May 10, 1932. E. L. BROWN 1,858,036

PUMP

Filed Aug. 1, 1929

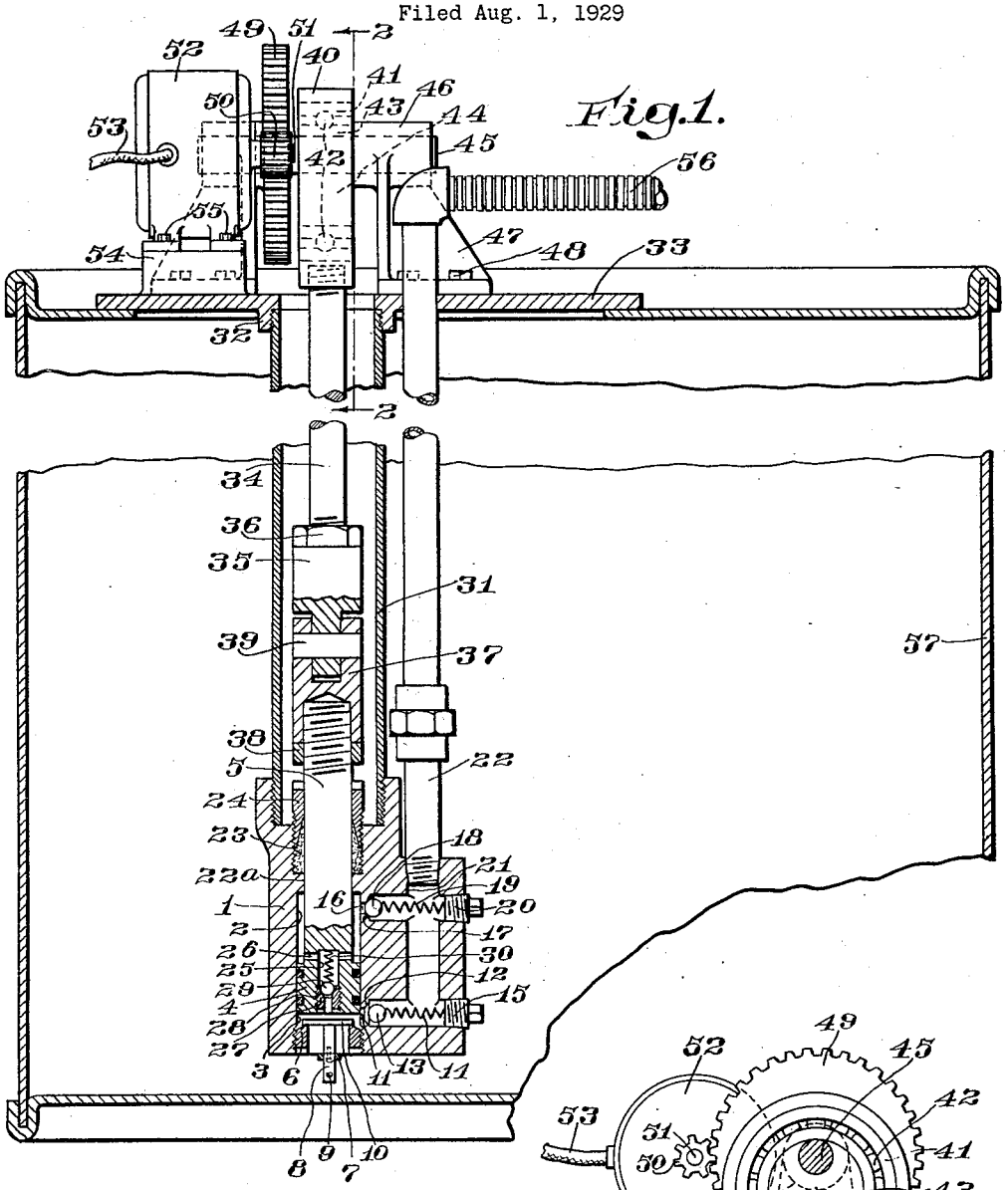

Fig. 1.

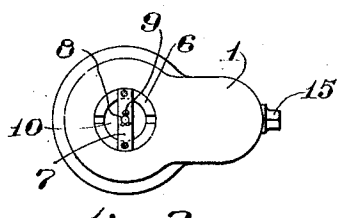

Fig. 3.

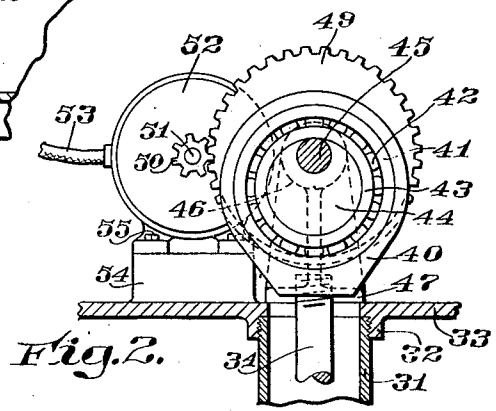

Fig. 2.

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UNITED STATES PATENT OFFICE

ERNEST L. BROWN, OF WATERTOWN, MASSACHUSETTS, ASSIGNOR TO BETTER-BUILT PUMPS, INC., OF CAMBRIDGE, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS

PUMP

Application filed August 1, 1929. Serial No. 382,745.

My present invention relates to pumps, and more particularly to a novel and improved pump particularly adapted for use in the removal and dispensing of oil and grease from containers, the pump of the present application being particularly applicable to and useful in pump units, such, for example, as that illustrated and described in the prior and copending application of Simeon Grossman, Serial No. 354,256, filed April 11, 1929.

An important object of the present invention is the provision of a double acting, compounding pump, which will be efficient in operation, simple to manufacture and assemble, and economical.

Another object of the invention resides in the provision of a pump, by means of which a continuous flow or discharge of lubrication, under extremely high pressure, will be effected through the discharge outlet.

Another feature of the present invention resides in the particular construction of the piston utilized, wherein the piston and piston rod are formed as an integral unit.

A still further object of the invention resides in the particular arrangement of connecting rod, and driving means therefor.

Another feature of the invention resides in the means by which I accomplish the compounding action.

When the pump of the present application is applied to and utilized in connection with a pump unit of the type illustrated in said prior and copending application, very satisfactory results will be attained. It is the present custom, in handling oils, greases, and lubricants, to ship the same in steel drums or other containers, having an opening in one end thereof which is usually closed by a cover. The lubricant is removed, by the user, from the original container, and placed in individual pumps or pump units, whence the lubricant is forced or distributed to the bearings, or other points to be lubricated. This handling of the oil or grease, from the original container to the intermediate pumping units, is inconvenient, bothersome, wasteful of time, labor and expense, and frequently results in contamination of the lubricant with dust, dirt, or other foreign matter. The pump of my present application, particularly when utilized in combination with the pump unit of said prior application, obviates and eliminates the necessity for any intermediate pumping devices, enabling the user or operator to pump or dispense the lubricant directly from the original container to the bearing or other point to be lubricated.

An electric motor is preferably utilized as the operating means for my novel pump, and said pump, when thus operated, is capable of delivering the lubricant, at the discharge outlet, with tremendous pressure, resulting in rapid and efficient lubricating of bearings or other points which ordinarily require considerable time and effort to effect their lubrication.

Referring to the drawings, illustrating a preferred embodiment of the present invention,

Fig. 1 is a vertical sectional view illustrating my novel pump utilized in connection with a pump unit in operative position in a lubricant container;

Fig. 2 is a vertical sectional view on the line 2—2 of Fig. 1; and

Fig. 3 is a bottom plan view of the pump.

Referring now to the drawings, for a particular description of the invention, its construction, assembly and operation, my present novel pump comprises a body 1, preferably formed as a casting and having therein a compartment, divided into two chambers 2 and 3, by a piston 4, said piston being preferably formed as an integral part of the piston rod 5. The normal area of the chamber 2 is reduced by the size of the piston rod 5 passing therethrough, to such an extent as to provide a compounding action, the ratio of the chambers 3 and 2 illustrated in the present drawings, being approximately three to one. A threaded nut 6 is screwed into the threaded end of the said compartment, said nut having a bar 7 secured thereto, a flange 8 being vertically slidable through said bar, and a pin 9 being provided to limit the upward movement of said rod 8. Carried at

the upper end of the rod 8 is a disc 10, adapted to seat on the top of the nut 6.

Positioned below the piston 4, in the body 1, is an outlet 11, a valve seat 12 being formed in the outlet, and a ball 13 is adapted to normally contact on said seat by means of a spring 14, retained in position by a threaded plug 15. Located above the piston 4 is a second outlet 16, a valve seat 17 being positioned in said outlet, and the ball 18 normally contacting with said seat 17 through the medium of a coiled spring 19 retained in position by a plug 20. Each of the outlets 11 and 16 lead to a common discharge passage 21, a pipe or conduit 22 being threaded into said body 1 in communication with said passage 21. The piston rod 5 has a bearing in the body 1, as illustrated at 22*a*, a packing gland 23 and nut 24 being provided to prevent leakage of the lubricant out of the chamber 2. The piston 4 is provided with a by-pass chamber 25, communicating with radial apertures 26, and an appertured plug 27 is threaded into the lower end of the piston, said plug having a valve seat 28 therein, on which is adapted to normally seat a ball 29 by the tension of a coiled spring 30.

The valve body 1 is secured, as by threading, to the lower end of a cylinder 31, the upper end of said cylinder being threaded to a depending flange 32 on a cover plate or member 33, and depending through this cylinder is a connecting rod 34, carrying at its lower end one part 35 of a knuckle joint, a lock nut 36 being provided to retain the part 35 in position, the other part 37 of the knuckle joint is threaded to the upper end of the piston rod 5, a lock nut 38 being provided to retain said part 37 in position, and a pin 39 uniting the two parts of said knuckle joint.

The upper end of the connecting rod 34 is threaded into an eccentric strap 40, the outer race 41 of an antifriction bearing 42 having a press fit within said strap, and the inner race 43 of said bearing having a press fit upon an eccentric 44 which eccentric is carried by or may be an integral part of a shaft 45. The shaft 45 has bearings in the journals 46 of brackets 47 secured to the cover 33 by bolts 48. Keyed to the shaft 45 is a gear 49 adapted to mesh with and be rotated by a pinion 50, said pinion being mounted on the shaft 51 of a motor 52, to which motor current is supplied from any suitable source of power through the current conducting wires 53. The motor 52 is mounted on a boss or projection 54, being secured thereto by bolts 55, or in any other desired manner. A flexible hose 56 or other lubricant carrying member is affixed to the upper end of the discharge pipe 22, said pipe being offset from its connection at the valve body 1 in order to pass through the cover plate 33 free of the bracket 47.

The operation of my present novel device is simple, and will be readily understood by those skilled in the art, being briefly described as follows:

The motor 52 being operated, the pinion 50 will rotate the gear 49, shaft 45 and eccentric 44, effecting a raising and lowering of the strap 40 and hence the reciprocation of the piston 4, through the medium of the connecting rod 34, knuckle joint, and piston rod 5. Assuming the piston to be at the bottom of its stroke, the disc 10 will be upwardly, and a supply of lubrication from within the container 57, will be sucked into the chamber 3. When the piston has reached the top of its stroke, and starts downwardly, the disc 10 will be seated on the nut 6, and lubrication in the chamber 3 will be forced through the outlet 11 into the discharge passage 21. As the piston descends, lubricant will be by-passed past the ball 29, through the chamber 25 and radial apertures 26, into chamber 2.

As the piston effects its next upward stroke, the filling of the chamber 3 will be accomplished in the same manner, while the lubricant by-passed into the chamber 2 will be forced upwardly through the outlet 16, and into the discharge passage 21. Due to the greatly reduced capacity of the chamber 2, a compounding action will be effected, the grease or other lubricant being discharged from the chamber 2 at a much greater pressure than the lubricant discharged through the outlet 11, thus resulting in a compounded pressure on the lubricant being discharged through the conduit 22 and hose 56. This action of the pump also results in a substantially continuous flow or discharge of the lubricant from the container 57 so long as the motor 52 is in operation. The valve body 1 is positioned to a sufficient depth within the container 57 to assure discharge of substantially the entire lubricant content of said container, and when said container has been emptied, or substantially emptied of lubricant, the entire pump unit, carried by the plate 33, may be removed from said container and transferred to another container or drum.

It will thus be seen that a direct dispensing of the lubricant from within the original drum or container to the bearing, housing, or other point to be lubricated, is effected, obviating and eliminating the necessity for any intermediate handling of the lubricant, and thus greatly increasing the efficiency and quality of the lubricant supplied to the point to be lubricated, in that contamination of the lubricant is eliminated. Because of the high pressures and constant discharge effected by my novel pump, a lubricating job may be completed in far less time than is possible in any existing lubricators of which I am aware.

While I have described my invention as being primarily adapted for use in connection with the dispensing of lubricants, it will be understood and appreciated that I am not

limited thereto, but may utilize my novel pump in connection with the dispensing or transmission of any fluid or semi-fluid desired.

It will also be appreciated that while I have illustrated and described the pump of the present invention as particularly applicable to a unit of the type illustrated and described in the said prior and copending application, Serial No. 354,256, I am not limited thereto, but may utilize my novel pump in connection or cooperation with other units or other supporting or operating devices.

It will be further understood that while I have necessarily described my present invention somewhat in detail, I am not limited thereto, but may vary the size, shape, and arrangement of parts, within reasonably wide limits without departing from the spirit of the invention.

My invention is further described and defined in the form of claims as follows:

1. A pump including a casing having a piston chamber, a piston reciprocal within said chamber, a piston rod extending from one end of said piston, said piston having a passage formed therethrough and said piston rod having a laterally extending duct providing communication between said passage and the end of the piston chamber in which the piston rod operates, means for reciprocating said piston, a check valve opening in the direction of said end of said chamber controlling flow of fluid through said passage and said duct, an inwardly opening check valve controlling inlet of fluid to the other end of said piston chamber, a boss integral with said piston casing at one side thereof, said boss having a fluid passage extending longitudinally therethrough and open at one end of said boss, said casing and said boss having lateral outlet passages communicating with said piston chamber beyond the limits of the piston movement in each direction, respectively, and with said fluid passage in said boss, outwardly opening check valves controlling said outlet passages, and a discharge conduit connected to said boss and communicating with the open end of the fluid passage therein.

2. A lubricant dispensing pump, comprising a casing having a piston chamber therein, a piston reciprocal within said chamber, a piston rod extending from one end of said piston, said piston having a passage formed therethrough and said piston rod having a laterally extending duct providing communication between said passage and the end of the piston chamber in which the piston rod operates, means for reciprocating said piston, a check valve opening in the direction of said end of said chamber controlling the flow of lubricant through said passage and said duct, an inwardly opening check valve controlling inlet of lubricant to the other end of said piston chamber, said casing having adjacent lateral outlet passages communicating with said piston chamber above and below said piston, outwardly opening check valves controlling said outlet passages, and a discharge conduit connected with said adjacent outlet passages.

3. A lubricant dispensing pump, comprising a casing having a piston chamber therein, a piston reciprocal within said chamber, a piston rod extending from one end of said piston, said piston having a passage formed therethrough and said piston rod having a duct providing communication between said passage and the end of the piston chamber in which the piston rod operates, means for reciprocating said piston, a check valve opening in the direction of said end of said chamber controlling the flow of lubricant through said passage and said duct, an inwardly opening check valve controlling inlet of lubricant to the other end of said piston chamber, said casing having lateral outlet passages communicating with said piston chamber above and below said piston, outwardly opening check valves controlling said outlet passages, and a discharge conduit connected with said adjacent outlet passages.

In testimony whereof, I have signed my name to this specification.

ERNEST L. BROWN.