METHOD OF LOADING A HAND GREASE GUN WITH A GREASE CARTRIDGE

Filed Aug. 13, 1965

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METHOD OF LOADING A HAND GREASE GUN
WITH A GREASE CARTRIDGE

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Filed Aug. 13, 1965, Ser. No. 679,059

3 Claims. (Cl. 222—260)

This application is a continuation-in-part of my co-pending application Ser. No. 444,156, filed Mar. 31, 1965, for "Axially-Operated Grease Gun," now U.S. Patent No. 3,300,100. While adapted for use with the grease gun described in said application, the method claimed herein is not limited to use with any specific type of grease-dispensing mechanism.

This invention relates to a method of loading a hand grease gun with a grease cartridge. The method is adapted for use with most kinds of cartridge-loading hand grease guns, which provide a cylindrical barrel for receiving the grease cartridge, a spring-urged plunger assembly within the barrel, and a detachable front cap.

Hand grease guns of the lever-operated or pistol grip types are widely sold and used in the United States. The older practice was to load such hand grease guns from a bulk-source of grease, using either pressure or suction to force the grease into the barrel during loading, or, in some cases, using hand packing of the barrel. More recently, the practice has developed of using cartridge-packed greases. Many users routinely employ cartridge-packed greases, and the loading of hand grease guns with grease cartridge is probably the loading procedure of choice for most present day users, except for special greases which may not be available in cartridges.

Therefore, there has been only one generally employed loading procedure for cartridge-packed greases. In introducing a cartridge into the grease gun, the front end cap is removed, and the plunger assembly is manually withdrawn by means of the external plunger rod handle which is provided with a locking means for holding the plunger assembly in a retracted position in the rearward portion of the barrel. The rear and front end caps are then removed from the grease cartridge, and the grease cartridge is fully inserted in the barrel before replacing the front end cap. At times, this procedure may prove both inconvenient and messy. The insertion of the grease cartridge with the front end cap removed may result in grease moving outwardly through the opening in the front end of the cartridge before the front end cap has been replaced and secured to the barrel. There is also the danger that the operating rod may become disengaged from its locked position, which will cause the plunger assembly to be thrust forwardly under the action of the spring. When this occurs, grease will almost certainly be forced out of the front end of the cartridge, with resultant inconvenience and discomfort to the person loading the gun. The grease may get on the hands and clothing of the person loading the gun, or on the exterior of the front cap or gun barrel so as to soil the hands or clothing of the person using the gun at a later time.

It is, therefore, a general object of the present invention to provide a novel method of loading a grease cartridge to substantially overcome the above problems and difficulties, while at the same time making possible a better and less expensive construction for the grease gun. More specifically, it is an object to provide a method of loading a hand grease gun with a grease cartridge which positively prevents the escape of grease from the open front end of the cartridge while it is being inserted, and which makes the gun faster and more convenient to load. Another object is to provide a method of the character described which can be used with a grease gun where the plunger is at a forward position at the beginning of the cartridge insertion, and in which means is provided for retracting the plunger assembly while locking it in retracted position. Further objects and advantages will be indicated in the following detailed specification.

The method of this invention is illustrated by the accompanying drawings, wherein—

FIGURE 1 is a side elevational view of a grease gun with which the method of this invention may be employed;
FIG. 2 is an enlarged side sectional view of the front portion of the grease gun of FIG. 1, showing the first step in loading a grease cartridge by the method of this invention;
FIG. 3 is an enlarged side sectional view of the rearward portion of the same grease gun showing the completion of the cartridge loading; and
FIGS. 4 to 6 are perspective views illustrating the steps in loading the grease gun.

Before describing the method of this invention, it is desired to point out the general constructional features of the grease gun shown in the drawings, which is illustrative of the kind of hand grease guns with which the method may be employed. The details of construction of the illustrated grease gun are set forth more fully in the cited application, Ser. No. 444,156. However, the general constructional features will be summarized herein for the purpose of clarifying the environment within which the method is employed.

The illustrated grease gun includes a cylindrical barrel 10 having an open front end 11 (FIG. 2), a detachable front cap 12 for closing the front end 11, a plunger assembly 13 within barrel 10 which is movable from a position at the rear of said barrel, as shown in FIG. 3, to a forward position adjacent the front end thereof, as shown in FIG. 2. In the illustration given, and preferably, the forward end portion of barrel 10 adjacent front end 11 is provided with an externally threaded portion 14. The cap 12 has a rearward cylindrical portion 15 which is provided with internal threads 16 for cooperation with the barrel threads 14 to permit the removal and attachment of the cap.

The plunger assembly 13 includes piston means 17 for sealingly engaging the inside of the grease cartridge 18. In the illustration given, the piston means 17 is formed of a flexible, resilient material, such as grease-resistant synthetic rubber, and is constructed so that it will form a sealing engagement at the reduced diameter of the inside of cartridge 18 or at the expanded diameter of the inside of the barrel 10, thereby making the gun selectively usable with either cartridge-packed greases or bulk-packed greases. The grease gun also includes a compression spring 19 for urging the plunger assembly 13 forwardly in the barrel while permitting the plunger assembly to retract to a rearward position where the method of this invention may be employed with grease guns which provide external means for retracting the plunger assembly, the method may advantageously be employed with grease guns such as the one illustrated in the drawings, where no means is provided for retracting the plunger assembly when front end 11 is closed with cap 12 in place. For this reason, the method is particularly adapted for use with axial-operated grease guns of the type shown where the operating handles, such as fixed handle 20 and movable handle 21, are mounted on rear cap 22, which may be permanently attached to the rear portion of barrel 10, as shown more clearly in FIG. 3. The details of the operating mechanism are described more fully in application Ser. No. 444,156, but since the particular operating mechanism is not essential to the present invention or an understanding thereof, further description is omitted.
In general terms, however, the handles 20 and 21 are employed for imparting a reciprocating motion to the actuating rod 23 which has a piston 24 mounted on the forward end thereof for reciprocating within a piston guide 25 and a high pressure cylinder 26, the grease being admitted to high pressure cylinder 26 through inlet ports 27, and being discharged from the cylinder through the valve port 29 to the grease applicator pipe 29 and the grease fitting connector 30.

There is a further element of the grease gun which is of importance in performing the method of this invention. This is the sealing gasket means 31, as shown in Fig. 2, which is mounted within front cap 12 at the forward end of cylindrical portion 15 and internal threads 16. As shown in Fig. 2, the gasket means 31, which may be formed of a grease-resistant, resilient material such as synthetic rubber, includes an outer annular portion 32 for sealingly engaging the front end of barrel wall 10, and an inner portion 33 for sealingly engaging the cap mounting rim 34 of the cartridge 18. The inner portion 33 of the gasket may advantageously provide a rearwardly-extending annular lip 35 to more effectively engage the cap mounting rim 34.

As shown in Figs. 2 and 3, the grease cartridge includes a rear container 18 which is receivable within barrel 10 and has an open rear end 35 (Fig. 3). During shipment and storage of the grease containers, the end 35 will have a slip-on cover applied thereto, which is removed prior to the insertion of the grease cartridge. Usually, the grease cartridge will be filled with grease G, and the grease will extend from the front end of the cartridge for most of the length of the cartridge, except that a rearward portion adjacent the open rear end 35 will normally be left open or unfilled to permit the grease to expand. The plunger assembly may be inserted in the cartridge end 35 as shown in Fig. 3. If in the shipping, storage, or handling of the cartridges, the grease is moved into the rearward portion of the cartridge, the plunger will be effective to move the grease forwardly as it is inserted within the rear end of the cartridge. Moreover, the provision of an unfilled portion at the rear of the cartridge is not essential.

In the illustration given, the front end of cartridge 18 is provided with a cap mounting rim 34 which has its outer peripheral edge portion crimped to the front end portion of the cartridge at 37, and includes an inwardly extending annular flange 38 which surrounds a central groove 39. During the distribution and storage of the grease cartridges, a lid or closure is received within opening 39, but this lid is removed before insertion of the grease cartridge.

In the illustration given, the portion of rim flange 38 adjacent the wall of cartridge 18 provides an annular recess 40. When the cap mounting rim includes a recess such as the recess 40, the gasket means lip 35 may advantageously be positioned and arranged to enter the recess and seal therein against the rim. However, the inclusion of a recess such as the recess 40 on the rim is not essential for the purpose of the present invention.

The method of the present invention will now be described. For the insertion of a grease cartridge, such as the cartridge 18, the front cap 12 is removed, and the plunger assembly 13 is permitted to move to a forward position, as shown in Fig. 2. In the illustration given, the forwardmost portion of the plunger assembly 13 is determined by the point at which the plunger assembly contacts the rearward portion of the piston 22, the rearward portion of the piston acting as a stop for the plunger assembly. Consequently, the plunger assembly is set in its forwardmost position in Fig. 2.

For best results, it is desirable that the forwardmost position of the plunger assembly be still within the barrel 10, or at least that the sealing means, such as the piston 17, be retained within the forward end of the barrel. It will be understood that spring 19 urges the plunger assembly 13 toward the forward position in the barrel 10.

The grease cartridge 18 has been prepared for insertion by removing the rear end cover and the front lid, leaving the cap mounting rim attached to the front end of the cover, as illustrated in Fig. 2. The rearward portion of the cartridge 18 is then inserted into the front end portion of the cylinder 10, and preferably plunger assembly 13 is at least partially inserted within the cartridge rearward portion. The plunger 17 when inserted within the rearward portion of the cartridge sealingly engages the inside of the cartridge while being in contact with the grease contained in the cartridge forwardly of the sealing engagement. The desired relationship is illustrated in Fig. 2. In this position, the rest of the cartridge 18 will project outwardly beyond the front end of the barrel, as also shown in Figs. 2 and 4. It will be understood that cartridge 18 normally has a length corresponding substantially with that of the barrel 10, so that when fully inserted, it extends from the front end of the barrel substantially to the rear thereof.

As a further step in the method, which may be performed either prior to, simultaneously with, or subsequent to, the initial insertion of the cartridge within the front of the grease container, the front cap 12 is placed over the projecting front end portion of the cartridge. In this position, as shown in Figs. 2 and 5, the cylindrical portion 15 of the cap will extend toward the barrel front end, and the inner gasket portion 33, or, more particularly in the illustration given, the sealing lip 35, will sealingly engage the front of the cap mounting rim 34. For example, one hand may be used to hold the barrel 10, while the other may be used to make the initial insertion of the rear end of the grease cartridge within the forward portion of the barrel, and then one hand may be used to continue to hold the barrel 10 while the other is used to hold cap 12 and apply it to the forward end of the grease cartridge, pressing the gasket means 31 into sealing engagement against the cap mounting rim 34.

The insertion of the cartridge is then continued by forcing the cap 12 toward the barrel front end and at the same time causing the plunger assembly 13 to move toward a rearward position as the cartridge 18 moves into barrel 10, while maintaining a sealing engagement between the gasket 31 and the cap rim 34. In this step, one hand can be used to hold barrel 10, while the other hand is used to hold cap 12 and apply force thereto to insert the cartridge within the barrel by moving the cap toward the front end of the barrel, as described. During this inserting operation, as shown in Figs. 2 and 5, the cylindrical portion 15 of the cap will extend toward the forward end of the barrel, as described. During this inserting operation, as shown in Figs. 2 and 5, the cylindrical portion 15 of the cap will extend toward the forward end of the barrel, as described.

The insertion of the cartridge is continued by the means just described until cap threads 16 begin to engage the barrel threads 14, as indicated in Fig. 6. The insertion is then completed by screwing cap 12 onto the barrel until the front end of the barrel sealingly engages the outer portion 32 of the gasket means. In this operation, one hand can continue to be used to hold the barrel 10, while the other hand is used to rotate cap 12 as the threads 14 of the cylindrical portion 15 are run onto the threads 16 of the barrel.

On the completion of the insertion of the cartridge, the rear end portion of the grease gun will appear as shown in Figs. 3 and 6. The plunger assembly 13 will be within the rear end portion of the cartridge and the barrel wall will extend to a rearward position in the grease container. In the illustration given, the wall of cartridge 18 extends completely to the rear cap 22, fastening around the outside of a piston stop 41, which includes an annular lip 42 for engaging the rearward end of sealing member 17. An air vent 43 is provided in rear cap 22 to prevent suction or pressure from being developed within the rearward portion of container 10 during the insertion or removal of the grease cartridges.
While, in the foregoing specification, the method of this invention has been described in relation to a particular grease gun, it will be apparent to those skilled in the art that the method is adaptable generally to hand-operated grease guns, and that many of the details described herein can be varied considerably without departing from the basic principles of the invention.

I claim:

1. The method of loading a hand grease gun with a grease-containing cartridge, said grease gun including a cylindrical barrel having an open front end, a detachable front cap for closing said end, a plunger assembly within said barrel movable from a position at the rear of said barrel to a forward position adjacent the said front end thereof, said grease cartridge including a tubular container receivable within said barrel and having an open rear end through which said plunger assembly can be inserted, and the front end portion of said cartridge extending around an opening for the discharge of grease, said grease gun also being provided with a sealing gasket means mounted within said front cap, said gasket means including an annular portion for sealingly engaging said cartridge front end portion around said discharge opening, characterized by the steps of:

(a) removing said front cap preparatory to the insertion of said grease cartridge and permitting said plunger assembly to move to a forward position;
(b) inserting the forward portion of said cartridge into the front end portion of said cylinder with said plunger assembly aligned with said cartridge open rear end for insertion therein;
(c) applying said front cap over the projecting front end portion of said cartridge, said annular portion of said gasket means sealingly engaging said front end portion of said cartridge around said opening; and
(d) inserting said cartridge by forcing said barrel cap toward said barrel front end to cause said plunger assembly to move toward a rearward position, said cartridge moving into said barrel and receiving said plunger assembly while maintaining the said sealing engagement betweensaid gasket annular portion and cartridge front end portion.

2. The method of loading a hand grease gun with a grease-containing cartridge, said grease gun including a cylindrical barrel having an open front end with an externally threaded portion adjacent thereto, a cup-shaped front cap for closing said barrel movable from a position at the rear of said barrel to a forward position adjacent the said front end thereof, said grease cartridge including a tubular container receivable within said barrel and having an open rear end through which said plunger assembly can be inserted, said container being filled with grease except for a rearward portion adjacent said open rear end, and a cap mounting rim attached to the front end of said cartridge, said rim having a central grease outlet opening, said grease gun also being provided with sealing gasket means mounted within said barrel front cap at the forward end of the internally threaded portion thereof, said gasket means including an annular portion for sealingly engaging said cap mounting rim around said opening, characterized by the steps of:

(a) removing said barrel front cap preparatory to the insertion of a grease cartridge and permitting said plunger assembly to move to a forward position adjacent the open front end of said barrel;
(b) inserting the rearward portion of said cartridge into the front end portion of said cylinder with said plunger assembly at least partially inserted within said cartridge rearward portion,
(c) applying said barrel front cap over the projecting front end portion of said cartridge with the cylindrical portion of said cap extending toward the barrel front end, said annular portion of said gasket means sealingly engaging said cap mounting rim;
(d) continuing the insertion of said cartridge by forcing said barrel cap toward said barrel front end to cause said plunger assembly to move toward its rearward position as said cartridge moves into said barrel while maintaining the said sealing engagement between said gasket annular portion and said cap rim; and
(e) completing the insertion of said cartridge by screwing the said cylindrical portion of said cap onto the said barrel threaded portion.
ing said barrel cap toward said barrel front end to
cause said plunger assembly to move toward its
rearward position as said cartridge moves into said
barrel while maintaining the said sealing engagement
between said gasket annular portion and said cap
rim; and
(c) completing the insertion of said cartridge by screw-
ing the said cylindrical portion of said cap onto the
said barrel threaded portion to fixedly retain the said
sealing engagement around said central opening.

No references cited.

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