Spray head for an aerosol dispenser

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Inventor
EDWARD H. GREEN

By Cromwell, Greist & Warden
The present invention relates to aerosol dispensers and, more particularly, to a new and improved spray head for use therewith.

It is the general object of the present invention to provide a new and improved spray head for aerosol dispensers which aids nebulization or atomization of the pressurized product being dispensed therethrough.

An important object of the invention is to provide a new and improved spray head having a discharge orifice and means for imparting a swirling action to the pressurized product being dispensed as it passes through the discharge orifice whereby to aid in nebulization thereof.

A more detailed object of the present invention is to provide a new and improved spray head of the character described having a post centered in the outer end of a discharge passage extending through the spray head, a nose piece having an orifice centered therein closing the outer end of the discharge passage in the spray head and abutting against the outer end of the post, and spiral grooves formed in the outer end of the post and providing communication between the discharge passage and the spray orifice whereby to impart a swirling action to the product as it passes through the orifice.

Certain other objects of the invention will, in part, be obvious, and will in part appear hereinafter.

For a more complete understanding of the nature and scope of the invention reference may now be had to the accompanying drawings wherein:

FIG. 1 is an enlarged vertical central section taken through an aerosol dispenser spray head embodying the invention.

FIG. 2 is a further enlarged front end view looking toward the nose member of the spray head of FIG. 1.

FIG. 3 is a still further enlarged front end view of the outer end of the post of the spray head of FIGS. 1 and 2.

FIG. 4 is a horizontal section taken generally on the line 4-4 of FIG. 3.

FIG. 5 is an enlarged vertical section taken generally on the line 5-5 of FIG. 1.

As illustrated in FIG. 1, a spray head 10 embodying the invention is characterized by a main body portion 11 having a centrally located depending stem portion 12. A discharge passage 13 extends upwardly through the depending stem portion 12 and into the main body portion 11 of the spray head 10.

The spray head 10 is adapted for use on a valve aerosol container having a dispensing valve assembly of a well-known type including a valve cap having an upstanding center island and an opening formed in the top thereof, a sealing gasket seated against the underside of the top of the center island and having a central bore aligned with the opening in the top of the center island, and a valve member normally resiliently urged upwardly into fluid-tight sealing engagement with the sealing gasket whereby to prevent the escape of pressurized product from the container. A dispensing valve assembly of this type is fully described and illustrated in FIG. 1 of co-pending application, Serial No. 18,549, filed March 30, 1960, now abandoned, by Edward H. Green. The depending stem portion 12 of the spray head 10 is adapted to be sealingly inserted downwardly through the aligned openings in the top of the center island and the sealing gasket and into an upwardly opening socket formed in the top of the valve member. When the spray head 10 is depressed, the valve member is moved downwardly out of sealing engagement with the sealing gasket whereby to permit the pressurized product in the container to flow into the discharge passage 13 of the spray head 10 through a vertically extending slot 14 formed in the lower end of the depending stem portion 12 in a manner well known in the art.

Referring again to FIG. 1, a horizontally disposed discharge passage 16 of substantial diameter extends between the upper end of the vertically disposed discharge passage 13 and the outer surface of the spray head 10 at the front thereof. An enlarged diameter circular recess 17 is provided in the front of the spray dispenser 10 in centered relationship to the outer end of the horizontally disposed discharge passage 16 for a purpose which will be evident hereinafter.

A generally cylindrical post 20, which may be formed integrally with the spray head 10 and which may be attached at its inner end to the main body portion 11 thereof by a narrow neck 21, is centered in the horizontally disposed discharge passage 16. The post 20 is provided with four integral longitudinally extending external ribs 23 which are spaced equidistantly about the circumference thereof and which terminate inwardly at the outer end of the post 20. As best illustrated in FIGS. 1 and 5, the maximum outer diameter of the ribbed post 20 is substantially less than the inner diameter of the horizontally disposed discharge passage 16.

To close the outer end of the horizontally disposed discharge passage 16, a generally cup-shaped nose piece 25 is provided. The nose piece 25 is characterized by an annular wall portion 26 having an outer diameter approximately equal to the inner diameter of the horizontally disposed discharge passage 16 and an inner diameter which is approximately equal to the maximum diameter of the ribbed post 20 and by an enlarged disc-like base portion 27 having an outer diameter slightly smaller than the diameter of the circular recess 17 formed in the front of the spray head 10. The nose piece 25 is tightly fitted in the outer end of the horizontally disposed discharge passage 16 with the base portion 27 thereof being received in the circular recess 17 formed in the front of the spray head 10, with the annular wall portion 26 being tightly fitted over the ribs 23 on the post 20 and with the inner surface of the annular wall portion 26 of the nose piece 25, and with the outer surface of the annular wall portion 26 of the nose piece 25. A discharge spray orifice 30 is centered in the base portion 27 of the nose piece 25. The inner end of the orifice 30 may be slightly enlarged in diameter, as illustrated in FIG. 1.

As best illustrated in FIGS. 2 and 5, the foregoing center post 20 and nose piece 25 arrangement serves to separate or divide the horizontally disposed discharge passage 16 into four smaller circumferentially spaced passages 32 each of which is defined by a pair of adjacent ribs 25, the inner surface of the annular wall portion 26 of the nose piece 25, and by the non-ribbed portion of the outer surface of the center post 20. In this fashion direct flow of fluid is permitted from discharge passage 13, to the inner end of the horizontal passage 16, and thus, to the four circumferential passages 32. As the ribs 23 on the post 20 terminate inwardly on the outer end of the post 20, all of the passages 32 open at their outer ends into an annular space 33 (FIG. 1) defined by the outer non-ribbed end of the post 20 and the adjacent inner wall portions of the nose piece 25.

Novel passages 34 are defined between the outer end of the post 20 and the inner surface of the base portion 27 of the nose piece 25 whereby to provide communication between the annular space 33 provided at the
outer end of the post 20 and the discharge spray orifice 30. An annular V-shaped groove 35 is formed in the outer end of the post 20 about the longitudinal axis of the post as its center, as illustrated in FIGS. 3 and 4, and with the innermost portion of the groove 35 being in communication with the enlarged diameter inner end portion of the discharge spray orifice 30, as illustrated in FIG. 1. The annular V-shaped groove 35 is intersected tangentially at four locations spaced equidistantly from each other by four V-shaped grooves 37 formed in the outer end of the post 20 and having their outer ends intersecting the cylindrical surface of the post 20 at the outer edge thereof. Thus, when the spray head 19 is depressed to open the dispensing valve of the aerosol container, the pressurized product flows upwardly through the vertically disposed discharge passage 13, through the four horizontally disposed passages 32 into the annular space 33, and then through the four grooves 37 into the annular groove 35 and outwardly through the spray discharge orifice 30. As the grooves 37 intersect the annular groove 35 tangentially, a swirling action is imparted to the pressurized product being dispensed whereby to aid in nebulization or atomization of the product as it passes through the orifice 30, whereby the product is dispensed as a desirable fine spray.

It is noted that the annular groove 35 and the grooves 37 tangentially intersecting the groove 35 may be provided with a configuration V-shaped and the like, or if desirable, these grooves could be formed in the inner surface of the base portion 27 of the nose piece 25 rather than in the outer end of the post 20.

It will be understood that certain additional changes may be made in the construction or arrangement of the aerosol dispenser spray head disclosed herein without detracting from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. In an aerosol dispenser spray head of the type which has a discharge passage extending therethrough and which is operable when depressed to open a valve mounted in the top of an aerosol container whereby to disperse a pressurized product in the container therethrough, the improvement which comprises, a removable nose piece closing the outer end of the discharge passage and having a spray orifice formed therein, a post integral with said spray head centering said opening of said base portion thereof closing the outer end of the discharge passage and abutting against the outer end of said post, substantially throughout the extent thereof, and an annular wall portion thereof disposed transversely to said discharge passage, said outer end surface substantially throughout the extent thereof, and the effects of abutting against said nose piece, and means communicating directly with said discharge passage defined between said post and said nose piece for imparting a swirling action to the pressurized product being dispensed prior to its passage through said spray orifice whereby to aid in the nebulization thereof.

2. In an aerosol dispenser spray head of the type which has a discharge passage extending therethrough and which is operable when depressed to open a valve mounted in the top of an aerosol container whereby to disperse a pressurized product in the container therethrough, the improvement which comprises, a post integral with said spray head having a diameter less than that of the discharge passage centered in the outer end thereof, said post having an outer end surface disposed transversely of said discharge passage, a removable mounted nose piece closing the outer end of the discharge passage and abutting substantially throughout the extent of the surface of said post against the outer end of said post, substantially throughout the extent thereof, said post having an outer end surface extending transversely of said passages, a spray orifice centered in said nose piece, and spiral groove means defined between the outer end of said post and the inner surface of said nose piece to provide communication directly from the discharge passage to said spray orifice in a manner adapted to aid in the nebulization of the pressurized product dispensed therethrough.

3. In an aerosol dispenser spray head of the type which has a discharge passage extending therethrough and which is operable when depressed to open a valve mounted in the top of an aerosol container whereby to disperse a pressurized product in the container therethrough, the improvement which comprises, a post integral with said spray head having a diameter less than that of the discharge passage centered in the outer end thereof, said post having an outer end surface disposed transversely of said passages, a removable mounted nose piece closing the outer end of the discharge passage and abutting against the outer end of said post substantially throughout the extent thereof, a spray orifice centered in said nose piece, and spiral groove means formed in the outer end of said post in communication with the inner end of said spray orifice, and at least one groove formed on the outer end of said post with one end thereof being open to the discharge passage at the outer edge of said post and with the other end thereof tangentially intersecting said annular groove, said groove arrangement providing spiral means between the discharge passage and said spray orifice for the pressurized product dispensed therethrough whereby to aid in the nebulization of the product being dispersed.
6. In an aerosol dispenser spray head of the type which has a discharge passage extending therethrough and which is operable when depressed to open a valve mounted in the top of an aerosol container whereby to dispense a pressurized product in the container therethrough, the improvement which comprises, a post integral with said spray head having a diameter less than that of the discharge passage centered in the outer end thereof, a narrow neck integrally connecting the inner end of said post to the main body portion of the spray head, a series of external longitudinally extending ribs formed on said post, a cup-shaped nose piece removably fitted in the outer end of the discharge passage with a base portion thereof closing the outer end of the discharge passage and abutting against the outer end of said post and with an annular wall portion thereof fitted over said ribs on said post, a spray orifice centered in the base portion of said nose piece, an annular V-shaped groove formed in the outer end of said post in communication with the inner end of said spray orifice, and a plurality of circumferentially spaced V-shaped grooves formed in the outer end of said post with one end of each being open to the discharge passage at the outer edge of said post and with the other end of each tangentially intersecting said annular V-shaped groove, said groove arrangement providing spiral passage means between the discharge passage and said spray orifice for the pressurized product dispensed therethrough whereby to aid in nebulization of the product being dispensed.

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