

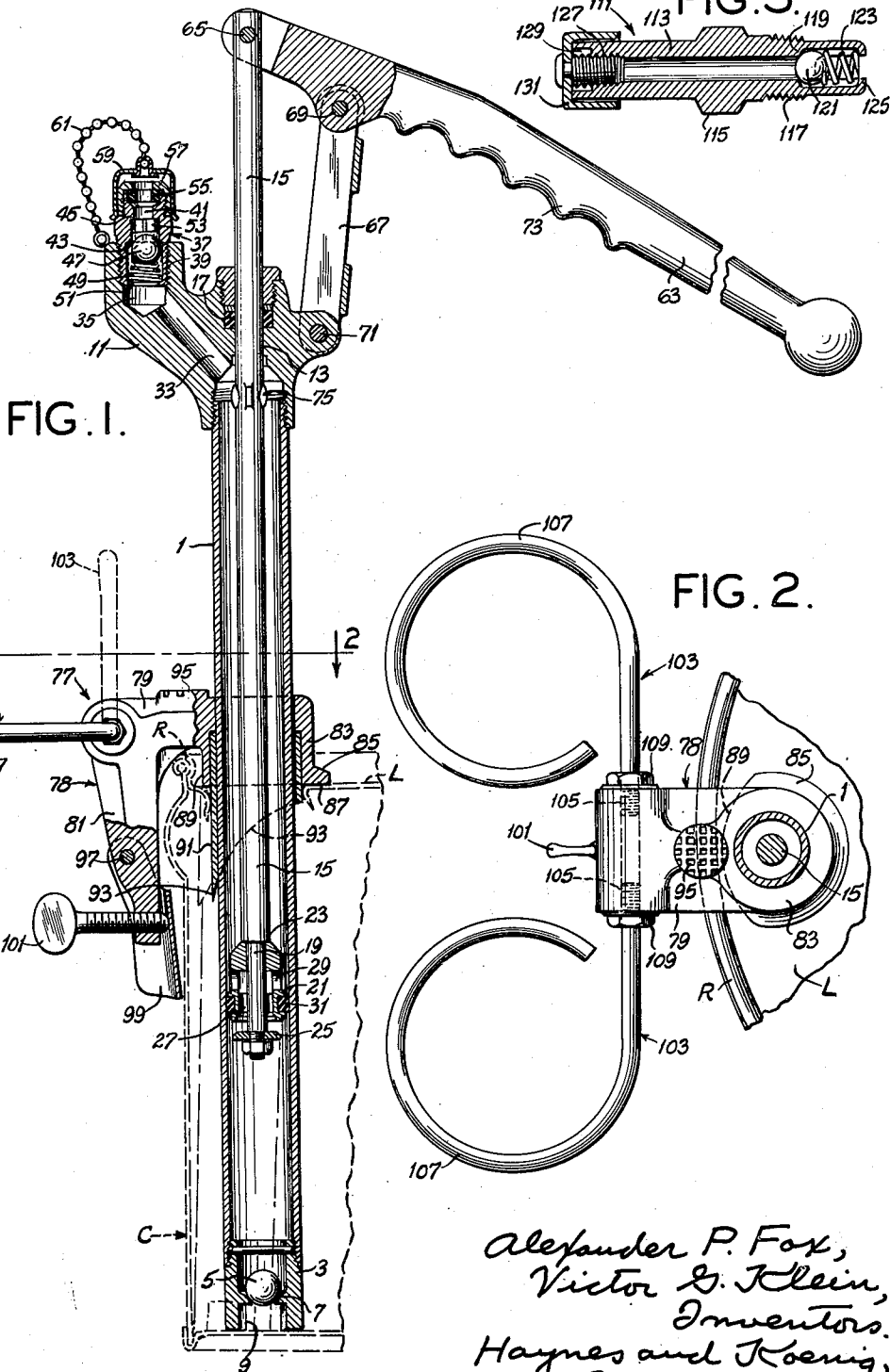
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LANCE TYPE PUMP MOUNTING

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LANCE TYPE PUMP MOUNTING

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1 Claim. (Cl. 222-82)

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This invention relates to lance-type pump mountings and, more particularly, to mountings for such pumps adapted for attachment to commercial lubricant containers, for pumping lubricant therefrom.

The principal object of the invention is to provide an improved lance-type pump mounting to facilitate the installation of the pump on a lubricant container without removing the container lid. To provide for quick and convenient installation, without any special tools, fasteners or fittings, there is provided a tubular cutter adapted to pierce a hole in the lid of a container and adapted slidably to receive the pump cylinder or tube of a special lance-type pump so that, when the lid has been pierced, the pump tube will easily slide down through the cutter into the container. After the cutter has been driven, it serves as a support for the pump. A clamp serves to maintain an assembly of the pump and container, so that the latter may be carried about by the former. Other features will be in part apparent and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structures hereinafter described, and the scope of the application of which will be indicated in the following claim:

In the accompanying drawing, in which one of various possible embodiments of the invention is illustrated,

Fig. 1 is a view in elevation, partly in section, of a lance-type pump and a mounting therefor embodying the invention, a container to which the pump is applied being shown in dash lines;

Fig. 2 is a horizontal section taken on line 2-2 of Fig. 1; and,

Fig. 3 is an enlarged longitudinal section through a special nipple fitting for use with the invention.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to Figs. 1 and 2 of the drawing, a lance-type pump for mounting in accordance with the invention is shown to comprise a pump cylinder or tube 1 the length of which is greater than the height of the largest commercial lubricant container C with which the pump is to be used. Threaded in the lower end of the tube is an inlet check valve seat fitting 3 which holds a ball check valve member 5. The fitting 3 is formed with a valve seat 7 above its lower end and with openings 9 below the seat for entry of lubri-

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cant when the end of the fitting is in engagement with the bottom of a lubricant container. As illustrated, the fitting 3 has the same outside diameter as the outside diameter of the tube 1. The ball 5 in cooperation with seat 7 is adapted to permit flow upward into the tube but to prevent flow downward out of the tube.

Threaded on the upper end of the pump tube 1 is a pump head 11. The pump head is bored as indicated at 13 slidably to receive a piston rod 15. Packing for the latter is indicated at 17. The piston rod extends down into the tube 1 and has a reduced-diameter extension 19 at its lower end. Slidable on this extension is a piston 21. This slides between limits determined by a shoulder 23 at the upper end of extension 19 and a valve member 25 fixed on the lower end of extension 19. Valve member 25 retains the piston on the extension. The piston is counterbored from its lower end to have a downwardly opening annular chamber or passage 27 around the extension 19. Lateral ports 29 in the annular piston wall provide for communication between the passage 27 and the interior of the tube 1 above a packing ring 31 on the piston. The piston may slide downward relative to the extension 19 to a position wherein its open lower end is closed by the valve member 25.

The pump head 11 is provided with an outlet passage 33 inclined upward and outward from the upper end of the tube 1 and leading to a vertical outlet 35. As shown in Fig. 1, an outlet fitting 37 is threaded into the outlet 35 as indicated at 39. The fitting has a vertical outlet passage 41 which is successively stepped to provide vertically spaced downwardly facing annular shoulders 43 and 45. The lower shoulder 43 serves as a valve seat for a valve ball 47 which is biased upward against the shoulder 43 by a spring 49 reacting from a spun-in flange 51 at the lower end of the fitting. A spacer 53, comprising a strip bent to generally S-shaped form in plan, is fitted in the passage 41 between the ball and the upper shoulder 45 and may slide up and down in the passage. The upper end of the passage 41 is enlarged to receive a packing ring 55 which is retained in place by a gland nut 57 threaded on the upper end of the fitting. A cap 59 is provided to cover the opening in the gland nut and may be attached to the pump head by a bead chain 61.

The piston rod is reciprocated by means of a handle 63 which is pivotally connected at one end to the upper end of the rod by means of a pin joint 65, and which is linked to the pump head 11 by means of a link 67. The latter has a pivotal

connection with the handle adjacent its connection to the rod at a pin joint 69 and with the pump head at a pin joint 71. The handle and the link are located on the side of the piston rod opposite the outlet 35. The handle is provided with a hand grip portion 73 for ease in carrying the pump and the container to which it is applied. The piston rod is formed with a stop 75 for limiting its upward stroke.

A pump supporting and container-lid-piercing unit is generally designated 77. As shown, this assembly includes a generally angle-shaped bracket or clamp 78 having a horizontal arm 79 and a vertical leg or arm 81 extending downward from one end of the horizontal arm. The other end of the horizontal arm 79 is formed as a vertical sleeve 83 which extends downward below the arm 79 and has an outwardly extending flange 85 at its lower end having a flat lower surface 87. The flange is discontinuous at 89 under the arm 79 where the sleeve faces the vertical arm 81. Fixed in the sleeve is an annular or tubular cutter 91 which extends down below the flange 85 concentric with the sleeve. The cutter is truncated or angled to have a pointed cutting edge as indicated at 93 so that it is adapted to be driven through the lid L of a container to pierce a hole therein. The lowest point on the truncation is preferably adjacent the bracket arm 81. The sleeve and cutter are of the same inside diameter, this diameter being such as slidably to receive the pump tube 1. The top of the horizontal bracket arm 79 is formed with a driving-blow-receiving pad or anvil portion 95. Pivotaly connected to the vertical bracket arm 81 at a pin joint 97 is a clamp jaw 99 shaped to straddle the lower end of the arm 81. A thumb screw 101 is threaded through the lower end of the arm and bears against the jaw. At 103 are shown swingable holders for two grease guns. These holders consist of rods threaded into an aperture 105 in the corner of the bracket and bent to form grease gun holding rings 107. The holders may be swung to position the rings 107 to extend horizontally outward (see the solid lines) from the lubricant container for vertically supporting two grease guns hanging at the side of the container, the guns being hung by the usual flanges thereon, or to position the rings to extend vertically upward (see the dotted lines) to hold two grease guns which may lie on the top of the lubricant container. Lock nuts 109 are provided to retain the holders in position.

Fig. 3 illustrates a nipple 111 for attachment to a grease gun to convert it to a type that may be filled with the pump of this invention if not already equipped with a nipple for filling purposes. As shown, this nipple comprises a tubular body 113 having a hexagonal body portion 115 for application of a wrench to turn it. On one side of the hexagonal portion 115, the nipple body is externally threaded, as indicated at 117. On this side of the portion 115, the body is interiorly stepped to provide an outwardly facing shoulder forming a valve seat 119. A ball 121 is biased against the seat by a spring 123 reacting from a spun-over flange 125 at the adjacent end of the body. The other end of the nipple body is internally threaded as indicated at 127 and counterbored as indicated at 129 to receive a cap 131. This end of the body is of such outside diameter that, with the cap removed, it may be inserted through the opening in the gland nut 57, the packing ring 55 and

the passage 41 in the pump fitting 37 to push the spacer 53 against the ball 47 to unseat the latter. The nipple is attached to a grease gun by drilling and tapping a hole in the head of the gun to receive the threaded portion 117 of the nipple body.

To install the pump on a lubricant container C, the unit 77 is positioned with the point of the cutting edge 93 resting on the lid L adjacent the usual upstanding peripheral rolled rim R of the container and with the horizontal bracket arm 79 extending outward beyond the rim and the vertical arm 81 extending downward alongside the container, the thumb screw 101 having been backed off to permit this. The lower end of the pump tube 1 is inserted through the sleeve 83 and the tubular cutter 91 until it rests on the lid of the container. The unit 77 is retained in position by grasping the pump tube, and is forced downward to pierce a hole in the lid. This is done by hammering on the pad 95. As soon as the cutter has pierced through the lid, the pump tube slides downward into the container through the sleeve and the cutter until its lower end reaches the bottom of the container. The unit 77 is adjusted so that the flat lower face 87 of the flange 85 is flush against the lid, with the rim R of the container located between the portion 89 of the sleeve and the vertical arm 81, and the pump is adjusted so that the handle 63 extends over the container. Then, the thumb screw 101 is turned to force the clamp jaw 99 against the side of the container C thereby to cause the portion 89, acting as a relatively fixed clamp jaw to be forced against the inside of rim R. This locks the bracket in position on the container. As a result of clamping the bracket in place the sleeve and cutter and the pump tube tends to become canted or inclined toward the adjacent side of the container as illustrated in dotted lines in Fig. 1. This causes the lower end of the pump tube to be forced towards the side wall of the container whereby it is effectively prevented from sliding out through the cutter and sleeve when the pump handle is operated or when the pump and container are picked up and carried by the pump handle.

Then the cap 59 may be removed, the grease gun nipple 111 inserted in the fitting 37 as previously described, and the pump handle 63 worked up and down to pump lubricant from the container into the grease gun. It will be understood that, on a down stroke of the pump handle and piston rod, the piston 21 will be forced to its upper limit and lubricant in the pump tube will be forced out from below the piston through the passage 27, ports 29, the space in the tube above the piston, and the outlet passages 33 and 41. The ball check 5 is closed by the pressure in the tube. The ball 47 is held in open position by the spacer 53 being pushed down by the end of the nipple. On an up stroke of the pump handle and piston rod, the piston 21 is forced to its lower limit, wherein valve member 25 closes the passage 27, and lubricant is drawn into the tube through its lower end, the ball check 5 opening at this time. It will be observed that the location of the outlet 35 is such that the grease gun may be applied for filling with its nozzle (if it has one) extending downward alongside the container. Thus, neither the pump nor the container interferes with the application of the grease gun to the pump for filling. It will be understood that the pump may be used to dis-

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charge lubricant through a lubricant hose coupled to the pump outlet, in addition to being useful to fill a grease gun as described. For this purpose, the fitting 37 is removed and an adapter for coupling a hose is threaded in the outlet 35.

From the above description, it will be seen that the invention comprises a tubular cutter, which may be considered to be the part 91 and the sleeve 83, the former adapted to be driven through the wall of a sheet metal container to pierce a hole in the wall. The cutter is carried by means for securing it to the container after it has been driven through the wall of the container. This means comprises the clamp 78 including as one clamp jaw the part 89 and as its other and movable clamp jaw the part 99. The tube 1 of the lance-type pump is slidable in the cutter, the latter serving as a support for the pump after it has been driven through the wall of the container and clamped to the container. It will be understood that it is within the scope of the invention to use lance-type pumps other than the one specifically shown, as, for example, a pump like that shown in U. S. Patent 2,403,122, as long as the pump has a pump tube adapted slidably to be inserted into a container through the tubular cutter.

The arrangement with the cutter closely adjacent the side of the container and carried by a clamp is advantageous in that it provides for releasably securing the pump to the container without requiring any extra fasteners for the purpose.

It will be seen that in one sense the invention consists in an inverted U-shaped member constituted by the parts 81, 79, 95, 83 and 91, which in their final position envelope the side of the container. One leg of this member is the cutter 91 which has pierced the cover L and the other leg is the outside downwardly extending arm 81. The turn of the inverted U-shaped portion is provided with the anvil 95. Hence it is convenient to use the pump barrel 1 as a support while driving the inverted U-shaped member by blows on the anvil 95. The blows being delivered over the side of the container have a solid reaction favoring a quick piercing. After the cutter 91 has pierced the cover L, the inverted U-shaped portion arches over the side of the container so that by means of the set screw 101 the U-shaped portion may be used as a clamp.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

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As many changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

We claim:

In combination, a tubular cutter having a pointed cutting end adapted to be driven through the top of a container to pierce a hole therein, a lance-type pump comprising a pump tube having a pump piston reciprocable therein, said tube being slidable in the cutter, the cutter constituting one leg of an inverted U-shaped member, the other leg of said member being spaced from the cutter a distance such that the cutter may be driven through the top of a container closely adjacent the side of the container with the inverted U-shaped member straddling the side of the container and the said other leg closely adjacent the outside of the container, the top of the inverted U-shaped member being formed to receive blows for driving the cutter through the top of a container, and a clamp member carried by the said other leg at its lower end movable toward and away from the cutter and adapted to engage the side of a container after the cutter has been driven through the top of the container to clamp the U-shaped member to the container and also to effect a canting of the cutter and pump tube toward the side of the container for engagement of the lower end of the pump tube with the inside of the container to prevent the pump tube from sliding out through the cutter.

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