CHEMICAL EJECTING FLASHLIGHT

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A dual purpose flashlight containing within its casing a pressurized chemical source which may be actuated to dispense a chemical within the range of the rays of its light by a trigger mounted on the exterior of its casing.

14 Claims, 5 Drawing Figures
CHEMICAL EJECTING FLASHLIGHT

BACKGROUND OF THE INVENTION

This invention relates to flashlights and more particularly to flashlights incorporating chemical dispensers. 1. Field of the Invention

This invention relates to a hand held device for spraying chemicals and more particularly to a flashlight which dispenses chemicals within the pattern of its rays of light and is particularly effective as a non-lethal weapon.

2. Description of the Prior Art

Heretofore chemical dispensers have been designed for dispensing the product without regard to the purpose for which the chemicals were intended. Flashlights have been used for producing rays of light and non-lethal weapons have been designed to look like guns. None of these devices have been effectively combined.

SUMMARY OF THE INVENTION

In accordance with the invention claimed an improved flashlight is provided having the usual casing containing a switch on its outside for connecting an electric bulb to a source of battery power which flashlight also contains a source of pressurized chemicals arranged to be dispensed in the range of the rays of light of the flashlight by a triggering means mounted on the exterior of the flashlight.

It is, therefore, one object of this invention to provide a new and improved non-lethal weapon.

A further object of this invention is to provide a new and improved flashlight for dispensing chemicals.

A still further object of this invention is to provide a new and improved flashlight in the range of its rays of light.

A still further object of this invention is to provide a new and improved flashlight which can dispense chemicals substantially parallel to the rays of light of the flashlight.

A still further object of this invention is to provide an improved flashlight which can be actuated at will to dispense chemicals through the rays of its light.

Further objects and advantages of the invention will be apparent as the following description proceeds and the features of novelty which characterize this invention will be pointed out with particularity in the claims annexed to and forming part of this specification.

BRIEF DESCRIPTION OF THE DRAWING

The present invention may be more readily described by reference to the accompanying drawings in which:

FIG. 1 is a sectional view of the flashlight of this invention with some parts shown in elevation and broken away;

FIG. 2 is a fragmentary enlarged sectional view of a portion of the front or light source and chemical dispensing end of the flashlight;

FIG. 3 is a fragmentary top plan view of a portion of the flashlight barrel with some parts shown in section taken substantially on the line 3—3 of FIG. 1;

FIG. 4 is an enlarged transverse vertical sectional view through the barrel of the flashlight taken substantially on the line 4—4 of FIG. 1; and

FIG. 5 is a sectional view similar to FIG. 1 showing a modified form of the flashlight of this invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring more particularly to the drawings by characters of reference FIG. 1 discloses a dual purpose flashlight 10 comprising a hollow housing or casing 11 having longitudinally extending tubular rear barrel portion 12 and an integral circular and offset front portion 13. The inner components of the flashlight are retained in their respective positions in the barrel and head portions by suitable closure caps, such as closure cap 14 threaded on the rear end of barrel portion 12 and the closure cap 15 threaded on head portion 13 of the casing. All of the components of the flashlight are preferably fabricated of a high impact strength, chemical resisting plastic material such as polyethylene or the like, to prevent corrosion or other damage to the flashlight especially under the severe handling and usage to which this particular type of flashlight might be subject to.

The inner perimeter of bore 16 of barrel portion 12 is provided on its upper and lower surfaces with pairs of integral escarpments 17, spaced mid-way from the vertical center line 18 to form upper and lower recesses or cavities 19 and 20 in which the metallic spring leads 21 and 22 are enclosed in sliding relation therein. The inner flat surfaces and edges of the escarpments 17, together with longitudinally extending and inwardly projecting integral beads 23, are adapted to provide a circular insulative space 24 between the cylindrical metallic inner components of the flashlight, including several "D" batteries 25 and an aerosol container 26, the purpose of which will be further described.

Located approximately mid-way longitudinally of bore 16 of the barrel portion 12 is positioned a bridge piece 27 integral with casing 11 which serves to reinforce barrel portion 12 and has a central bore 28 and a flat transverse top portion 29 which serves to support and rigidly retain, as by means of a round headed screw 30, a flexible metallic contact member 31. Member 31 is adapted to be put in electrical contact with the downwardly extending hooked rear end 32 of the metallic spring lead 32 when the thumb activated switch 33 is pushed forward in the direction of arrow 34.

Batteries 25 which supply the electrical energy to illuminate a standard flashlight bulb 35, are arranged in the rear of bore 16 of barrel portion 12 in the usual manner, that is, with their center posts 36 contacting either the head of screw 30 or the bottom metallic surface 37 of an aligned battery. The bottom surface of the rearmost battery is contacted by the usual metallic spring 38 which is compressed between the bottom surface of the battery and a metallic washer or lining 39 secured in closure cap 14. Lining 39 contacts the rear flanged end of metallic spring lead 22 when the closure cap is screwed in place, thereby partially completing the flashlight's electrical circuit.

The center of the circular shaped front head portion 13 of flashlight casing 11 is offset upwardly on the vertical center line 18, from the horizontal center of the tubular barrel portion 12, as indicated in FIG. 1 and 2, by their respective center lines 40 and 41. This design feature causes the flashlight to always lay in an upright
position when at rest and allows for quick pickup, ease of operation, and other desirable features. The inner walls of head portion 13 define a hollow cavity 42 which communicates with bore 16 of barrel portion 12 in which a parabolic shaped reflector 43 is removably mounted in a non-rotative manner. Reflector 43 is locked in position by suitable projecting lugs 44 which mate with notches formed in the inner periphery of the circular wall which forms the front access end of head portion 13. A glass or clear plastic lens 45 is removably and non-rotatively secured between the front face of the reflector 43 and the circular flange 46 of the open end front closure cap 15 when the cap is screwed onto the threaded front end of head portion 13. The parabolic reflector 43 is preferably fabricated of insulative plastic material and its front reflective face 46 is coated with a smooth brilliant surface material such as chrome or silver, having good reflective properties, to provide a strong beam of light when illuminated by bulb 35. Bulb 35 projects through a suitable counterbored hole 47 centered on line 40 and is adapted to receive and support the circular flange of the metallic rear end portion 48 of the conventional bulb. Bulb 35 is held securely in position for good electrical contact and easy removable by spring pressure applied to the rear contact end portion 48 of the bulb by the upper end of the flexible metal lead member 49.

Projecting rearwardly from the lower curved surface of the reflector member 43 and located in vertical alignment on the center line 18, are the integral bosses 50 and 51 respectively. Bosses 50 and 51 have reduced outer end portions 52 and 53, respectively, which are adapted to receive and support the lower end of spring lead 49 so as to contact the extreme front flexible end of the lower spring lead 22, as shown in FIGS. 1 and 2. The extreme front end of the upper spring lead 21 is provided with a turned up end portion 54, which normally is held out of contact with the upper end of the lead 49 by a downwardly projecting boss 55 which is an integral extension of the head portion 13. Lead 21 may be placed in electrical contact with the metal end portion 48 of bulb 35 when it is pushed forward in the direction of arrow 34 by thumb pressure being applied to switch 33 and by the resulting forward movement of a depending lug 56. Lug 56 extends through an aperture in the rear end of lead 21. This lug is an integral part of the inner portion 57 of switch 33 and is adapted to slide forward and backward on a flat raised surface 58 of casing 11 and in a rectangular opening 59 formed in the top center of barrel portion 12. The forward movement of switch 33 serves to complete all the required electrical contacts necessary to activate the flashlight to produce a beam of light. Deactivation of the flashlight is accomplished by simply moving switch 33 in a rearward or opposite direction. The preceding paragraphs describe the various features pertaining to construction, electrical components and operation of the flashlight. The following description describes a special feature of the design, construction, components and operation of the disclosed structure which accomplish other purposes of this flashlight, namely the ejection of a spray or stream of any desired non-lethal chemical, directly through and parallel with the center of the array of light, when desired.

To accomplish this second purpose there is inserted in the forward end of bore 16 of barrel portion 12 of casing 11, a cylindrical shaped aerosol type container 26, having a diameter approximately the same as batteries 25. Container 26 is spaced from the inner wall of bore 16 by the insulative air space 24 and is adapted to freely slide forward or rearward on the inner top surfaces of escarpments.

The characteristics and function of aerosol containers or bombs as they are sometimes referred to, are well known in the art, therefore only the specific features that pertain to and are utilized in this invention will be described. Container 26 may store any kind of colloidal particles in a gas, fluid or liquid under pressure within the container and provides for the ejection of this mixture in the form of a spray or stream from the nozzle end 60 of the container when the nozzle is manually retracted or tilted. The retracting or tilting action opens a spring biased valve (not shown) within the head of the container to release the gas under pressure. It should be understood that any non-lethal type chemical, such as mace, tear-gas or an insecticide could be stored in the aerosol container.

The aerosol container of this invention may be inserted in the forward end of flashlight casing 11 by simply removing closure cap 15, reflector 43 together with lens 45 and their associated parts. An ejection tube 61 and ejection tube holder 62 are arranged to extend through reflector 43, as shown in FIGS. 1 and 2. When container 26 is thus inserted its rearward movement is limited by front face 63 of bridge piece 27. Its forward movement is limited to only a slight change of position by the insertion of nozzle 60 in the rear chamfered end 64 of the ejection tube holder 62. Slight clearance between nozzle 60 and the chamfered end 64 of the injection tube holder 62 and a suitable O-ring 65 is provided when reflector 43, lens 45 and associated parts are reinstalled and closure cap 15 tightly secured to casing 11.

It should be noted that the ejection tube 61 is small in diameter, preferably tubular in cross section containing a minute bore (not shown) and is of sufficient length to extend slightly through lens 45 at its front end. Ejection tube 61 also extends through reflector 43, lead 49 and into a spacer 66 which bears against one side of O-ring 65 and the flat end surface of the reduced end portion 52 of boss 50, all of which are secured as by cementing or otherwise, in the bore of ejection tube holder 62.

The chemically charged aerosol container 26 will always remain stored in the position shown in FIG. 1 until a direct force is applied to the rear surface 67 of the container by means of the manually operated trigger arrangement 68. The trigger arrangement 68 comprises an exterior actuating portion 69 which is positioned adjacent to and preferably directly forward of and in horizontal alignment with switch member 33 to allow for quick manipulation of one or the other by the operator of the flashlight. The trigger arrangement 68 also includes an interior portion 70, which extends upwardly through a rectangular opening 71 in the raised flat surface 58 on the top of barrel portion 12 upon which the actuating portion 69 is adapted to slide, forwardly and rearwardly, in a manner similar to electrical switch 33.
The interior trigger portion 70 of the trigger arrangement 68 is secured in a cavity in the actuating portion 69, for example, by cementing, to provide for unified movement of the two parts. The interior trigger portion 70 has an integral lower portion 72 having upper angular or curved surfaces 73 which are adapted to slide freely within the projecting escarpments 17 as shown in FIG. 4. The lower portion 72 is also provided at its rearmost end with a pair of spaced integral depending arms 74 which form an open space 75 therebetween in which spring lead 21 and switch lug 56 can move without interference from the adjacent trigger parts. The depending arms 74 of the trigger arrangement 68 project downwardly into the open space to the rear of container 26 with their front edge surfaces adjacent the rear surface 67 of the container.

Therefore when manual pressure is applied to actuating portion 69 in a forward direction, as indicated by the arrow 34, arms 74 will contact the rear surface 67 of container 26 forcing it to move forwardly in barrel portion 12. This action depresses aerosol nozzle 60 by its contact with O-ring 65, and opens the valve in the container, causing the particular non-lethal chemical to be ejected in a fluid form from the orifice of ejection tube 61. As shown in the drawing the fluid is ejected in the same direction and parallel to the center 40 of the light beam as previously described. When manual pressure is released from the trigger or actuating portion 69 of the container it will automatically be returned to its normal position by the spring actuated nozzle 60 returning to its released extended position. This action causes container 26 to move rearwardly until it reaches the front face 63 of bridge piece 27. O-ring 65 provides a sealing relation between the mating ejection elements during the travel of the container.

When switch 33 is being utilized to activate the flashlight, it is conceivable that the operator's thumb or finger might slip from the switch and accidentally activate the trigger mechanism for container 26 causing gas to be emitted when not wanted. To eliminate this possibility, a safety locking device 76 has been provided, which includes a flat T-shaped piece 77. Angular serrated ends 78 and 79 of piece 77 are adapted to project through suitable openings in the side walls of the actuating portion 69, allowing its flat base and forward projecting leg 80 to slide transversely from left to right, or vice-versa, bearing on the flat raised surface 88 of barrel portion 12. When the T-shaped piece 77 of the locking device 76 is in locked position as shown in FIG. 3, the projecting leg 80 of the T-piece 77 abuts a raised projection or lug 81 which may be an integral extension of the barrel portion 12. This action prevents trigger assembly 68 from moving. Should it be desired to make the ejection feature of the flashlight ready for instant use, the operator merely moves T-shaped piece 77 to the right, thereby allowing the projecting leg 80 to bypass lug 81, allowing the trigger assembly 68 to be moved forward to eject the non-lethal chemical.

Referring now to FIG. 5 of the drawing, it will be evident that the components that make up the dual purpose flashlight of this invention are similar in most respects to those shown in FIGS. 1—4 with the exception that the head portion 13 and its assembled components, including the ejection tube 61, face at right angles to the center of barrel portion 12. The electrical leads have been modified somewhat by splitting lead 49 into two separate leads 49a and 49b. Ejection tube holder 62a is an integral transverse portion of tubular barrel portion 12. In addition to the preceding exceptions, an auxiliary compression spring 82 has been added which bears on the ejection tube holder 62a and the face of the aerosol container 26 which provide an extra spring as a safety means to return the container to its normal position in the possible event of malfunction of the container nozzle valve spring. In other respects the function and results obtained with the modification illustrated in FIG. 5 are the same as described for the structure shown in FIGS. 1—4.

FIGS. 1—5 show the chemical ejecting means as dispersing fluid under pressure out of the flashlight within the beam of light but substantially parallel to the center line of the light reflector. Although this is preferable, it is intended that the fluid may be dispersed ouf of the flashlight at an angle to the center line of the light reflector, if so desired. Further, the batteries and aerosol container can be mounted in the flashlight in any axial alignment or side by side as required by the flashlight configuration.

Although but two embodiments of the invention have been shown and described, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

I claim:
1. A chemical ejecting flashlight comprising:
a casing for receiving one or more batteries and an aerosol container,
said casing being closed at one end and provided with a light reflector at the other end,
a light bulb mounted in said reflector and electrically connected through an electric switch to the batteries,
an electric switch mounted on the outside of said casing for selectively connecting the batteries to said light bulb to energize said bulb,
chemical discharging means mounted on said reflector to extend outwardly therefrom for discharging fluid under pressure,
said chemical discharging means being adapted to receive at one end the tip of the aerosol container when it is moved longitudinally into said chemical discharging means to cause the aerosol container to discharge at least a part of its fluid under pressure through said chemical discharging means outwardly of said flashlight,
a triggering switch means mounted on the outside of said casing for selectively moving the aerosol container into said chemical discharging means for discharging at least a part of its fluid under pressure.
2. The chemical ejecting flashlight set forth in claim 1 wherein said casing receives in axial alignment one or more batteries and the aerosol container and said chemical discharge means comprises a nozzle means.
3. The chemical ejecting flashlight set forth in claim 2 wherein said electric switch and triggering switch means are aligned on the outside of said casing longitudinally of the axis of said casing.
4. The chemical ejecting flashlight set forth in claim 1 wherein said chemical discharge means is mounted on said reflector to discharge fluid under pressure from the aerosol container within the zone of the rays of light of said bulb.

5. The chemical ejecting flashlight set forth in claim 1 wherein said chemical discharge means is mounted on said reflector to discharge fluid under pressure from the aerosol container in the same direction as the rays of light of said bulb.

6. The chemical ejecting flashlight set forth in claim 1 wherein said chemical discharge means comprises a nozzle mounted on said reflector for discharging fluid under pressure from the aerosol container through the rays of light of said bulb when said bulb is energized and said aerosol container is moved into said nozzle means.

7. The chemical ejecting flashlight set forth in claim 1 in further combination with an interlocking means mounted on said casing for prohibiting the movement of said actuating means until moved in a predetermined direction.

8. A chemical ejecting flashlight comprising:
   a casing for receiving one or more batteries and an aerosol container having a spring biased discharging tip,
   said casing being closed at one end and provided with a light reflector at the other end,
   a light bulb mounted in said reflector and electrically connected to the batteries,
   electric switching means mounted on the outside of said casing for selectively connecting the batteries to said light bulb to energize said bulb,
   a nozzle means mounted on said reflector extending from within said casing through said reflector,
   a transparent covering mounted on the front of said reflector,
   a hollow tube connected to said nozzle means and extending through said covering outwardly of said flashlight,
   said nozzle means being adapted to receive within said casing one end of the tip of the aerosol container when it is moved longitudinally into said nozzle means to cause the aerosol container to discharge at least a part of its contents under pressure through said nozzle means, and said hollow tube outwardly of said flashlight,
   an actuating means mounted on the outside of said casing for selectively moving the aerosol container into said nozzle means for discharging its contents under pressure,
   said nozzle discharging the contents under pressure within the zone of the rays of light of said bulb.

9. The chemical ejecting flashlight set forth in claim 8 wherein said casing is provided for receiving the batteries and aerosol container in axial alignment.

10. The chemical ejecting flashlight set forth in claim 9 wherein said transparent covering comprises a lens.

11. The chemical ejecting flashlight set forth in claim 8 in further combination with an interlocking means mounted on said casing for prohibiting the movement of said actuating means until moved in a predetermined direction.

12. The chemical ejecting flashlight set forth in claim 8 wherein said reflector is off set from the longitudinal axis of said casing.

13. The chemical ejecting flashlight set forth in claim 12 wherein said hollow tube is mounted along the longitudinal axis of said casing.

14. The chemical ejecting flashlight set forth in claim 8 wherein said reflector and hollow tube are arranged to extend outwardly from said casing at an angle to the longitudinal axis of said casing.

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