Feb. 21, 1967

O. W. GRAVELEY

3,304,797

ACTUATING DEVICE

Original Filed June 26, 1964

2 Sheets-Sheet 1

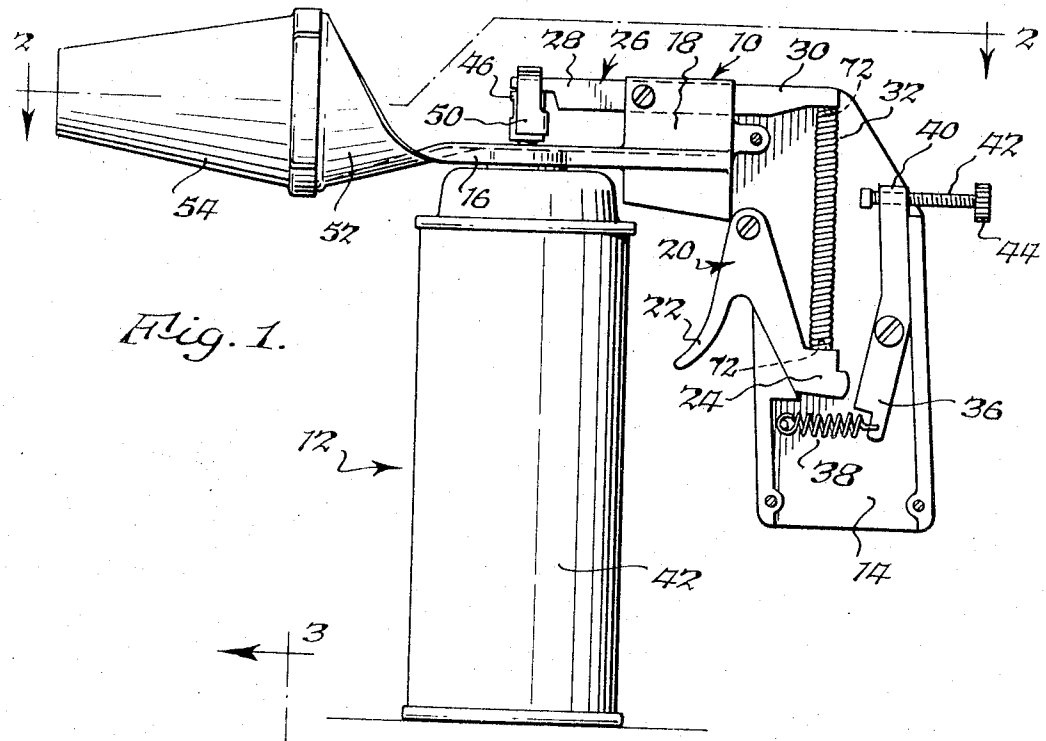


Fig. 1.

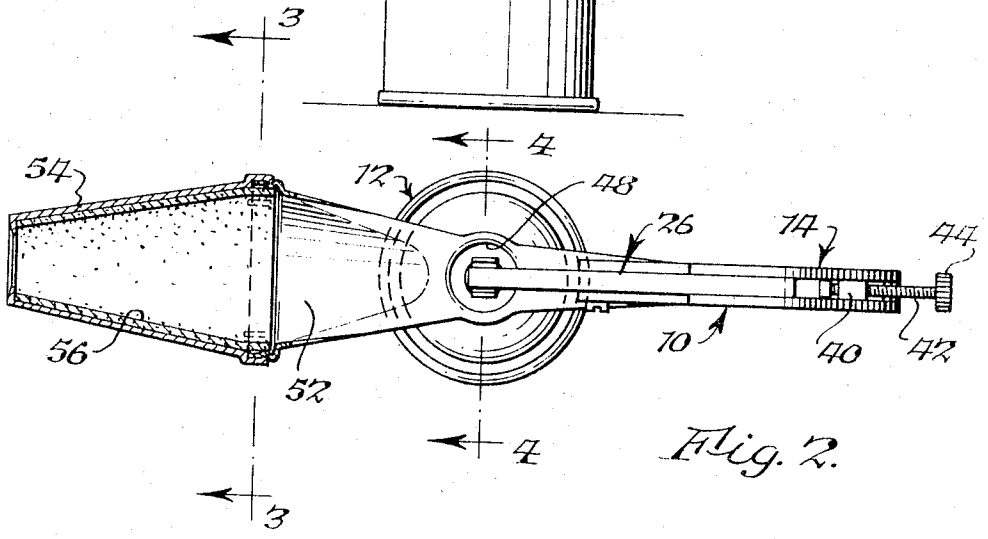


Fig. 2.

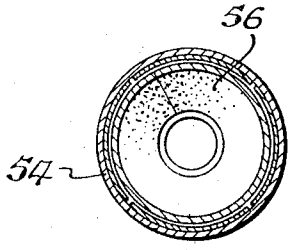


Fig. 3.

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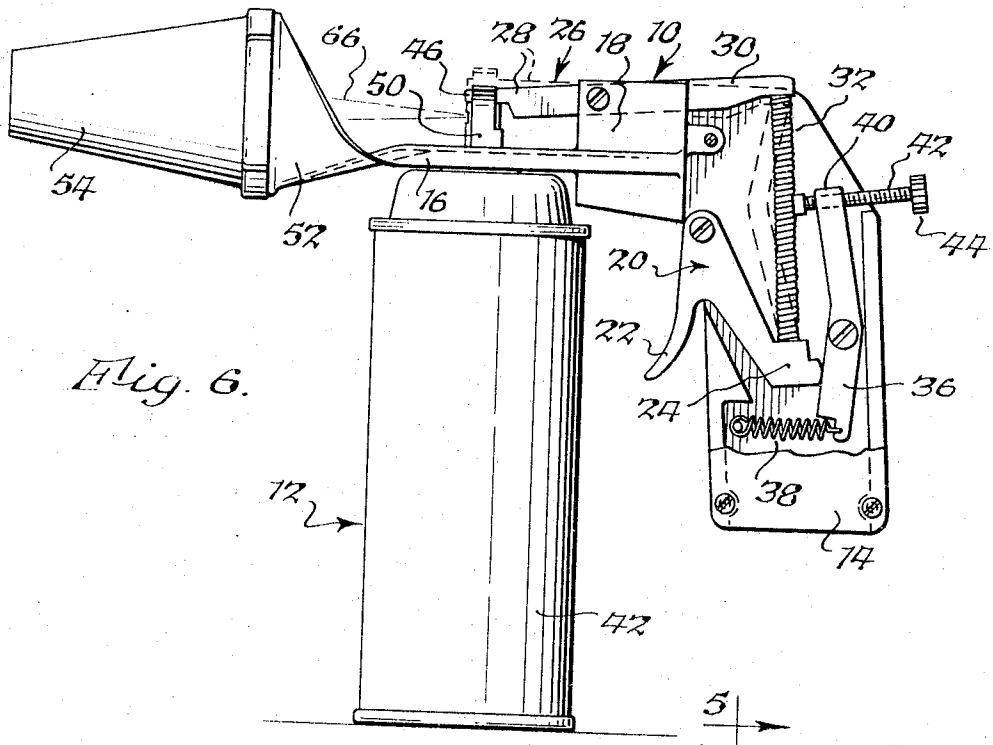


Fig. 6.

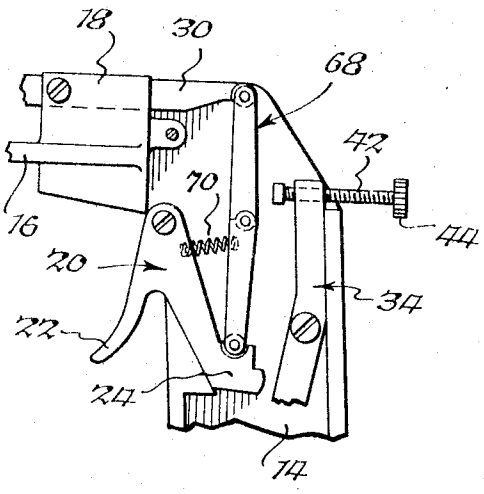


Fig. 7.

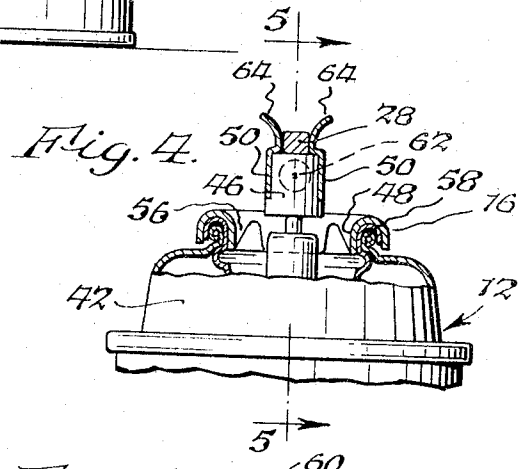


Fig. 4.

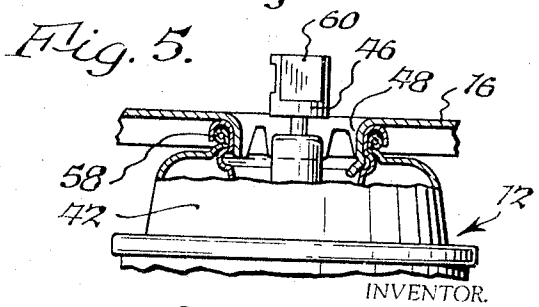


Fig. 5.

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3,304,797

ACTUATING DEVICE

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Original application June 26, 1964, Ser. No. 378,193, now Patent No. 3,276,699, dated Oct. 4, 1966. Divided and this application Mar. 18, 1966, Ser. No. 535,472
8 Claims. (Cl. 74—491)

This application is a division of my pending application Ser. No. 378,193 filed June 26, 1964, now Patent No. 3,276,699 for Device for Dispensing Pressurized Material.

This invention relates generally to the control art, and more specifically to an actuating linkage. While not limited thereto, the instant invention is herein disclosed by way of example incorporated in a gun type holder for dispensing pressurized material, such as aerosol sprays, either pre-packaged in canisters or from a fixed supply for controlling the amount dispensed.

Dispensers containing pressurized aerosol sprays are well known in the art and have been utilized for applying such diverse chemicals as insecticides, germicides, paints, fire retardants, air fresheners and even moth proofers. These aerosol spray cans may contain powdered, comminuted, semi-solid, liquid and fluid materials each to be dispensed by a carrier gas under pressure, usually through a spray nozzle or orifice extending through a controlling actuator button or plunger. When the button or plunger is depressed, by fingers pressure, the carrier gas and the material to be sprayed are passed together through the orifice causing the material to be atomized.

The conventional aerosol cannister is designed so that the operator holds the cylindrical body portion in the palm of one hand and actuates the upper valve mechanism with the thumb of the same hand. When the material is released the pressurized carrier gas expands, cooling the cannister, and depending upon the original pressure of the gas within the cannister, the container may become so cold that the skin of the operator is numbed or even burned.

The dispenser may also contain insecticides or other poisonous materials which should not be permitted to contact the skin. With the hand of the operator encircling the can and in close proximity to the spray orifice it is inevitable that some of the spray will be deposited upon the operator's hand possibly causing an irritating reaction on the skin.

Furthermore, with the spray orifice situated in the usual small actuator button, it is difficult to aim the spray precisely. Also, due to manufacturing tolerances, the orifices of many of the cannisters tend to be large, allowing the cone of the spray to diverge quickly, not permitting the precise application of the sprayed material that is desired if the cannister is held at a distance from the point of application. When the spray cannister is held too close to the surface being covered, the coating tends to run while if the can is held at a distance from the surface, the applied material tends to come out of the dispersion and drip, as well as covering a large area.

It is often desirable to be able to apply the same amount of spray time after time. With the use of a regular finger depressed plunger this is impossible. The human judgment of time is, at best, not very accurate, and as the hands become tired or cramped, the time of applying the coatings will vary.

Therefore, it is an object of my invention to provide a hand operated device for actuating an aerosol can without the hand of the operator touching the cannister, so that the operator is protected from the icy cold of the cannister and possible skin irritation from the spray.

A further object of my invention is to provide a means for regulating the actuation time of the dispenser which is substantially free of the operator's sense of time.

Other objects and advantages of my invention will become apparent during the course of the following description.

In the accompanying drawings, forming a part of this application, and in which like numerals are employed to designate like parts throughout the same:

FIG. 1 is a side elevational view of an aerosol cannister holder of the present invention with the cannister attached thereto, and having a section of the handle cover portion removed from the holder for a view of the actuating mechanism of this invention contained therewithin;

FIG. 2 is a view partly in plan and partly in section of the cannister holder and aerosol cannister of FIG. 1 with the handle cover portion in place, being taken about on line 2—2 of FIG. 1;

FIG. 3 is a cross-sectional view of the spray shield of the cannister holder taken along line 3—3 of FIG. 2;

FIG. 4 is an enlarged cross-sectional view of the upper end of the cannister taken along line 4—4 of FIG. 2 illustrating means for attaching the cannister body to the holder frame, and the actuating button of the cannister to the actuating lever of the holder;

FIG. 5 is a cross-sectional view of the upper end of the cannister attached to the cannister holder frame, taken along line 5—5 of FIG. 4, with the actuating lever removed to illustrate the shape of the actuator button;

FIG. 6 is a side plan view of the cannister holder with a cannister attached thereto, similar to FIG. 1, showing the holder with the trigger depressed to the point at which the spray is released and illustrating the operation of the spring connecting line; and

FIG. 7 is a partial side plan view of a second embodiment of the invention utilizing a toggle linkage in place of the collapsible spring link.

Referring to FIGS. 1 and 2, the aerosol dispenser holder, generally designated **10**, is shown mounting an aerosol cannister, generally designated **12**. The holder **10** consists of a hollow pistol type handle **14** with a cannister mounting frame section **16** riveted thereto by a flange **18**. A trigger **20** is pivotally mounted within the hollow pistol handle **14** and has an integral finger grip **22** extending through the handle **14** to a position at which it may be easily held by a hooked finger of the hand of the operator wishing to use the aerosol cannister **12**. An abutment **24**, on the body of the trigger **20**, lies within the hollow handle. An actuating lever **26** is pivotally mounted in the upper end of the handle **14** with a first end **28** extending out across the upper end of the aerosol cannister **12** and a second end **30** of the actuating lever **26** being contained within the hollow pistol handle **14**. A compression spring **32**, within the handle **14**, is held between an upper face of the abutment **24** on the trigger and the lower face of the second end **30** of the actuating lever **26**. Spring **32** can seat around projections **72** (FIG. 6) on end **30** and abutment **24**.

An adjusting lever **34** is pivotally mounted within the hollow handle **14** of the aerosol dispenser holder **10**, in the same plane as the trigger **20**, with a first end **36** of the adjusting lever **34** adjacent the abutment **24** on the trigger **20** and biased toward the abutment **24** by a tension spring **38** connected at one end to the first end **36** of the adjustment lever **34** and at the other end to a fixed point in the hollow pistol handle **14**. The second end **40** of the adjustment lever **34** has an adjusting screw **42** extending therethrough at a point adjacent the center of the compression spring **32** and substantially perpendicular thereto, with the knurled head **44** of the screw **42** lying outside the handle **14**.

A cannister 12 is fixed in the frame 16 of the holder 10 with the cylindrical body portion 42 of the cannister 12 positioned beneath the frame 16 and the actuating button 46 extending through a circular hole 48 in the frame 16. The first end 28 of the actuating lever 26 is operatively connected to the button 46 by a resilient, removable, coupling 50. The end of the frame 16, distant from the handle 14, is curved to form a circular mounting 52 for a conical funnel 54 whose walls tend to converge at a point distant from the mounting portion 52. As shown in FIGS. 2 and 3, an absorbent lining 56 may be included within the conical funnel 54 to catch any particles that may tend to leave the spray and prevent dripping therefrom. Lining 56 is removable.

As shown in FIGS. 4 and 5, the cannister 12 may be removably held in the frame 16 of the holder 10 by means of a depending resilient flange 56 surrounding the hole 48 and snapping into the conventional crimped over annular neck bead 58 of the cannister 12. The actuator button 46 of the cannister 12, extending through the frame 16, has a pair of opposed flats 60, lying in planes parallel to the axis of the spray orifice 62 while the resilient coupling 50, connecting the button 46 to the end 28 of the actuating lever 26, has a pair of flat spring ears 64 formed so as to extend across the flats 60 on the button actuator 46 and further clamp onto the sides of the end 28 of the actuator lever 26 to hold the button 46 against rotation in a position with the axis of the orifice 62 coincident with the axis of the conical funnel.

FIG. 6 illustrates the operation of the aerosol cannister holding device. In solid line, the trigger 20 is shown partially depressed, the compression spring 52 being driven upward thereby, pivoting lever 26 counterclockwise to depress the button 46 and emit a spray 66 from the orifice 62 through the funnel 54. As the trigger 20 is further depressed, the outer end of the abutment 24 on the trigger 20 pivots the adjustment lever 34 counterclockwise, causing the inner end of the screw 42 to bear against the compression coil spring 32 and buckle the same, as shown in broken lines. When this occurs, actuating lever 26 pivots clockwise under the influence of the usual compression spring (not shown) associated with the button 46, shutting off the spray 66. It will be appreciated that, except for the flat sides 60, button 46 can be any conventional, spring returned aerosol spary control button.

FIG. 7 illustrates a modification of the invention wherein the compression spring 32 has been replaced with a toggle 68 pivotally connected between the abutment 24 on the trigger 20 and the end 30 of the actuating lever 26 and held upright to transmit a reciprocatory force by a compression spring 70 positioned between the trigger 20 and one of the links of the toggle 68. When the trigger 20 is first depressed, the toggle will hold the position shown, depressing the actuator button 46 and allowing a spray 66 to be emitted. Further depressing of the trigger will cause the end of the screw 42 to press against a link of the toggle 68, collapsing the toggle and releasing the actuator button 46.

The length of the portion of the adjustment screw 42, extending through the lever 34 toward the compression spring 32 (or toggle 68), determines the length of time that the spray will be activated. The operator does not need to hold the trigger depressed in one position for a calculated time at each actuation to obtain a consistent amount of spray. All that need be done is to set the screw 42 by the knurled head 44 to a particular position and then slowly squeeze the trigger 20 to first activate the spray and second to shut it off.

If a narrow spray 66 is desired, for stenciling or other uses, the funnel 54 is used, if on the other hand, a large area is to be covered, the funnel 54 need only be unsnapped and removed.

While only one particular method for holding the cannister 12 to the frame 16 is shown, the cannister 12 could be held by any number of means that are quite old in the art such as a pipe clamp.

It will be understood of course, that for purposes of explanation, I have merely illustrated in detail what I deem to be the presently preferred specific embodiments of my invention and that within the broader purview of the invention, as defined by the appended claims, various modifications may be made in the illustrated structure. The dispensing device of my invention is not limited to aerosols, or to use with portable cannisters. It can also be used to control a dispensing line from a fixed or remote supply. The actuating linkage of my invention is not limited to the dispensing art, but has utility elsewhere as well.

What I claim is:

1. An actuating linkage comprising a first pivotable lever movable from a first position through a second position to a third position, a second pivotable lever adapted for actuating engagement with a member to be actuated, a collapsible section between said first and second levers operable to pivot said second lever from a first to a second position when said first lever is pivoted from said first position to said second position, and means automatically collapsing said collapsible section to enable pivoting of said second lever back from its second position to its first position when said first lever is pivoted from said second position to said third position.

2. The linkage of claim 1, wherein said collapsing means is adjustable to change the location of said second position of said first pivotable lever.

3. The linkage of claim 1, wherein said collapsible section is a compression spring arranged between said first and second pivotable levers.

4. The linkage of claim 1, wherein said collapsible section is an overcenter toggle consisting of a pair of links pivotally interconnected at the center and connected to the first and second levers at the ends of said toggle.

5. The linkage of claim 4, together with spring means yieldably holding said toggle against collapsing.

6. The linkage of claim 1, wherein said automatic collapsing means comprises a third pivoted lever engageable by said first lever and carrying an adjustable screw engageable with said collapsible section.

7. The linkage of claim 6, together with spring means biasing said third lever into engagement with said first lever.

8. An actuating linkage comprising a trigger movable from a first position through a second position to a third position, a lever adapted for engagement with a member to be actuated, a collapsible section between said trigger and said lever operable to move said lever from a first position to a second position when said trigger is moved from said first position thereof to said second position thereof, and means automatically collapsing said collapsible section and thereby enabling return movement of said trigger from said second position thereof to said third position thereof.

No references cited.

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