A. J. DILLEY.

GREASE GUN.

APPLICATION FILED FEB. 18, 1919.

1,400,034. Patented Dec. 13, 1921.

FIG. 1.

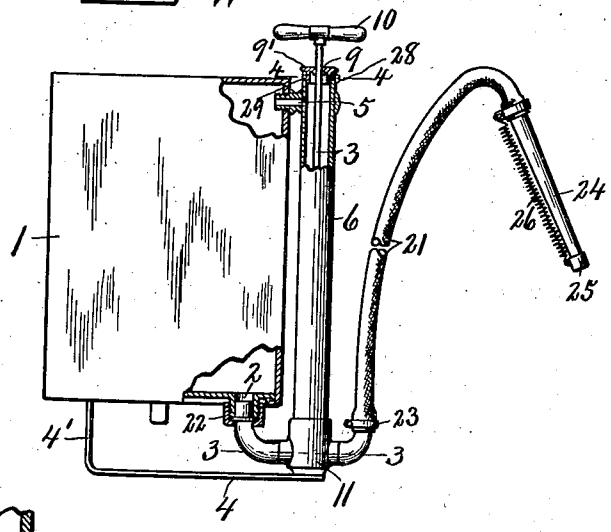



FIG. 2.

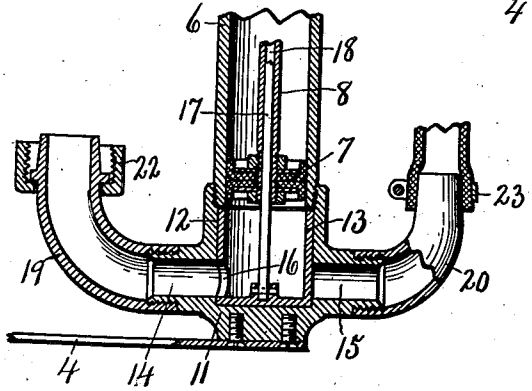



FIG. 3.

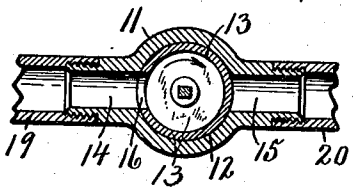



FIG. 4.

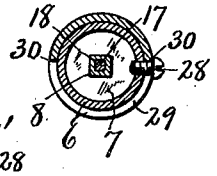



FIG. 5.

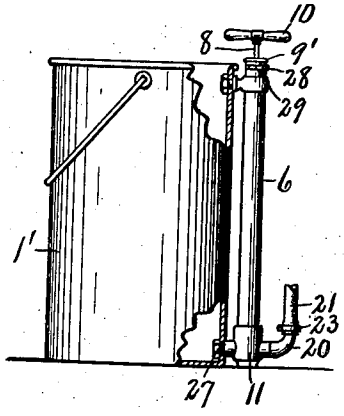
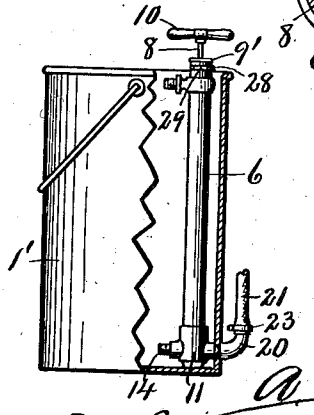



FIG. 6.




INVENTOR

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# UNITED STATES PATENT OFFICE.

ARZENO J. DILLEY, OF MUIR, MICHIGAN.

## GREASE-GUN.

1,400,034. Specification of Letters Patent. Patented Dec. 13, 1921.

Application filed February 18, 1919. Serial No. 277,827.

*To all whom it may concern:*

Be it known that I, ARZENO J. DILLEY, of Muir, in the county of Ionia, in the State of Michigan, have invented new and useful Improvements in Grease-Guns, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in grease guns involving the use of a hand operated pump of the reciprocatory piston type, having an inlet and an outlet in one end for connection respectively to a source of supply and to the delivery nozzle.

The grease adapted to be used for lubricating purposes, and particularly as applied to the various bearings of motor vehicles, is usually put up in cans or receptacles of convenient size for delivery to the user, and one of the objects of my present invention is to provide a pump which may be easily and quickly attached to the outlet of the can and used in connection therewith in lubricating bearings, thus permitting the pump to be used as the refilling medium for transferring the grease directly from the can to the bearing, and avoiding the inconvenience of separate means for filling of the pump.

Another object is to enable the valve which controls the inlet and outlet ports to be operated at will by the piston operating handle at the end of each stroke of the piston so that the communication between the inlet and cylinder may be opened, and that between the outlet and cylinder closed at the end of the compression stroke, while communication between the outlet and cylinder is opened, and that between the inlet and cylinder is closed at the end of the suction stroke of the piston.

Other objects and uses relating to specific parts of the grease gun will be brought out in the following description.

In the drawings—

Figure —1— is a side elevation, partly in section, and partially broken away, of a lubricating apparatus, showing the various features of my invention.

Fig. —2— is an enlarged sectional view through the lower portion of the pump and valve case, showing more particularly the coupling connection between the can and delivery pipe.

Fig. —3— is an enlarged horizontal sectional view taken in the plane of line 3—3, Fig. —1—.

Fig. —4— is an enlarged transverse sectional view through the upper portion of the pump cylinder taken in the plane of line 4—4, Fig. —1—.

Figs. —5— and —6— are side elevations partially in section of the same pump applied in different ways to the exterior and interior of a grease containing pail.

In Fig. —1— is shown an ordinary grease containing can —1—, arranged in an inverted position and provided with an outlet —2— for connection with a piston pump —3— of the reciprocatory type, the base of the pump provided with an L shaped plate —4—, having one end secured thereto in a substantially horizontal position and its other end deflected upwardly at —4'— to form a rest for the can at a point some distance from the outlet —2—.

If desired the upper end of the pump cylinder may be provided with a tubular nipple —5— secured in an opening in the adjacent side of the can —1— to connect the interior of the pump cylinder with the interior of the can above the grease line, when the can is inverted, so that when the piston is elevated to draw the grease into the bottom of the pump case a certain amount of air-pressure will be exerted from the top of the grease body to force the latter downwardly, and thereby assist its passage into the pump.

The pump comprises an upright cylinder —6— and a reciprocatory piston —7— movable therein, said piston being provided with a tubular stem —8—, extending upwardly through a gland —9— on the upper end of the cylinder, and carrying at its external end a handle —10—, shown more clearly in Fig. —1—.

A valve case —11— is removably secured by screw threads to the lower end of the cylinder —6—, and is provided with an upright valve chamber coaxially and communicating with said cylinder for receiving a rotary cup-shaped valve —13—, said valve case being also provided with diametrically opposite inlet and outlet ports —14— and —15— leading from the valve chamber —12—.

The valve —13— forms a continuation of the cylinder —6— in so far that it is open at its upward end and communicates with

the interior thereof, said valve being provided in one side with a passage —16— movable alternately into and out of registration with the ports —14— and —15— for opening and closing communication between said ports and the interior of the valve and cylinder.

The valve —13— is provided with an upwardly projecting stem —17— preferably of angular cross section, shown in Figs. —3— and —4— to loosely fit in a correspondingly shaped lengthwise opening —18— in the tubular stem —8—, so that when either stem is rotated similar motion will be imparted to the other stem, as will be hereinafter more fully explained.

The valve —13— is interposed between the lower end of the cylinder —6— and bottom of the valve case —12—, and is thereby held against axial movement but free to move rotarily about its axis.

The valve stem —17—extends upwardly a sufficient distance to maintain connection with the tubular stem —8— in all positions and adjustments of the piston.

The passage —16— in the valve —13— is of substantially the same area as that of either of the ports —14— or —15— so that when registered with one port the opposite side of the valve will close the other port.

Suitable couplings, consisting in this instance of elbows —19— and —20—, are provided for connecting the inlet —14— and outlet —15— to the outlet —2— of the can —1—, and to a delivery tube —21— respectively, said couplings being removably secured from the valve case by screw threads, shown in Fig. —2—, the coupling —19— being removably secured by a union —22— to the outlet —2— of the can —1—.

The delivery tube —21—, which is flexible, is detachably secured at one end to the coupling —20— by means of a clamp —23—, and its other end is provided with a nozzle —24— for directing the discharged grease to the bearings to be lubricated, or to any other receiver, the open end nozzle being normally closed by a cap —25— through the medium of a spring —26—.

One of the objects in making the couplings —19— and —20— removable from the valve case is to permit the pump to be used in connection with grease pails as —1′— in an upright position, as shown in Figs. —5— and —6—.

For example in Fig. —5— the coupling —19— is removed and the inlet nipple is projected through an opening in one side of the pail near the bottom and secured in place by a nut —27—.

In Fig. —6— the pump is arranged on the inside of the pail to rest upon the bottom thereof, and its outlet nipple is passed through an opening in the adjacent side of the pail and clamped in place by the coupling —20—, the coupling —19— being removed to allow the grease to enter the valve chamber and pump directly through the inlet —14—.

As previously explained the piston —7— has not only a reciprocatory motion but also an angular motion about its axis both motions being controlled by the handle —10—, which also controls the angular movement of the valve —13— simultaneously with the angular movement of the piston.

The operation is as follows:—

Assuming that the piston is at the limit of its downward movement, as shown in Fig. —2—, and that it is desired to draw the grease from the can —1— into the interior of the valve —13— and pump case —6—, then the operator will simply rotate the handle 10, which in turn will cause a similar rotation of the piston —7—, and valve —17— until the passage —16— is registered with the inlet —14—.

The piston is then raised to draw the grease from the can through the open port —14— and passage —16— into the interior of the valve and lower end of the pump case until the piston reaches the limit of its upward movement, whereupon the handle —10— is turned a half revolution to register the port —16— with the outlet —15—, and close the inlet —14—, at which time the piston is forced downwardly to expel the grease previously drawn into the pump through the open outlet —15—, tube —21—, and delivery nozzle —24— to the place of delivery.

In order that the angular movement of the piston rod and valve may be limited to approximately a half revolution the piston rod and gland —9— are preferably angular in cross section to establish a turning connection between them, so that when the rod is turned similar motion will be imparted to the cap as —9′—, in which the gland is formed, said gland being provided with radial projecting stud or screw —28— movable in a semi-circular circumferential slot —29— in the adjacent portion of the cylinder —6— terminating in diametrical opposite stops —30— for limiting the turning movement of the piston and valve —6— and thereby assuring proper registration of the passage —16— with either ports —14— or —15—.

What I claim is:—

1. In a grease gun, a piston pump, hand operated means for imparting a reciprocal motion and angular motion around the axis of the pump to the piston, a valve controlling the passage of grease to and from the pump, and means actuated by the angular movement of the piston, for operating said valve.

2. In a grease gun, a piston pump, hand operated means for imparting a reciprocal

motion and rotary motion to the piston, a valve controlling the passage of grease to and from the pump, and means actuated by the rotary movement of the piston independently of the reciprocatory movement for operating said valve.

3. In a grease gun, a piston pump, hand operated means for imparting a reciprocal motion and angular motion around the axis of the pump to the piston, and including a hollow rod, a valve controlling the passage of grease to and from the pump and provided with a stem telescoping within the hollow rod and splined thereon to turn therewith for operating the valve.

4. In a grease gun, a piston pump, a valve case having an inlet port and an exit port, a valve communicating with the piston chamber and having means for alternately opening and closing each port, hand operated means for reciprocating the piston and for moving it about its axis independently of its reciprocatory movement, and means actuated by the movement of the piston about its axis for operating said valve.

5. In a grease gun, a piston pump, a valve case secured to the lower end of the pump cylinder and having its valve-chamber coaxial with said cylinder and provided with radial inlet and exit ports, a cup-shaped valve turnable in said chamber and provided with a port adapted to alternately register with the first named ports as the valve is rotated, means for imparting independent reciprocatory and rotary movements to the piston, and means actuated by the rotary movement of the piston for operating the valve.

6. A piston pump provided with a handle turnable about the axis of and relatively to its cylinder, a valve case secured to the other end of the cylinder and provided with a valve chamber coaxial with the cylinder, said chamber having an inlet port and an exit port, a valve turnable in said case and controlling said ports, and means actuated by the turning of the handle for operating said valve.

7. In a grease gun the combination of a cylinder, a piston movable in the cylinder, a valve case secured to the cylinder and provided with an inlet and an outlet, a valve in said case controlling the inlet and outlet and means extending through the cylinder and piston for operating the valve.

8. In combination with a grease container having an outlet, a pump having a base plate extending under and supporting the container, said pump having an inlet and an outlet, the inlet being connected to the outlet of the container, and a delivery pipe connected to the outlet of the pump.

9. In combination with a grease container having an outlet, a pump having a base plate extending under and supporting the container, said pump having an inlet and an outlet, the inlet being connected to the outlet of the container, and a delivery pipe connected to the outlet of the pump, said pump having an air exit leading to the container above the grease level.

In witness whereof I have hereunto set my hand this sixth day of February, 1919.

ARZENO J. DILLEY.

Witnesses:
WM. H. DILLEY,
WILL DENNIS.