

[54] CONTAINER WITH INTEGRAL PUMP

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[76] Inventor: Hess M. Roberts, 12 Crabapple Ct.,  
St. Louis, Mo.

Primary Examiner—Robert B. Reeves  
Assistant Examiner—Thomas E. Kocovsky  
Attorney, Agent, or Firm—John D. Pope, III

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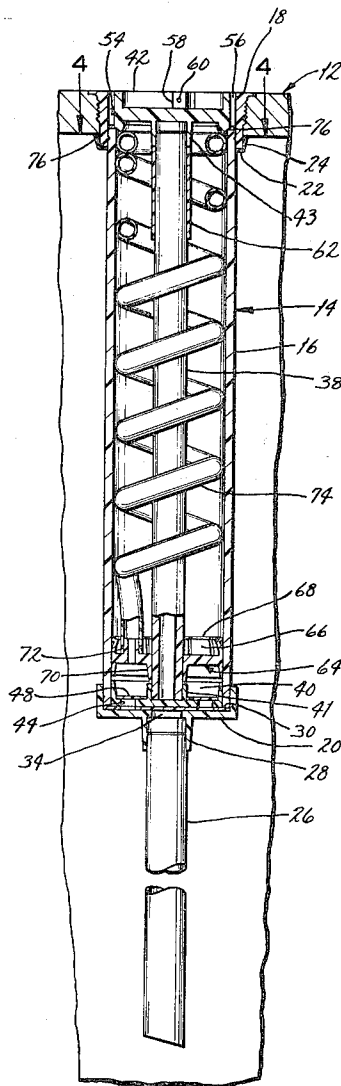
[57] ABSTRACT

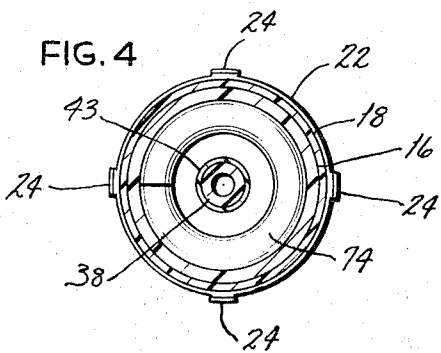
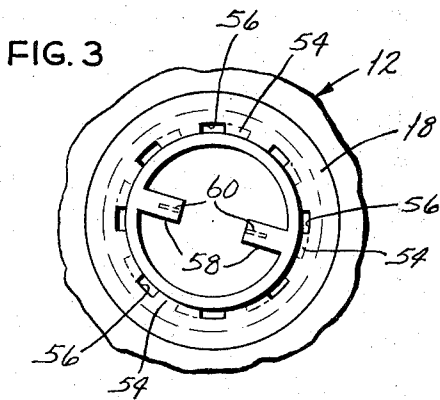
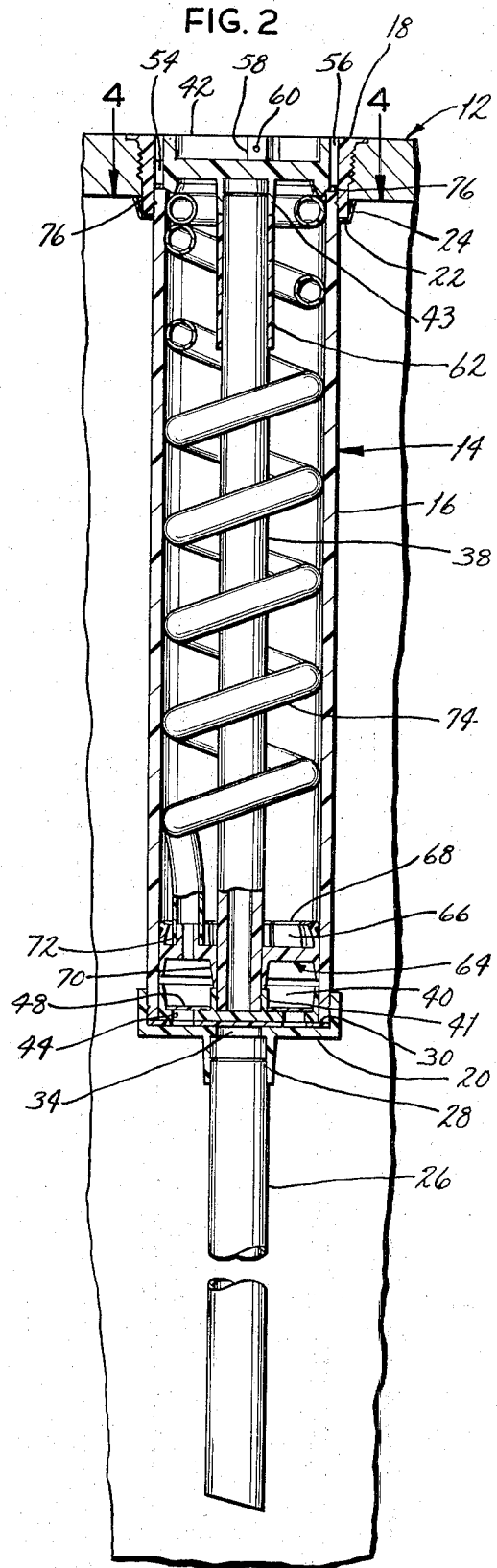
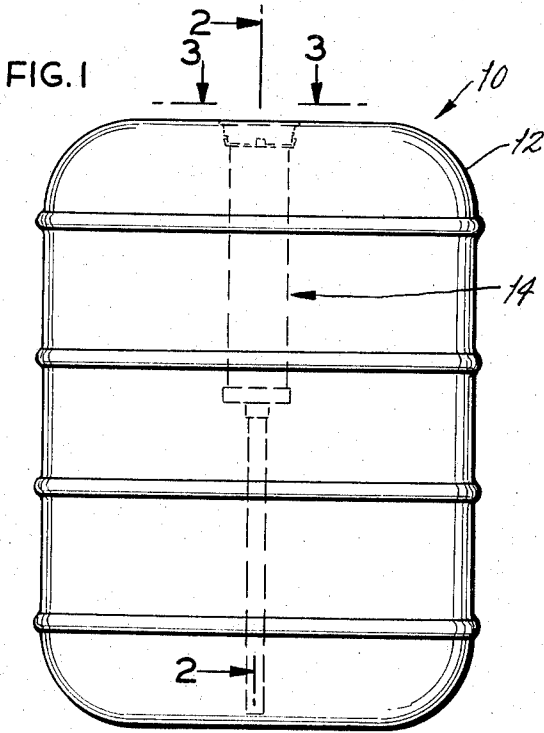
A container and pump unit integrally combined to form a dispensing container. The dispensing container has an inoperative position wherein the pump unit does not project from the container. The dispensing container is placed in operation by withdrawing a pump handle from the pump housing to move a pump chamber cover member to one end of a pump cylinder. Further reciprocation of the handle dispenses fluid from the container.

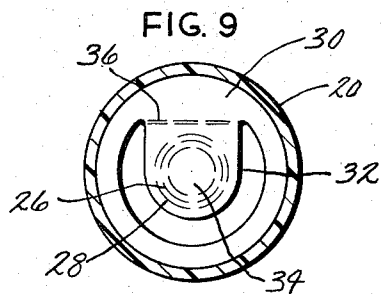
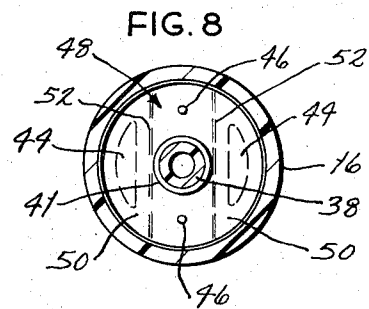
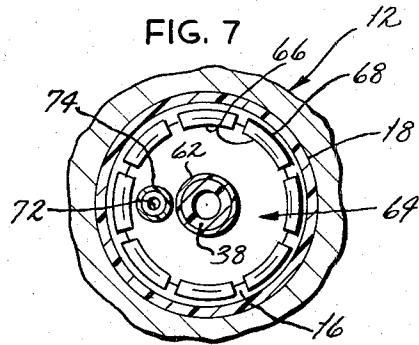
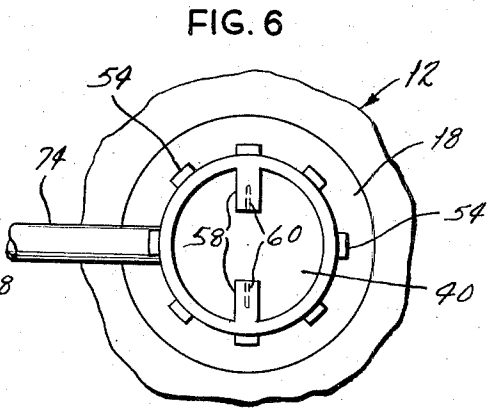
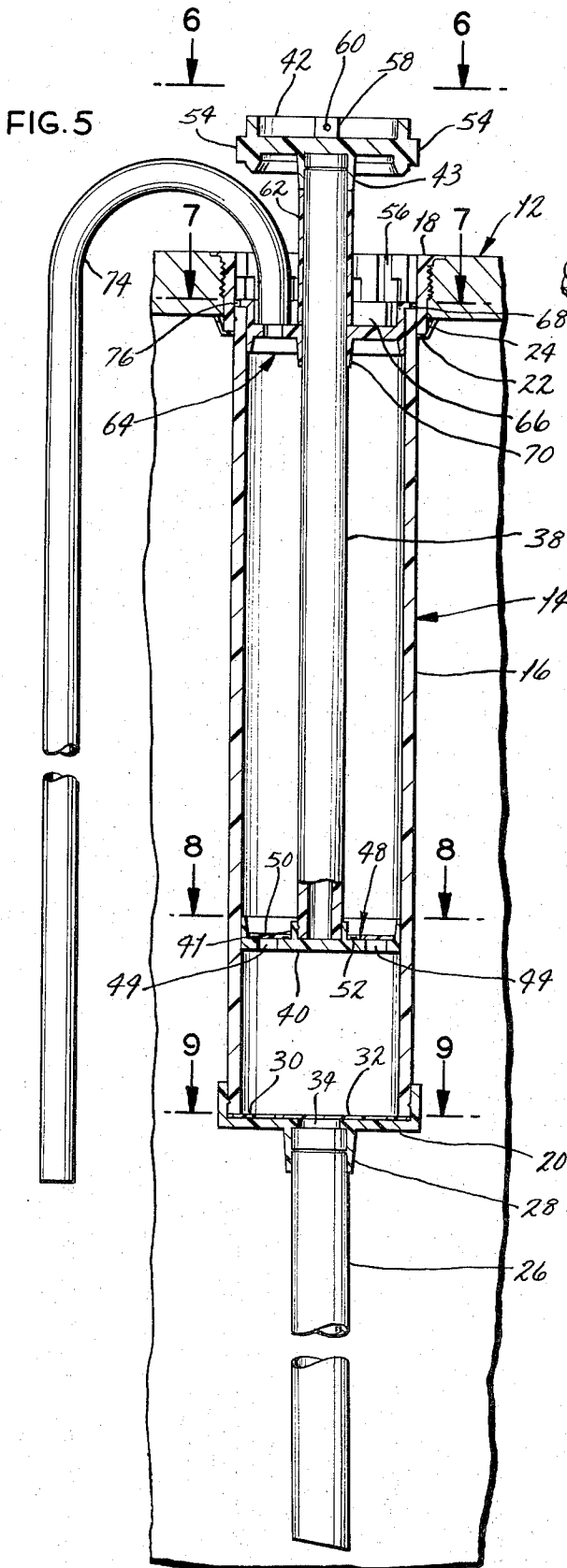
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9 Claims, 9 Drawing Figures







## CONTAINER WITH INTEGRAL PUMP

This invention relates to devices for shipping and dispensing a fluid and more particularly to a dispensing container and pump that are integrally combined.

Frequently fluids such as cleaning agents, chemicals, insecticides and lubricants are packaged in large containers for commercial users. Dispensation of the fluid from such a container is often accomplished by attaching a pump to the container after it has been delivered to the user. Once the container contents are exhausted the pump is usually detached and the empty container disposed of. The detached pump is then often used again.

Installation of a pump on a container and subsequent detachment thereof can be time consuming operations requiring special tools and skilled workmen. Used pumps, even though periodically cleaned, often accumulate residues that contaminate the contents of a fresh container.

It is thus desirable to provide a disposable container incorporating an integral pump element. This eliminates the risk of a used pump contaminating the contents of a fresh container and obviates the need for assembling and disassembling a reusable pump to and from the container.

Among the several objects of the present invention may be noted the provision of a novel dispensing container; a novel dispensing container having a pump forming an integral part of the container; a novel dispensing container having an inoperative position wherein a pump forming part of the container does not project from the container; and a novel dispensing container that avoids the risk of cross-contamination from reused pumps. Other objects and features will be in part apparent and in part pointed out hereinafter.

The present invention relates to a novel dispensing container. In one embodiment the invention comprises a container and a pump combined to form a dispensing unit. The dispensing unit has a first inoperative position wherein the container and pump form a sealed enclosure for fluid contained therein and the pump does not project from the container. The pump includes a pump cylinder affixed to the container by a collar that is threaded to the container wall. A lockring secured to the periphery of the pump cylinder below the collar prevents separation of the pump cylinder from the container. The pump further includes a pump rod having a handle that is seated in the collar when the dispensing container is in its inoperative position.

Dispensation of fluid from the container requires unseating of the pump handle from the collar. A pump chamber cover member disposed at one end of the pump cylinder is relocated into a fixed position at the opposite end of the cylinder upon initial movement of the pump handle away from the collar. The dispensing container is then ready for operation and further reciprocation of the pump handle dispenses fluid from the container. As the pump is integrally combined with the container, there is no need for the user to install or detach a pump.

The invention accordingly comprises the constructions hereinafter described, the scope of the invention being indicated in the following claims.

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

FIG. 1 is a side elevation of a dispensing container incorporating one embodiment of the present invention; FIG. 2 is an enlarged fragmentary sectional view taken on line 2—2 of FIG. 1;

FIG. 3 is an enlarged sectional view taken on line 3—3 of FIG. 1;

FIG. 4 is a sectional view taken on line 4—4 of FIG. 2;

FIG. 5 is a view similar to FIG. 2 showing the pump in operating position;

FIG. 6 is a sectional view taken on line 6—6 of FIG. 5;

FIG. 7 is a sectional view taken on line 7—7 of FIG. 5;

FIG. 8 is a sectional view taken on line 8—8 of FIG. 5; and

FIG. 9 is a sectional view taken on line 9—9 of FIG. 5.

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

Referring now to the drawings, a dispensing unit 10 comprises a container 12 of any suitable known construction and a pump unit 14.

Pump unit 14 includes a housing defined by an elongated cylinder 16, a collar 18 at one end of cylinder 16 and a cap 20 at the opposite end of cylinder 16. All components of pump 14 are formed of any suitable material that does not react with the contents of container 12. Collar member 18 is threaded to container 12, and both collar 18 and cap 20 are secured to cylinder 16 in any suitable known manner. Preferably, collar 18 and cap 20 are integral with cylinder 16.

A lock-ring 22 is affixed to the periphery of cylinder 16 below collar 18 in any suitable known manner. Lock-ring 22 includes peripheral projecting fingers 24 diverging upwardly toward container 12. An intake tube 26 depends from a throat portion 28 of cap member 20. Tube 26 is affixed to throat 28 in any suitable known manner. A disc-shaped inlet valve 30 having a valve flap 32 covering an opening 34 of throat 28 is sandwiched between cylinder 16 and cap 20. Valve flap 32 pivots at a flexible hinge 36 formed in valve 30 in any suitable known manner.

Pump 14 further includes a pump actuating member comprising a tubular pump rod 38 in cylinder 16, rod 38 having a piston 40 at one end and a handle 42 at the opposite end. Piston 40 and handle 42 are secured to rod 38 in any suitable known manner such as by pressing the rod ends into necks 41 and 43 of piston 40 and handle 42, respectively. Piston 40 includes inlet ports 44, 44 and a pair of locating nipples 46, 46 formed thereon. A disc-shaped valve 48 on piston 40 is held in place by flattening down nipples 46, 46 onto valve 48 in any suitable known manner. Valve 48 has a pair of hinged flaps 50, 50 that cover inlet ports 44 and pivot at flexible hinges 52, 52 formed in valve 48 in any suitable known manner.

Handle 42 is provided with a plurality of lugs 54 projecting from the outer periphery thereof for engagement with L-shaped slots 56 formed at the inner periphery of collar 18. Handle 42 also includes oppositely disposed ribs 58, 58 having holes 60, 60 formed therein. A spacer sleeve 62 is provided on rod 38 adjacent handle 42.

Pump 14 also includes a pump chamber cover 64 having a plurality of peripheral resilient segments 66,

each of which terminates in a bent finger 68. Rod 38 is slidable in a neck 70 of cover 64. Pump chamber cover 64 also includes a hollow stub portion 72 engageable with one end of a flexible tube 74.

To use dispensing unit 10, container 12 is filled with fluid (not shown) in any suitable known manner. Pump 14 can be attached to container 12 before or after the container has been filled. For example, prior to attachment of pump 14, container 10 can be filled through the threaded opening that accommodates collar 18. Pump 14 is then attached to container 12 so as to seal dispensing unit 10, as shown in FIG. 2, wherein pump 14 does not project from container 12. Although not shown in the drawing, there is sufficient clearance between the unthreaded periphery of collar 18 and container 12 to permit lock-ring 22 to pass into container 12 during installation of pump 14, and to allow fingers 24 of lock-ring 22 to diverge below the interior wall of container 12.

With dispensing unit 10 in its inoperative position, chamber end cover 64 of pump 14 is recessed in cylinder 16 and flexible tube 74 is entirely disposed in cylinder 16. Peripheral resilient segments 66 of chamber end covers 64 are flexible to permit end cover 64 to be recessed in cylinder 16 in any suitable manner, such as by flexing segments 66 toward neck 70 and forcing cover 64 into cylinder 16. Handle 42 is seated in collar 18 so that lugs 54 engage L-shaped slots 56, thereby holding handle 42 in seated position.

When handle 42 is seated in collar 18, piston 40 is bottomed against end cap 20 preventing valve flap 32 from opening. Fluid in container 12 is thus prevented from seeping into cylinder 16. Fluid is also prevented from leaking out of container 12 by collar 18 which forms a leak-tight seal with container 12.

To dispense fluid from container 12 a counterclockwise torque is applied to ribs 58, 58, as viewed in FIG. 3. This torque permits handle 42 to be unseated from slots 56 of collar 18. Handle 42 is then pulled away from collar 18 by inserting any suitable known hook (not shown) in openings 60 in ribs 58, 58 and pulling on the hook. As handle 42 is pulled away from collar 18 (FIG. 2), rod 38 withdraws from cylinder 16 and piston 40 bears against end cover 64 causing end cover 64 to displace upwardly in cylinder 16 toward collar 18. Bent fingers 68 of cover 64 are biased to flex radially outwardly when not restrained by cylinder 16. Maximum extension of handle 42 from collar 18 positions end cover 64 at collar 18. Bent fingers 68 of end cover 64 can then latch onto the end of cylinder 16 in an undercut 76 formed in collar 18 below L-shaped slots 56. End cover 64 is thus fixed in position in pump 14 and dispensing unit 10 is now in operating position. When handle 42 is moved away from collar 18 fluid from container 12 is drawn through tube 26, throat opening 34 and valve flap 32 into cylinder 16 between piston 40 and end cap 20. At maximum extension of pump handle 42 from collar 18, piston 40 is generally adjacent end cover 64 and fluid occupies substantially the space between piston 40 and end cap 20.

Downward movement of handle 42 toward end cap 20 causes downward movement of piston 40 in cylinder 16 enabling fluid below piston 40 to pass through ports 44, 44, and into the space between piston 40 and end cover 64. Downward movement of piston 40 also keeps valve flap 32 on end cap 20 from opening. A subsequent upward movement of handle 42 causes piston 40

to force fluid through stub portion 72, flexible tube 74 and into any suitable known fluid collection device (not shown). Such upward movement also keeps valve flaps 50, 50 on piston 40 from opening ports 44, 44. Spacer sleeve 62 on pump rod 38 limits the downward stroke of handle 42 preventing handle 42 from engaging collar 18 or pinching tube 74.

Dispensing unit 10 is designed to be disposable or returnable to eliminate the danger of cross-contamination due to reuse of pumps. Thus pump 14 forms an integral part of container 12. Lock-ring 22 helps accomplish this. Any suitable known permanent bonding adhesive applied between collar 18 and container 12 may also be employed.

As will be apparent to those skilled in the art, tube 26 can be made in varying lengths to extend to the bottom of container 12.

Some advantages of the present invention evident from the foregoing description include a dispensing container having a pump integrally combined with the container to form a sealed marketing and dispensing unit, and a dispensing container combined with a pump to eliminate the risk of cross-contamination. As a further advantage, the dispensing container has an inoperative position wherein the pump structure does not project from the container. Thus a plurality of dispensing containers, in their inoperable positions, can be stacked on each other in adjacent rows during shipment and/or storage.

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

As various 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 drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A device for holding and dispensing fluid comprising a container and means for delivering fluid from said container, said delivery means comprising a pump housing fastened at one end to said container and an actuator member comprising a handle seated in said pump housing when said delivery means is in a first inoperative position, said delivery means having a second operative position wherein said handle is movable with respect to said pump housing for dispensing fluid from said container, said pump housing defining a pump chamber, and said pump actuator member including a pump rod displaceable in said pump chamber, said pump rod having opposite ends, with a piston fixed to one of the rod ends and said handle affixed to the other rod end, said pump further including first and second cover means for defining opposite ends of said pump chamber, both said cover means being disposed at one end portion of said pump chamber when said delivery means is in said first inoperative position, said first and second cover means being respectively disposed at opposite ends of said pump chamber when said delivery means is in said operative position.

2. The device of claim 1 further including a pump outlet hose attached to one of said cover means, said outlet hose being entirely recessed in said pump housing when said delivery means is in said first inoperative position, said outlet hose extending outwardly of said

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pump housing when said delivery means is in said operative position.

3. The device of claim 1 wherein said delivery means is disposed in an opening in said container, said delivery means further comprising locking means provided on said pump housing for preventing removal of said pump from said container.

4. The device of claim 3 wherein said locking means include a ring member affixed to the periphery of said pump housing, said ring member having finger portions extending therefrom for interference with said container to prevent removal of said pump from said container opening.

5. The device of claim 3 wherein said locking means include means for adhesively bonding said pump housing to said container.

6. A device for holding and dispensing fluid comprising a container and means for delivering fluid from said container, said delivery means comprising a pump housing fastened at one end to said container and an actuator member comprising a handle seated in said pump housing when said delivery means is in a first inoperative position, said delivery means having a second operative position wherein said handle is movable with respect to said pump housing for dispensing fluid from said container, said one end of said pump housing including a collar member, said pump actuator member including a pump rod displaceable in said housing, said

handle being at one end of said pump rod seated in said collar when said delivery means is in said first inoperative position, said handle being movable toward and away from said collar when said delivery means is in said operative position.

7. The device of claim 6 wherein said collar means is threadably secured to said container, said delivery means further including locking means comprising a ring member secured to the periphery of said pump housing below said collar, said ring member having finger portions extending therefrom for engagement with said container to prevent unthreading of said collar from said container.

8. The device of claim 6 further including a spacer member provided on said pump rod adjacent said handle to maintain said handle a predetermined distance from said collar when said handle is moved toward said collar.

9. The device of claim 8 wherein said pump housing defines a pump chamber, said pump further including a cover member at one end of said pump chamber adjacent said collar, said spacer member comprising a sleeve embracing said pump rod adjacent said handle, said sleeve having one end engageable with said cover member when said handle is moved toward said collar, said engagement maintaining said handle at said predetermined distance from said collar.

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