SPRAY MIST DISPENSING APPARATUS


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3 Claims. (Cl. 239—415)

In general, this invention relates to a new and improved spray mist dispensing apparatus and more particularly to a spray mist dispensing nozzle capable of directing a liquid spray without initial dripping or divergent scattering.

In the modern beauty salon, a hairdresser will spray a hair set mist on the customer's coiffure to hold it in place. The spray is achieved by dispensing air through a nozzle and directing it at a continuously dispensed liquid so as to create a fine mist which is controlled by the hairdresser.

However, in the past, the liquid lotion for the hair spray would initially drip before becoming a mist. Additionally, since the lotion was also dispensed through a nozzle, the pressure from the air nozzle would cooperate with the pressure from the liquid or lotion nozzle to scatter the resultant spray-liquid droplet mixture in a direction not intended by the hairdresser.

Therefore, it is the general object of this invention to avoid and overcome the foregoing and other difficulties of prior art practices by the provision of a new and better spray mist dispensing apparatus.

A further object is the provision of new and better spray mist dispensing apparatus which will automatically eliminate initial dripping or scattering from the air in liquid nozzles.

A still further object of this invention is the provision of a new and more simple spray mist dispensing apparatus which can be simply and easily operated and cleaned with little or no effort.

Another object of this invention is the provision of a more simple and better spray mist dispensing apparatus wherein the direction of spray is automatically determined by the direction of the air nozzle.

Other objects will appear hereinafter.

For the purpose of illustrating the invention, there is shown in the drawings a form which is presently preferred; it being understood, however, that this invention is not limited to the precise arrangements in instrumentality shown.

FIGURE 1 is a perspective view of the spray mist dispensing apparatus of the present invention.

FIGURE 2 is a cross sectional view of the apparatus of FIGURE 1 taken along lines 2—2.

FIGURE 3 is a cross sectional view of the apparatus of FIGURES 1 and 2 taken along lines 3—3 in FIGURE 2.

FIGURE 4 is a cross sectional view of the apparatus of the present invention taken along lines 4—4 in FIGURE 3.

FIGURE 5 is a cross sectional view of the apparatus of the present invention taken along lines 5—5 in FIGURE 3.

In FIGURE 1, the spray mist dispensing apparatus of the present invention is generally designated by the numeral 10. The apparatus 10 includes a main body 12 which is substantially rectangular. Extending outwardly from one face 13 of the main body 12 is a liquid nozzle extension 16. The liquid nozzle extension 16 supports a liquid dispensing nozzle 14 parallel to the face 13.

On the face 13 is in line with the liquid dispensing nozzle 14 is a suitable air dispensing nozzle 18. The air dispensing nozzle 18 is spaced from and perpendicular to the liquid dispensing nozzle 14 and in the same horizontal plane.

The liquid dispensing nozzle receives liquid such as a hair spray lotion through a suitable conduit 20 which shall be generally designated as a liquid supply means. The air nozzle 18 receives pressurized air through a suitable conduit 22 which shall be generally designated as a pressurized air supply means.

The conduits 20 and 22 are removably secured to bushings 24 and 26 respectively so that the apparatus 10 can be utilized with other types of hair spray lotions in accordance with the desires of a customer.

The dispensing apparatus 10 includes an actuator 28 mounted above the main body 12 and supported by the air valve stem 32. The valve stem 32 is threadably engaged with the actuator 28. Additionally, a liquid valve stem 30 is provided which has a lost motion connection with the actuator 28 by reason of an enlarged recess 34. The actuator 28 is spaced from the main body 12 by the air valve stem 32 a distance greater than the space between the end of liquid valve stem 30 and the bottom of recess 34.

The liquid valve stem 30 extends through a vertical bore 36 formed in the main body 12. The air valve stem 32 extends through a second vertical bore 38 parallel to bore 36 in main body 12.

The liquid valve stem 30 is sealed in the bore 36 for axial movement by a suitable O-ring 40. The air valve stem 32 is sealed for vertical movement in the bore 38 by O-ring 42. The bore 36 widens at its lower end to form a valve seat 43. An O-ring 44 on the valve stem 30 rests against the valve seat 43 in the closed position shown in FIGURE 3. The bore 38 widens at its lower end into a valve seat 45 against which rests an O-ring 46 connected to valve stem 32. The valve stem 32 is shown in its closed position in FIGURE 3.

The valve stems 30 and 32 are expanded to form guide heads 48 and 50 respectively which will cooperate with the O-rings 44 and 46 and valve seats 43 and 45 to seal the bores 36 and 38 when the actuator 28 is in the position shown in FIGURE 3.

The guide portions 48 and 50 each have four outwardly extending keys 52 and 54 respectively which maintain the valve stems 30 and 32 in fixed alignment for movement only in a vertical direction. The valve stems 30 and 32 are biased to the closed position shown in FIGURE 3 by suitable springs 56 and 58 placed between the guide heads 48 and 50 and bushings 24 and 26 respectively.

The liquid nozzle 14 is connected to the bore 36 between O-ring 40 and 44 by a passage 64 extending from bore 36 into extension 16 and terminating at a needle valve 66 within the extension 16. The needle valve 66 controls the flow of liquid through passage 64 to a passage 68 leading to liquid nozzle 14.

The pressurized air nozzle 18 receives air from bore 38 intermediate O-rings 42 and 46 through a suitable passageway 70 extending between nozzle 18 and bore 38.

In operation, the conduit 28 supplies hair set lotion through the bushing 24 behind the O-ring 44. Similarly, pressurized air is fed through conduit 22 and bushing 26 behind O-ring 46.

The hairdresser need only press downwardly on actuator 28 to directly receive a hair spray mist without dripping or scattering. Pressure of actuator 28 on valve stem 32 downwardly and removes O-ring 46 from valve seat 45. Air under pressure is then passed through bore 38 into passageway 70 and out nozzle 18.

The valve stem 30 is not immediately actuated by downward movement of actuator 28 because of recess 34. The recess 34 provides a lost motion connection between the actuator 28 and the valve stem 30. After pressurized
air is transmitted through nozzle 18, the continued downward movement of actuator 28 moves valve stem 30 downwardly unsealing O-ring 44 from valve seat 43.

Liquid hair set lotion then passes upward through passageway 64 and passageway 68 in accordance with the setting of needle valve 66. This liquid then passes out of liquid nozzle 14 and in a direction perpendicular to the flow of pressurized air from air nozzle 18. Pressurized air having been previously transmitted through nozzle 18, instantly forms a mist of the liquid dispensed through nozzle 14. The liquid will not drip from nozzle 14 as the pressurized air will already be passing immediately in front of it. Also, the pressure from the liquid nozzle will not have an opportunity to cause scattering of the resultant mist as no liquid droplets will be formed and the resultant direction of the flow of mist will be determined by the air spray nozzle 18.

There are times, when solid material may build up within the liquid flow path causing clogging of the spray mist dispensing apparatus. In order to clean the path 68 and the nozzle 14, it is only necessary to remove the valve nozzle 66 and push a wire through the path 68 till it is cleaned. Further, the nozzle 14 is screw threaded to the extension 16 and can be separately removed if necessary.

To clean the path 64, a second path 72 has been provided in the main body 12 in line with the path 64 and extending from a face 73 opposite from face 13 of main body 12. The path 72 has one end closed by a suitable plug hole screw 74. Additionally, a hole 76 has been formed in the valve stem 30 immediately adjacent and in line with the paths 72 and 64 when the valve is in its closed position. By passing a wire through path 72, hole 76 and path 64, the path 64 can be unclotted without the necessity of removing the valve stem. The hole 76 does not in any way interfere with the operation of the dispensing apparatus.

The air passage 70 can be easily cleaned by removing the air nozzle 18 which is screw threaded into the main body 12.

The valve stems can be removed by removing the bushings 24 and 26 which are screw threaded into the main body 12. Once the valve stem 30 has been removed, the actuator 28 can be unscrewed from the valve stem 32 thus permitting the stem 32 to be removed through the opening provided by the removal of bushing 26. In this way, the entire dispensing apparatus can be simply and easily cleaned when necessary.

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. Spray mist dispensing apparatus comprising a main body, a liquid dispensing nozzle projecting outwardly from said main body, a presurized air dispensing nozzle spaced from said liquid dispensing nozzle and projecting outwardly from said main body, means for mounting said liquid dispensing nozzle on said main body spaced from said air dispensing nozzle with the longitudinal axis of said air dispensing nozzle intersecting the longitudinal axis of said liquid dispensing nozzle, liquid supply means for supplying liquid to said liquid dispensing nozzle, air supply means for supplying air to said air dispensing nozzle, a pair of parallel, longitudinally extending bores through said main body, means communicating said liquid supply means and said air supply means with one end of one of said parallel bores respectively, means communicating said air and liquid dispensing nozzles with one of said parallel bores respectively, air flow means in one of said bores intermediate its ends for controlling the flow of air from said air supply means to said air dispensing nozzle, liquid valve means in the other of said bores intermediate its ends for controlling the flow of liquid from said liquid supply means to said liquid dispensing nozzle, a valve actuator above said main body, said valve actuator being operative to simultaneously control said liquid and said air dispensing nozzles and said valve means, said valve actuator being integrally coupled to said air valve means, said valve actuator being connected to said liquid valve means through a lost motion device, biasing means in said body for biasing said liquid and air valve means to a closed position preventing the flow of liquid and air in said dispensing nozzle and said valve means, said actuator being operative upon movement thereof in one direction through said lost motion device to open said air valve means to supply air from said air supply means through said air dispensing nozzle before opening said liquid valve means to supply liquid from said liquid supply means to said liquid dispensing nozzle and operative upon movement in an opposite direction through said lost motion device to close said liquid valve means before closing said air valve means.

2. The spray mist dispensing apparatus of claim 1 wherein said air valve means includes an air valve stem projecting upwardly from said main body through one of said bores, means threaded connecting said air valve stem to said actuator, said liquid valve means including a liquid valve stem projecting upwardly from said main body through the other of said bores, said liquid valve stem being spaced from an abutment surface of said actuator, said actuator being mounted for movement toward and away from said liquid valve stem, said actuator being operative to linearly displace said liquid valve stem after engagement of said abutment surface with said liquid valve stem.

3. Spray mist dispensing apparatus of claim 2 wherein said means for connecting said air valve stem to said actuator includes a screw threaded recess cooperative with screw threads on said air valve stem for threadably engaging said actuator to said air valve stem, said actuator having a second recess on the same side thereof as said screw threaded recess, said second recess having a lesser cross sectional area than said liquid valve stem, said liquid valve stem extending therein, said air and liquid valve stems being mounted in said main body for reciprocational movement therein, said actuator being spaced from said main body when said air and liquid valve means are biased to a closed position, said liquid valve stem being spaced from the bottom of said second recess a distance less than said space between said actuator and said main body when said air and liquid valve means are biased to a closed position.

4. The spray mist dispensing apparatus of claim 1 wherein said main body includes a first surface, an extension integral with said first surface, said extension having a second surface thereof and said first surface, said air dispensing nozzle and said liquid dispensing nozzle being mounted on said first and second surfaces respectively, said air and liquid dispensing nozzles being located in the same horizontal planes, said air dispensing nozzle being directed at the front of said liquid dispensing nozzle.

5. The spray mist dispensing apparatus of claim 4 including a needle valve in said main body between said liquid valve means and said liquid dispensing nozzle, said liquid dispensing nozzle having a longitudinal passageway therethrough connected to said needle valve, said needle valve including a longitudinal passageway extending from said liquid dispensing nozzle passageway to a surface of said extension opposite from said second surface whereby said liquid dispensing nozzle passageway can be cleaned by removing said needle valve.

6. The spray dispensing apparatus of claim 5 wherein said liquid valve means includes a liquid valve stem, said liquid valve stem being mounted for reciprocable movement in said bores, said needle valve being connected to said liquid valve stem bore by a connecting passageway, said main body having a clean out passageway in line
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with said connecting passageway extending from said liquid valve stem bore to a third surface opposite from said first surface on said main body, and a clean out passageway plug, said clean out passageway plug being removably secured within said clean out passageway adjacent said third surface.

7. The spray mist dispensing apparatus of claim 6 including liquid valve stem key means, said liquid valve stem key means preventing rotative movement of said liquid valve stem in said bore and permitting longitudinal movement thereof, said liquid valve stem having a hole therethrough, said biasing means biasing said liquid valve stem to a closed position, said liquid valve stem hole being in line with said connecting passageway and said clean out passageway when said liquid valve stem is biased to a closed position.

8. The spray mist dispensing apparatus of claim 1 wherein said air valve means and liquid valve means includes a stem projecting upwardly from said main body through each bore, said air valve stem being threadedly connected to said valve actuator, said liquid valve stem being connected to said valve actuator through a lost motion device, an O-ring seal on each valve stem between each valve means and the end of each bore through which stem extends, said means communicating said nozzles with said bores respectively including conduits within said main body opening into said bores between said O-ring seals and valve means.

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