United States Patent

Vanier

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[54] **LIQUID DISPENSING APPARATUS**

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[52] **U.S. Cl.** **239/333,** 239/571, 222/383

[51] **Int. Cl.** **B05b 7/32**

[58] **Field of Search**.....239/333, 349, 354, 359, 525, 239/526, 527, 571, 572, 581, 582, 383; 222/520, 341, 380

[56] **References Cited**

UNITED STATES PATENTS

3,061,202	10/1962	Tyler	239/333
3,033,428	5/1962	Van Baarh	22/520 X
3,176,883	4/1965	Davis, Jr.	222/327 X
2,886,219	5/1959	Van Baarn	222/520 X
3,474,936	10/1969	McDonnell	239/327 X

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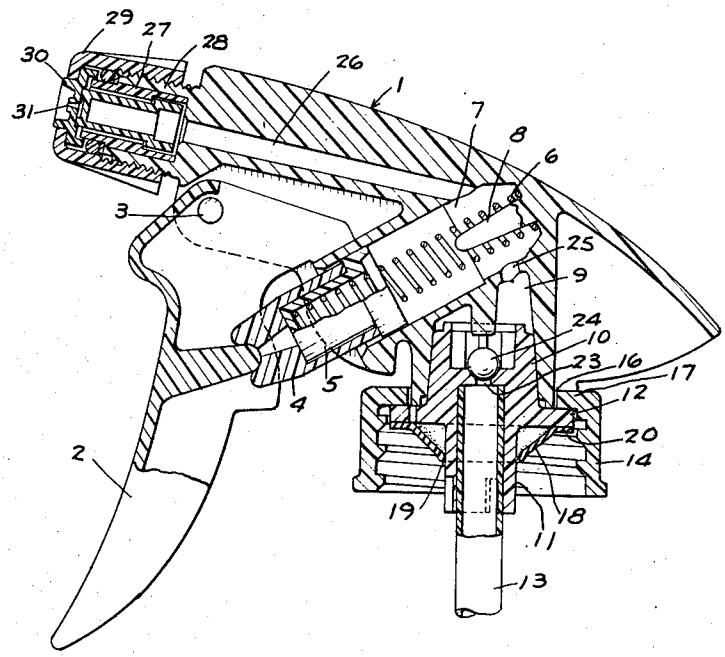
[57] **ABSTRACT**

A combined closure and liquid pumping device for a container having a cap adapted to screw onto a threaded spout of the container The closure also includes a pump mechanism having a nozzle connected by a liquid conduit to an inlet within the container. The pump has inlet and outlet check valves in the conduit and a pump chamber connected to the conduit between the valves. The outlet valve is located between the pump and the outlet orifice of the nozzle inwardly or upstream from the nozzle orifice. The nozzle is adjustable on the body of the device and in one adjusted position positively holds the outlet valve closed so that the outlet valve closes off the conduit for disabling liquid pumping operation of the pump and also serves as a static seal to prevent leakage from the container via the liquid conduit. In another adjusted position of the nozzle the outlet valve is free to function as a check valve in the conduit which closes the conduit during the intake stroke of the pump and opens during the ejection stroke of the pump to pass liquid from the conduit through said orifice. The pumping device is also provided with a check valve which permits admission of air through a vent into the container above the liquid during the intake stroke of the pump but closes the vent at all other times to prevent leakage of the liquid from the container through the vent.

20 Claims, 8 Drawing Figures



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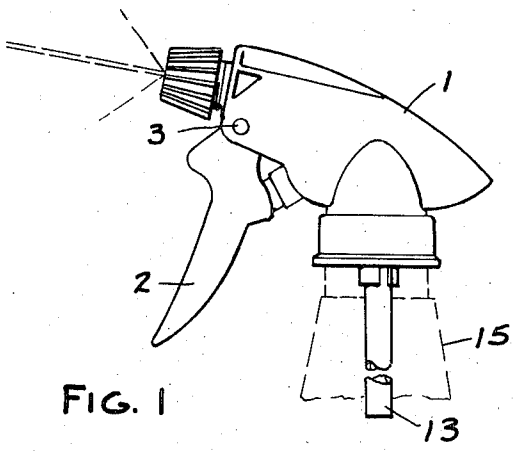

FIG. 1

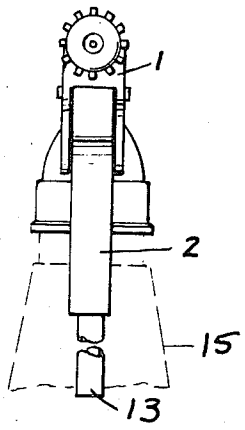

FIG. 2

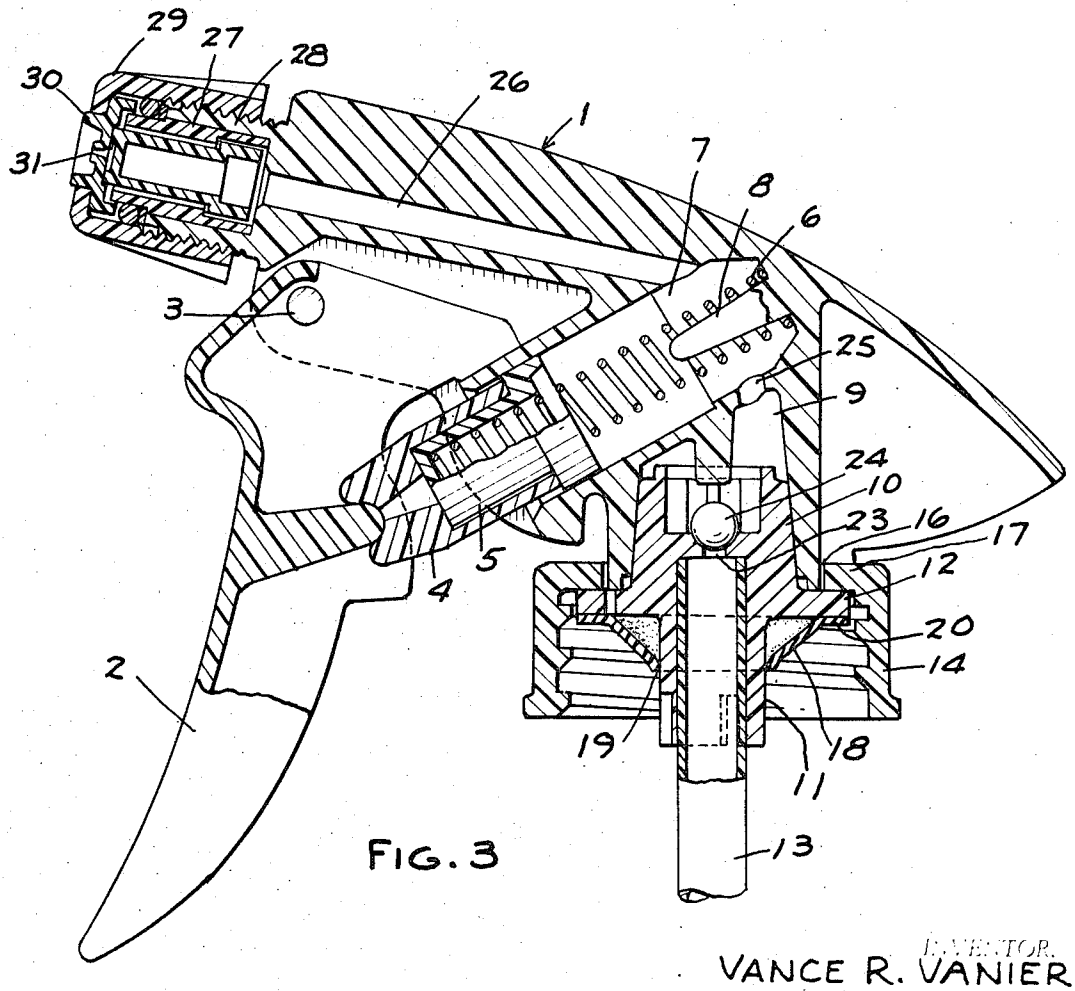

FIG. 3

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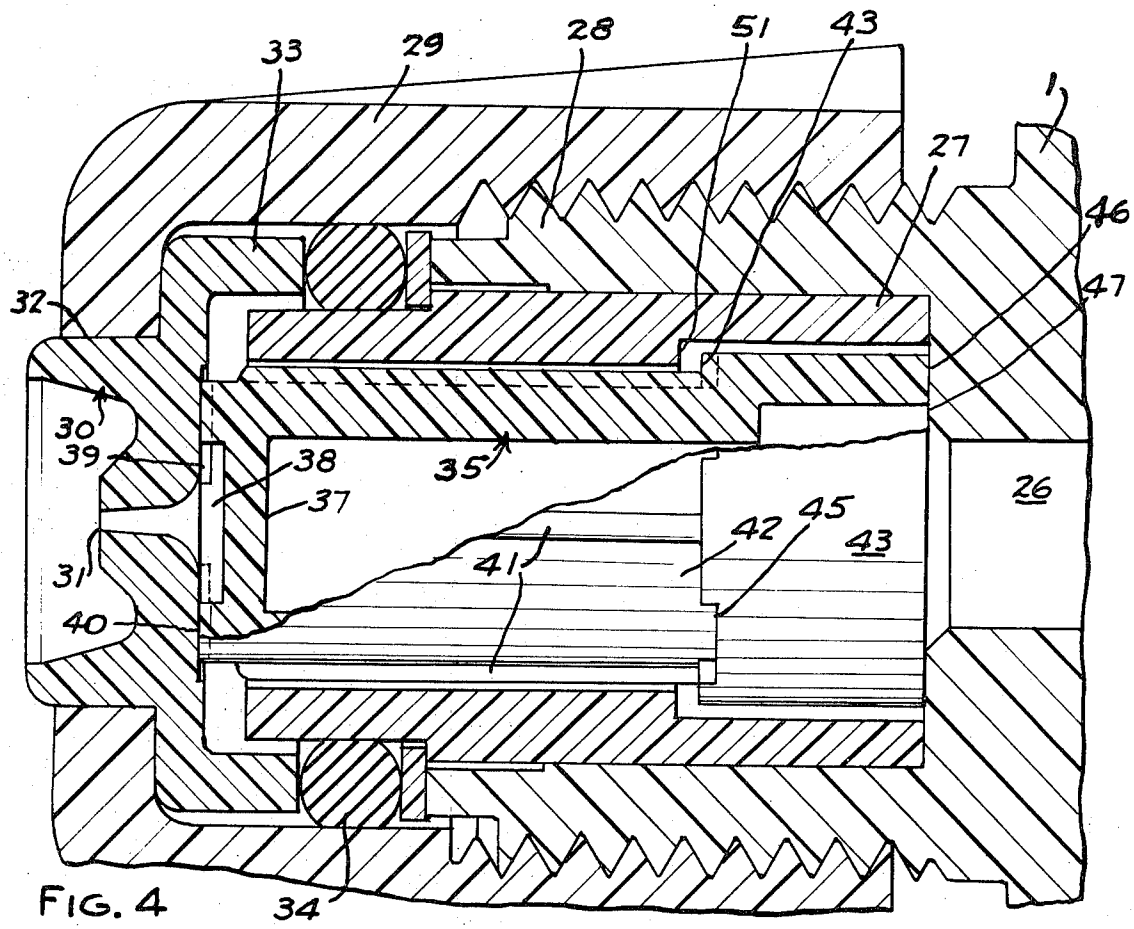

FIG. 4

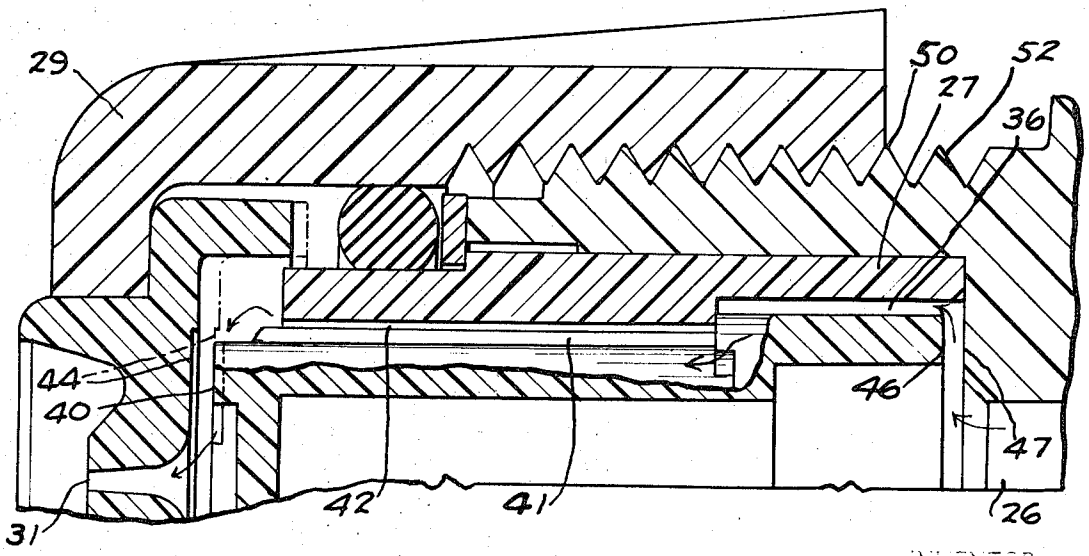

FIG. 5

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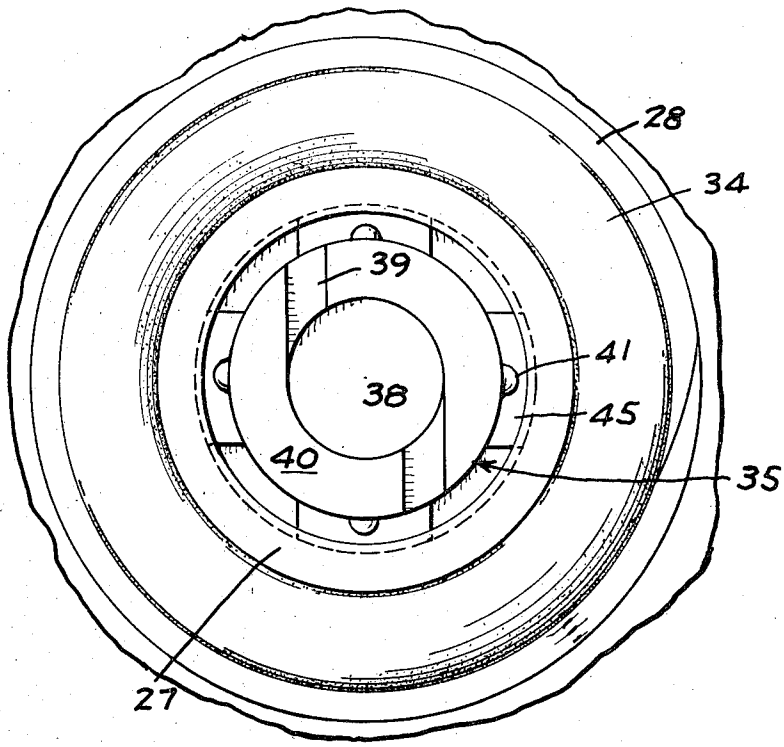

FIG. 6

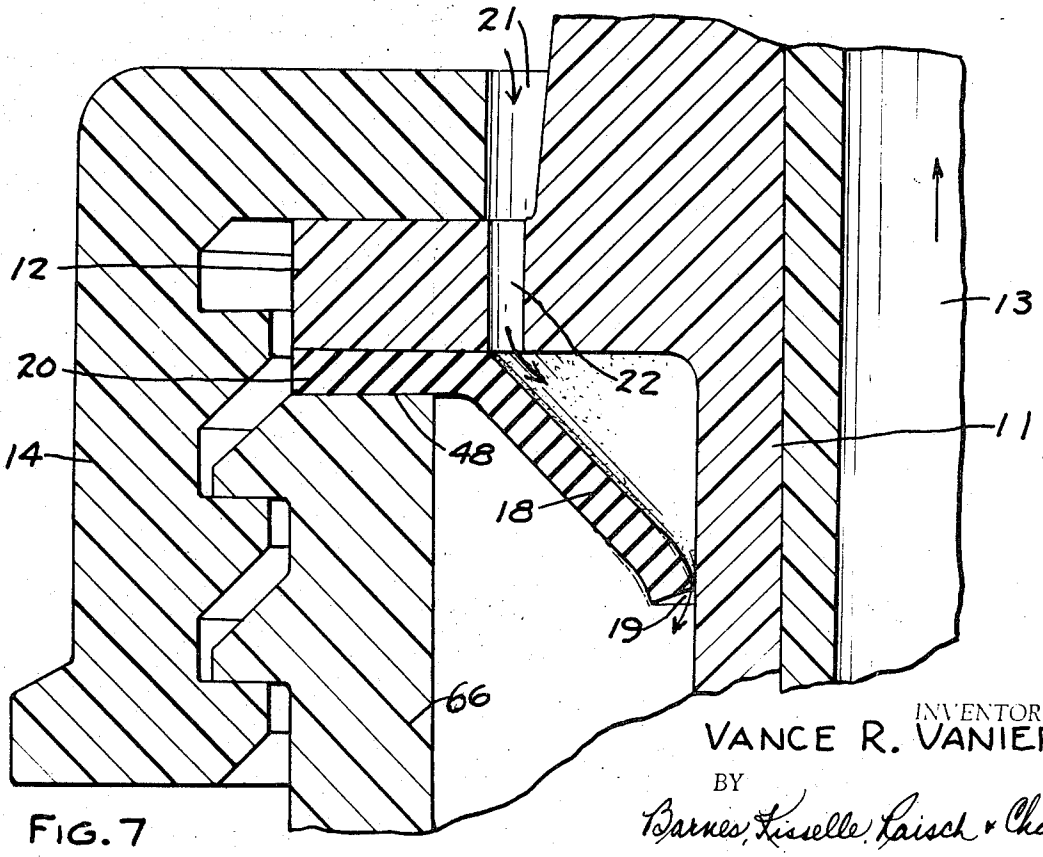

FIG. 7

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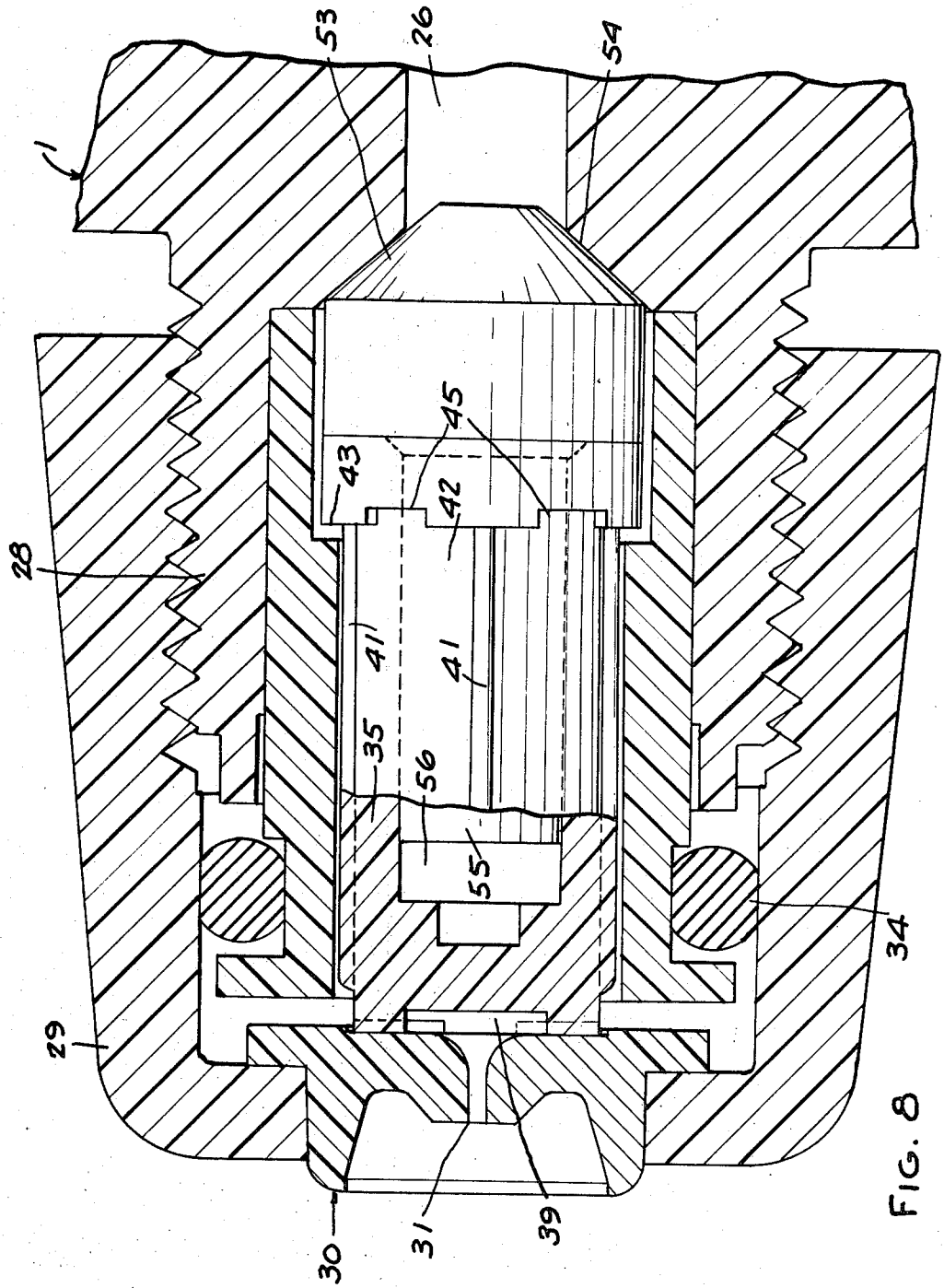

FIG. 8

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LIQUID DISPENSING APPARATUS

This invention relates to a liquid dispensing apparatus and more particularly to means for sealing and disabling a liquid dispensing pump of the type which mounts on a container to thereby provide a shippable closure for the container.

This invention relates to spray dispensing devices of the type disclosed in U.S. Pat. No. 3,061,202. Although such dispensers normally employ inlet and outlet check valves associated with the pump mechanism which may be lightly spring biased or gravity biased to a seated position, such valves are not intended as static seals to prevent gravity flow of liquid through the dispenser unit in the event that the container should be inverted. Hence such dispensers normally are not capable of serving as a shippable closure; i.e., capable of sealing the container against leakage of its contents during shipment and/or storage of the dispenser prior to purchase by the ultimate consumer. Hence a separate screw-on cap or other closure must be secured to the container if it is to be shipped full of liquid, and the dispenser included in the package as a separate device disconnected from the container.

Where the spray dispensing device of the type referred to above is attached to the container containing the liquid to be dispensed, either before or after shipment, the existence of an externally or internally manually operated element or trigger invites tampering of the device so that, either inadvertently or maliciously, the same may be actuated so as to partially or fully pump liquid before the unit has been sold to the customer. This has necessitated mechanical locking means for the operating element or other additional protective packaging enclosures in order to render such dispensers tamper-proof.

Accordingly it is an object of the present invention to provide a liquid dispensing device of the type having a self-contained pumping mechanism which is removably mountable on the spout of a container and which incorporates an inexpensive leakproof and tamper-proof seal which is factory installed to both disable the pump mechanism with respect to its ability to pump a liquid and to prevent leakage of liquid from the container so that the liquid dispensing device can serve as a shippable closure for a liquid filled container.

A further object is to provide a closure-dispenser of the above character wherein the seal is readily opened by the ultimate consumer and merely opening the seal enables operation of the liquid pumping mechanism of the dispenser and wherein the dispenser is readily resealable and thereby disabled for storage.

Still another object is to provide a closure-dispenser of the above character wherein the seal and other parts of the dispenser may be made of plastic material by mass production injection molding techniques at a minimum of cost.

Other objects as well as features and advantages of the present invention will become apparent from the following detailed description taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a side elevational view of the trigger operated liquid dispensing device mounted on a liquid container, the container being shown in fragmentary elevation and in broken lines.

FIG. 2 is a front elevational view of the device of FIG. 1 with the container shown in fragmentary elevation and in broken lines.

FIG. 3 is a vertical sectional view of the device on an enlarged scale.

FIG. 4 is a vertical section through the nozzle portion of the liquid dispensing device showing the outlet check valve held positively in closed position by the nozzle in one adjusted position to thereby disable the pump.

FIG. 5 is a vertical section through the nozzle and outlet check valve portion of the liquid dispensing device showing the nozzle in another adjusted position so that the check valve is free to close the conduit during the intake stroke of the pump and free to open during the ejection stroke of the pump thus enabling the device to dispense liquid from the container.

FIG. 6 is a front view of the outlet end of the liquid dispensing device with the nozzle removed.

FIG. 7 is a fragmentary vertical section on an enlarged scale showing the container closure or cap with its air vent and the check valve which admits air into the container during the intake stroke of the pump but seals the container against flow of liquid through said vent.

FIG. 8 is an enlarged sectional view similar to FIG. 4 showing a modified form of outlet check valve.

Referring to the drawings it will be seen that the subject shippable closure-dispenser of the invention is an improvement upon the liquid trigger operated device of the type shown in U.S. Pat. No. 3,061,202. Referring to U.S. Pat. No. 3,061,202 sprayer **10** as disclosed cannot be used as a closure for the container for shipping purposes unless the container is empty of liquid. This is because inlet check valve **17** is lightly biased by spring **19** to open position, and outlet check valve **29** is also only lightly biased by spring **30** to closed position. Hence if the container is inverted when full of liquid, any liquid contained in dip tube **22** will run down hill past valve **17**, through passage **34**, chamber **32** and passage **35** to valve **29**. The stray liquid can then leak around valve **29** into the nozzle passages and then run out of unit **10** through orifice **25**. This same condition also exists in a modification of sprayer **10** wherein a metal check ball is substituted for valve **17** and the force of gravity acting on the ball when sprayer **10** is upright is relied upon to lightly bias the ball to closed position.

Consequently, the sprayer **10** of U.S. Pat. No. 3,061,202 when sold with a packaged liquid has had to be packaged separately from the container and the container sealed by a separate closure, such as a conventional screw cap. This, of course, entails additional cost both for the extra closure cap and the additional packaging procedure involved, as well as the cost involved in the extra bulk required to accommodate the detached or separate sprayer **10** in the shipping carton. However, in accordance with a principal feature of the present invention, the liquid dispensing unit is inexpensively converted to a shippable closure by converting the misting or spinner element and the outlet valve into one element and arranging the nozzle with respect to the combined spinner element and outlet check valve so that the nozzle can be adjusted to one position where it positively closes the outlet valve to disable the pump

and to another position where the outlet valve is responsive to the action of the pump, closing on the intake stroke of the pump and opening on the liquid ejecting stroke of the pump and in addition an air vent and check valve therefor are provided for the container closure which admit air into the container on the suction stroke of the pump and seals the closure against loss of liquid from the container while the container with its load of liquid and the pump assembled thereto are shipped or otherwise handled as an assembly.

Referring to the drawings herewith the device comprises a body **1**, a trigger **2** pivotally supported on the body by a pin or rivet **3**, a hollow piston **4** containing a rubber or flexible cup-shaped piston washer **5**, a piston reaction spring **6** mounted within the cylinder bore or cavity **7** formed in body **1**. Piston **4** with its rubber washer **5** acts as a two-piece piston. One end of spring **6** is positioned over and supported on guide stem **8** in cylinder **7** and integral with body **1**. The other end of spring **6** seats in the rubber cup washer **5** which forms part of piston **4**. The body **1** is provided with a conical cavity **9** into which is pressed the upper conical end **10** of the intake stem **11**, the stem **11** thus being securely affixed to the body **1**. The lower end of the body which forms cavity **9** preferably abuts the flange **12** on intake stem **11**. An intake or suction tube **13** which has a press fit in intake stem **11** extends into container **15** to a point adjacent the bottom of container **15**.

An internally threaded bottle cap or closure **14** is provided for securing the liquid dispenser to the liquid container **15** having a threaded neck **66** upon which the closure **14** is screwed. Stem **11** passes through a central opening **16** in the cap and the surrounding flange portion **17** of the cap extends over flange **12** on the intake stem. A rubber seal **18** in the form of a frustum of a cone surrounds and seals circumferentially against stem **11** as at **19**. The circumferential flange **20** at the upper end of conical seal **18** is compressed between the flange **12** and the top surface **48** of the outlet or neck **66** of the container **15** for the liquid being dispensed so as to effect a liquid tight seal between the upper end of outlet or neck **66** of container **15** and flange **12** (FIG. **7**). Cap **14** is provided with a small vent opening **21** which communicates with a vent opening **22** in flange **12**.

During the suction stroke of the two-piece piston **4, 5** air is drawn into the container **15** above the liquid from atmosphere through vents **21, 22** and by the lower circumferential edge **19** of the rubber seal **18**, as indicated in FIG. **7**. A check valve is provided for permitting air to be drawn into the container through passages **21** and **22** but checking or stopping the reverse flow of air from the container to atmosphere. Preferably this check valve takes the form of conical seal **18** which acts as a check valve by sealing against the stem **11** permitting air to enter the container through vents **21** and **22** and preventing air from flowing out of the container **15** through vents **21** and **22**. Thus seal member **18** serves the dual function of a check valve and a washer for effecting a liquid tight seal between flange **12** of intake stem **11** and the outlet of neck **66** of the container **15**.

Stem **11** is provided with an opening **23** adjacent the upper end of the tube **13**. Orifice or opening **23** is controlled by a ball check type valve **24** which permits liquid to be drawn upwardly from the container **15** through tube **13** and opening **23** into cavity **9** but prevents reverse flow of liquid from cavity **9** through opening **23** into container **15**. Cavity **9** communicates through orifice or opening **25** with cylinder **7**.

Body **1** is provided with an outlet conduit **26** which provides communication between cylinder or pump chamber **7** and nose bushing **27** which has a press fit in the hollow nose **28** of body **1**. An ejection nozzle **29** which is internally threaded has a screw fit on the externally threaded nose **28**. An orifice member **30** having an orifice **31** is pressed into an opening **32** in the outer end of nozzle **29**. Orifice member **30** has a circumferential flange **33** which surrounds the outer end of nose bushing **27** (FIG. **4**). A rubber **0**-ring **34** is provided within nozzle **29** around bushing **27** and between flange **33** of the orifice member **30** and the outer end of hollow nose **28**. As shown in FIGS. **4** and **5**, the O-ring **34** effects a liquid tight seal between nose bushing **27** and nozzle **29** so that all the liquid ejected by the pump will pass through orifice **31**.

Within nose bushing **27** there is provided a combination check valve and spinner element **35**. Combination spinner and check valve **35** takes the form of a cup or cylinder closed at its outer end by wall **37**. The outside face of wall **37** is provided with a circular cavity **38** which communicates with outlet orifice **31** and a plurality of tangential slots **39** which extend from cavity **38** to the outer face of spinner element **35** (FIG. **6**). The outer end face **40** of spinner element is flat so that it can effect a liquid tight seal against the inner face **44** of orifice member **30** thereby forcing all of the liquid ejected by the pump to pass through tangential slots **39**. Combined spinner and check valve **35** is provided externally with a plurality of circumferentially spaced longitudinal ribs **41** and is freely slidable within cylindrical nose bushing **27**. Ribs **41** slide upon the internal face of nose bushing **27** and provide passageways **42** through which liquid can pass through nose bushing **27** around the outside of valve **35**. The inner end portion of member **35** is enlarged and thus forms a circumferential shoulder **43**. Shoulder **43** has a plurality of circumferentially spaced radial slots **45** which communicate with passageways **42** and the space **36** between the enlarged end of member **35** and the interior wall of bushing **27**.

The inner end face **46** of member **35** is flat so that it can make a liquid tight seal with the end wall **47** of nose **28** when member **35** is pressed against wall **47** by screwing nozzle **29** to the right as shown in FIG. **4**. When nozzle **29** is screwed to the left or open position, as shown in FIG. **5**, face **46** of member **35** is free to withdraw from wall **47** to place passageway **26** in communication with space **36**.

Preferably as a matter of reducing the cost of this liquid dispensing device all of the elements referred to above except the rubber seal **18**, stainless steel check valve **24**, metal coil spring **6**, rubber piston member **5** and **0**-ring **34** may be made of plastic by well known molding techniques.

The operation of the dispensing device above described is as follows: Assume that nozzle **29** is turned outwardly so that the distance between the inner face **44** of orifice member **30** and wall **47** of nose **28** is greater than the over-all length of combined check valve and spinner element **35** so that member **35** is free

to move longitudinally within nose bushing 27 as shown in FIG. 5, that cavity 9, cylinder or pump chamber 7, and passageway 26 are empty of liquid and filled only with air and that the container is filled to a level above the lower end of tube 14. Under such conditions if trigger 2 is manually squeezed to rapidly force the two-piece piston 4, 5 inwardly of pump chamber 7, then air compressed by the piston will cause inlet check valve 24 to seat and close opening 23 and outlet check valve and spinner element 35 to move leftward to open position, FIG. 5, to thereby expel a quantity of pressurized air to atmosphere through nozzle orifice 31. If trigger 2 is then released, spring 6 will bias piston 4 back to the outward position thereof shown in FIG. 3, thereby creating a sub-atmospheric pressure in chamber 7. This air pumping action is repeated for several strokes of the piston until the resulting evacuation of air from chamber 7, cavity 9 and passageway 26 causes liquid from container 15 to be drawn into pump chamber 7 to thereby prime the pump with liquid. Further actuation of the trigger to reciprocate piston 4 will then cause liquid to be pumped from the container 15 and dispensed in a spray or jet from orifice 31 each time trigger 2 is squeezed.

In FIG. 5 nozzle 29 is turned outwardly a short distance as indicated by the end of the nozzle being aligned with the second thread 50 on nose 28 so that the distance between faces 44 and 47 is greater than the length of member 35. This frees member 35 for sliding action in bushing 27. Now when shoulder 43 of member 35 abuts the internal shoulder 51 of nose bushing 27, the outer face 40 of member 35 is spaced from the inner face 44 of orifice piece 30. In such position the liquid being ejected is free to pass between end 40 of member 35 and face 44 and leaves the orifice 31 as a jet or solid stream.

However, if nozzle 29 is turned to the right, FIG. 5, so that the rearmost end of the nozzle is positioned over innermost thread 52 on nose 28, as appears in FIG. 3, the outer end 40 of member 35 is free to be pressed against the inner face 44 of orifice member 30 during the ejection stroke of the pump thus requiring all of the ejected liquid flowing through passages 42 to pass through the tangential slots 39 which gives the liquid a centrifugal action as it enters orifice 31 and is then ejected from orifice 31 in the form of a spray or mist. At this time with spinner face 40 tightly abutting orifice inner face 44 (dotted line showing in FIG. 5), shoulder 43 on the member 35 will clear internal shoulder 51 of nose bushing 27 and faces 40 and 44 will abut in a substantial liquid tight seal to force all liquid being ejected through the tangential slots 39.

The shut-off or disabled condition of the pump is shown in FIG. 4. At this time nozzle 29 is turned inwardly so that check valve and spinner element 35 is clamped tightly between end wall 47 of nose 28 and inner surface 44 of orifice member 30. Since ejection nozzle 29 clamps face 46 of member 35 tightly against face 47 to effect a liquid tight seal, liquid cannot escape from pump chamber 7 and passageway 26.

In FIG. 3 nozzle 29 is positioned so that check valve and spinner element 35 on each ejection stroke of the pump will cause the liquid to be ejected from orifice 31 in the form of a spray. In FIG. 5 (full line showing) the nozzle 29 is positioned so that check valve and spinner element 35 on each ejection stroke of the pump will cause the liquid to be ejected from orifice 31 in the form of a spray. With nozzle 29 positioned as shown in FIGS. 3 and 5, assuming the pump to be primed, as spring 6 moves piston 4 on its suction stroke valve 35 will be drawn to closed position and liquid will be drawn upwardly through tube 13 by check valve 24 into cavity 9 and pump chamber 7 and as the liquid is being withdrawn from the container through tube 13 atmospheric air will pass into the container through air orifices 21, 22 and by rubber check valve 18. Rubber check valve 18 will close around stem 11 immediately or at the end of the suction stroke of piston 4. Now as trigger 2 is squeezed and piston 4 moves upwardly and to the right, FIG. 3, on its pressure or ejection stroke, check valve 24 seats, closing off opening 23, and the pressure of the liquid being ejected from chamber 7 through passageway 26 acts against member 35 moving it to the left until the outer face 40 of member 35 seats against the inner face 44 of nozzle 30, FIG. 3, in the event a spray is desired or until shoulder 43 of valve 35 abuts against shoulder 51 of nose bushing 27 in the event a solid stream or jet of liquid is desired.

On the pressure or ejection stroke of piston 4 liquid is forced from chamber 7 through tube 26 around valve 35 (valve 35 being open as above said) into space 36 thence through notches 45 into passageways 42, then through either the tangential slots 39 (FIG. 3) or between front face 40 of the member 35 and face 44 of orifice member 30 (FIG. 5), and thence through orifice 31 where the liquid is ejected either in the form of a spray or a jet. Thus valve 35 acts as a pressure actuated valve closing off passageway 26 during the suction stroke of piston 4 and opening upon the pressure stroke of piston 4.

When it is desired to ship container 15 containing the liquid to be dispensed and with the combined closure and liquid pumping device mounted thereon, nozzle 29 is turned so that it moves to the right until valve 35 is closed tightly against face 47 of nose 28 thereby closing or sealing off passageway 26 and the pump is now disabled so that inadvertent or malicious operation of trigger 2 will not eject fluid from the nozzle orifice 31. Further, liquid cannot leak out from the container through cap 14 because of the liquid tight seal provided by conical rubber seal 18. This condition of valve 35 is shown in FIG. 4. Further, the container can be turned upside down or laid on its side and no liquid will be lost either by an attempted pumping action or through the closure 14.

When it is desired to render the pump operative nozzle 29 is turned so that nozzle 29 moves to the left on nose 28 to free valve 35 for reciprocating action so that during the suction stroke of the pump it seals against wall 47 as above described and during the pressure or ejection stroke of the pump member 35 moves to the left or open position as illustrated in FIGS. 3 and 5 and as described above.

FIG. 8 shows a modification of the combined check valve and spinner element, otherwise the combined closure and pumping device is identical with that shown and described above. The modified form of check valve and spinner element, FIG. 8, differs from that shown in FIGS. 1 to 7 only in that the valve is provided with a conical nose piece 53 which co-acts with a

conical seat **54** at the terminal end of passageway **26**, conical nose piece **53** is provided with a cylindrical stem **55** which has a press fit within the hollow cavity **56** of member **35**. The modified valve of FIG. **8** operates exactly the same as the principal form of the valve shown in FIGS. **1** through **7** except that conical end nose piece **53** seats against a conical seat **54** to close off passageway **26** whereas in the principal form of the combined spinner and valve member **35** the flat face **46** of member **35** seats against flat face **47** of the nose piece **28** to close off passageway **26** when the valve is in closed position.

When the pumping mechanism is secured to the neck of the container **15**, as shown in FIG. **1**, and the nozzle is turned to its shut off position, FIG. **4**, valve member **35** is clamped between the nozzle and face **47** at the outlet end of passageway **26** and thus effects a liquid tight seal preventing liquid from flowing out of passageway **26**. At this time the conical rubber seal provides a liquid seal between the neck of the container and the closure to prevent liquid from flowing out of the container except through tube **13**. However, the cylinder **7** is effectively sealed against liquid leakage by the piston washer **5**. Thus, the container with liquid therein and the pump assembled thereto can be shipped and handled without any loss of liquid from the container.

I claim:

1. In a device adapted for dispensing liquids from a container wherein the device comprises a pumping mechanism adapted to be secured to a container containing the liquid to be dispensed, said pumping mechanism including a pump chamber, an inlet conduit adapted to connect the pump chamber with the liquid in the container, an inlet check valve in the inlet conduit between the pump chamber and the container, a nozzle having a dispensing orifice, an outlet conduit connecting said pump chamber with said orifice, and an outlet check valve in said outlet conduit between the pump chamber and said orifice, the improvement wherein said nozzle is adjustable to a first position providing clearance for movement of said outlet check valve whereby said outlet check valve in the liquid dispensing operation of said pumping mechanism is free to move to an open position in response to said pumping mechanism being actuated to eject liquid through said dispensing orifice and to a closed position in response to said pumping mechanism being actuated to draw liquid into said chamber via said inlet conduit and inlet check valve, and wherein said nozzle is adjustable to a second position with respect to said check valve to take up said clearance and thereby hold the outlet check valve in said closed position to maintain said outlet conduit closed and thereby disable the pumping mechanism from ejecting liquid from said orifice.

2. The combination claimed in claim **1** wherein said pumping mechanism includes a body having a nose with a passageway therein leading from said pumping mechanism and forming at least a portion of said outlet conduit, said outlet check valve being mounted within said nose passageway and movable within said passageway between said open and closed positions thereof, said nozzle being adjustable to said second position wherein it positively holds said outlet valve in said closed position to shut off communication between said orifice and said pump chamber via said outlet conduit and adjustable to said first position wherein said outlet check valve is free to move in response to said pumping action of said pumping mechanism between said open and closed positions of said outlet check valve to thereby enable said outlet check valve to close the outlet conduit during the suction cycle of said pumping mechanism and to open the outlet conduit in response to the liquid ejecting action of said pumping mechanism to permit dispensing of the liquid through said dispensing orifice.

3. The combination claimed in claim **2** wherein said outlet check valve is slidable in said nose passageway between said open and closed positions thereof when said nozzle is in said first adjusted position.

4. The combination set forth in claim **3** wherein said outlet check valve is in the form of a closed body and is provided with external ribs which have a sliding engagement with the nose passageway and provide passageways through which the liquid being dispensed flows when said outlet valve is in open position.

5. The combination set forth in claim **4** wherein the outer end portion of said outlet check valve abuts said nozzle when said nozzle is in a third adjusted position between said first and second positions thereof and when the pumping mechanism is actuated to pressurize said liquid, said outer end portion being provided with at least one radial slot through which the pressurized liquid flows preparatory to being ejected from the nozzle orifice as a spray.

6. The combination claimed in claim **4** wherein said nozzle is threadably mounted on said nose such that when said nozzle is adjusted by screwing it to its second position the outlet check valve is clamped between the nozzle and a seat in said outlet conduit to thereby shut off said conduit and disable the pumping mechanism.

7. The combination set forth in claim **1** including closure means for securing said pump mechanism to a container for the liquid to be dispensed, said closure means having a vent for admitting air into the container and a normally closed check valve for said vent which opens to admit air into the container in response to the pumping action of said pumping mechanism when it withdraws liquid from said container.

8. The combination set forth in claim **7** wherein said pumping mechanism includes an intake stem adapted to project into the neck of the container and said normally closed check valve is in the form of a truncated flexible inverted cone provided with a peripheral flange clamped between the closure means and the container outlet to provide a liquid tight seal, said truncated conical seal having an opening through which the intake stem portion of said pumping mechanism projects in liquid sealing relation therewith.

9. In combination a container adapted to hold liquid to be dispensed, a device adapted for dispensing liquids from a container wherein the device comprises a pumping mechanism adapted to be secured to a container containing the liquid to be dispensed, said pumping mechanism including a pump chamber, an inlet conduit adapted to connect the pump chamber with the liquid in the container, an inlet check valve in the inlet conduit between the pump chamber and the container, a nozzle having a dispensing orifice, an outlet conduit

connecting said pump chamber with said orifice, and an outlet check valve in said outlet conduit between the pump chamber and said orifice, said nozzle being adjustable to a first position providing clearance for movement of said outlet check valve whereby said outlet check valve in the liquid dispensing operation of said pumping mechanism is free to move to an open position in response to said pumping mechanism being actuated to eject liquid through said dispensing orifice and to a closed position in response to said pumping mechanism being actuated to draw liquid into said chamber via said inlet conduit and inlet check valve, and wherein said nozzle is adjustable to a second position with respect to said check valve to take up said clearance and thereby hold said outlet check valve in said closed position and thereby disable the pumping mechanism from ejecting liquid from said orifice whereby the said container with the pumping mechanism assembled thereto is sealed against loss of liquid through said pumping mechanism when the nozzle is in its second adjusted position.

10. The combination set forth in claim **9** including closure means for securing said pumping mechanism to the container for the liquid to be dispensed, said closure means having a vent for admitting air into the container and a normally closed check valve for said vent which opens to admit air into the container in response to the pumping action of said pumping mechanism when it withdraws liquid from said container whereby the container is also sealed against loss of liquid through said closure means.

11. The combination claimed in claim **2** wherein the nose passageway is a portion of said outlet conduit, the length of said outlet check valve being less than the distance between the outlet orifice and a first stop in said outlet conduit when the nozzle is in its first adjusted position and the length of said outlet valve being equal to the distance between the outlet orifice and said first stop with said outlet conduit when the nozzle is adjusted to its second position.

12. The combination claimed in claim **11** wherein said outlet valve is slidable in said nose passageway and said first stop comprises a valve seat at the juncture of the nose passageway with the portion of said outlet conduit extending from said pump chamber against which the valve seats to close said outlet conduit when the pump is drawing liquid from the container when the nozzle is in its first adjusted position as well as when the nozzle is in its second adjusted position.

13. The combination claimed in claim **12** wherein the outlet nozzle is provided with second seat around the outlet orifice against which the outer end of the outlet valve seats when the nozzle is in its second adjusted position.

14. The combination set forth in claim **13** wherein the nose is provided with a second stop in its passageway and the valve is provided with a stop which abuts against said second stop to thereby space the outlet end of the valve from said second valve seat when the nozzle is in its first adjusted position.

15. The combination set forth in claim **13** wherein in a third position of said nozzle between said first and second positions thereof said outlet check valve is responsive to the subatmospheric pressure created by said pumping mechanism as it withdraws liquid from the container to thereby move said outlet check valve into closed position against said first seat to close said outlet conduit and said outlet valve is responsive to the pressurized liquid during the liquid ejection action of said pumping mechanism to thereby move said outlet check valve against said second seat and to open said outlet conduit, and wherein said second seat and said nozzle have cooperative liquid whirling means adapted to produce a spray pattern in conjunction with said outlet orifice when liquid is being dispensed through said dispensing orifice with said nozzle in said third position.

16. The combination claimed in claim **15** wherein the pump consists of a pumping chamber and piston reciprocable therein.

17. The combination claimed in claim **16** wherein a trigger is pivoted on the pump body and operatively connected to the pumping piston for actuating the same.

18. In a liquid pumping device having a cylinder, a reciprocable piston therein and an inlet for said cylinder, means for connecting said inlet to a source of liquid, a check valve at said inlet operable to open on the intake stroke of said piston and to close on the discharge stroke of said piston, an outlet for said cylinder, a combination spinner and check valve for said outlet operable to close said outlet on the intake stroke and open said outlet on the discharge stroke of said piston, an adjustable orifice member at the discharge end of said cylinder adjustable to one position whereby said outlet check valve is free to open and close, said outlet check valve when open cooperating with said member to control the pattern of liquid ejected via the orifice of said member, said member being adjustable to a second position wherein said orifice member holds said outlet check valve in closing relation with said cylinder outlet whereby said pump is inoperable to discharge liquid through said outlet.

19. The combination set forth in claim **18** wherein said orifice member is threaded on the cylinder outlet whereby said orifice member can be turned to move it to said open and closed positions thereof.

20. The combination set forth in claim **19** wherein said cylinder outlet has a cavity in which said outlet check valve reciprocates between its open and closed positions, said check valve being received with a clearance in said cavity, the outer end of said outlet check valve having a groove therein extending transversely of the end of said outlet check valve whereby on the discharge stroke of said piston said outlet check valve opens said outlet and liquid passes through said clearance and groove to and through said orifice.

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