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W. L. BOYER

3,170,606

AEROSOL ACTUATOR

Filed Jan. 31, 1962

FIG. 1

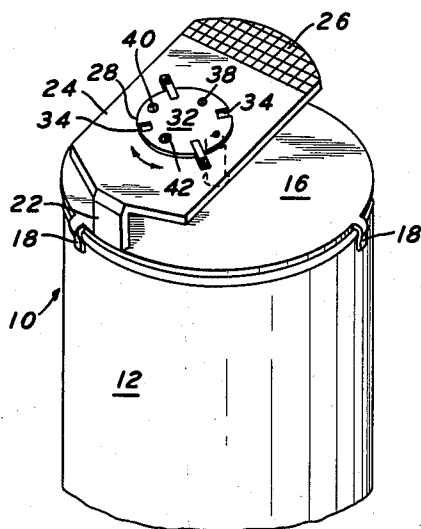


FIG. 2

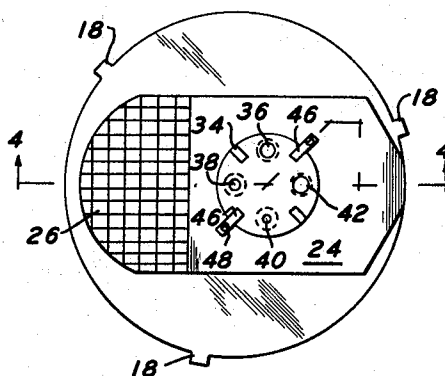


FIG. 3

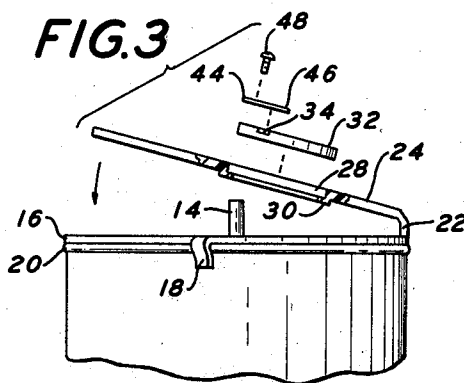


FIG. 5

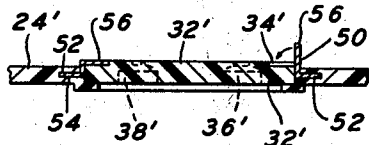
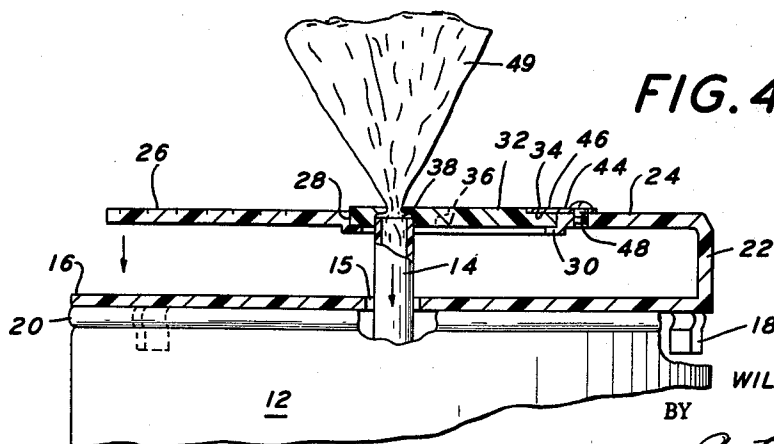


FIG. 4



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AEROSOL ACTUATOR

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3 Claims. (Cl. 222-394)

This invention relates to an aerosol actuator, and more particularly, to an aerosol container having a novel actuating mechanism.

In its simplest form, the actuating mechanism of the present invention includes a pivotable arm having a nozzleplate therein. The nozzleplate is adapted to be moved to a disposition wherein it is in abutting contact with an end of a discharge conduit on an aerosol container. Preferably, a nozzleplate is provided with a plurality of different orifices therein. The nozzleplate is preferably adjustably mounted so that any one of a variety of nozzle orifices may be placed in line with a discharge conduit on the aerosol container. In this manner, any one of a wide variety of discharge patterns may be obtained.

The actuating mechanism may be a separate discrete member, or may be an integral part of the aerosol container. That is, the manufacturer of aerosol containers may utilize the actuating mechanism of the present invention with the nozzleplate disposed in a predetermined position depending upon the material in the aerosol container. For example, if the material in the container is a room deodorant, the manufacturer will preset the nozzleplate so that the material is discharged in a fine spray. If the material to be dispensed is paint, the nozzleplate will be positioned in a location so that a nozzle orifice will provide a discharge pattern in the form of a mist. If the material to be dispensed is shaving cream, the nozzleplate will be positioned so that the material is discharged as a foam.

Hence, it will be seen that manufacturers of aerosol dispensers may materially simplify their inventory problems by utilizing a single nozzleplate which may be set in any one of a wide variety of positions. In each of the positions of the nozzleplate, an orifice will be located so that it will be in line with the outlet of a discharge conduit when it is desired to dispense material from the aerosol container. The nozzleplate may be removably mounted so that the discharge pattern may be varied as desired by the operator. Alternatively, the nozzleplate may be fixedly secured in a predetermined position as determined by the manufacturer of the aerosol container.

It is an object of the present invention to provide an aerosol container with a novel actuator mechanism.

It is another object of the present invention to provide an aerosol container with a novel actuator mechanism which may provide any one of a plurality of flow patterns for the material being discharged.

It is another object of the present invention to provide a novel actuator mechanism which permits any one of a variety of discharge flow patterns.

It is another object of the present invention to provide a novel actuator mechanism which may be utilized with any one of a wide variety of aerosol containers, thereby substantially decreasing the inventory problems of manufacturers.

It is still another object of the present invention to provide a novel actuating mechanism which may be utilized with a variety of aerosol containers having materials which are to be dispensed with a varied discharge flow pattern.

Other objects will appear hereinafter.

For the purpose of illustrating the invention there is shown in the drawings forms which are presently preferred; it being understood, however, that this invention

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is not limited to the precise arrangements and instrumentalities shown.

FIGURE 1 is a partial perspective view of an aerosol container having the actuator mechanism of the present invention.

FIGURE 2 is a top plan view of the aerosol container illustrated in FIGURE 1.

FIGURE 3 is a side elevation view of the aerosol container and actuating mechanism thereon, with the actuator mechanism being exploded for purposes of illustration.

FIGURE 4 is a sectional view taken along the lines 4-4 in FIGURE 2, with the elements shown in an operative disposition wherein material is being dispensed from the aerosol container.

FIGURE 5 is a partial sectional view of the actuating mechanism of another embodiment of the present invention.

Referring to the drawing in detail, wherein like numerals indicate like elements, there is shown an aerosol actuator designated generally as 10.

The aerosol actuator 10 includes an aerosol container 12 of conventional construction except as will be made clear hereinafter. Hence, the aerosol container 12 contains a liquid which is adapted to be selectively dispensed. The container 12 is provided with a discharge conduit 14. It will be noted that the discharge conduit 14 extends in an axial direction and extends beyond one end of the container 12. The end of the conduit 14 which is not shown is adapted to cooperate a conventional valve mechanism. When the conduit 14 is depressed in an axial direction, a valve is unseated and material to be dispensed is permitted to flow through the conduit 14 under pressure.

An actuator mechanism is provided to permit selective actuation of the conduit 14. Such mechanism includes a baseplate 16 having a central hole 15 through which the conduit 14 extends. The baseplate 16 is secured to the container 12 by a plurality of spring fingers 18 which snap around a lip or bead 20 at the upper end of the container 12. The fingers 18 facilitate detachment of the baseplate 16 with respect to the container 12.

The actuating mechanism includes an upright wall 22 which is integral with the baseplate 16. The mechanism also includes an actuator arm 24 having one end integral with the wall 22. The arm 24 extends across a central portion of the baseplate 16 in cantilever fashion. The arm 24 and wall 22 are made from resilient spring metal so that the arm 24 remains in the angled disposition as shown in FIGURE 3 due to the inherent resiliency of the metal or plastic material from which it is made.

If the actuator mechanism is applied to the container 12 by the manufacturer thereof, the baseplate 16 and fingers 18 may be eliminated. That is, the end of the wall 22 remote from the arm 24 may be fixedly secured to the top wall of the container 12 in any conventional manner.

The end of the arm 24 remote from the wall 22 is provided with a knurled section 26. The knurled section 26 is the portion of the arm which is contacted by a person's finger or the like when it is desired to move the arm to a dispensing position. The arm 24 is provided with an enlarged hole 28 therethrough. The arm 24 is provided with a radially inwardly directed flange 30 which provides a seat for a nozzleplate 32. The nozzleplate 32 is preferably circular as illustrated, but may be rectangular if desired. As shown more clearly in FIGURES 1, 2 and 4, the plate 32 is provided with a plurality of recesses 34. The depth of the recesses 34 is substantially less than the thickness of the plate 32.

As shown more clearly in FIGURES 1 and 2, the plate 32 is provided with a plurality of different nozzle orifices 36, 38, 40 and 42. The nozzle orifices are circumfer-

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entially disposed about the plate 32. The orifices 36-42 are adapted to provide a variety of discharge flow patterns varying from a fine mist to a controlled stream discharge pattern. The greater or lesser number of orifices may be utilized. In its simplest embodiment, the plate 32 may be provided with a single orifice. This feature will enable the manufacturer to use the actuator mechanism illustrated on each of the various types of aerosol containers and only vary the nozzleplate 32 depending upon the type of discharge pattern desired.

The plate 32 is selectively retained in a predetermined position by means of two tabs 44. Each tab 44 has one end 46 which is adapted to be disposed within the juxtaposed recess in the plate 32. The thickness of the tab 44 corresponds with the depth of the recess 34. The other end of the tabs 44 have a hole therein through which a screw 48 extends. The screw 48 is adapted to cooperate with internal threads on a hole in the arm 24. The screws 48 may be selectively loosened and the plate 32 rotated to a disposition wherein the preselected orifice such as orifice 38 is to the left of the center of the plate 32 in FIGURE 2. Thereafter, pressure may be applied on the knurled section 26 to pivot the arm 24 to the disposition illustrated in FIGURE 4. In doing so, it will be noted that the orifice 38 will be in line with the end of the discharge conduit 14. The plate 32 will abut such end of conduit 14 and cause the conduit 14 to reciprocate in the direction of the arrow illustrated in FIGURE 4. After the conduit 14 is reciprocated in said direction for a sufficient distance to cause a valve to unseat, the material 49 will discharge from the container 12 in the flow pattern illustrated.

If a different flow pattern is desired, the screws 48 are loosened and the plate 32 rotated to a position wherein another one of the orifices is positioned so that it may be in line with the end of the discharge conduit 14 when the arm 24 is in the position illustrated in FIGURE 4.

If the plate 32 were rectangular in plan view, it will be seen that it is necessary to physically remove the plate 32 each time it is desired to change the position of the orifices. By using a circular plate 32, the plate 32 may be rotated when changing orifices. If desired, a detent device may be substituted for the recesses 34 and the tabs 44.

FIGURE 5 illustrates an alternative embodiment of a mounting of the plate 32 on the arm 24. The embodiment in FIGURE 5 provides a plate which is permanently prepositioned on the arm by the manufacturer thereof.

As shown more clearly in FIGURE 5, the arm 24' is provided with a hole terminating at a radially inwardly directed flange 30' in the same manner as described above. The plate 32' is supported by the flange 30' in the same manner as described above. The plate 32' is provided with a plurality of orifices such as orifice 36' and orifice 38'. The plate 32' is provided with recesses 34' which are identical with the recesses 34. Hence, it will be noted that the plate 32' is identical with the plate 32.

The arm 24' is provided with a pair of recesses 54 which extend radially outwardly from the hole in the arm 24'. The recesses 54 receive one end 52 of a L-shaped member 50. The other end 56 of the member 50 is adapted to be bent to a disposition wherein it lies in the recess 34'. Hence, the plate 32' will be fixedly secured to the arm 24' by means of a Z-shaped member as shown more clearly at the lefthand end of FIGURE 5. The mounting means for the nozzleplate illustrated in FIGURE 5 enables the manufacturer to utilize the same plate while providing a device which is selectively preset to provide a predetermined discharge pattern.

The construction of the container 12 and the valve responsive to reciprocation of the conduit 14, per se, form no part of the present invention. Hence, it is not deemed necessary to describe these features in detail. From the above description, it is considered obvious as to the manner in which the present invention operates. The arm 24 will remain biased to the position illustrated in FIGURE

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3. When it is desired to dispense material, pressure is applied on the knurled section 26 thereby pivoting the arm 24 to the disposition illustrated in FIG. 4. When the dispensing action has been accomplished, pressure is relieved on the knurled section 26 thereby enabling the arm to pivot to the inoperative disposition illustrated in FIGURE 3.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof and, accordingly, reference should be made to the appended claims, rather than to the foregoing specification as indicating the scope of the invention.

I claim:

1. An article of manufacture comprising an aerosol container having a discharge conduit, an actuator for said conduit, said actuator being mounted upon said container, said actuator including a pivotably mounted arm, a nozzle plate supported by said arm, said nozzle plate having a plurality of orifices circumferentially disposed on said plate, each orifice having an end which has a diameter at least as great as the I.D. diameter of said conduit, said arm being mounted for pivotable movement through a range between first and second positions, a portion of said arm abutting an end of said conduit and one of said orifices being in line with said end of said conduit in the first position of said arm, means biasing said arm to its second position wherein said arm and said one orifice are spaced from said conduit, and means mounting said plate on said arm so that each of the orifices may be selectively disposed for cooperation with said conduit, whereby a variety of flow discharge patterns may be selectively obtained.

2. An article of manufacture comprising an aerosol actuator, a base plate connected to said actuator, said base plate being adapted to be secured to an aerosol container, means defining an aperture in said base plate through which a conduit on an aerosol container may extend, said actuator including an arm mounted for pivotable movement toward and away from the plane of said base plate between first and second positions, means biasing said arm to said second position, a nozzle plate, means removably securing said plate to said arm, said plate being provided with a plurality of circumferentially disposed orifices, and said arm having a hole therethrough, a radially inwardly directed flange on said arm, said nozzleplate being supported in said hole on said flange, one of said orifices being adapted to be in a dispensing position for cooperation with a conduit on a container when said arm is in its first position, and said arm being closer to the plane of said base plate when said arm is in its first position.

3. An article of manufacture comprising an aerosol actuator, a base plate connected to said actuator, said base plate being adapted to be secured to an aerosol container, means defining an aperture in said base plate through which a conduit on an aerosol container may extend, said actuator including an arm, means supporting one end of said arm on said base plate in cantilever fashion in overlying relationship to said base plate at an angle with respect to the plane thereof, said arm having a nozzle orifice, said support means mounting said arm for pivotable movement toward and away from the plane of said base plate between first and second positions, said support means biasing said arm to said second position wherein said arm extends at an angle with respect to the plane of said base plate, said orifice and said arm being adapted to be in a dispensing position for cooperation with a conduit on a container when said arm is in its first position, and said arm being closer to the plane of said base plate when said arm is in its first position, said support means including a resilient wall directly connecting the one end of said arm to one end of said base plate, said base plate being provided with resilient fingers adapted to be secured to an end of an aerosol container, said fingers extending downwardly and radially in-

wardly from said base plate so as to be adapted to engage a bead on the upper end of the container.

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