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P. R. RICCIO

3,335,965

ONE-PIECE AEROSOL SPRAY HEAD

Filed June 22, 1966

Fig. 1.

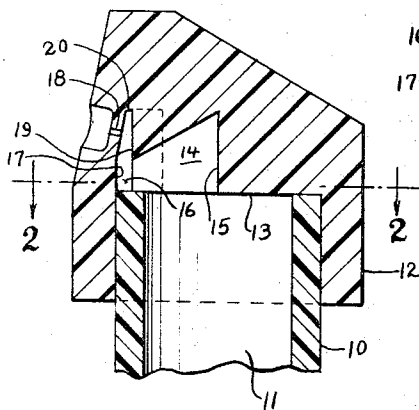


Fig. 2.

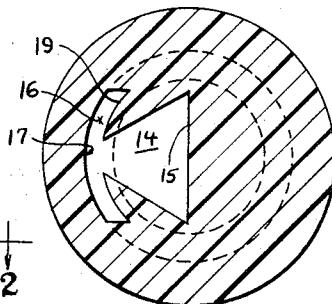


Fig. 3.

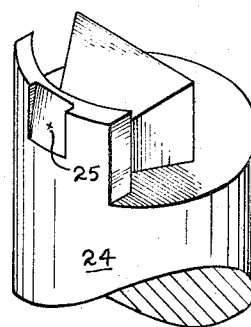


Fig. 4.

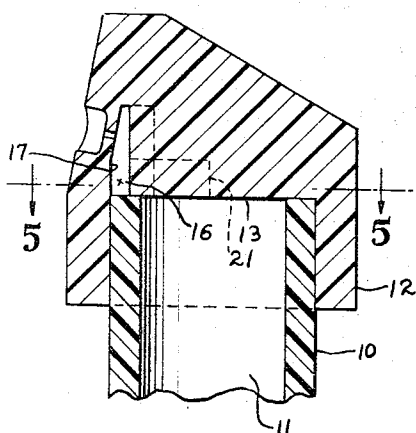


Fig. 5.

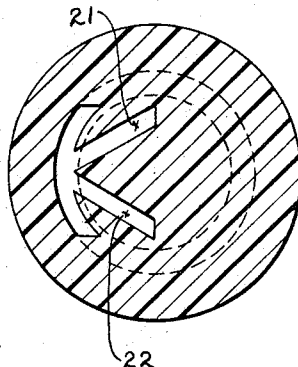


Fig. 6.

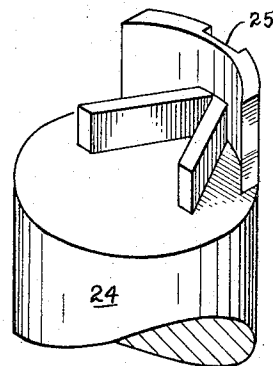


Fig. 7.

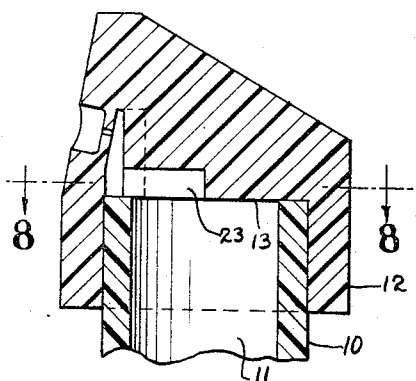


Fig. 8.

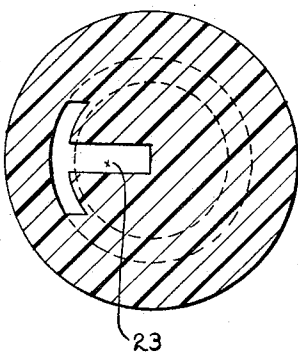
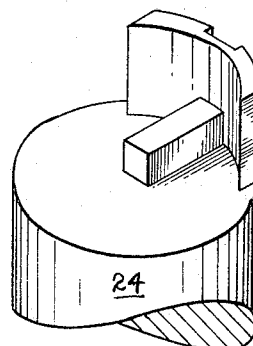


Fig. 9.



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ONE-PIECE AEROSOL SPRAY HEAD

Pasquale R. Riccio, Salem, N.H., assignor to Scovill Manufacturing Company, Waterbury, Conn., a corporation of Connecticut

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4 Claims. (Cl. 239—589)

This invention relates to an improved spray head for aerosol containers which is adapted to be molded in one piece from a suitable plastic material and which incorporates an improved flow passageway system.

An object of the invention is to accomplish better mechanical breaking up of the fluid particles along the flow path to the discharge orifice. An important reason for this result is the sudden and abrupt change of direction when the fluid flow is directed from a horizontal path squarely against a vertical surface.

Another purpose is to obtain the improved flow passageway system without employing complicated mold structures and wherein all portions, with the exception of the orifice, can be formed by extensions on the core which forms the socket in the head. The result is accomplished, furthermore, without any lateral projections which might cause trouble in drawing the core.

In the accompanying drawing, I have illustrated three embodiments which the invention may assume in practice. In the drawing:

FIG. 1 is a vertical central section of a spray head positioned on the end of the aerosol discharge tube;

FIG. 2 is a cross-section on line 2—2 of FIG. 1;

FIG. 3 shows in perspective the core for molding the socket and flow passages;

FIGS. 4, 5 and 6 are views similar to FIGS. 1, 2 and 3 respectively, but dealing with a different specific form of the invention;

FIGS. 7, 8 and 9 also correspond to FIGS. 1, 2 and 3, but show a somewhat simpler third form of the invention.

There is indicated in the drawing a common cylindrical shape of aerosol discharge tube 10 having a vertical flow passage 11. The spray head or button, as it is commonly called, has a cylindrical wall 12 forming a socket which fits snugly around the discharge end of the tube in fluid-tight relationship. The end wall 13 of the socket abuts the end of the tube so that there is no difficulty in locating the spray head on the tube.

In each of the three embodiments, there is a horizontal passage opening downwardly into the socket and in unrestricted communication with the tubular passage 11. In FIGS. 1 and 2, this passage designated 14, starts from the central portion of the head indicated by the line 15, as relatively wide and deep and tapers downwardly and inwardly as it extends radially outwardly to a vertical chamber 16. This vertical chamber has its outer wall surface 17 formed as a continuation of the inner wall surface of the socket from which it extends upwardly beyond the region of the laterally directed orifice 18. This chamber 16 also is wide enough to extend some distance to both sides of the orifice 18 and the horizontal passage 14 leads through the inner wall surface 19 directly opposite the outer vertical wall surface 17.

In operation, the fluid flowing upwardly and through the discharge tube 10 at a low velocity, freely enters the passage 14 where it gradually increases in velocity toward

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the chamber 16. The stream from this horizontal passage is thus directed across the narrow chamber 16 against the vertical wall surface 17. This requires an abrupt and sudden change of direction, principally upwardly, for effectively breaking up the fluid particles. A still further break-up of the particles may occur when the fluid stream strikes the upper end wall 20 of the chamber 16 where it is again required to change direction. The result is, of course, a considerable turbulence in the chamber 16 before the final discharge through orifice 18.

The action in the second form shown in FIGS. 4, 5 and 6 is quite similar. Here, instead of the one tapering passage, there are provided two angular horizontal passages 21 and 22 which lead, however, to a common opening into the chamber 16. The resultant effect is to direct the flow perpendicularly against the wall surface 17 as in FIGS. 1 and 2.

In FIGS. 7, 8 and 9, I have indicated a still simpler form of the invention where there is a single radial passage 23. The choice of one form or the other, as well as the particular sizes of the cross-sections of the passages and chamber, will be chosen in accordance with the particular spray pattern desired in any individual case.

It will be observed from FIGS. 3, 6 and 9 that the cores in each instance have suitably formed projections from a cylindrical plug 24 to make the desired flow passageways. In no case is there any lateral projection beyond the cylindrical surface. The small notch 25 in each of the cores is to provide material for accommodating the discharge orifice which is shown as inclined at a slight upward angle.

It will thus be evident to those skilled in the art that I have provided a one-piece molded spray head with a flow passageway system which will effect an adequate breaking up of the fluid particles by reason of the required abrupt change in direction of a fluid stream which has already gathered substantial velocity. Also, this result is accomplished without the need for complicated or difficult to handle molds since all flow passages, except for the orifice itself, are formed by straight line movement of a single core.

What I claim is:

1. For an aerosol container, the combination with a discharge tube, having a fluid passage opening through its discharge end in the direction of its length; of a one-piece molded spray head having a socket snugly embracing said tube with said discharge end abutting the end wall of said socket, said head having a flow passageway system consisting of

- a laterally directed discharge orifice located a substantial distance above the discharge end of said tube;
- a vertical chamber communicating with said orifice and extending from said socket upwardly beyond the region of said orifice and extending also to both sides of said orifice, the outer wall surface of said chamber being an extension of the inner surface of said tube socket, and
- horizontal passage means opening downwardly into said socket and having unrestricted communication with said tube, said passage means leading into the bottom portion of said chamber below said orifice and directly opposite the outer vertical wall thereof whereby a horizontal stream of fluid strikes squarely against the surface of said outer wall and

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is forced suddenly to change direction causing mechanical break-up of the fluid particles.

2. The combination defined in claim 1 wherein said horizontal passageway decreases in cross-section from the central portion of the head to the vertical chamber.

3. The combination defined in claim 1 wherein said horizontal passage extends in a radial direction.

4. The combination defined in claim 1 wherein said horizontal passage means consists of a plurality of angular passages merging into a single opening to the vertical chamber.

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M. HENSON WOOD, JR., *Primary Examiner*.

M. MAR, *Assistant Examiner*.