MANUALLY OPERABLE DISPENSER VALVE
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ABSTRACT OF THE DISCLOSURE

An aerosol dispenser having a flexible discharge tube of substantial length and an orifice-carrying fitting attached to the remote or free end of the flexible tube, in the orifice fitting the tube has a bend. A manually operable valve part or control means is provided for a decreased bending to permit the flow of aerosol substance to the orifice, or else a decreased bending to permit the flow of aerosol substance to the orifice for discharge therefrom.

This invention relates to aerosol dispensers, and more particularly to dispensers having pressurized containers and manually operable valves for controlling the discharge of the aerosol substance.

This application is a division of our pending application Ser. No. 435,965, filed Mar. 1, 1965, now Patent No. 3,305,144.

An object of the invention is to provide a novel and improved aerosol dispenser wherein the discharge may be effected at points remote from the pressurized container, and wherein different areas may be readily sprayed without holding or moving the container.

Another object of the invention is to provide, in a dispenser as above set forth, an improved manually operable valve and orifice device of extremely simple construction, which utilizes a minimum number of parts.

A further object of the invention is to provide, in a dispenser as above characterized, a simple and improved operable control and actuator for the valve mechanism of the pressurized container or can.

Other objects of the invention are to provide an aerosol dispenser as above outlined, which is especially effective and reliable in its operation, which is easy and convenient to use, and which has a small size, being characterized by a desirable compactness.

Other features and advantages will hereinafter appear.

In the drawings accompanying this specification, similar characters of reference are used to designate like components throughout the several views, in which:

FIG. 1 is an overall view of the improved aerosol dispenser, the pressurized container and its valve control device being shown in side elevation. The extension discharge tube and the manually operable valve and orifice device are shown in axial section, in the nondischarging condition.

FIG. 2 is an axial sectional view of the valve and orifice device of FIG. 1, showing the positions of the parts for the discharging condition.

FIG. 3 is an axial sectional view of the valve stem actuator and control provided by the invention, mounted on a pressurized container, the parts being in the positions necessary to effect a discharge of the contents of the container.

FIG. 4 is a sectional view of the actuator and control of FIG. 3 but showing the parts in the positions occupied when the valve stem is not depressed and not discharging.

FIG. 5 is an axial sectional view of a valve stem actuator or control means, illustrating another embodiment of the invention.

FIG. 6 is an axial sectional view of a valve stem control means constituting yet another embodiment of the invention.

FIG. 7 is an axial sectional view of a valve stem control device as provided by the invention and illustrating still another embodiment thereof.

FIG. 8 is a perspective view of the base member of the valve control device of FIG. 7.

Considering first FIG. 1, there is shown a pressurized container 10 having a usual type of top closure or wall 12 mounting a hollow, depressible valve stem 14 and an actuator mounting collar or shoulder 16.

Attached to the pressurized container 10 by engagement with the annular shoulder 16 there is, as provided by the invention, an improved, simple adapter 18, including an operable control by which the depressible valley stem 14 may be shifted from the raised, non-discharging position to a depressed, discharging position. The adapter 18 connects with an extension tube 20 of flexible or resilient plastic such as polyethylene, said tube having a relatively small external diameter which may advantageously be slightly less than ¼ of an inch. One end portion 22 of the tube 20 is connected to the adapter fitting 18, and the other end portion 24 is connected with a discharge valve and orifice assembly designated generally by the numeral 26.

It will be understood that with the above organization the user can apply the aerosol spray to various different locations in a most convenient manner, without requiring lifting or movement of the pressurized container 10. This is of considerable advantage if, for instance, the pressurized contents of the container 10 comprises a laundry starch, whereby the user applies the starch in a spray form to a garment prior to ironing the same. With the illustrated construction the pressurized container 10 may be placed at a convenient spot adjacent or on the ironing board, and need not be moved or lifted when the contents are to be dispensed and put to use. Moreover, with the present arrangement the container 10 can remain perfectly upright at all times whereby maximum utilization of the liquid contents is had, with little likelihood of leakage or bleeding of the pressurized gas only.

The manually operable valve and orifice assembly as provided by the invention is of extreme simplicity, involving relatively few parts, yet is particularly effective and reliable in its operation.

The actual valving is done by forming a kink in the end portion 24 of the resilient plastic tube 20. If a tight kink is formed, the flow of aerosol substance is effectively shut off, whereas if a more open kink exists in the tube it will permit the passage of the aerosol substance. As seen in FIG. 1, a relatively tight kink or bend 28 exists in the tube portion 24, thereby shutting off the flow of aerosol substances from an orifice member 30. In FIG. 2, the nozzle unit 26 reveals a more open bend in the tube 24 whereby a flow of the aerosol substance is permitted through the tube and out of the discharge orifice 30.

The nozzle unit 26 comprises an orifice member 32 which includes the orifice 36, said member having an axial, centrally disposed discharge passage 34 communicating with the nozzle 30 and also with the extremity 36 of the flexible plastic tube 20, such extremity being held in a lateral opening or socket 38. The orifice member 32 also has a longitudinal slot 40 through which the bent back end portion 24 of the tube 20 extends. The slot 40 provides clearance whereby the portion 24 may be shifted between the positions of FIGS. 1 and 2.
to respectively shut off the flow or permit the flow through the plastic tube 20, as by making the kinks 28 either tighter or more open.

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The above process being done, the invention provides manually operable means in the form of a tubular member 42 surrounding the orifice member 32, the latter constituting in effect a plunger which is movable in the member 42 between the limits shown in FIGS. 1 and 2. The tubular member 42 has a side opening 44 through which the discharge tube 25 may be extended and the flexible tube 22a used to effect the operating movement thereof.

The tubular member 42 has at one end an annular outwardly extending flange 46, and the orifice member has a head or button shape 48 at the end adjacent the flange 46, said button shape and flange constituting a finger grip for the nozzle unit. A helical compression spring 50 is disposed in the opposite end of the member 42, engaging shoulders 52 and 54 respectively on the tubular member and orifice member, thereby to maintain the latter normally in a projected position as seen in FIG. 1.

If will now be understood that with the parts in the FIG. 1 position no flow is possible through the plastic tube 20 and out of the orifice 30. However, when the plunger member 32 is depressed as indicated in FIG. 2, the resultant partial unbending of the plastic hose portion 24 will permit a flow of aerosol substance through the hose 20 and tube 25 as being indicated by the broken lines in FIG. 2 which show a spray.

By the present invention an especially simple and easy-to-operate control adapter comprising the unit 18 is provided, to cooperate with the nozzle unit 26 and container 10 for the purposes specified. The adapter 18 comprises, as seen in FIGS. 3 and 4, a base member 58 in which a tubular fitting member 60 is movably mounted. The fitting 60 has a socket 62 which snugly receives the protruding end of the depressible hollow valve stem 14 of the dispenser.

The base 58 has depending claws 64 provided with hooks 66 which engage the underside of the annular mounting shoulder 16. The base 58 also has a depending hollow boss or bearing portion 68 in which the tubular fitting member 60 vertically slides. The end portion 22 of the flexible tube is press-fitted in the upper part of the fitting 60, and with such construction communication is established between the bore of the valve stem 14 and the bore of the flexible tube. When the valve stem 14 is depressed, aerosol substance will pass through the tube 20, 22, provided that the nozzle unit 26 is in discharging condition. The base member 58 provides a guide for the fitting 60 and also constitutes a mounting by which the fitting is retained on the container 10.

In order to retain the fitting 60 on the valve stem 14 in the depressed, discharging position, or to easily release the same for shutting off the flow, there is provided a latch member 70 in the form of a lever, having a depending pivot portion 72 with a hook 74 disposed at an aperture 76 in the base member to constitute a pivot means. The latch member 70 also has a depending finger 78 provided with a barb 80 which is receivable in a recess 82 of the base member, to effect latching engagement therewith. As seen in FIG. 3 the member 70 is latched and the valve stem 14 is depressed, enabling a discharge of the aerosol substance to take place, FIG. 4 shows the parts wherein the latch member 70 is released and the valve stem 14 is in its raised position, preventing passage of the aerosol substance. Latching of the member is effected by finger pressure in a downward direction as indicated in FIG. 3, unless unlatching may be effected by applying upward and outward pressure to a tab 84 to disengage the barb 80 from the recess 82. The latch member 70 is resilient or slightly yieldable to enable it to function properly as described above.

FIG. 5 shows another embodiment of the invention, wherein a base 58a, adapted for mounting on the annular shoulder 16 of the container 10, has a threaded central opening 86 in which a screw 88 is threaded. The screw 88 has a stepped bore receiving the portion 22a of a flexible discharge hose. The extremity 90 of the tube 22a is of enlarged diameter. The enlargement 90 constitutes a socket, so to speak, in the screw 88. With such construction, turning down the screw 88 will effect a depressing movement of the valve stem 14, causing a discharge to occur. When it is desired to cut off the flow, the screw 88 is merely raised by turning it in the opposite direction.

Another embodiment of the invention is illustrated in FIG. 6 wherein a threaded base member 58c carries a tube 88c provided with a socket 90c receiving the upper extremity of the valve stem 14. The discharge tube 22b is frictionally held in the upper portion of the screw 88c, preferably by forming the end portion of the tube into an annular groove 92 in the bore of the screw. Turning the screw 88c downward or clockwise as viewed from above will depress the valve stem 14, and vice versa.

Another embodiment of the invention is illustrated in FIGS. 7 and 8. Here, the base member 58c has an opening 96 provided with notches 98 and accommodating a tubular fitting 100 having prongs 102 adapted to pass through the notches 98. At the underside of the base member 58c recesses 104 are provided, to receive the prongs 102 of the fitting 100 for locking the same against turning when the fitting is in the discharging position. In the fitting accommodates the valve stem 14, and the upper portion of the fitting 100 has press-fitted in it the end 22c of the plastic discharge tube.

FIG. 7 shows the discharging position of the parts, with the prongs 102 locked in the recesses 104. When it is desired to shut off the flow, the fitting member 100 is pressed downward slightly and turned through an angle of 90°. The prongs 102 may then pass upwardly through the notches 98, enabling the valve stem 14 to return to the raised, nondischarging position.

It will now be seen from the foregoing that we have provided an improved and advantageous aerosol dispenser wherein the spray may be discharged at various areas removed from the pressurized container, without requiring lifting or moving of the latter. A simplified nozzle and orifice unit is provided, as well as a simplified adapter and valve control unit in conjunction with the flexible plastic discharge hose. Relatively few parts are required, and the construction may be economically fabricated. Moreover, the operation is easy and effective, and the device is reliable in use.

Variations and modifications may be made within the scope of the claims, and portions of the improvement may be used without others.

We claim:

1. A manually operable valve construction for a dispenser, comprising in combination:
   (a) a flexible tube for connection to a dispensing container, said tube being capable of kinking by bending it back on itself a number of times without wall failure,
   (b) an orifice member having a discharge passage to which one end of the flexible tube is connected, and
   (c) means slidabley engaged with said orifice member, for holding in a U-shape a portion of said tube adjacent said orifice member, said means including a manually operable device for tightly kinking and for partially un-kinking said tube portion to respectively prevent flow therethrough or else to permit flow therethrough.

2. A dispenser control for a dispensing type container comprising, in combination:
   (a) a base member,
   (b) a tubular fitting axially slidable back and forth on the base member,
   (c) said fitting having a socket for snugly receiving the protruding end of a depressible hollow valve stem of a dispensing container whereby slidable
axial movement of the fitting on the base member effects opening and closing of the valve, (d) a flexible discharge tube having one end connected to said fitting and communicating with the socket thereof, (e) releasable latch means including a manually operable lever for axially moving said fittings to, and releasably holding it in, a position on said base member wherein it depresses the value stem to effect a discharge from the container through said fitting and discharge tube, and (f) a manually operable valve device connected to the other end of the flexible discharge tube to control the flow of fluid therethrough.

3. A manually operable valve construction for a dispenser, comprising in combination: (a) a flexible tube for connection to a dispensing container, said tube being capable of kinking by bending it back on itself a number of times without wall failure, (b) an orifice member having a discharge passage in which one end of the flexible tube is held, and (c) manually operable means for tightly kinking and for partially uninking said tube to respectively prevent flow therethrough or else to permit flow therethrough, (d) said manually operable means comprising a tubular member with a side opening, (e) said orifice member comprising a plunger movable in the tubular member and having a transverse slot registering with said side opening, (f) said flexible tube extending through the said side opening and transverse slot from one direction and extending into the said discharge passage from the opposite direction.

4. A valve construction as in claim 3, wherein: (a) the said tubular member has an annular outwardly extending flange at one end, (b) said orifice member having a button shape at the side adjacent the flange, (c) said button shape and flange constituting a finger grip for the valve construction.

5. A valve construction as in claim 3, wherein: (a) said tubular member having a longitudinal slot opposite the said side opening, in which the kink of the tube is disposed.

6. A valve construction as in claim 3, wherein: (a) spring means are provided in the tubular member, engaged with the plunger to urge the latter to a position in the member which effects more kinking of the flexible tube.

7. A dispenser control for a dispensing type container comprising, in combination: (a) a base member, (b) a tubular fitting movably mounted on the base member, (c) said fitting having a socket for snugly receiving the protruding end of a depressed hollow valve stem of a dispensing container whereby movement of the fitting effects opening and closing of the valve, (d) a flexible discharge tube connected to said fitting and communicating with the socket thereof, and (e) releasable latch means for moving said fitting to and releasably holding it in a position on said base member wherein it depresses the valve stem to effect discharge from the container through said fitting and discharge tube.

8. A dispenser control for a dispensing type container comprising, in combination: (a) a base member, (b) a tubular fitting movably mounted on the base member, (c) said fitting having a socket for snugly receiving the protruding end of a depressed hollow valve stem of a dispensing container whereby movement of the fitting effects opening and closing of the valve, (d) a flexible discharge tube connected to said fitting and communicating with the socket thereof, and (e) operable means for releasably maintaining said fitting in a discharging position on the base member wherein it holds the valve stem depressed to effect discharge of the container contents through the said flexible discharge tube.

9. The invention as in claim 8, wherein: (a) the base member has recesses in one side, to receive the prongs of the fitting for locking the same against turning when in the discharging position.

10. A dispenser control for a dispensing type container comprising, in combination: (a) a base member, (b) a tubular fitting movably mounted on the base member, (c) said fitting having a socket for snugly receiving the protruding end of a depressed hollow valve stem of a dispensing container whereby movement of the fitting effects opening and closing of the valve, (d) a flexible discharge tube connected to said fitting and communicating with the socket thereof, and (e) operable means for releasably maintaining said fitting in a discharging position on the base member wherein it holds the valve stem depressed to effect discharge of the container contents through the said flexible discharge tube.

11. The invention as in claim 10, wherein: (a) the said lever is resilient and has a finger piece to enable it to be fixed for release.

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