April 18, 1967 J. DOBLIN 3,314,577

CAM LEVER AEROSOL SPRAY BUTTON

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Fig. 2

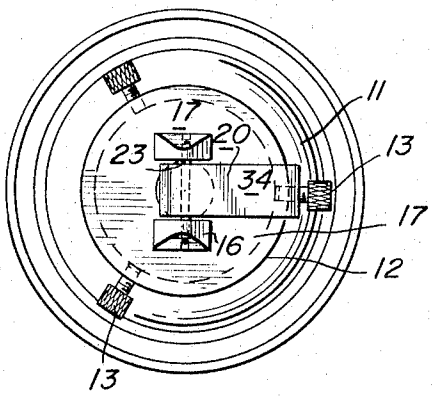

Fig. 3

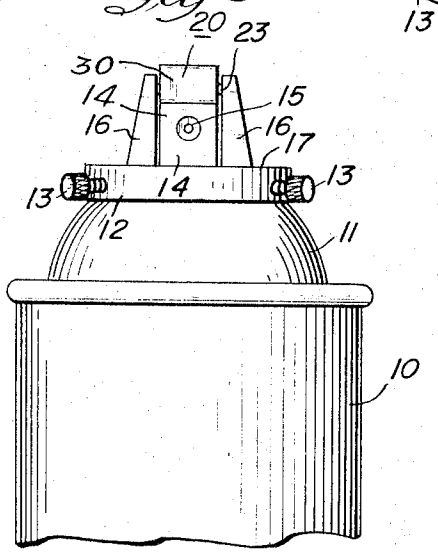

Fig. 1

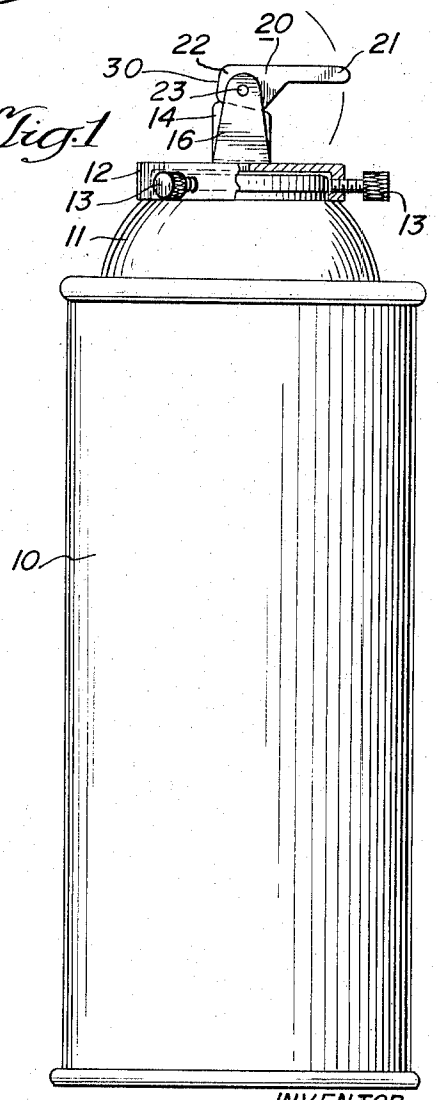

Fig. 8

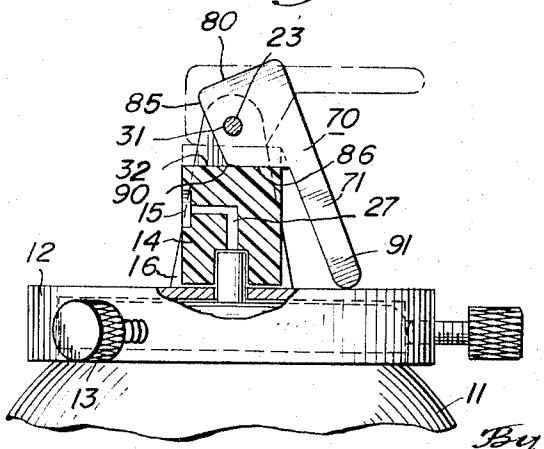

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Fig. 4

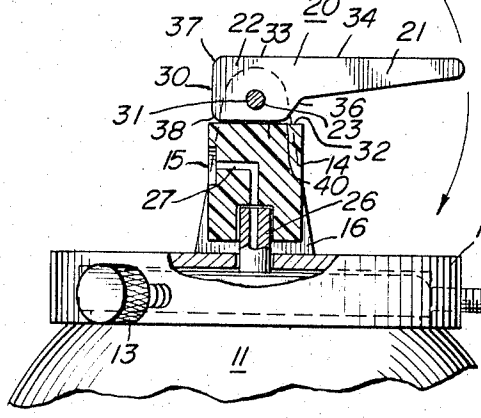


Fig. 5

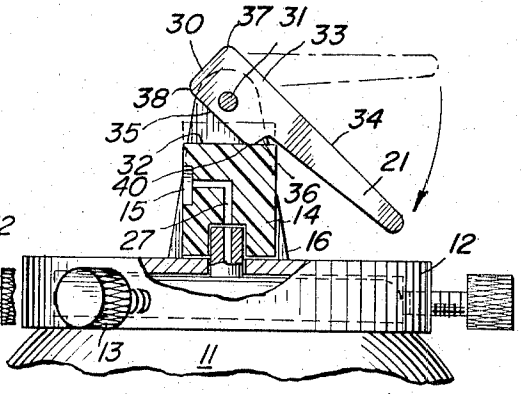


Fig. 6

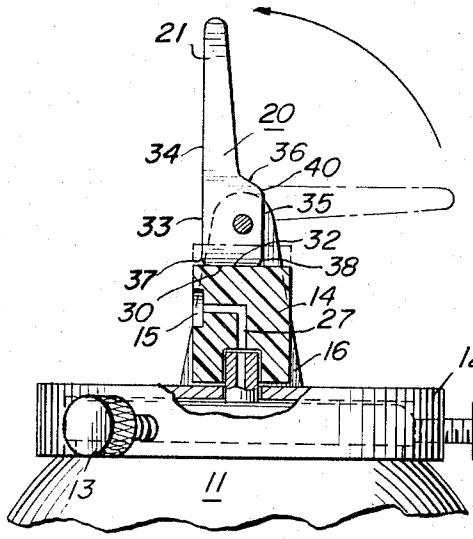
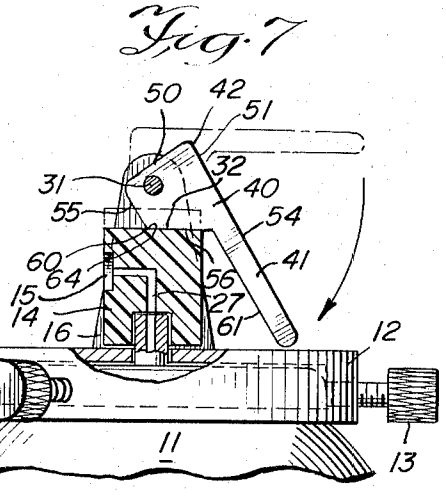


Fig. 7



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CAM LEVER AEROSOL SPRAY BUTTON

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4 Claims. (Cl. 222—402.14)

This invention relates to a novel aerosol actuator and more particularly to an actuator comprising a cam lever pivotally mounted adjacent to the aerosol valve button.

In the use of aerosol devices, difficulty has been encountered in pressing the aerosol valve button due to the strong upward bias of the valve spring. With certain aerosol items such as paint, insecticide, etc., when the spray is being released for a long duration of time, the pressure of the button against the finger can become uncomfortable and painful. The release of other aerosol items such as hair spray, requiring repeated use, may also cause discomfort.

The present invention provides a cam lever which is pivotally mounted adjacent the aerosol valve button. The lever arm provides a mechanical advantage thereby reducing the pressure necessary to operate the valves.

When the lever is in its normal position, the cam portion of the lever permits the aerosol button to occupy a first, or non-actuated position. When the lever arm is pushed down, a portion of the cam presses against the aerosol button causing depression of the button and thereby placement of the valve in a second, or actuated position. Hence, operation of the spray is commenced.

The cam has at least one side which is spaced a greater distance from the lever pivot point than the distance of the top face of the valve button in its non-actuated position from the lever pivot point.

In one embodiment of the invention, when the lever is not pushed down but is lifted so that the spaced side is in contact with the top face of the aerosol button, the valve button becomes depressed to its actuated position and remains locked even after the operator lets go of the arm.

In another embodiment of the invention, the side of the cam which is spaced a greater distance from the lever pivot point than the distance of the top face of the aerosol button in its non-actuated position is substantially adjacent to the under side of the lever arm, and when the top side of the lever arm is pressed to a far downward position, the valve button becomes locked in its actuated position.

In a further embodiment of the invention the aerosol button may be locked in its actuated position by either moving the lever arm to an upward position or to a far downward position.

In all these embodiments, the locking of the button in its actuated position results from the fact that the spaced side has its end on both sides of an axial line which passes through the pivot point of the lever and represents the force urging the aerosol button into its non-actuated position.

The invention further provides a means enabling the cam lever to be removably placed on different aerosol containers. In an embodiment of the invention the cam lever and its pivot means are affixed to an adapting collar which can be either permanently mounted on an aerosol container or removably mounted by means such as set screws.

A more detailed explanation of the invention is provided in the following description and claims and illustrated in the accompanying drawings which disclose by way of examples the principles of the invention and the best mode contemplated of applying those principles.

In the drawings:

FIGURE 1 is a side elevation of an aerosol container including the actuator of the present invention, the actuator collar being shown in fragmentary cross-section;

FIGURE 2 is a plan view of an aerosol container with the actuator of the present invention affixed thereto;

FIGURE 3 is a front view thereof with a fragmentary showing of the aerosol container;

FIGURE 4 is a fragmentary side elevation of an embodiment of the invention showing the aerosol valve button in cross-section;

FIGURE 5 is a fragmentary side elevation of the embodiment of FIGURE 4 showing the cam lever in another position;

FIGURE 6 is a fragmentary side elevation of the embodiment of FIGURE 4 showing the cam lever in a different position;

FIGURE 7 is a fragmentary side elevation of a second embodiment of the invention showing the aerosol valve button in cross-section; and

FIGURE 8 is a fragmentary side elevation of a modification of the invention showing the aerosol valve button in cross-section.

With reference to FIGURES 1, 2 and 3 an aerosol container 10 is shown having neck 11 with collar 12 secured thereto by means of set screws 13. Adjacent the aerosol valve button 14 having outlet aperture 15 are pivot means 16 which are affixed to the top surface 17 of collar 12. Set screws 13 allow collar 12 to be removably positioned on aerosol containers. However, it is to be understood that pivot means 16 could be permanently affixed to the aerosol container without departing from the scope of the invention.

Cam lever 20 comprising lever arm 21 and cam 22 is pivotally mounted by means of pin 23 which forms a part of the pivot assembly. Although pivot pin 23 is shown aligned with the center line of the aerosol valve button, the rotation point of the cam may be shifted to either side without departing from the invention. Such an expedient might be used to obtain controlled variations in lever and cam pressures and for design considerations.

FIGURE 4 shows an embodiment of the invention wherein the aerosol valve button 14 is in its non-actuated position. The aerosol valve button is of conventional construction and contains valve 26 with output channel 27 and output aperture 15. Cam lever 20 is shown positioned adjacent to the aerosol valve button 14.

In the embodiment shown in FIGURE 4, cam lever 20 comprises arm 21 and cam 22. Cam 22 has a first side 30 which is located at one end of the lever and is spaced a greater distance from pivot point 31 than the distance of the top face 32 of the aerosol valve button in its non-actuated position (as shown) from pivot point 31. Cam 22 further comprises a second side 33 which is continuously disposed in relation with the top side 34 of lever stem 21. Two other sides, 35 and 36 of the cam are provided, these sides being contiguous and forming a corner 40 at their line of intersection. Corner 40 is spaced a greater distance from pivot point 31 than the distance of top face 32 from pivot point 31 with the aerosol button in its non-actuated position.

With reference to FIGURE 5, it is apparent that a downward pressure on the lever arm 21 causes corner 40 to engage and depress button 14 causing actuation of the aerosol valve.

With many of the present aerosol valves, the spray density increases with increasing downward movement of the aerosol button. The invention is particularly useful in a situation where a regulated spray is desired, due to the mechanical control achieved by the lever arm. When a constant spray is desired for a continuous interval of time, the lever arm 21 is lifted to assume the position shown in FIGURE 6. Because of the distance be-

tween cam side 30 and pivot point 31 the actuator button is placed in a depressed position causing actuation of the aerosol valve. When side 30 contacts top face 32 of the aerosol button 14, the ends 37 and 38 of side 30 are disposed on opposite sides of an axial line which passes through pivot point 31 and represents the force urging the valve button 14 into the first, or non-actuated, position. In this manner, the button becomes locked in its second, or actuated, position.

In the embodiment shown, the cam side 30 has a configuration which is complementary to the top face 32 of the aerosol valve button. Such a provision provides the greatest amount of frictional contact between side 30 and face 32.

In the modification of FIGURE 7 a cam lever 40 is provided having elongated arm portion 41 and cam portion 42. Cam portion 42 includes a first side 50, a second side 51 which is continuous with top side 54 of arm portion 41, and third and fourth sides 55 and 56 respectively. Cam sides 55 and 56 are contiguous and form a corner 60 at their line of intersection. Corner 60 is spaced a greater distance from pivot point 31 than the distance of top face 32 of the aerosol actuator button 14 from the pivot point 31 and hence, when arm 41 is pushed downward, the corner 60 engages the top face 32 of the aerosol actuator button causing it to depress to its actuator position.

In the embodiment shown in FIGURE 7 cam side 56 is spaced a greater distance from pivot point 31 than the distance of top face 32 from the pivot point. Cam side 56 is adjacent to the under side 61 of lever arm 41. Hence, when lever arm 41 is pressed to a far downward position, cam side 56 engages top face 32 of the valve button 14 causing depression of the button.

When cam side 56 is in contact with top face 32 of the button 14, corner 60, with respect to lever arm 41, is located on the opposite side of the axial line passing through pivot point 31 representing the line of force which urges button 14 to its first, or actuated, position. An upward force is exerted against the portion 64 of the cam side 32 that is on the same side of the imaginary line as corner 60. The upward force tends to bias the lever in a clockwise direction and thereby causes locking of the aerosol button in its second, or actuated, position.

In the embodiment shown side 56 has a configuration which is substantially complementary to the configuration of top face 32 of actuator button 14. Thus a cam lever is provided having a mechanical advantage due to its arm portion and the locking provision when the lever arm 41 is pressed to a far downward position.

The embodiment of FIGURE 8 allows the actuator button 14 to be locked when the cam lever 70 is in two positions. In this embodiment cam sides 80 and 86 are both spaced a greater distance from the lever pivot point 31 than the top face 32 of the actuator button 14. Side 80 is disposed at one end of lever 70 and side 86 is adjacent to under side 91 of the lever arm 71.

Corner 90 is formed at the line of intersection of contiguously disposed cam sides 85 and 86 and is also spaced a greater distance from pivot point 31 than the top face 32. With respect to lever arm 71, when side 86 is contacting top face 32, corner 90 is located on the opposite side of an axial line representing the line of force of the button 14, passing through pivot point 31. In this manner the advantages of the FIGURE 6 and the FIGURE 7 embodiments are combined to achieve an actuating lever which allows locking of the actuator button 14 when lever arm 71 is in a far downward position and side 86 engages top face 32 and when lever arm 71 is in a far upward, preferably vertical, position and side 80 contacts top face 32. When locking is not desired, the arm 71 is moved so that corner 90 engages and depresses button 14 causing a controlled spray.

An inexpensive yet highly effective aerosol actuator has been disclosed. In a normal position of the lever the actuating button is in its non-actuated position. Upon a slight pressure on the lever arm, the actuator button is depressed thereby actuating the aerosol valve. Another movement of the lever arm causes the button to be locked and hence, the valve remains in its actuated position. The aerosol actuator is pleasing to the eye and may be removably mounted so as to be useful with many different aerosol containers.

Although the fundamental novel features of the invention as applied to preferred embodiments have been shown and described it will be understood that various omissions and substitutions and changes in the detail and form of the device illustrated may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. An aerosol actuator for actuating a valve button having a channel therein to allow the flow of fluid, said button being normally biased to a first position, which comprises: an actuating lever pivotally mounted adjacent said button, said lever comprising an actuating arm portion adapted to be actuated by an operator, a cam portion adapted to contact the top surface of said button to move the button to a second position against its bias, a first surface on one side of said cam portion disposed adjacent said top surface of said button when said button is in said first position, and a second surface distinct from said first surface adapted to contact said top surface of said button while said button is in said second position, said second surface being spaced a greater distance from the pivot point than said first surface, the ends of said second surface being disposed on opposite sides of an axial line passing through the pivot point when the button is in said second position, whereby said second surface locks the button in said second position.

2. An aerosol actuator as described in claim 1, wherein said second surface is disposed on the side of said cam portion opposite said one side, at a location adjacent said arm portion.

3. An aerosol actuator as described in claim 1, wherein said second surface is disposed on the same side of said cam portion as said first surface, at a location remote from said arm portion.

4. An aerosol actuator as described in claim 1, including means for pivotally mounting said actuating lever adjacent said button, said means comprising a removable collar, which is adapted to be attached to an aerosol container and to encircle the valve button thereof.

References Cited by the Examiner

UNITED STATES PATENTS

2,621,746	12/1952	Beauregard.	
2,646,248	7/1953	Cornelius	251—263
2,766,772	10/1956	Welty et al.	251—263 X
2,941,700	6/1960	Gable	222—394
3,081,918	3/1963	Scoggins et al.	222—402.14
3,109,565	11/1963	Kutik	222—394
3,112,849	12/1963	Wallace	222—394
3,143,254	8/1964	Vanderhyde	222—394
3,159,319	12/1964	Parish	222—394
3,178,077	4/1965	Benedetto	222—394
3,207,472	9/1965	Seltsam	251—263 X

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