Jan. 6, 1953 D. J. PEEPS 2,624,621

ATOMIZER

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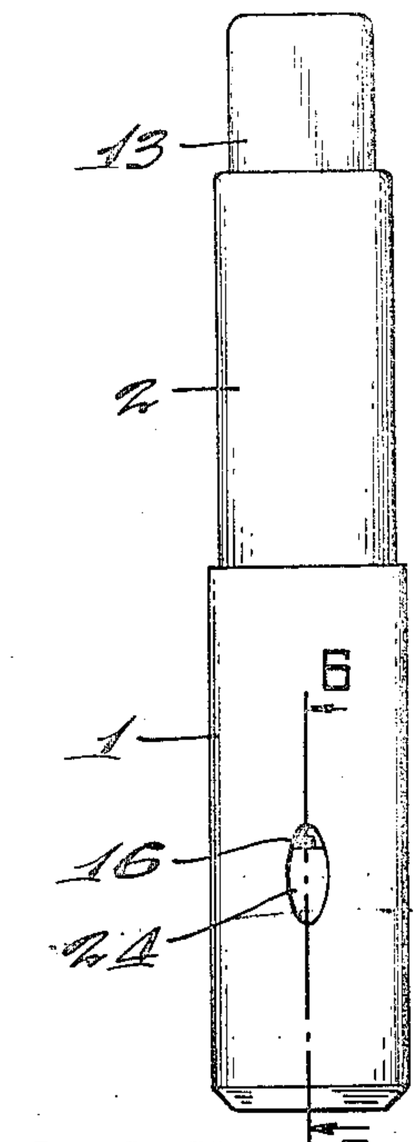

FIG-1-

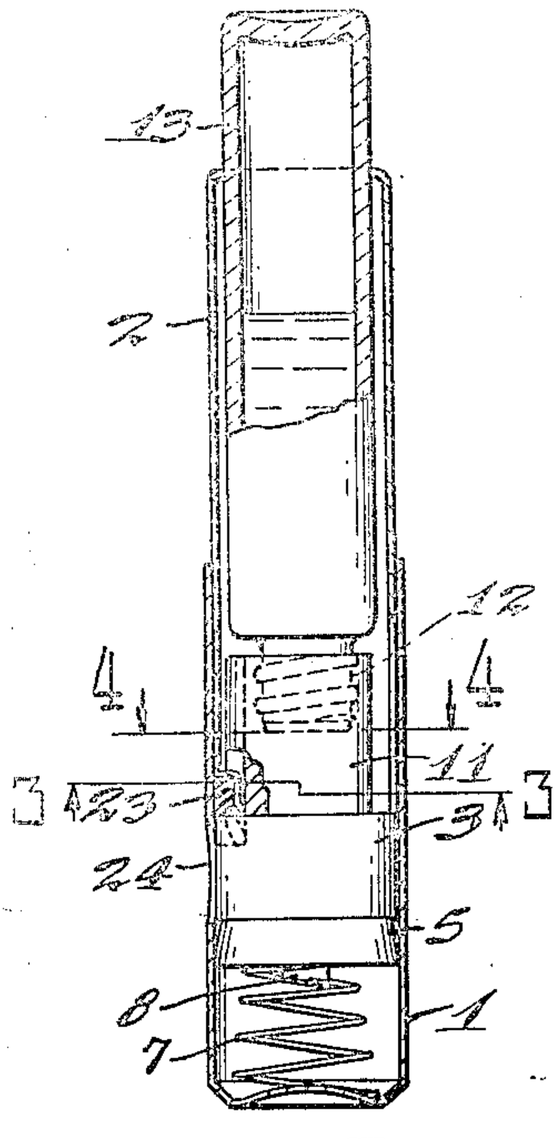

FIG-2-

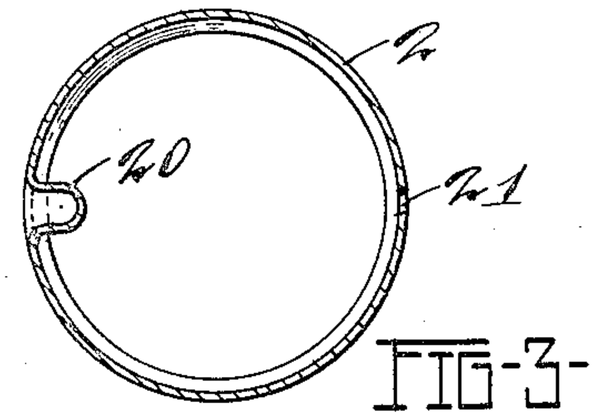

FIG-3-

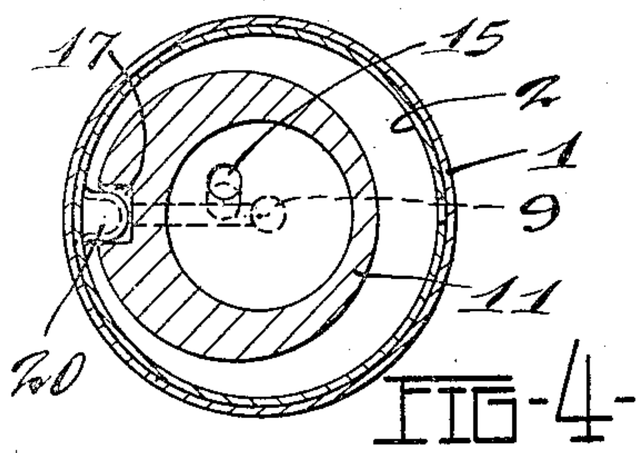

FIG-4-

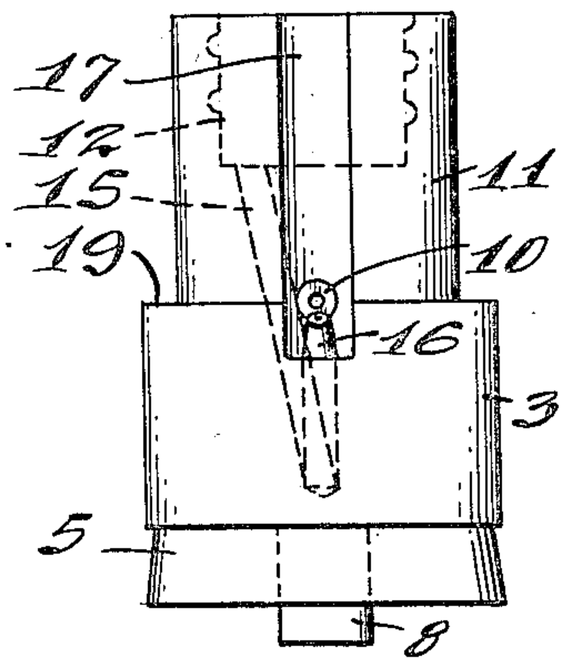

FIG-5-

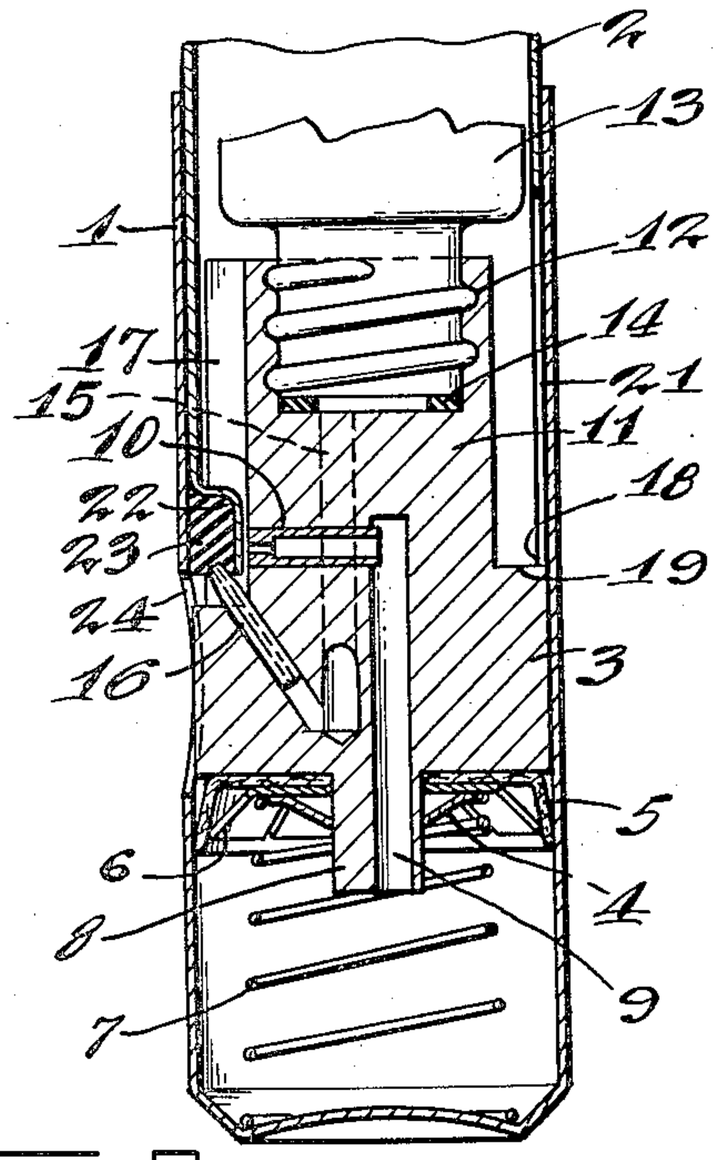

FIG-6-

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ATOMIZER

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4 Claims. (Cl. 299—88)

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This invention relates to an atomizer for spraying perfume and to such an atomizer of a compact size for carrying in a pocket or purse and having means for maintaining the atomizer sealed against leakage when not in use.

A principal object of the invention is the provision of an atomizer of the type described which may be economically produced and is designed to stand long use without failure.

These and other objects and advantages of the invention may be perceived by referring to the following description and the accompanying drawings.

In the drawings:

Figure 1 is an elevational view of an atomizer embodying the invention;

Figure 2 is a vertical section with the atomizer turned 90° to the left of its position in Figure 1;

Figure 3 is a horizontal section of one part of the casing taken on the line 3—3 of Figure 2;

Figure 4 is a horizontal section taken on the line 4—4 of Figure 2;

Figure 5 is an enlarged front view of the piston member of the atomizer; and

Figure 6 is an enlarged vertical section of the lower portion of the atomizer taken on the line 6—6 of Figure 1.

Referring in more detail to the drawings the atomizer has a main cylindrical casing 1 into which is telescopingly fixed an upper casing extension 2. The two parts are firmly joined by a press fit. To permit easier starting of the telescoping press fit the lower end of the extension 2 has a limited longitudinal slot 21.

A compact piston 3 is lodged within the casing 1. By locking disc nut 4 a downwardly facing cup leather 5 is held to the bottom of the piston 3. An expanding washer 6 between the nut 4 and cup leather 5 retains the latter in contact with the casing wall. A spring 7 rests on the inner bottom of the casing and is thrust against the lower end of the piston.

The stud 8 extending downwardly from the lower end of the piston is an anchoring post for the locking nut 4, a stopping element for downward movement of the piston, and provides an outlet for the air compressed beneath the piston by way of the vertical bore 9 therethrough. This bore communicates with a laterally directed air discharge nozzle 10.

The piston 3 has an upper cylindrical extension 11. This extension is of reduced diameter and is axially offset in respect to the lower portion of the piston 3.

In the upper end of extension 11 is a threaded

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socket 12 adapted to receive the threaded neck of an inverted perfume vial 13. The vial is of sufficient length to project out of the casing extension 2 to provide a finger contacting portion for actuation of the piston. Within the socket 12 is a gasket 14 for sealing reception of the vial.

A liquid passage 15 descends at an angle from the socket 12 into the piston body to a point below the air nozzle 10. The passage 15 then turns upwardly for delivering liquid to the liquid discharge tip 16, the outlet of which is forwardly in line with the outlet of air nozzle 10. The nozzle and tip terminate within the lower end of a vertical groove 17 which extends the length of the most offset side of the piston extension and slightly into the main piston body.

For proper atomizing cooperation between the air nozzle 10 and the liquid tip 16 they are positioned in outwardly converging relation with the air nozzle above the liquid tip in the same radial plane from the piston axis. In order for the air passage bore 9 and the liquid passage 15 to communicate respectively with the air nozzle 10 and the liquid tip 16 both the bore and the passage are oppositely off-center and the latter is angled to pass beneath the air nozzle.

The lower edge 18 of the casing extension 2 by opposing the shoulder 19 formed at the juncture of the two differing diameters of the piston constitutes a stop for the spring propelled upward movement of the piston.

A small section 20 of the lower edge 18 of the casing extension is flanged inwardly into the groove 17 forming a downwardly facing pocket 22. The piston extension 2 of reduced diameter is offset in order that the guiding groove 17 therein is closely adjacent to the casing for receiving the flanged edge section 20. The latter serving as a key in the groove 17 prevents relative turning of the piston 3 and the casing 1.

In the pocket 22 is a liquid tip sealing plug 23. The plug 23 is kept vertically in line with the tip by the key action of the pocket flange 20 extending into the groove 17. A vertically elongated aperture 24 in the casing provides an opening for the discharge of atomized perfume formed by the low of air across the outlet of the liquid tip 16.

The abutment of the piston shoulder 19 against the lower edge 18 of the casing extension 2 is gauged to permit sealing contact of the liquid tip 16 with the sealing plug 23 while preventing too forceful inpingement of the tip against the plug which would deform the latter and destroy its sealing effect.

In using this atomizer the vial 13 is first de-

tached for filling. With the atomizer in inverted position the filled vial is threaded tightly back into place against the gasket 14. Then holding the atomizer endwise between the thumb and forefinger the projecting end of the vial is repeatedly pressed inwardly against the return pressure of the spring 7. The downward movement of the piston draws the liquid tip 16 away from the sealing plug 23 and places the air nozzle and liquid tip in line with the aperture 24 for spraying therethrough.

The air compressed beneath the piston travels upwardly through bore 9 and out air nozzle 10. The resulting air jet passing over the outlet of liquid tip 16 creates a suction effect thereon and draws perfume from the vial and out of the tip. This perfume is atomized by the action of the air and is discharged forwardly through aperture 24.

On discontinuance of the atomizing action the piston is returned by the spring 7 to its upper stopped position against edge 18 of the casing extension 2 with the liquid tip 16 slightly embedded in the sealing plug.

It may be observed from the preceding that the design of atomizer set forth is compact, inexpensive to manufacture, has a minimum number of parts and a simple but effective sealing means.

The features believed to be novel and which contribute to the improved results include the holder for the sealing plug which also serves as a key for guiding the piston vertically; the form of piston which provides the stop shoulder preventing the liquid tip from penetrating the sealing plug too deeply and which includes the offset upper portion bringing the guiding slot therein adjacent to the casing wall and the tricky arrangement of the air and liquid passages which must bypass each other and then connect to the air nozzle and liquid tip in their selected coplanar positions.

It will be apparent that the invention resides in certain principles of construction and operation which may be embodied in various forms other than that specifically disclosed herein.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. In an atomizer of the type described, a casing with a side opening for spray discharge, a piston in the casing, a longitudinal groove in the side of the piston, a liquid outlet nozzle projecting from the piston upwardly into the groove and longitudinally in register with the side opening in the casing, a flange extending into the groove from the wall of the casing preventing relative turning of the piston and casing, nozzle sealing material supported by said flange, and a spring beneath the piston thrusting the piston upwardly, thereby yieldingly holding the liquid nozzle against the sealing material.

2. In an atomizer of the type described an open topped casing, a piston of cylindrical form within the casing above an air compression chamber, an inverted liquid container attached to the upper end of the piston, said piston having a longitudinal groove along one side, spray nozzle means carried by the piston and projecting into the groove toward an opening in the side of the casing, said piston having air and liquid passages respectively from its lower and upper ends to said nozzle means, and a projection extending from the casing wall inwardly into the groove to maintain the piston and casing in vertical alignment.

3. An atomizer as set forth in claim 2 in which a sealing element is secured to the underside of the projection, and there is a spring beneath the piston impelling it upwardly and bringing the nozzle means carried thereby into contact with the sealing element.

4. An atomizer as set forth in claim 2 in which the upper end of the piston is of reduced cylindrical form and is axially offset in respect to the lower piston portion, and the longitudinal groove extends along that side of the upper end of the piston nearest the side wall of the casing.

DONALD J. PEEPS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,079,587	Aronson	May 11, 1937
2,203,576	Mikosz	June 4, 1940
2,462,563	Seyforth	Feb. 22, 1949
2,528,641	Cotter	Nov. 7, 1950