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VALVE ACTUATING ASSEMBLY FOR PRESSURIZED CONTAINERS

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2 Sheets-Sheet 2

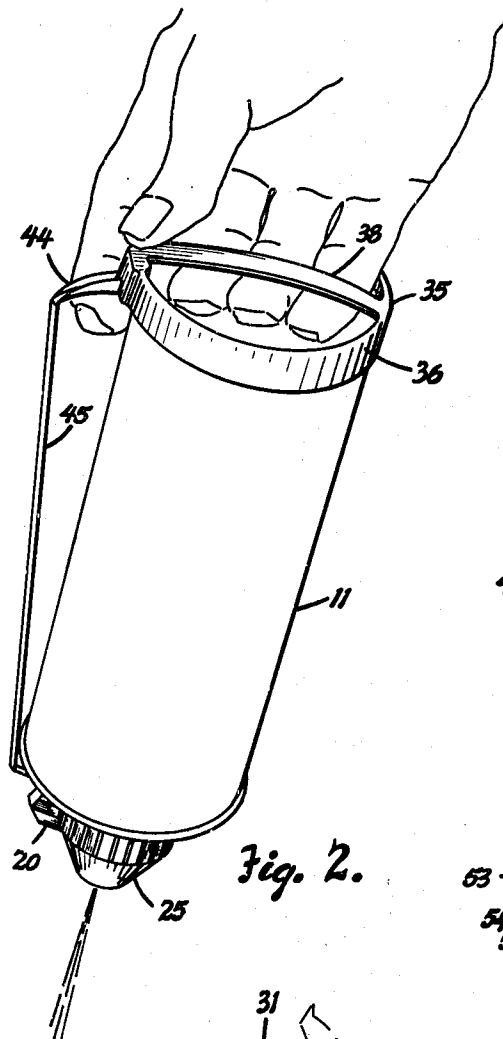


Fig. 2.

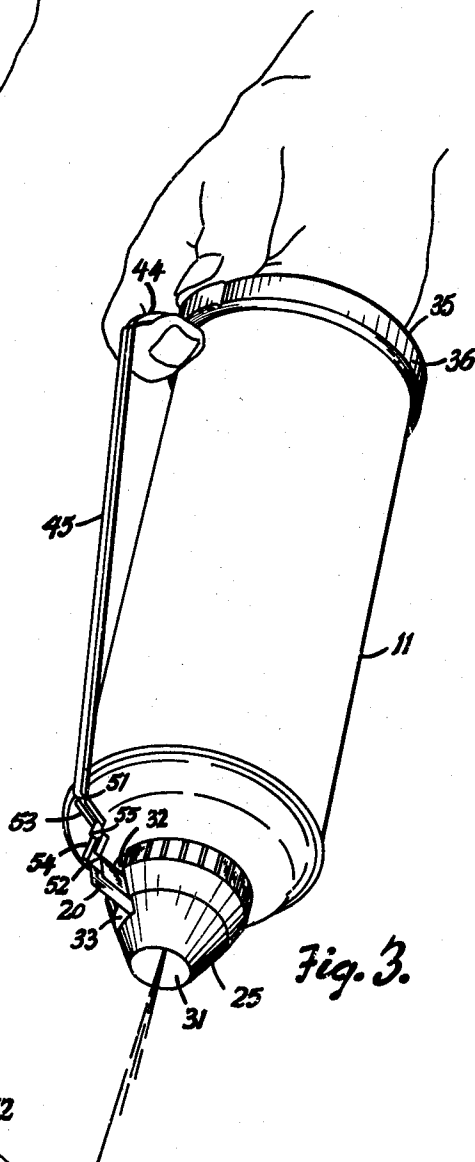


Fig. 3.

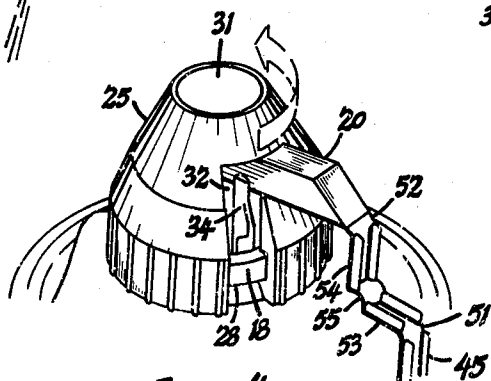


Fig. 4.

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VALVE ACTUATING ASSEMBLY FOR PRESSURIZED CONTAINERS

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8 Claims. (Cl. 222—394)

This invention relates to a valve actuating assembly for pressurized containers. More specifically, the invention relates to a valve actuating assembly equipped with a locking mechanism for preventing the contents of a pressurized container from being inadvertently dispensed. The invention also relates to a valve actuating assembly equipped with a holding means and a valve release mechanism which permits the package to be used in an inverted position at arm length.

A number of pressurized products are presently on the market for spraying objects located a significant distance from the pressurized container for specialized purposes such as eradicating undesirable plants such as thistle, dandelion, plantain, chickweed and the like. These products are difficult to use, however, since they are equipped with small tilt valve buttons which must be deflected by a single finger, usually the forefinger. Deflecting the valve button under these conditions is very tiring. The finger is frequently chilled by the rapidly vaporizing propellant and is occasionally exposed to the toxic ingredients in the product.

Aside from the difficulties of use, the pressurized container appears to be the most desirable product with which to eradicate localized weeds in home lawns. The present invention comprises a valve actuating and container holding assembly for use with a pressurized container to eradicate undesirable garden vegetation in a manner overcoming the above difficulties. The invention also embraces a valve actuating and locking assembly which may be effectively used with a wide variety of pressurized products such as furniture polishes, paints and insecticides.

FIGURE 1 is a vertical cross section of the present valve actuating and containing holding assembly mounted on a pressurized container shown in phantom. FIGURES 2 and 3 are perspective views showing the valve actuating and holding assembly in use in combination with pressurized containers. FIGURE 4 is a perspective view of the valve actuating and locking assembly mounted on a pressurized container.

In FIGURE 1, the pressurized container 11 shown in phantom is equipped with a valve assembly comprising a valve cup 12, valve stem 13 and valve button 14 having a fluid passage 15. Valve cup 12 when assembled with container 11 fits over and is crimped to container bead 16. Anchor ring 18 is disposed around the valve cup skirt 17. Lip 19 of the anchor ring 18 fits over the lower edge of the valve cup skirt 17 to hold it securely after it is snapped into position. An actuator arm 20 is connected to the anchor ring 18 by a hinge connection 21. The actuator arm 20, as shown, is hollow, opening on the underside, and has a cross brace 22 for added stability. The actuator arm also has a vertically disposed section 23 outlining a circular opening 24 in its central portion. The inner wall of section 23 defining opening 24 is inclined inwardly from bottom to top for a distance of about two thirds of the thickness of the anchor ring 18 and for the remainder of the distance is inclined outwardly. The upper and lower diameters of opening 24 are thereby substantially equal while the diameter of the central section is smaller.

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A pair of vertical guide posts, one of which is designated 34, extend from and above anchor ring 18 in a position opposite the hinged end 21 of actuator arm 20. The moveable end of actuator arm 20 is positioned between said guide posts for vertical movement therebetween. The guide posts permit the quick and accurate matching of opening 24 in anchor arm 20 with valve button 14 and prevent hinge 21 from being subjected to undue twisting stresses. Guide post 34 is shown in FIGURE 1, in reverse cross-hatch since it resides behind the plane of the cross section. This post also may be seen in FIGURE 4.

When the valve actuating and locking assembly is in use, opening 24 of actuator arm 20 longitudinally matches fluid passage 15 of valve button 14, and when the actuator arm 20 is depressed the inner wall of section 23 impinges upon the upper and outer wall portion of valve button 14 depressing it thereby actuating the valve, not shown, to permit fluid to be dispensed from container 11.

Mounted on anchor ring 18 is a nozzle shaped overcap 25 having a circumferential groove 26 on its inner wall. The lower lip 27 of groove 26 fits over a circumferential shoulder 28 of anchor ring 18 thereby holding the overcap in position on said ring. Overcap 25 has a central opening 31 longitudinally matching opening 24 in actuator arm 20 and opening 15 in the valve button 14 to permit unrestricted passage of a spray through the overcap.

Overcap 25 has a cutout comprising connected axial and radial portions 32 and 33. This cutout is better seen in FIGURE 4 where actuator arm 20 is positioned in the radial portion 33. When the valve actuator and locking mechanism is assembled, overcap 25 is pressed over the anchor ring 18 with the axial portion 32 of the cutout matching actuator arm 20 until the circumferential groove 26 on the inner wall of overcap 25 engages shoulder 28 of the anchor ring 18. Overcap 25 is rotatable on the anchor ring 18, so that the overcap may be moved into and out of a locking engagement with the actuator arm.

The valve actuating and locking assembly discussed thus far provides a unique means for actuating the valve of a pressurized container and locking it to insure that the contents are not dispensed in an untimely manner. In operation the nozzle 25 is rotated to a position such that the actuator arm 20 fits in the axial portion 32 of the cutout in the wall of the overcap 25. The container on which the actuating and locking assembly is mounted is then inverted. To actuate the valve the free end of the actuator arm 20 is depressed, i.e., moved toward the bottom of the container, at which time the inner wall of vertical section 23 of actuator arm 20 bears upon the top and outer wall of valve button 14 depressing the button and actuating the valve. After use, either overcap 25 or anchor ring 18 is rotated so that actuator arm 20 is moved from the axial portion 32 to the radial portion 33 of the cutout in the overcap thereby locking the lever in a position so that it cannot be depressed to engage valve button 14. The nozzle end of overcap 25 could be cut off at the top of the axial portion 32 of the cutout in which event actuator arm 20 could still be locked in position by rotating either the overcap 25 or actuator arm 20. In this case, actuator arm 20 would be locked over what would then be a shoulder or top edge of overcap 25.

The valve actuating and locking assembly as described above may be used alone with a pressurized container equipped with any valve button which is actuated by tilting or depressing it adapted to discharge the contents of the container along the direction of the longitudinal axis of the container. The invention is particularly desirable

in this form for dispensing space deodorants and products for surface application such as furniture polish, spray starch and the like. When, however, the articles to be treated are a few feet away, such as lawn weeds the above valve actuating and locking assembly will be most advantageously used with the container holding device and trigger mechanism shown in the drawings. This complete assembly will be referred to herein as the valve actuating and holding assembly. In addition to the elements discussed heretofore, the valve actuating and holding assembly comprises a sling ring 35 and a trigger connecting means extending between the sling ring 35 and actuator arm 20.

The sling ring 35 has a side wall 36 with lugs 37 and 39 on the inner surface thereof for engaging the top and bottom surfaces of the lower bead 42 of container 11 to secure the sling ring in position. Extending between the sling ring 35 and the actuator arm 20 is a trigger connecting means comprising hook 43 for engaging lower container bead 42 of container 11, a compensating section 46, strap 45 section and trigger section 44. The trigger section 44 is separated from hook 43 by hinge 47 and from strap 45 by hinge 48. The compensating section is located between strap 45 and anchor arm 20 by hinges 51 and 52. The compensating section consists of horizontally disposed member 53 and vertically disposed member 54 joined by hinge 55. The trigger connecting means and the actuator arm 20 will hereafter and in the claims be referred to collectively as the trigger assembly.

That part of the valve actuating and holding assembly comprising the anchor ring 18, actuator arm 20 and overcap 25 are assembled as discussed previously. Hook 43 then is engaged with the lower bead 42 of container 11. After the hook 43 is snapped around container bead 42, sling ring 35 is fitted over the bottom of the container with the bead 42 being engaged by lugs 37 and 39 in side wall 36 of the sling ring.

In use, the valve actuating and holding assembly fitted on a pressurized container is inverted as shown in FIGURES 2 and 3 with a plurality of fingers wrapped around strap or handle 38 diametrically crossing sling ring 35. Container 11 with which the sling ring is used has a recessed bottom 29 to accommodate positioning of the fingers around handle 38. Compensating section 46 of the trigger assembly permits strap 45 and trigger section 44 to rest close to the container wall 11 when the device is not in use. The compensating section also permits the actuator arm 20 to be raised above valve button 14 when this is desired without removing anchor ring 18 from engagement with the valve cup. The compensating section further permits the index finger to be placed between the strap and the side wall of container 11 pulling the trigger section 44 down to a substantially horizontal position to form a "trigger" which may then be pulled further toward the bottom of the container thereby bringing the actuator 20 to bear on valve button 14 to open the valve and cause product to be dispensed.

The sling ring, anchor ring and the various parts of the trigger assembly may be molded as separate units and joined with hinges of any suitable material and construction. Alternately, any combination of these items may be molded together. For example, the sling ring, anchor ring, trigger assembly and even the valve button could be molded as an integral unit.

The assemblies of the present invention may be constructed from any suitable material or combinations of material, such as plastic or metal. Plastic such as low density and linear polyethylene, polypropylene, or polystyrene and copolymers of these materials are preferred. Very suitable assemblies have been prepared by utilizing low density polyethylene for the sling ring, polypropylene for the anchor ring and trigger assembly and linear polyethylene for the overcap. Polypropylene is particularly desirable for use in molding trigger assembly and anchor ring since it permits this assembly to be molded as an

integral unit with thin sections constituting tough long life flexible hinges between the various components of the assembly.

It should be understood that the present disclosure is for purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

Having described the invention, what is claimed is:

1. A valve actuating assembly for a pressurized container having a recessed bottom and equipped with a valve assembly including a valve button adapted to discharge the contents of said container along the direction of the longitudinal axis of the container when depressed, said valve actuating assembly comprising

(a) an anchor ring to be disposed around the valve assembly of said container and secured to the valve cup

(b) a sling ring to be secured to the lower extremity of said container, said sling ring having a transverse strap disposed across the bottom of said container when assembled therewith for gripping by inserting the fingers around it

(c) a trigger assembly comprising

(1) an actuator arm with a central opening hinged to one edge of said anchor ring and extending thereacross said actuator arm bearing on the valve button of said container valve assembly when depressed and having an opening longitudinally matching the valve opening in the valve button

(2) a strap connecting the free end of said actuator arm with said sling ring whereby the valve button is depressed or tilted when said strap is pulled toward the bottom of said container, said strap having a compensating section located near the actuator arm comprising a plurality of hinges and horizontal linkage disposed therebetween whereby the strap when not in use is maintained closely alongside the container and yet is long enough to permit insertion of a finger between the strap and container and a trigger section located near the sling ring, and

(d) an overcap mounted on said actuator ring, said overcap having a central opening matching the opening in the actuator arm and the valve button to permit the unrestricted passage of a spray and a cutout in its wall having connected axial and radial portions, said overcap being rotatable over said actuator arm may be made to extend through the axial portion of said cutout when the valve of said container valve assembly is to be actuated and through the radial portion thereof to lock the actuator arm in a position whereby it cannot be moved to actuate the valve of said container valve assembly.

2. A valve actuating assembly for a pressurized container equipped at one end with a valve assembly including a valve button adapted to discharge the contents of said container substantially along the direction of the longitudinal axis of the container when depressed, said valve actuating assembly comprising:

(a) an anchor ring disposed around the valve assembly and secured to the valve end of said container,

(b) an actuator arm hinged to the edge of said anchor ring and extending thereacross said actuator arm bearing on the valve button of said container valve assembly when depressed and having a central opening longitudinally matching the opening in the valve button; and

(c) an overcap rotatably mounted on said anchor ring, said overcap having:

(1) a central opening aligned with the openings in the actuator arm and the valve button to permit the unrestricted passage of a spray substantially along the direction of the longitudinal axis of the container, and

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(2) a cutout in its wall having connected axial and radial portions, so that said actuator arm may be made to extend through the axial portion of said cutout when the valve of said container valve assembly is to be actuated and through the radial portion thereof to lock the actuator arm in a position whereby the actuator arm cannot be moved to actuate the valve assembly.

3. A valve actuating assembly in accordance with claim 2 whereby said anchor ring has a pair of vertical guide posts extending above said ring in a position opposite the hinged end of the actuator arm, the free end of the actuator arm being positioned between said guide posts for vertical movement therebetween.

4. A valve actuating assembly for a pressurized container having a recessed bottom and being equipped with a valve assembly including a valve button adapted to discharge the contents of said container substantially along the direction of the longitudinal axis of the container when depressed, said valve actuating assembly comprising:

(a) an anchor ring disposed around the valve assembly and secured to the upper portion of said pressurized container;

(b) a sling ring secured to the lower extremity of said container, said sling ring having a transverse strap disposed across the bottom of said container for gripping by inserting the fingers around it;

(c) a trigger assembly comprising:

(1) an actuator arm with a central opening hinged to the edge of said anchor ring and extending thereacross said actuator arm having an opening longitudinally aligning with the opening in the valve button; and

(2) a strap connecting the free end of said actuator arm with said sling ring whereby the valve is actuated when said strap is pulled toward the bottom of said container; and

(d) an overcap mounted over said anchor ring having a central opening to permit the passage of a spray substantially along the direction of the longitudinal axis of the container, said overcap and anchor ring being rotatable with relation to each other so that the free end of said actuator arm may be brought into locking engagement with said overcap.

5. A valve actuating assembly for a pressurized container having a recessed bottom and being equipped with a valve assembly including a valve button adapted to discharge the contents of said container substantially along the direction of the longitudinal axis of the container when depressed, said valve actuating assembly comprising:

(a) an anchor ring disposed around the valve assembly and secured to the upper portion of said pressurized container;

(b) a sling ring secured to the lower extremity of said container, said sling ring having a transverse strap disposed across the bottom of said container when assembled therewith for gripping by inserting the fingers around it;

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(c) a trigger assembly comprising:

(1) an actuator arm with a central opening hinged to the edge of said anchor ring and extending thereacross, said actuator arm bearing on the valve button of said container valve assembly when depressed and having an opening longitudinally aligning with the valve opening in the valve button; and

(2) a strap connecting the free end of said actuator arm with said sling ring whereby the valve button is depressed when said strap is pulled toward the bottom of the container; and

(d) an overcap rotatably mounted on said anchor ring, said overcap having:

(1) a central opening aligned with the openings in the actuator arm and the valve button to permit the unrestricted passage of a spray substantially along the direction of the longitudinal axis of the container; and

(2) a cutout in its wall having connected axial and radial portions, so that said actuator arm may be made to extend through the axial portion of said cutout when the valve of said container valve assembly is to be actuated and through the radial portion thereof to lock the actuator arm in a position whereby the actuator arm cannot be moved to actuate the valve assembly.

6. A valve actuating assembly in accordance with claim 5 whereby said anchor ring has a pair of vertical guide posts extending above said ring in a position opposite the hinged end of the actuator arm, the free end of the actuator arm being positioned between said guide posts for vertical movement therebetween.

7. A valve actuating assembly in accordance with claim 5 whereby the strap of said trigger assembly connecting the free end of said actuator arm and the sling ring has a compensating section comprising a plurality of hinges and a horizontal linkage disposed therebetween whereby the strap when not in use is maintained closely alongside the container and yet provides sufficient freedom to permit insertion of a finger between the strap and container when said compensating section is expanded.

8. A valve actuating assembly in accordance with claim 5 whereby the strap of said trigger assembly connecting the free end of said actuator arm and the sling ring has a trigger section near the sling ring separated from the remainder of the strap by a pair of hinges.

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