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L. GOODMAN

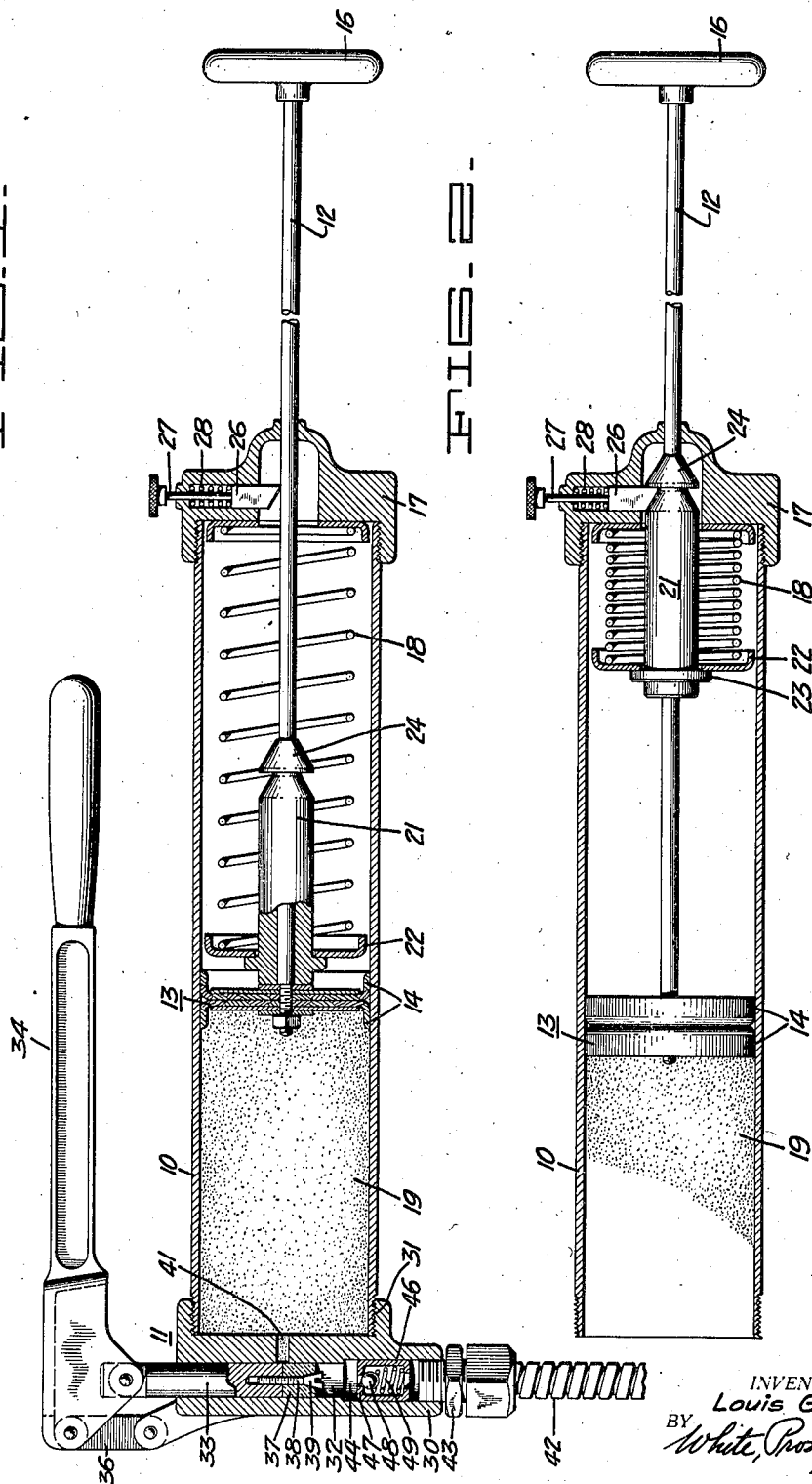
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GREASE DISPENSING DEVICE

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FIG. 1--

FIG. 2--



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GREASE-DISPENSING DEVICE.

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This invention relates generally to devices for dispensing lubricants, such as the heavier lubricating oils or greases. It is particularly applicable for portable dispensing devices used in supplying grease under high pressure to the bearings of machines such as automobiles and motor trucks.

It is an object of this invention to devise a grease dispensing device which may be readily refilled by an operator.

It is a further object of this invention to devise a grease dispensing device which is cheap to manufacture but which will be provided with reliable means for furnishing grease under low pressure to a high pressure booster means.

It is a further object of this invention to devise a grease dispensing device of the type utilizing a spring for forcing a follower down upon the charge of grease, which will be provided with releasable means for retaining the spring in inactive compressed condition while at the same time permitting free movement of the follower for refilling the grease chamber.

It is a further object of this invention to devise a high pressure grease dispensing device having means for relieving the high pressure in the discharge pipe before this pipe is removed from the bearing or other device being supplied with grease.

It is a further object of this invention to devise a high pressure pump for discharging grease or other lubricants, having means for readily adjusting the packing of the pump plunger.

Further objects of this invention will appear from the following description in which I have set forth the preferred embodiment of my invention. It is to be understood that the appended claims are to be accorded a range of equivalents consistent with the state of the prior art.

Referring to the drawings:

Figure 1 is a transverse cross sectional view illustrating a device incorporating the various features of this invention.

Fig. 2 is a transverse cross sectional view of the grease chamber removed from the high pressure pump, illustrating the manner in which the invention is utilized for aiding refilling of the grease chamber.

In the drawing I have illustrated one specific embodiment of my device in order to explain the principles of my invention. To

form a chamber for holding a charge of grease, I prefer to utilize a shell 10 which is preferably cylindrical in shape. To one end of this shell there is attached a booster 11, or in other words a high pressure pump for receiving grease from the grease chamber and discharging it at high pressure. Extending into the other end of the shell, there is an actuator rod 12 to the inner end of which is secured a suitable follower 13. For a reason which will presently be apparent, I propose to form the follower 13 out of two oppositely faced cup washers 14. A handle 16 is preferably secured to the outer end of actuator rod 12, in the event this rod is to be manually operated, as is usually the case. The end of the shell thru which rod 12 projects, is preferably covered by a suitable removable closure 17.

Disposed within the shell between the closure 17 and the follower 13, there is a compression spring 18 which is intended to perform the normal function of pressing the follower 13 down upon a charge of grease 19. To withdraw the follower 13 into the shell by pulling upon the handle 16 it is therefore normally necessary to compress the spring 18. Generally in filling a grease dispensing device of this kind, it is customary for the operator to disconnect the shell 10 from the booster 11, and then to insert the open end of the shell in a barrel or other container of grease, at which time the actuator rod 12 is pulled outwardly to suck a charge of grease into the shell. However since the spring offers considerable resistance to movement of the follower, it is apparent that the operator cannot readily feel whether or not grease is being drawn into the shell, with result that in some instances considerable time is lost in properly filling the dispensing device, or the shell may be attached to the booster 11 without having been properly filled. It is also inconvenient to manually hold the follower in retracted position against the compression of the spring while the shell is being attached to the booster. It has previously been proposed to remedy this latter difficulty by providing means interlocking the actuator rod with the shell when the follower is in retracted position, this means being releasable so that the spring may normally press the follower down upon the grease after the shell is attached to the booster. Dispensing devices utilizing this construction are still subject to

the difficulty of being unable to properly feel the grease when performing a refilling operation.

In my invention I provide releasable means for retaining the spring 18 in inactive compressed condition, but this means permits free reciprocating movements of the actuator rod and follower 13 in order to assist the operator in properly refilling the shell. Thus referring again to the drawing, I have shown a sleeve or other suitable member 21 slidably disposed upon the inner portion of actuator rod 12. Sleeve 21 is cooperably associated with that end of compression spring 18 which is adapted to press upon the follower 13. For example to obtain this result I have shown the compression spring 18 as being seated upon a suitable cup shaped member 22, which in turn is retained upon the sleeve 21 as by means of a collar 23. One end of sleeve 21 is provided with a suitable shoulder 24 which is adapted to automatically engage and be retained by a slidable latch 26. Latch 26 is preferably slidably mounted within the closure tap 17 and has secured thereto a laterally projecting rod 27 by means of which latch 26 may be manually retracted by an operator. Latch 26 is preferably normally urged toward engaging position as by means of a compression spring 28. When the follower 13 has been practically fully retracted within the shell, shoulder 24 automatically engages with latch 26 and thereafter retains spring 18 in compressed inactive condition. With latch 26 in this engaged condition, the operator is free to reciprocate rod 12 and follower 13 to perform the desired refilling operation. After the shell has been properly filled and it has been again attached to booster 11, latch 26 may be manually retracted to cause its disengagement from shoulder 24, thus again permitting spring 18 to press down upon follower 13.

The booster 11 is of more or less conventional construction except with respect to certain features to be pointed out below. It preferably consists of a body 30 having a threaded connection 31 with the shell 10. Body 30 is formed with an inner cylinder bore 32 within which is reciprocally disposed the plunger 33. Reciprocation of plunger 33 is accomplished by some suitable actuating mechanism, as for example the manual lever 34 connected with the plunger 33 thru suitable motion applying linkage mechanism 36. The high pressure end of plunger 33 is preferably packed against leakage, and for this purpose I have shown a packing washer 37 of leather, rubber, or some other material which may be expanded into fluid tight relationship with the cylinder walls. As a convenient means for retaining this washer upon the plunger and for effecting expansion of the packing washer upon the cylinder walls,

I have shown a screw 38 threaded into the ends of the plunger and having a tapered or conical head 39. Since I construct the check valve and fittings for the booster so that they may be readily removed from the discharge end of cylinder bore 32, it is a simple matter to effect adjustment of the packing 37 by inserting a screw driver to tighten the screw 38.

Cylinder bore 32 is in communication with the interior of shell 10 at the top of its stroke, as by means of a port or passage 41. It is also necessary, as is usual with such boosters, to employ a check valve intermediate the discharge end of the cylinder bores 32 and the discharge pipe or other connection which leads the grease to the desired point of application. I have indicated a conventional discharge hose or pipe at 42, which is connected to the discharge end of cylinder 32 as by means of a suitable fitting or nipple 43. When utilized in the high pressure lubrication of bearings for automobiles or other motor vehicles, hose 42 is generally provided with a suitable connector which is detachably secured to a fitting, the fitting being permanently secured to the bearing to be lubricated. Assuming that the hose is attached to a fitting and that a certain charge of grease has passed thru the hose by operation of the booster 11, if an ordinary type of check valve is employed near the discharge of cylinder bore 32, then the pressure within pipe 42 will not be relieved until the connector is disengaged from the bearing fitting. The presence of such a high pressure makes removal of the connector difficult and also causes the discharge of a certain amount of excess grease the instant the connector is removed.

As one feature of my invention, I propose to provide means for relieving this pressure after the operator stops operating the booster, and before the hose 42 is disconnected from the bearing fitting. The specific means which I have disclosed for this result consists of another cylinder bore 44 which is preferably in alinement with cylinder bore 33 so as to form in effect a counter bore. Within the bore 44, there is a member 46 in the form of a plunger which is slidable a limited amount determined by the length of bore 44. Member 46 is preferably made hollow and its inner end is provided with an annular portion 47 providing a convenient seat for a ball check 48. Ball check 48 is normally pressed against the seat as by means of a compression spring 49.

In operation when the plunger 33 is forced downwardly by movement of the hand lever 34, grease from the cylinder bore 32 forces member 46 outwardly to the limit of its movement, after which the pressure of the grease opens ball check 48 and permits the grease to discharge thru the pipe 42. Upon the up stroke of plunger 33 sufficient vacuum is

created to suck the grease thru the port 41 from the shell 10. When sufficient grease has been injected into the bearing being lubricated, considerable pressure will be present within pipe 42, and this pressure immediately upon relieving the force applied to plunger 33, will force member 46 and the check valve inwardly to the limit of its movements. This movement of member 46 is sufficient to substantially relieve pressure within pipe 42, so that when this pipe is removed from the fitting being lubricated, the grease pressure will be insufficient to cause the escape of superfluous grease. Furthermore the absence of pressure within pipe 42 makes it easy for the operator to remove the connector from the bearing fitting.

To briefly review the operation of the device as a whole, to refill the device, the operator unscrews the shell 10 from the booster 11, and then draws handle 16 outwardly until latch 26 engages and retains the spring 18 in inactive compressed condition. Handle 16 is then manually moved forwardly to carry the follower 13 to substantially the open end of shell 10, after which the shell is inserted in a quantity of grease. Retracting the follower by again pulling outwardly upon handle 16, causes the semi-fluid grease to be sucked into the chamber 10. The vacuum necessary for sucking the grease into the shell may be readily felt by the operator, so that the operator is assured that the shell is being properly filled. After the shell has been filled and the follower 13 is still in retracted position, the shell 10 is again screwed upon the booster 11, and then latch 26 is released to permit the compression spring to force follower 13 down upon the grease body. The pressure of the spring 18 develops sufficient pressure within the grease charge 19 that the grease is forced thru port 41 and thus supplies grease to the cup without the necessity of priming the pump. When the hose is attached to a fitting or other device which is to be supplied with grease, operation of handle 34 causes the pump plunger to eject the desired quantity of grease under high pressure. The packing for the plunger 33 may be readily adjusted merely by removing the nipple 43 and the member 46.

I claim:

1. A grease dispensing device comprising a grease chamber, a follower disposed in said chamber, spring means for pressing said follower upon grease in said chamber, and releasable means for rendering said spring ineffective without preventing free reciprocating movement of said follower.

2. A grease dispensing device comprising a grease chamber, an actuating rod extending into one end of said chamber, a follower secured to the inner end of said rod, a compression spring disposed within the chamber between said follower and said end of the cham-

ber, and releasable means for retaining said spring in compressed condition without preventing free reciprocating movement of said rod.

3. A grease dispensing device comprising a shell adapted to hold a charge of grease, a discharge passage in one end of said shell, a rod extending into the other end of the shell, a follower secured to the inner end of said rod, a compression spring adapted to normally force said rod and follower toward said end of the shell for discharging grease, latch mechanism comprising a pair of engageable members, one of said members being mounted on said shell, and the other of said members being secured to one end of said spring, said mechanism serving as means for releasably retaining said spring in ineffective compressed condition to permit force reciprocation of said rod and follower.

4. A grease dispensing device comprising a shell adapted to hold a charge of grease, a discharge passage in one end of said shell, pressure boosting means associated with said discharge outlet, a rod extending into the other end of the shell, a follower secured to the inner end of said rod, a compression spring adapted to normally force said rod and follower toward said end of the rod for discharging grease, latch mechanism comprising a pair of engageable members, one of said members being mounted on said shell, and the other of said members being secured to one end of said spring, said mechanism serving as means for releasably retaining said spring in ineffective compressed condition to permit force reciprocation of said rod and follower.

5. In a high pressure grease dispensing device, a high pressure grease pump, a discharge pipe associated with the pump, said pipe being adapted for detachable connection to a device to be lubricated, and means for controlling flow of grease between said pump and pipe comprising a cylinder having its ends communicating respectively with said pump and pipe, a plunger disposed in said cylinder and movable a limited amount, a passage thru said plunger, and a pressure operated check controlling said passage whereby when grease is discharged from the pump said member is moved to its limit in one direction after which said check is opened by pressure to permit grease to discharge in the pipe, and when the pump is inactive said member is moved to its limit in the opposite direction to relieve pressure within the pipe.

6. In a high pressure grease dispensing device, high pressure grease pumping means having a discharge passage, and means for controlling flow of grease thru said passage comprising a cylinder having its ends communicating respectively with said pumping means and said discharge passage, a plunger disposed in the cylinder and movable a limited

ited amount, a passage thru said plunger, and
a pressure operated check controlling said
passage whereby when grease is discharged
from the pumping means said member is
5 moved to its limit in one direction after which
said check is opened by pressure to permit
grease to discharge, and when the pump is in-
active said member is moved to its limit in the
opposite direction to relieve pressure in the
10 pipe.

7. In a high pressure grease dispensing de-
vice, a high pressure grease pump, a dis-

charge pipe associated with the pump, said
pipe being adapted for detachable connec-
tion to a device to be lubricated, check valve 15
for controlling back flow of grease into the
pump, and a movable member carrying said
valve, said member being bodily movable
relative to said pipe for relieving pressure in
said pipe when the pump is inactive. 20
In testimony whereof, I have hereunto set
my hand.

LOUIS GOODMAN.