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R. RAPELLIN

1,905,569

GREASE GUN

Filed Dec. 9, 1931

FIG. 1.

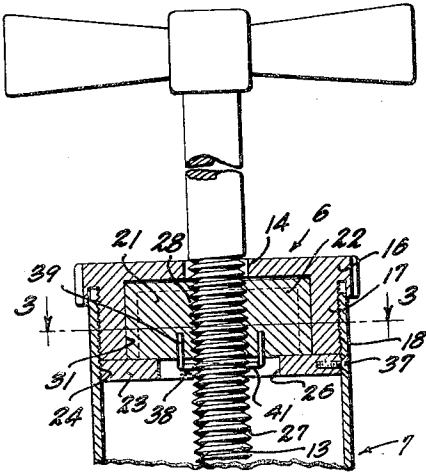
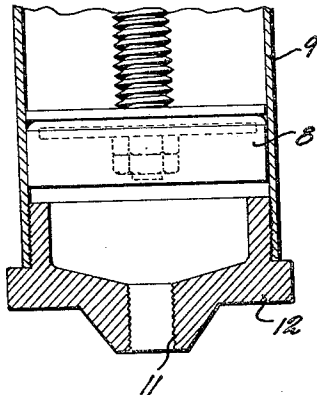


FIG. 2.

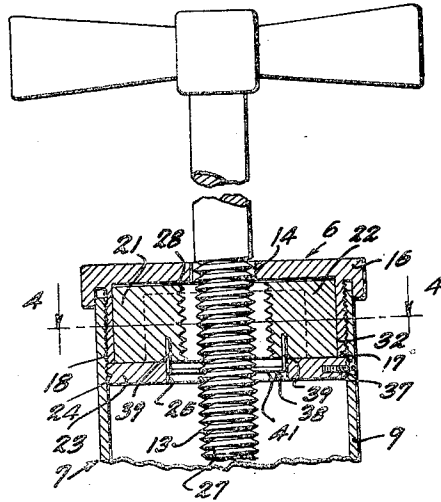


FIG. 4.

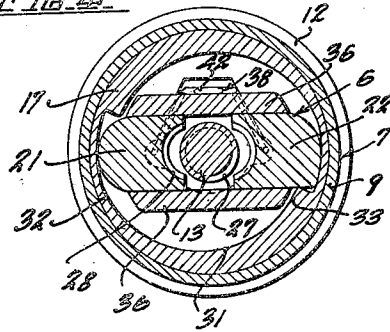


FIG. 6.

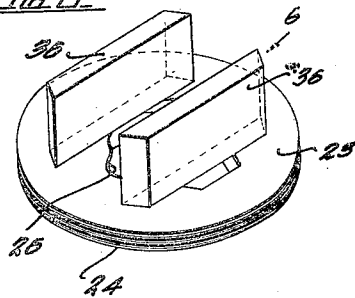
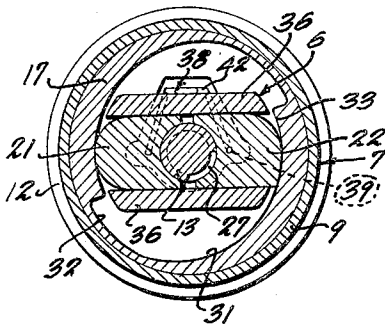


FIG. 3.



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GREASE GUN

Application filed December 9, 1931. Serial No. 579,882.

This invention relates to feeding mechanisms, and more particularly to quick-return feeding mechanisms wherein one machine part may be advanced with respect to the other through the expedient of a threaded interengagement therebetween which is capable of being released to permit quick return of the parts to their initial relative position.

An object of the invention is the provision of a feeding mechanism, which, while being capable of practically universal application, is particularly designed as means for forcibly advancing a plunger in a cylinder to eject the fluid or semifluid contents of the cylinder, such construction being commonly known as a "grease gun." Accordingly, the device of the present invention constitutes an improvement over those of my prior Patents No. 1,724,616 and No. 1,724,617 issued August 13, 1929, and No. 1,810,426 issued June 16, 1931.

A more detailed object of the present invention is to provide a quick-release feeding mechanism of improved design, comprising one or more threaded members which may optionally be advanced into engagement with the feed screw of the grease gun or retracted therefrom, and means carried by the closure cap for the upper end of the barrel of the grease gun for advancing the threaded member or members to the screw by rotation of the closure cap.

Another object is to provide feeding mechanism of the general class indicated, wherein all the operative parts whereby the threaded members are advanced and retracted, are contained inside the upper end of the barrel, thereby avoiding the necessity of providing apertures in the barrel through which the operating parts may extend and which are apt to permit leakage of the grease from the interior of the gun, and also providing a substantially smooth exterior surface on the entire grease gun.

A further object is to materially simplify the construction and to decrease the cost of manufacture of the grease gun without impairing its efficiency in any way.

The invention possesses other objects and

advantageous features, some of which, with those enumerated, will be set forth in the following description of the invention's particular embodiment which is illustrated in the drawing accompanying and forming a part of the specification.

Referring to the drawing:

Fig. 1 is a longitudinal medial sectional view of a grease gun provided with feeding mechanism embodying the principles of the present invention. Portions of the figure are broken away to reduce its size, and the feeding mechanism is shown with the threaded members engaging the feed screw.

Fig. 2 is a view similar to Fig. 1, but showing the threaded members retracted from engagement with the feed screw.

Fig. 3 is a transverse sectional view taken upon the line 3—3 of Fig. 1, with the direction of view as indicated, showing the threaded members engaged.

Fig. 4 is a horizontal sectional view taken upon the line 4—4 of Fig. 2, with the direction of view as indicated, and showing the threaded members disengaged.

Fig. 5 is a perspective view of the guide upon which the threaded members are slidably mounted.

Broadly considered, the device of the present invention comprises a feed screw longitudinally slidable with respect to a suitable guide, and preferably a plurality of threaded members or split nut sections slidably mounted upon the guide for movement toward or away from the feed screw to permit the nut parts optionally to be engaged therewith or disengaged therefrom. A rotatable member encircles the feeding screw, and is provided with a flange enclosing the nut sections and having a cam surface whereby the nut sections may be advanced into threaded engagement with the feed screw by turning the said rotatable member. Hence, when the feeding mechanism of the present invention is embodied in a grease gun, this rotatable member may conveniently be employed as the closure cap for the upper end of the barrel.

More specifically described, the feeding mechanism of the present invention is indi-

cated in its entirety at 6, and is embodied in a grease gun 7, being employed therein as means for forcibly advancing a plunger 8 within a barrel 9 to eject the liquid or semiliquid contents of the barrel through a discharge orifice 11 in the lower closure cap 12 of the barrel 9. The plunger 8 is carried by a threaded shaft or feed screw 13 which is disposed coaxially of the barrel 9 and extends slidably and rotatably through a hole 14 in a cap 16 which serves as the closure for the upper end of the barrel 9.

The cap 16 is provided with an annular flange 17 which is threaded exteriorly and complementarily to threads 18 formed on the interior surface of the barrel 9 adjacent the upper end thereof, thereby permitting the cap 16 to be mounted in the upper end of the barrel. However, when in operative position, the cap 16 is not tightened against the end of the barrel, but is merely threaded into the barrel far enough to insure a sufficiently tight joint between the cap and the barrel but to permit turning the cap with respect to the barrel through substantially a quarter turn, so as to effect adjustment of the split nut sections 21 and 22, as will be described hereinbelow.

The nut sections 21 and 22 are preferably in the form of blocks or other suitably shaped members slidably mounted upon a guide plate or disk 23 having threads 24 on its peripheral edge adapted to be engaged with the interior threads 18 of the barrel 9 below the cap 16, i. e., the guide plate 23 is threaded into the barrel before the cap 16. The guide 23 is provided with a central aperture 26, through which the stem or feed screw 13 extends, and this aperture 26 is considerably larger than the stem 13, so that the stem is freely reciprocable and rotatable with respect to the guide 23.

The stem 13 is provided with threads 27, and complementary threads 28 are formed on the proximal faces of the blocks or split nut sections 21 and 22. These blocks 21 and 22 are adapted to be slid radially inwards, so that their threads 28 are brought into engagement with the threads 27 of the stem 13 upon rotation of the upper closure cap 16. To this end the flange 17 of the cap 16 is provided with a cam surface 31 upon its inner face for each of the blocks 21, 22. Each cam 31 extends for a distance of half a circle. The parts are so proportioned and arranged that when the blocks 21 and 22 are engaged by the low portions 32 of the cam surfaces 31, i. e., the portions of greatest radial distance from the stem 13, the blocks 21 and 22 are withdrawn from the stem 13, as illustrated upon Fig. 4, whereas the blocks 21 and 22 are forced radially inwards so that their threads 28 engage the threads 27 of the stem 13 when the blocks are engaged by the high points 33 of the

cam surfaces 31, i. e., when the blocks are engaged by those portions of the cam surfaces which are at the least radial distance from the stem, as illustrated upon Fig. 3. Each of the cam surfaces 31 slopes gradually from the low point 32 to the high point 33, so that the blocks may be forced radially inwards by turning the cap 16 half a revolution with respect to the barrel 9. The blocks 21 and 22 are prevented from turning with the cap 16 by means of a pair of spaced upstanding guides 36, consisting of two blocks having plane vertical inner faces parallel to each other and carried by the plate 23, which is secured to the barrel 9 by any suitable means such as a locking screw 37, which holds the plate 23, guides 36, and blocks 21 and 22 from turning with respect to the barrel.

The blocks 21 and 22 are continually urged outwards into contact with the cam surfaces 31 by means of a spring 38, each end 39 of which engages the under surface of one of the blocks 21, 22. From the ends 39 horizontal portions 41 of the spring 38 extend transversely with respect to the blocks, to one side of the stem 13, and within the aperture 26 of the plate 23. These horizontal sections 41 are connected integrally by an inverted, V-shaped portion 42 of the spring, which extends upwards from the aperture 26 along the outer face of one of the guides 36, as best shown upon Figs. 3 and 4, thereby presenting a portion of the spring 38 which is accessible exteriorly of the grease gun after the plate 23 and blocks 21 and 22 have been inserted into the barrel 9, and before the cap 16 has been placed in position. Thus it is possible to assemble the device with the spring 38 properly connected to the blocks 21 and 22.

By turning the cap 16 half a revolution in the other direction so as to bring the low points 32 of the cam surfaces 31 into engagement with the blocks 21 and 22, the spring 38 is permitted to move the blocks outwards away from the stem, whereupon the stem may be freely reciprocated, causing the plunger 8 to move longitudinally within the barrel 9. This is the way in which the grease gun should be used when handling relatively fluid substances such as liquids. However, when heavier substances are being employed, such as cup grease, the cap 16 should be turned to bring the high points 33 of the cam surfaces 31 into engagement with the blocks 21 and 22, thereby causing the blocks to be forced inwards against the action of the spring 38 and into threaded engagement with the stem 13. Thereupon, the plunger 8 may be moved longitudinally of the barrel 9 by rotating the stem, thereby developing a mechanical advantage which permits pressing the plunger 8 against the contents of the barrel 9 with

great force, although relatively little force is needed to rotate the stem 13.

It will be observed that the device of the present invention differs from those disclosed in my aforesaid patents, inasmuch as the threaded members and the operating mechanism therefor, are contained entirely within the barrel 9 and upper closure cap 16. This avoids the necessity of providing any protruding portions on the exterior surface of the barrel, which makes the grease gun much easier to handle and much less liable to become damaged through rough handling. Furthermore, the device of the present application is considerably less expensive than one of more complicated construction.

It is to be understood that the details of the invention as herein disclosed, are subject to alteration within the spirit or scope of the appended claims.

I claim:

1. In a device of the class described, a tubular barrel, a closure cap mounted adjacent one end of said barrel and rotatable with respect thereto, a feed screw extending slidably and rotatably through said cap, a pair of spaced guides rigid with said barrel and having opposed faces parallel to each other, a pair of threaded members slidable between said guides, an annular flange carried by said cap and having a pair of cams on its inner face engaging said threaded members, each cam extending a distance of half a circle, said cam surfaces being adapted to advance said members to said screw when said cap is turned half a revolution in one direction, and spring means for moving said members away from said screw when said cap is turned a half revolution in the other direction.

2. In a device of the class described, a tubular barrel, a closure cap mounted adjacent one end of said barrel and rotatable with respect thereto, a feed screw extending slidably and rotatably through said cap, a guide rigid with said barrel, a pair of threaded members slidable upon said guide, an annular flange carried by said cap and having a pair of cams on its inner face engaging said threaded members, each cam extending a distance of half a circle, said cam surfaces being adapted to advance said members to engage said screw when said cap is turned half a revolution in one direction and spring means for moving said members away from said screw when said cap is turned a half revolution in the other direction.

In testimony whereof I have signed my name to this specification.

RENÉ RAPELLIN.