts;

Fig. 3 is a vertical section taken on line 3—3 of Fig. 1;

Fig. 4 is a fragmentary view similar to certain lower parts of Fig. 1, but showing an alternate reciprocated position and an interchange of reciprocating and outlet parts;

Fig. 5 is a fragmentary horizontal section taken on line 5—5 of Fig. 1; and,

Fig. 6 is a fragmentary view on a reduced scale showing an alternative form of handle.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

United States Patents 2,122,177 and 2,141,022, dated June 28, 1938, and December 20, 1938, respectively, disclose lubricant injector systems in which a reciprocating hand pumping unit is used for withdrawing lubricant from a local supply and forcing it into an injector line. Associated with this pumping unit is a relief valve which, after a certain pressure is reached above that required for injection, relieves the line pressure and returns some lubricant to the supply. The injectors are ordinarily located at various bearing points on a machine, such as on a punch press, rolling mill or the like, and it is desirable that the pumping unit itself, including the local lubricant supply and relief valve, be attached in some convenient position on the machine being served. Since the machines to which the pumping unit is to be attached vary in form and location. the design of a suitable given pumping unit to adapt itself to all situations presents a problem. The present invention provides for the desired adaptation without the requirement of carrying various pumps for the purpose.

Referring now more particularly to Fig. 1, there is shown at numeral 1 a substantially symmetrical base or body casting forming a fluid enclosure. This body carries a flat vertical side pad 3 having openings 5 for bolting on or near the machine to be served. This body 1 has a suction compartment 7. In the upper inlet of this compartment 7 is a strainer 9. Bolted on the upper face of body 1 is a lubricant container 11.

The container 11 has a cover 13 through which slides a rod 15 carrying a follower plate 17 at its lower end and a handle 19 at its upper end. The follower 15, 17, 19 is for the purpose of applying hand pressure to the lubricant when desired, and for preventing cavitation under atmospheric pressure as lubricant is withdrawn from the container 11. It also acts as an indicator.

In order to provide for filling the device, the body 1 is provided with an inlet fitting 21 to which an attachment may be made of a lubricant gun or nozzle. This fitting 21 connects with container 11 by means of a passageway through the body 1 and holding flanges. The passageway 23 bypasses the screen 9 so that infilling of the container 11 may be made above the screen from fitting 21 without passing through that screen. On the other hand, material which flows from the container 11 to the suction chamber 7 does pass through the screen. The fitting 21 may be one of various types, but an exemplary one is shown in United States Patent 2,265,655, dated December 9, 1941, although that structure is not to be taken as limiting the type of fitting that may be used.

The body 1 is longitudinally bored on a common center line to provide opposite equal sized openings 25 and 27, adjacent the ends of which are similar pads 29 and 31, respectively. The openings 25 and 27 are threaded coaxially, as

indicated, with equal-sized threads. The pads 29 and 31 are counterbored to receive similar gaskets 33.

At numeral 35 is a threaded pump cylinder having an inside port 37. This cylinder is flanged at 39 to form a stop which presses against the adjacent gasket 33. An outlet nipple 41 is threaded into the outlet of the cylinder 35, and into this nipple is threaded a manifold 43 which connects with the injector supply pipe 45. A manually openable release valve is indicated at 47.

Within the outlet nipple 41 is an outlet check valve 49 normally pressed closed by a spring 51. This valve is pressed to an open position by action of a plunger 53 operating in the cylinder 35. The plunger 53 reciprocates and crosses the inlet port 37. This plunger 53 is held by means of a flanged cap 55 to a plunger rod 57. The rod 57 passes through a guide 59 which is threaded into the opening 27 (Fig. 1). A spring 60 biases from the shouldered portion of the cap 55 against a packing 61 in the hollow portion of the guide 59, holding the latter in place, and normally maintaining the handle 82 in an out-of-the-way position after having been manually so placed. That is, it prevents the handle from falling back. The spring is not strong enough alone to effect a pumping stroke.

The guide 59 is provided with a headed portion 63 as indicated, which holds in place an eye ring 65 of a cross slot member 67. The ring 65 has in it eight equally spaced recesses 69, any one of which cooperates with either of a pair of pins 71 respectively on the pads 29 and 31. Thus the cross slot member 67 may be placed into any of eight different angular positions on either end of the device. Different angular positions are suggested by the two positions (solid and dotted) shown in Fig. 2. The reciprocating parts are held in any one of the eight possible rotary positions by one of the pins 71 and tightened by guide 59. The head of the guide is formed with a wrench engaging portion to effect tightening of its threads.

Reciprocation of the member 57 is accomplished by forming the cross slot member 67 with spaced hook shaped arms 72 between which a toggle member 79 is guided. Guide slots 73 are provided for movement of anti-friction rollers 75. The latter are carried on a gudgeon pin 77, the latter being affixed to the toggle link 79. The toggle link 79 is pinned at 81 to the flat rear end of the reciprocating member 57. A handle 82 affixed in the toggle link 79 serves to receive manual oscillation.

Oscillation of the handle 82 in any of the eight planes in which it may be operated results in movement of the rollers 75 in the guides 73. This causes reciprocation of the member 57, and consequently reciprocation of the plunger 53 across port 37. Forward movement of the plunger 53 drives lubricant out past the check valve 49 and to the injector pipe 45. The member 79 functions as a toggle link.

In Fig. 4 is shown how the pump cylinder 35 (with associated outlet parts) and the guide 59 (with associated reciprocating parts) may be interchanged end-for-end on the body 1. In this Fig. 4 the pumping mechanism is also shown in its extreme rearward position, with the plunger 53 withdrawn across the inlet port 37. The valve 49 is also shown shut.

It will be understood that the cross slot member 67 may be placed in any of eight different angular positions on the pads 29, just as it was adapted to be placed in any of eight different angular positions on the pad 31. It will of course be understood that other than eight angular positions may be employed.

As stated in said Patents 2,122,177 and 2,155,250, a relief valve is desired between the line 45 and the supply. An improved form of relief valve is shown in Fig. 3 of United States Patent 2,162,898, dated June 20, 1939. Such a relief valve will not be again detailed herein, but an outside view of the same is shown at numeral 83. Its hexagonal body portion, by means of a cradle 85 and bolts 87, is held to the bottom of the body 1. A connection 89 leads from the enclosure 43 to the inlet of the relief valve 83. The outlet of the relief valve is shown at 91 and leads through an opening 93 in the body 1, the same being packed as indicated at 95. Thus, after operation of the injectors associated with the line 45, and after the pressure has risen to a predetermined value, relief valve 83 relieves pressure by returning lubricant back to the suction chamber 7. When relief operation occurs, it can be detected by the reduction in the degree of resistance of operation of handle 82.

From the above it will be seen that the body 1 may be considered to be an enclosure for lubricant with provision for interchangeability between the reciprocating parts and the outlet parts, along with means for permitting the reciprocating parts to be operated in any of various predetermined planes passing through the axis of reciprocation of the pump.

In Fig. 6, like numerals designate like parts. The figure illustrates an alternative form of handle in which it is made slidable through the toggle link 79, the latter being provided with a rigid rearward extension as indicated at 97. This extension 97 has an opening 99 through it for slidingly receiving the alternate form of handle 101. The latter has knobs 103 to limit the sliding motion. The dotted position shown in Fig. 6 indicates the upper limit of motion. By means of this alternative handle, the oscillating action may be performed by a hand either above or below the toggle. In addition, by placing this handle at any intermediate desired position, any desired leverage may be obtained within limits; or, a two-handed action may conveniently be employed with one hand on each knob 103. This type of handle is also useful in adjusting the angular position of the cross slot member 67.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. In a pump mechanism, a body forming an enclosure for fluid, said body having oppositely located openings, means associated with one of the openings comprising a pump cylinder extending into the enclosure and a check valve organized with said cylinder, a reciprocating plunger means cooperating coaxially with said cylinder within the enclosure and reaching through the other opening, a plunger guide for said plunger means associated with the other opening, means for reciprocating the plunger, interchangeable means for attaching at either

opening either the cylinder on the one hand or on the other hand the guide, and a linkage for operating the plunger means comprising a cross slot member adapted to be held adjacent either opening by the plunger guide when the latter is fastened to the body at either opening, and including a handle having a part forming an operating link between the cross slot member and the reciprocating means.

2. In a pump mechanism, a body forming an enclosure for fluid, said body having oppositely located threaded openings, means adapted to be threaded into either one of the openings comprising a pump cylinder, a check valve organized with said cylinder, a receiprocating plunger means cooperating coaxially with said cylinder and reaching through the other opening, a guide for said plunger means threaded into the opening unused by said pump cylinder, the threads of both openings being the same for attaching either the cylinder or the guide at either opening, a linkage for reciprocating the plunger means comprising a stationary but adjustable member adapted to be held adjacent either opening by the guide when the latter is fastened to the body at the respective opening, and including a handle having a part forming an operating connection between the adjustable member and the reciprocating means, and cooperating means between the body and said adjustable member whereby the latter may assume any one of various fixed angular positions adjacent either opening.

3. A pump mechanism comprising a body, a shouldered guide threaded into said body, a reciprocating plunger means in said guide, a cross slot member having a portion rotary on the guide and adapted to be held in any of various angular positions by threading the guide into final position on the body portion, said cross slot member having spaced extension members, each having a lateral guide slot, a handle member having a portion located for guided angling between said spaced members and having gudgeon means in said slots and being coupled to said reciprocating plunger means, and a removable cylinder threaded to said body opposite and coaxial with said reciprocating member and cooperating therewith; said cylinder on the one hand, and said guide and associated plunger, cross slot member and handle member on the other hand, being interchangeable end-for-end on said body.

4. A pump mechanism comprising a body, a shouldered guide threaded into said body at one end, a reciprocating plunger means in said guide, a cross slot member having a portion rotary on the guide and adapted to be held in any of various angular positions by threading the guide into final position on the body portion, said cross slot member having spaced extension members, each having a lateral guide slot, a handle member having a portion located for guided angling between said spaced members and having gudgeon means in said slots and being pin-jointed to said reciprocating member, a removable cylinder threaded to the other end of said body opposite and coaxial with said reciprocating member and cooperating therewith; said cylinder on the one hand, and said guide and associated plunger, cross slot member and handle member on the other hand, being interchangeable end-for-end on said body portion, and means on both ends of the body and cooperating with suitable means on the cross slot member for predetermining a plurality of fixed angular positions of the latter when attached at either end of the body.

LUTWIN C. ROTTER.