Aug. 30, 1966 R. L. WEBER III 3,269,602

PERIODICALLY OPERATED AEROSOL DISPENSER

Filed Sept. 24, 1964 2 Sheets-Sheet 1

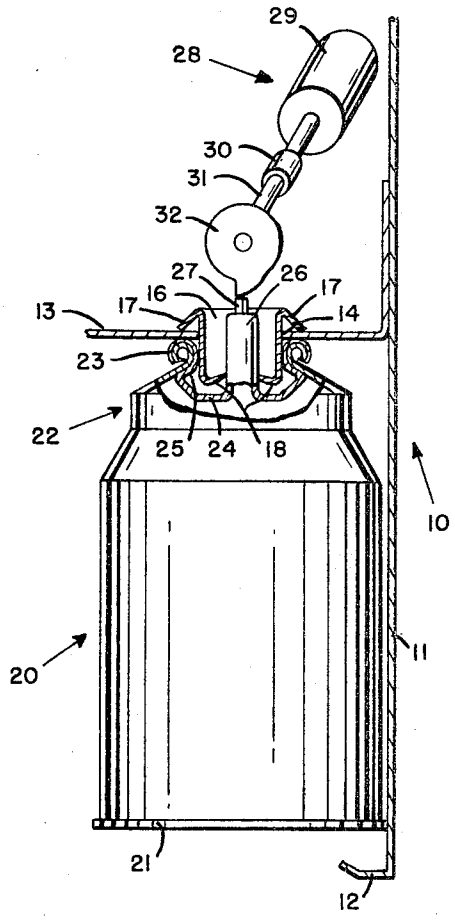


FIG. 1

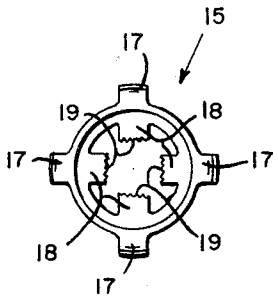


FIG. 2

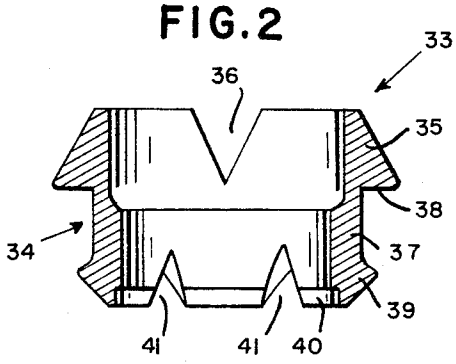


FIG. 4

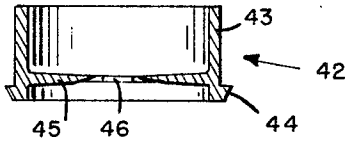


FIG. 5

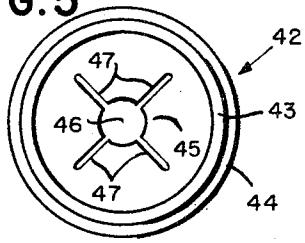


FIG. 5A

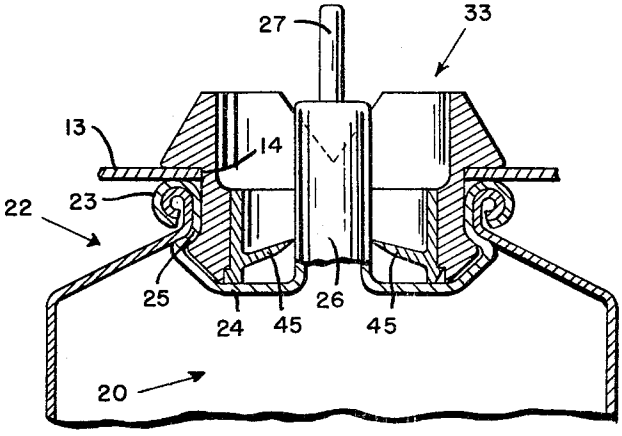


FIG. 3

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PERIODICALLY OPERATED AEROSOL DISPENSER

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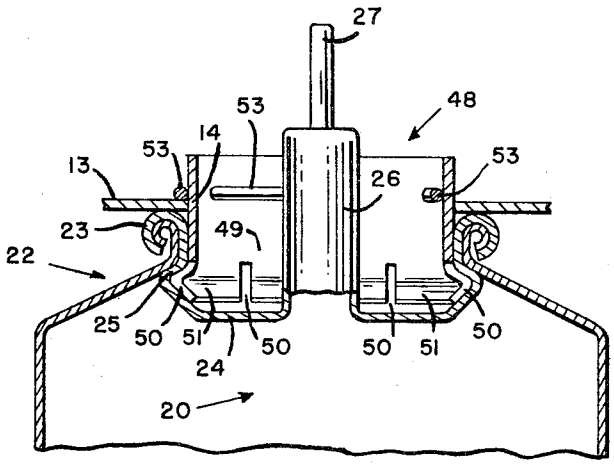


FIG. 6

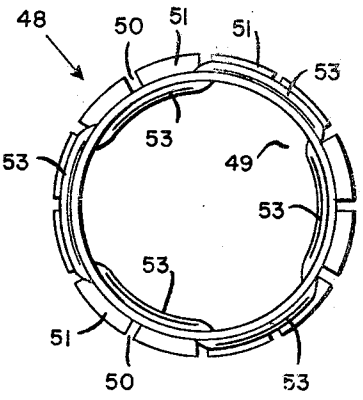


FIG. 7

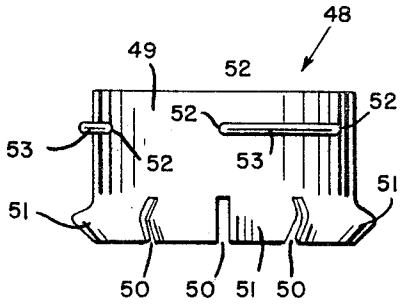


FIG. 8

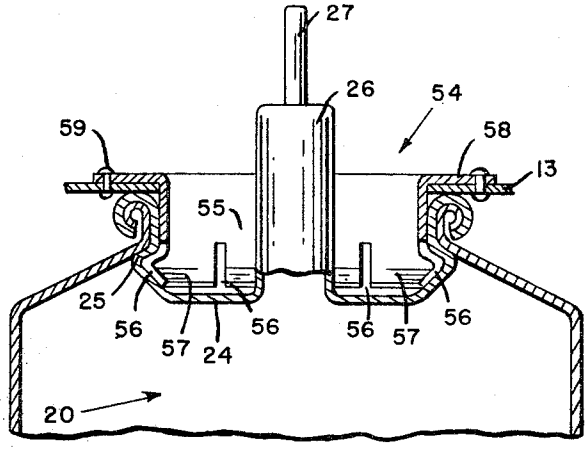


FIG. 9

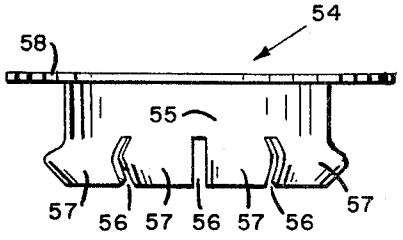


FIG. 10

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United States Patent Office 3,269,602 Patented August 30, 1966

3,269,602

PERIODICALLY OPERATED AEROSOL DISPENSER

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Filed Sept. 24, 1964, Ser. No. 398,932
6 Claims. (Cl. 222—70)

This invention relates generally to fluid spraying apparatus and more particularly to motor driven devices for the periodic and automatic dispensing of pressurized material from containers such as aerosol cans.

For many years aerosol containers with manually actuated valves have been used for discharging fine sprays of atomized liquids into the atmosphere. Such containers or cans contain aerosols in which the fluid to be dispensed is in association with a liquified gas. In the can is a spring closed valve with an upwardly projecting discharge stem carrying a spray nozzle in the form of a fingerpiece or button, the depression of which opens the valve to effect the dispensing of the active ingredient and the carrier in the form of a fine mist. The valve mechanism may be such that the spray is continuously discharged as long as the nozzle is held depressed, or it may be of the metering type in which the depression of the nozzle causes a single burst of spray. In recent years there have been marketed devices for automatically operating the nozzles of such aerosol cans at timed intervals such as one, five, fifteen or more minutes. Such automatic actuators have used slow speed electric motor units to periodically operate some form of mechanism that engages the valve nozzle or button fixed to the top of the tubular discharge stem of the valve mechanism.

The active ingredients in the sprays from such aerosol containers may be of various kinds such as an insecticide to control flying insects in homes, eating places, food stores and greenhouses, an air purifier to sanitize and deodorize the air in hospitals, food stores, restaurants and kennels, and a chemical to produce a fragrant odor such as evergreen, spice, chocolate, or hickory smoke useable in retail stores, specialty shops and food stores to aid in selling various products.

An object of the invention is the provision of an automatic spraying mechanism in which a can of pressurized active ingredient is held in a frame so that a motor driven means can periodically actuate the valve of the pressurized can.

Another object of the invention is to provide such a mechanism in which a resilient connector is employed to hold the can of pressurized ingredient in a bracket adjacent motor driven means for actuating the valve of the pressurized can.

Still another object of the invention is to provide such a mechanism in which a connector cooperates with the standard form of aerosol can to suspend it from a bracket adjacent motor driven means for actuating the valve of the aerosol can.

Another object of the invention is to provide a connector for aerosol cans which includes means for cooperating with a hole in a bracket and separate means for cooperating with structure of the can.

In one aspect of the invention, a horizontal plate may be connected to a vertical plate forming a bracket adapted to be attached to a wall. The horizontal plate may include an opening extending therethrough for the reception of a connector adapted to be attached to the top of a can containing a pressurized active ingredient.

In another aspect of the invention, the connector may comprise a semi-rigid, resilient body portion adapted to be forced through the opening in the horizontal plate, and it may have means extending radially beyond the diameter of the opening in order to support the body portion of the connector on the horizontal plate.

In another aspect of the invention, the lower portion of the body may be tubular in form and of such an outside diameter as to frictionally engage the wall of the recess provided in conventional pressurized cans. Such cans are usually constructed with a top portion that is closed by a recessed cap, the outer edge of which is spun together with the top edge of the can opening. Usually the recessed cap includes a central, upstanding, cylindrical portion providing an annular space between it and the outer wall of the recessed cap. The upstanding, cylindrical, central portion of the cap supports valve mechanism well known in the art which includes a depressible stem extending upwardly from the central portion.

In a further aspect of the invention, the lower end of the connector may include inturned means having tooth means formed on its inner edge and adapted to grip the exterior of the tubular upstanding means supporting the valve of the pressurized can.

In a still further aspect of the invention, the body member may include a two-part construction in which the lower part of the main body portion may be compressible and have a radially outwardly extending lip adapted to spring into a re-entrant angle of the cover plate of the pressurized can. A separate member may be provided having inturned means adapted to grip the central upstanding portion of the cap for the pressurized can.

In still another aspect of the invention, motorized means may be provided for periodically actuating the valve stem of the pressurized can for dispensing predetermined amounts of active ingredient.

The above, other objects and novel features of the improved pressurized can supporting and actuating means will become apparent from the following specification and accompanying drawings which are merely exemplary.

In the drawings:

FIG. 1 is an elevational view, partly in section, of apparatus embodying the principles of the invention;

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

FIG. 3 is a modified form of the invention;

FIGS. 4 and 5 disclose a view of the disassembled connector of FIG. 3;

FIG. 5A is a plan view of the element shown in FIG. 5; and

FIGS. 6 to 10, inclusive, show other modified forms of the invention.

Referring to the drawings, the principles of the invention are shown as applied to apparatus including bracket **10** having a vertical plate **11** on which is a lower flange **12**. A horizontal plate **13** is fixed to plate **11** and it includes a hole **14** extending therethrough.

Referring to FIGS. 1 and 2, a connector **15** may comprise a body portion **16** made from spring steel or other suitable material. It is shown as tubular in form having outwardly extending tabs **17** at spaced intervals about its upper end. The tabs **17** are shown as being inclined downwardly, the lower edges of tabs **17** contacting the top surface of plate **13**. The lower end of the body **16** is shown as being provided with inturned tabs **18**, the facing edges of which are provided with teeth **19**. Referring to FIG. 1, the tabs **18** are shown as being inclined upwardly.

A can **20** of pressurized active ingredients adapted periodically to be dispensed is shown as being cylindrical in form, with a closed bottom **21** and a truncated conical top portion **22**. The top portion terminates in an edge **23** that is rolled or spun together with the outer periphery of a closure cap **24** for the can **20**. The cap **24** may include a re-entrant angular portion **25** and a central upstanding housing portion **26**. The housing portion **26** is adapted to contain the usual valve mechanism of such cans including a stem **27** that slidingly extends outwardly from the top of housing **26**.

The construction and arrangement of the parts are such that upon forcing the connector **15** through the hole **14** in plate **13**, the tabs **17** engage plate **13**, and the walls of connector **15** frictionally engage the wall of hole **14**. Then, forcing the central housing **26** of can **20** upward through the space between tabs **18** causes the teeth **19** thereof to dig into and grip the central housing **26** to securely hold can **20** to plate **13**.

In order periodically to actuate valve stem **27**, a motorized means **28** may be provided. It is shown schematically and may be mounted on plates **13, 11**, or in any other suitable manner. It may comprise a motor **29** that is connected by a one-revolution clutch **30** to a cam shaft **31**. A cam **32** may be fixed to shaft **31** so that it acts on valve stem **27** to dispense a predetermined amount of the contents of can **20** each time it makes a revolution. By means well known in the art, the motor can be periodically energized to cause a single revolution of cam **32** to dispense a charge of active ingredient from can **20**.

Referring to FIGS. 3, 4 and 5, a two-part connector **33** is shown. It includes a main body **34** having a truncated conical portion **35** with spaced V-notched **36** to provide resilience thereof. The main body also includes a portion **37** having an outside diameter less than that of the base of the truncated conical portion **35**, thereby providing a surface **38** adapted to contact the top of plate **13** when attached to said plate.

The bottom of main body **34** includes an outwardly extending lip **39** and a recessed portion **40** for a purpose to be described later. Notches **41** are provided in spaced relation about the bottom peripheral edge of body **34**. A separate element **42** is provided, and it includes a tubular portion **43** adapted frictionally to be pressed into the portion **37**. Portion **43** includes a flange **44** that seats against the shoulder formed by recess **40** in main body **34**. The element **42** includes a bottom **45** (FIG. 5A) having a hole **46** centrally thereof. Slots **47** are provided in bottom **45** so that a certain degree of flexibility is inherent in the arms formed by slots **47**. With element **42** inserted in the main body member **34**, the assembly may be forced through hole **14** in plate **13**, and the can **20** may be forced upwardly over the lip **39** while at the same time the arms formed by slots **47** in bottom **45** grip the central upstanding housing **26** of can **20**.

Referring to FIGS. 6, 7 and 8, a connector **48** includes a tubular portion **49** having axially extending slots **50** spaced about its lower end. The portion including slots **50** is formed so as to produce a resilient lip **51**. A series of spaced holes **52** about the upper portion of the connector **48** has a wire **53** threaded therethrough, providing a ledge that rests on the top of plate **13** when the connector is forced through the hole **14** therein. When can **20** is forced upwardly into contact with the connector **48**, the lip **51** contracts and then expands into the re-entrant angular portion **25** of the cap **24** of can **20**. In this embodiment, the holding of can **20** is effected by the lip **51** and by-entrant angular portion **25** rather than by means gripping the central upstanding housing **26** of cap **24**.

Referring to FIGS. 9 and 10, a connector **54** includes a tubular portion **55** having slots **56** in its lower portion and formed to provide a lip **57** similarly as connector **48** is formed. The upper end of tubular portion **55** includes a flange **58** that may be attached to plate **13** by rivets **59** or the like. This embodiment is permanently attached to plate **13**, and the application of can **20** to the connector **54** is identical to that of connector **48**.

Although the various features of the improved mechanism have been shown and described in detail to fully disclose several embodiments of the invention, it will be evident that changes may be made in such details and certain features may be used without others without departing from the principles of the invention.

What is claimed is:

1. In combination, an aerosol container having a cup-shaped top including a re-entrant angular portion forming an annular shoulder, said cup-shaped top having an upstanding protuberance at substantially the center thereof which latter communicates with the interior of said container; valve actuating means in said protuberance; a horizontal bracket having a hole therethrough; a connector for attaching said container to said horizontal bracket, said connector having a tubular body portion; outwardly directed tab means at the top of said body portion extending beyond the diameter of said hole; and inwardly directed tab means at the bottom of said body portion adapted to engage said protuberance, said inwardly directed tab means including tooth means thereon at their inner surface for gripping said upstanding protuberance.

2. In combination, a aerosol container having a cup-shaped top including a re-entrant angular portion forming an annular shoulder, said cup-shaped top having an upstanding protuberance at substantially the center thereof which latter communicates with the interior of said container; valve actuating means in said protuberance; a horizontal bracket having a hole therethrough; a connector for attaching said container to said horizontal bracket, said connector having a two-part construction including a main body portion including flange means at its top extending outwardly beyond the diameter of the hole in said horizontal bracket, and an outwardly extending shoulder near the bottom of said main body portion adapted to fit within said re-entrant angular portion; a tubular element adapted frictionally to be held within the tubular main body portion, said last mentioned element including inturned tab means adapted to grip said protuberance; and periodically operated means for actuating said valve actuating means.

3. In combination, an aerosol container having a cup-shaped top including a re-entrant angular portion forming an annular shoulder, said cup-shaped top having an upstanding protuberance at substantially the center thereof which latter communicates with the interior of said container; valve actuating means in said protuberance; a horizontal bracket having a hole therethrough; a connector for attaching said container to said horizontal bracket, said connector having a tubular body portion of a diameter adapted to pass through the hole in said bracket; axially extending slots spaced about the periphery of the bottom of said body portion, said bottom portion being compressed axially, forming a resilient shoulder portion adapted to mate with said re-entrant angular portion; spaced holes about the periphery of said body portion near the top thereof; and wire means threaded through said spaced holes providing means adapted to rest on the top of said horizontal bracket.

4. In combination, an aerosol container having a cup-shaped top including a re-entrant angular portion forming an annular shoulder, said cup-shaped top having an upstanding protuberance at substantially the center thereof which latter communicates with the interior of said container; valve actuating means in said protuberance; a horizontal bracket having a hole therethrough; a connector for attaching said container to said horizontal bracket, said connector having a tubular body portion of a diameter adapted to pass through the hole in said bracket; axially extending slots spaced about the periphery of the bottom of said body portion, said bottom portion being compressed axially, forming a resilient shoulder portion adapted to mate with said re-entrant angular portion; spaced holes about the periphery of said body portion near the top thereof; wire means threaded through said spaced holes providing means adapted to rest on the top of said horizontal bracket; and periodically operated means for actuating said valve actuating means.

5. A connector for an aerosol can and the like comprising in combination, a tubular body portion; axially

extending slots spaced about the periphery of the bottom of said body portion, said body portion being compressed axially, forming a resilient outwardly extending shoulder portion; spaced holes about the periphery of said body portion near the top thereof; and wire means threaded through said spaced holes.

6. In combination, an aerosol container having a cup-shaped top including a re-entrant angular portion forming an annular shoulder, said cup-shaped top having an upstanding protuberance at substantially the center thereof which latter communicates with the interior of said container; valve actuating means in said protuberance; a horizontal bracket having a hole therethrough; a connector for attaching said container to said horizontal bracket, said connector having a tubular body portion of a diameter adapted to pass through the hole in said bracket; axially extending slots spaced about the periphery of the bottom of said body portion, said bottom portion being compressed axially, forming a resilient shoulder portion adapted to mate with said re-entrant angular portion; a flange about the periphery of said

body portion near the top thereof; and periodically operated means for actuating said valve actuating means.

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