FOAM DISPENSING HEAD FOR AEROSOLS

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FOAM DISPENSING HEAD FOR AEROSOLS

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This invention is a foam dispensing head for aerosols and more particularly that type of aerosols which are adapted to be dispensed in the form of foam.

The dispensing of foam forming aerosols has been here-tofore practiced with widely different constructions, but all of them have been of a complicated nature.

The object of the present invention is to provide a structure of extreme simplicity, one which may be economically die molded from plastics or polymers and which will function with high efficiency in the carrying out of its intended purposes.

The invention, in its preferred form, is of unitary construction. It embodies, generally speaking, a cup adapted to fit over the neck of a conventional aerosol container. The cup comprises an elastic diaphragm, the inner side of which has a discharge passage. One end of said passage fits over and is adapted to receive the valve stem of the dispenser, while its other end forms a discharge nozzle from which the foam is adapted to issue. The cup is fitted onto an aerosol container with the diaphragm in a normally retracted condition to permit closing of the dispensing valve of said container. When it is desired to dispense the aerosol, thumb pressure by an operator, applied against the center of the diaphragm, will cause unsealing of the dispensing valve and the discharge of such aerosol in the form of foam. The structure is constituted as to permit of unlocking the containers, without inadvertent release of the contents thereof. Moreover, its operation is so simple that it may be readily accomplished by the most uninitiated persons without recourse to directions. It is also cheap, effective and efficient.

Features of the invention, other than those adverted to, will be apparent from the hereinafter described and appended claims, when read in conjunction with the accompanying drawings.

The accompanying drawing illustrates one practical embodiment of the invention, but the construction therein shown is to be understood as illustrative, only, and not as defining the limits of the invention.

Fig. 1 is a top view of the head embodying the present invention.

Fig. 2 is a bottom view of the same.

Fig. 3 is a section on the line 3—3 of Fig. 1.

Fig. 4 shows the head on a container with the diaphragm of the head in a position corresponding to the closed position of the dispensing valve.

Fig. 5 is a like view showing the diaphragm depressed to open the valve and the dispensed foam from the container.

The dispensing head of this invention shown in the drawing is in the form of a cap which, in practice, may be made from rubber or any other suitable plastic having similar characteristic although, by preference, I mold the same from some suitable synthetic plastic, such as polyethylene, nylon or the like. These materials may be slightly stretched, are pliable to varying degrees depending upon the thickness of the walls and are not detrimentally affected by the aerosol compounds dispensed therethrough, nor do they contaminate such compounds. They are also readily shaped by simple pressure molding practice.

The cup is of generally tubular form. It has a side wall 1, the lower portion of which is flared outwardly and is provided internally with an annular channel 2 which may be sprung over the head of an aerosol container or the cup with which some of such containers are provided. Figs. 4 and 5 indicate such a cup at e. The elasticity of the material from which the cap is made readily adapts it to be thus attached to a container or cup and when the head of the latter has been received into the channel 2 at the bottom of the cap, the union between the two will be permanent.

I have shown in Figs. 4 and 5 the type of cup shown in my Patent No. 2,631,814, granted March 17, 1953. Such a cup carries the dispensing valve with its tubular valve stem v projecting upwardly from the central portion of the cup and a nipple z depending therefrom for attachment of a conventional dip tube.

The top wall of the cup is spaced some little distance from the upper edge of the side wall 1 and constitutes a diaphragm 3 which extends across the upper portion of the cap. By so positioning the diaphragm, the side wall projects above the diaphragm to form a protective head 4 so that, if aerosol containers equipped with this invention are stacked one upon another, the weight of the superimposed containers will not flex the diaphragm. This diaphragm is preferably made somewhat thinner than the side wall 1, so as to have more inherent flexibility.

Molded integral with the inner side of the diaphragm 3 is a radial rib 5 which radiates from a central hub 6 to and is extended beyond the side wall 1 to form a spout 7. The extending portion of this spout is reinforced from underneath by gussets 8.

The hub 6 and rib 5 are cored to provide a discharge passage 9. The inner end of this passage is formed within the hub and provides a cylindrical chamber 10 adapted to receive the upper end of the tubular valve stem v and at the top of this chamber is an offset forming a shoulder 11 adapted to bear against the upper end of the stem without sealing the passage through said valve stem.

When the cap is applied to a dispensing container as stated, the spring conventionally associated with the valve, together with the pressure in the container, will normally cause the diaphragm to be sprung slightly upward, as shown in Fig. 4 and the dispensing valve will occupy a closed position. The parts are so shown in Fig. 4, although, if desired, the arrangement may be such that the diaphragm will be perfectly flat at this time. This diaphragm is, however, relatively thin and elastic, so that the slight distortion shown in Fig. 4 will not affect the closing of the dispensing valve.

The parts will remain in this condition indefinitely with the valve sealed, until such times as it is desired to dispense part or all of the contents of the container. At such times the application of thumb pressure to the exterior of the diaphragm will flex the diaphragm downwardly against the upper end of the valve stem, cause the dispensing valve to be unsealed and the aerosol composition will exit through the valve stem and through the passage 9 to issue from the spout 7, as indicated in Fig. 5. That portion of the channel 9 within the spout 7 is preferably made somewhat wider than the remainder of the channel to facilitate the building up of foam in the spout as it issues therefrom.

It will be apparent from the foregoing detailed description that the dispensing head of this invention embodies, essentially, a flexible diaphragm 3 and that the side wall 1 constitutes a peripheral skirt about the same. The purpose of the skirt is to secure the diaphragm to an aerosol container in such position that said diaphragm
will overlie the end of the valve stem of such container, so that pressure on the exterior of the diaphragm will depress the valve stem, open the valve, and permit the discharge of the contents of the container through the hollow valve stem. As the aerosol material is thus discharged, it is led to the exterior of the cup through the discharge passage which passes through one wall of the cap, specifically shown as the side wall, and terminates exteriorly of the side wall in an enlarged spout. The head 4 provides an upstanding wall about the periphery of the diaphragm so that the stacking of containers, thus equipped, one on another will not inadvertently cause discharge of the contents of any underlying containers.

The foregoing detailed description sets forth the invention in its preferred practical form, but the invention is to be understood as fully commensurate with the appended claims.

Having thus fully described the invention, what I claim as new and desire to secure by Letters Patent is:

1. In a dispensing head for aerosol containers which have a discharge valve with a movable tubular operating stem through which the contents of the container are adapted to be dispensed, the combination of a flexible diaphragm to overlie the end of the valve stem to depress the latter and open the discharge valve when pressure is applied to the exterior of the diaphragm to permit the flow of said contents out through the hollow valve stem, said diaphragm having an integral peripheral skirt for securing it to the container, and a discharge outlet comprising a walled passage integral with the diaphragm and skirt, the inner end of which passage is adapted to closely embrace the movable tubular valve stem while the outer end extends through one of the walls of the head whereby the contents of the container pass directly from the interior of the tubular valve stem into and through said discharge passage to the exterior of the head, both the diaphragm and skirt being of flexible and elastic plastic material with the skirt thicker and less flexible than the diaphragm.

2. In a dispensing head for aerosol containers which have a discharge valve with a movable tubular operating stem through which the contents of the container are adapted to be dispensed, the combination of a flexible diaphragm to overlie the end of the valve stem to depress the latter and open the discharge valve when pressure is applied to the exterior of the diaphragm to permit the flow of said contents out through the hollow valve stem, said diaphragm having an integral peripheral skirt for securing it to the container, a central hub on the diaphragm having therein a socket adapted to closely embrace the outer end of the movable tubular valve stem to form an uninterrupted continuation of the passage through the tubular operating valve stem, and a radial rib on the diaphragm provided with an internal discharge passage leading from the socket of the hub outwardly through the skirt.

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