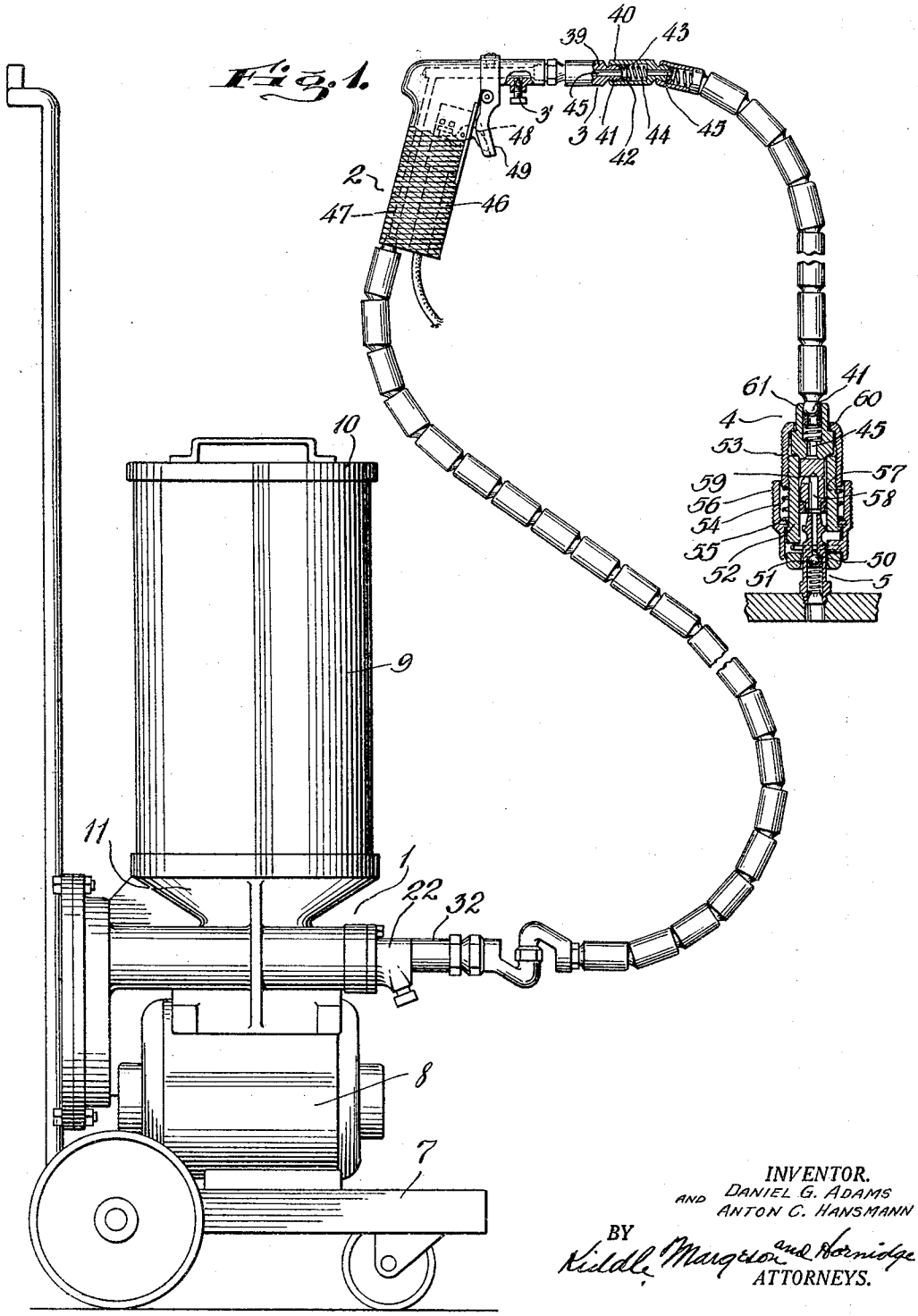
Aug. 9, 1932. D. G. ADAMS ET AL 1,871,291

DISPENSING DEVICE

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Fig. 1.



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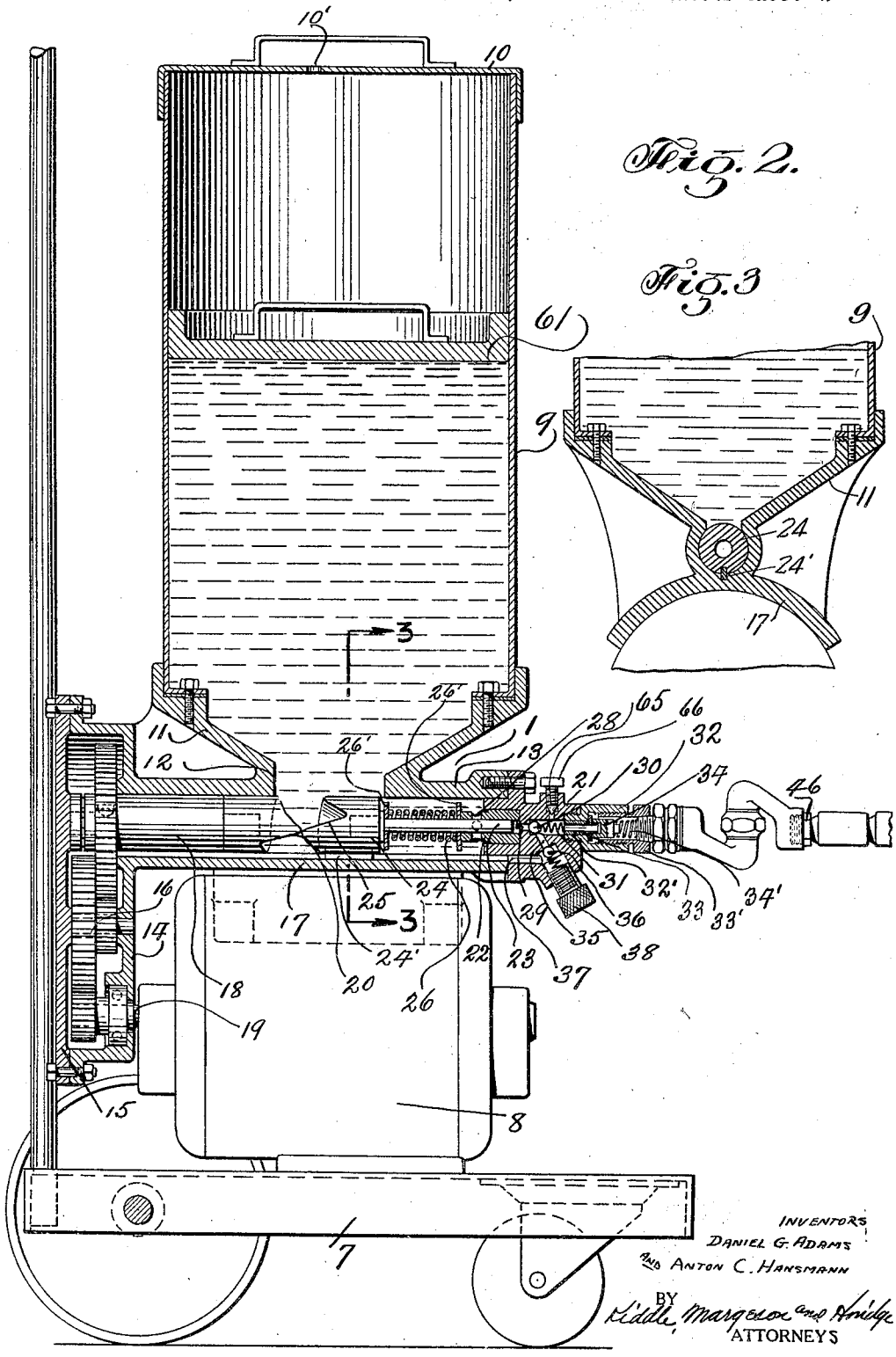


Fig. 2.

Fig. 3

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UNITED STATES PATENT OFFICE

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DISPENSING DEVICE

Application filed November 26, 1929. Serial No. 409,963.

This invention relates to an improvement in dispensing devices and has for one of its objects the provision of a dispensing device of an improved construction wherein the material to be dispensed is placed under pressure and discharged from the device by electrically driven apparatus.

More specifically our invention is directed to an improved dispensing device which is particularly well adapted for dispensing greases and provides an apparatus electrically driven and provided with a control mechanism of such a character as to render the control of the material being dispensed extremely simple and convenient so that the operator who is dispensing the material may readily start and stop the machine from a remote point.

Still more specifically our invention provides an apparatus particularly well adapted for lubricating machinery, automobiles, etc. provided with fittings at the bearings to be lubricated, our apparatus providing a connection whereby our dispensing device may be readily attached to such fittings for the discharge of lubricant thereto, the control of the apparatus being adjacent the fitting so that the operator who is dispensing the material may readily control the apparatus while at the fitting and without the necessity of returning to the apparatus in order that the same may be shut down.

Our invention provides also an apparatus for the dispensing of material in which the material may be dispensed at high pressures the pressure at which the material is dispensed however being adjustable and automatically controllable whereby not only may the delivery pressure be varied but the building up of an excessive pressure is prevented.

In the drawings accompanying this application:

Figure 1 shows our improved dispensing device, the control therefor, and its connection to a fitting to which the material is to be delivered;

Figure 2 is a sectional elevational view of our improved dispensing machine; and

Figure 3 a section on the line 3—3 of Figure 2.

Referring to the drawings in detail and first of all to Fig. 1, our improved dispensing device is designated 1, 2 is a control therefor, and 3 designates a hose or conduit through which the material being dispensed is passed. 4 designates a coupling on the end of hose or conduit 3 which is adapted to be removably attached to a fitting 5 to which the material is to be dispensed.

It is to be noted that while our invention will be described herein with reference to the dispensing of lubricants it is to be distinctly understood as above pointed out that this application of the invention is illustrative only and is not intended to in any way limit the employment of our apparatus for the dispensing of such materials.

7 designates a wheeled truck on which our apparatus is adapted to be mounted. This truck or carrier mounts an electric motor 8. The truck also carries a container 9 mounted above the motor and provided with a cover 10 having an air vent 10′ and with a sloping bottom 11 having discharge opening 12.

The sloping bottom 11 of the container is provided with a flange 13. Secured to this flange are members 14 and 15 providing a gear housing for a gear train 16. The member 14 extends vertically along the end of the motor 8 to provide one wall of the gear housing or gear case and then horizontally above the top of the motor as shown at 17, this horizontally extending portion in conjunction with the flange 13 receiving a rotary horizontally extending driving member 18. The gear train 16 connects the armature shaft 19 of the motor with the member 18 so as to drive the latter at the proper speed relatively to the speed of the motor as will be understood. The inner end of the member 18 is provided with a cam face 20.

At the outer end of the cylinder provided by the members 13 and 14 is secured a bushing 21, provided at its inner end with a thimble 22, which in turn is provided with a central bore for receiving a plunger or piston stem 23. The stem 23 at the end remote from the thimble 22 carries a piston 24 provided at its forward end with a cam face 25 adapted to cooperate with the cam face 20 on the rotary

driving member 18 above referred to. The cam faces 20 and 25 are so shaped that upon rotation of the member 18 and consequent rotation of cam face 20, the plunger 24 held against rotation by key 24′ will be caused to recede moving toward the right as viewed in Fig. 2.

Motion of the piston 24 in the opposite direction, viz: toward the left in Fig. 2, is insured by the provision of a coil spring 26 which surrounds the stem 23 and is placed under compression when the piston 24 is moved to the right by cam 20.

The thimble 22 is provided with a series of ports designated 28 for the entry to the thimble of the material being dispensed. As the stem 23 moves to the left, as viewed in Fig. 2, to uncover ports 28, the material being dispensed fills the thimble back of the stem 23. On the opposite stroke of this stem, after the same closes the ports 28, the material is trapped in the thimble 22 and placed under high pressure which forces the material through port 29 past the spring loaded check valve 30 to a chamber 31 in the bushing 21. At each end of the spring 26 is a washer 26′ for preventing surging of the material being dispensed by movement of the piston 24. As the grease or other material being dispensed is forced to ports 28, on inward movement of the piston, movement of this material in the opposite direction on the outward movement of the piston is prevented.

In the outer end of the bushing 21 is screwed a thimble 32 provided with a bushing 32′ leading from the chamber 31 and extending into an enlarged bore in said thimble 32. Surrounding this bushing and seated in said enlarged bore is a washer 33. The said enlarged bore is screw threaded to receive a bushing 33′ carrying a plunger check valve 34 which is held seated in engagement with said washer 33 by means of a spring 34′.

The bushing 21 is also provided with a port 35, controlled by spring loaded check valve 36, this port communicating with port 29 when valve 30 is unseated. The port 35 is adapted when valve 36 is unseated to communicate with passageway 37 communicating with the interior of the apparatus, that is, with the piston chamber. The tension of the spring loading the valve 36 is regulatable by adjustable plug 38. This construction not only provides, therefore, for preventing the building up of excessive pressure in the system but permits of the pressure being regulated as desired.

The hose connection 3 by which the dispensing device 13 connected to the fitting 5 comprises combined male and female members 39 and 40, respectively, the male end of each member being spherical as shown at 41 while the female end of the cooperating member which receives this sphere is spun over as is shown at 42. Packing 43 backed by spring 44 is provided within the female end of each member. Each member is provided with passageway 45 for the passage therethrough of the material being dispensed. This provides a flexible liquid tight hose construction suitable for our purpose although other types of hose may be employed. The inner end of this hose is removably connected to the thimble 32 as shown at 46 through any suitable connection. Intermediate the ends of the hose is provided a vent 3′ whereby the hose may be vented, when, for example the fitting 4 may have been applied to a frozen bearing through which it has been found impossible to force the lubricant. Under these conditions a high pressure will be built up in the hose, making it difficult and undesirable to remove the fitting from the bearing until the pressure is relieved by opening vent 3′.

Intermediate its ends the hose 3 is provided with switch mechanism 2 for controlling the motor 8, this locating of the switch permitting of control of the motor from a remote point, for example, adjacent the delivery end of the hose. This is a very useful construction, as will be appreciated.

Switch 2 comprises a metal casing 46 provided with a conduit 47 for the passage of the material being dispensed. The hose 3 is connected to each end of this conduit, so that the material being dispensed passes through the switch casing. The housing or casing 46 is preferably provided with a pistol grip for the convenience of the operator. The contact mechanism within the switch casing is shown at 48 and is operated by a trigger 49. In operation it is merely necessary to hold the switch in the hand and by depressing the trigger 49 close the circuit to the motor 8, opening of the circuit being accomplished by merely releasing the trigger.

The fitting 5 for the bearing 6 or other part to be lubricated is shown as being provided with a central port 50 controlled by a spring loaded check valve 51.

The coupling 4 which is carried on the outer end of the hose 3 fits over the outside of this fitting and comprises a shell 52 carrying a cap 53 at its upper end and screw threaded thereon. Surrounding the shell 52 is a spring 54, the lower end of which abuts a shoulder 55 provided on a knurled sleeve 56 which is outside of and surrounds the shell 52. The upper end of the spring 54 is engaged by the lower end of the cap 53. This construction permits of sufficient upward movement of the sleeve 56 to uncover the opening in the shell 52 which receives the pin of fitting 5.

Within the shell 52 is a plug 57 provided with a longitudinally extending port 58 communicating with an annular groove 59 provided in the face of the plug. The upper end of the cap 53 is spun over so that when the cap is screwed down it will engage the

end member 61 of the hose and force the same into and against the upper end of sleeve 52 effectually holding the member 61 against movement. The necessary movement of the hose relatively to the coupling is provided by the male member or ball 41, as will be appreciated.

In dispensing lubricant to the fitting 5, the pressure of the lubricant will move the plug 57 downwardly away from stationary member 61, to permit the lubricant to travel across the top of the plug and along the side until it reaches groove 59. In operation the lubricant or other material to be dispensed is placed in the container 9 and when dispensing material such as grease initial pressure on the material may be obtained by superposing a weight 61 on the contents of the container. If now the switch be operated so as to close a circuit to the electric motor 8 it will be understood that the cam member 18 through the gear train 16 will be caused to rotate and the cam face 20 thereon cooperating with the cam face 25 on the piston 24 will force the latter to the right as viewed in Fig. 2 to compress spring 26 and continued rotation of the member 18 will permit of the piston moving in the opposite direction under the action of the coil spring 26. The movement of the piston 24 to the left under the action of the spring will permit the material being dispensed to pass down through the bottom of the container into the chamber in which the spring is located and through the ports 28 in the thimble 22, and from thence along the outside of the piston stem 23 to the chamber 29 adjacent the rear end of the stem. As the piston moves to the right again the material being dispensed will be forced out of the chamber 29 unseating the check valve 30 and from thence by port 33, past check valve 34 to the hose 3. The material then passes through the hose until it reaches conduit 47 in the switch housing, and from thence passes through the remainder of the hose, coupler 4 and fitting 5 to the bearing or other point to which the material is to be delivered. Should the pressure in the apparatus build up too fast, check valve 36 will open, permitting the material to by-pass back to the interior of the apparatus again thereby reducing the pressure.

In order to prevent the building up of air under pressure in the chamber 31 we provide an air release valve leading from said chamber to the outside of the apparatus. This valve is provided with a plug 65 having a thumb piece 66 and can be removed and replaced as desired.

As stated above this apparatus has been described in connection with the dispensing of lubricants, merely by way of illustration. It is thought that this is clear from the foregoing description, inasmuch as it is obvious that our apparatus is useful for dispensing many materials other than lubricants. It is to be understood also that in some cases where it might be desired to dispense liquids under pressure, paints and enamels, for example, the fitting 5 and coupler 4 could be dispensed with and the hose be equipped with a spray nozzle of any convenient design.

It will be seen furthermore that the switch mechanism shown at 2 is an extremely practicable construction as it not only provides a convenient way for an operator to support the hose 3 but it also permits of a nicety of control not possible when the operator is required to return to the machine in order to close or to open the circuit of the motor 8.

It will be appreciated, furthermore, that the pressure under which the material being dispensed is discharged may be regulated merely by properly tensioning the spring which backs the check valve 36. This feature not only provides a safety device but as just mentioned permits of the regulating of the discharge pressure of the apparatus.

What we claim is:—

1. A dispensing device, comprising in combination a container, a cylinder in communication therewith, a piston in said cylinder, the outer end of said piston being provided with a cam face, an electric motor, and a shaft in line with said piston rotated by said motor and provided with a cam face cooperating with the cam face on the piston to cause positive movement of the piston into its cylinder thereby to place material which has passed from said container into said cylinder under pressure.

2. Dispensing apparatus comprising in combination a vertically extending container, a horizontally disposed cylinder at the bottom of the container and in communication therewith, a piston in said cylinder, an electric motor beneath said cylinder, and a cam rotatable about a horizontal axis in line with said piston, said cam lying above said motor for effecting movement of said piston inwardly of said cylinder.

3. A dispensing device comprising a container having a sloping bottom with a central discharge, a cylinder adjacent the bottom of said container and communicating with the discharge thereof, a piston in said cylinder, the outer end of said piston being provided with a cam face, a spring within said cylinder opposing the inward movement of said piston, a shaft in line with said piston and provided with a cam face cooperating with the cam face on said piston, and an electric motor for driving said shaft to effect through said cam faces a movement of said piston inwardly of said cylinder against the action of said spring.

4. A dispensing device comprising in combination a container, a cylinder adjacent the bottom of the container and in communication therewith, a piston in said cylinder,

means for preventing rotation of said piston, a cam face on the outer end of said piston, a rotary shaft in line with said piston, and a cam face on the end thereof cooperating with the cam face on the piston whereby rotation of said shaft will effect lengthwise movement of said piston inwardly of said cylinder.

5. A dispensing device comprising in combination a container, a cylinder in communication therewith, a piston in said cylinder, a stem carrying said piston, a bearing for said stem, said bearing being provided with ports extending radially of the bearing and piston stem, a chamber at the inner end of said stem, and means for effecting reciprocation of said piston to force material passing from the container into said piston cylinder along said piston stem through said ports and into the chamber at the inner end of said stem.

6. A dispensing device comprising in combination a container, a cylinder in communication therewith, a piston in said cylinder, a stem carrying said piston, a bearing for said stem said bearing being provided with ports extending radially of the bearing and piston stem, means for effecting reciprocation of said piston to force material passing from the container into said piston cylinder through said ports on inward movement of the piston, and washers carried by said stem and forwardly of said ports for preventing movement of material from said ports toward said container on outward movement of said piston.

7. A dispensing device comprising in combination a container, a cylinder in communication therewith, a piston in said cylinder, a stem carrying said piston, a bearing for said stem provided with ports extending radially of the bearing and piston stem, a spring on said stem, a washer at each end of said spring and intermediate said ports and container whereby movement of material from said ports toward said container on outward movement of the piston is prevented.

8. In a dispensing apparatus, the combination of a pump, a bushing at the discharge end thereof, a thimble fitting within said bushing, a second bushing within said thimble, said thimble having an enlarged bore providing a chamber into which one end of the second bushing projects, a washer fitting over said projecting end of the second bushing and seating in the bottom of said enlarged bore, and a plunger check valve in said enlarged bore fitting over the projecting end of said second bushing and engaging said washer.

This specification signed this 19th day of November, 1929.

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