May 23, 1939. P. L. HINES 2,159,894

SPRAYER

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Fig. 1.

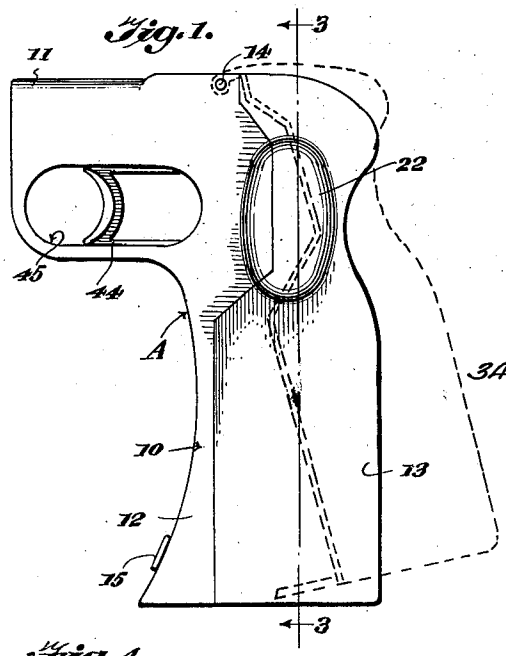


Fig. 2.

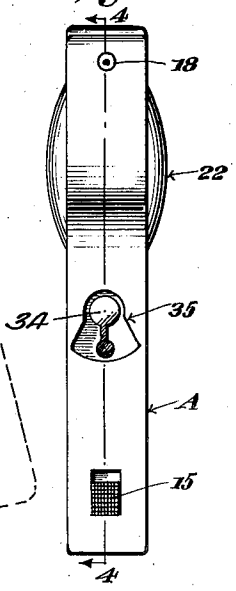


Fig. 3.

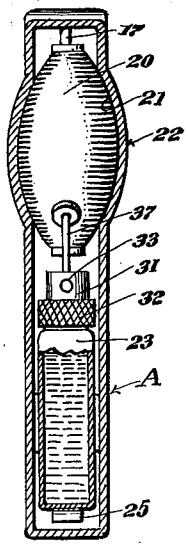


Fig. 4.

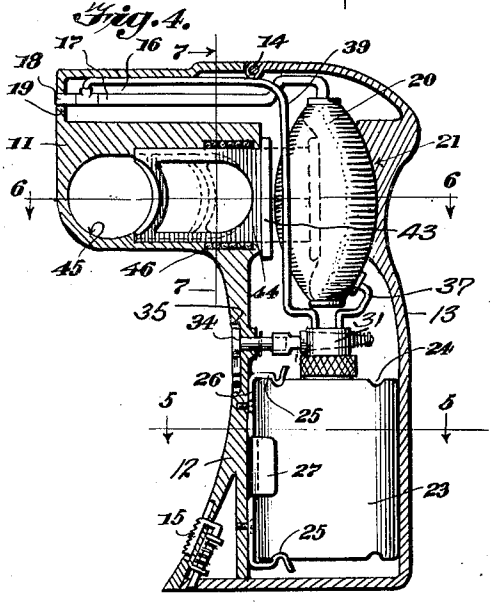


Fig. 6.

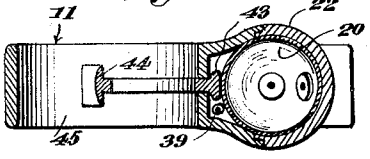


Fig. 7.

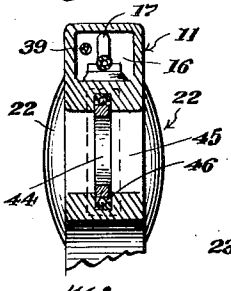


Fig. 8.

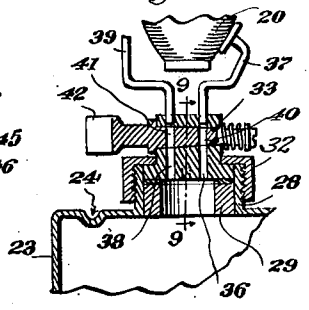


Fig. 9.

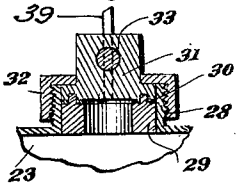
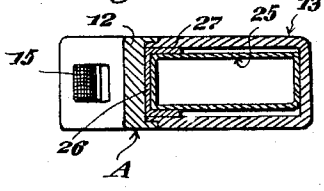


Fig. 5.



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Fig. 10.

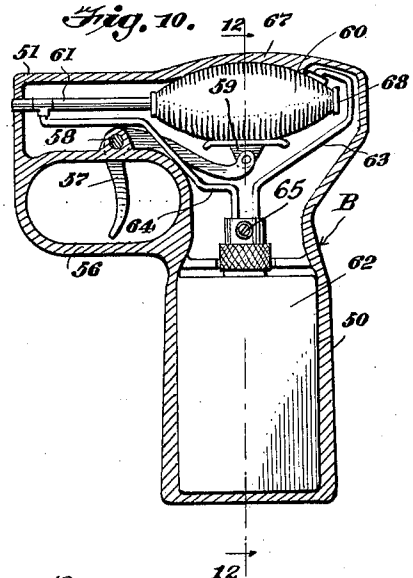


Fig. 11.

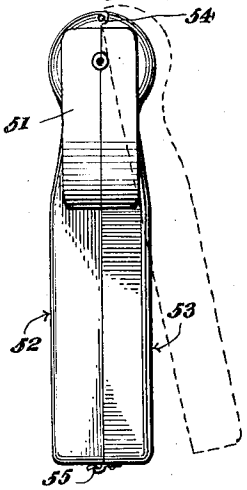


Fig. 12.

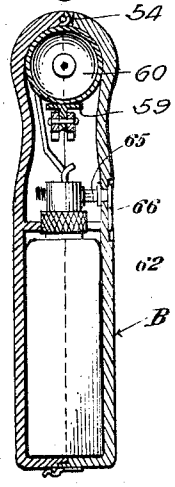


Fig. 17.

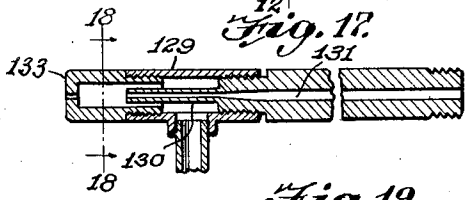


Fig. 19.

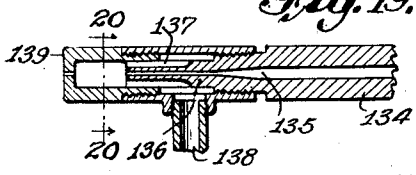


Fig. 13.

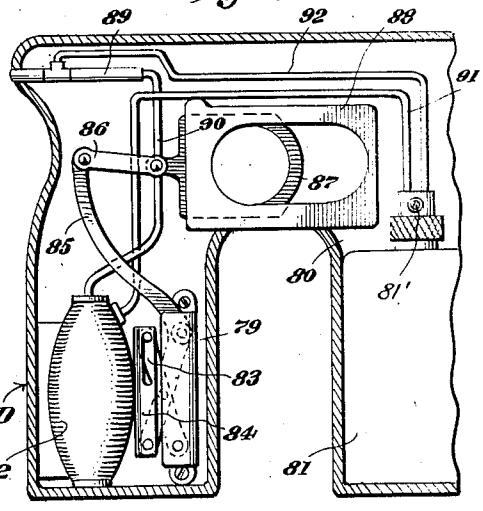


Fig. 20.

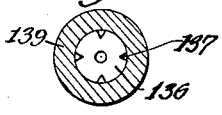


Fig. 18.

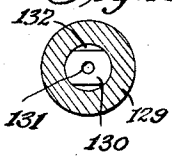


Fig. 14.

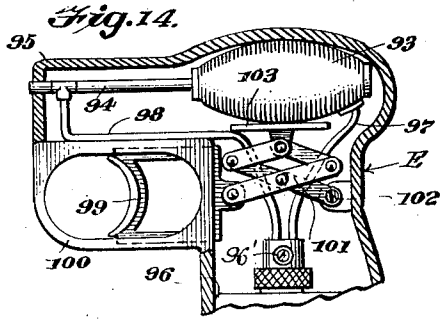


Fig. 15.

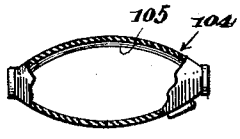
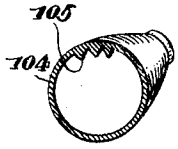


Fig. 16.



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Patented May 23, 1939 2,159,894

UNITED STATES PATENT OFFICE

2,159,894

SPRAYER

Posie L. Hines, Roanoke, Va.

Application February 4, 1937, Serial No. 124,119

3 Claims. (Cl. 299—89)

This invention relates to sprayers, and more particularly to sprayers which are used for spraying perfume and the like, one of the objects of the invention being the production of a simple and efficient sprayer which is so constructed as to be easily carried within a lady's purse when the sprayer is not in use.

A further object of this invention is the production of a simple and efficient perfume or other sprayer which is actuated by means of a trigger and which may be easily and conveniently handled whereby the contents of the sprayer may be accurately sprayed upon a desired and selected location.

Other objects and advantages of this invention will appear throughout the following specification and claims.

In the drawings:—

Figure 1 is a side elevation of one form of the invention;

Figure 2 is a front elevation of the form shown in Figure 1;

Figure 3 is a vertical sectional view taken on line 3—3 of Figure 1;

Figure 4 is a vertical sectional view taken on line 4—4 of Figure 2;

Figure 5 is a transverse sectional view taken on line 5—5 of Figure 4;

Figure 6 is a transverse sectional view taken on line 6—6 of Figure 4;

Figure 7 is a vertical sectional view taken on line 7—7 of Figure 4;

Figure 8 is a vertical sectional view taken through the upper end of the liquid reservoir showing the control valve carried thereby;

Figure 9 is a vertical sectional view taken on line 9—9 of Figure 8;

Figure 10 is a vertical sectional view through a modified form of the invention;

Figure 11 is a front elevation of the form of the device shown in Figure 10;

Figure 12 is a vertical sectional view taken transversely through Figure 10 along the line 12—12;

Figure 13 is a longitudinal sectional view through a further modified form of the invention illustrating a further modified type of bulb compression means;

Figure 14 is a vertical sectional view through a modified form of the invention illustrating a still further type of bulb compression means;

Figure 15 is a side elevation partly in section of one type of pump bulb;

Figure 16 is a sectional perspective view of the type of pump bulb shown in Figure 15;

Figure 17 is a longitudinal sectional view through one type of spray nozzle used in conjunction with my invention;

Figure 18 is a vertical sectional view taken on line 18—18 of Figure 17;

Figure 19 is a longitudinal sectional view through a modified form of spray nozzle;

Figure 20 is a vertical section taken on line 20—20 of Figure 19.

By referring to Figs. 1 to 9 of the drawings, it will be seen that A designates a casing which comprises a vertically extending grip portion 10 and a right angularly extending nozzle carrying portion 11 at the upper end of the grip portion 10 and extending from one side thereof. The casing A comprises a pair of hinged sections 12 and 13 which are hingedly connected, as at 14, at the upper end of the casing, the sections being held in a closed position through the medium of a suitable spring latch 15 at the bottom of the casing, as shown in Figure 4. The casing A is formed in two hinged sections to facilitate the placing or the operating mechanism within the casing and the removal thereof when occasion requires.

The nozzle carrying portion 11 is provided with a cavity 16 in which is mounted a spray nozzle 17 which has its discharge end 18 extending through an aperture 19 formed in the outer end of the nozzle carrying portion 11, as shown in Figure 4. The nozzle 17 communicates at its rear end with the upper end of a pumping bulb 20, which bulb extends in a vertical position and is snugly fitted within a pocket 21 formed in the casing A, the sides of the casing being bulged, as at 22, to conform to the contour of the bulb 20, as shown clearly in Figures 1, 2 and 3.

A liquid reservoir 23 is supported in the lower end of the grip portion 10 of the casing A, as shown in Figure 4, the reservoir 23 comprising a tank-like body having notches 24 along its top and bottom ends for receiving the spring clips 25 of the supporting bracket 26, which bracket 26 is fixed to one wall of the section 12 of the casing A. This bracket 26 is provided with a pair of vertically extending spaced ears 27 also engaging the side of the reservoir or tank 23 to facilitate the holding of the tank or reservoir in position. By means of this structure, the tank or reservoir 23 may be easily removed and replaced in position when desired.

The tank or reservoir 23 is provided with the upstanding threaded neck 28 within which is fitted and securely positioned a collar 29 having upstanding lugs 30 which fit into suitable sockets

formed in the bottom of the valve casing 31 and this valve casing 31 is held firmly upon the collar 29 by means of a suitable threaded cap ring 32 which is threaded over the threaded neck 28. The collar 29 is anchored in position and through the medium of the upstanding lugs 30 the valve casing 31 may be correctly positioned to place the valve 33 in proper alignment with the valve operating key or button 34 carried by the casing A, this key or button 34 preferably fitting within a countersunk socket 35. The valve casing 31 is provided with a port 36 which communicates with a pipe 37 leading to the lower end of the pump bulb 20 and is also provided with a port 38 communicating with a pipe 39 which is connected at its opposite end to the spray nozzle 17 near the outer end of the discharge nozzle, as shown in Figure 4. The valve 33 is also provided with ports 40 and 41 which are adapted to communicate with the ports 36 and 38 respectively, as will be obvious. The outer end of the valve 33 is provided with a socket 42 which receives the inner end of the key or button 34 to allow the valve 30 to be properly operated to cut off the flow of fluid from the tank or reservoir 23 or to permit the flow through the valve, as will be obvious.

It will be seen by carefully considering Figure 6 that the pipe 39 is offset with respect to the vertical center of the bulb in order to permit the inner end 43 of the operating trigger 44 to engage the bulb for the purpose of compressing the bulb 20 without interfering with or engaging the pipe 39. This structure is shown clearly in Figure 6. The trigger 44 is slidably mounted within the casing A in a position to extend at right angles to the bulb 20 and is slidably mounted within the cut-out finger-receiving portion 45 located directly below the nozzle 17. Ball-bearings engage the trigger 44, as shown in Figure 4, to facilitate the sliding of the trigger. The expansion of the bulb 20 after the trigger is released will cause the trigger to return to its normal position without the necessity of employing a spring.

The particular form shown in Figure 1 is constructed in such a manner as to facilitate the handling and holding of the sprayer in the hand of the operator since the vertical grip portion 10 may be gripped in the hand between the fingers and thumb and the forefinger may engage the trigger 44, the casing A being of a pistol-like structure. The construction of the device also is quite compact and may be placed easily within the purse or hand-bag of the user.

In the form shown in Figures 10 to 12 inclusive, a casing B is illustrated comprising a grip portion 50, and a nozzle carrying portion 51, which nozzle carrying portion extends at right angles to the grip portion and from one end thereof. The casing B is split longitudinally to provide longitudinally extending fitted sections 52 and 53 which are hingedly connected at their upper ends, as at 54, whereby the sections may be swung apart for the purpose of obtaining access to the interior of the casing B. A suitable latching device 55 is carried at the lower ends of the sections 52 and 53 to hold the sections in closed relation.

A finger guard 56 is formed directly under the nozzle carrying portion 51 within which guard is pivotally mounted a trigger 57, as at 58, which trigger is of a bell crank structure having a pivoted shoe 59 at its inner end for engaging the pump bulb 60 which pump bulb extends transversely across the top of the grip portion 50, and in line with the spray nozzle 61. The bulb 60 is connected at its rear end to the reservoir 62 which is mounted in the lower end of the grip portion 50 by means of a pipe 63 and a pipe 64 extends from the reservoir 62 to the nozzle 61 at a point near its discharge end. A shut-off valve 65 is carried by the upper end of the reservoir 62 and is provided with a control button 66 fitting flush with the outer face of the casing B to permit the reservoir to be cut-off when the device is not in use and prevent leakage.

In the form shown in Figures 10 to 12 it will be seen that the bulb 60 lies upon the shoe 59, and by pulling the trigger 57 the bulb 60 will be compressed upwardly against the top 67 of the casing B, the resiliency of the bulb providing sufficient spring action to return the trigger 57 to normal when released. The bulb 60, as well as the bulb 20, is of the conventional pump type having an air inlet valve 68 at its rear end for supplying air to the bulb whereby air may be forced down through the pipe 63 into the reservoir 62 driving the fluid up through the pipe 64 into the spray nozzle 61 where it is engaged by an air column from the bulb 60 in order to produce a spray. I do not desire to limit my invention to any particular type of spray nozzle, although I have illustrated and will describe in the following a special type nozzle which has been found suitable.

In Figure 13 there is shown a still further modified type of the invention comprising a casing D having vertically extending transversely spaced compartments 79 and 80, the compartment 80 carrying a reservoir 81 and the compartment 79 carrying a vertically extending pump bulb 82 and an expansible lever mechanism 83 of the lazy tong structure, carrying a slotted shoe 84 which engages the bulb 82. This expansible lever mechanism 83 carries an upwardly inclined arm 85 which in turn engages a pivoted link 86 which link is connected to a trigger slide 87, the trigger slide being slidably mounted within the guide 88 located above and intermediate the compartments 79 and 80. A spray nozzle 89 is carried by the upper end of the casing D and an air tube 90 forms a communication between the nozzle 89 and the bulb 82. A pipe 91 communicates with the bulb 82 and the reservoir 80 and a pipe 92 communicates with the reservoir 81 and the nozzle 89 near its discharge end, the parts operating in the manner similar to that previously described. The reservoir 81 is provided with a suitable cut-off valve 81' similar to the valves 33 shown in Figure 8, and 65 as indicated in Figure 12.

In Figure 14, I have shown a still further modified type of the invention illustrating a casing E carrying a bulb 93 at its upper end extending transversely across the same and carrying a forwardly extending spray nozzle 94 which projects through the nozzle housing 95. A reservoir 96 is located below the bulb and communicates therewith by means of the pipe 97, the reservoir also communicating with the nozzle 94 by means of a pipe 98. A trigger slide 99 is slidably mounted within the trigger guard 100, and this trigger 99 is connected to the expansible lever or lazy tong structure 101 which is anchored, as at 102, at one end and carries a pusher shoe 103, the pusher shoe engaging the under face of the bulb 93 for compressing the bulb as the trigger 99 is reciprocated.

In Figures 15 and 16, I have shown a special type or form of the bulb indicated by the numeral 104 which is provided with longitudinally ex-

tending tapered ribs 105 throughout the length thereof to prevent the complete collapsing of the bulb, and to also reinforce the contacting face which is engaged by the pusher shoe.

Although I do not desire to unnecessarily limit myself to any particular type of nozzle, I have found that the type of nozzle as illustrated in Figures 17 and 18 may be utilized to good advantage wherein a casing 129 is provided having a sprayer neck 130 therein, the sprayer neck having an air pressure port 131 extending longitudinally thereof, and the neck being provided with flattened faces 132 upon its upper and lower faces, whereby the air pressure passing through the port or channel 131 will cause the liquid to pass through the channels provided by the flattened faces 132 thereby atomizing the liquid as it is discharged from the apertured cap 133.

In the type shown in Figures 19 and 20, the nozzle tube 134 is provided having a longitudinal air pressure port 135 formed in the sprayer neck 136, the sprayer neck being provided with a plurality of longitudinally extending substantially V-shaped notches 137 along its side face to allow fuel to be drawn up through the tube 138 and be atomized out through the apertured cap 139 in the conventional manner.

From the foregoing description, it should be understood that although the present device is especially adapted for use as a perfume sprayer, the same may be utilized for spraying any liquid without departing from the spirit of the invention so long as the structural features fall within the scope of the appended claims.

Having described the invention, what I claim as new is:

1. A sprayer of the class described comprising a casing, having a nozzle carrying portion and a grip portion depending from the nozzle carrying portion, a pump carried within said casing and a nozzle carried by the nozzle carrying portion, a container in said casing, a cap for said container having an air inlet passage and a liquid outlet passage, a valve for controlling both passages, tubes leading from said passages communicating with said nozzle and pump respectively, and trigger means for actuating said pump carried by the casing and located in front of the grip portion and under the nozzle carrying portion.

2. A sprayer of the class described comprising a casing, having a grip portion, a liquid reservoir releasably secured within the grip portion, manually operable valve means for cutting-off the supply of liquid from said reservoir, a pump bulb arranged in substantially vertical alignment with the reservoir and communicating therewith, a marginal portion extending at substantially right angles from one end of the grip portion, a nozzle carried by the marginal portion and connecting with the bulb, a conduit forming a communication between the reservoir and the nozzle and arranged in offset relation with respect to the central axis of the bulb, said nozzle portion having a finger guard formed adjacent the same, a sliding trigger mounted within the guard and having means engaging said bulb to one side of said conduit for compressing the bulb as the trigger slides under the operation of a finger of an operator to cause liquid to be atomized and sprayed from said nozzle.

3. A sprayer of the class described comprising a casing having a grip portion, a liquid reservoir releasably secured within the grip portion, manually operable valve means for cutting-off the supply of liquid from said reservoir, a pump bulb arranged in substantially vertical alignment with the reservoir and communicating therewith, a marginal portion extending at substantially right angles from one end of the grip portion, a nozzle carried by the marginal portion and connecting with the bulb, a conduit forming a communication between the reservoir and the nozzle and arranged in offset relation with respect to the central axis of the bulb, said nozzle portion having a finger guard formed adjacent the same, a sliding trigger mounted within the guard and having means engaging said bulb to one side of said conduit for compressing the bulb as the trigger slides under the operation of a finger of an operator to cause liquid to be atomized and sprayed from said nozzle, roller bearings engaging said trigger, an operating button for actuating said valve arranged in countersunk position upon said casing, and spring clips for detachably supporting said reservoir within said casing.

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