

- [54] **SPOUT FOR DISPENSING A FOAMABLE PRODUCT**
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### Related U.S. Application Data

- [63] Continuation of Ser. No. 398,103, Sept. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 249,895, May 3, 1972, abandoned.

- [52] U.S. Cl. .... **222/146 HA**
- [51] Int. Cl.<sup>2</sup> .... **B67D 5/62**
- [58] Field of Search .... 239/521, 590, 564; 222/460-462, 146, 569, 146 HA, 564, 146 HE

### References Cited

#### UNITED STATES PATENTS

- 1,456,408 5/1923 Scherer ..... 222/564
- 3,292,823 12/1966 Weidman et al. .... 222/146

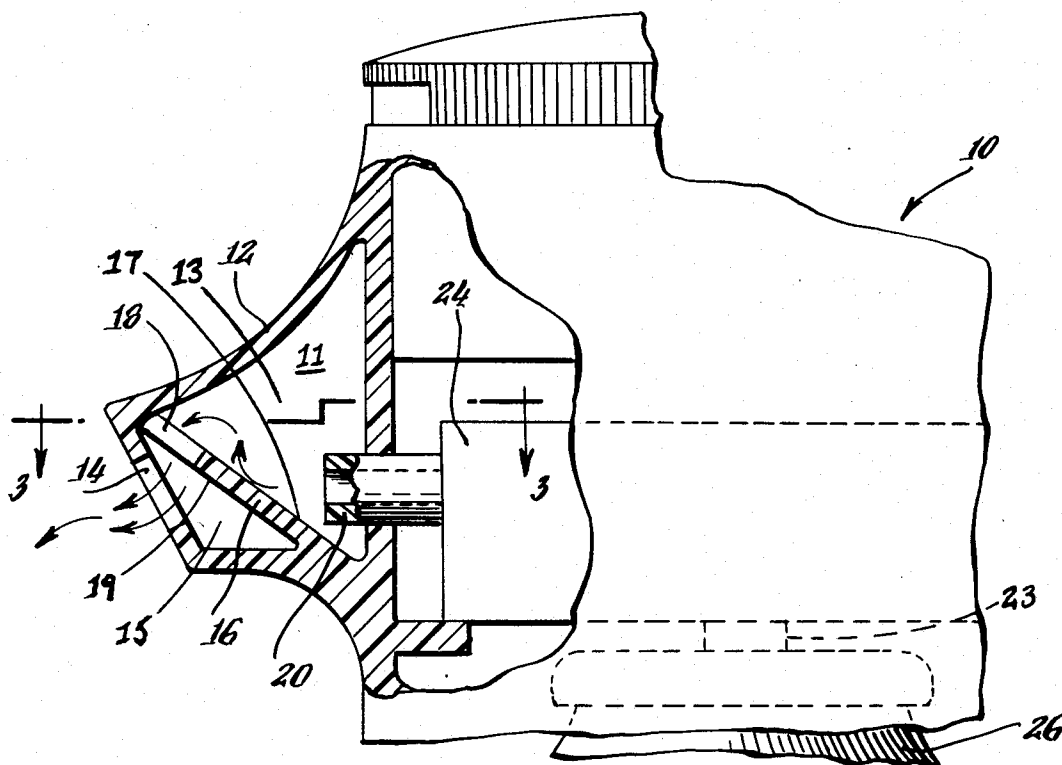
- 3,373,904 3/1968 Lowry ..... 222/146 HA
- 3,399,810 9/1968 Burne ..... 222/146 HA
- 3,493,720 2/1970 Francis ..... 219/214

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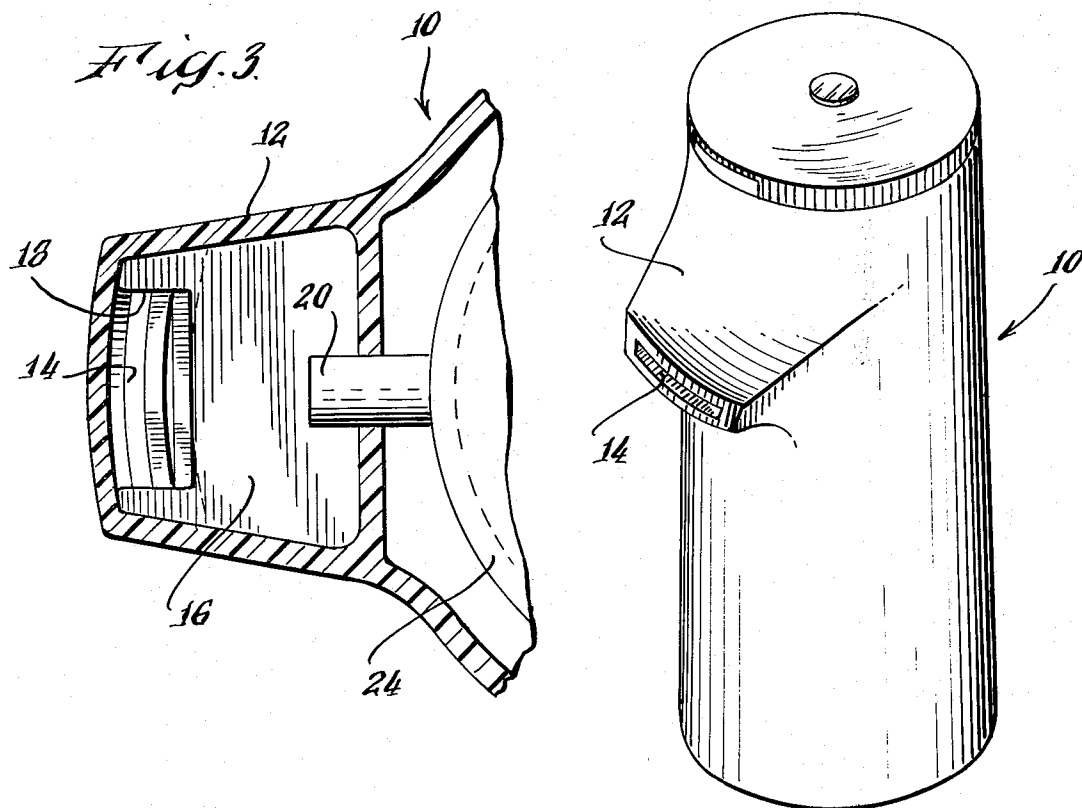
### [57] ABSTRACT

The specific disclosure provides a spout for dispensing a foamable product from a source comprising a spout outlet for discharging the product, and passage means for fluidly interconnecting the source and the spout outlet. The spout also includes a surface spaced from the spout outlet and in fluid communication with the passage means. The surface extends downwardly from the passage means in an inward and downward direction from the spout outlet to provide a surface area for retraction of the foamed product after discharge of the product through the spout outlet.

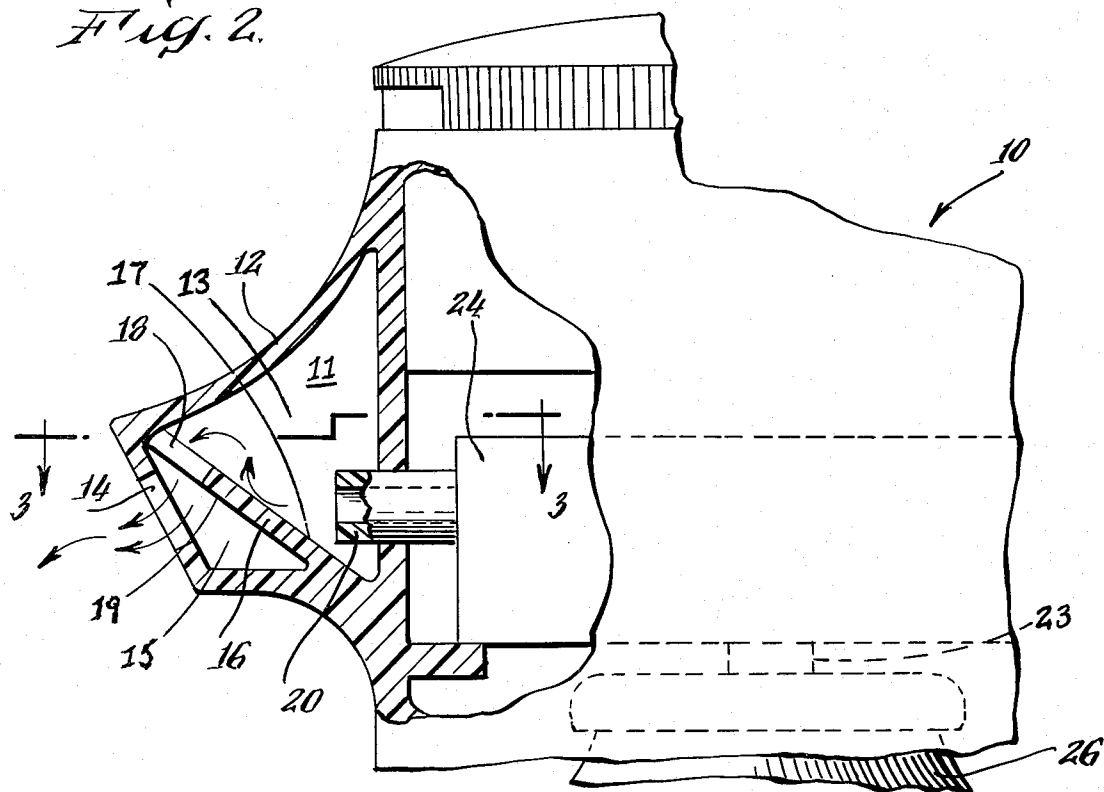
**7 Claims, 3 Drawing Figures**



*Fig. 1.*



*Fig. 2.*



## SPOUT FOR DISPENSING A FOAMABLE PRODUCT

### CROSS-REFERENCE TO RELATED APPLICATION

This application is a continuation of application Ser. No. 398,103, now abandoned filed Sept. 17, 1973 which, in turn is a continuation-in-part of U.S. patent application Ser. No. 249,895, filed May 3, 1972, and now abandoned.

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

The present invention relates to spout constructions for dispensement of foamable products. More particularly, the present invention relates to a spout structure for avoiding after-flow or "drool" when dispensement of the foamed product is discontinued.

#### 2. Description of the Prior Art

There has been a widespread use of various foamable products packaged in pressurized aerosol-type containers. In such packages, the product within the container is under a pressure exerted by a propellant. In many such products, the propellant exists within the container in liquified form emulsified in the product as small droplets. Upon discharge of the product from the container, the liquid droplets of propellant expand to gas bubbles to generate the foam.

Generally, an expansion chamber and/or conduit is provided to permit expansion of the foam prior to discharge through a spout. However, many such devices cause an after-flow or "drool" of the foamed product out the spout after the user discontinues the dispensing operation. This after-flow is caused by continued expansion of the product in the expansion chamber and/or conduit.

The after-flow problem is particularly evident in heated cream dispensers of the type wherein the product passes from an aerosol can into a heat exchanger. The heat exchanger generally has a tortuous path in which the foam is heated during the expansion process.

### SUMMARY OF THE INVENTION

The present invention overcomes the foam after-flow problem by providing a surface area in the spout beneath the discharge flow path of a foamable product for retraction of residue foam in the spout after discontinuance of use.

In accordance with an aspect of the present invention, there is provided a spout for dispensing a foamable product from a source comprising a spout outlet for discharging the product in a foamed state, and passage means for fluidly interconnecting the source and the spout outlet. The spout also includes means having a surface spaced from the spout outlet for retraction of the product after discharge of the product through the spout outlet. The surface is in fluid communication with the passage means, and extends downwardly therefrom in an inward and downward direction from the spout outlet.

In accordance with another aspect of the present invention, there is provided a spout for dispensing a foamable product from a source comprising a spout cavity having an inlet in fluid communication with the source, and a spout outlet spaced outwardly from the spout inlet. The spout also includes a baffle interposed between the inlet and the outlet, and extending upwardly and outwardly from the inlet to divide the spout

cavity into an expansion chamber above an upper surface of the baffle and a retraction chamber below a lower surface of the baffle. The product enters the spout cavity through the inlet and is deflected from the upper surface of the baffle for expansion in the expansion chamber, and the product flows over the top of the baffle to the outlet. When dispensing is discontinued, additional expanded product clings to the lower surface of the baffle, possibly by capillary action, and is retained in the retraction chamber to avoid after-flow of the product through the spout outlet.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of one form of a foamable product dispenser in which the spout according to the present invention may be embodied;

FIG. 2 is a fragmented view of the upper portion of the dispenser of FIG. 1 with a spout embodiment of the present invention shown in cross-section; and

FIG. 3 is a cross-sectional view of the spout embodiment taken along Line 3—3 of FIG. 2.

### DESCRIPTION OF SPECIFIC EMBODIMENTS

With reference to the figures, an aerosol can 26 having a foamable product such as a shaving cream is inserted through the lower end of a dispenser 10. A valve stem 23 of the aerosol can 26 is positioned in the lower end of a heat exchanger 24. The heat exchanger 24 has an outlet conduit 20 in fluid communication with a spout cavity 11 formed within a spout 12. U.S. Pat. No. 3,358,885 provides a detailed description of a suitable hot cream dispenser having a heat exchanger and heat generating means for use in combination with an aerosol can. U.S. Pat. No. 3,358,885 is incorporated herein by reference.

The spout 12 has a spout outlet 14 spaced outwardly from the heat exchanger outlet conduit 20. The spout outlet 14 has a common horizontal plane with the heat exchanger outlet conduit 20. A baffle 16 is interposed between the heat exchanger outlet conduit 20 and the spout outlet 14, and slopes upwardly and outwardly from the heat exchanger outlet conduit 20. The baffle 16 divides the cavity 11 into an expansion chamber 13 above an upper surface 17 of the baffle and a retraction chamber 15 below a lower surface 19 of the baffle 16. A horizontally elongated aperture 18 is formed at the upper end of the baffle 16 at a position higher than the outlet conduit 20 of the heat exchanger 24.

In operation, pressure is applied to the top of the dispenser 10 to compress the valve stem 23 and open an aerosol valve (not shown) in the can 26. The foamable product with propellant flows upwardly through the valve stem 23 to the heat exchanger 24 wherein the product is heated while expanding. The heated expanding product passes under pressure into the expansion chamber 13 through the outlet conduit 20. The pressurized stream of expanding product is deflected upwardly by the upper surface 17 of the baffle 16. The product continues to expand in the expansion chamber 13 and flows through the baffle aperture 18 to the spout outlet 14 for discharge therethrough. Discharge of the product continues until the aerosol can valve (not shown) is closed by removal of pressure from the top of the dispenser 10.

However, upon closure of the aerosol can valve (not shown), the product remains in an expanding state in the heat exchanger 24 and the expansion chamber 13.

The remaining product continues to expand, but the portion passing through the baffle aperture 18 flows along the bottom surface 19 of the baffle 16 to the retraction chamber 15. This portion of the product retracts by dissipation of the propellant to the atmosphere to thereby avoid the problem of after-flow or "drool" through the spout outlet 14.

It is believed that the product passing through the baffle aperture 18 due to expansion after closure of the aerosol can valve (not shown) clings to the bottom surface 19 of the baffle 16 by capillary action. Further, flow of the product through the spout outlet 14 under pressure of the aerosol can 26 when the aerosol can valve is open may cause a slight partial vacuum in the retraction chamber 15. Thus, when the aerosol can valve (not shown) is closed, the product may be forced against the bottom surface 19 of the baffle 16 to initiate capillary flow therealong.

The internal diameter of the outlet conduit 20 can be approximately 3/32 inches, the aperture 18 can be approximately 5/8 inches by 1/8 inches, and the spout outlet 14 can be approximately 7/8 inches by 3/16 inches.

What is claimed is:

1. A spout for a heated cream dispenser, wherein said dispenser includes a heat exchanger for heating cream passing therethrough to a heat exchanger outlet, said spout comprising:

a spout cavity in fluid communication with said heat exchanger outlet, said spout cavity having a cross-sectional area greater than said heat exchanger outlet,

a spout outlet in fluid communication with said spout cavity, said spout outlet being spaced outwardly from said heat exchanger outlet, and

a baffle interposed between said heat exchanger outlet and said spout outlet, and extending upwardly and outwardly from said heat exchanger outlet for deflecting all of the heated cream, and for dividing said spout cavity into an expansion chamber above

an upper surface of said baffle and a retraction chamber below a lower surface of said baffle, said baffle having an aperture at an upper end thereof, and said aperture having a cross-sectional area greater than said heat exchanger outlet.

2. The spout of claim 1 wherein said spout outlet and said heat exchanger outlet have a common horizontal plane.

3. The spout of claim 1 wherein said spout outlet has a cross-sectional area greater than said heat exchanger outlet.

4. The spout of claim 3 wherein said spout outlet has a cross-sectional area greater than said aperture.

5. A spout for a pressurized foamable product dispenser, wherein said dispenser includes a valve for selectively passing said product therethrough, said spout comprising:

a spout cavity including an inlet in fluid communication with said valve, said spout cavity having a cross-sectional area greater than said spout inlet, a spout outlet in fluid communication with said spout cavity, said spout outlet being laterally spaced from said spout inlet, and

a baffle interposed between said spout inlet and said spout outlet, and extending upwardly and outwardly from beneath said spout inlet for deflecting all of said product, and for dividing said spout cavity into an expansion chamber above an upper surface of said baffle and a retraction chamber below a lower surface of said baffle,

said baffle having an aperture at an upper end thereof, and said aperture having a cross-sectional area greater than said spout inlet.

6. The spout of claim 5 wherein said spout outlet has a cross-sectional area greater than said spout inlet.

7. The spout of claim 6 wherein said spout outlet has a cross-sectional area greater than said aperture.

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