ABSTRACT: An actuating mechanism for pressurized fluid dispensers involves a cap having a pillar with a hinged body carrying a tubular element engageable with the dispenser spout. The mechanism includes a trigger secured to the body whereby the application of force to the trigger depresses the body with the consequent movement of the tubular element and spout. Changeable nozzles direct the spray to selected target areas, and a locking system prevents inadvertent spray emission.
ACTUATING MECHANISM FOR PRESSURIZED FLUID DISPENSER

BACKGROUND OF THE INVENTION

1. Field of the Invention
This invention relates to actuating means for pressurized containers particularly those of the aerosol variety.

2. Statement of the Prior Art
It has heretofore been proposed to provide spray actuating and directing devices attachable to pressurized fluid dispensers, some such devices employing finger controlled levers for depression of the valve means normally associated with such containers. Examples of the previously known devices are found in the following U.S. Pat. Nos. 2,393,346 to Stroop issued Jan. 22, 1946; 2,631,891 to Kocher et al. issued Mar. 17, 1953; 2,635,921 to Deutsch issued Apr. 21, 1953; 2,757,048 to Balmer issued July 31, 1956; 2,877,934 to Wallace issued Mar. 17, 1959; 2,904,262 to Peep issued Sept. 15, 1959; 3,061,202 to Tyler issued Oct. 30, 1962; and 3,189,232 to Joffe issued June 15, 1965.

The previously known devices, while adequate in some respects and comprising substantial improvements over the use of aerosol containers without trigger attachments are nonetheless subject to adverse criticism in that they are expensive to manufacture, given to inadvertent actuation, and not sufficiently positive in operation as to spray direction.

SUMMARY OF THE INVENTION

The present invention relates to a detachable spray actuation mechanism for pressurized containers, notably that type of container which is operated through the application of pressure to a projecting valve in the form of a spout. The actuating mechanism is adaptable for reliable engagement with the container and the spout, and the actuating mechanism is operable in such manner as to effectively and positively aim the emitted spray for application to a selected target area. This type of positive application is of particular importance where the dispensed fluid is intended for treatment of selected areas only, as in painting, lubricating, and the like. A basic objective of this invention is therefore to provide an actuating mechanism as aforesaid wherein the orientation of the spray nozzle with respect to the trigger is such that maximum efficiency of aim is provided.

This invention further provides means to prevent inadvertent discharge of the fluid from the container. This not only serves as an effective safety lock to prevent accidental discharge, but permits shipment of containers with the actuator in place thereon. The locking means is of noncomplex construction and operation, and adds little to the cost of manufacture of the apparatus.

A further objective of the invention resides in the provision of changeable nozzle means for the actuator. In first forms of the nozzle, the changeable inserts are variable in installation to provide variant spray patterns. In a further modification, an extended nozzle projects outwardly from the trigger area, thus to prevent contact of the spray with the operator's finger.

Other and further objects and advantages of the invention will become apparent to those skilled in the art from a consideration of the following specification when read in conjunction with the annexed drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view showing an actuating mechanism constructed and assembled in accordance with the teachings of this invention in place on a pressurized fluid dispenser;

FIG. 2 is an enlarged, medial cross section taken on the line 2-2 of FIG. 1, looking in the direction of the arrows, showing the locking system hereof in open and locked positions in full and phantom lines, respectively, and showing the details of the dispensing spout means of the container;

FIG. 3 is a detail sectional view showing the modification of the nozzle to include a second type of changeable nozzle; and

FIG. 4 is a perspective view of a further modification.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawing in more detail, and initially to FIGS. 1 and 2, a pressurized fluid container of conventional design and construction is therein indicated by a reference numeral 10. The container 10 comprises a can 12 having a top wall 14 with an annular rim 16 surrounding a valve assembly 18 with a projecting hollow spout 20. The operation of this type of container is well known, and it is necessary to this characterization of the present invention to state only that, upon the application of pressure to the spout 18, the valve is opened, causing the continuous emission of fluid through the spout so long as the pressure is contained and the supply thereof unexhausted. In some instances, lateral spray emission is achieved in these containers through the employment of a removable button. Such buttons are discarded when the present invention is to be used.

The present invention is identified generally in the drawing by reference numeral 22 and includes a cap portion 24 with a sidewall 26 and a top wall 28. The actuating mechanism 22 is formed of plastic or the like throughout, and preferably is of substantially integral construction. The sidewall 26 has an inward flange 30 at its lower extremity, and the flange 30 is adapted for snap fitting about the container rim 16 whereby the cap is releasably engaged with the can. The top wall 28 has a central opening 32 therein through which the spout 20 extends.

Located adjacent a peripheral edge of the cap 24 is a pillar 34 comprising a back member 36 and rigidifying sides 38, 40. The back member has a top edge 42 functioning as described below.

Secured to the pillar and preferably integral therewith is a main body portion 44 comprising a top panel 46 with a forward end section 48 and a rear end section 50. The end section 50 terminates at an edge 52 forming, with the edge 42, a hinge between the pillar and the main body portion. The main body portion forward end has a nozzle section 54, as herein described, in more detail below. Depending from the panel 46 adjacent the nozzle section is a tubular member 56 having a compound opening therein. The opening is composed of an enlarged entry section 58 which admits the spout 20 and frictionally engages the same, and a restricted fluid passage 60 separated from the entry section at a shoulder 62 against which compresses the distal end of the spout seats. The nozzle section 54 and the member 56 have a lateral bore 64 therein which intercepts the fluid passage 60 to dispense a spray therefrom.

Trigger means 66 hereof comprises a handle 68 with a ledge 70 connecting it to the main body portion at the forward section of the nozzle, the handle depending below the path of spray emission. Rigidifying side panels 72 and 74 may extend the full length of the trigger and the body portion on either side of the tubular member. It will be observed that the trigger is thus disposed in a diametrically opposite position from the pillar, thereby providing a longitudinal, accurate aiming system for the spray.

In the embodiment of the invention shown in FIGS. 1 and 2, the nozzle section has an internally threaded opening 76 which extends about a central block member 78, tee base of which is aligned with lateral bore 64. A detachable nozzle 80, having a mouth 82 and rim 84 is threadedly received therein, and, by inward and outward adjustment of the nozzle 80 through the thread means, the spray characteristics may be altered from a fine mist to a straight linear jet. Thus, the actuator provides a means for variance in the type of spray emitted which enhances the utility of the container beyond its normal capabilities.

As shown in the drawings, an elongated, flexible post 86 is integrally joined to the top wall 28 of the cap 24. The post is enlarged at its base 88 and is gradually reduced in diameter from the base to the top 90 thereof. An elongated slot 92 is provided in the top panel 46 of the main body portion 44, and the post extends through said slot. The slot has an enlarged forward portion 94 and a smaller rear portion 96, with restricting ears 98 therebetween. The post 86 projects through the slot 92, occupying either the forward portion or rear portion
thereof at the option of the user. The post and the slot comprise locking means for the device.

In FIG. 3, a substantially similar arrangement is shown. Here, however, the nozzle 80a is frictionally engaged in an opening 76a. Again, inward and outward movement of the nozzle has a changeable effect on the spray characteristics.

FIG. 4 discloses the invention modified to include an elongated adapter 100 fixed on the nozzle section, and having a tubular nose section 102 which projects forwardly of the trigger. In this form of the invention, the fluid from the container is emitted forwardly of the hand of the operator, thereby barring any possibility of fluid contact, and moreover, the spray area may be more finely localized.

The operation of the invention is believed to be clear from the foregoing description of its structure. The hinge section, and the flexibility of the elements of construction permit ready application of the attachment to a container 12 by snap fitting of the cap portion 24 over the rim 16 thereof, and by engagement of the tubular element 56 with the container spout 20. Thereafter, application of force, as by placing a finger of the user's hand on the handle 68 causes the valve 20 to be depressed and fluid to be emitted through the passage 60 into the lateral passage 64 and thence outwardly through the spray mouth 82. The depression of the body portion to actuate the spout 20 can occur only when the post 86 occupies the forward portion 94 of the slot 90. When the post is flexed rearwardly into the slot rear portion 96, the body portion is withheld from effective operating engagement with the spout.

I claim:

1. A trigger assembly for use with a pressurized container of the type including a projecting dispensing spout actuated to emit fluid discharge therethrough upon depression, the trigger assembly comprising:
   a cap portion engageable with the container, with the container spout extending through the cap portion;
   a pillar on the cap portion;
   a main body portion hingedly connected to tee cap portion;
   a tubular member depending from the main body portion, including an open entry section engageably with the spout and having a restricted fluid passage into which the fluid discharge is emitted;
   a trigger secured to the main body portion and extending forwardly thereof; and
   a nozzle section on the forward end of the main body portion, having a lateral fluid passage through which the restricted fluid passage of the tubular member extends, and through which said emitted fluid is directed upon the application of inward force to the trigger.

2. A trigger as defined in claim 1, and locking means to retain the tubular member in a position wherein it is withheld from operating contact with the spout.

3. The invention of claim 2, wherein the locking means comprises an upstanding post on the cap and a dual position slot in the main body portion, the post being engageable in the slot in operative and nonoperative positions.

4. The combination, with a pressurized container having an upwardly projecting dispensing spout actuated to emit fluid discharge therethrough upon depression, the container having a rim about the spout, of a trigger assembly comprising:
   a cap portion having a sidewall and a top wall, the sidewall being engageable with the rim, and the top wall having an opening therethrough through which the spout extends;
   an upstanding pillar extending from the cap portion, including a back member with an upper edge portion;
   a trigger and spout assembly including an elongated main body portion having a forward end section and a rear end section, the rear end section being hingedly connected to the upper edge portion of the back member of the pillar; a tubular member depending from the main body portion intermediate its ends and having an enlarged entry section engageable with the spout, and a restricted fluid passage section;
   a nozzle section on the forward end section of the main body portion;
   a trigger projecting forwardly of the main body portion, including an elongated grip portion; and
   the nozzle section being integrally with the tubular member and having a lateral passage therein which intersects the restricted fluid passage section thereof.

5. The invention of claim 4, and:
   an elongated, flexible post projecting upwardly from the top wall of the cap portion;
   the main body portion having elongated slot formed therein, the slot having enlarged forward portion adjacent the spout and a rear portion of reduced size adjacent the pillar, the post extending through said slot; and
   the main body portion being actuateable to depress the spout with the post in the forward portion, and being locked with the post engaged in the rear portion.

6. The invention of claim 4, wherein the nozzle block has an opening about said lateral passage; and a changeable flow nozzle engaged in said opening.

7. The invention of claim 4, wherein the nozzle section has an opening about said lateral passage and an elongated nozzle engaged in said opening and extending outwardly of the trigger.