Aug. 22, 1961 W. V. HENRY 2,997,216

DISPENSING NOZZLE

Filed Nov. 18, 1959

Fig. 1.

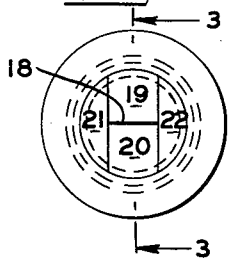


Fig. 3.

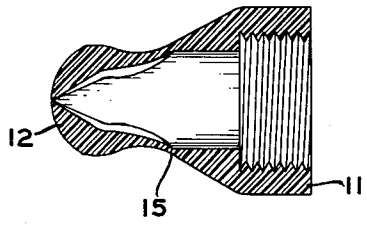


Fig. 2.

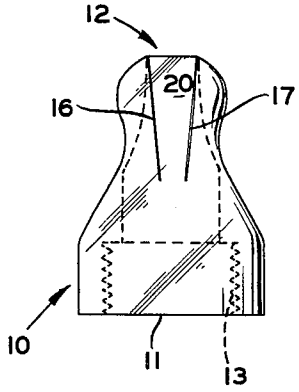
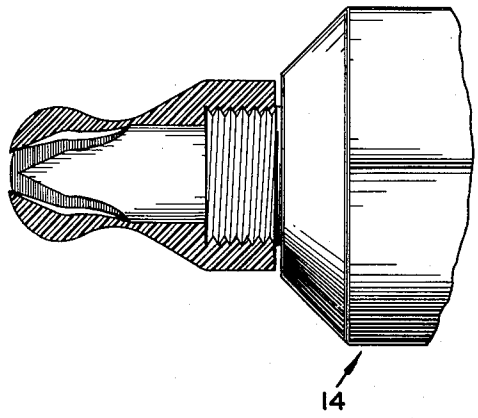


Fig. 4.



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DISPENSING NOZZLE

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This invention relates to an improved dispenser and more particularly to an improved dispensing nozzle for attachment to a container such as a collapsible tube.

I am aware that various attempts have been made to provide a satisfactory dispensing nozzle for containers. For example, see U.S. Patents Nos. 2,733,843 and 2,611,515. However, so far as I am aware, none of these attempts have resulted in a low cost nozzle which may be repeatedly used with satisfaction and which effects a successful closing operation. In view of the inconvenience inherent int he use of a screw cap on a dispensing container such as a tube of toothpaste or shaving cream it is highly desirable that a satisfactory nozzle be provided which will obviate the need for a cap of any kind on such containers.

It is an object of the present invention to provide an improved dispenser nozzle.

Another object is to provide a dispenser nozzle provided with an automatic closure outlet.

Still another object is to provide a dispenser nozzle which may be used on a dispensing container in lieu of a cap.

Other objects will appear from a consideration of the following description when taken in conjunction with the attached drawing wherein;

FIGURE 1 is a plan view of a dispenser nozzle made in accordance with my invention;

FIGURE 2 is a view in elevation of the nozzle of FIGURE 1;

FIGURE 3 is a sectional view taken through the central axis of FIGURE 1, showing the nozzle in closed position; and

FIGURE 4 is a sectional view taken through the central axis of FIGURE 1, showing the nozzle in open or dispensing position.

In general, my improved nozzle is characterized by a hollow nipple-like member having wall portions of reduced thickness intermediate of the egress end and the ingress end. Two spaced longitudinal slits extend from the egress end into the area of reduced wall thickness so as to subdivide the egress end of the nozzle into a relatively broad inner section bounded by two relatively narrow outer sections. A third slit extends across the broad section to connect the two longitudinal slits. The two longitudinal slits preferably converge toward the ingress end of the nozzle. The ingress end of the nozzle may be threaded on the interior to permit it to be screwed onto a tube or other container in lieu of a cap. Alternatively, the nozzle may be attached to the container by other means or it may be formed integral with the container.

Referring now to the drawing, there is shown a hollow nozzle member **10** having an ingress end **11** and a nipple-like egress end generally indicated with the numeral **12**. End **11** is provided with a threaded portion **13** for attachment to collapsible tube **14**. It is to be noted that the wall thickness of member **10** varies from relatively thick at egress end **12** to relatively thin in an intermediate portion **15** to relatively thick again at ingress end **11**.

Two spaced longitudinal slits **16, 17** extend from egress end **12** into the intermediate portion **15** of relatively thin wall area. Slits **16, 17** in effect subdivide the surface area of the nozzle at end **12** into three sections composed of a relatively broad inner section bounded on each side by a thinner outer section. A lateral slit **18** is disposed normal to slits **16, 17** and connects the two. As seen in

FIGURE 2, slits **16, 17** tend to converge toward one another at the lower end.

It will be apparent from the foregoing that the three slits **16, 17, 18**, divide the nipple-like egress end **12** into four sections, viz., two normally abutting inner lips **19, 20**, on opposite sides of slit **18** and two comparatively rigid spaced outer sections **21, 22**. Since lips **19, 20** are attached to member **10** only at their lower extremity in the area of reduced wall thickness **15**, they are disposed to yield when pressure is applied to the interior of the hollow nozzle so as to open the egress end **12** as shown in FIGURE 4. When the pressure is relieved, lips **19, 20** automatically return to the abutting position shown in FIGURES 1 and 2 to effectively close egress end **12**.

The nozzle of the present invention is easily made by injection molding for example, the member **12** from a suitable plastic material and thereafter providing slits **16, 17, 18** by any suitable means. The plastic material may be formed by means other than injection molding and the slits may be formed in situ, if desired. However process, the plastic of which member **10** is made should have the proper degree of resiliency and flexibility to satisfy the requirements of the material being dispensed. Obviously, the nozzle should be chemically resistant to the material that is to be passed therethrough. Among the substances that might be used are polyvinyl butyral, polyolefins, rubber, both natural and synthetic, and others. For use on a toothpaste tube, a highly satisfactory nozzle may be prepared from polyethylene.

A typical nozzle comprises a member **12** formed from polyethylene with a density of 0.923, ⅞ inch in height and about ⅝ inch in outside diameter at the ingress end and about ⅜ inch in outside diameter at the portion of the egress end having the largest diameter. The outside diameter at the intermediate portion **15** of reduced wall thickness is around ¼ inch. The inside diameter at the ingress end **11** is about ⅜ inch, providing a wall thickness of ⅛ inch at this end. The wall thickness at the free ends of lips **19, 20** is about ⅛ inch and the wall thickness at the intermediate portion **15** is about 1/32 inch. The longitudinal slits **16, 17** extend about 7/16 inch from the end **12**. At the top slits **16, 17** are 3/16 inch apart which is the length of slit **18**. At the opposite end slits **16, 17** are only ⅛ inch apart. The threaded portion at end **11** makes its possible to attach this nozzle to a tube of toothpaste, for example, and upon the application of pressure to the tube, lips **19, 20** open and permit the paste to flow outward. When the application of the pressure is discontinued, lips **19, 20** automatically revert to the closed position, sealing the end of the nozzle. Such a nozzle may, if desired, be provided at its ingress end with an interior lip to permit it to be snapped into position on a dispensing container, or it may be formed as an integral part of the container.

Since the lips **19, 20**, in open position do not extend beyond the interior surfaces defined by the rigid sections **21, 22**, the material being dispensed can only flow longitudinally through the nozzle, i.e., the possibility of lateral flow is eliminated.

From the foregoing it is seen that the present invention provides a simple, economical nozzle which may be repeatedly used in a convenient manner and which eliminates the use of caps or other closures for dispensing containers.

What is claimed is:

A dispensing nozzle comprising a hollow, flexible, resilient member having an ingress end and a nipple-like egress end and having relatively thick walls adjacent its respective ingress and egress ends, an intermediate portion disposed between said ingress end and said egress end,

said intermediate portion having a relatively thin wall, said nipple-like egress end being provided with a pair of longitudinal slits extending into the intermediate portion having a relatively thin wall and a third lateral slit connecting the two longitudinal slits at said egress end, said longitudinal slits converging toward said ingress end of said member.

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