

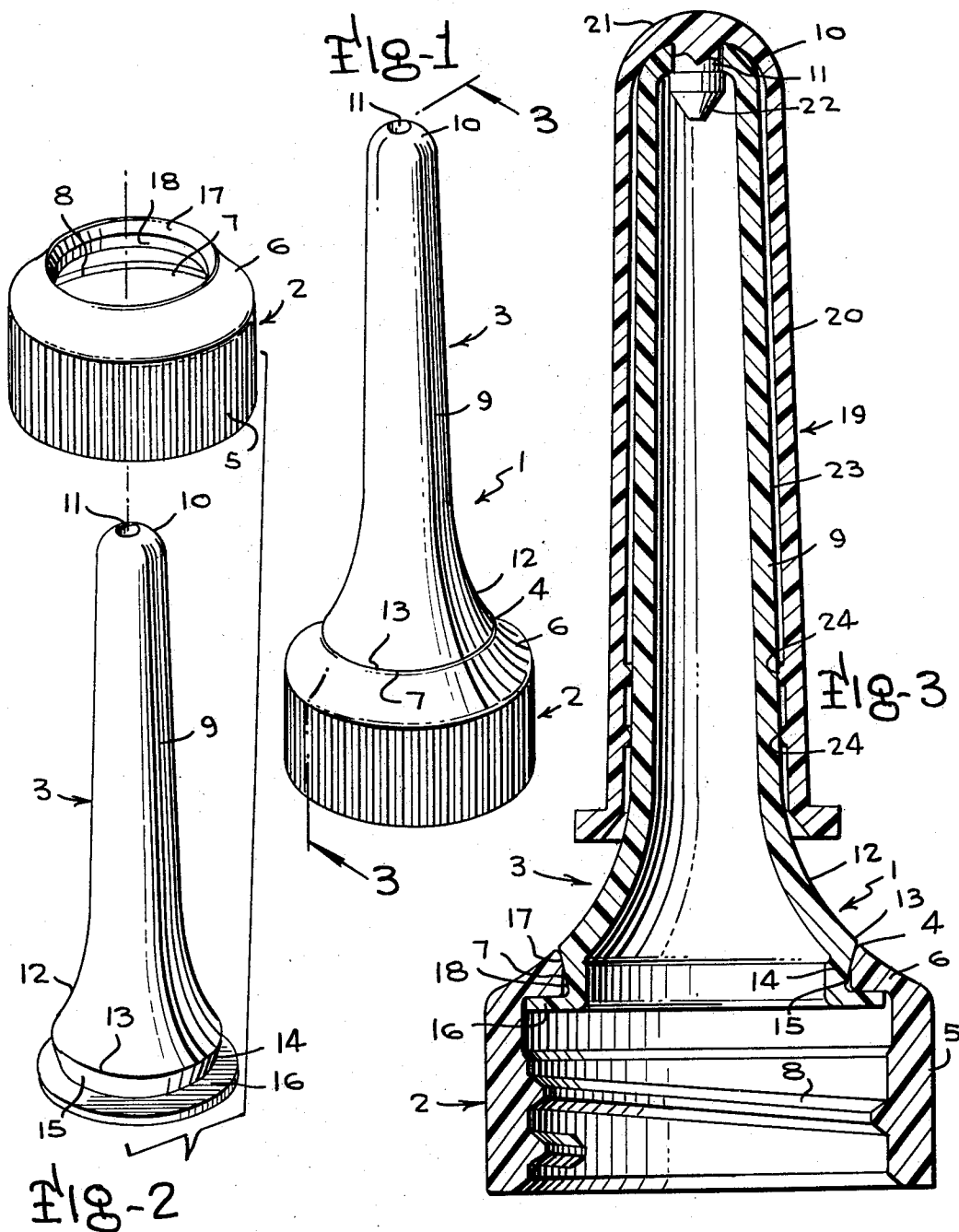
Dec. 30, 1969

ALVIN J. PORTER ET AL

3,486,503

TWO-PIECE NOZZLE

Filed June 13, 1967



INVENTORS
ALVIN J. PORTER &
ANTHONY W. MERCHLEWITZ
BY
Mason, Fenwick & Lawrence
ATTORNEYS

1

3,486,503

TWO-PIECE NOZZLE

Alvin J. Porter, 750 Florida Ave. S., Minneapolis, Minn. 55426, and Anthony W. Merchlewitz, 2716 Brunswick Ave. S., St. Louis Park, Minn. 55416
 Filed June 13, 1967, Ser. No. 645,754
 Int. Cl. A61m 3/00, 1/00; B65d 5/72
 U.S. Cl. 128—239

2 Claims

ABSTRACT OF THE DISCLOSURE

A two-piece nozzle assembly, particularly adapted for use with enema containers, wherein the threaded cap portion of the assembly is a relatively rigid member and the tip portion is soft, the two being held together by a snap interlock. The interlocking parts of the two portions are so related that they are wholly concealed when assembled, and the surface of one portion merges smoothly into the other. A sheath covers the tip portion to protect it and to form a chamber for lubricant between the tip and sheath.

BACKGROUND OF THE INVENTION

This invention relates to nozzle structures, and particularly to improvements in nozzles formed of materials of different characteristics.

United States Patent No. 2,869,545 to Forsyth discloses a disposable enema package which is in widespread use. The package consists of a collapsible bottle having a neck to which an elongated nozzle is threadedly attached. There is a slit diaphragm within the cap portion of the nozzle at the mouth of the bottle. A sheath covers and protects, the nozzle tip portion.

The nozzle is a one-piece member consisting of a threaded cap portion for attaching the nozzle to the bottle neck, and an elongated tip which serves as a rectal tube when dispensing the fluid. Difficulties have arisen from the one piece construction due to the radically different functions the cap portion and tip must perform. To secure a tight closure for the container, the cap should be rather rigid to maintain proper threaded engagement with the bottle. On the other hand, the tip should be soft, having only sufficient rigidity to facilitate entry into the rectal passage.

The one piece construction has been a compromise, with the material being too soft to form a proper cap, yet too hard for the tip.

SUMMARY OF THE INVENTION

The general object of the present invention is to provide a nozzle of two-part construction, having a cap portion of relatively hard material and a tip of softer material.

A more specific object is to provide a nozzle of this type with the two sections of the nozzle having a snap fit when assembled.

Another object is the provision of a two-part nozzle having improved snap lock construction.

A further object is to provide a nozzle of this type wherein the mating surfaces of the elements forming the snap lock are entirely concealed when the parts are assembled, and the two elements define a continuous smooth surface.

Other objects of the invention will become apparent from the following description of one practical embodiment thereof, when taken in conjunction with the drawings which accompany, and form part of, this specification.

2

BRIEF DESCRIPTION OF THE DRAWING

FIGURE 1 is a perspective view of an assembled nozzle embodying the principles of the present invention;

FIGURE 2 is a perspective view of the two parts of the nozzle before assembly; and

FIGURE 3 is a longitudinal section through the nozzle taken on the line 3—3 of FIGURE 1, and shown on an enlarged scale with a covering sheath in place on the tip portion.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In general, the invention is concerned with a two-part nozzle having a hard cap portion and a soft tip, and the construction of the parts to permit snap action assembly between the parts of different hardness.

Referring to the drawings in detail, there is shown a nozzle 1 having a cap portion 2 and a tip portion 3. The two portions are separate members connected by a joint 4.

The cap portion, or member, 2 has an annular wall 5 and a top 6. The top 6 has a central opening 7. On the interior of wall 5, there are screw threads 8 for mating with the threaded neck of the container, or bottle, upon which the nozzle is to be mounted.

It is desirable that the cap be relatively hard, so that it may serve its purpose as a cap, and firm, secure engagement may be had between the threads of the cap and bottle. It is preferred to form the cap of a plastic material, and materials such as polyethylene or polystyrene are suitable for the purpose. The material should be sufficiently hard so that the cap can be screwed down firmly on the bottle without likelihood of stripping the cap threads.

Tip 3 is an elongated member, with the greater portion of its length being a slightly tapering tube 9. The tube is rounded at its end 10, and has an outlet opening 11 at the center of the end. The base of the tube flares outwardly, as at 12, to provide a curving wall to merge with the top 6 of the cap when the parts are assembled. The flare terminates at a rim 13, and the wall then tapers downwardly to form an inverted frusto-conical section 14 having a tapering wall 15 which provides one of the mating surfaces of the snap lock, as will be described. At the bottom of the section 14 there is a flange 16 projecting outwardly about the section 14 in a plane substantially normal to the longitudinal axis of the tip.

The tip is also formed of plastic material, but it is much softer than the cap so that it will not injure, or irritate, the rectal passage of the user. At the same time, it must have sufficient rigidity to permit ready insertion into the rectal passage. Polyethylene, polyurethane and vinyl are examples of suitable materials for the tip. In determining upon a material, it must be borne in mind that rigidity can be increased by an increase in tip wall thickness, without changing the degree of hardness of the material.

By molding the tip as a separate member, the mold may be gated on the inside of the end wall, instead of outside as was required for one piece construction. Thus, any flashing will be on the inside of the tube where it cannot burn the body of the user. Furthermore, the material is hottest as it enters the tip end providing greater strength in the end where it is needed to prevent splitting.

The cap and tip members are assembled by inserting the tube end of the tip into the cap and upwardly through the opening 7 in the top of the cap. In order to provide for locking the members together, and for sealing the joint, the opening 7 has a wall 17 which is tapered to match the taper of the wall 15 of the tip. This wall extends only from the upper edge of the cap top wall ap-

3

proximately half way through the wall. The diameter of the opening at the upper surface of the top wall is about that of the tip member at the rim 13, so that the wall 15 of the inverted frusto-conical section 14 of the tip will be in close, sealing contact with wall 17 of the cap opening. From the lower edge of the wall 17, the opening edge extends downwardly, parallel to the central axis of the opening, to form the cylindrical wall 18. By having the tapering wall 17 extend only part way through the top wall of the cap, less deformation of the tip is required to assemble the two units. The width of the top wall annulus from the cap interior wall to the opening bottom edge is slightly greater than the width of the tip member flange 16 to permit the flange to seat flush against the underside of the cap top.

When the two units are to be assembled, the tube portion 9 of the tip member is inserted into the bottom of the cap and through the central opening. As the tube moves through the opening, the flared base 12 of the tip will serve to center the tip relative to the cap opening, so that the rim 13 will be substantially equally spaced from the opening as it approaches the opening and uniform compression of the rim portion will take place as pressure is applied to the tip base to snap the rim section through the opening. When the tip is fully seated in the opening, the upper portion of the conical wall 15 will be in sealing and locking contact with the tapered wall 17 of the cap opening. The lower portion of wall 15 will be spaced slightly from the cylindrical wall 18 of the cap opening, as seen in FIGURE 3. The height of the wall 15 is approximately the depth of the opening 7, so that, when in assembled relation, the flare of the tip and the curvature of the cap top merge, and the entire locking assembly is internal, beneath the surface joint between the two members. This gives the appearance of a one-piece unit of pleasing contour.

The complete assembly for mounting on a container includes a split rubber disc (not shown, but disclosed in the above mentioned prior patent) which fits within the cap and seats beneath the tip base flange 16 to control flow of fluid into the tubular outlet tube 9 of the tip, and a sheath 19 to cover, and protect, the tubular portion of the tip.

Sheath 19 has a hollow body 20 to fit over the end of the tip and cover the tapering portion of the tube 9. The top 21 of the sheath has an interior, depending stud 22 which snaps into the outlet opening 11 in the tube. This serves two functions. It secures the sheath to the tip and it centers the sheath relative to the tip tube so that the larger sheath is held spaced from the tube to

4

form a chamber 23 between the tube and sheath for a lubricant applied to the tube. Interior, annular beads 24 near the open end of the sheath hold the bottom of the sheath spaced from the tube wall and close off the chamber to prevent the escape of lubricant. The sheath and its function are fully described in the mentioned prior patent.

The assembly of cap, tip, disc and sheath can be screwed onto a filled container to complete a package.

We claim:

1. A two-piece nozzle assembly comprising, a cap of relatively hard plastic material and an elongated tip of softer plastic material, the cap having a top and a threaded skirt depending from the top with a central opening through the top, the tip having an annular base flange lying within the skirt and against the underside of the top of the cap and a base portion to seat within the central opening in the cap, the cap wall surface forming the central opening in the cap having two sections of different configuration defined by an upwardly diverging upper surface section and a cylindrical lower surface section, said cylindrical lower surface section being parallel to the longitudinal central axis of said cap and the tip base having an upwardly diverging outer surface the full depth of the cap wall surface forming the central opening with the upper portion of the tip base outer surface in surface engagement with the upper surface section of the cap central opening.

2. A two-piece nozzle assembly as claimed in claim 1 wherein, the upper surface of the cap is curved, and the surface of the tip adjacent the base is curved, with the two curved surfaces forming a continuous curve across the joint between the cap central opening and the tip base.

References Cited

UNITED STATES PATENTS

286,041	10/1883	Mayall	128—239
2,848,997	8/1958	Miskel et al.	128—232
2,869,545	1/1959	Forsyth	128—232
2,956,702	10/1960	Ransom	128—252 XR

FOREIGN PATENTS

1,467,933	12/1966	France.
48,358	6/1964	Poland.

RICHARD A. GAUDET, Primary Examiner
R. L. FRINKS, Assistant Examiner

U.S. Cl. X.R.

128—232, 247; 222—215, 568