Nov. 4, 1941. J. D. MORGAN 2,261,834

GREASE DISPENSING APPARATUS

Filed April 30, 1940

Fig. 1.

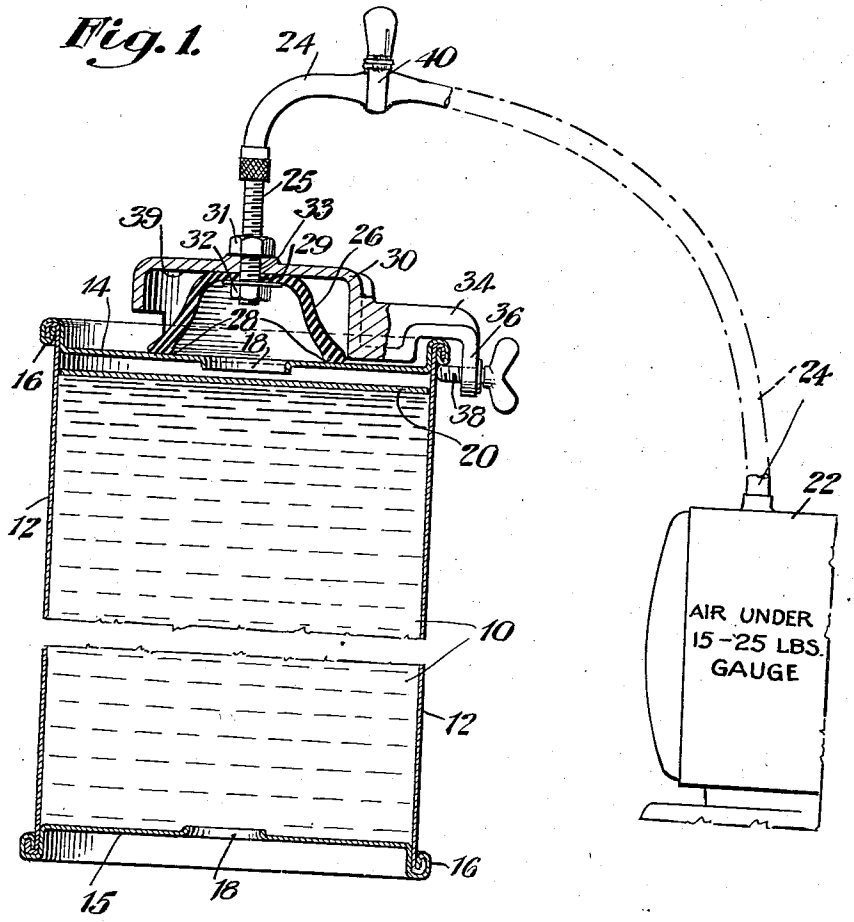
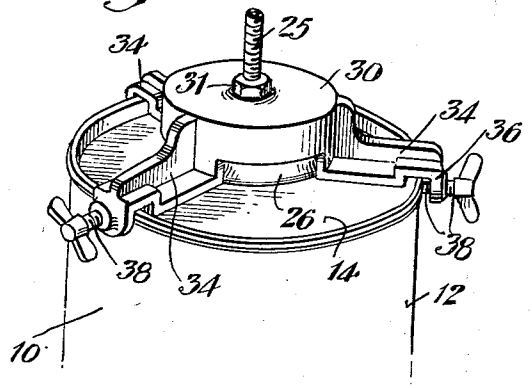


Fig. 2.



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Patented Nov. 4, 1941

2,261,834

UNITED STATES PATENT OFFICE

2,261,834

GREASE DISPENSING APPARATUS

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Application April 30, 1940, Serial No. 332,433

3 Claims. (Cl. 221—74)

This invention relates to apparatus for dispensing viscous semisolids, and more particularly to an improved apparatus for unloading grease from end-apertured grease cans.

Grease or other viscous semisolid is generally marketed in sealed cylindrical cans of light sheet metal from which the grease must be removed for the purpose of charging automatic dispensing equipment, such as high pressure grease guns. One method heretofore employed for unloading such cans has been to open the can at each end and then mount it vertically in a pressure chamber having a grease outlet nipple in its base aligned with the aperture in the bottom of the can. By then developing within the chamber a high superatmospheric pressure (usually above 100 lbs. per square inch), the grease is forced out of the can through the bottom outlet apertures of the can and chamber by exposing all parts of the can except the outlet aperture to the same high pressure.

A primary object of the present invention is to provide improved grease can-unloading apparatus which is economical in design and can be rapidly assembled or disassembled, whereby to apply air or other fluid under moderate pressure (15–25 lbs. per square inch) to the inside of the can only, for removing grease therefrom.

Since grease cans are commonly constructed of very light sheet metal, their side walls are frequently dented or deformed by rough handling during shipment, and such deformations interfere with or prevent the use of follower discs or pistons within the can during the grease unloading operation.

Another object of the present invention is to provide improved apparatus for applying moderate air pressure differentials between the interior and the exterior of a grease container whereby dents or deformations in the container walls are straightened out simultaneously with the can-unloading operation. An advantageous feature of the present can-unloading apparatus is that by its use grease cans originally equipped with removable plug closures for their end apertures may be unloaded without injury to or distortion of the can, thus permitting refilling and reuse of the can.

The invention has particular utility for unloading end-aperture grease cans of the type incorporating a follower disc inserted between the grease charge and that end aperture of the can through which pressure fluid is introduced for the purpose of unloading grease from the opposite end of the can.

With the aforementioned objects and features in view, the invention consists of the apparatus for dispensing viscous semisolids which is hereinafter described and more particularly defined by the accompanying claims.

The invention will be hereinafter described more particularly by reference to the attached drawing, in which Fig. 1 is a view in vertical section showing a grease can unloading apparatus embodying a preferred form of the invention; and Fig. 2 is a perspective view of the apparatus as it appears when clamped to a can to be unloaded.

Referring to the drawing, numeral 10 designates a cylindrical grease can or cartridge constructed of light sheet metal (for example 24 gauge) with straight cylindrical side walls 12 joined to ends 14, 15, (preferably recessed for stiffness) by outwardly rolled reinforcing ring joints 16. Each end of the can 10 is preferably provided with a central aperture 18 which is normally sealed by a friction plug closure (not shown). In the drawing the can 10 has been shown with the plug closures for the end apertures 18 removed, and with the grease-unloading apparatus coupled to the can preparatory to effecting removal of grease by application of air pressure.

A follower piston 20 is shown in the drawing as slidably mounted in can 10 between the grease and that end 14 of the can through which compressed air is introduced. Piston 20 is employed for the purpose of insuring complete displacement of the grease from the can through the can-unloading aperture 18 in end 15. The piston is dimensioned to form a close sliding fit within the can. For example, with a can of 9¼ inches inside diameter, the piston may have a diameter $\frac{1}{32}$ inch less than that of the can. The piston is normally a disc of about ⅛ inch–¼ inch thickness, and according to the present invention should be constructed of mechanically strong somewhat flexible material, so that the piston may have a specific gravity preferably less than one half that of the grease with which the can is charged. A preferred material for the construction of the piston is a corrugated paper having a bursting strength of about 200 lbs. per square inch and sufficient flexibility so that its edges will yield to pass any small dent or deformation in the wall of the can.

Air under moderate pressure of from 15 to 25 lbs. gauge may be conducted to end 14 of can 10 from a source 22, by a conduit 24. Conduit 24 has been illustrated as a flexible tube terminat-

ing adjacent the can in an externally threaded nipple 25. For the purpose of connecting the can 10 to the conduit 24 as an extension thereof, a tubular nozzle or reducing-coupling 26 of rubber or other flexible and resilient leakage-proof material is attached as an extension to the end of nipple 25. The coupling 26 has been illustrated in the drawing as shaped somewhat like the ordinary rubber suction cup. That end of the coupling 26 which is adapted to form a sealing engagement with the end 14 of the can 10 has a somewhat enlarged annular smooth face 28 having an internal diameter greater than the diameter of the end aperture 18 in the cam 10. An aperture 29 at the smaller end of coupling 26 is dimensioned to slip over the end of nipple 25 and to be affixed thereto by a pair of threaded nuts 31, 32.

For the purpose of clamping the annular face 28 of coupling 26 into coaxially aligned abutting relation with the end of the can 10 which surrounds the end aperture 18, a spider clamp 30 is provided having a central aperture 33 which slips over the end of nipple 25 just above coupling 26 and is held in that position by the nuts 31, 32. Clamp 30 is provided with radial clamp arms 34 having right angle extension lugs 36 at the ends thereof dimensioned to overhang an end ring joint 16 of can 10 and to center the coupling 26 with respect to the can end aperture. Each lug 36 of the spider arms carries an adjustable set screw 38 by means of which the spider can be centered on the can and then clamped in place under the ring joint 16. It will be appreciated that coupling 26 has a length slightly exceeding the distance separating the inner surface 39 of the spider from the end of the can 10 when the spider is in clamping position as illustrated.

When the operator desires to empty a can of grease, it need take him no more than a minute to pry open the plug closures for the end apertures 13, to slip the spider 30 and arms 34 into proper alignment over end 14 of the can, and to adjust the screws 38 to centering and clamping position with respect to the can rim joint 16. With the spider 30 in clamped position as shown in Fig. 1, the side walls of the rubber reducing-coupling 26 are placed under some compression strain forcing the flat annular end face 28 into tightly-abutting contact with the outside surface of the can end 14 around aperture 18. By opening a clamp valve 40 on air supply tube 24, the operator may now apply air pressure of 15–25# gauge to the inside of the can above the follower piston, and thereby unload the can through the aperture in end 15 without any loss of air pressure by leakage past the sealing contact between end 14 of the can and surface 28 of the rubber cup 26.

Having thus described the invention, what is claimed as new is:

1. A coupling adapted to connect an end-apertured cylindrical container to a pressure fluid supply conduit as an extension thereof, comprising a flexible reducing pipe-coupling having walls of resilient material and having one smooth annular end face dimensioned to encircle the container aperture and having its other end dimensioned to encircle the end of the conduit and form a sealed joint therewith, means for clamping the reducer to the conduit as an extension thereof, and means for clamping the conduit to the container with the reducer walls under compression strain and coaxially aligned with the container aperture and with its smooth end face in abutting sealed relation with the end of the container surrounding the container aperture.

2. Apparatus for unloading end-apertured cylindrical cans comprising a pressure fluid supply conduit, a detachable rubber nozzle with a mouth of greater diameter than one of the can apertures and with a smooth annular face, means for clamping the nozzle to the end of the conduit with the rear end of the nozzle as a sealing element for the joint, together with a clamping device adapted to couple the supply conduit and can together with the nozzle walls under some compression strain and substantially coaxially aligned with the can aperture and with the annular face of the nozzle mouth in tightly abutting air sealing relation to that portion of the end of the can immediately surrounding the aperture.

3. A coupling adapted for connecting an end-apertured cylindrical grease container to a pressure fluid supply conduit as an extension thereof, comprising a tubular rubber reducing-coupling having its small end clamped in fluid sealing relation to the free end of the conduit and having at its other end a smooth annular face dimensioned to encircle an end aperture of the container, and a spider clamp centrally attached to the conduit and having clamping arms dimensioned to overhang the container end and to couple the conduit and container together with the walls of the reducing-coupling under compression strain and coaxially aligned with the container end aperture and with the annular face in abutting leakage-tight relation with the end of the container surrounding said end aperture.

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