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ENCLOSURE AND OPERATING MECHANISM FOR AN AEROSOL CAN

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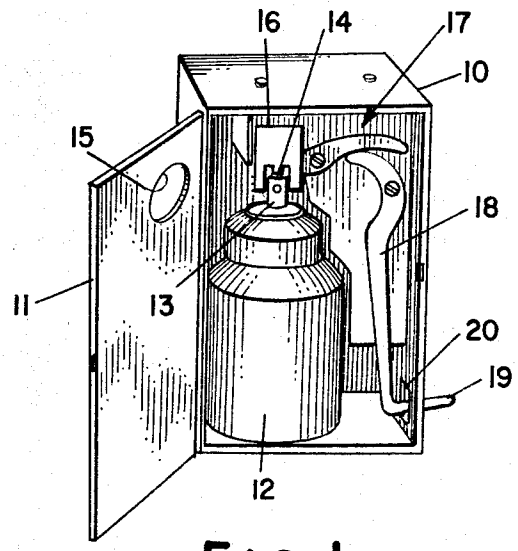


FIG. 1.

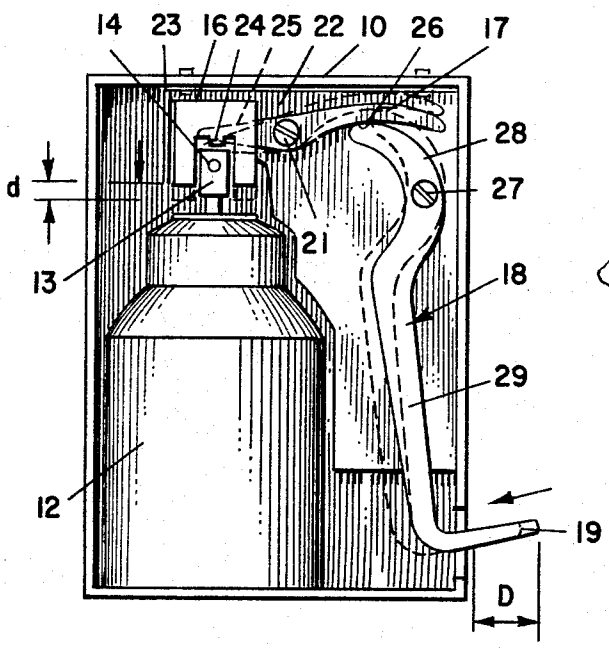


FIG. 2.

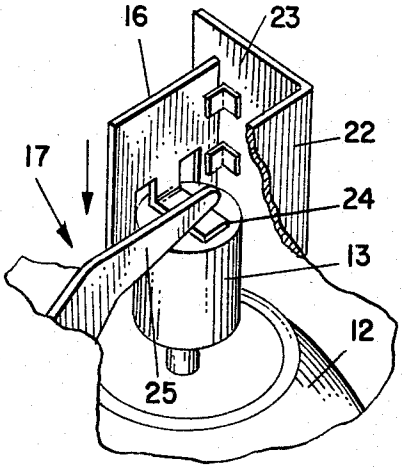


FIG. 3.

INVENTOR.
JACK TAKIFF
BY Elliott & Pastoriza
ATTORNEYS

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ENCLOSURE AND OPERATING MECHANISM FOR AN AEROSOL CAN

Jack Takiff, Los Angeles, Calif., assignor to Mediclean Drug & Chemical Corporation, a corporation of California

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This invention relates generally to an improved means for housing and operating aerosol type cans, such as are used to spray deodorant and disinfecting chemicals in kitchens, bathrooms, and the like.

Conventional aerosol spray cans include a cap structure having a nozzle outlet opening. Upon depression of the cap structure, contents from the can are sprayed through the nozzle opening. A return spring mechanism is incorporated in the cap structure so that when pressure is released from the cap, the spray nozzle passage will be closed. Usually the degree of movement of the cap to effect spraying is quite small so that when manually operated, the cap is fully depressed allowing the maximum amount of spray to emanate from the nozzle. Attempts to only partially depress the cap to cut down the volume of spray are very difficult since the return spring is non-linear in action.

In certain instances, it would be desirable to provide an actuating mechanism for operating such type aerosol spray cans in which a very carefully controlled movement of the cap structure can be effected. By such an arrangement, the volume of spray may be carefully controlled, which feature might be desirable in effecting automatic action of the spray can as by moving doors, time clock mechanisms and so forth. Such action would also, of course, be desirable in manual operation in those instances in which only a small amount of spray is desired.

It would also be desirable to provide a suitable enclosure for aerosol spray cans which will provide a neat appearance and within which the can may be positioned without in any manner altering the can structure itself so that it may be easily removed and replaced by a new can when the contents thereof have been used up.

With the foregoing considerations in mind, it is accordingly, a primary object of this invention to provide a novel enclosure together with an operating mechanism for an aerosol can which fully meets the above mentioned desirable features.

More particularly, it is an object to provide an enclosure and operating mechanism for an aerosol can in which the degree of depressing movement of the nozzle cap may be very carefully controlled to the end that the volume of spray from the can in turn can be controlled.

Another important object is to provide in combination with an operating mechanism, a suitable enclosure for a can which presents a neat appearance and which enclosure may be mounted on a wall or other convenient place in a room.

Briefly, these and many other objects and advantages of this invention are attained by providing a housing structure adapted to receive an aerosol can. The housing is provided with a cover having a central opening positioned to register with the nozzle outlet portion of the can so that spray from the can will pass through the opening in the cover of the housing, the can itself being substantially invisible from the exterior of the housing.

Within the housing structure there is provided a compound lever means for depressing the cap of the can to enable operation of the unit. This compound lever arrangement includes first and second levers pivotally mounted intermediate their ends to the interior of the housing. The arrangement is such that movement of the

levers by actuating a portion of one lever extending to the exterior of the housing serves to depress the cap on the can, the movement of the cap being considerably less than the movement of the exposed portion of the lever mechanism so that a fine degree of control is realized.

A better understanding of the invention will be had by now referring to a preferred embodiment thereof as illustrated in the accompanying drawings, in which:

FIGURE 1 is a perspective view of the enclosure and operating mechanism for an aerosol can in accordance with the present invention with the cover of the enclosure open to expose the interior thereof;

FIGURE 2 is an enlarged elevational front view partly in cross-section useful in explaining the operation of the invention; and,

FIGURE 3 is a fragmentary perspective view of a portion of the operating mechanism as viewed from the upper rear interior portion of the housing shown in FIGURE 2.

Referring first to FIGURE 1, there is shown a housing **10** which may also serve as a supporting frame structure. As shown, the housing **10** is provided with a cover or door **11** for enclosing an aerosol can **12** having a conventional operating cap **13** with an outlet nozzle opening **14**. Contents from the can **12** are sprayed through the outlet nozzle **14** upon depression of the cap **13**. As shown, the door **11** includes an opening **15** positioned at a level to register with the outlet nozzle **14** when the door is closed and the can enclosed to permit spray to pass to the exterior of the housing.

Suitable operating mechanism within the housing for depressing the cap **13** includes an actuating plate **16** guided for vertical movement within the housing and arranged to depress the cap **13** when engaged by one end of a first lever **17**. The second lever **18** in turn is arranged to actuate the other end of the first lever **17** when an end portion **19**, protruding through a lateral slot **20** in the side of the housing **10**, is moved.

With particular reference now to FIGURES 2 and 3, it will be noted that the first lever **17** is pivoted intermediate its ends as at **21** to an interior plate **22** which may constitute part of the housing structure and includes a corner portion **23** serving as a guide for the actuating plate **16**. This actuating plate includes a bent tab **24** best illustrated in FIGURE 3 which overlies the top of the cap **13**. With this arrangement, one end **25** of the first lever **17** engages in camming arrangement the top of the tab **24** so that downward movement of the one end **25** will cause the guide plate **16** to move downwardly and thus the tab **24** to depress the cap **13**.

The other end of the first lever **17** includes a concave surface **26**. The second lever **18** is pivoted at **27** and has one end provided with a convex surface **28** for camming engagement with the concave surface **26**. The other end portion of the second lever **18** is elongated as indicated at **29** and terminates in the projection portion **19** which passes to the exterior of the housing **10** as described in conjunction with FIGURE 1.

It will be evident from FIGURE 2 that the one end **25** of the first lever **17** is closer to its pivot point **21** than its far end portion **26** and similarly, the one end **28** of the second lever **18** is closer to its pivot point **27** than its far end **19**. As a consequence of this relationship, there will be required a considerably larger movement of the end **19** of the second lever **18** to effect a given movement of the one end **25** of the first lever **17**. More particularly, if "*d*" designates the distance through which the cap **13** is moved upon actuation of the lever mechanism, the other end of the second lever **19** must move through the distance D.

The operation of the mechanism will be evident from the foregoing description. With the can in the housing

and the cover **11** closed, there will only be exposed the end portion **19** of the second lever protruding through the slot **20** from the side of the housing. To operate the aerosol can, a person, or other suitable actuating mechanism, need only press inwardly on the lever portion **19**. This action pivots the second lever **18** about the pivot point **27** to a new position such as illustrated in the dotted lines of FIGURE 2. This action in turn causes the convex surface **28** to effect upward movement of the other end **26** of the first lever **17** as also indicated in dotted lines. This upward movement in turn causes downward movement of the one end **25** of the first lever against the tab **24** thereby sliding the guide plate **16** downwardly to depress the cap **13**. The normal return spring in the cap **13** will move the one end of the first lever upwardly when the pressure on the other end **19** of the second lever is released to return the levers to their solid line positions illustrated in FIGURE 2.

With respect to all of the foregoing, it should be noted that by employing the convex surface **28** in camming engagement with the concave surface **26** and by having the longitudinal axes of the respective levers **17** and **18** at an angle to each other, there will be a greater movement of the one end surface portion **28** of the second lever than the other end surface portion **26** of the first lever **17**. In other words, the camming of the first lever by the second lever also results in a change in the ratio of the respective distances moved so that a very fine degree of control with the further advantage of very little force being required to actuate the cap, is realized.

It will also be clear that the end **19** of the second lever **18** protruding from the housing may be manually actuated, or may be suitably coupled to a clock actuating mechanism or swinging door actuating mechanism, or any other automatic means for operating the aerosol can.

When the contents of the can have been used up, it is a simple matter to open the door **11** and replace the can with a new one without any disassembly of the actuating mechanism.

The present invention has thus provided an improved enclosure and operating mechanism for an aerosol can which fully satisfies all of the objects set forth heretofore.

What is claimed is:

1. An enclosure and operating mechanism for an aerosol can having an upper cap with an outlet nozzle adapted upon depression to spray contents from said can, comprising, in combination: a housing for receiving said can and including a cover for the front of said housing having an opening at a level corresponding to the height of said outlet nozzle so that contents sprayed from said can pass through said opening when said cover is in place; a first actuating lever pivotally mounted intermediate its ends in said housing near a top portion thereof, one end being positioned to effect depression of said nozzle upon upward movement of the other end of said lever; and a second lever pivotally mounted intermediate its ends in said housing extending vertically within said housing, one end of said second lever being positioned to cam said other end of said first lever upwardly when the other end of said second lever is moved, said housing having a side opening in a side portion thereof through which said other end of said second lever projects to enable movement of said second lever from the exterior of said housing, said other end of said second lever being actuable in a direction substantially normal to said side portion.

2. The subject matter of claim **1**, in which said one end of said first lever is closer to the pivot point of said first lever than its other end and said one end of said second lever is closer to the pivot point of said second lever than the other end of said second lever whereby a large movement of said other end of said second lever effects a small depressing movement of said one end of said first lever.

3. The subject matter of claim **2**, in which the longitudinal axis of said second lever forms an angle with the longitudinal axis of said first lever, said other end of said first lever having a concave surface portion and said one end of said second lever having a convex surface portion in camming engagement with said concave surface portion whereby the movement of said one end of said first lever is less than the movement of said one end of said second lever when said first lever is actuated by said second lever.

4. The subject matter of claim **3**, including an actuating plate means disposed adjacent to said cap and being mounted to said housing for vertical sliding movement, said actuating plate means including a bent tab overlying the top of said cap, said one end of said first lever engaging said tab so as to move said plate and tab downwardly upon actuation and thereby depress said cap.

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ROBERT B. REEVES, *Primary Examiner.*

CHARLES R. CARTER, *Examiner.*