Oct. 22, 1963 R. E. KRUCK 3,107,826

SPRAY DEVICES

Filed Dec. 23, 1960 2 Sheets-Sheet 1

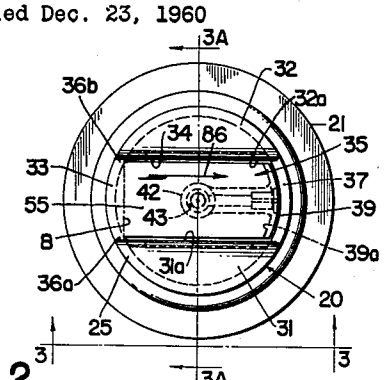


FIG. 2.

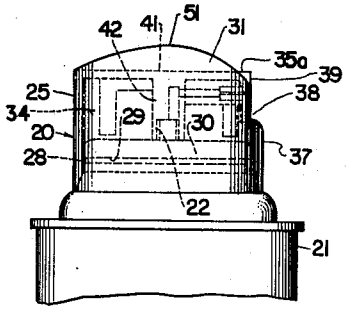


FIG. 3.

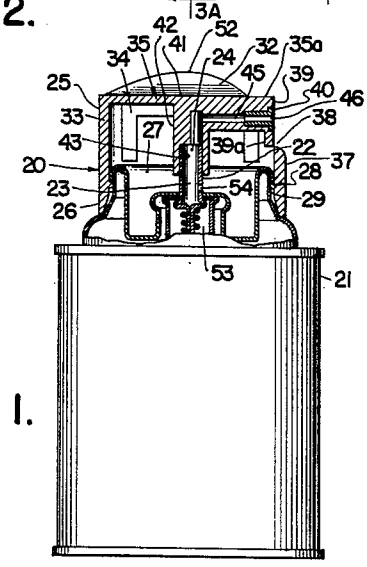


FIG. 1.

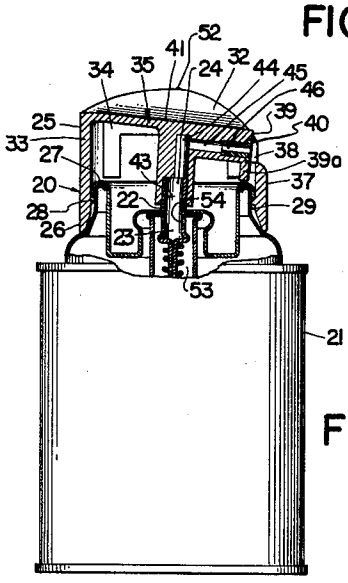


FIG. 6.

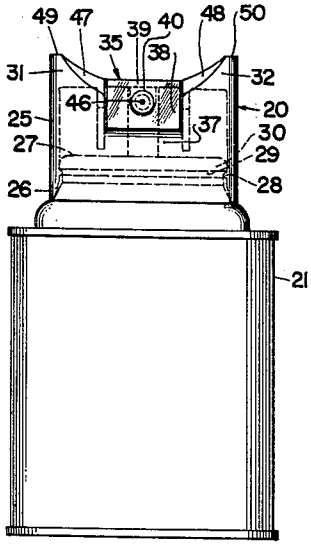


FIG. 4.

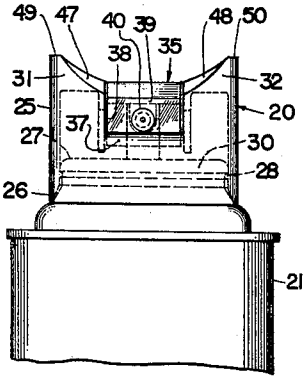


FIG. 5.

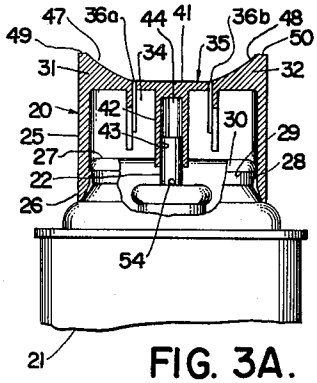


FIG. 3A.

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Oct. 22, 1963 R. E. KRUCK 3,107,826

SPRAY DEVICES

Filed Dec. 23, 1960 2 Sheets-Sheet 2

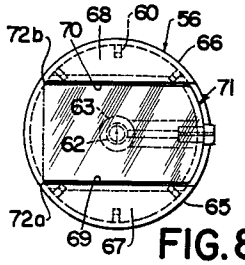


FIG. 8.

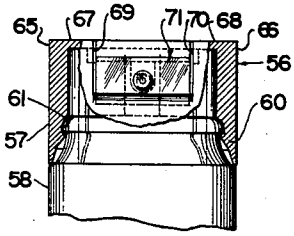


FIG. 10.

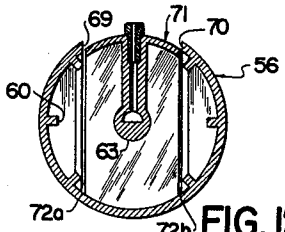


FIG. 12.

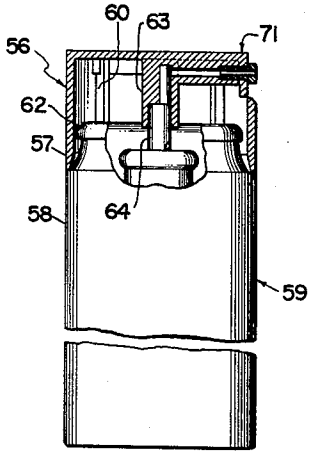


FIG. 7.

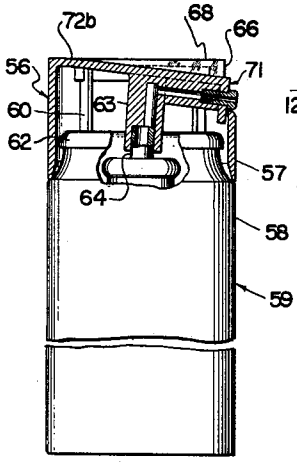


FIG. 11.

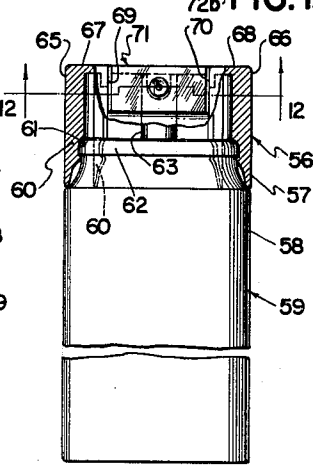


FIG. 9.

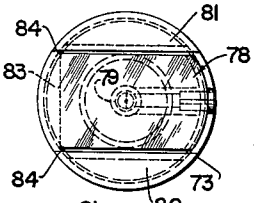


FIG. 14.

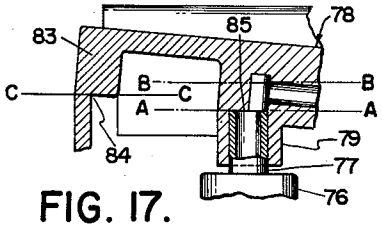


FIG. 17.

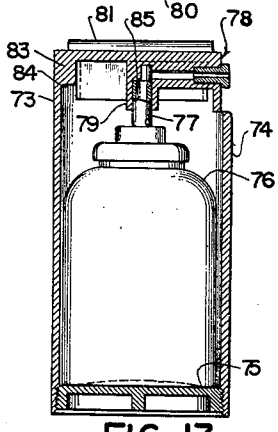


FIG. 13.

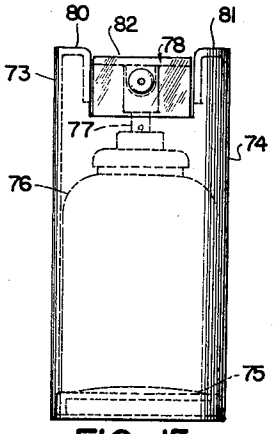


FIG. 15.

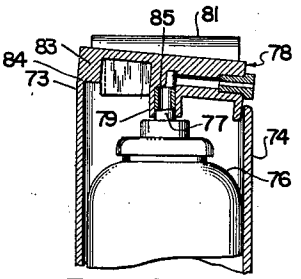


FIG. 16.

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3,107,826

SPRAY DEVICES

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Filed Dec. 23, 1960, Ser. No. 77,912
6 Claims. (Cl. 222—394)

This invention relates to spray devices of the category wherein a fluid under pressure within a container is discharged in an atomized spray upon the depression of spring-loaded valve means.

In conventional devices of this class, whether the fluid is contained within a special cartridge or aerosol bomb, or within the container proper, a manually manipulable stem or stem cap is generally arranged in position for receiving a finger, whereby pressure of the finger depresses the stem or cap to discharge the fluid in the form of a spray. Due to the fact that the discharge nozzle is necessarily small, its position cannot readily be seen in those constructions where it does not extend outwardly beyond the casing, such as occurs in perfume spray devices and other devices where a protruding nozzle is considered undesirable or is too costly. In such inconspicuous nozzle constructions the discharged spray may be inadvertently misdirected, resulting either in a wastage of the gasified materials or an unwanted spraying of the skin or clothes of the user when it is intended for other purposes. It is accordingly one of the objects of this invention to provide a spray device of the above mentioned category in which a manually depressible member is so positioned and constructed as to minimize the danger of a misdirected spray.

It is a further object of this invention, in connection with the aspect thereof above mentioned, to provide a dispensing head for a spray device of the class above mentioned in which there is a novel manually operable lever member so proportioned and positioned with respect to the nozzle as to indicate the position of the latter and the direction of discharge, the construction being such that the finger is guided into the proper and optimum position for depressing the lever.

Another object of my invention is the provision of a unitary member serving as a combination valve actuator and discharge nozzle, wherein the nozzle is disposed within the movable actuator, the arrangement being such as to facilitate manufacture and assembly.

A further important object is the provision of means for reducing the danger of an accidental discharge through the nozzle. In the accomplishment of this objective I employ two spaced wing members in flanking relation to said actuator, said wing members being positioned at a level no lower than the top surface of the actuator when it is in its uppermost inoperative position, whereby the wing members act as protective walls so that an operative manipulation of the actuator can only occur when a finger is deliberately inserted between said members.

It is also an object of this invention to provide means in cooperation with a manually depressible member of the type above mentioned, which will prevent the finger from slipping off such depressible member, as frequently occurs in certain conventional devices.

It is another one of my objectives to enable a controlled operative actuation by the finger, whereby the rate of discharge—as determined by the amount of depression of the valve stem—can be readily regulated.

Another object of this invention is to provide a construction where there is a minimum of strain at the fulcrum of said lever, whereby extended life is assured for this device.

It is still another object of this invention, in one form thereof, to enable the above-mentioned lever construction to be operatively applied to a spray device valve stem in such a manner as to provide a minimum of lateral deflection thereof, whereby the invention may effectively be used with relatively stiff stems.

And it is my further objective to provide a readily fabricated and economical construction that is aesthetically attractive, that has the aforesaid features, and that is adapted for use with containers and caps of conventional configurations.

Other objects, features and advantages will appear from the drawings and the description hereinafter given.

Referring to the drawings,

FIG. 1 is a side view of one form of my invention shown in its inoperative position, the upper portion of the container and the dispensing head being shown sectioned.

FIG. 2 is a top view of FIG. 1.

FIG. 3 is a fragmentary side view of FIG. 2 looking in the direction of arrows 3—3.

FIG. 3*a* is a section of FIG. 2 taken along line 3*a*—3*a*.

FIG. 4 is a front view of FIG. 1.

FIG. 5 is a fragmentary view substantially like FIG. 4 but showing the device in its operative position with the lever depressed.

FIG. 6 is a view substantially like FIG. 1 but showing the device in the operative position of FIG. 5.

FIG. 7 is a part side elevational and part sectional view of another form of my invention shown in its inoperative position.

FIG. 8 is a top view of FIG. 7.

FIG. 9 is a front elevational view of FIG. 7, parts being broken away for clarity.

FIG. 10 is a fragmentary view substantially like FIG. 9 but showing the device in its operative position with the lever depressed.

FIG. 11 is a view substantially like FIG. 7 but showing the device in the operative position of FIG. 10.

FIG. 12 is a section of FIG. 9 taken along line 12—12.

FIG. 13 is a vertical sectional view of another embodiment of my invention shown in its inoperative position.

FIG. 14 is a top view of FIG. 13.

FIG. 15 is a front view of FIG. 13.

FIG. 16 is a fragmentary view substantially like FIG. 13, but showing the device in its operative position with the lever depressed.

FIG. 17 is an enlarged fragmentary section like FIG. 16.

In the form of my invention illustrated in FIGS. 1 to 6, the spray device dispensing head, generally designated 20, is detachable secured to the top of the conventional container 21 from which fluid under pressure is adapted to be released upon an operative depression of the valve stem 22, in known manner. The said valve stem and the mechanism operatively associated therewith are well known to those skilled in the art, and a detailed description thereof is accordingly not necessary for an understanding of this invention. Suffice it to say that when said stem 22 is depressed from the position shown in FIG. 1 to that shown in FIGS. 5 and 6, fluid under pressure will flow upwardly through the stem's passageway 23 and out through its discharge aperture 24 toward a nozzle to be hereinafter described.

The device 20 has an annular wall 25 the lower portion 26 of which is proportioned to fit over and around the upper portion 27 of said container 21 for a friction fit. In the particular form illustrated, the said lower wall portion 26 contains along the inner surface thereof the annular protuberance 28 adapted to removably fit into the annular recess 29 below the upper rim 30 of the container's said upper portion 27.

The lateral upper portions 31 and 32 of said member 20, above said lower annular wall portions 26 thereof are of thickened proportions and constitute finger-guiding wings, as will more clearly hereinafter appear. The rear wall portion 33 and said wings form therebetween the recessed cavity 34 operatively accommodating therein the stem-actuating lever 35 hingedly connected to said rear portions 36*a* and 36*b* of said respective wings 31 and 32. In the preferred form shown, the lever 35 is integral with the body of the dispensing head 20, the material of member 20 being resilient, whereby the lever will be able operatively to bend at the hinge junctures 36*a* and 36*b* along the dot-dash bend line designated B. The front central wall portion 37 of the member 20 is lower than the said rear wall portion 33, leaving an open portion 38 exposing the front end 39 of the lever 35 and the nozzle 40. Extendingly downwardly from the front of the lever is the lip 39*a*, said lip being disposed inwardly of said front wall 37, so that upon an operative downward movement of the lever it will be positioned inwardly behind said wall 37, as clearly shown in FIG. 6. Depending from the flat top wall 41 of the lever 35 is the boss 42 containing the recess 43 into which the said stem 22 extends, the stem's said passageway 23 communicating through its discharge aperture 24 with the lever's passageways 44 and 45, the latter communicating with the discharge passageway 46 of said nozzle.

The said wings 31 and 32 which flank said cavity 34 have their respective upper surfaces 47 and 48 curved downwardly and inwardly toward said lever 35, as clearly shown in FIGS. 4 and 5. The upper contour of the peripheral edges 49 and 50 of the respective wings 31 and 32 are convex, the respective crests 51 and 52 being intermediate—preferably midway—between the front and rear of the member 20, said edges 49 and 50 sloping downward forwardly and rearwardly to the respective front and rear regions of the lever 35. It is preferred that foremost portion 35*a* of lever 35 protrude forwardly beyond the said wings 31 and 32 when the lever is in its raised or inoperative position shown in FIG. 1, thereby to indicate the nozzle end of the lever.

In the operation of this device, a finger is placed over the top surface of the lever 35, the finger being guided into proper position by the said guide surfaces 47 and 48. Upon a depression of the lever it will pivotally move downwardly, the boss 42 pushing the valve stem 22 from its inoperative position of FIG. 1 to its operative position of FIG 6, whereunder the fluid from the chamber 53 will enter the inlet aperture 54 of the stem and flow through the said passageways 23, 44, 45 and 46 into the atmosphere in the form of a spray, in known manner. If the stem 22 is somewhat flexible—as is the case with most plastic stems used in devices of this category—it will slightly flex as indicated in FIG. 6; but if said stem is rigid, the said boss 42 will flex (see FIG. 16) since the material of member 20 (of which boss 42 is an integral part) is, as above stated, resilient. Upon a release of the lever 35, it will return to its initial inoperative position of FIG. 1 due to its resiliency, said initial position having been determined by the configuration of the mold or other fabricating tools.

It is apparent that the nozzle end 35*a* of the lever 35 is readily recognizable both by inspection and touch. Moreover, the extended length of the upper surface 55 provides sufficient room for an arrow 86 or other direction-indicating indicia, thus rendering it extremely unlikely that the spray will inadvertently be misdirected. The extended area of upper surface 55 from the rear to the front of the device and between the wings 31 and 32 makes it easy to control the operative movement of the stem 22; and since the operative path of the forward end of the lever is greater than that of the stem, minute movements of the stem can be effected by relatively greater manipulative movements of the forward end of the lever. Because of the flanking disposition of wings 31 and 32 with respect

to the lever, there is no possibility of the finger slipping off the lever, thereby assuring optimum positioning of the manipulating finger. And since the lever is in spaced relation to the inner surfaces 31*a* and 32*a* of the respective wings 31 and 32, the lever is subjected to substantially no frictional wear; and inasmuch as the movement of the lever at the fulcrum points 36*a* and 36*b* is minimal, the wear at that region is insignificant, thereby assuring a long life for the device.

In the form of my invention illustrated in FIGS. 7 to 12, the dispensing head 56 is so proportioned that its annular wall 57 is flush with the lateral wall 58 of the container 59. Extending inwardly from said annular wall 57 are the radial ribs 60 with recessed portions 61 in frictional removable engagement with the peripheral rim 62 of said container 59. The member 56, preferably also of somewhat resilient material, is substantially similar to the corresponding member 20 above described, the boss 63 actuating the valve stem 64 in the manner aforesaid. The lateral guide wings 65 and 66, however, have their respective upper surfaces 67 and 68 of flat configuration and flush with the upper surface of the lever 71 when it is in its upper inoperative position. The inner walls 69 and 70 of the said wings serve as guides for a finger operatively manipulating the lever 71, hingedly supported at hinge corners 72*a* and 72*b*, from its inoperative position of FIG. 7 to the operative position of FIG. 8.

In the embodiment of my invention illustrated in FIGS. 13 to 17 the dispensing head portion 73 is integral with the container 74, the latter having a removable base 75 for permitting the insertion and removal of the fluid-containing unit 76, the latter having the conventional valve stem 77 of the type above described. The lever 78 has the boss 79 depending therefrom and operatively connected to said stem 77 in the manner aforesaid, the lateral guide wings 80 and 81 flanking said lever and extending thereabove, to provide a channel-like finger recess 82. In the preferred form illustrated, the upper rear wall portion 83 is thickened, thereby providing weakened hinge portions at 84, the junctures with the thinner wall therebelow.

As will be seen from FIG. 17, the said hinge level C—C is midway between the lower limiting level A—A of the top 85 of stem 77 and the upper limiting level B—B of said stem top when the stem is in its inoperative position. The arrangement is hence such that there will be a minimum of deflection of the stem 77, or of the boss 79, during the operative travel of the stem between its extreme limiting positions. This form of my invention is especially adaptable for use with relatively stiff valve stems.

In the above description, the invention has been disclosed merely by way of example, and in preferred manner; but obviously many variations and modifications may be made therein. It is to be understood, therefore, that the invention is not limited to any specific form or manner of practicing same, except insofar as such limitations are specified in the appended claims.

I claim:

1. In a spray device of the type having a casing with gaseous contents therein under pressure and a valve stem having a discharge aperture therein and movable between upper and lower limiting positions, a dispensing head having a body portion and a stem actuator disposed above said casing, said actuator comprising a lever hingedly connected to said body portion and being in engagement and movable with said stem, said lever being so positioned and proportioned that it is in a predetermined uppermost inoperative position when said stem is in its said upper limiting position and in a predetermined lower operative position when the stem is in its said lower limiting position, a nozzle on said lever and in communication with said discharge aperture of said stem, said body portion having a pair of laterally spaced guide wings extending upwardly therefrom and in flank-

ing relation to said lever, said body portion having a wall connecting said wings, said lever being hingedly connected to the junctures of said last-mentioned wall and said wings, said lever being separated from said wings throughout the lever's extent from the hinged connection thereof to its free end.

2. In a spray device of the type having a casing with fluid contents therein under pressure and a valve stem having a discharge aperture therein and movable between two limiting positions, one being a normal closed position and the other an operative open position, a dispensing head having a body portion and a stem actuator disposed above said casing, said actuator comprising a lever having a free end and an oppositely positioned hinge end connected to said body portion and being in engagement and movable with said stem, said lever being separated from said body portion throughout the lever's extent from its said hinge end to its said free end, and a nozzle on and movable with said lever and in communication with said discharge aperture of said stem, the position of said hinged connection of said lever being intermediate the upper and lower limiting positions of the top of said stem.

3. In a spray device of the type having a casing with fluid contents therein under pressure and a valve stem having a discharge aperture therein and movable between two limiting positions, one being a normal closed position and the other an operative open position, a dispensing head having a body portion and a stem actuator disposed above said casing, said actuator comprising a lever hingedly connected to said body portion only at the rear thereof, the sides of the lever throughout their extent from the rear hinge connection of the lever to the foremost portion thereof being separated from the body portion, whereby said lever is free from said body portion

and pivotally movable with respect thereto forwardly from said rear hinge connection, said lever being in engagement and operatively movable with said stem, said lever having at its front end a front apertured portion in communication with said discharge aperture of said stem, and a nozzle disposed within said apertured portion, whereby the nozzle will follow the operative path of said front end of the lever.

4. In a spray device, the combination according to claim 3, said body portion having a front wall below said lever when the latter is in its inoperative position, the front end of the lever being in a plane adjacent the plane of said front wall.

5. In a spray device, the combination according to claim 3, said body portion having a front wall below said lever when the latter is in its inoperative position, said lever having at its front end a downwardly extending lip, said lip being in a plane adjacent the plane of said front wall.

6. In a spray device, the combination according to claim 3, said body portion having a front wall below said lever when the latter is in its inoperative position, said lever having at its front end a downwardly extending lip, said lip being disposed behind said front wall when said lever is in its operatively depressed position.

References Cited in the file of this patent

UNITED STATES PATENTS

2,577,245	Tuttle et al.	Dec. 4, 1951
2,753,214	Abplanalp	July 3, 1956
2,921,722	Focht	Jan. 19, 1960
2,932,434	Abplanalp	Apr. 12, 1960
2,940,641	Norrish et al.	June 14, 1960
2,966,283	Darvie	Dec. 27, 1960
3,058,626	Hibbs et al.	Oct. 16, 1962