April 28, 1959 R. H. ABPLANALP 2,884,207

VALVE OPERATING SPRAY BUTTON FOR AEROSOL DISPENSERS

Original Filed Oct. 12, 1953

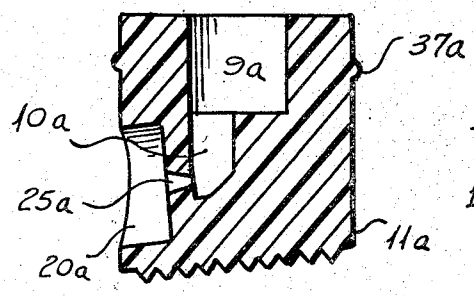

Fig 1

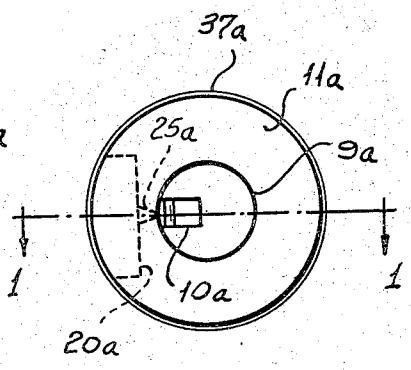

Fig 2

INVENTOR
ROBERT H. ABPLANALP
BY
Cornelius Kobrick
ATTORNEY

United States Patent Office 2,884,207 Patented Apr. 28, 1959

2,884,207

VALVE OPERATING SPRAY BUTTON FOR AEROSOL DISPENSERS

Robert H. Abplanalp, Bronx, N.Y., assignor, by direct and mesne assignments, of one-half to John J. Baessler, Yonkers, N.Y.

Original application October 12, 1953, Serial No. 385,524. Divided and this application November 8, 1956, Serial No. 621,139

1 Claim. (Cl. 239—601)

This application, a valve operating spray button for aerosol dispensers, is a division of my copending application Serial No. 385,524, filed October 12, 1953, now U.S. Patent 2,783,502, issued March 5, 1957.

The primary object of the invention is to provide a spray button which will discharge aerosol products in an absolutely uniform manner in the spray pattern.

Buttons of the character described are commonly produced by injection molding and unless properly made, burrs or fins are apt to be formed within the delivery orifice and cause the formation of relatively large droplets in the spray pattern or there may result dripping at the orifice during discharge of the products.

The primary object of the invention is to provide a button construction susceptible of production molding without the formation of burrs or fins formed in the casting, so that a uniform pattern is assured.

The great difficulty in the injection molding of buttons under prior practice is that the core which forms the orifice in the cast has had to be made so long that this core was frail and weak and thus very apt to become deformed, with the resulting formation of the burrs and the like to which reference has been made.

The present invention overcomes this objection by so forming the button that the orifice passage is of relatively short axial length and leads from an expansion chamber within the button to a recessed outlet mouth formed in the exterior surface of the button. The base of this recess is close to the expansion chamber and consequently the orifice passage is so short that the core for forming the same may be correspondingly short. As a consequence, this core is relatively rugged and capable of maintaining its shape. It will properly coact with the core which forms the expansion chamber and abut that core in a manner to preclude burrs, fins, and the like to provide a clean smooth passage for the aerosol material as it leaves the expansion chamber. Because of these facts, the button of the present invention produces a spray pattern which is uniform throughout.

Features of the invention, other than those adverted to, will be apparent from the hereinafter detailed description and appended claim, when read in conjunction with the accompanying drawing.

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 central section taken in the plane of the line 1—1 of Fig. 2 through the orifice.

Fig. 2 is a plan view of the button shown in Fig. 1.

As shown in the accompanying drawing, the push button **11***a* is preferably substantially cylindrical in form, and it is provided near one end with a circumferential bead **37***a*. One end surface of the button is normal to the axis of the button and in this surface is formed a centrally located socket **9***a*, adapted to receive and tightly fit the outlet end of a tubular valve stem. In the base of the socket **9***a* is formed an off-center expansion chamber **10***a* of rectangular cross section and at one side of this expansion chamber is a discharge orifice **25***a*. This orifice flares in the direction of its outer end and there terminates coaxially of a recessed cylindrical outlet mouth **20***a* formed in the outer cylindrical surface of the button. The common axis of both the orifice and the cylindrical outlet mouth is inclined to the axis of the button as shown. The closed end of the button is inclined in the direction of the outlet mouth and it has a milled or serrated surface as shown.

In practice, the core pin which forms the recessed outlet mouth **20***a* is preferably circular in cross section, although it may be made of any other shape without departing from this invention and this is also true of the core which forms the expansion chamber. It is also apparent that the orifice opening may be of any desired shape, so long as the core which forms the orifice comes into firm abutting relation with the core which forms the expansion chamber and in this way leaves no pockets or crevices into which plastic may enter to form burrs at this point of engagement.

As shown in Fig. 1, the axis of the orifice **25***a* is inclined with respect to the axis of the button and that portion of the wall of the expansion chamber which is directly contiguous to the inner end of the orifice is inclined, so as to be normal to the axis of the orifice. With this arrangement, the cores which form these parts are in abutting relation during the molding operation and the formation of burrs is eliminated. The relatively short orifice core, made possible by the relatively deep outlet mouth recess **20***a*, will maintain its shape and position and produce the highly effective results which I have described.

It will be noted from Fig. 1 that the discharge orifice **25** is tapered so as to be of frusto conical form and that it leads from the expansion chamber **10***a* to the base of the recess **20***a* which constitutes the outlet mouth. This recess is shown as cylindrical and the outer terminus of the discharge orifice is coaxial with the recess **20***a*, so that the outer terminus of the discharge orifice is spaced from the peripheral wall of such recess. This recess is of such diameter that its peripheral wall lies wholly exterior of an imaginary cone figuratively constituting an extension of the surface of the frusto conical wall of the orifice **25***a*. One operating advantage of this construction is that the cone-like spray issuing from the discharge orifice will not contact with the peripheral wall of the recess **20***a*. Such being the case a more effective spray pattern is obtained and the tendency of the discharge material to wet and drip from the exterior surface of the button is avoided.

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

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

A valve stem operating button for an aerosol dispenser comprising: a unitary body having in its bottom a valve stem receiving socket extending upwardly and terminating below the top of said body, said unitary body having in its lateral face an unencumbered recess with a substantially cylindrical peripheral wall and a substantially flat bottom and which recess is at all times completely open to the exterior of the body, there being formed within said unitary body a spray-pattern-forming frusto conical discharge passage interconnecting said valve stem receiving socket with the mid portion of the substantially flat bottom of said recess in spaced relation to the peripheral wall of said recess, the entire cylindrical peripheral wall of said recess lying exterior to an imaginary cone figuratively constituting an extension of the surface of the

frusto conical wall of the discharge passage and extended through said recess.

References Cited in the file of this patent

UNITED STATES PATENTS

2,362,080	Martin	Nov. 7, 1944
2,621,746	Beauregard	Dec. 16, 1952
2,658,714	Fooshee	Nov. 10, 1953
2,659,629	Graham	Nov. 17, 1953
2,667,991	Boyer	Feb. 2, 1954
2,686,652	Carlson	Aug. 17, 1954
2,744,665	Carlson	May 8, 1956
2,754,228	Bede	July 10, 1956