July 3, 1934. J. A. WATSON 1,964,866

LUBRICATION DEVICE

Filed Feb. 15, 1932

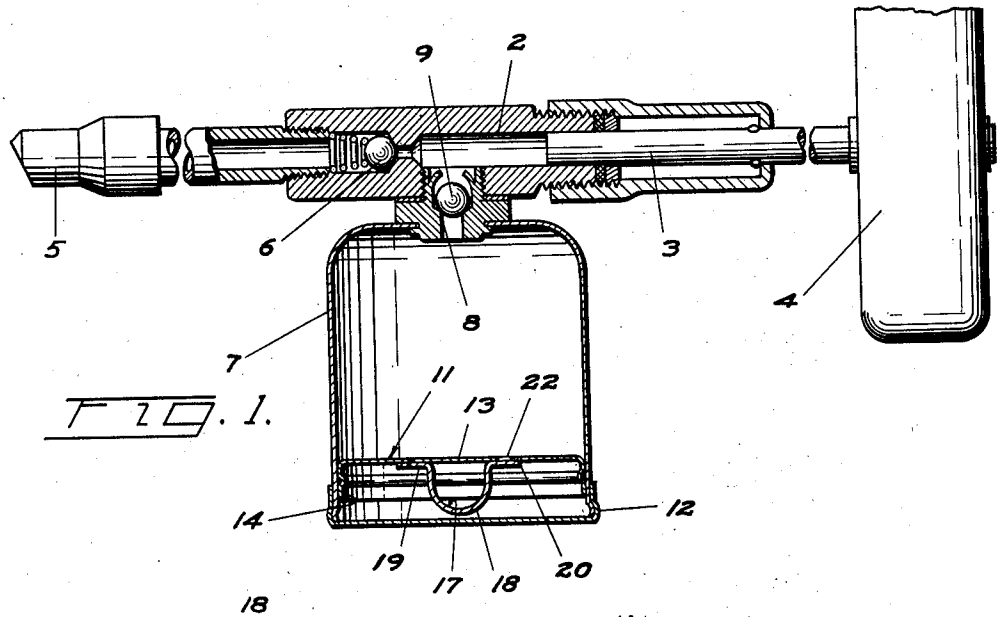


FIG. 1.

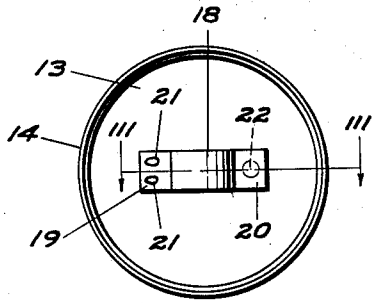


FIG. 2.

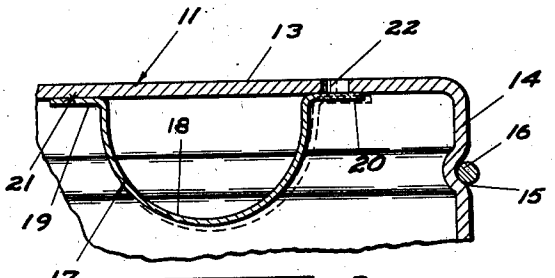


FIG. 3.

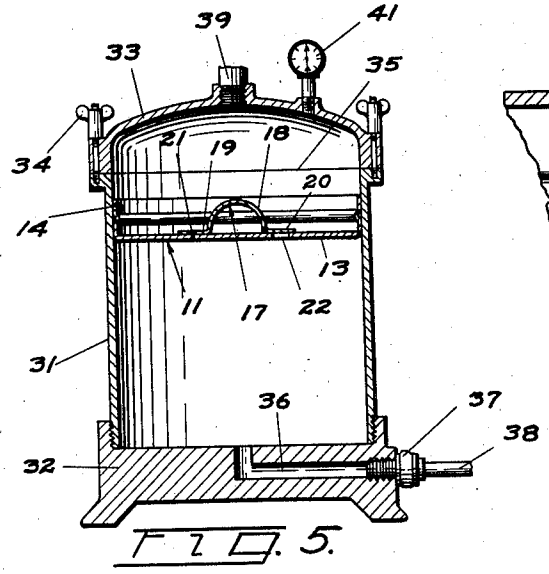


FIG. 5.

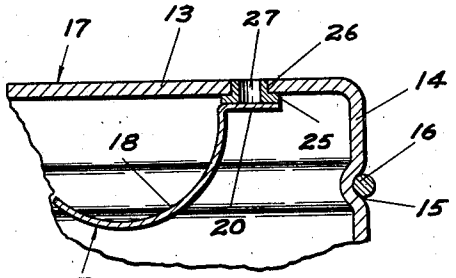


FIG. 4.

INVENTOR.

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UNITED STATES PATENT OFFICE

1,964,866

LUBRICATION DEVICE

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Application February 15, 1932, Serial No. 593,074

10 Claims. (Cl. 221—47.3)

This invention relates to lubrication devices and particularly to pistons or followers, for lubricant containers and cartridges.

An object of the invention is to provide an improved piston or follower for use in containers or cartridges for lubricants and similarly viscous fluids, wherein a hand grip is provided on the piston or follower to enable its withdrawal from the container or cartridge and wherein a vent through the piston or follower is opened by rearward manual movement applied to the hand grip so as to equalize pressure on opposite sides of the piston or follower.

Hereafter, wherever the term piston is used, whether in the description or claims except where the context otherwise requires, it is to be understood as meaning a follower as well.

Another object is to provide a piston wherein air ahead of the piston is bled therethrough when the piston is manually moved into the container or cartridge, to engage with the contents thereof.

Another object is to provide a piston, of the type described, wherein the vent or bleed opening through the piston is closed tightly during the application of pressure uniformly directed against the rear side thereof as by compressed air when the piston is used in an air operated dispenser.

Other objects and advantages will be, or should become apparent, after reading the following specification and claims and after consideration of the accompanying drawing wherein:

Fig. 1 is a sectional view of a hand gun illustrating one application of my improved piston;

Fig. 2 is a rear plan view of the piston illustrated in Fig. 1;

Fig. 3 is an enlarged sectional view along the line III—III of Fig. 2;

Fig. 4 is a view similar to Fig. 3 of a modified form of the piston; and

Fig. 5 is a sectional view of an air valve lubricant dispenser illustrating another application of the piston.

In general my improved piston is intended for use in any type of dispenser, container, cartridge or cylinder for lubricants, or similarly viscous fluids, where access to the rear of the piston is available for the purpose of withdrawing the piston, as to replenish the contents, and wherein the piston may act as either a follower or pressure piston.

It is desirable, in the type of assembly above described, that some means be provided for bleeding out air ahead of the piston as it is initially moved inwardly against the contents of the dispenser, container or cartridge so that the air will not become entrapped between the piston and the lubricant and ultimately find its way into the pressure cylinder of the feeder or gun with which the assembly may be associated. It is also desirable to prevent the lubricant or other fluid contained in the reservoir or cylinder from passing through the bleed opening or vent in those instances where the piston is forced against the contents of the reservoir or container by a compression spring or by compressed air. Furthermore, as the piston or follower must make a fair fit with the reservoir or container and as this would make it almost impossible to remove the piston by application of a reasonable force to the handle, means must be provided whereby substantially to equalize the pressures on opposite sides of the piston; in other words there must be relief of the tendency toward a low pressure condition created on the forward side of the piston by a rearward movement.

All these features and others are provided for in the embodiments of the invention herein described.

In Fig. 1 I have illustrated a lubricant feeder gun, of the small hand type, having a pressure cylinder 2, a plunger 3, slidably disposed therein actuated by a hand grip 4, and a lubricant discharge nozzle 5, communicating with the pressure cylinder 2 through a check valve 6, adapted to engage with a lubrication fitting or nipple to supply lubricant thereto. A cylindrical casing 7 is mounted upon the cylinder 2 and has an outlet passage 8 which communicates with the pressure cylinder 2 through a check valve 9. The piston 11, forming the subject matter of the present invention, is slidably disposed within the casing 7, to act in the present instance as a follower piston. A cap 12 is provided to close the lower end of the casing 7, when the gun is in use, and may be removed for the purpose of withdrawing the piston, as to refill the casing with lubricant.

With reference to Figs. 1 to 3 of the drawing it will be noted that the piston 11 comprises a body, which may be formed of sheet metal, having a head 13 lying within a plane perpendicular to the axis thereof and formed with a rearwardly extending skirt 14. An annular depression 15 is formed in the outer wall of the skirt 14 to receive a packing ring 16 for the purpose of causing a lubricant tight seal between the piston and casing wall.

The piston further comprises a hand grip 17 which may be formed of clock spring steel by means of which the piston may be manually engaged and rearwardly withdrawn from the cas-

ing 7. The hand grip 17 has an intermediate semi-circular portion 18 providing a partial loop in which the finger may be inserted, as during withdrawal, and a pair of flat end portions 19 and 20 normally disposed parallel, and contacting, with the rear surface of the head 13. The portion 19 of the hand grip may be secured to the head by rivets, bolts or any desirable securing means. In the present embodiment it is shown secured to the rear face of the piston by spot welding the portion 19 to the head as indicated at 21. The end 20 is unattached, but is held resiliently in close contact with the rear face of the head. An opening 22 is provided through the head 13 in that portion registering with the end 20 of the hand grip, the area of the opening 22 being less than the area of the portion 20.

In use the piston, as applied to the hand gun illustrated in Fig. 1, is withdrawn from the casing 7 to permit the casing to be filled with lubricant. Thereafter the piston 11 is inserted through the open and lower end of the casing, and manual force directed against any portion of the rear face of the piston other than the hand grip 17. The piston is thereupon moved forwardly until it has engaged with the contents of the casing. During this procedure air ahead of the piston is expelled through the opening 22 to cause the portion 20 of the hand grip to move yieldingly from engagement with the adjacent rear face of the head 13.

As the lubricant is withdrawn from the casing 7 into the pressure cylinder 2 of the gun, during use, by operation of the plunger 3, atmospheric pressure will cause the piston to advance until such time as the lubricant is entirely consumed. During this operation the portion 20 will be held closely to the rear face of the head 13 to effectively close the mouth of the opening 22, by virtue of the inherent resilient characteristics of the hand grip, and because of the application of atmospheric pressure against the relatively large area of the hand grip, and particularly the portion 20, as compared to the area of the opening 22.

The piston may be withdrawn from the casing 7 to replenish its contents by extending a finger through the intermediate portion 18 of the hand grip and pulling rearwardly thereupon. During this procedure the initial rearward movement of the piston will cause a depression on the lubricant side of the piston to retard further withdrawal, and the hand grip 17 will be drawn yieldingly to the position shown in dotted lines of Fig. 3 so that the mouth of the opening 22 is uncovered. Air is thereupon bled through the opening 22 to equalize pressure on the opposite sides of the piston and permit continued unretarded withdrawal. In pistons of the type formerly used, considerable difficulty has been encountered in the removal of the piston, particularly from cylinders or containers of appreciable length due to atmospheric pressure working against the piston and it is reasonable to assume that under such conditions air may be drawn into the lubricant through the dispensing apparatus if slight leakage in these parts is present.

In Fig. 4 I have illustrated a modified form of the piston wherein I employ a gasket 25 which is preferably constructed of pressed cork. The gasket is inserted within an opening 26 corresponding to the opening 22 but slightly larger in diameter and held securely in place by frictional engagement therewith and by the pressure of the portion 20 of the hand grip 17 thereagainst, except for the provision of a more adequate seal between the portion 20 of the hand grip 17 and the mouth of the passage 27 provided by the gasket 26, this embodiment of the piston structure operates precisely as that form described in connection with Figs. 1 to 3.

In Fig. 5 I have illustrated the piston as applied to a lubricant dispensing device of the air pressure type comprising a container 31, supported upon a base 32, having a removable head 33 which is secured to the casing by wing nuts 34, and in which a packing gasket 35 is employed to provide a fluid tight connection between the casing and head. A lubricant discharge passage 36 is provided in the base 32 which communicates with a connecting stud 37 for the attachment of a dispensing hose 38 thereto. The piston 11 is placed in the casing 31 above the lubricant with its skirt 14 extending upwardly. Air under pressure is admitted to the casing at the rear of the piston through a conduit 39, extending through the head 33, so as to force the piston downwardly and expel lubricant through the passage 36 and the hose 38 to a feeder gun or similar apparatus which may be connected to the hose 38.

The pressure against the rear face of the piston 11 augments the pressure of the portion 20, of the hand grip 17, against that region of the head surrounding the opening 22, due to the inherent resilient characteristics of the hand grip, to effectively maintain the mouth of the opening 22 closed so that lubricant may not be extruded through the opening. This is due to the fact that the area of the hand grip 17 and particularly the portion 20 thereof is larger than the area of the opening 22 and the piston must therefore be urged ahead to maintain the lubricant in the container under a positive predetermined pressure proportional to the air pressure as indicated by a pressure gauge 41 communicating with the interior of the head 33.

After the lubricant in the container has been exhausted the head 33 may be removed and the piston easily withdrawn by virtue of the yielding of the hand grip 17 to expose the mouth of the opening 22 thus relieving the relatively lower pressure caused ahead of the piston by its withdrawal movement.

If desired, the use of air pressure for urging the piston ahead may be dispensed with and a compression spring placed within the container at the rear of the piston. In this event it is essential that at least a part of the spring bear against the hand grip and particularly its portion 20.

It is to be understood that the above described embodiments of the invention are for the purpose of illustration only, and various changes may be made therein without departing from the spirit and scope of the invention.

I claim:

1. As an article of manufacture, a piston having a check valve therein and a spring forming a hand grip and forming a part of said valve as a closing means therefor, and arranged to open said valve when moved in one direction.

2. As an article of manufacture, a piston comprising a body having an opening extending therethrough and a hand grip of spring material secured to the body at its rearward side and formed with a portion thereof contacting the rear surface of the body about the mouth of said passage yieldingly to close said passage.

3. As an article of manufacture, a piston having a sheet metal body formed with an integral skirt, said piston having an opening therethrough, and a hand grip of spring steel secured at one end to the rear face of said piston and having its other end bearing against the rear surface of said piston about the mouth of said opening.

4. As an article of manufacture, a piston having a sheet metal body formed with an integral skirt, said piston having an opening therethrough, and a hand grip of spring steel secured at one end to the rear face of said piston and having its other end bearing against the rear surface of said piston about the mouth of said opening, said hand grip having an intermediate portion formed to define a partial loop.

5. A piston for use with lubricants or similarly viscous fluids comprising a head having a skirt extending rearwardly, said head having an opening therethrough and a spring member forming a hand grip secured to the rear face of said head and having a portion of greater area than the area of said opening held yieldingly against the mouth thereof and normally sealing said opening.

6. As an article of manufacture, a piston having a vent opening therethrough, a spring secured at one end to the rear face of said piston and provided with a hand grip, and means on the other end of said spring for sealing said vent opening, said spring normally tending to urge said means toward said piston to effect sealing of said vent.

7. As an article of manufacture, a piston having a vent opening therethrough, and a leaf spring secured to the rear face of said piston, said spring having a sealing portion releasably closing said vent and a portion providing a handle whereby a pull on the handle will release said sealing portion and open said vent.

8. As an article of manufacture, a piston having a vent opening therethrough, and a leaf spring handle secured to the rear side of said piston, said spring having a portion normally covering said vent to seal the same, said portion being releasable to open said vent by a pull upon the spring handle.

9. As an article of manufacture, a piston including a disc of packing material having a passage therethrough for establishing communication between opposite sides of the piston, and a resilient metal member contacting the surface of said packing disc about the mouth of said passage to form a yielding closure therefor.

10. As an article of manufacture, a piston including a disc of packing material having a passage therethrough for establishing communication between opposite sides of the piston, and a resilient metal member including a hand grip portion contacting the surface of said packing disc about the mouth of said passage to form a yielding closure therefor.

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