Jan. 24, 1939. R. E. HULME 2,144,702

APPARATUS FOR DISPENSING GREASE

Filed Oct. 16, 1936

Fig. 1.

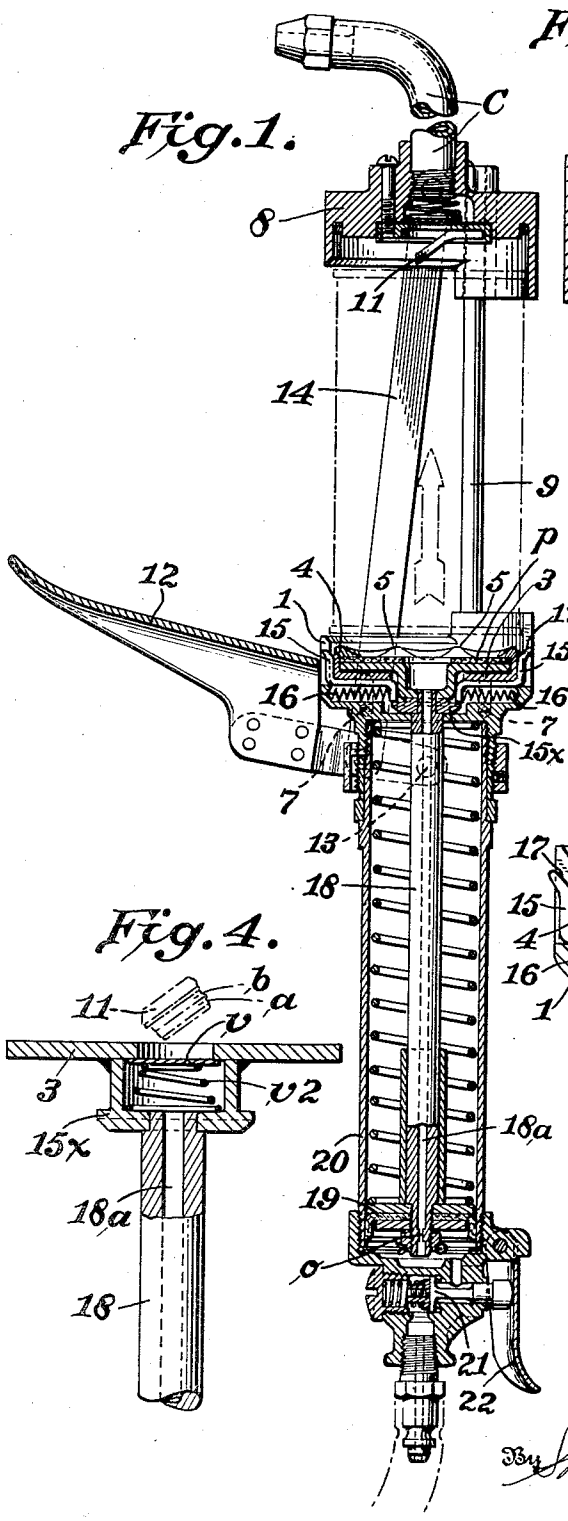


Fig. 2.

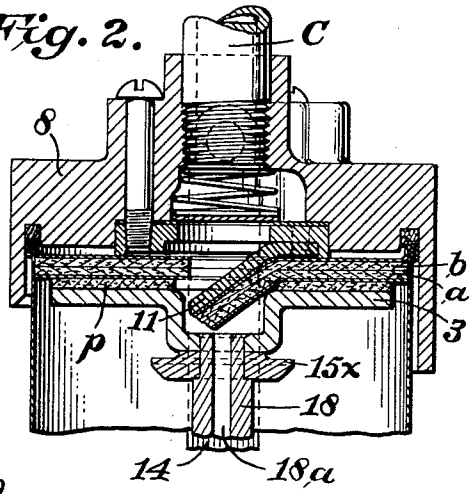


Fig. 3.

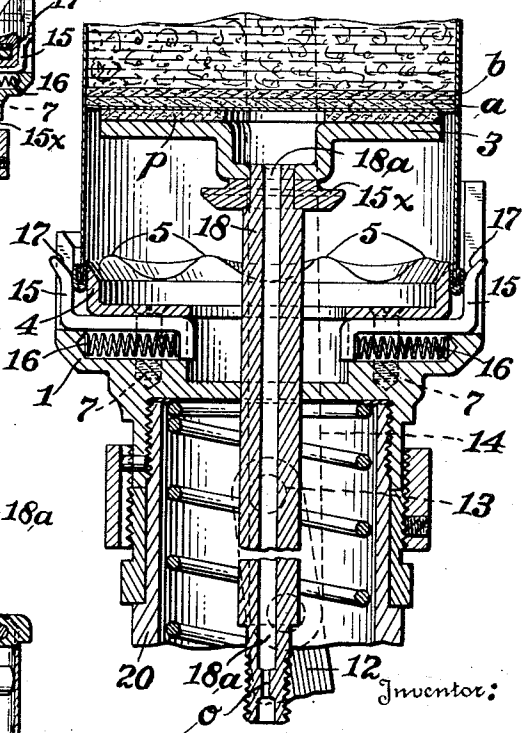


Fig. 4.

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APPARATUS FOR DISPENSING GREASE

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26 Claims. (Cl. 221—47.3)

The invention relates to grease guns and particularly to method and means for discharging the grease or oil from the nozzle or hose which is intended to direct the grease to the part to be lubricated. If the small quantity of grease which remains in the discharge pipe or nozzle after the main body of grease is discharged from the carton or other container is left in the nozzle for discharge when the gun is again operated, there will occur a mixture of part of the grease of the first operation, and a part of that of the second operation, and where different kinds of greases are discharged in successive operations, there will result contamination of the second discharge with a part of the first discharge.

Furthermore, where grease remains in the nozzle of the gun there will be a shortage in the delivery of grease at the first operation of the gun.

The invention is disclosed as carried out in connection with the form of grease gun shown in my application for Letters Patent of the United States filed May 29, 1935, Ser. No. 24,138, though it will be understood that the invention may be used with forms of grease guns other than that shown in said application.

In the drawing:

Figure 1 is a central longitudinal section of a grease gun with its grease container or carton omitted, but indicated by a dot and dash line.

Fig. 2 is a central axial sectional view of the upper head of the gun with associated parts, a portion of the can or carton and the plunger in advanced position.

Fig. 3 is a central axial section of the lower head of the gun with the plunger in partly advanced position.

Fig. 4 is a view of a modification of the invention showing a valve controlling the air conduit.

In the drawing 1 is a head of generally circular form having a cavity for receiving the end of a can or carton which may be in the form of an ordinary tin can having heads attached to its body by beading in the ordinary manner, said can having within a gasket or gasket members *a, b*. At 4 is shown an annular knife attached to the head by suitable screws 7, and at 3 is shown a plunger for forcing the head of the can after being cut from the body by the knife. When the can is initially seated its lower head rests upon the high points 5 of the knife, pressure exerted upon the opposite end of the can by a head member 8 forces the can down in relation to the knife and thus the head is cut close to the body and by the action of the plunger this cut out can end or head, together with the gasket or gaskets, is forced to the opposite end of the can to discharge the contents therefrom. The head 8 of the apparatus slides on guides 9 connected with the main head member 1. Said head carries a blade 11 which punctures the upper or head end of the can so as to provide an outlet opening at this point through which the grease may be forced from the can through a suitable discharge pipe or hose leading to a suitable nozzle which directs the grease to the parts to be lubricated. The movable head 8 is operated by hand lever 12 pivoted to the frame at 13 and connected by links 14 with the head so that by operating the lever the head 8 will be drawn down towards the head 1 resting in first puncturing the upper head or end of the can by the knife 11, and thereafter the cutting of the bottom end of the can takes place by forcing the can against the circular knife, it being noted that the puncturing action of the blade 11 takes place first because the ring shaped knife 4 encounters, because of its extent, greater resistance than the blade 11.

The movement of the can also releases detents 15 from a flange 15*x* of the stem 18 of the plunger 3, so that the plunger may, when operated, contact the can end which has been acted on by the knife, and move it towards the other end of the can, thereby to discharge the cans contents therefrom. The detents 15 are pressed by springs 16 into position to lock the plunger 3 against action until the can by engaging the inclined edges 17 of the detents retract them from the flange 15*x* against the pressure of the springs.

The plunger 3 is operated by a piston 19 in a cylinder 20, to which air pressure is introduced through a valve 21 operated by a finger lever 22, for forcing the piston 19 along its cylinder, and thus forcing the plunger 3 along the interior of the can to effect the discharge of the cans contents, the packing gasket or gaskets *a, b* serving to wipe the inner sides of the can body, and prevent leakage. When the cut out can end with the packing *a, b*, reaches the puncturing blade 11 they will be punctured thereby, thus allowing these members to complete their stroke to the upper end of the can, thus delivering the entire contents from the can. The action just described will not clear the discharge nozzle or hose C of the grease, and for the purpose of discharging the grease from the nozzle so that none will remain therein after the complete operation of the gun has taken place, I deliver air pressure to the grease within the discharge hose or nozzle to force all of it therefrom to the point to be lubricated, thus eliminating all waste

and preventing the grease of one operation from mixing with the grease of a subsequent operation. Thus where greases of different qualities and for different effects are discharged from the same gun contamination of one grease by another will be avoided. For this purpose I employ a hollow plunger stem 18 so that air pressure may pass therethrough from the source of air pressure supply, and I provide packing material at *p* on the face of the plunger 3 to make air tight contact between the plunger and the can end which is to be forced toward the opposite end of the can by the plunger after it has been separated from the can body. The port 18*a* through the plunger stem is open at its upper end. Therefore, when air pressure is let into the cylinder 20 it will pass into the hollow stem and will discharge into the pipe or hose C leading to the nozzle as soon as gasket *a*, *b*, and the lower end of the can has reached the puncturing blade 11 and have been punctured thereby. Previous to this time the compressed air will be prevented from discharging from the upper end of the passage 18*a* through the plunger stem because of the fact that the gasket *p* on the upper face of the plunger is in sealing contact with the ruptured end of the can, so that until this end, together with the gasket *a*, *b* superposed thereon, have been punctured by the blade 11, there will be no discharge of air pressure into the discharge pipe, hose, or nozzle member C.

I show in Fig. 4 a modification which includes a spring pressed valve *v* contained in a chamber at the upper end of the plunger stem so that the puncturing blade 11 will open this valve by contacting the same after it has punctured the cut out end of the can and its superposed gasket *a*, *b*.

This valve is closed by a spring *v*2.

The term "nozzle" as employed herein applies to any pipe, hose or other means for delivering the grease to the part to be lubricated. Where I mention contaminating one kind of grease with another, I refer, for instance, to the use in the gun of say Hypoid lubricant after extreme pressure lubricant has been used in the gun, or where regular mineral oils and greases are used in the gun either before or after a grease such for instance of the character above mentioned.

At *o* is shown a restricted orifice in the stem of the plunger near its lower end. This orifice is of a diameter as will properly control the supply of compressed air to the apparatus for discharging residual oil or grease from the discharge pipe or nozzle, and for properly delivering said oil or grease to the part to be lubricated without scattering or subjecting that portion already delivered to a blast of undue intensity.

By reason of having the air passage in the stem of the plunger above the orifice of a larger diameter than said orifice, a reservoir is provided in which the air can build up to the prescribed pressure to be ready to exert its force upon the residual oil or grease in the discharge pipe or nozzle as soon as the upper blade punctures the gasket and the can end upon which it is superposed.

While I have for convenience referred to the apparatus and method as relating to "grease" it will be understood that the apparatus is particularly adapted for dispensing lubricating oils. The term "grease" is therefore employed to include lubricants of any desired viscosity.

There is a tendency for the grease or oil left in the nozzle to slowly discharge in the form of drops unless it is cleared from said nozzle, and my invention by supplying air pressure to the nozzle removes residual oil or grease and removes the objection just mentioned.

Furthermore, the use of air pressure as a means of clearing the nozzle will enable the attendant as well as the customer to determine when the full amount of oil or grease has been completely delivered, because after the full discharge has taken place the compressed air issuing from the nozzle will produce an audible sound.

It will be seen from Fig. 2 that when the air pressure is delivered through the plunger stem and plunger to the nozzle, said nozzle will have been sealed off by the packing *a*, *b*, and *p* from communication with any space within the main body of the package so that the air will pass directly into the nozzle and under full force.

I claim:

1. In combination in a grease gun, means for holding grease, means for discharging grease from said holder through a nozzle comprising a gasket which is moved along the grease holder, means for puncturing said gasket as the discharge end of said holder is approached and means for delivering air pressure to the inner end of the nozzle or discharge pipe through said punctured gasket, substantially as described.

2. In combination in a grease gun, a grease holder, a nozzle, air pressure operated means for forcing grease from said holder, means for delivering air pressure to the inner end of the nozzle through said air pressure operated means to clear the same after the main body of grease has been forced from said holder through the nozzle, and means for sealing the inner end of the nozzle from communication with the interior of the grease holder while the delivery of air to said inner end takes place.

3. A grease gun comprising a plunger for forcing a can end and a superposed gasket to the discharge end of said can, a discharge pipe or nozzle connected with the discharge end of the can, means for operating said plunger by compressed air, a blade for puncturing said can end and gasket, and a passage for delivering compressed air through the punctured can end and gasket to the inner end of the discharge pipe or nozzle.

4. A grease gun according to claim 3 in which said passage is in the stem of the plunger, substantially as described.

5. A grease gun according to claim 3 in which the said puncturing blade is located at the discharge end of the can.

6. A grease gun having heads to receive a can of grease between them, one of said heads having a nozzle connected therewith and having also a blade to puncture the can end, means for moving the other end of the can along the can within the same for the discharge of grease, said blade puncturing said other end of the can, and means for delivering air pressure through said puncture of said other end to the inner end of the nozzle, substantially as described.

7. In combination in a grease gun having a discharge pipe or nozzle, means including a plunger for discharging grease from the gun through said nozzle, means for delivering air under pressure through said plunger to the inner

end of the discharge pipe only after substantially the main body of grease has been discharged for discharging grease from said pipe to clear the same of residuum, and means for sealing the inner end of the nozzle from communication with the interior of the grease holder while the delivery of air to said inner end takes place, substantially as described.

8. In combination in a grease gun, a holder for the grease, a nozzle or discharge pipe leading from said holder, a plunger for forcing grease from the holder, and means for supplying air under pressure through said plunger to the inner end of the discharge pipe for clearing the same of residual grease, substantially as described.

9. A grease gun according to claim 8 in which a valve controls the passage of air to the inner end of said discharge pipe and means for operating the valve.

10. A grease gun according to claim 8 in which the plunger pushes a head of said holder to the discharge end thereof, a blade for puncturing said head, and an air valve for delivering air to the puncture in the said head, and thence to the inner end of a discharge pipe leading off from said holder, said valve being operated by said blade to supply the air pressure for clearing the discharge pipe, substantially as described.

11. In combination in a grease gun, a can having a packing member on its interior at one of its ends, a knife for cutting the end adjacent to which the packing member is located, a plunger for forcing said can end with the packing disc to the discharge end of the can, a head at the discharge end of the can having a nozzle, a blade for puncturing the end of the can adjacent the discharge end of the gun, said blade also puncturing the can end and the packing which lies thereagainst, means for operating the plunger, and a passage for directing air pressure through the plunger to the puncture of the last mentioned can end and the puncture of the packing and thence to the inner end of the discharge pipe or nozzle, substantially as described.

12. A grease gun according to claim 11 having a valve associated with the plunger and controlling the air through said passage.

13. A grease gun according to claim 11 having a valve associated with the plunger and controlling the air through said passage, said valve being opened by contact with the puncturing blade.

14. In apparatus of the class described having a discharge nozzle, a grease holder, a plunger for discharging grease therefrom, said plunger having a stem with a conduit for delivering air through the plunger for clearing the nozzle, said conduit having a restricted aperture for controlling the pressure of the air delivered to the nozzle, and a portion of larger diameter than said aperture to determine the volume of said air, said restricted aperture constituting the air inlet to said larger diameter portion, substantially as described.

15. In a dispenser for oil, grease, or the like, a frame having a discharge nozzle and a blade for puncturing the end of a can, for the discharge of the grease through said puncture to the nozzle, means for cutting out the opposite end of the can, a plunger for forcing the cut out end of the can along the interior thereof, and against said blade, to be punctured thereby, said plunger having a port extending therethrough for the delivering of air under pressure through the puncture in said opposite can end to the nozzle for clearing the same of residue, and means for directing said air to said port, substantially as described.

16. In combination in a grease gun, a grease holder, a nozzle leading from said holder through which the grease is discharged from the holder, a plunger for forcing grease from the holder, and means for delivering air under pressure past the interior of the grease holder to the inner end of the nozzle after the plunger has substantially performed its discharge stroke.

17. In combination in a grease gun having a discharge nozzle, means for holding grease, means movable along the holder for discharging grease from said holder through the nozzle, and means for clearing grease from the nozzle, comprising an air pressure conduit normally closed during the discharge of grease from said holder, and means for automatically establishing connection past the interior of the grease holder from said conduit to the nozzle as the said discharging means is completing its stroke, whereby said nozzle will be cleared of grease, substantially as described.

18. A grease gun according to claim 17 in which the means for automatically establishing connection between the said conduit and the nozzle is rendered effective by the movement of said means movable along the holder, substantially as described.

19. In combination holding means for a can of grease, means for severing an end of said can from the body and for forcing said end to the discharge end of the can, means for puncturing said can end whereby it may be moved to a position close to the discharge end of the can, said holding means having a nozzle, and means for delivering air pressure through the punctured severed can end to the nozzle for clearing said nozzle of residue, substantially as described.

20. In a lubricant dispenser in combination, an original lubricant package of substantially cylindrical side wall shape having a closed end adapted to be substantially wholly cut away, and means for cutting away said closed end and for forcing lubricant through an opening at the opposite end of the package comprising an annular knife engageable with said closed end adjacent the side walls to cut out said end, means for moving the knife toward the package to perform said cutting operation, means engageable with said cut out end to move it through the package to force the lubricant therefrom, a nozzle through which the lubricant is delivered from the said opening in the package, and means for supplying air pressure to the nozzle for clearing the same of residuum lubricant.

21. Dispensing apparatus having means for forming a discharge outlet in one end of a can, a substantially ring shaped knife for cutting out one end of the can, means for effecting relative movement between the can and knife for performing said cutting out operation, means for relatively moving the can and said cut-out end for effecting the discharge of the can's contents through said opening, a nozzle for delivering the contents from said outlet, and means for supplying air pressure to the nozzle for clearing the same of residuum.

22. Dispensing apparatus comprising a device having a space to receive the end of a can, means for holding a can with its end in said space, a cutter arranged to form a discharge opening in the can, an annular knife arranged to act on one end of the can to cut out said end of the can, means for effecting relative movement between the can and knife, means for effecting relative movement of the can and said cut out

end to discharge the contents of the can through said opening, a nozzle for delivering the contents from said opening, and means for supplying air pressure to said nozzle for clearing the same of residuum, substantially as described.

23. Dispensing apparatus comprising means for receiving an original package, a knife for puncturing said package for the discharge of the contents therefrom, a nozzle for receiving and directing the contents discharged from the package, an annular cutter for severing an end of the package from its body portion, a plunger for effecting relative movement between the body of the package and its severed end for the discharge of the contents of the package through the nozzle, and means for delivering air pressure to the nozzle for discharging residue of grease therefrom, substantially as described.

24. A dispensing apparatus comprising means for holding an original package, an annular knife for severing an end from the body of the package, a puncturing knife for providing an outlet for the discharge of the contents of the package, a plunger movable relative to the annular knife and puncturing knife and for effecting relative movement between the severed end and the body of the package for the discharge of the grease, a nozzle for conducting the grease discharged from the package to the point of delivery, and means for supplying air pressure to the inner end of the nozzle for clearing the same of grease, substantially as described.

25. A dispensing apparatus comprising a holder for an original package, a puncturing knife and an annular knife for respectively forming an outlet for the discharge of the contents of the package and for severing an end of the can from the body, a plunger for effecting relative movement between the body of the package and the severed end for the discharge of the package's contents through the outlet, a nozzle for conducting the contents to a point of delivery from said outlet, means for supplying air pressure for the discharge of grease residue from the nozzle, the said puncturing knife operating upon the same end of the package upon which the annular knife operates to provide an opening for the passage of air, substantially as described.

26. A dispensing apparatus comprising a holder for an original package containing the material to be dispensed, an annular knife, said annular knife cutting an end from the package, means for effecting relative movement between the cut out can end and the package, a puncturing knife for forming an opening in said end, and means for supplying air pressure to said opening, and a discharge nozzle with which said opening communicates.

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