

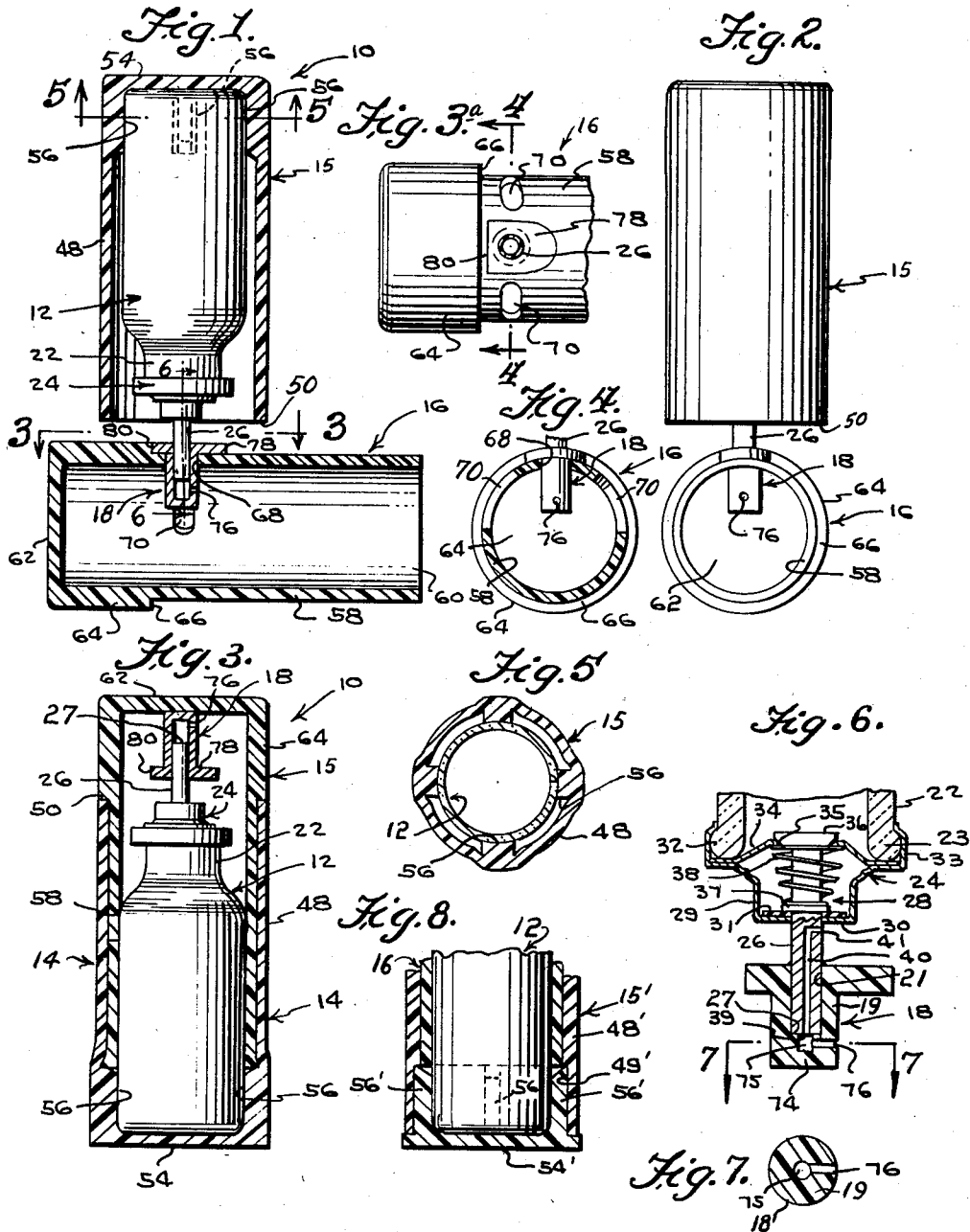
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ENCLOSED MEDICAMENT CONTAINER AND ATOMIZER

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1

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ENCLOSED MEDICAMENT CONTAINER AND ATOMIZER

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5 Claims. (Cl. 128—201)

This invention relates to an improved portable medicament container and atomizer.

The primary object of the invention is to provide a more efficient and practical device of this kind which involves a closed and sealed housing composed of sections which are adapted to be separated when the device is in use, one of the sections being a holder for a container of pressurized fluid medicament and the other of the sections being an applicator into which atomized medicament is discharged from the container by the operation of valve means associated with the container and the applicator.

Another object of the invention is to provide, in a device of the character indicated above, improved spring-closed manually operable valve means, including nozzle means for directing atomized medicament within the applicator section of the housing.

A further object of the invention is to provide a device of the character indicated above which can be readily and economically manufactured, is easily used, is easily carried in a pocket or purse, and is highly satisfactory for the purpose intended.

These together with other objects and advantages which will become apparent, reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings wherein like numerals refer to like parts throughout the several views, and in which:

Figure 1 is a side elevation, partly in section, showing a device of the invention, arranged for use;

Figure 2 is a right hand end elevation of Figure 1;

Figure 3 is a side elevation, partly in section, showing the device arranged for carrying in a pocket or purse;

Figure 3a is a fragmentary horizontal section taken on the line 3—3 of Figure 1;

Figure 4 is a fragmentary transverse section taken substantially on the line 4—4 of Figure 3a;

Figure 5 is a horizontal section taken on the line 5—5 of Figure 1;

Figure 6 is an enlarged fragmentary vertical transverse section taken on the line 6—6 of Figure 1;

Figure 7 is a horizontal section taken on the line 7—7 of Figure 6; and

Figure 8 is an enlarged fragmentary side elevation similar to the lower part of Figure 3, showing other forms of housing sections.

Referring to the drawings in detail, the illustrated device, indicated generally at 10, comprises a pressurized medicament container 12 and a sectional housing 14, which comprises an outer section 15 and an inner section

2

16, and valved nozzle means 18, which are constructed of any suitable materials, such as readily moldable plastic material, and are readily susceptible of mass production.

- 5 The pressurized container 12 is preferably an elongated bottle 20 having on one end a reduced neck 22 having around the open end thereof an annular outwardly extending rib 23 having sealingly clamped thereon a closure cap assembly, indicated generally at 24.
- 10 The closure cap assembly 24 includes an axial endwise displaceable valve stem 26 of a valve assembly, indicated generally at 28, see Figure 6.

The pressurized container 12 contains a charge of pressurized medicament in liquid or powder form.

- 15 As shown in Figure 6, the closure cap assembly 24 includes a cup-shaped cap 29 having a centrally apertured end wall 30 through which an intermediate part of the valve stem 26 works. Suitably secured on the inner surface of the end wall 30 is a centrally apertured sealing disk 31. The cap 29 has on its open end an annular clamping flange 32 sealingly and clampingly engaging over the bottle neck rib 23. A circular sealing disc 33 is interposed between the cap 29 and the open end of the bottle neck 22 and has an inwardly offset portion 34 extending partially into the neck 22 which has therein an opening whose edge defines a valve seat 35. The valve stem 26 extends through the valve seat 35 and has on its inward end an enlarged bevelled valve 36. Fixed on an intermediate part of the valve stem 26 is an annular lateral sealing rib 37 for sealingly engaging the inward side of the sealing disc 31. A coil spring 38 is circumposed on the valve stem 26 and is compressed between the cap portion 34 and the sealing rib 37 so as to seat the valve 36, as clearly seen in Figure 6.

- 35 Engaged on the outer end of the valve stem 26 is a nozzle 18, having a cylindrical body 19 provided with an axial bore 21 in which the outer end of the stem 26 is engaged. The bore 21 has at its outer end a shoulder 39 in which is a reduced diameter closed chamber 75 into which opens a radial orifice 76 which opens through a side of the nozzle 18. The valve stem 26 has thereon an axial bore 40 which opens through the outer end 27 of the stem, and which at its inward end communicates with a lateral radial intake passage 41 which opens through a side of the stem 26, and is normally positioned outwardly of the cap end wall 30, as shown in Figure 6. The outer end 27 of the valve stem 26 engages the shoulder 39.
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- The outer section 15 of the housing 14 is of elongated cup-shape and has a closed end 54 and an open end 50, and a side wall 48 which has, near the closed end 54, circumferentially spaced longitudinal internal ribs 56, in which the bottom end of the pressurized container 12 is frictionally and removably secured. The outer end portion of the valve stem 26 beyond the cap end wall 30, is exposed beyond the open end 50 of the outer housing section 15.
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- In the form of the invention shown in Figure 8, the pressurized container 12 has its bottom end in an end cap 54' having therein a plurality of inwardly bottle gripping ribs 56'. In this instance, the outer housing section 15' comprises an elongated sleeve 48' having in one end a counterbore 49' in which the end cap 54' is engaged.
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3

The inner section 16 of the housing 14 is elongated cup-shaped in form and has a cylindrical side wall 58, an open end 60, and a closed end wall 62. An annular enlargement 64 on the outer side of the side wall 58 at the closed end of the section 16 defines, at the inner end of the enlargement an abutment shoulder 66 for engagement by the open end 50 of the outer housing section 15 when the sections are assembled, as in Figure 3. The side wall 58 of the section 16 has near to and spaced from the abutment shoulder 66 an opening 68, in Figure 1, and at opposite sides of the opening 68 two circumferentially elongated slots 70. The opening 68 is provided to pass the nozzle 18 into the interior of the inner section 16, as shown in Figure 1. The slots 70 serve as inlets for air to be mixed with atomized medicament when discharged from the bottle 12.

On the inward end of the nozzle body 19 is a laterally extending abutment flange 78, having a semi-elliptical shape, as seen in Figure 3a, and having a straight end edge 80 engageable with the shoulder 66. When the straight edge 80 is positioned against the shoulder 66, the orifice 76 is properly positioned to direct atomized medicament within and along the inner section 16 toward and out of its open end 60.

Although the nozzle 18 is shown as being mounted on the valve stem 26, as shown in Figure 1, the nozzle 18 can be constructed as a component of the inner housing section 16.

When the nozzle 18, and hence the valve stem 26, is pressed inwardly, against the resistance of the spring 38, far enough to put the intake passage 41 inwardly of the cap sealing disc 31 and to unseat the valve 36, medicament is discharged from the bottle 12 under pressure through the valve stem bore 40, and is discharged and atomized into the inner housing section 16 and through the orifice 76. When the nozzle 18 is released, the spring 38 returns the valve and the valve stem to closed positions. When the housing sections 15 and 16 are assembled, as shown in Figure 3, the device is sealed against leakage of medicament and forms a compact package of small mass.

The foregoing is considered as illustrative only of the principles of the invention. Since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, as fall within the scope of the appended claims.

What is claimed as new is as follows:

1. A medicament container and atomizer comprising an elongated housing comprising normally telescoped cup-shaped inner and outer sections having open ends, a pressurized medicament bottle engaged in one of said sections, valved atomizing nozzle means on said bottle reaching beyond the open end of said one section, the other section having a side wall provided with an opening and air inlet means, said valved nozzle means having a nozzle adapted to be engaged in said opening and operatively engaged with said side wall when the sections are separated from each other, said nozzle having an atomizing discharge orifice within said other section and directed toward the open end of said other section.

2. A medicament container and atomizer according to claim 1, wherein said valved nozzle means further comprises a closure cap secured on the bottle and having an axial annular seat surrounding an opening in a portion of the cap, an endwise movable valve stem working through said opening, said valve stem having an inner end having a valve thereon engageable with the inner side of the valve seat and an outer end portion reaching beyond the open end of the related housing section, spring means yieldably urging said valve stem out of the open end of said related section and seating the valve, said valve stem having therein a longitudinal bore terminating at its

4

inner end in a lateral intake passage opening through a side of the valve stem and normally positioned outwardly of the cap, said valve stem bore having an open outer end, said nozzle having a longitudinal bore opening through its inner end in which the outer end portion of the valve stem is engaged, said nozzle bore terminating at its outer end in said atomizing discharge orifice.

3. A medicament container and atomizer according to claim 1, wherein said valved nozzle means further comprises a closure cap secured on the bottle and having an axial annular seat surrounding an opening in a portion of the cap, an endwise movable valve stem working through said opening, said valve stem having an inner end having a valve thereon engageable with the inner side of the valve seat and an outer end portion reaching beyond the open end of the related housing section, spring means yieldably urging said valve stem out of the open end of said related section and seating the valve, said valve stem having therein a longitudinal bore terminating at its inner end in a lateral intake passage opening through a side of the valve stem and normally positioned outwardly of the cap, said valve stem bore having an open outer end, said nozzle having a longitudinal bore opening through its inner end in which the outer end portion of the valve stem is engaged, said nozzle bore terminating at its outer end in said atomizing discharge orifice, a lateral flange on the inner end of said nozzle, said lateral flange having an end edge, and a shoulder on the side wall of said other housing section with which said end edge engages so as to position the nozzle with its orifice directed toward the open end of said other section.

4. A pressurized fluid containing bottle having a neck, a closure cap secured on said neck, said cap having a portion provided with an opening surrounded by a valve seat, an endwise movable valve stem working through said opening and having an inner end, an enlarged valve fixed on said inner end normally engaging said seat, spring means yieldably urging said valve in an outward direction and toward said seat, said valve stem having an outer end, a longitudinal bore in said valve stem extending from the outer end of the valve stem to an intermediate part of the valve stem, said valve stem bore terminating at its inner end in a lateral intake passage normally located outwardly of the closure cap and arranged to enter the interior of the closure cap, and a nozzle having a longitudinal bore opening through the inner end and receiving the outer end of the valve stem, said nozzle bore terminating at its outer end in a radial atomizing discharge orifice opening through a side of the nozzle, said nozzle being arranged to be pushed inwardly so as to move the valve stem inwardly against the resistance of said spring means and put the inlet passage into the interior of the closure cap, said closure cap having an outer end wall spaced longitudinally from the valve seat and having an opening through which the valve stem works, a sealing disc on the inner side of the outer end wall and surrounding the valve stem, said valve stem having thereon a lateral annular sealing flange normally engaged with said sealing disc.

5. A pressurized fluid containing bottle having a neck, a closure cap secured on said neck, said cap having a portion provided with an opening surrounded by a valve seat, an endwise movable valve stem working through said opening and having an inner end, an enlarged valve fixed on said inner end normally engaging said seat, spring means yieldably urging said valve in an outward direction and toward said seat, said valve stem having an outer end, a longitudinal bore in said valve stem extending from the outer end of the valve stem to an intermediate part of the valve stem, said valve stem bore terminating at its inner end in a lateral intake passage normally located outwardly of the closure cap and arranged to enter the interior of the closure cap, and a nozzle having a longitudinal bore opening through the inner end and receiving the outer end of the valve stem, said nozzle bore terminat-

ing at its outer end in a radial atomizing discharge orifice opening through a side of the nozzle, said nozzle being arranged to be pushed inwardly so as to move the valve stem inwardly against the resistance of said spring means and put the inlet passage into the interior of the closure cap, said closure cap having an outer end wall spaced longitudinally from the valve seat and having an opening through which the valve stem works, a sealing disc on the inner side of the outer end wall and surrounding the valve stem, said valve stem having thereon a lateral annular sealing flange normally engaged with said sealing disc, said spring means being a coil spring circumposed on the

5

10

valve stem and compressed between said sealing flange and the seat-bearing portion of the closure cap.

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