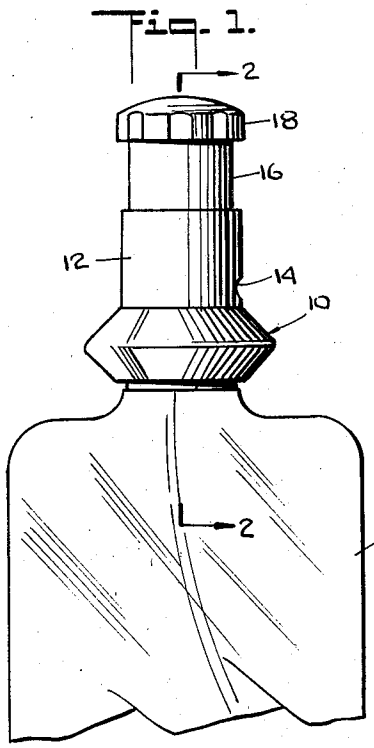
Sept. 23, 1958 A. A. BAMBERGER ET AL 2,853,343

ATOMIZER WITH THUMB-ACTUATED PISTON PUMP

Filed March 11, 1955 4 Sheets-Sheet 1

Fig. 1.



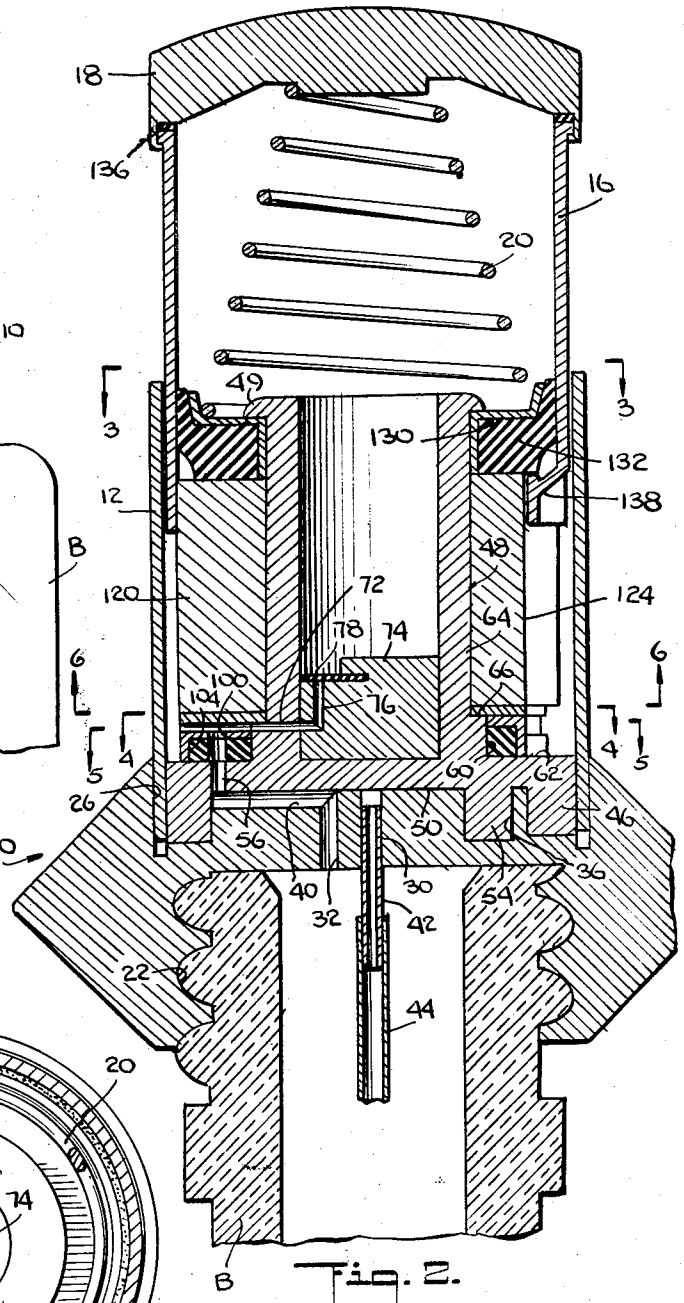
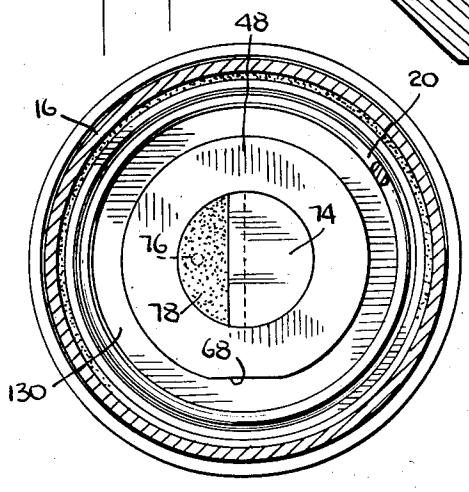


Fig. 2.

Fig. 3.



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ATOMIZER WITH THUMB-ACTUATED PISTON PUMP

Filed March 11, 1955 4 Sheets-Sheet 2

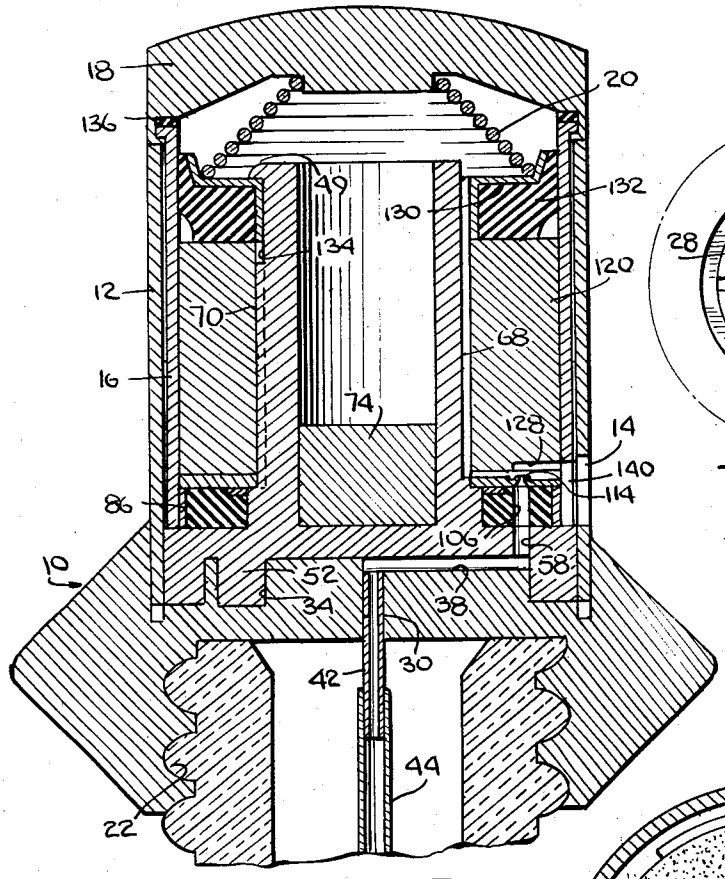


Fig. 7.

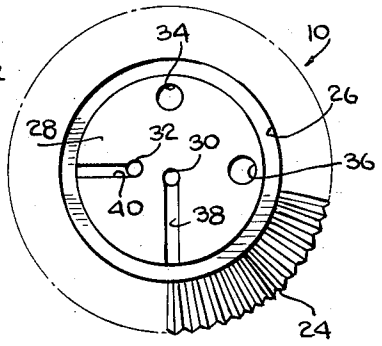
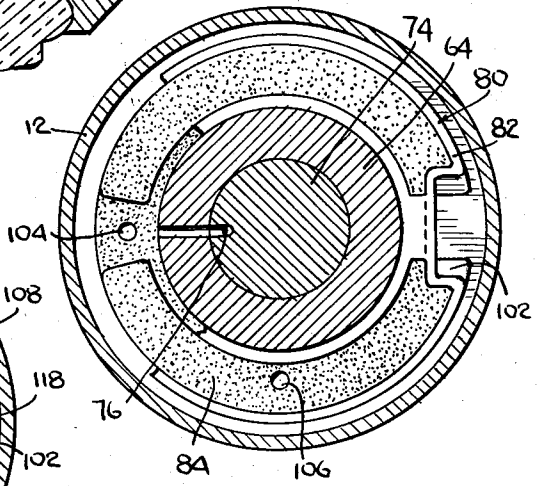


Fig. 8.

Fig. 5.



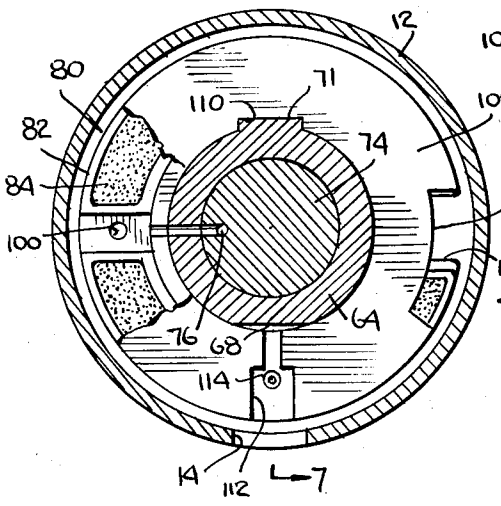


Fig. 4.

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ATOMIZER WITH THUMB-ACTUATED PISTON PUMP

Filed March 11, 1955 4 Sheets-Sheet 3

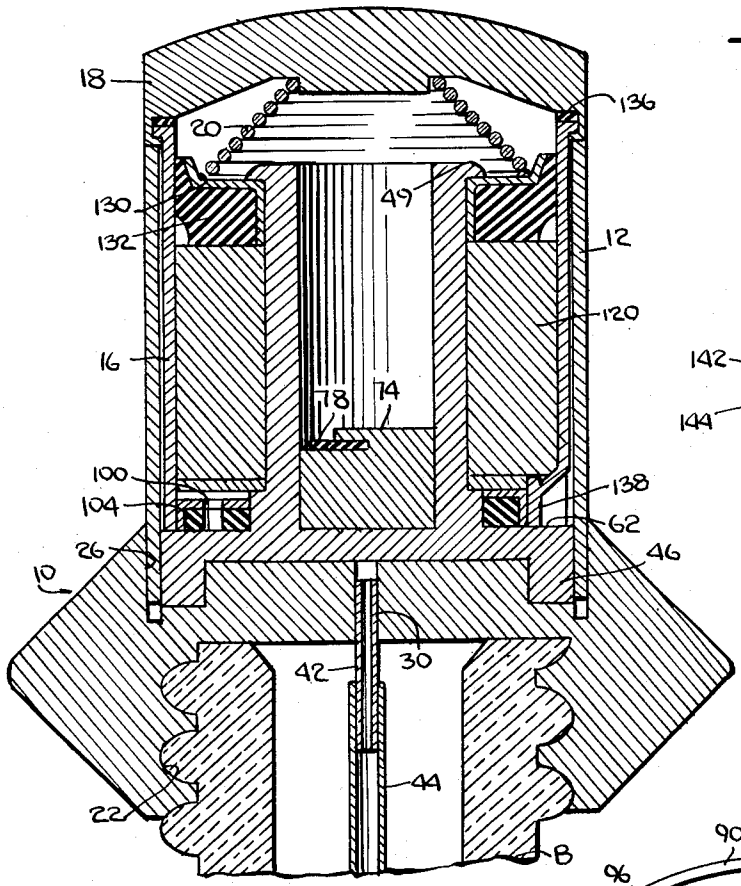


Fig. 8.

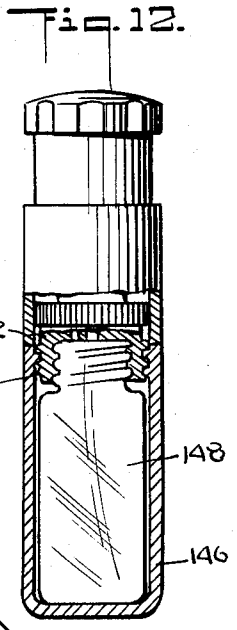


Fig. 12.

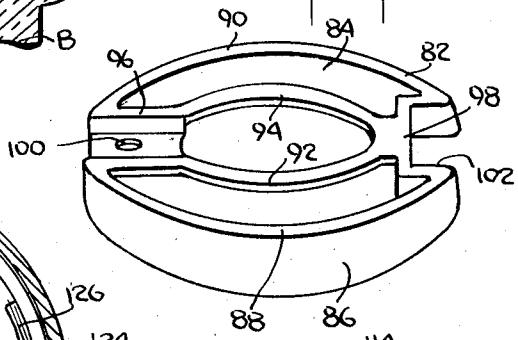


Fig. 10.

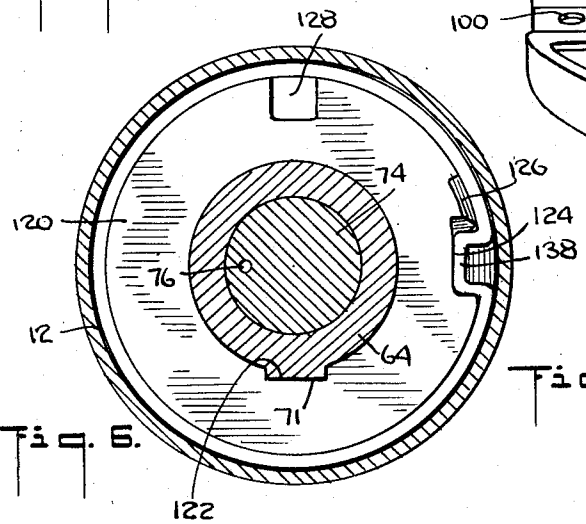


Fig. 6.

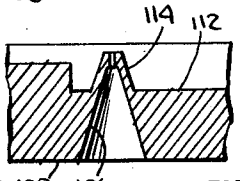


Fig. 11.

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ATOMIZER WITH THUMB-ACTUATED PISTON PUMP

Filed March 11, 1955 4 Sheets-Sheet 4

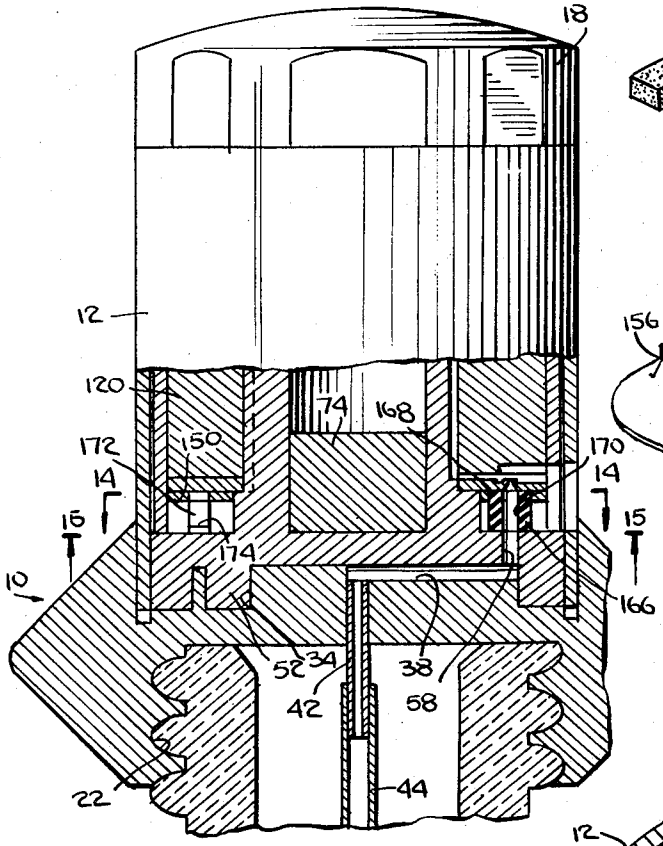


Fig. 19.

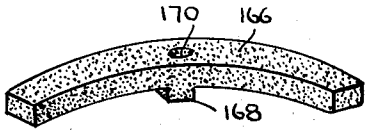


Fig. 17.

Fig. 18.

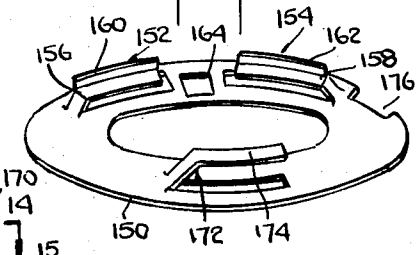
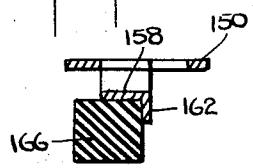


Fig. 16.



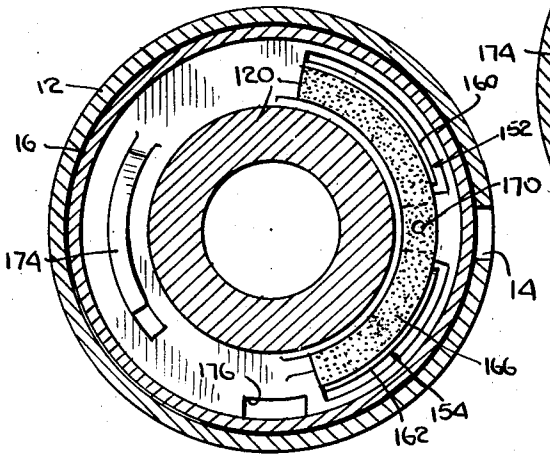


Fig. 15.

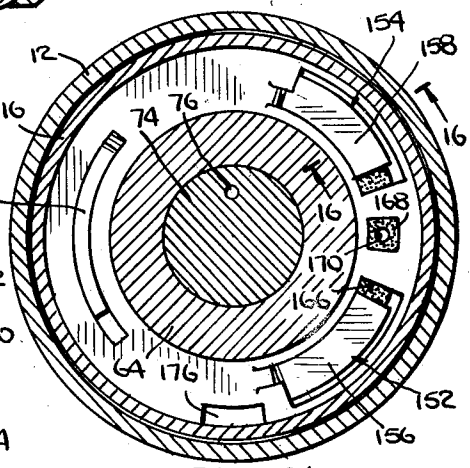


Fig. 14.

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2,853,343

ATOMIZER WITH THUMB-ACTUATED PISTON PUMP

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Application March 11, 1955, Serial No. 493,716

19 Claims. (Cl. 299—88)

This invention relates to atomizers and is directed particularly to an atomizer having a thumb-actuated piston pump and which may be removably attached to a bottle for atomizing liquid therefrom.

The object of the invention is to provide a bottle top atomizer of the character described that can readily be applied to a screw top bottle neck for example, and which comprises selectively operable means for simultaneously locking the atomizer and sealing off the bottle contents from the outer atmosphere when the atomizer is not being used.

Another object is to provide an atomizer of the above nature which is ornamental in appearance, simple in construction, comprised of inexpensively manufactured parts and which is foolproof and long-wearing in operation.

With these and other objects in view there is described herein and illustrated in the accompanying drawings three forms in which the invention may be embodied in practice.

In the drawings, in which like reference numerals are used to designate similar parts throughout the several views;

Fig. 1 is an elevational view of one embodiment of the invention shown in use on a bottle;

Fig. 2 is an enlarged vertical cross-sectional view taken along the line 2—2 in Fig. 1 in the direction of the arrows;

Fig. 3 is a horizontal cross-sectional view taken along the line 3—3 of Fig. 2 in the direction of the arrows;

Fig. 4 is a horizontal cross-sectional view, with a portion broken away, taken along the line 4—4 of Fig. 2 in the direction of the arrows;

Fig. 5 is a horizontal cross-sectional view, with a portion broken away, taken along the line 5—5 of Fig. 2 in the direction of the arrows;

Fig. 6 is a horizontal cross-sectional view taken along the line 6—6 of Fig. 2 in the direction of the arrows;

Fig. 7 is a vertical cross-sectional view of the embodiment of the invention shown in Fig. 1 taken along the line 7—7 of Fig. 4 in the direction of the arrows;

Fig. 8 is a vertical cross-sectional view similar to that of Fig. 2 but showing the atomizer in locked position;

Fig. 9 is a reduced separate top view of the bottle adaptor part which screws on the bottle neck as shown in Fig. 2;

Fig. 10 is a perspective view of the seal ring comprising the embodiment of the invention illustrated in Figs. 1 through 11;

Fig. 11 is an enlarged, partial view of the air washer showing details of the atomizing nozzle therein;

Fig. 12 is front elevational view with parts broken away and in cross-section, of a modification of the invention shown in Figs. 1 through 11 wherein inclosure means is provided for housing a small bottle containing the fluid to be atomized;

Fig. 13 is a view similar to Fig. 1 but showing another modification of the invention wherein an alternative form of seal ring and seal is used;

Fig. 14 is a horizontal cross-sectional view taken along the line 14—14 of Fig. 13 in the direction of the arrows;

Fig. 15 is a horizontal cross-sectional view taken along the line 15—15 of Fig. 13 in the direction of the arrows;

Fig. 16 is a cross-sectional view of the seal ring and seal taken along the line 16—16 of Fig. 14 in the direction of the arrows;

Fig. 17 is a perspective view of the modified seal ring used in the alternative embodiment shown in Fig. 13; and

Fig. 18 is a perspective view of the modified seal used in the alternative embodiment of the invention shown in Fig. 13.

Referring first in general to the embodiment of the invention illustrated in Figs. 1 through 11, the improved bottle top atomizer comprises a bottle adaptor **10**, preferably molded of a synthetic plastic, into the upper end of which is press-fitted a tubular metallic shield or cylindrical sleeve member **12**. The shield or sleeve member **12** is provided with a circular side opening **14** for passage of the atomized fluid and has telescopically fitted in its upper end for reciprocal and relatively rotative motion, a metal cylindrical pump sleeve or shell plunger **16**. The upper end of the pump sleeve **16** is topped with a cap **18** adapted to be pumped by thumb against the action of an interior spring **20** and cause, in the manner hereinbelow to be described, atomized fluid to be discharged from the side opening **14** in the shield **12**. The bottle adaptor member **10** may be provided with an internally threaded opening **22** at its underside adapting it for screw-on attachment to a bottle B the contents of which are to be atomized.

Considering now the construction and operation of the improved bottle top atomizer in greater detail, the bottle adaptor member **10** (see Fig. 9) which preferably has its outer periphery fluted as indicated by the numeral **24**, is provided with a cylindrical recess **26** in its upper surface within which the shield **12** is press-fitted. A raised, circular central portion **28** is also provided in the adaptor member **10**, which raised portion has a small center bore **30**, a small off-center bore **32** and a pair of circular recesses **34**, **36**, ninety degrees mutually displaced. The bores **30** and **32** have respective, radially-extending grooves **38**, **40** communicating with the annular groove defined by the outer periphery of the central portion **28** and the circular wall of the cylindrical recess **26**. A small metallic tube **42** is fitted within the center bore **30** to provide a nipple on which is attached a flexible synthetic plastic tube **44** extending to the bottom of the bottle being used.

Press-fitted between the inner surface of the shield **12** and the outer cylindrical periphery of the central portion **28** of the adaptor member **10** is an annular flange or skirt portion **46** of a core member **48**. Said core member has a flat undersurface portion **50** from which extends a pair of locating pins **52**, **54** fitting into the recesses **34**, **36** respectively of the adaptor member **10**. A vertical bore **56** extends through the core member **48** to communicate with the radial groove **40** (see Fig. 2) and a vertical bore **58** extends through the core member **48** to communicate with the radial groove **38** (see Fig. 7). The core member **48** has a first annular axial portion of reduced diameter **60** forming a first annular shoulder **62** and a second annular axial portion of further reduced diameter **64** forming a second annular shoulder **66** (see Fig. 2). The outer periphery of the second annular portion of the core member **48** is vertically flattened at a position aligned with the bore **58** as indicated by the reference numeral **68** to provide an air passage for the purpose hereinbelow described. Said second annular portion has a longitudinal rectangular projection **71** at a position diametrically opposite said flattened portion to provide a locating key for parts hereinbelow described.

The core member **48** is horizontally bored at **72** at a position in alignment with the vertical bore **56** (see Fig. 2), to provide an opening from the annular shoulder portion **66** to the interior of the core member. A cylindrical plug member **74** is seated within the central opening of the core member **48**. Said plug member is provided with an interior right angular channel **76** communicating at one end with the bore **72** and covered at the other end by a resilient flap **78** secured at one end in a groove in the plug member **74** and serving as a check valve.

Sealing or valve means is provided for shutting off the vertical bores **56** and **58** in the core member **48**, the same comprising an annular valve assembly **80** of a metallic seal ring **82** (see Fig. 10), within the framework of which a rubber nail **84** is fitted. The real ring **82** is annular in shape and has a peripheral, substantially cylindrical, outer wall **86** and bent over, opposed, arcuate outer top portions **88**, **90** joined at their ends with inner arcuate top portions **92**, **94** by interconnecting portion **96**, **98**. The interconnecting portion **96** is inwardly stepped in the vertical direction and centrally drilled to provide an opening **100**. The interconnecting portion **98** is inwardly stepped in the horizontal direction to provide a rectangular slot **102**. The bottom of the seal ring **82** is open to allow fitting therein of the rubber seal member **84**, said seal being of such shape and configuration as to fit within the seal ring **82** so that its upper and lower surfaces are substantially flush with the upper and lower ends of the seal ring (see Figs. 4 and 5). The seal member **84** is further provided with a vertical opening **104** aligned with the opening **100** in the seal ring **82**, and a vertical opening **106** ninety degrees displaced from the opening **104**. The sealing means or valve assembly **80** is seated in the annular groove formed by the annular shoulder **62** in the core member **48** and is rotatable therein from the pumping position to sealing position in the manner hereinbelow more fully described.

Seated upon the annular shoulder **66** of the core member **48** and overlying the seal ring **82** and its contained rubber seal **84**, is a metallic air washer **108** (Fig. 4) having an inner rectangular recess **110** by which it is keyed to the rectangular projection of the core member **48**. At a position opposite the recess **110**, the top of said washer has a horizontally stepped portion of reduced thickness **112** in the central portion of which there is provided a vertically apertured, upwardly-extending atomizing nozzle **114**. The underside of the washer **108** beneath said nozzle is conically recessed, as indicated by the numeral **106**, to reduce frictional force with respect to the flow of fluid through the atomizing nozzle. At a position approximately ninety degrees removed from the atomizing nozzle **114**, the outer edge of the air washer **108** is provided with an arcuate recess **118** for the purpose hereinbelow described.

Surrounding the core member **48** and seated upon the air washer **108** is an annular body member **120**, preferably of plastic material, having an interior vertical slot **122** adapted to key said body member on the projection **71** thereof. The body member **120** is also provided in its outer surface with a vertical guide slot **124** terminating in a sidewardly-extending portion of increased width **126** (see Fig. 6). At a position approximately ninety degrees removed from the vertical slot **124** in the body member **120**, the bottom surface is provided with a shallow, inwardly-extending, substantially rectangular recess **128** (see Fig. 7).

An annular metallic pump cap **130** surmounted by a rubber pump member **132** is fitted upon the upper end of the core member **48** and rests upon the body member **120**. As indicated by the numeral **134** in Fig. 7, the longitudinal projection **71** of the core member **48** terminates short of the upper end of said core member so that the metallic pump cap **130** is not keyed to the core member. The parts mounted upon the core member **48** are held in assembled relation by turning over the upper end of said core member as indicated at **49**.

The pump sleeve **16** reciprocally mounted within the shield **12** as hereinabove mentioned, is hermetically sealed with respect to the cap **18** by means of an intermediate gasket **136**. The lower end of the pump sleeve **16** is inwardly shaped in the form of a lug **138** which in the assembled atomizer is located in the vertical slot **124** of the body member **120**, thereby being constrained to vertical motion in said slot, and sideward motion only the lower portion of increased width **126** of said slot (see Fig. 2 and Fig. 6). At a position approximately ninety degrees removed from the lug **138**, the pump sleeve **16** has a substantially semi-circular cut-out portion **140** (see Fig. 7), to allow for outward flow of the atomized liquid when the atomizer is in pumping condition.

As can best be seen in Fig. 2, the pump sleeve **16** is held in assembled relation with respect to the body member **120**, by virtue of the fact that the pump member **132**, after being assembled, blocks the upper end of the vertical guide slot **122**.

With respect now to the operation of the improved bottle top atomizer hereinabove described, consideration will first be given to the instance when the device is in open condition or ready for atomizing. Fig. 2 shows this condition with pump sleeve **16** in the upward position, and Fig. 7 shows the sleeve pressed in the downward position. When the pump sleeve **16** is pressed downwardly, air entrapped in the uppor portion of the device will be forced down the passage formed by the flattened portion **68** and out over the horizontally stepped portion of reduced thickness **112** of the air washer **108**. In passing said stepped portion, the air will flow with increased velocity over the atomizing nozzle **114**, whereupon liquid from the bottle B will be drawn up through the tube **44**, the nipple **42**, the channel **38**, the bore **58** in core member **48**, the opening **106** in the rubber seal **82**, and the nozzle **114**, all of which are in communicative alignment when the device is in operating position.

It will be evident that on the downward stroke of the pump sleeve **16**, air flow into the bottle is prevented by means of the check valve in the plug member **74**. However, upon the return stroke of the pump sleeve **16** (in the upward direction), air can pass through the bore **32**, channel **40**, bore **56**, aligned openings **104** and **100** in the rubber seal **84** and the seal ring **82**, respectively, side opening **70** and vertical opening **76**, past the check valve flap **78** and into the upper portion of the pump sleeve **16**. It is further to be noted that this air passage for the return stroke is of such size as will offer less resistance to air passage than the above-described path past the nozzle **114**, so that the possibility of liquid being aspirated inwardly during the return stroke will be minimized.

When it is desired to close the bottle top atomizer, it is only necessary to turn the pump sleeve **16** slightly when in the downward position so that its bottom lug **138** becomes latched in the sidewardly-extending portion **126** of the guide slot **124** (see Fig. 8). In turning the lug **138**, extending through the arcuate recess **118** in the air washer **108**, carries with it the seal ring **82** together with its rubber seal **84**, since the lug **138** will also extend when in this lowermost position, into the rectangular slot **102** in said seal ring. The resulting rotary movement of the rubber seal **84**, will therefore seal off at the annular shoulder **62** of the body member **48**, the above-described passages communicating with the vertical bores **30** and **32** leading to the interior of the bottle B. The semi-circular cut-out **140** in the pump sleeve **16** moreover, will be moved out of alignment with respect to

the opening **14** in the outer shield **12** to close off the chamber surrounding the nozzle **114** from the outside.

The modification of the invention shown in Fig. 12, differs only from that described above in connection with Figs. 1 through 11, in that the bottle adaptor **142** has an externally threaded portion **144**, upon which a cylindrical container **146**, enclosing the small bottle **148** is screwed. There is thus provided a small, neat atomizing device suitable for carrying in a pocket or handbag.

Figs. 13 through 17 illustrate an alternative embodiment of the invention, wherein a modified form of seal ring is used. In Fig. 18, the seal ring **150**, shown in upside down position for clarity of detail, comprises an annular metallic ring having an outwardly-struck pair of lugs **152, 154** comprising flat portions **156, 158** spaced from and parallel with respect to the body of the seal ring and outwardly-extending portions **160, 162** bent at right angles to said flat portions. A substantially square hole **164** is provided in the seal ring **150** between the lugs **152, 154**. An arcuate rubber seal **166** (Fig. 17) has a central, substantially square projection **168** adapted to fit into the square hole **164** in the seal ring **150** when the end portions of the seal **166** are seated against the lugs **152, 154** (see Fig. 14). A vertical opening **170** extends through the seal **166** centrally of its square projection **168**. The ends of the seal **166** extend just short of ninety circular degrees from the central opening **170**. Another lug **172** is struck from the seal ring **150** at a position substantially opposite the square hole **164**, said lug having a portion **174** bent parallel to the body of the seal ring at such spacing thereupon as to be substantially in a plane with the outer surface of the rubber seal **166** when in place. At a position approximately midway between the square hole **164** and the lug **172** in the seal ring **150**, said ring is provided with a substantially rectangular recess **176** adapted to receive the lug **138** in the pump sleeve **16** to turn the ring together with its rubber seal **166** when the device is turned to locking position as described above in connection with the first embodiment of the invention illustrated in Figs. 1 through 11. Operation of the modifier device is the same as described in connection with the embodiment illustrated in Figs. 1 through 12. It is to be noted in this connection that the length of the seal **166** is such that it will seal off the vertical bore **56** in the core member **48** when the device is in locked condition.

While there has been disclosed in this specification three forms in which the invention may be embodied in practise, it is to be understood that these forms are shown for the purpose of illustration only, and that the invention is not to be limited to other specific disclosure, but may be modified and embodied in various forms without departing from its spirit. In short, the invention contains all the modifications and embodiments coming within the scope of the following claims.

We claim:

1. An atomizer device comprising a cylindrical sleeve member having means at one end for attachment to a fluid containing bottle, a hollow cylindrical pump member slidably mounted within said sleeve member and having its outer end enclosed, an atomizing nozzle in said sleeve mounting means and extending within said sleeve member, rotary valve means on said sleeve mounting means having a passage communicating with said nozzle and adapted to communicate with fluid in said bottle in one angular position of said valve means, resilient means between said sleeve member and said pump member for resiliently holding them in mutually separated axial position, air flow means communicating with the interior of said pump member and extending radially of said sleeve member and past said nozzle, and an opening in said sleeve member and aligned with said nozzle for permitting outward flow of atomized liquid upon inward pressing of said pump member, said pump member having means to engage and rotate said valve means to seal off said nozzle in one axial position of said pump member relative to said sleeve member.

2. An atomizer device comprising a cylindrical sleeve member having means at one end for attachment to a fluid containing bottle, a hollow cylindrical pump member slidably mounted within said sleeve member and having its outer end enclosed, an atomizing nozzle in said sleeve mounting means and extending within said sleeve member, rotary valve means on said sleeve mounting means having a passage communicating with said nozzle and adapted to communicate with fluid in said bottle in one angular position of said valve means, resilient means between said sleeve member and said pump member for resiliently holding them in mutually separated axial position, air flow means communicating with the interior of said pump member and extending radially of said sleeve member and past said nozzle, an opening in said sleeve member and aligned with said nozzle, and selectably actuable locking means operative to hold said pump member within said sleeve member against the action of said resilient means, and to rotate said rotary valve means to seal off said nozzle, in one axial position of said pump member.

3. The invention as defined in claim 2 wherein said locking means comprises a lug extending inwardly of said pump member, a guide member within said sleeve member and fixed with respect thereto, said guide member defining a vertical guide groove having a horizontally extending recess at its lower end, said lug being constrained within said guide groove.

4. An atomizer device comprising a cylindrical sleeve member having means at one end for attachment to a fluid containing bottle, a hollow cylindrical pump member slidably mounted within said sleeve member and having its outer end enclosed, an atomizing nozzle in said sleeve mounting means and extending within said sleeve member, rotary valve means on said sleeve mounting means having a passage communicating with said nozzle and adapted to communicate with fluid in said bottle in one angular position of said valve means, resilient means between said sleeve member and said pump member for resiliently holding them in mutually separated axial position, means on said pump member to rotate said valve means, air flow means communicating with the interior of said pump member and extending radially of said sleeve member and past said nozzle, an opening in said sleeve member and aligned with said nozzle, air return means communicating between the interior of said bottle and the interior of said pump member, and a check valve in said air return means operative to seal against air flow in the direction to the interior of said bottle.

5. An atomizer device comprising a cylindrical sleeve member having means at one end for attachment to a fluid containing bottle, a hollow cylindrical pump member slidably mounted within said sleeve member and having its outer end enclosed, an atomizing nozzle in said sleeve mounting means and extending within said sleeve member, rotary valve means on said sleeve mounting means having a passage communicating with said nozzle and adapted to communicate with fluid in said bottle in one angular position of said valve means, resilient means between said sleeve member and said pump member for resiliently holding them in mutually separated axial position, said pump member having means to engage and rotate said valve means, in one axial position of said pump member, air flow means communicating with the interior of said pump member and extending radially of said sleeve member and past said nozzle, an opening in said sleeve member and aligned with said nozzle, air return means communicating between the interior of said bottle and the interior of said pump member, and a check valve in said air return means operative to seal against air flow in the direction to the interior of said bottle, and selectably actuable locking means operative to hold said pump member within said sleeve member against the action of said resilient means.

6. The invention as defined in claims 5, wherein said locking means comprises a lug extending inwardly of said pump member, a guide member within said sleeve member and fixed with respect thereto, said guide member defining a vertical guide groove having a horizontally extending recess at its lower end, said lug being constrained within said guide groove.

7. An atomizer device comprising a cylindrical sleeve member having means at one end for attachment to a fluid containing bottle, a hollow cylindrical pump member slidably mounted within said sleeve member and having its outer end enclosed, an atomizing nozzle in said sleeve mounting means and extending within said sleeve member, rotary valve means on said sleeve mounting means having a passage communicating with said nozzle and adapted to communicate with fluid in said bottle in one angular position of said valve means, resilient means between said sleeve member and said pump member for resiliently holding them in mutually separated axial position, air flow means communicating with the interior of said pump member and extending radially of said sleeve member and past said nozzle, an opening in said sleeve member and aligned with said nozzle, air return means communicating between the interior of said bottle and the interior of said pump member, a check valve in said air return means operative to seal against air flow in the direction to the interior of said bottle, and locking means operative simultaneously to hold said pump member within said sleeve member against the action of said resilient means and to rotate said valve means to obstruct both said nozzle communicating conduit means and said air return means.

8. The invention as defined in claim 7 wherein said locking means comprises a lug extending inwardly of said pump member, a guide member within said sleeve member and fixed with respect thereto, said guide member defining a vertical guide groove having a horizontally extending recess at its lower end, said lug being constrained within said guide groove.

9. An atomizer device comprising a cylindrical sleeve member having means at one end for mounting the same on a fluid containing bottle, a hollow cylindrical pump member slidably mounted within said sleeve member and having its outer end enclosed, an atomizing nozzle in said sleeve mounting means and extending within said sleeve member, conduit means communicating with said nozzle and adapted to communicate with fluid in said bottle, resilient means between said sleeve member and said pump member for resiliently holding them in mutually separated axial position, air flow means communicating with the interior of said pump member and extending radially of said sleeve member and past said nozzle, said sleeve member being formed with an opening aligned with said nozzle, air return means communicating between the interior of said bottle and the interior of said pump member, a check valve in said air return means operative to seal against air flow in the direction to the interior of said bottle, and locking means operative simultaneously to hold said pump member within said sleeve member against the action of said spring and to obstruct both said nozzle communicating conduit means and said air return means, said locking comprising a lug extending inwardly of said pump member, a guide member within said sleeve member and fixed with respect thereto, said guide member defining a vertical guide groove having a horizontally extending recess at its lower end, said lug being constrained within said guide groove, said nozzle conduit and air return obstructing means comprising an annular seal member rotatable from a first position within said sleeve member to a second position, said seal member having open portions in alignment with said nozzle conduit and air return means, when in said first position, and out of alignment therewith when in said second position.

10. The combination of claim 9, wherein said nozzle conduit and air return obstructing means comprises an annular seal member rotatable from a first position within said sleeve member to a second position, said seal member having open portions in alignment with said nozzle conduit and air return means, when in said first position, and out of alignment therewith when in said second position, and selectably actuable locking means operative to hold said pump member within said sleeve member against the action of said spring.

11. An atomizer device comprising a cylindrical sleeve member having means at one end for attachment to a fluid containing bottle, a hollow cylindrical pump member slidably mounted within said sleeve member and having its outer end enclosed, an atomizing nozzle in said sleeve mounting means and extending within said sleeve member, conduit means communicating with said nozzle and adapted to communicate with fluid in said bottle, resilient means between staid sleeve member and said pump member for resiliently holding them in mutually separated axial position, air flow means communicating with the interior of said pump member and extending radially of said sleeve member and past said nozzle, an opening in said sleeve member aligned with said nozzle, air return means communicating between the interior of said bottle and the interior of said pump member, and a check valve in said air return means operative to seal against air flow in the direction to the interior of said bottle, the air flow resistance of said air return means being less than the air flow resistance of said air flow means.

12. An atomizer device comprising a cylindrical sleeve member having means at one end for atachment to a fluid containing bottle, a hollow cylindrical pump member slidably mounted within said sleeve member and having its outer end enclosed, an atomizing nozzle in said sleeve mounting means and extending within said sleeve member, conduit means communicating with said nozzle and adapted to communicate with fluid in said bottle, resilient means between said sleeve member and said pump member for resiliently holding them in mutually separated axial position, air flow means communicating with the interior of said pump member and extending radially of said sleeve member and past said nozzle, and an opening in said sleeve member and aligned with said nozzle, a hollow cylindrical container adapted to house said bottle, said container being closed at one end and internally threaded at the other end, said cylindrical sleeve member being externally threaded for attachment of said threaded container.

13. The invention as defined in claim 9 wherein said seal member comprises an annular metallic member having a base portion and outwardly-struck portions having surfaces parallel to said base portion, an opening in said base portion intermediate said outwardly-struck portions, and an arcuate rubber sealing member seated against said parallel surfaces and having an opening in alignment with the opening in said base portion.

14. The invention as defined in claim 9 wherein said seal member comprises a metallic shell of annular configuration, an axially extending cut-out portion in said shell, a radially extending recessed portion in said shell at a position diametrically opposite said cut-out portion, a central opening in said recessed portion, and an arcuate resilient member of such configuration as to fit within said shell and having ends adjacent the sides of said cut-out portion, said resilient member having a first opening in alignment with the central opening in said cut-out portion, and a second opening angularly displaced from said first opening.

15. An atomizer device comprising a member having an axial portion and an annular outwardly extending flange at the lower end of said axial portion, a valve on said annular portion and surrounding said axial portion, a pump member at the upper end of said axial portion, an inverted shell plunger having a cylindrical

wall surrounding said pump member and having a wiping fit thereon, said plunger having a top wall at the upper end of the cylindrical wall, means forming an outlet nozzle, said valve having an opening communicating with said outlet nozzle, said flange having an opening adapted to register with the opening in said valve in one angular position of said valve, a conduit connected to said opening in said annular portion and adapted to be received in a container for liquid to be atomized, means to provide for passage of air from the interior of said plunger to said outlet nozzle as said plunger is depressed, spring means interposed between said pump member and the top wall of said plunger to raise the plunger, means operable after the plunger is fully depressed to engage and rotate the valve upon rotating said plunger in its fully depressed position, means on said valve to seal off said opening in said annular portion upon rotating said valve from said one angular position thereof, and means to connect said plunger and member for relative reciprocatory movement of said plunger, said valve being formed with an air opening, said annular portion being provided with an air opening adapted to register with the air opening in said valve in said one angular position of said valve, and said valve having means to seal the air opening in said annular portion upon rotating said valve away from said one angular position thereof.

16. An atomizer comprising a member having a liquid opening and an air opening, a container for liquid connected to said member, a conduit connected to said liquid opening and projecting into said container, a valve rotatably mounted on said member and having a liquid opening registering with the liquid opening in said member in one angular position of said valve, said valve having an air opening registering with the air opening in said member in said one angular position of said valve, means providing an outlet nozzle communicating with the liquid opening in said valve, a piston on said member, a plunger having a top wall and a cylindrical wall having wiping contact with said piston, means to connect said plunger to said member for reciprocation of said plunger, means to provide engagement of said plunger with said valve at the lower end of the depression stroke of the plunger so that rotation of the plunger at the lower end of its stroke will be accompanied by rotation of the said valve, and said valve having means to seal the liquid and air openings in said member upon rotating said valve away from said one angular position thereof, and means to provide for passage of air from the interior of said plunger to said outlet nozzle upon depressing said plunger.

17. The combination of claim 16, in combination with spring means interposed between said piston and the top wall of said plunger, and means to resiliently press the valve against said member to insure sealing off of said openings in said member when said valve is rotated away from said one annular position.

18. The combination of claim 17, in combination with means to retain said plunger in depressed position upon depressing and then rotating said plunger.

19. The combination of claim 18, in combination with an outer sleeve attached to said member and adapted to surround said cylindrical wall when said plunger is depressed.

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