Nov. 20, 1934. C. G. BUTLER 1,981,495

FILLING DEVICE

Filed Feb. 17, 1934

Fig. 1.

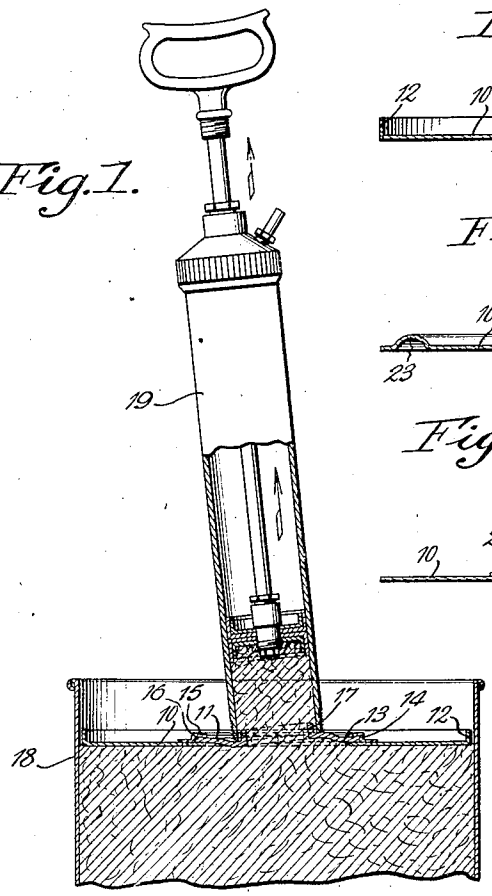


Fig. 3.

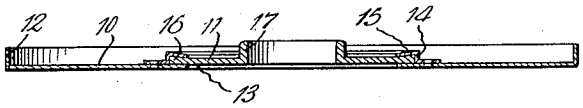


Fig. 4.

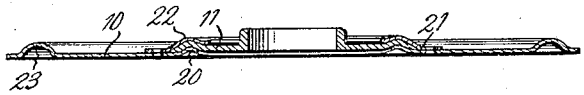


Fig. 5.

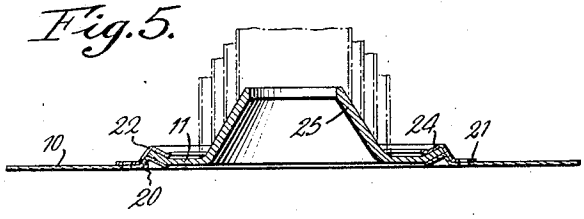


Fig. 6.

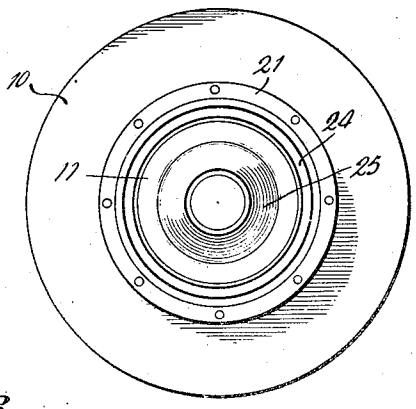
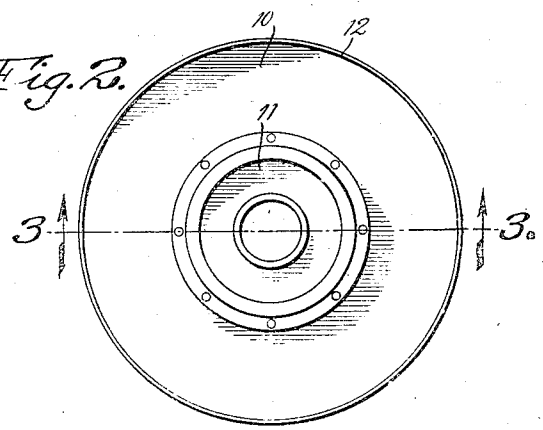


Fig. 2.



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UNITED STATES PATENT OFFICE

1,981,495

FILLING DEVICE

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Application February 17, 1934, Serial No. 711,678

7 Claims. (Cl. 221—47.5)

This invention relates to greasing equipment and is particularly directed to a filling device, to which, portable grease containers, to be loaded, can be applied for transferring grease or other tacky or viscous substances from an original or supply container. More particularly, the filling device of the present invention is adaptable for use in removing, from original containers, greases or other tacky substances of a character which are not liquid enough to flow to a common level.

As one example of the type of gun or pump for which the filling device of this invention can be utilized in filling operations, reference is made to the conventional small portable hand operated grease guns in current use today for lubricating automobiles. It has been the practice to fill these guns by unscrewing the forward head in each instance and plunging the forward end of the gun barrel into the bulk of grease as contained in the delivery or supply container. The greases ordinarily used are of the nature mentioned, that is, they are solid enough that they will not flow readily to maintain a common level. The operator after plunging the gun in the grease loads the same by pulling back on the follower plate or piston in the gun, thereby sucking in a quantity of grease sufficient to fill the gun. Repeated operations of this sort result in the formations of a multiplicity of pockets in the surface of the grease bulk. In order to keep the grease levelled off, it has been necessary to scrape down the sides of the original container from time to time to eliminate the pockets in the grease. Then too, there has been no way of regulating the depth to which the gun has been submerged or of properly utilizing, applying and timing the retraction of the follower plate or piston for a complete loading or filling operation. This method of filling has not only been extremely awkward and difficult to use and highly inefficient, but because of the viscosity of the grease has resulted in extreme untidiness in that the grease has gotten onto the hands of the operator and the exterior parts of the gun.

It is therefore the object of this invention to provide a filling device for use in removing or transferring grease from the original or shipping container, which filling device entirely eliminates the foregoing disadvantages in that: first, it levels the grease in the container and automatically and uniformly shears or cuts down the grease from the wall of the container, thereby eliminating the necessity for repeated hand performed levelling operations; second, it permits ready and convenient application thereto of the gun or pump which is being filled from an angle if desired; third, it enables the operator to expel all air from between the follower plate and the grease, and at the same time to perfect a seal so that the retraction of the following plate results in a complete filling of the gun or pump with grease; fourth, it receives a wide range of sizes of grease guns; and fifth, it accomplishes filling of the gun or pump without loss of grease or without accumulation of grease on the hands of the operator or the exterior parts of the gun.

In other words, the broad purpose of this invention is to provide a filling device which can be placed on top of the grease as it is contained in bulk, which device is effective as a medium for efficient removal of grease from the bulk as heretofore set forth. This device preferably comprises a plate having a contact or coupling portion cooperating with the gun or device to be filled.

Other objects and further advantages will be more fully apparent from a description of the accompanying drawing, in which:

Figure 1 is a general view showing the filler plate of this invention in use.

Figure 2 is a top plan view of the filler plate of this invention, showing it removed from the container.

Figure 3 is a sectional view taken on line 3—3, Fig. 2, detailing the construction of the flexible center of the filler plate.

Figure 4 is a sectional view taken similar to Figure 3, but illustrating a modified form of the plate.

Figure 5 is a view taken similar to Figure 2, illustrating a still further modification.

Figure 6 is a top plan view of Figure 5, detailing the modification shown therein.

The filling device herein disclosed, as one embodiment of the invention, comprises a plate fitting slidably within the container and adapted to lie flat against the top surface of the grease therein. A flexible contact disc or washer, preferably a washer, is mounted across a central opening in this plate, this flexible contact disc also lying against the top surface of the grease and including a central opening. The gun to be loaded is pressed against the inner flexible disc directly over the opening through the disc.

Referring to the drawing, the main body or large rigid circular plate is indicated at 10 in all views, and the central flexible disc at 11. A number of modifications are illustrated but in all forms the essential idea as expressed heretofore is embodied. Referring specifically to Figures 1 to

3, the circular plate element is provided with an upturned marginal flange 12. This flange strengthens the material about the opening. The central flexible disc element is of a diameter slightly larger than the diameter of the aperture 13 over which it is fitted so that a marginal engagement is established between the flexible element and the plate, that is to say, the flexible disc or plate lies upon the rigid plate. It is held in place thereon by means of a clamping ring 14 riveted to the rigid plate and including a flange 15 overhanging the margin of the flexible disc or collar.

The margin of the flexible disc or collar may be thickened, that is to say, may be tapered to a greater edge thickness as at 16 to provide an inwardly inclined edge portion. The overhanging flange 15 is correspondingly inclined so that wedge action is procured as the ring is secured in place, thus holding the same marginally against those strains tending to pull the flexible element from under the supporting flange of the ring when the gun to be loaded is pressed down on the flexible element. The flexible element includes a central opening defined by an upstanding circular flange or collar 17.

As shown in Figure 1, this circular filler plate structure is placed on top of the grease mass in the can, the can being indicated at 18. A typical gun is shown at 19. The conventional gun includes a head (not shown) which can be unscrewed from the forward end of the gun barrel. The head has been removed from the gun shown, and the open forward end of the barrel is placed against the top surface of the flexible disc telescopically over the upstanding circular flange 17 of the flexible disc. It will be apparent that as the operator pulls the follower plate or feed piston of the gun back into the gun, suction is created forming a seal between the circular end edge of the gun and the flexible disc, the flexible disc readily fitting to any irregularity in the end of the gun.

As the piston is drawn back in the gun in the loading operation, the grease is forced into the gun in front of the piston under the influence of atmospheric pressure on the top of the filler plate or because of the vacuum created in the gun as the piston moves back. The filler plate will adhere to the top of the grease and will move down in the can as the grease is used.

In Figure 4, a slight modification of the preceding form is shown. The only differences in this construction are as follows: The margin of the rigid plate about the central opening thereof is pressed upwardly to form a circular bead 20. The margin of the flexible disc lies upon this bead or ridge and is held thereon by means of a clamping ring 21 also having a bead or ridge 22 adjacent that of the rigid plate but somewhat larger. This overlies and clamps the margin of the flexible disc against the bead of the rigid plate and effectively prevents displacement of the disc as the gun is forced into sealing engagement with the flexible element.

For the purpose of strength, the outer margin of the flexible rigid plate incorporates a relatively large annular bead or reinforcing ridge 23.

In the modification shown in Figure 6, the beads 20, 22, of the clamping ring and the rigid plate are more angular. In this case the margin of the flexible disc is inclined upwardly between the adjacent inwardly downwardly inclined flanges 24 of the rigid plate and the clamping ring. The flexible element is more in the nature of a tapered sleeve in this form. The central passageway is formed by an upstanding sleeve portion 25 tapered inwardly to its top to provide a discharge end of a diameter less than the inner diameter of the smallest grease gun barrel to be loaded. The outer inclined wall of this sleeve portion provides for contact with gun barrels of different diameters, the gun barrel being fitted thereon in each instance as shown in dot and dash lines in Figure 5. All forms of the device shown provide for loading gun barrels of various sizes, the last mentioned form being shown as another expedient for producing the same result. It will be apparent in the device of Figure 3 that the space between the upturned flange and the point of attachment of the flexible disc is sufficient for enabling sealing contact with a wide range of gun barrel sizes.

Referring to Figure 1, it will be noted that the gun can make sealed contact with the filling plate at an angle. This eliminates the necessity for an accurate directional application of the gun to the filling device. The flexibility of the disc provides for a perfect seal, even when the engagement or contact is made angularly. This is important since it occurs sometimes that the plate becomes tilted on the top of the grease and the closer the plate is to the bottom of the tank the more inconvenient it would be to apply the gun thereto if it were not for the fact that the gun can be applied angularly relative to the plate.

In applying the open ended gun to the device, the operator can force all air from between the piston and the grease by pushing down on the piston and on the gun. This pushes the flexible disc into the bulk of grease and the piston coming down comes in direct contact with the grease, thereby expelling the air from between the gun end and the disc. Immediately upon the start of the retraction or suction stroke, a perfect seal is established and a full charge of grease can be drawn into the gun as shown on the drawing.

Having described my invention, I claim:

1. A filling device adapted for use on the top of a grease mass in a container for filling hand operated grease guns of the type having barrels with removable heads; comprising a flat follower plate having a central flexible portion adapted to be engaged by the open end of a barrel to be filled, said central flexible portion having a central passageway.

2. A filling device adapted for use on the top of a grease mass in a container for filling hand operated grease guns of the type having barrels with removable heads, comprising, a flat plate fitting loosely in the container and having a central flexible portion secured therein, said central flexible portion including an upwardly inwardly inclined sleeve portion therein defining a central passageway and providing an exterior surface of varying diameter for contact with gun barrels of different diameters.

3. A filling device, comprising, a rigid plate, said plate having a central aperture therein, a flexible disc mounted over said aperture, and a clamping ring for securing said disc in position on said plate, said disc having a central passageway and an upstanding circular flange about said central passageway.

4. A filling device adapted to rest on the top surface of grease as contained in the original shipping container, comprising, a circular plate slidably fitted in the container and against the top surface of the grease, an apertured flexible

diaphragm in the plate for cooperating with the open end of a receptacle to be filled for permitting filling of the receptacle by suction created in the receptacle.

5. A filling device for use against the top surface of grease contained in bulk, comprising, a circular plate adapted to fit on the top surface of the grease, an apertured flexible diaphragm in the plate adapted to be contacted by the open end of a receptacle to be filled, said flexible diaphragm permitting filling connection angularly relative to the plate and adaptable for permitting filling of the receptacle by suction created in the receptacle.

6. A filling device, comprising, a rigid plate, said plate having a central opening therein, a flexible apertured diaphragm mounted over said opening and engageable by the open end of a receptacle to be filled, and a clamping ring for securing said flexible diaphragm in position.

7. A filling device of the class described, comprising, a rigid plate having a central aperture, a flexible disc having a central aperture and disposed over the opening of said plate, and a clamping ring secured to the plate, clamping the margin of the disc against the margin of the opening of the plate, said ring and margin of the plate having ridges therein for wedging the margin of the disc for a secure attachment.

CLYDE G. BUTLER.