HYDRAULIC LUBRICANT DISPENSER

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Fig. 5.

Fig. 6.

Fig. 7.

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This invention relates to hydraulic lubricant dispensing devices, and has for its general object the provision of an apparatus of the character described especially designed to be employed by service stations and the like, for dispensing a particular grade of grease, tenacious in character.

Fluid pressure actuated grease dispensers are of course known, but so far as applicants are aware, such devices have invariably been designed for the filling or small cups, etc., with grease of non-tenacious property, conditions that call for raising the pressure ratio of the grease relative to the applied pressure for operating the mechanism.

The present invention operates upon the opposite principle and provides for the extrusion of a large volume of grease at a relatively low pressure.

While the invention is in the present specification contemplated in its relation to the automobile industry, it is to be understood that the apparatus is adapted for general use.

Other objects of the invention relate to improvements in the details of construction in the simplification of the mechanism and in the accessibility of the parts, all as will appear as the following description of a preferred and practical embodiment of the invention proceeds.

In the drawings in the several figures of which the same characters of reference have been employed to designate identical parts:

Figure 1 is a vertical section through a grease dispenser embracing the principles of the present invention;

Figure 2 is a section taken along the line 2—2 of Figure 1;

Figure 3 is a vertical section of a detail on an enlarged scale showing the valve mechanism;

Figure 4 is a perspective view of the release valve;

Figure 5 is a view in elevation, showing in broken lines the grease plunger at the upper end of its stroke;

Figure 6 is a perspective view of the hydraulic plunger; and

Figure 7 is a fragmentary detail in elevation of the operating mechanism.

Referring now in detail to the several figures, and first adverting to Figure 1, the numeral 1 represents a cylindrical body suitably secured to a base 2. The base 2 may be mounted on a truck and trundled by means of a handle 3 at the upper end of the apparatus, which handle is the means by which the filler cap 4 is removed. The cylindrical chamber within the body 1 is segregated by means of the head 5 into an upper or grease chamber and a lower chamber 6 for the hydraulic fluid which in this instance may be glycerine although the use of any of a full range of equivalent transmission fluids is contemplated.

A hydraulic cylinder 7 is placed within the body 1 preferably axially of the chamber 6 and secured at its lower end to the base 2.

The upper end is slightly reduced forming a shoulder 8 upon which the head 5 rests. Said head comprises a plate 8, a cup leather or its equivalent 9 and a follower 10. A nut 11 compresses these members, forcing the cup leather into sealing contact with the interior walls of the body 1. A hydraulic plunger rod 12 reciprocates within the cylinder 7 having a plunger at its lower end comprising as is shown in Figure 3, a plate 13, cup leather 14 and follower 15. A nut 16 holds these parts together and in compressive relation, forcing the cup leather 14 into sealing contact with the interior wall of the cylinder 7. The grease plunger which in general is designated by the reference character 17 is carried at the upper end of the hydraulic plunger rod 12, said grease plunger comprising a plate 18, cup leather 19 and follower 20, all compressed together by means of the nut 21.

A stuffing box 22 surrounds the plunger rod at the upper end of the head 5 and prevents any glycerine which may leak past the hydraulic plunger getting into the grease chamber. The latter chamber is provided with an outlet fitting 23 having a hose connection 24 terminating in a suitable nipple 25 adapted to be connected to the part to which the lubricant is to be supplied.

UNITED STATES PATENT OFFICE

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HYDRAULIC LUBRICANT DISPENSER

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The base 2 is cored out at 26 to form a pump chamber having pump inlet and outlet valves 27 and 28 respectively. The inlet valve 27 communicates by way of a passage 29 and strain-er 30 with the glycerine chamber 6. The base 2 is provided with a bore 31 communicating with a passage 32 leading to the lower end of the hydraulic cylinder 7, beneath the hydraulic plunger. The base is cored out on its opposite side as indicated at 32' forming a passage which communicates by way of a bore 33 with the glycerine chamber. Bushings 34 and 35 are arranged in opposite ends of the bore 31 and a release valve 36 seats against the inner end of the bushing 34. The pump outlet valve 28 seats in similar manner against the bushing 33 and a spring 37 is compressed between said valves normally holding both of them to their seats. The pump outlet valve is of course, unseated against the tension of said spring by pressure from within the pump. The release valve 36 is actuated by a stem 38 extending through the bushing 34 and terminating loosely against the release valve. A fitting 39 is bolted or otherwise suitably secured to the base 2, in which is journaled an oscillating shaft 40 operated by a foot pedal 41, see Figure 2, and returned by a spring 42 acting against the under side of said pedal. The shaft has an inclined cam end 44 acting against a similarly shaped cam 43 at the end of the fitting 39. A spring 46 normally holds the push rod out of contact with the stem 38. When the foot pedal is depressed, the cam faces ride upon one another forcing the push rod inwardly against the stem 38 which in turn presses against the release valve forcing it from its seat against the tension of the spring 37.

A fitting 47 is bolted or otherwise secured to the base 2, closing the open side of the pump chamber 26. Said fitting has a pump cylinder 48 and a pump plunger 49. The pump chamber communicates with the cylinder 48 by means of a passage 50. The pump plunger is operated in any suitable manner, one means being illustrated in Figure 7 in which a link 51 is pivotally secured to the base as at 52 and at its upper end it is pivotally connected to a lever 53. The pump plunger is pivotally connected to the lever 53 at an intermediate point of said lever. The far end of said lever is connected by means of a link 54 with the lever 55, one end of which is pivotally mounted upon the base as shown at 56, and the other end of which carries the foot pedal 57. Upon pressing upon the foot pedal, the plunger 49 descends. Upon releasing pressure upon the foot pedal, the latter is returned to its original position by a spring 58.

In operation, successive strokes are imparted to the pump plunger 49, the pump withdrawing glycerine from the glycerine chamber forcing it out through the bore 31 and passage 32 to the hydraulic cylinder. The plunger rod 12 is thus moved up and carries with it the grease plunger 17. In view of the difference in areas of the hydraulic plunger and the grease plunger, the pressure ratio between the grease pressure and the hydraulic pressure is reduced. The grease is thus delivered in large volume but at a lower pressure than that required to operate the mechanism.

It is contemplated that the grease chamber shall hold sufficient grease for a number of dispensations. When the hydraulic plunger finally reaches its uppermost point, which indicates the point in the grease chamber in which all of the grease has been depleted, the hydraulic plunger uncovers a port 59 so that glycerine thereafter overflows back into the glycerine chamber without advancing the grease plunger any higher.

If at any time it is desired to release pressure upon the hose 24, it is merely necessary to press momentarily upon the foot pedal 41. This opens the release valve 36 and permits the relief of pressure from the hydraulic cylinder. In filling the grease dispenser, the handle 3 is turned so as to unscrew the cap 4. Pressure is then applied and maintained on the foot pedal a sufficient length of time to permit the return of all of the glycerine in the hydraulic cylinder back to the glycerine chamber under the descent of the hydraulic plunger, produced by pressing upon the grease plunger by means of a stick or any other suitable instrument inserted in the open end of the cylinder 1. When the hydraulic plunger has reached its lowermost position, grease is supplied to the grease chamber manually.

In disassembling the apparatus for replacing the cup leathers when necessary or for making such adjustments as may be required to cure leakage, the grease plunger 17 as well as the head 5 are provided with eyes 60 and 61 which may be engaged by hooked wires to permit the withdrawal of these members. The grease plunger may be withdrawn after a socket wrench has been introduced and the nut 21 removed. Access is thus had to the stuffing box 22 which may be tightened by a suitable socket wrench. If the head 5 has to be removed, the nut 11 is first unscrewed and the head then drawn out through the body 1 by means of wires hooked into the eyes 61. Convenient access may be had to any of the valves or appurtenant elements located in the base 2. For instance if it is desired to remove the pump inlet valve and strainer a plug 63 is provided, the removal of which gives access to the fitting 29 by a socket wrench. The bushings 34 and 35 are in alignment, with the cored out portions 26 and 32. By removing either the fittings 39 or 47 access may be had to either of the bushings 34 or 35 by means of a socket wrench. When either of
these bushings is removed, the spring 28 and both the pump inlet and release valve may be taken out.

The body 1 is provided, between the head 5 and the grease plunger 17 with air relief ports 64 permitting air to escape when the grease plunger descends.

While it is obvious that a single inclined surface would act as a cam between the oscillating shaft 40 and the collar 44 by making the cam surfaces in the form of teeth as shown, a more abrupt sloping may be obtained and a quicker opening of the release valve thus accomplished.

While we have in the above description disclosed what we believe to be a preferred and practical embodiment of the invention, it is to be understood that the details of construction as shown are merely by way of example and are not to be considered limiting in their bearing upon the scope of the invention as claimed.

What we claim as our invention is:

1. Hydraulic viscous fluid dispenser comprising a base, inner and outer cylinders secured to said base, the inner cylinder terminating at an intermediate point within the outer cylinder, a head supported by said inner cylinder and fitting the outer cylinder in sealing relation defining a reservoir for the hydraulic transmission fluid within said outer cylinder between said head and base, plungers in said inner and outer cylinders unilaterally related, that part of the outer cylinder above the plunger of said outer cylinder constituting a reservoir for the viscous fluid to be dispensed, a pump, and a valve controlled inlet and outlet for said pump carried by said base and communicating with the chamber in the lower part of said outer cylinder and with the inner cylinder respectively.

2. Hydraulic viscous fluid dispenser comprising a base, inner and outer cylinders carried by said base, the inner cylinder terminating at a point intermediate the length of the outer cylinder, a head supported by said inner cylinder and fitting the outer cylinder in sealing relation, a plunger in said inner cylinder, a plunger in said outer cylinder above said head, a plunger rod connecting said plungers, that part of the outer cylinder above said base and below said head constituting a reservoir for the transmission fluid, a pump associated with said base, a valve controlled inlet and outlet for said pump carried by said base communicating with the transmission fluid reservoir and with the inner cylinder, a release valve also carried by said base communicating with said inner cylinder and said transmission fluid reservoir, and means for operating said release valve.

3. Hydraulic viscous fluid dispenser comprising a base, inner and outer cylinders carried by said base, the inner cylinder termi-