United States Patent

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[31] **P 17 75 533.8**

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[54] **DISPENSING HEAD FOR AN AEROSOL CONTAINER**
6 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **222/494,** 222/402.12, 239/534
[51] **Int. Cl.** **B65d 5/72**
[50] **Field of Search** 222/402.12, 490, 494, 491, 492, 402.19, 207, 398; 239/2.71, 334

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ABSTRACT: A dispensing head for an aerosol container with a spray opening which can be closed against the atmosphere, the dispensing head being attachable to a tubular stem of a release valve of the associated aerosol container.

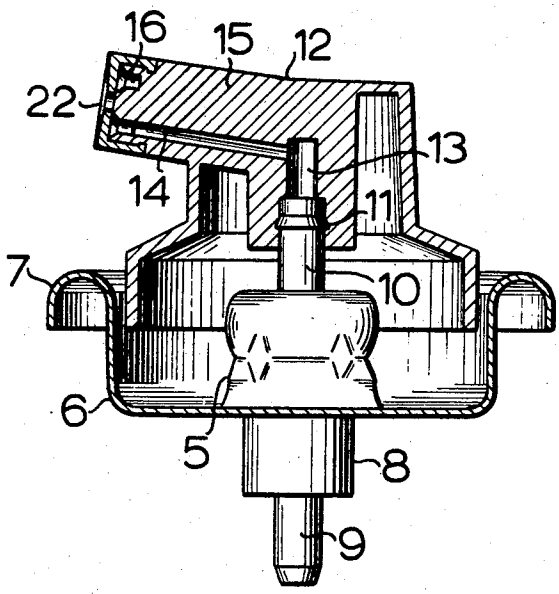


FIG. 1

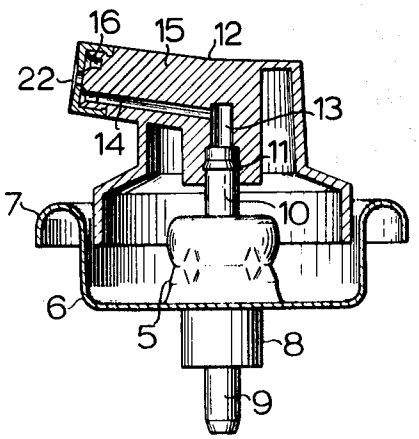


FIG. 2

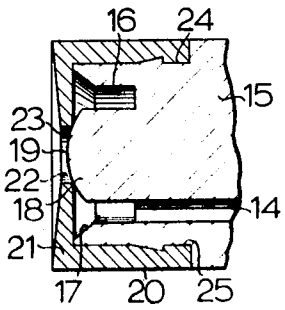


FIG. 3

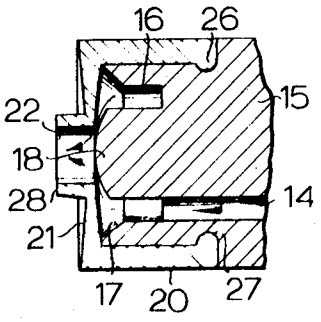
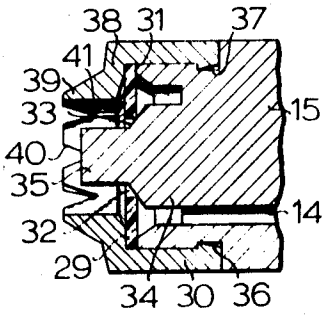


FIG. 4



DISPENSING HEAD FOR AN AEROSOL CONTAINER

Depending on the kind of product filled into the aerosol container difficulties can arise due to residues remaining after the firm dispension in the spaces between the seat of the tubular stem of the release valve and the discharge opening of the dispensing head. Such residues choke the channels in the dispensing head after drying, agglutination or resinification due to access of air so that the product can no longer be dispensed from the aerosol container, thus rendering it without any value. Moreover, residues of food are susceptible to bacterial attack, mold development etc.

Object of the invention is to provide a dispensing head with an end opening automatically closing against the atmosphere with which it is possible to dispense liquid or pasteous products as strand, spray or foam.

The solution according to the invention is providing the discharge opening of the dispensing head with a relief pressure valve.

The invention is explained more detailed by means of the attached drawing which shows in

FIG. 1 a vertical section through a dispensing head with a relief pressure valve attached to the stem of the release valve;

FIG. 2 the relief pressure valve according to FIG. 1 in closed condition in a larger scale;

FIG. 3 the relief pressure valve according to FIGS. 1 and 2 in open condition and

FIG. 4 another embodiment of a relief pressure valve in closed condition.

According to FIG. 1, the housing 8 of a release valve is fixed within a dome 5 of a valve plate 6 the upper rim 7 of which is closely rolled up on the edge of the aerosol container not shown. A nipple 9 for attaching a dip tube which is not shown extends from the bottom of the housing 8. A dispensing head 12 is fitted on a tubular valve stem having a ring-shaped claw 11. The claw 11 ensures a tight and close seat of the dispensing head on the stem 10. A bore within the dispensing head being axially directed to the valve stem 10 forms an expansion chamber 13 from which a passage channel 14 extends within a laterally extending projection 15 of the dispensing head ending in an annular chamber 16 at the front of the projection 15. The chamber is enlarged in discharge direction by a chamfering 17 of the outer wall. A central portion 18 is disposed in the middle of the annular chamber and has a convex front face 19. An adapter sleeve 20 engages over the front end of the projection whereby the bottom of the adapter sleeve forms a membrane 21 with a discharge opening 22 in the middle of it. The inner part of the edge 23 of the discharge opening facing the front face 19 of the central portion 18 fits closely against the front face with elastical prestressing. The membrane 21 becomes increasingly thinner towards the discharge opening so that its elasticity is increased. The prestressing of the adapter sleeve is achieved by an inner shoulder 24 at the end of the adapter sleeve opposite the membrane, the inner shoulder engaging tightly, but detachably into an annular groove 25 of the projection 15 with a snap effect.

FIG. 3 shows the valve according to FIG. 2 in open condition so that the product within the aerosol container can be dispensed out of the dispensing head in the direction of the arrows as shown. As a variant, the adapter sleeve 20 has a rounded inner shoulder 26 and the projection 15 has a corresponding annular groove 27. From the edge of the discharge opening of the membrane 21 projects a tubular socket 28 which ensures the delivery of a strand of the product.

According to FIG. 4 a plate-shaped membrane 29 is formed separately in relation to an adapter sleeve 30. The outer edge of the membrane 29 engages elastically prestressed a front face 31 of the projection 15. The inner edge of the rim 32 of the discharge opening in the middle of the membrane 29 engages sealingly and also under an elastic prestressing effect a conical sealing surface 33 of a central portion 34. The central portion 34 is tapered to a diameter in the area of the discharge opening of the membrane which is essentially smaller than the diameter of the discharge opening and then goes over in a cylindrical extension 35 which projects far through the discharge opening in spray direction.

The adapter sleeve 30 is provided with a sawtooth-shaped claw 36 on the inner side of its end turned away from the spray direction whereby the adapter sleeve engages with this claw in an annular groove 37 of a cross section of the projection 15. The front face 31 is set back in relation to the contact line of the edge of the discharge opening of the membrane to the conical sealing surface 33 opposite to the spray direction so that the middle of the membrane is slightly arched in spray direction and therefore fits with elastical prestressing to the conical valve seat surface 33. The inner shoulder 38 of the adapter sleeve engaging with the membrane 29 at the outer edge is extended tubularlike at 39 in spray direction whereby this tubular extension is provided on its circumference at equal distances with recesses 40 which are enlarged in spray direction. Consequently the cylindrical pivot 35 and the tubular extension 39 of the adapter sleeve form a ring chamber 41. This arrangement is especially recommendable for foam products as for example whipped cream. Obviously it would also in this case be possible to provide the membrane beveled to the discharge opening. By this it is possible to adjust the opening and closing pressure respectively depending on the kind of the material, the prestressing and the thickness of the membrane. Compared with the internal pressure of the aerosol container, however, this opening respectively closing pressure of the membrane will be low and will be at most approximately one-tenth of this pressure so that always a practical free delivery of the product out of the aerosol container is assured.

At operation of the release valve a counterpressure develops in the inner chambers of the dispensing head until the counterstress of the membrane is overcome and the product can flow The membrane then A closing of the release valve the pressure inside the dispensing head diminishes to the closing pressure of the membrane. The membrane then abuts to the central portion and seals the bore hermetically.

It is also obvious that the diameter of the discharge opening in the membrane can be provided in different measures depending on the special desired operating conditions so that the delivery of the product is possible as well in a strand as in foam or spray. It is clear that the material used for the dispensing head and the membrane must be resistant against the products and must show the necessary mechanical properties. Polyethylene and mixed polymerides derived from ethylene and vinyl acetates meet these requirements satisfactorily and can be used in this process.

What I claim is:

1. In an aerosol container having a discharge valve with a tubular stem movable between a closed extended position n and a depressed discharging position, a dispensing head attached at one end to said tubular stem and having an other free end formed with an annular chamber extending from said free end into said dispensing head and defining at said free end a central portion having an end face; passage means arranged eccentrically with respect to said central portion and providing communication between said tubular stem and said annular chamber; and a membrane extending over said chamber and said end face and being formed in the region of said end face with an opening having an inner edge, said membrane being attached in prestressed condition to said other free end so that said inner edge tightly engages said end face of said central portion, whereby upon movement of the tubular stem to its depressed discharging position by exerting pressure on said dispensing head, pressurized material will pass in a turbulent manner from said eccentrically arranged passage means into said annular chamber and outwardly deflect said membrane so as to be discharged through the gap forming between said inner edge and said end face, while upon release of said dispensing head said inner edge will reengage said end face to prevent air to enter into said annular chamber and said passage means.

2. A dispensing head as defined in claim 1, wherein said end face of said central portion is convex.

3. A dispensing head as defined in claim 1, wherein said membrane is integrally formed with an outer annular skirt having an inwardly extending annular shoulder at the free end thereof and wherein said dispensing head is formed spaced from said other free end thereof with an annular groove receiving said annular shoulder.

4. A dispensing head as defined in claim 3, wherein the thickness of said membrane gradually decreases from said skirt toward said opening.

5. a dispensing head as defined in claim 1, wherein said annular chamber flares outwardly toward said membrane.

6. A dispensing head as defined in claim 1, and including a tubular projection integral with said membrane about said opening therein and projecting away from said end face.