

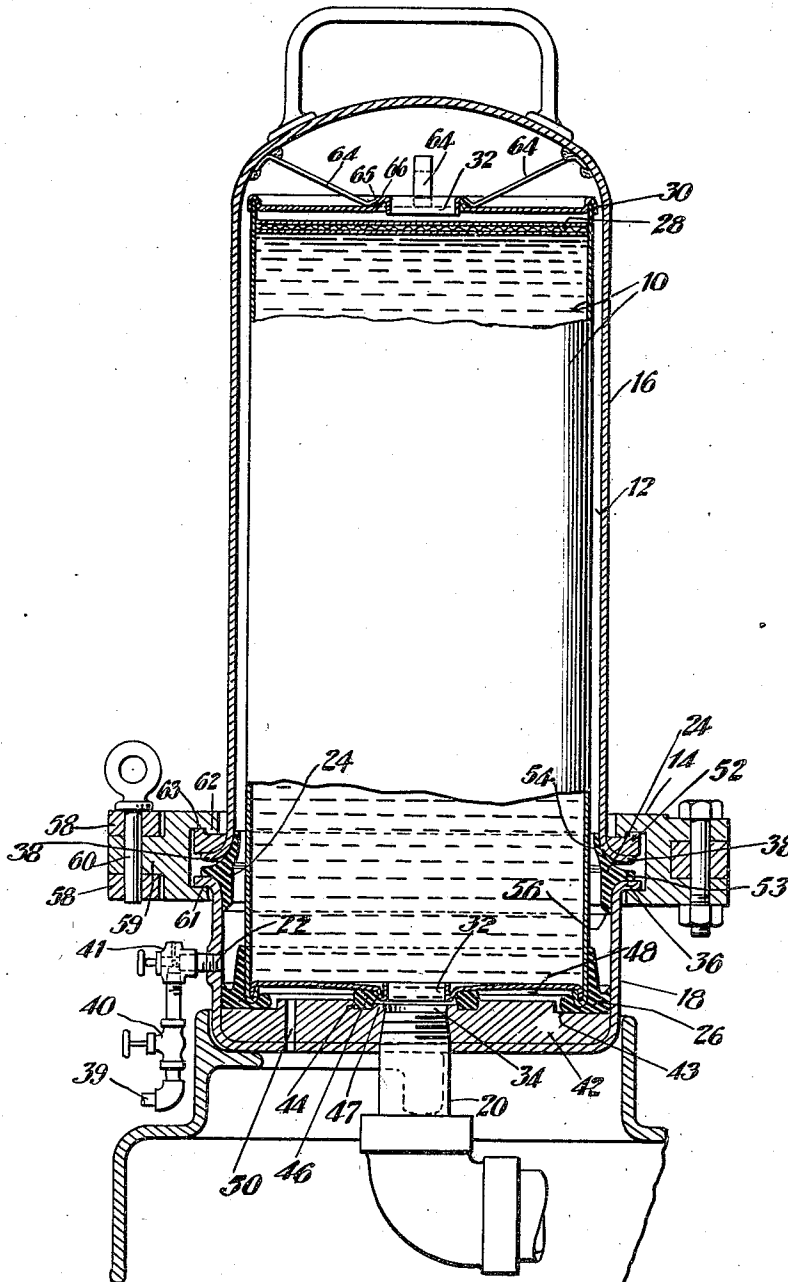
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E. I. FRANSON

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GREASE DISPENSING APPARATUS

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INVENTOR  
ELMER I. FRANSON  
BY *Edmund H. Roney*  
ATTORNEY

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## GREASE DISPENSING APPARATUS

Elmer I. Franson, Lakewood, Ohio, assignor to  
Cities Service Oil Company, New York, N. Y.,  
a corporation of Pennsylvania

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This invention relates to viscous liquid dispensing apparatus, and more particularly to improvements in apparatus for feeding grease to grease guns. The specific grease dispensing apparatus hereinafter described is particularly adapted for feeding grease directly under air pressure from a cartridge or can in which it was originally packed and shipped, to a gun such as described in Staples U. S. Patent No. 2,007,113.

The apparatus of the present invention was developed as an improvement over that which is disclosed in the copending application of John D. Morgan and Thomas Anderson, Serial No. 285,070, filed July 18, 1939 for Grease dispensing apparatus. In apparatus of this type the full grease can is opened at each end and mounted uprightly on the base of a sectioned pressure chamber having a grease outlet nipple in its base and a removable lid. A follower piston is placed in the top of the can before it is filled with grease while inverted; and when the can is inserted in the pressure chamber it is placed so that the opening in the bottom of the can is immediately above and aligned with the outlet nipple of the chamber. By application of compressed air pressure to the pressure chamber after the lid has been set in place, the outlet opening in the bottom of the can is forced into close engagement with the chamber base and the outlet nipple, and the piston is forced downwardly toward that end of the can engaging the outlet nipple. Usually the pressure chamber and grease gun, with connections, are mounted on a common movable carriage for convenience in shifting the equipment to different locations where greasing operations are to be carried out.

Heretofore the operating air pressure within the pressure chamber has been the means employed to hold the can in longitudinally aligned position within the chamber, with its bottom opening in engagement with the grease discharge nipple. However, during periods when the apparatus is being shifted from one location to another, and when there is no air pressure within the chamber, the can may be tilted away from longitudinal alignment within the chamber, with the result that subsequent application of pressure may cause some leakage of air from the pressure chamber into the grease outlet nipple. Another result of having the can tilted out of its normal upright position is that small amounts of grease may leak from the bottom opening of the can and from the outlet nipple onto the base of the pressure chamber immediately beneath the can when air pressure is applied to the pis-

ton, thereby preventing return of the can to its proper seating position and increasing the danger of air leakage difficulties. It will be understood that air thus leaking from the pressure chamber into the grease outlet nipple dilutes the grease and frequently develop air pockets which air-bind the grease pump to which the grease is being fed. Even when the can does not tip or shift away from its proper seat on the base of the pressure chamber, a certain amount of trouble is frequently experienced in operation of the apparatus simply by reason of dilution of the grease with the small amount of air which is trapped beneath the can at the time of original insertion of the can into the pressure chamber.

Objects of the present invention are, therefore, to provide an improved grease dispensing apparatus embodying features of design which largely overcome the aforementioned operating defects.

Among the novel features of the present invention may be mentioned an air-bleeding orifice in the base of the pressure chamber positioned to permit escape of air trapped beneath the can to thereby facilitate a more complete pressure sealing contact of the base of the can with the base of the chamber; and provision of a flexible centering and stabilizing connection between the lid of the pressure chamber and the can by means of which to hold the can in upright position within the chamber independently of the maintenance of operating air pressure therein.

With the above and other objects and features in view, the invention consists in the improved grease dispensing apparatus which is hereinafter described and more particularly defined by the accompanying claims.

In the following description reference will be had to the accompanying drawing, in which the single figure is a view in vertical section showing the principal elements of the apparatus in assembled relation after application of air pressure preparatory to the dispensing of grease from a full can.

Referring to the drawing, the principal elements of the apparatus comprise a cylindrical sheet metal or cardboard can or cartridge grease container 10; a cylindrical two-sectioned pressure chamber 12 which is dimensioned to accommodate can 10 therein with sufficient clearance for easy insertion and removal; a coupling including ring 14 by means of which a removable lid 16 and a stationary base 18, which together make up the sectioned chamber 12, may be coupled together; a grease outlet nipple 20 lead-

ing out centrally from the base of chamber 12 to a grease gun (not shown); an inlet port 22 for introducing compressed air into chamber 12; annular gaskets 24 and 26 for sealing the chamber 12 against escape of air therefrom; and a follower piston 28 slidably mounted in can 10 for the purpose of displacing grease from the can through outlet nipple 20.

Can 10 is normally constructed of light sheet metal with straight cylindrical sides joined to the ends (preferably recessed for stiffness) by outwardly rolled reinforcing ring joints 30. At each end of the can center apertures 32 are provided, and these are constructed with flange walls to accommodate friction plug closures (not shown). In Fig. 1 the apparatus is shown with the base 18, the bell 16 and the coupling ring 14 and gaskets 24 and 26 in the positions which they assume after sufficient air pressure has been built up in chamber 12 to seal the chamber against escape of air and to effect removal of grease from the can through the outlet nipple 20.

The base section 18 of the pressure chamber 12 is shown as a cylindrical dish-shaped vessel having in the center of its base an aperture 34 with which grease discharge nipple 20 threadably engages. The top rim of the base 18 is provided with an annular squared outwardly projecting flange 36 which is adapted to form a seat for an outwardly projecting flange 38 at the lower rim of the bell lid 16. An air supply pipe 39, equipped with an air supply valve 40 and an air release valve 41, threadably engages air inlet orifice 22 in base 18. The bottom of base 18 is preferably constructed of a heavy pressure resistant plate 42 in the top face of which an annular groove 43 is cut as a seat within which to mount gasket 26 as a seal for the base of the bottom rim of can 10. Another annular groove 44 is cut in the top surface of base plate 42 in coaxial relation around the central aperture in the plate, and such groove 44 serves as the seat for an annular gasket 46 which encircles the bottom outlet opening of the can immediately surrounding side wall 47 for the grease discharge outlet 34. Gaskets 26 and 46 (preferably constructed of synthetic rubber or other flexible oil resistant material) function as centering seats respectively for the bottom rim and for the bottom aperture of can 10, and as seals against leakage of air and grease into the annular chamber 48 bounded by the bottom of the can, the top of plate 42 and the gaskets 26 and 46. To permit of escape of any air originally trapped in chamber 46 and of any air which may thereafter leak into the chamber, an air-bleed orifice 50 is ported out through base plate 42 into the chamber 48.

Flange 38 of bell 16 is fitted at its rim with an upwardly projecting annular locking ring 52. The bottom of flange 38 is designed to seat on the top of flange 36 of the base member, and the top of flange 38 and ring 52 cooperate with the bottom of flange 36 and with coupling ring 14 to form a safety lock coupling for the sections 16 and 18, preventing dismantling of the apparatus prior to the release of air pressure from chamber 12. Gasket 24 has been illustrated as an annular ring gasket of substantially Y-shaped cross-section having one leg 53 shaped and dimensioned to rest on the top surface of flange 36; the two other legs 54, 56 of the gasket being shaped to be forced by air pressure in tight sealing relation to the top rim of base 18 and to the lower inside wall of bell 16. Thus the gasket 24 forms a seat for bell 16 on base 18 when there is

no pressure within chamber 12, and when bell 16 is raised off its seat by application of compressed air within chamber 12 (as illustrated) the gasket is forced into tight sealing relation with the bell and base to prevent escape of air past the joint.

Coupling ring 14 preferably consists of two semi-circular ring sections which are permanently hinged together at one end and which may be rapidly brought together and pinned at the swinging ends by matching lugs 58, 59 and a locking pin 60. Each section of the coupling ring is shown as substantially C-shaped in cross-section, with that portion 61 of its concave inner surface which overhangs the bottom edge of flange 34 squared to match the flange, and with the top section of its inner surface which overhangs ring 52 having a depressed rim 62 forming an annular groove 63 which is dimensioned and shaped to match and lock with the top of ring 52 of flange 36 when the bell 16 is raised off its seat by air pressure applied to the chamber 12. With this construction, therefore, it is impossible to disconnect the coupling ring sections from the flanges 34 and 36 as long as there is sufficient air pressure in chamber 12 to elevate the bell 16 off its seat on flange 34. The ring 52 has a slightly less height than the width of the space separating the bottom of flange 38 from the horizontal arm of gasket 24, with the bell in its raised coupled position. Consequently when there is no air pressure within chamber 12, ring 14 can be easily swung into or out of coupling position; and pin 60 is not necessary to hold the ring in coupling position during periods of application of air pressure within the chamber 12.

Can 10 is preferably filled with grease while in a position upside down with respect to that shown in the drawing, with the top friction plug closure in place and with the bottom plug removed, and with the piston 28 inside of the can so that when grease is introduced, the piston will lie in the bottom of the can in the grease filling position. After filling the can, the top cover is fitted thereto by the grease manufacturer preparatory to shipment. When the operator is ready to insert a filled can in the grease dispensing apparatus herein described, the procedure is to clamp gasket 26 over the bottom rim of the can; to remove the friction plugs from both end apertures 32; and to place the can in the air chamber 12 with the upper end of the can (in which the piston 28 is located) at the top of the chamber, and with the bottom rim of the can with its attached gasket 26 centrally seated in groove 43. With gasket 46 around the bottom aperture rim of the can properly seated in groove 44, the bottom central aperture of the can is aligned with grease discharged nipple 32, and gaskets 26 and 46 are disposed as seals which prevent leakage of air and/or grease into chamber 48.

In order to hold the can in upright position within chamber 12 at all times, independently of application of air pressure to chamber 12, spring steel centering legs 64 have been shown as attached under the dome of the bell lid with their free ends 65 shaped to bear on the upwardly turned edge 66 of the top of the can around the central aperture 32 when the lid is lowered over the can onto its seat on base 18. Before lowering the bell 16 into place, and after seating the can, gasket 24 is inserted on flange 34, after which the bell is lowered into place and the coupling ring 14 swung into position. All that is

necessary then in order to dispense grease from the can is to build up air pressure within chamber 12 to a pressure of say 50-200 lbs. sufficient to deliver grease from the can to the associated grease gun. The compressed air within the chamber 12 applied equalized pressure to the piston and to the inside and outside vertical walls of the can, thus forcing the can downwardly in tight sealing relation against the gaskets 26 and 46 and pressing the piston downwardly against the load of grease within the can. An unbalanced air pressure proportional to the relative areas of the follower piston with respect to can aperture 32 serves to force the grease out of the can through the outlet nipple 20. Air which is trapped within chamber 48 is readily bled therefrom through orifice 50, rather than into the grease outlet nipple 20, when the size of chamber 48 is reduced by distortion of the bottom end wall of the can toward the top surface of plate 42 under application of pressure to the grease inside the can.

The invention having been thus described, what is claimed as new is:

1. A grease gun unloading apparatus comprising a vertically disposed air cylinder having a removable lid and a base with a centrally disposed grease outlet, said chamber being dimensioned to enclose an end-apertured cylindrical grease gun in upright position with its bottom aperture aligned with said grease outlet and having a wall inlet port for compressed air, and

means for preventing escape of air from said chamber through the said grease outlet comprising a pair of annular gaskets respectively dimensioned for insertion in spaced relation on the chamber base beneath the outer rim of the can and encircling the rim of the grease outlet, together with flexible means under the bottom of said lid and above the can top for holding the can against its seat and preventing tipping thereof, and an air bleed aperture in the chamber base ported out in the chamber below the can and between the two gaskets.

2. In grease can unloading apparatus including a sectioned pressure chamber having a dished base and a bell lid dimensioned to enclose an end-apertured cylindrical grease gun in longitudinal position, said chamber having a compressed air inlet and a grease discharge port in the base aligned with said container end openings, means to prevent air from leaking past the can to the grease discharge port comprising flexible centering springs adapted for insertion under the dome of the bell above the can in position to hold the can against the chamber base and prevent tipping, two annular gaskets respectively dimensioned for insertion beneath the can on the base in spaced concentric relation around the grease discharge port, and an air bleed aperture in the dished base ported out in the chamber between the two gaskets.

ELMER I. FRANSON.