Jan. 24, 1967 B. C. WILLIAMS 3,300,092

COIN-CONTROLLED HAIR SPRAY

Filed May 7, 1965

FIG. 1.

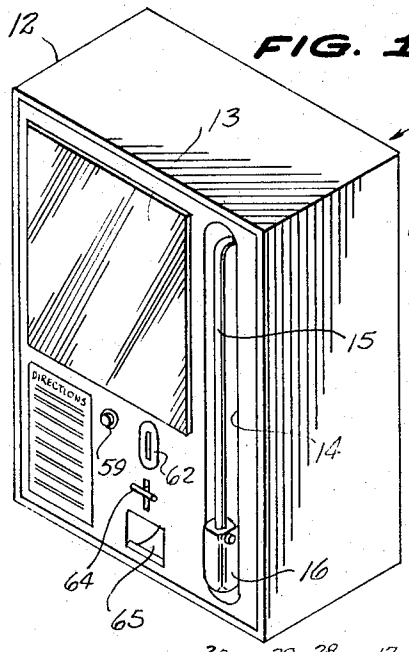
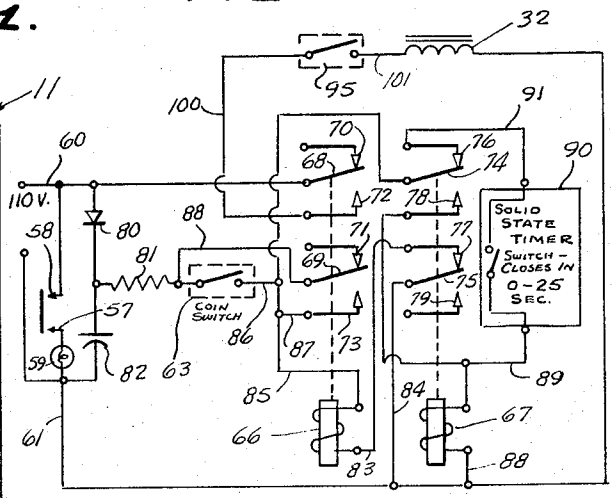


FIG. 3.



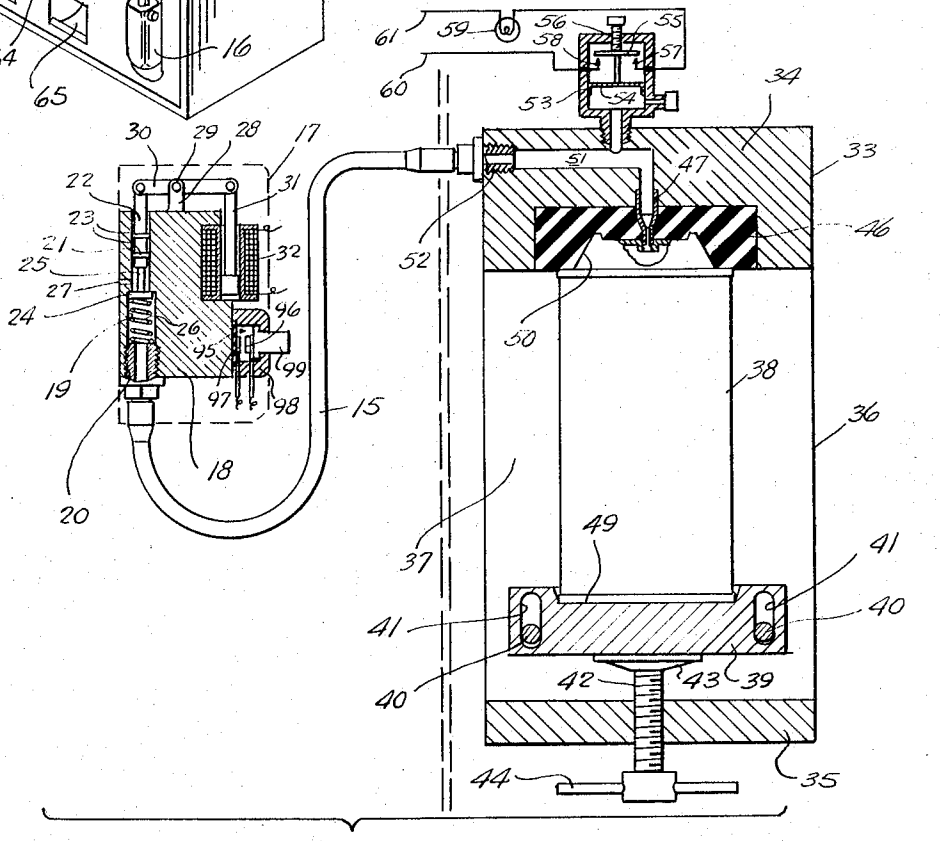


FIG. 2.

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COIN-CONTROLLED HAIR SPRAY

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This invention relates to coin-operated dispensing devices, and more particularly to an automatic coin-operated hair spray dispenser.

A main object of the invention is to provide a novel and improved coin-operated dispensing apparatus for delivering a metered quantity of hair spray liquid, the apparatus being suitable for installation in various public places and being conveniently available for use by women, as required, the apparatus being relatively simple in construction, being adapted to employ commercially packed containers of spray material which can be readily inserted in the apparatus, as required, and being so arranged that the spray material is economically and efficiently utilized with minimum leakage or loss.

A further object of the invention is to provide an improved coin-operated apparatus for dispensing hair spray liquid, the apparatus being compact in size, being inexpensive to manufacture, being easy to operate, and being neat in appearance.

A still further object of the invention is to provide an improved coin-operated dispenser for hair spray liquid, the dispenser being provided with timing means to provide a timed discharge of hair spray material therefrom when the apparatus is operated, the apparatus being safe to use and being reliable in operation.

A still further object of the invention is to provide an improved coin-operated dispensing machine for delivering a timed discharge of hair spray material from a reservoir of such material contained in the apparatus, the apparatus being provided with automatically-operating indicator means to show when the contents of the reservoir of spray material are substantially depleted, and being further provided with easily-operated means for removing a depleted reservoir and for replacing same with one which is full.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawing, in which:

FIGURE 1 is a perspective view of an improved coin-operated dispenser of hair spray liquid constructed in accordance with the present invention.

FIGURE 2 is a generally schematic view showing on an enlarged scale the supporting means and replenishment indicator for the hair spray liquid container and the discharge nozzle associated with the apparatus of FIGURE 1.

FIGURE 3 is an electrical wiring diagram showing the circuit connections of the electrical elements employed in the coin-operated hair spray liquid dispensing apparatus of FIGURE 1.

Referring to the drawing, **11** generally designates a typical embodiment of an improved coin-operated hair spray dispenser constructed in accordance with the present invention. The apparatus **11** comprises a generally rectangular housing **12** provided on its front wall with a mirror **13** and with a vertical recess **14** adjacent the mirror adapted to contain a flexible conduit **15** provided at its end with a discharge nozzle **16**. The nozzle **16** is shaped so that it may be easily held by a user, said nozzle comprising a rigid outer housing **17** containing a valve body **18**, as shown in FIGURE 2, the valve body being provided with an outlet passage **19** in which is mounted a conduit fitting **20**, one end of the flexible conduit **15** being connected to said conduit fitting. The valve body **18** is formed with a reduced bore which is axially aligned with the chamber **19**, said reduced bore being shown at

21, and slidably and sealingly mounted therein is a plunger **22**, said plunger being provided with resiliently-formed sealing rings **23** which seal the plunger relative to the inside surfaces of the bore **21**. As shown in FIGURE 2, the sealing rings **23** are located at the lower portion of the plunger **22**, but are spaced a substantial distance from a valve disc **24** carried by the depending reduced shank portion **25** of the plunger, said disc portion **24** being urged into sealing engagement with the annular shoulder defined between chamber **19** and bore **21** by the action of a coiled spring **26** bearing between the disc **24** and the top end of the conduit fitting **20**. A restricted discharge passage **27** is provided in the wall of body **18** which connects the lower portion of bore **21** with the atmosphere, said passage **27** serving as the discharge orifice for the nozzle assembly and allowing liquid hair spray material to discharge therefrom responsive to downward movement of the disc **24** relative to the shoulder defined between chamber **19** and bore **21**.

An upstanding supporting lug **28** is provided on the body **18**, and pivoted thereto at **29** is a lever **30**. One end of the lever **30** is pivotally connected to the top end of the plunger **22**, as viewed in FIGURE 2, and the other end of the lever **30** is pivotally connected to the plunger **31** of a solenoid **32** mounted in the body **18**. When solenoid **32** is energized, it elevates its plunger **31**, whereby lever **30** depresses plunger **22** and unseats the valve disc **24**, allowing liquid material to discharge through the nozzle orifice **27**.

Located in the housing **12** and supported therein in any suitable manner is an upright frame **33** having a top wall **34**, a bottom wall **35**, and spaced sidewalls **36** defining therebetween a chamber **37** adapted to receive a commercially packaged container **38** of liquid hair spray material packed under pressure. Designated at **39** is a supporting shelf or platform which is disposed in the lower portion of the chamber **37**, being loosely secured therein by transverse bolts **40**, **40** extending through opposite vertical slots **41**, **41** provided in the end portions of said member **39**. A clamping screw **42** is threadedly engaged through the bottom wall **35**, said screw being provided with a bearing foot **43** engageable with the bottom of the shelf member **39**. The outer end of screw **42** is provided with an operating handle **44** which is readily accessible for rotating the screw **42**, whereby to exert upward pressure on the shelf member **39**. The top wall **34** is provided in its bottom surface with a resiliently-deformable sealing block **46** which is suitably recessed to receive the top end of the container **38**. Fixedly mounted in said top wall **34** is a depending hollow prong or nipple **47** whose sharpened bottom end depends below the face of the cavity in the block **46** and which is engageable with the top end of the container **38** to pierce same when the container **38** is forced upwardly by the tightening of the screw **42**. Thus, the shelf member **39** is provided with a seat or recess **49** shaped to receive the bottom end of the container **38** and to hold the container in proper position for making sealing engagement with the resilient deformable block **46**. When the container is first positioned in the seat **49** with the shelf member **39** in its lowered position, the top end of the container is located so as to be moved into the receiving cavity **50** in the block **46** when the shelf member **39** is elevated. By tightening the screw **42**, the shelf member **39** may then be elevated to move the top end of the container against the surface of the recess **50** and to force the fixed hollow nipple **47** into the top wall of the container, piercing the container and connecting it to said nipple. The nipple **47** communicates with a passage **51** formed in the top wall **34**, leading to a conduit fitting **52**. Conduit **15** is connected to said conduit

52, whereby passage 51 is placed in communication with the chamber 19 in the nozzle body 18.

Mounted on the top wall 34 is an indicator chamber 53 which communicates with the passage 51 and which contains a slidable piston 54 carrying at its top end a conductive disc 55 which is normally urged against the bottom end of an adjustable stop screw 56 threadedly engaged in the top wall of chamber 53, the disc 55 being held against the stop screw by the fluid pressure normally existing in passage 51 when the nipple 47 is placed in communication with the interior of a charged container 38 of low pressurized hair spray liquid, at a pressure of approximately 8 to 10 pounds per square inch. When the container becomes depleted, the pressure acting on piston element 54 decreases, and eventually allows the conductive disc 55 to descend and engage a pair of spaced stationary contacts 57 and 58. An indicating lamp 59 is connected in series with said stationary contacts and a pair of supply-line conductors 60 and 61, whereby the lamp 59 becomes energized when conductive disc 55 bridges contacts 57 and 58, indicating that the container 38 is depleted and requires replacement.

The housing 12 is provided with a coin slot 62 leading to a conventional coin-operated switch 63, the coin-receiving mechanism being of conventional construction and being of any well-known type, for example, the type provided with an operating lever 64 which actuates the mechanism to momentarily close the coin switch 63 after a proper coin has been deposited in the slot 62. The mechanism includes a coin-return chute 65 for returning unacceptable coins.

Mounted in the housing 12 are respective relays 66 and 67. The relay 66 is provided with the poles 68 and 69 which engage respective stationary contacts 70 and 71 in the normal de-energized condition of the relay. When the relay is energized, the poles 68 and 69 are engageable with respective bottom contacts 72 and 73.

The relay 67 is provided with the movable poles 74 and 75. In the normal de-energized condition of relay 67, the poles 74 and 75 normally engage respective upper contacts 76 and 77. When relay 67 becomes energized the poles 74 and 75 move into engagement with respect to lower contacts 78 and 79.

Line wire 60 is connected to the pole 68. Wire 60 is connected through a rectifier 80 and a resistor 81 to one terminal of the coin-controlled switch 63. A filter capacitor 82 is connected between the junction of rectifier 80 and resistor 81 and line wire 61.

One terminal of relay 66 is connected by a wire 83 to stationary relay contact 77, the associated pole 75 of relay 67 being connected by a wire 84 to line wire 61. The remaining terminal of relay 66 is connected by a wire 85 to the pole 74 of relay 67. The remaining terminal of coin switch 63 is connected to the wire 85, as by a wire 86. Thus, the closure of coin switch 63 energizes relay 66 through a circuit comprising line wire 60, rectifier 80, resistor 81, coin switch 63, wire 86, wire 85, the winding of relay 66, wire 83, contact 77, pole 75, wire 84 and line wire 61. Relay 66 is held energized by a holding circuit including wire 85, a wire 87, the stationary contact 73, pole 69, and a wire 88 connected to the junction between switch 63 and resistor 81, this holding circuit shunting the coin switch 63.

One terminal of relay 67 is connected by a wire 88 to line wire 61. The other terminal of the relay 67 is connected to a wire 89, said wire being connected through a normally open timer switch 90 to a wire 91. Wire 91 is connected to upper contact 76 of relay 67. The pole 74, normally engaging contact 76, is connected to wire 85.

When wire 85 is connected to line wire 60 by the energization of relay 66, a circuit is established for initiating the operation of the timer switch 90. Thus, this circuit comprises wire 85, pole 74, contact 76, wire 91, the circuitry of the timer 90, wire 89, the winding of relay 67, wire 88, and line wire 61. After a predetermined time period, which may be adjusted within a suitable range, for example, from 0 to 25 seconds, the normally open switch element of time assembly 90 closes, connecting wire 89 directly to wire 85 through wire 91, contact 76, and pole 74, causing relay 67 to become energized and opening the circuit of relay 66 at pole 75 and contact 77. This also establishes an energizing circuit for the relay 67 at contact 78 and pole 74 to assure energization of relay 67.

The relay 66 thus becomes energized for a predetermined time period, responsive to the closure of the coin switch 63, determined by the setting of the adjustable timer 90. Means are provided for energizing the hair spray discharge solenoid 32 at any time during this time period. Thus, a control switch 95 is provided in the housing 17, consisting of a push button-operated contact element 96 engageable with a stationary contact 97 mounted in a switch housing 98 secured on body 18. The operating push button 99 projects from the housing 17 in a position to be engaged by the user's finger. With relay 66 energized, closure of switch 95 energizes solenoid 32 through a circuit comprising line wire 60, pole 68, contact 72, a wire 100 leading to one terminal of switch 95, a wire 101 leading to one terminal of solenoid 32, and the line wire 61, connected to the opposite terminal of solenoid 32. Hair spray liquid may thus be dispensed from the nozzle member 16 throughout the time period provided up to the closure of the switch incorporated in the timer mechanism 90. At the end of this time period, which, as mentioned above, may be adjusted to any value within a suitable range, for example, from 0 to 25 seconds, the energization of relay 67 opens the circuit of relay 66 at contacts 75–77, as above-mentioned, releasing the relay 66 and re-establishing its initial condition whereby it cannot be re-energized until coin switch 63 is again closed. The timer mechanism 90 is also de-energized and re-sets to its initial condition, preparatory to the next operation thereof. Relay 67 becomes de-energized by the opening of contacts 69–73 of relay 66. Thus, all the elements return to their original starting conditions and are ready for another operation of the apparatus which can be initiated by inserting a proper coin in the slot 62 and operating the actuating member 64 of the mechanism.

The timer 90 is of conventional construction and in itself does not form any part of the present invention. It is merely typical of various commercially available timer mechaisms of the type incorporating a normally open switch which closes at a predetermined time following the energization of the timer.

An important feature of the apparatus of the present invention is that it supplies the hair spray liquid at a substantially constant pressure for the entire dispensing interval. This is an important advantage over previously-used systems where there is a rapid pressure decay when the spray material is released by the user. The loss of adequate pressure results in poor or no atomization of the hair spray at some point in the dispensing interval.

While a specific embodiment of an improved hair spray liquid dispensing device has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. A liquid dispensing device comprising a supply reservoir containing liquid under pressure, a spray discharge nozzle, conduit means connecting said nozzle to said reservoir and including an electrically-operated normally closed control valve, an energizing circuit, first relay means, circuit means connecting said energizing circuit to said control valve responsive to energization of said first relay means, a holding circuit for said first relay means closed responsive to the energization of said first relay means,

second relay means, means opening said holding circuit responsive to energization of said second relay means, means to energize said first relay means, and means to energize said second relay means responsive to a predetermined time period of energization of said first relay means, whereby to open said holding circuit.

2. A liquid dispensing device comprising a supply reservoir containing liquid under pressure, a spray discharge nozzle, conduit means connecting said nozzle to said reservoir and including an electrically-operated normally closed control valve, an energizing circuit, first relay means, a holding circuit for said first relay means closed responsive to the energization of said first relay means, circuit means connecting said energizing circuit to said control valve responsive to energization of said first relay means, second relay means, means opening said holding circuit responsive to energization of said second relay means, means including a coin-operated switch to energize said first relay means, and means to energize said second relay means responsive to a predetermined time period of energization of said first relay means, whereby to open said holding circuit.

3. A liquid dispensing device comprising a supply reservoir containing liquid under pressure, a spray discharge nozzle, conduit means connecting said nozzle to said reservoir and including an electrically-operated normally closed control valve, an energizing circuit, a first relay, a holding circuit for said first relay closed responsive to the energization of said first relay, circuit means connecting said energizing circuit to said control valve responsive to energization of said first relay, a second relay, means opening said holding circuit responsive to energization of said second relay, means to energize said first relay, means including a normally open timed electrically-operated switch connecting said energizing circuit to said second relay, said timed switch closing a predetermined period after its energization, and means to energize said timed switch simultaneously with the energization of the first relay, whereby to open said holding circuit at the end of said predetermined period.

4. A liquid dispensing device comprising a supply reservoir containing liquid under pressure, a spray discharge nozzle, conduit means connecting said nozzle to said reservoir and including an electrically-operated normally closed control valve, an energizing circuit, a first relay, a holding circuit for said relay closed responsive to the energization of said first relay, circuit means connecting

said energizing circuit to said control valve responsive to energization of said first relay, a second relay, means opening said holding circuit responsive to energization of said second relay, means including a coin-operated switch to energize said first relay, means including a normally open electrically-operated timed switch connecting said energizing circuit to said second relay, said timed switch closing a predetermined period after its energization, and means to energize said timed switch simultaneously with the energization of the first relay, whereby to open said holding circuit at the end of said predetermined period.

5. A liquid dispensing device comprising a supply reservoir containing liquid under pressure, a spray discharge nozzle, conduit means connecting said nozzle to said reservoir and including an electrically-operated normally closed control valve, an energizing circuit, a first relay, a holding circuit for said first relay closed responsive to the energization of said first relay, circuit means connecting said energizing circuit to said control valve responsive to energization of said first relay, a second relay, means opening said holding circuit responsive to energization of said second relay, means to energize said first relay, means including a normally open electrically-operated timed switch connecting said energizing circuit to said second relay, said timed switch closing a predetermined period after its energization, means to energize said timed switch simultaneously with the energization of the first relay, whereby to open said holding circuit at the end of said predetermined period, an indicating circuit, a fluid pressure-controlled switch operatively connected to said conduit means, and means to energize said indicating circuit through said fluid pressure-controlled switch.

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