

June 23, 1964

L. F. KUTIK

3,138,331

ACTUATOR FOR PRESSURIZED DISPENSING CANS

Filed July 30, 1962

2 Sheets-Sheet 1

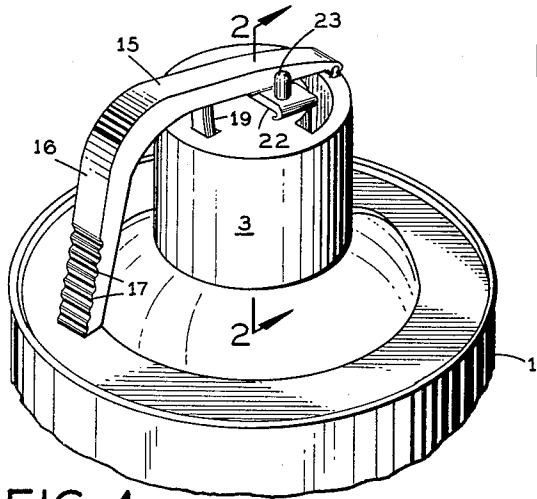


FIG. 1

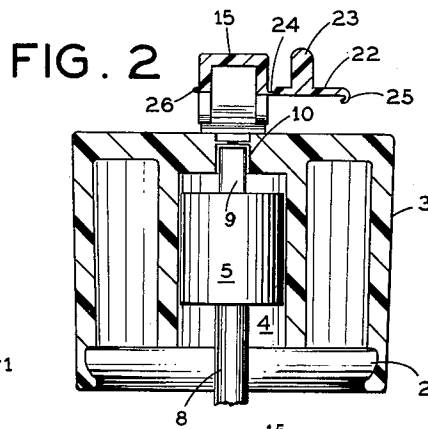


FIG. 2

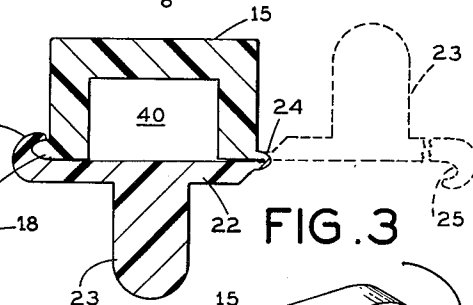


FIG. 3

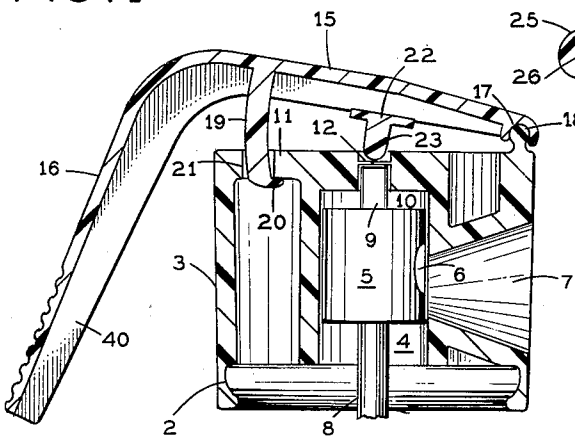


FIG. 4

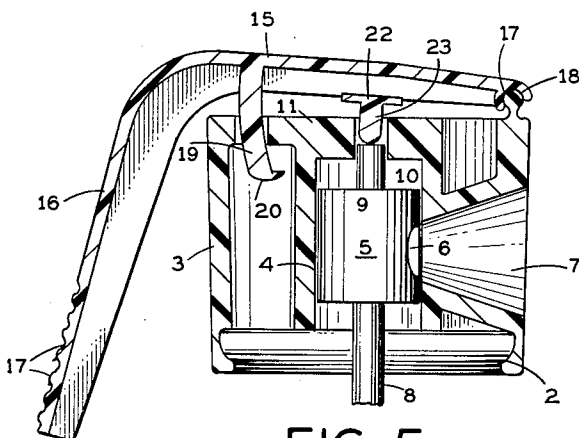


FIG. 5

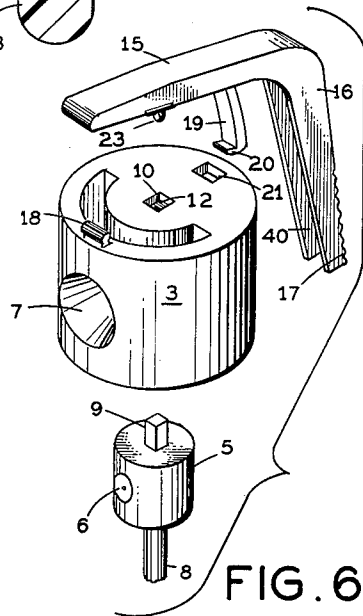


FIG. 6

INVENTOR  
LOUIS F. KUTIK  
BY *James N. Lyles*  
ATTORNEY

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L. F. KUTIK

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2 Sheets-Sheet 2

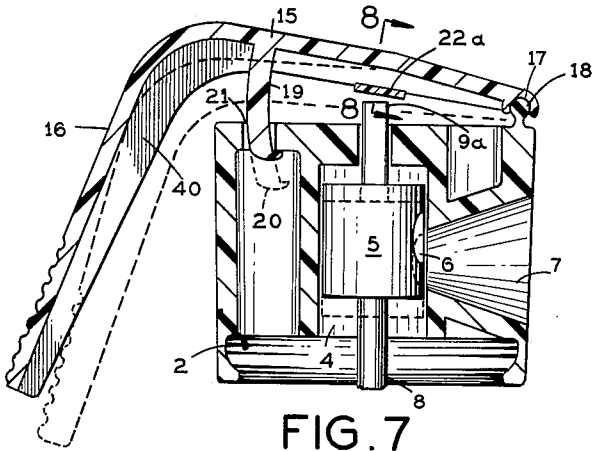


FIG. 7

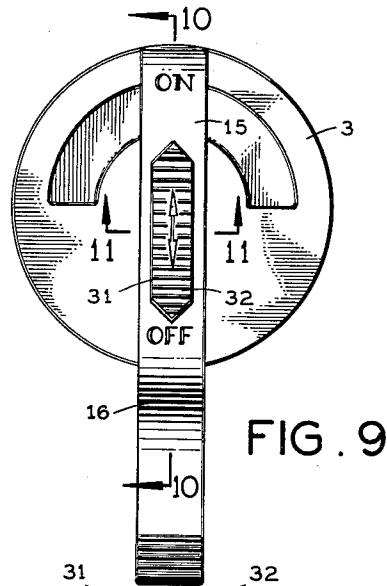


FIG. 9

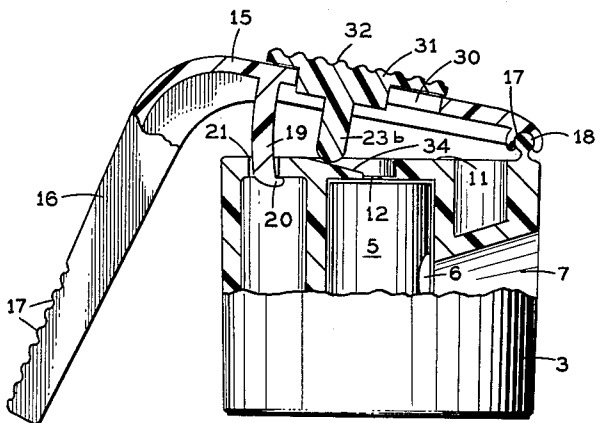


FIG. 10

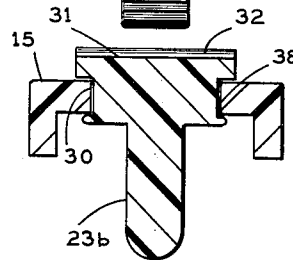


FIG. 11

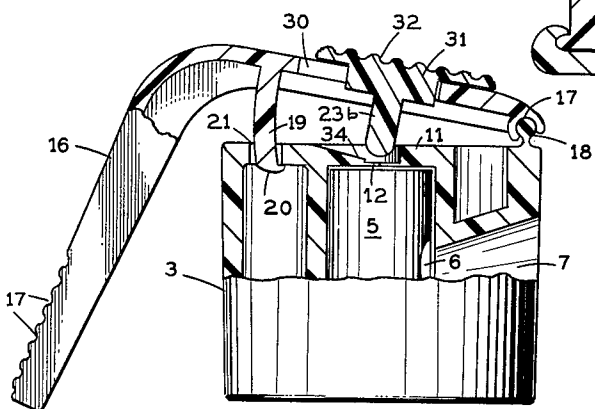


FIG. 12

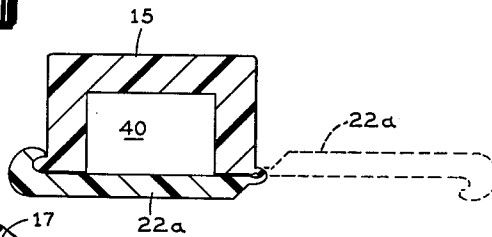


FIG. 8

INVENTOR  
LOUIS F. KUTIK  
BY *James W. Lyles*  
ATTORNEY

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3,138,331

## ACTUATOR FOR PRESSURIZED DISPENSING CANS

Louis F. Kutik, 5601 SW. 56th St., Fort Lauderdale, Fla.  
Filed July 30, 1962, Ser. No. 213,424  
10 Claims. (Cl. 239—337)

This invention relates to spraying devices, and more particularly to a device adapted to be fitted upon the top of a pressurized or spray can to spray the contents thereof.

In many cans of this kind, such as those which are used for containing insecticides, deodorants, liquid soaps and many other liquid preparations, a plunger is provided at the top which, upon its depression, opens a valve and causes the spraying out of the can contents. The ease with which these cans can be sprayed often causes them to be taken from the shelves in stores and "test sprayed" by customers. This results in the reduction of the can contents so that many of the cans when purchased, are partially emptied or do not contain the required full amount of contents. Also, some of these cans are so constructed that the possibility of them being accidentally sprayed is likely.

It is an object of the present invention to provide a spraying device which will prevent the unauthorized or accidental spraying of a can's contents; which can be made economically, and if desired in whole or in part of a plastic material; which will be provided with closure means preventing accidental spilling; which will aid in directing the spray toward the desired area of dispersion; which can be made either as a removable or non-removable attachment to a spray can, and which will possess numerous other advantages apparent to those skilled in this art.

More particularly, the invention contemplates the provision of a cup-shaped cap member fitted over the plunger of a pressurized container or spray can, and which cap member is provided with a hinged lever extending across the top of the cap member, the cap member being provided in its top wall with an aperture for permitting access to the plunger, and the lever carrying a bodily-shiftable element capable of movement to either align it with the aperture and permit it to engage the plunger, or else be moved to disalign it with the aperture so that the plunger will not be moved when the lever is moved downwardly.

With these and other objects to be hereinafter set forth in view, I have devised the arrangement of parts to be described and more particularly pointed out in the claims appended hereto.

In the accompanying drawings, wherein several illustrative embodiments of the invention are disclosed,

FIG. 1 is a perspective view of one embodiment of the invention, with the parts thereof in the inoperative position of the device;

FIG. 2 is a sectional view, taken substantially on the line 2—2 of FIG. 1, looking in the direction of the arrows;

FIG. 3 is a transverse sectional view through the operating lever, with the depressing pin in operative position;

FIG. 4 is a vertical sectional view, taken at right angles to that of FIG. 2, showing the spraying device in position for depression to initiate the spraying operation;

FIG. 5 is a view similar to FIG. 4, but showing the operating lever in its depressed position in order to secure the spray ejection;

FIG. 6 is an exploded view of the parts of the device;

FIG. 7 is a vertical sectional view of another embodiment of the invention;

FIG. 8 is a sectional view, taken substantially on the line 8—8 of FIG. 7, looking in the direction of the arrows;

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FIG. 9 is a top plan view of another embodiment of the invention;

FIG. 10 is a side elevation, with parts in section, of the embodiment shown in FIG. 9;

FIG. 11 is a transverse sectional view through the operating lever of the embodiment of FIGS. 9 and 10, and through the slidable depressing pin, and

FIG. 12 is a view similar to FIGURE 10 but showing the slide 31 in the operative position.

Referring to the drawings, and more particularly to FIGS. 1 to 6 thereof, there is therein shown at 1, a part of a can or pressurized container upon which the improved spray device or head is adapted to be fitted. Such a can is provided at the top with a neck, not shown, but which is formed with a bead adapted for interengagement with an annular groove 2, formed at the bottom part of a cup-shaped cap member 3. The improved spray head, of which the cap 3 forms a part, is preferably, but not necessarily made of molded plastic material and if desired the other parts of the device may also be composed of a suitable plastic. A plastic such as polypropylene is suitable for the purpose since such material is resistant to the effects of acids, paints and chemicals.

By the attachment of the cap 3 to the top of the can, the spraying device is securely fitted in place. The cap 3 includes a centrally-located open bottom chamber 4 within which a head 5 is slidable, said head being provided with an outlet opening 6 in its side wall, and through which, when the head is depressed as shown in FIG. 5, the fluid in spray form will be forced out through a frusto-conical outlet passage 7 provided in the side of the cap. The frusto conical passage 7 when aligned with the opening 6 permits the contents of the can to be discharged in a conical spray and the passage 7 causes the material from the can to be mixed with air and a turbulence is created in the passage 7 whereby the insecticide or other material is discharged in a more efficient manner. The lower end of the head 5 is provided with a stem 8 which extends down into the can 1. On its upper end, the head 5 is provided with a square shank 9 guided in a complementarily-shaped opening 10 provided in the top wall 11 of the cap. The parts 5, 8 and 9 co-operate in forming a plunger which, upon its depression, causes the ejection of the liquid contents of the can out of the aligned outlets 6 and 7.

The opening 10 in the cap 3 is normally closed by a membrane or diaphragm which prevents leakage or evaporation of the can contents. The diaphragm 12 requires rupturing to permit of access to the shank 9 by a depressing pin or similarly-operating element to be presently described.

At 15 is indicated a pivoted lever, provided at one end with a down-turned finger piece 16, which may be roughened or serrated as shown at 17 for facilitating finger engagement with the lever. The finger piece 16 extends downwardly alongside the body 3 which greatly increases the leverage with respect to the lever 15 and allows the operator to actuate the lever in a balanced position with the hand grasping the can while the operator depresses the finger piece 16 with the thumb. As clearly seen in FIG. 3, the lever 15, including the finger piece 16 thereof, is of channel shape in cross section, with the channel opening downwardly, and at its forward end it is formed with a groove 17 for snap engagement with a cylindrical bead 18 formed integrally with and on the top of the cap 3. By this interengaging arrangement of the parts 17 and 18, a hinged connection is established between the lever 15 and the cap 3.

Extending downwardly from the lever 15 and projecting out of the channel thereof, is a guide finger 19 provided with a slightly hooked end 20, and said finger is slidable through a guide opening 21 provided in the top wall 11

of the cap 3. In its raised position, the finger has its hooked end 20 engaging under the top wall 11 adjacent to the guide opening 21 so that the limited upward swing of the lever is determined.

Normally extending laterally of the lever 15 as shown in FIG. 1 is a tab or flap 22, and extending from the then upper face of the tab or flap is a pin 23, which pin constitutes a depressing pin which, when properly positioned in axial alignment with the shank 9, will, upon downward depression of the lever 15, depress the shank 9 down to the position shown in FIG. 5, wherein the outlet opening 6 in the head 5 will be properly aligned with the outlet passage 7 and the spray will accordingly be ejected from the can.

While the filled can remains on the shelves of a store or elsewhere where it is not intended for unauthorized use, the tab or flap 22 is intended to remain positioned laterally of the lever 15 as shown in FIG. 1. When the parts are in the position shown in FIG. 1, lever 15 may be freely depressed, but since the pin 23 projects upwardly and is disaligned from the shank 9, the head 5 will not be reached by the pin and will not be depressed and hence no spraying will take place.

The flap or tab 22 is integrally connected to the lever 15 by means of a flexible web 24 constituting a hinge which, when doubled upon itself as shown in FIG. 3, will permit the tab or flap 22 to be swung underneath the channelled under face of the lever and will bridge the channel thereof, as clearly seen in FIG. 3. When the tab or flap 22 is located in this position, the pin 23 thereon will be facing downwardly and will also be in axial alignment with the aperture 10 and the shank 9 located therein. Thus, when the lever 15 is then depressed, the downwardly-projecting pin 23 will puncture the diaphragm 12 and will then contact with the upper end of the shank 9 forcing the head 5 downwardly to the spraying position, substantially as shown in FIG. 5.

In order to hold the tab 22 in its operative position across the bottom of the lever 15 as shown in FIG. 3, a locking arrangement is provided by forming the free end of the tab or flap 22 with a hook portion 25 for engagement with a bead or projecting rib 26 formed on the lower end of one of the side walls of the lever 15.

From the foregoing, the operation of the improved spray head will be readily understood. The condition of the parts of the device while the can is in a store or stored elsewhere, is shown in FIG. 1, wherein it will be observed that the tab or flap 22 is disposed laterally of the lever 15 and with its pin 23 projecting upwardly. While the parts are in this position, the lever 15 may be freely depressed without resulting in the spraying of the can contents, since the head 5 will not be depressed. When it is desired to place the spraying device in the required operative position, the tab or flap 22 is then swung downwardly on its hinge 24 to bring it beneath the lever 15 and hold it in such position by causing the interengagement of the locking parts 25 and 26. Then, when the lever 15 is depressed, the pin 23 being aligned with the shank 9, will puncture the diaphragm 12 and depress the head 5 to cause the liquid contents of the can to be sprayed out through the aligned outlets 6 and 7.

The parts may be left in the operative position just described, or the device can be rendered inoperative by swinging the tab or flap 22 outwardly to its lateral position as shown in FIG. 1, so that subsequent handling by children for example, and the depression of the lever 15, will not result in spraying.

In the embodiment of FIGS. 7 and 8, the flap or tab therein shown at 22a is similar to that shown at 22 in the first-described embodiment, except that the tab 22a is not provided with a depressing pin. In this embodiment, the shank shown at 9a is increased in length so that it projects above the top wall 11 of the cap 3 and extends into the channel 40 of the lever 15 when the lever

laterally of the lever 15 as was described with respect to the tab 22, the lever 15 when downwardly moved, will not depress the shank 9a since the shank will fit in the channel of the lever and will not be moved. However, when the flap or tab 22a bridges the channel of the lever, as shown in FIG. 8, the tab or flap 22a will, upon the descent of the lever 15, contact with the top of the shank 9a to thereby depress the same bringing the head 5 down to the position to cause spray ejection.

A further embodiment is shown in FIGS. 9 to 11 inclusive. Therein the lever 15 is provided in its top wall with an elongated slot 30 in which a slide 31 is mounted. Said slide is provided with a roughened or serrated upper surface 32 for engagement by the finger of the operator to move the slide back and forth as required, within the limit permitted by the slot. The opposite edges of the slide are grooved as shown at 38 to receive the side edges of the slot 30 and to enable the slide to be easily moved back and forth. When the slide is in its rearward or retracted position, as shown in FIG. 10, any downward depression of the lever 15 will bring the end of a depressing pin 23b, provided on the bottom of the slide 31 and projecting downwardly therefrom, into contact with a clearance groove 34 provided in the top wall 11 of the cap. This inclined groove is effective to guide the pin 23b since the same is of relatively rigid material, causing no damage to the pin. At this time, the pin 23, being disaligned from the opening 10, will neither rupture the diaphragm 12 nor depress the head 5. Therefore, as long as the slide 31 is in its retracted position the device will remain inoperative as far as spraying is concerned. When it is desired to spray the contents of the can, the slide 31 is advanced forwardly in the slot 30 by pressure of the finger of the operator, to the position shown in FIG. 10, whereupon depression of the lever 15 will cause the pin 23b, then positioned above the head 5 to puncture the diaphragm 12 and depress the head 5 to align the spray outlets 6 and 7 and cause spraying of the can contents.

It will be apparent from the foregoing, that a spraying device is provided which is clean and easily operated. When in the condition shown in FIGS. 1 and 10, the parts are so arranged that inadvertent or unauthorized depression of the operating lever will not cause spray ejection. Because of the fact that the entire device may be made of molded plastic it can be inexpensively made and sold. The large lever 15 and its location provides for easy operation and for the direction of the spray toward the area to be sprayed, and many other advantages are apparent to those skilled in this art.

Having thus described several embodiments of the invention, it is obvious that the same is not to be restricted thereto, but is broad enough to cover all structures coming within the scope of the annexed claims.

What I claim is:

1. A spraying head for pressurized cans including a plunger to be depressed to spray the contents of the can, said head including a cap fitted over the plunger, a lever pivotally mounted across the top of the cap, the cap being provided with an aperture for access to the plunger, the plunger having a head provided with a spray outlet, the cap having a conical spray opening for registry with the outlet, and a pin carried by the lever, said pin being mounted so as to be bodily shifted to either disalign it with the aperture in the cap or else align it therewith so that upon the depression of the lever the pin will enter the aperture and depress the plunger to cause the alignment of the spray outlet and the conical opening resulting in the spraying of the can contents.

2. A spraying head as provided for in claim 1, wherein the pin is mounted on a hinged tab movable to position the pin either directly beneath the lever or to one side of the same, whereby the pin in the latter position will be disaligned from the aperture in the cap.

3. A spraying head as provided for in claim 1, wherein the pin is mounted on a slide movable with respect to

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the lever, said slide by its movements permitting the pin to be either aligned with the aperture in the cap or disaligned therewith.

4. A spraying head for pressurized cans including a plunger adapted to be depressed to spray the contents of the can, said head including a cap fitted on the can above the plunger, a channel-shaped lever pivotally mounted across the top of the cap, the cap being provided with an aperture below the lever for access to the plunger, the plunger including a head having a spray outlet, the cap having a frusto conical spray opening for alignment with the spray outlet and whereby a conical spray will be discharged from the spray opening, and an element carried by the lever and bodily movable relatively to the same to either cause said element to engage and depress the plunger upon depression of the lever, or else be so disaligned with the plunger that it will not depress the plunger when the lever is depressed, the lever being provided with a finger piece that extends downwardly alongside the head and whereby the device and the can may be held in a balanced position while the finger piece is shifted toward the head.

5. A spraying head as provided for in claim 4, wherein the element is a pivoted flap which, in its disaligned position projects laterally of the lever, and which in its position of alignment with the plunger projects below and engages the plunger.

6. A spraying head as provided for in claim 5 wherein the pivoted flap is provided with a pin which extends upwardly when the flap is disposed laterally of the lever, and which pin projects downwardly when the flap is positioned below the lever.

7. A spraying head as provided for in claim 5, wherein the flap is connected to the lever by an integral, flexible web, foldable to act as a hinge for the flap and permitting the flap to be pivotally moved from its lateral position to its position beneath the lever.

8. A spraying head for a pressurized can having a plunger adapted to be depressed to spray the contents of the can, said head including a cap fitted over the plunger, the cap having an aperture for access to the plunger, the plunger having a spray outlet, the cap having a frusto conical outlet opening for registry with the spray outlet, the lever being channel shaped in cross section, with its channel opening downwardly, a flap integrally attached

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to the lever and pivotal to be either disposed alongside of the lever or else positioned below the channel thereof, and a pin integrally projecting from a face of the flap and projecting upwardly therefrom while the flap is positioned alongside of the lever and projecting downwardly while the flap is located beneath the lever, said pin when in its downwardly-projecting position being located above and capable of movement through the aperture in the cap when the lever is depressed.

9. A spraying head for a pressurized can having a plunger to be depressed to spray the contents of the can, said head including a cap fitted over the plunger, a lever pivotally mounted across the top of the can, the lever having a downwardly directed finger piece that is positioned alongside the head, the lever having a slot, a slide mounted for movement in the slot, the slide having a downwardly-projecting pin, the cap having an aperture in its top through which said pin is movable in one position of the slide to thereby reach and depress the plunger, the pin being disaligned from the aperture when the slide is in another position.

10. A spraying head for a pressurized can comprising, a plunger for causing spraying of the can contents when said plunger is depressed, a cap fitted on the can over the plunger, a lever pivoted on the cap, a pivoted flap on one side of the lever, a pin projecting from the flap, the flap being pivoted to enable it to be positioned alongside of the lever or underneath the lever, the cap having a top opening in which a part of the plunger is exposed, the pin being capable of entry through the top opening to thereby reach and depress the plunger when the pin is positioned beneath the lever and when the lever is depressed, the pin being ineffective to depress the plunger when the flap is positioned alongside of the lever and while the lever is then depressed with the flap in such position.

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