United States Patent

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[72] Inventor **Leonard B. Sloan**
Webster, N.Y.

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[73] Assignee **Xerox Corporation**
Rochester, N.Y.
a corporation of New York

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[54] **TRIGGERING APPARATUS AND WORK LOCATING MEANS FOR AEROSOL SPRAY CANS**
1 Claim, 3 Drawing Figs.

[52] **U.S. Cl.** **222/402.15**
[51] **Int. Cl.** **B65d 83/00**
[50] **Field of Search** ..... 222/402.15, 394, 182, 162(Inquired), 402.13; 401/193, 148, 206, 48, 137

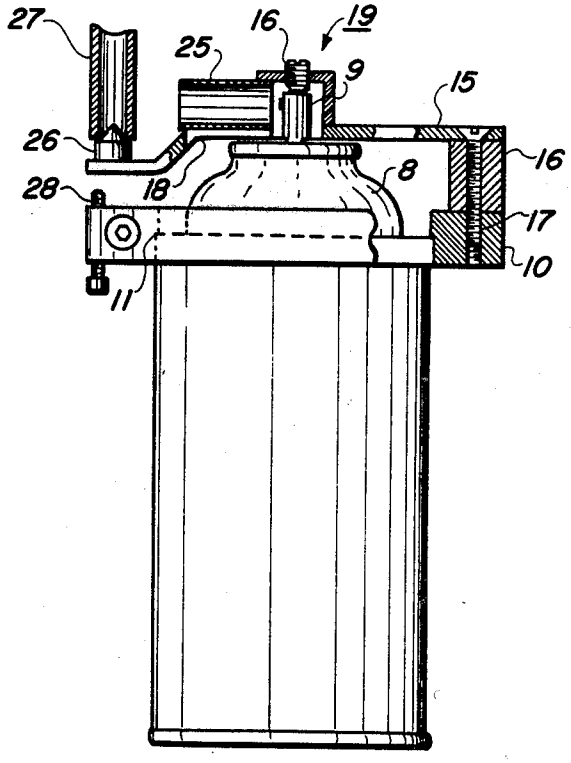
[56] **References Cited**
UNITED STATES PATENTS

2,821,048	1/1958	Efford et al.	222/402.13X
3,159,319	12/1964	Parish	222/402.15X
3,180,531	4/1965	Beard, Jr. et al.	222/182
3,260,416	7/1966	Abplanalp	222/402.15X

Primary Examiner—Stanly H. Tollberg
Attorneys—Paul M. Enlow, Norman E. Schrader, James J. Ralabate, Ronald Zibelli and Thomas J. Wall

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ABSTRACT: An aerosol spray can triggering mechanism having a frame adapted for mounting on a spray can, devices for actuating the pushbutton for the spray can and locating means positionable upon a work element and associated with the devices for positioning the spray can nozzle at a predetermined position relative to the work element.



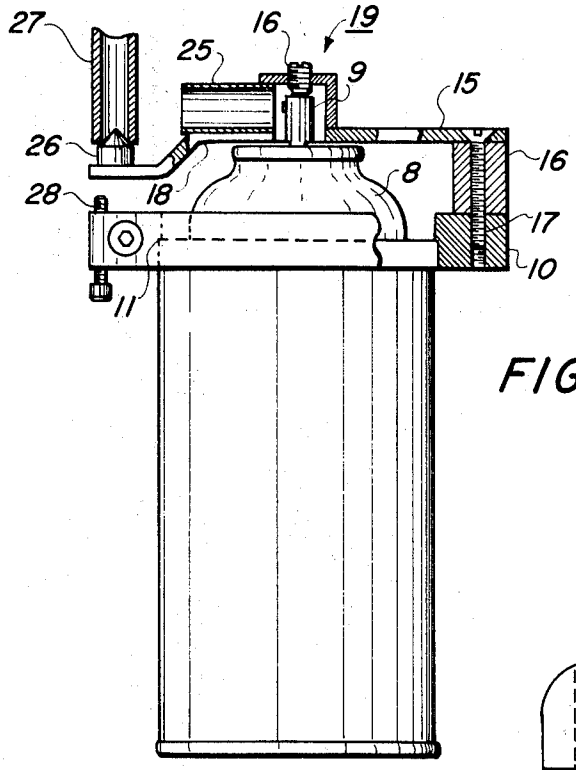


FIG. 1

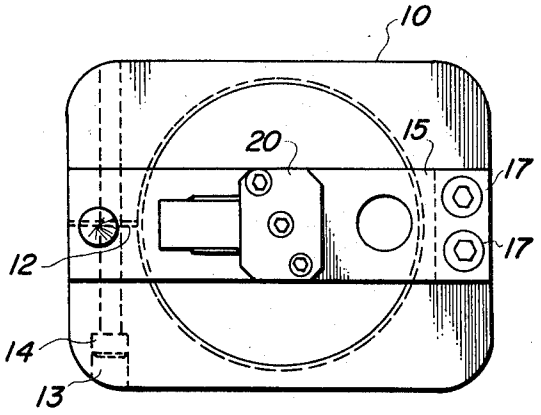


FIG. 2

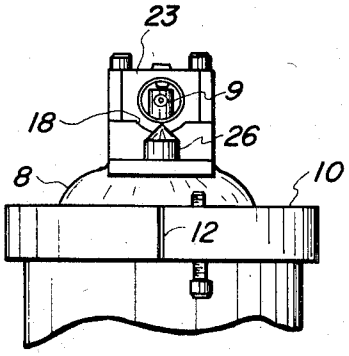


FIG. 3

INVENTOR.
LEONARD B. SLOAN
BY
ATTORNEY

TRIGGERING APPARATUS AND WORK LOCATING MEANS FOR AEROSOL SPRAY CANS

This invention relates to a spray can trigger apparatus and, in particular, to a spray can trigger apparatus for accurately directing and efficiently dispensing liquid material onto a target area.

Many dispensable liquids are now conveniently packaged in aerosol spray dispensers, or, as more commonly referred to, spray cans. Along the wide range of industrial uses found for the spray can is the dispensing of lubricants or cooling oils in small hand-cutting operations such as pipe threading or the like. Although the spray can dispenser has certain advantages over the heretofore used hand brush application, it nevertheless has proven to be a wasteful means of applying liquids, primarily due to the human errors involved. It has been found that the operator has trouble directing the spray initially into the target area. That is, the operator must seal or sense in some manner the direction of the main spray stream and then redirect the stream into the target. As can be seen, much material is wasted during the aiming sequence before the liquid can be accurately placed onto the target. Furthermore, the rate and volume at which the lubricant is delivered into the target is found to vary with individual operators depending on the distance that the nozzle is positioned from the target and the amount of pressure applied to the dispensing nozzle. Here again, because of the many human variables involved, it has been found that the spray can application is wasteful and therefore uneconomical.

It is therefore a primary object of this invention to provide a spray can triggering mechanism which will accurately direct and efficiently apply a liquid dispensed from an aerosol spray can.

A further object of this invention is to eliminate waste due to human error in the dispensing of spray can liquids.

These and further objects of the present invention are obtained by means of a spray can mechanism having a yokelike support member being adapted to be affixed to a body of a spray can applicator, a flexible arm mounted on the support member, locating means on said flexible trigger arm being adapted to be positioned the spray nozzle at a known distance from the target area, a nozzle actuator mounted on the flexible arm and being arranged to actuate the spray can nozzle when the flexible arm is depressed and a spray guide associated with the nozzle actuator to direct the spray from the can into the target area.

For a better understanding of these and other objects of the present invention, reference is had to the following detailed description of the invention to be read in connection with the accompanying drawings, wherein:

FIG. 1 is a side elevation in partial section of the trigger apparatus of the present invention shown mounted on an aerosol spray can;

FIG. 2 is a plan view of the triggering apparatus shown in FIG. 1;

FIG. 3 is a partial end view of the triggering apparatus of the present invention shown in FIG. 1.

The apparatus of the present invention is illustrated in FIGS. 1—3 and is adapted for use in conjunction with a spray can 8 having a barrel shaped can actuator 9 having a recessed type nozzle therein. Generally, in this type of spray can, the volume rate of liquid dispensed from the can is proportional to the distance that the cap is displaced. The greater the displacement of the cap greater the volume rate of flow of liquid allowed to pass through the nozzle. The spray can shown in FIG. 1 is illustrated acting upon a pipelike work element, however, as will become apparent from the discussion below, the present invention is not restricted in its use and is adaptable to be used in relation with any type work element. Furthermore, it should also be clear that the type or shape of the spray can are likewise not limiting and the present invention can be adapted to the number of cans of different sizes and shapes.

As illustrated, a typical trigger mechanism will include a yokelike support frame 10 having a recessed opening 11 therein adapted to slip over and seat upon the upper rim of the spray can. The support member has a slot 12 machined therein which allows the yoke to be separated sufficiently to permit recess 11 to easily slip over and seat against the rim portion of the can. As shown in FIG. 2, a countersunk clearance is in one half of the support hold 13 machined therein to receive screw 14 while the opposite half of the support is threaded to mate with the screw. In operation, the support member after it is properly seated on the rim, is locked to the can by tightened screw 14 causing the split halves of the support to be forced together.

Flexible actuator arm 15 is supported in cantilever style at a predetermined height above the support member by means of spacer 16. Both the arm and the spacer are affixed to the support member by means of flat head screws 17 passing therethrough so that the arm extends substantially parallel and below the intended spray stream path. An elongated slotted aperture 18 is provided in the flexible arm through which the upper part of the spray can is free to pass. Mounted over aperture 18 on the flexible arm 15 is trigger button housing 19 which includes four sidewalls and a cover plate 20. The housing is secured to the flexible actuator arm by means of screws 21. A setscrew 22, having a rounded end portion thereon, is adjustably supported in cover plate 20 and is arranged to contact the barrel-shaped spray can actuator when the flexible arm is in a natural or a nondeformed condition. The front wall 23 of the housing has a round aperture therein in which is inserted a plastic tube or barrel 25. In assembly, the support frame is locked in relation to the can so that the nozzle located in actuator cap 9 is pointed directly down barrel 25. The barrel acts as a guide to direct the liquid sprayed from the nozzle towards the intended target area.

As shown in FIG. 1, the flexible actuator arm is bent well below the elevation of tubular plastic barrel 25 and has affixed to the free end thereof adapted to be inserted into pipe member 27. The shank portion of the tapered member is passed through the flexible arm and riveted over to secure the member to the arm. Although the spray can is herein illustrated operating on a pipelike member, it should be clear that the apparatus of the present invention can be similarly engaged by any type work element to preposition the nozzle prior to application of the spray. An adjustable screw 28 is supported in support frame 10 directly below the free end of the flexible arm and can be set to a predetermined height to limit the horizontal movement or deflection of the arm. Adjusting screw 28 to a predetermined height restricts the vertical movement of the arm and thus limits the amount of "overspray" directed into the target area.

In practice, a conventional spray can was positioned so that the centerline of the can was 3 inches away from a flat piece of cardboard with the centerline of the nozzle substantially perpendicular to the plane of the cardboard paper. The nozzle was than depressed for one second to dispense liquid material onto the cardboard target. Five sample tests were made in the above manner and the results noted. Circles of ¼-inch increments up to 2.0 inches in diameter were marked off on the targets and patterns in the area coverage determined. Definite diametral patterns were prevalent. From the center of the target outward to a diameter 0.500 inches, 100 percent of the target area was covered by the dispensed material. From 0.500 inches to 0.750 inches approximately 90 percent covered and from the 0.750 inch diameter out to the 1.250 inch diameter there showed a light low density coverage of about 5 percent to 0 percent area coverage.

The above test was repeated utilizing the fixture as herein disclosed having a barrel which was approximately 2½inches long and having an inside diameter of 0.375 inches. The results from this second test showed 100 percent area coverage on the targets up to the 0.500 inch in diameter. However, the coverage rapidly fell off from this point out. Only up to 5 percent coverage between the 0.500 inch diameter and the 0.750 inch diameter and no coverage at greater distances was noted. For all practical purposes, a definite one diameter pattern was produced by using the present fixture with practically no waste outside the intended target area.

It was further found during the testing period that most conventional spray cans produce what is called "center-miss" when material is sprayed onto a target area less than 3 inches away from the nozzle. That is, the spray is directed substantially outward away from the centerline of the nozzle so that the center of the target receives comparatively little dispensed material. By placing a tubular barrel in the fixture of the present invention, it was found that the normal spray pattern is substantially contained or even inwardly directed thus effectively eliminating the "center-miss" effect. In fact, these tests showed that the spray pattern could be controlled to obtain desired target coverage by modification to the barrel shape.

In operation, the operator inserts tapered member **26** into the hole portion of pipe **27** and, with the member properly seated therein, continues to apply pressure to deflect actuator arm **15** downwardly against setscrew **28**. The deflection of arm **15** causes screw **22** to move downwardly into actuating contact with cap **9** of the spray can. As can be seen, when the trigger apparatus is so engaged with the workpiece, the spray nozzle is properly aimed at a predetermined distance from the target area. It should be further evident that by adjusting the height of setscrews **28** the amount of travel of the pushbutton actuator is limited, thus controlling the volume rate of flow of liquid dispensed from the nozzle. The volume rate of flow is preset to an optimum dispensing condition in relation to the distance that the work is supported from the spray and nozzle. Once the tapered member is properly located in the hole portion of the pipe and the actuator button depressed, the nozzle is properly aimed at the target area and an optimum rate of fluid dispensed into the target area to eliminate much of the waste heretofore associated with this type of dispenser.

While the invention has been described with reference to the structure disclosed herein, it is not confined to the details set forth, and this application is intended to cover such modifications or changes as may come within the scope of the following claims.

I claim:

1. A trigger apparatus for accurately directing and efficiently applying liquid material to a predetermined target area on a work element from an aerosol spray can dispenser of the type having a pushbutton nozzle, said trigger apparatus including:

a support frame for mounting said trigger apparatus on the spray can in predetermined relation with the spray can nozzle;

a flexible arm supported on said support frame in cantilever fashion and being capable of deflecting substantially in the plane of movement of the spray can pushbutton;

actuator means mounted on said flexible arm and arranged to overlay the spray can pushbutton wherein a deflection of said arm in the plane of movement of said pushbutton actuates the spray can, said actuator means being adjustable in relation to the elevation of the pushbutton;

an adjustable stop positioned in said support frame to limit the amount of deflection of said flexible arm; and

locating means mounted on the free end of said flexible arm and disposed in front of the spray can nozzle for contacting and engaging said work element for positioning the spray can nozzle at a predetermined location and distance from the work whereby applying further contacting pressure between the work and the arm will deflect the arm to actuate said spray can.