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DISPENSING DEVICE

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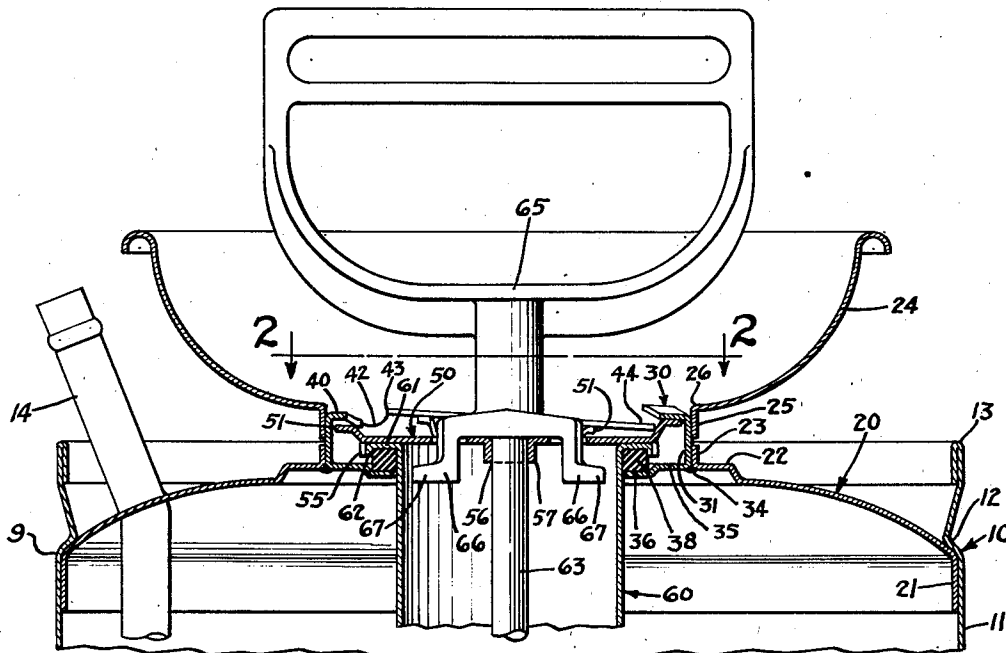


FIG. 1

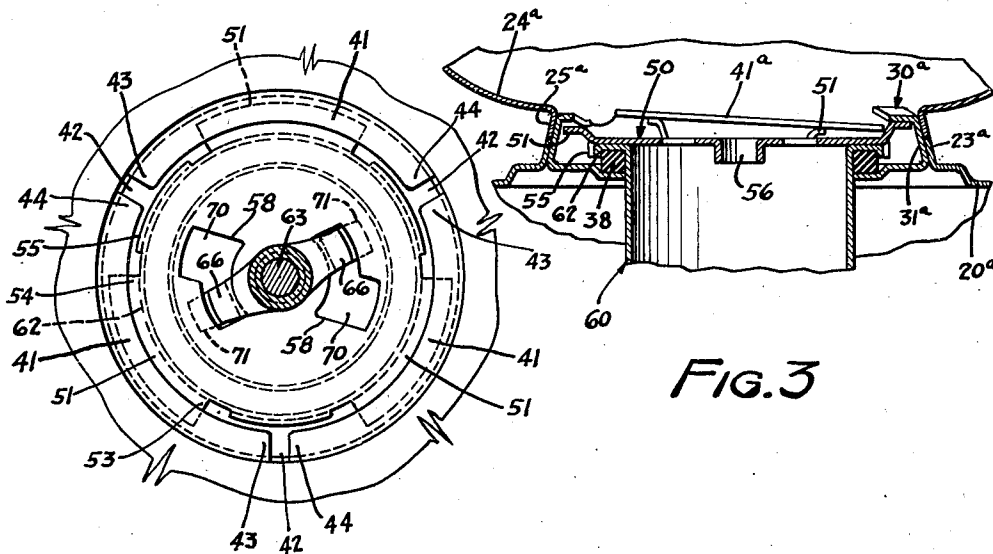


FIG. 3

FIG. 2

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DISPENSING DEVICE

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7 Claims. (Cl. 221-77)

This invention relates to apparatus for dispensing fluids under pressure, and more particularly to liquid dispensing tanks used for the spraying of liquid insecticide and disinfectant compositions for portable watering fountains and the like.

Devices of this character include a pressure type fluid containing vessel in which pressure within the vessel is built up by a self-contained pump, which is usually mounted upon the cover of the vessel forming a combined cover and pump unit.

Various constructions have been devised for obtaining and maintaining a fluid tight connection between the tank and the combined cover and pump unit, but such constructions heretofore used have been subject to objections, principally excessive cost of manufacture, displacement of metals during use due to corrosion and the like, and other difficulties.

It is the object of the present invention to provide an improved pressure dispensing apparatus in which there is a connection between the pump and cover unit, and the container is especially simple and fluid tight and one which may be manufactured economically and easily.

More specifically, it is an object of the invention to provide an improved pressure dispensing apparatus in which the tank sealing connection is made of different and stronger metals than the metal of the tank.

It is a further object of the invention to provide an apparatus in which a single gasket may be used for sealing the vessel and for maintaining a pressure tight connection between the pump cylinder and the vessel.

It is a specific object of the invention to provide an improved closure for fluid dispensing apparatus in which the closure per se is made separately and attached in fluid tight relationship to the vessel and in which the closing forces for the tank cover are confined solely to the pressure closure parts, per se, rather than transmitted to the vessel walls.

Other objects of the invention are those inherent in and implied by the invention herein illustrated, described and claimed.

The invention is illustrated with reference to the drawing in which

Figure 1 is a fragmentary elevational view partly in section through the upper part only of a fluid dispensing apparatus embodying the present invention.

Figure 2 is a fragmentary plan view in the direction of arrows 2-2 on Figure 1.

Figure 3 is a fragmentary elevational view of a modified form of the invention.

Throughout the specification and drawing, the same numerals designate corresponding parts.

The pressure dispensing apparatus of the present invention consists of a fluid tight vessel, generally designated 10, having a cylindrical side wall 11 and a bulged out upper end wall, generally designated 9. The vessel is preferably constructed of sheet metal, the cylindrical walls 11 being spun in so as to present a shoulder at 12 and folded over at 13 so as to present a smooth edge at the upper wall. The upper end wall 20 is preferably made of stamped sheet metal and is of such a configuration that it fits within the cylindrical side wall 11. The end wall 20 has a downturned edge flange 21, which fits neatly against the side walls 11 and is sealed in fluid tight relation thereto by soldering or galvanizing. The end wall 20 rests against the spun-in shoulder 12 whereby outside movement of the end wall is resisted. The upper end wall 20 is provided with a central upwardly embossed portion 22 in which there is an opening, the opening being defined by a short outwardly extending flange 23. The flange 23 is formed during the stamping operation of the wall 20 and the metal of the flange is therefore cold-worked during formation. At one side of the fluid tight vessel 10, there is a delivery tube 14, which preferably extends downwardly to the bottom of the vessel.

Within the cylindrical opening defined by flange 23, there is pressed a ring member, generally designated 30, having an outer cylindrical wall 31 of a shape and configuration such that it fits tightly into the opening defined by flange 23 when the member 30 is pressed into the opening. After being pressed into the opening, the member 30 is sealed to the end wall 20 by soldering as shown at 34 or, alternatively, the walls 23 and 31 may be spot-welded together and then galvanized or tinned as a unit after assembling, thus pressure sealing the joints in the units. The ring member 30 is provided with a lower inturned flange 35, which is depressed downwardly at the center so as to form a gasket seat 36 upon which a rubber or composition gasket 38 may rest. At the upper portion of the member 30, there is provided another inturned flange 40, which is divided into several, preferably, three (3) sectors 41, by means of the notches 42, all as shown in Figure 2. The sectors 41 are formed so that each is a portion of a spiral thread. Thus the ends 43 of each sector are elevated with respect to the adjacent ends 44 of the adjacent sector. The

three (3) sectors 41 are in effect portions of a triple-thread on the ring member, generally designated 30. Obviously, the ring member 30 may be divided into any other desired number of sectors.

Within the ring member, there is positioned a cover plate 50, which is preferably made of stamped sheet metal, the cover plate 50 being provided with a number of tongues 51 corresponding to the number of sectors 41. The outside diameter of tongues is such that they project outwardly and bear against the under-surface of the sectors 41. The tongues 51 are elevated at the trailing edges 53 and depressed at the leading edges 54 so as to cooperate with the triple-thread ring construction of the ring member 30. The difference in elevation between adjacent portions 43 and 44 of the ring member flange sectors 41 is just sufficient to permit the tongues 51 to be moved edgewise into the space 42.

Accordingly, when the cover 50 is inserted upon the upper part of the member 31 and rotated, the tongues 51 will enter the spaces 42 and the tongues will be rotated under the flange sectors 41 thereby moving the cover 50 downwardly.

In the intermediate spaces between the tongues 51 of the cover, there are short downturned flanges 55. Beneath the cover 50, there is positioned a pump cylinder, generally designated 60, preferably made of brass having an outwardly turned flange 61 at its upper edge. The outer portion of the flange 61 is turned downwardly at 62 and has an outer diameter such as to be gripped by the downturned flanges 55 of the cover member 50. The downturned flanges are preferably made so that they grip the downturned portion 62 of the pump cylinder flange tightly but not immovably, and as a result, the cylinder 60 may with some effort be rotated with respect to the cover member 50.

The downturned edge 62 of the pump cylinder flange 61 serves as a recess in which there is positioned a rubber or other composition gasket 38. The gasket is normally retained on the pump cylinder in the recess under flange 61.

The center part of the cover member is provided with a circular opening 56 defined by a downwardly turned flange 57, and on either side of the center opening are L-shaped slots 58. A pump piston rod 63 projects through the opening 56 and has a handle 65 attached thereto, the lower part of the handle being provided with downturned lugs 66 terminating in outwardly directed fingers 67. The fingers 67 are of a shape and configuration such that they will be received in the portion 70 of the L-shaped slots 58, but will project under the cover as shown at 71 when the handle 65 is rotated counterclockwise as shown in Figure 2. The vertical height of the cylindrical wall 31 of the ring member 30 is such that it projects above the upper edge of flange 23 on upper end wall 20, and the rung thus provides a seat upon which the funnel 24 may be mounted. The funnel 24 has a downwardly turned flange 25, which has a tight pressed fit upon the wall 31, the flange 25 and wall 31 preferably being spot-welded together. In some instances, it is desirable to press the ring member 30 into the end wall 20 and then to press the funnel 24 onto the ring member so as to bring the lower edge of flange 25 into contact or almost into contact with the upper edge of flange 23. The flanges 23 and 25 may then either be soldered to the wall 30 or spot-welded and thereafter galvanized or tinned

together so as to seal all of the parts together in pressure tight relationship. Where a tinning or galvanizing of the entire unit is done after assembling, it is preferable to begin manufacturing operations with ordinary black iron whereas where the seams are sealed by means of soldering, it is preferable to use galvanized or tinned iron. Obviously, for some uses, it is desirable to make the entire tank and cover of other metal such as stainless steel, brass, copper or aluminum.

The thickness of the metal in ring member 30, and the strength of the metal used, is preferably greater than the thickness of the metal and the strength of the metal in the upper end wall 20, or the funnel 24. Thus, by this method of manufacturing, it is possible to utilize one type of metal for the head 20 and funnel 24, and a thicker, stronger, or more ductile, and easily worked, metal for the ring member 30.

It will be observed that when the handle 65 is rotated counter-clockwise, as shown in Figure 2, the cover 20 will likewise be rotated thus "unscrewing" the tongue members 51 from the position shown in Figure 2 until they move outwardly through the slots 42 to a position above the sectors 41 of upper flange 40 on the ring member. When this occurs, the entire assembly of cover 50, pump cylinder 60, handle 65 and gasket 38 may be lifted from the dispensing apparatus thereby opening the tank for filling or cleaning.

It will be observed that during the initial portion of the opening movement, the pump cylinder 60 may be held immovably with respect to the tank cover 20 by means of the frictional contact between flange 61 of the pump cylinder, gasket 38 and the gasket seat 36. When this occurs, the cover 50 may nevertheless rotate to loosening position since the downturned flanges 55 grip, but do not immovably hold, the downturned edge 62 of the pump flange. As soon as the closure pressure exerted by the cover upon the gasket 38 is released, the relatively tight gripping of the downturned flange 55 upon the edge flange 62 of pump cylinder, will cause the pump cylinder to be rotated thereby freeing the gasket from engagement with the gasket seat 36. In this way, the gasket is protected from destruction by excessive abrasion or tearing.

When the cover-pump cylinder assembly is removed from the vessel, the funnel 24 will provide a free flowing path through the ring 31 into the vessel due to the fact that the notches 42 are cut down to a level below the edge 25 of the funnel. Hence, any fluids in the funnel will drain into the container.

Likewise, after use, it is desirable to invert the entire container so as to permit fluids to drain from the container. Since the ring member 30 is substantially on a level with the portion 22 of the upper cover member 20, fluid will easily be drained from the tank through the opening.

In the modification shown in Figure 3, the wall 31a of ring member 30a has the shape of a frustum of a cone and is fitted into the correspondingly shaped inner surface of the flange 23a on cover member 20a. When the parts are thus shaped, upward movement of the ring member 30a under pressure is resisted since the larger diameter of the wall 31a is greater than the minor upper diameter of the flange wall 23a. Hence, any tendency of the ring member 30a to move upwardly merely drives the walls 31a and 23a more tightly into contact. In this modification also, the lower downturned flange 25a of the funnel 24a is correspondingly shaped to fit

the upper frustum conical surface of the wall 31a.

It will be noted that in both of the constructions illustrated herein, a single gasket 38 serves to seal the ring member 30 (which constitutes a fluid tight continuation of the end wall 20) and the pump cylinder 60. Hence, the opportunity of fluid leakage is reduced to a minimum. It may also be observed that the downturned edge 62 of the pump flange serves as an outer wall against which the gasket 38 is supported. Accordingly, internal pressure on the gasket 38 will not cause the gasket to be "blown-out" of the space between the pump cylinder flange 61 and the gasket seat 36.

Many obvious modifications will occur to those skilled in the art and may be made in the apparatus illustrated, described and claimed.

I claim as my invention:

1. A fluid dispensing apparatus comprising a pressure containing vessel having walls and an opening therein, a neck extending outwardly of the vessel around the opening, a member having a wall fitted into said neck in fluid tight relationship thereto, said member being formed with an internal flange having a gasket seat thereon and with internal screw threads, a closure member having cooperating screw threads for engaging the gasket to seal the opening, a pump cylinder mounted on the closure member, said cylinder being provided with an outwardly extending flange frictionally secured to the closure member, and a gasket seated between the cylinder flange and the gasket seat.

2. A device for dispensing fluids under pressure comprising a tank having an opening therein having an outwardly extending cylindrical tank flange therearound, a ring member pressed into the tank flange, so as to have an outer end of the ring extending beyond the outer end of the tank flange, and an inner end approximately flush with the tank wall adjacent the tank opening, the ring member having an integral inner flange extending approximately parallel to the tank wall so as to form a gasket seat, cam surfaces spaced outwardly from the integral internal flange, a closure plate having cooperating cam surfaces thereon for closing the opening and a funnel pressed onto the outer surface of the outer end of the ring.

3. A device for dispensing fluids under pressure comprising a tank having an opening therein, an outwardly extending flange around said opening, said flange being frustro-conical and of a diameter decreasing outwardly, a ring member of corresponding frustro-conical configuration pressed in the tank flange, said ring member having an inner end approximately flush with the tank wall adjacent the tank opening, the ring member having an integral internal flange extending approximately parallel to the tank wall so as to form a gasket seat, cam surfaces spaced outwardly from the integral internal flange, a closure plate having cooperating cam surfaces thereon for closing the opening.

4. A device of the type set forth in claim 3 wherein the ring member projects beyond the

frustro-conical tank flange and has a funnel pressed on to the outer extending surface.

5. A device for dispensing liquids under pressure comprising a tank of thin sheet metal having an outwardly bulged head, a central opening in said head having a flange extending outwardly of the bulged head thereby forming a short cylindrical neck, a ring pressed into said cylindrical neck, said ring being of heavier sheet metal and having a gasket receiving flange substantially parallel with the metal of the head adjacent the neck, and an outwardly spaced flange, said outwardly spaced flange being divided into a plurality of cam shaped segments, a closure plate of sheet metal having cam shaped arcuate extensions cooperable with the cam shaped segments of the outwardly spaced flange for forcing the closure plate toward the gasket receiving flange when the closure plate is rotated, and a funnel mounted upon the ring to facilitate filling of the tank.

6. A device for dispensing liquids under pressure comprising a tank of thin sheet metal having an outwardly bulged head, a central opening in said head having a flange extending outwardly of the bulged head thereby forming a short cylindrical neck, a ring pressed into said cylindrical neck, said ring being of heavier sheet metal and having a gasket receiving flange substantially parallel with the metal of the head adjacent the neck, and an outwardly spaced flange, said outwardly spaced flange being divided into a plurality of cam shaped segments, a closure plate of sheet metal having cam shaped arcuate extensions cooperable with the cam shaped segments of the outwardly spaced flange for forcing the closure plate toward the gasket receiving flange when the closure plate is rotated, a pump cylinder having a flange overlying the gasket seat flange said pump cylinder being held onto the closure plate by inturned flanges of the closure plate positioned to grip the edges of the pump cylinder flange.

7. A device for dispensing liquids under pressure comprising a tank of thin sheet metal having an outwardly bulged head, a central opening in said head having a flange extending outwardly of the bulged head thereby forming a short cylindrical neck, a ring pressed into said cylindrical neck, said ring being of heavier sheet metal and having a gasket receiving flange substantially parallel with the metal of the head adjacent the neck, and an outwardly spaced flange, said outwardly spaced flange being divided into a plurality of cam shaped segments, a closure plate of sheet metal having cam shaped arcuate extensions cooperable with the cam shaped segments of the outwardly spaced flange for forcing the closure plate toward the gasket receiving flange when the closure plate is rotated, a pump cylinder within the tank said cylinder having a flange overlying the gasket seat, said closure plate having a central aperture and a radial aperture of varying radial width to receive a pump plunger rod and a pump plunger rod locking finger respectively.

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