



(11) Publication number: **0 416 694 A1**

(12) **EUROPEAN PATENT APPLICATION**

(21) Application number: **90202323.3**

(51) Int. Cl.⁵: **B65D 47/18**

(22) Date of filing: **01.09.90**

(30) Priority: **08.09.89 US 404540**

(43) Date of publication of application:
13.03.91 Bulletin 91/11

(84) Designated Contracting States:
CH DE FR GB IT LI NL

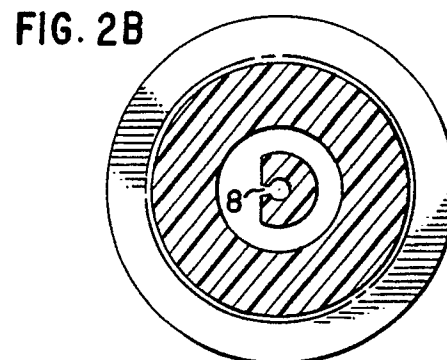
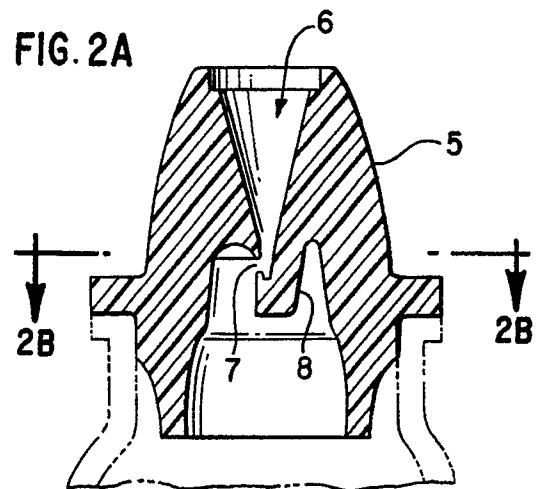
(71) Applicant: **MERCK & CO. INC.**
126, East Lincoln Avenue P.O. Box 2000
Rahway New Jersey 07065-0900(US)

(72) Inventor: **Bunin, Leonid**
109 Roanoke Street
Woodbridge, NJ 07095(US)

(74) Representative: **Hesketh, Alan, Dr. et al**
European Patent Department Merck & Co.,
Inc. Terlings Park Eastwick Road
Harlow Essex, CM20 2QR(GB)

(54) **Liquid drop dispensing tip.**

(57) A liquid drop dispensing tip (1) for a standard squeeze bottle (2), having a convoluted delivery path (6, 7) provides low cost manufacturing, and the ability to control drop size and to prevent streaming.



LIQUID DROP DISPENSING TIP

This invention is concerned with a novel design of a dropper tip useful on conventional medicine droppers used primarily for dispensing ophthalmic medications.

The conventional ophthalmic drug delivery system, FIG. 1, consisting of a dropper tip, 1, and squeeze bottle, 2, is intended to deliver the medication in a drop by drop manner, the drops being of a uniform predetermined size. The drop size control is achieved by means of the hydraulic resistance presented by a small diameter channel, 3, forming the beginning of the straight delivery channel, 4, in the dropper tip, 1, having a diameter of about 0.006 inches or 0.150 mm. which restricts the flow from the squeeze bottle, 2. This conventional drug delivery system generally serves the intended purpose but in the hands of many patients does not always result in discrete drops but rather streaming of the liquid resulting in loss of medication, and possibly soiled clothes and other fabrics.

In addition conventional dropper tips with the narrow channel, 3, are commonly fabricated from plastics by injection molding techniques which require a complex technology not readily available in less developed countries.

Now with the present invention there is provided a dropper tip providing better delivery control, that requires a lower level of technology to fabricate, thus lowering the cost per unit device, and permitting fabrication practically anywhere in the world.

These advantages are achieved by the design of the tip, 5, shown in Fig. 2, wherein entry to the delivery channel, 6, is not through a narrow channel, but rather through an orifice, 7, which is not concentric with the delivery channel but rather at an angle, preferably right angle, to it on the side of the hub, 8.

In the novel tip of this invention the restriction to flow or hydraulic resistance, is provided, not by a narrow channel that is difficult to fabricate, but in part by a convoluted delivery path causing the liquid flow to change direction as it enters the delivery channel which impedes the conversion of the internal static energy provided by squeezing of the bottle into the kinetic energy of the liquid flow.

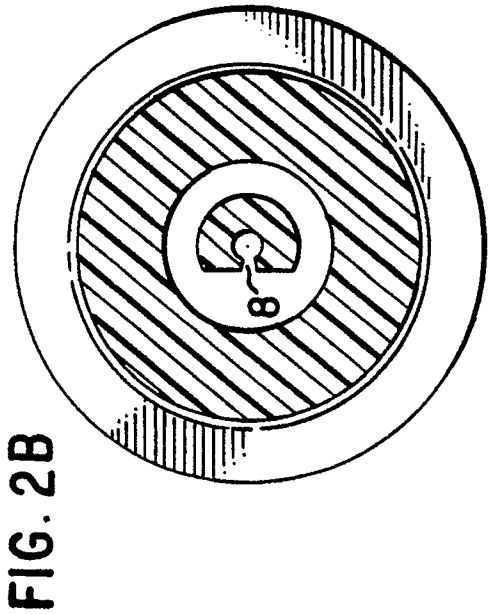
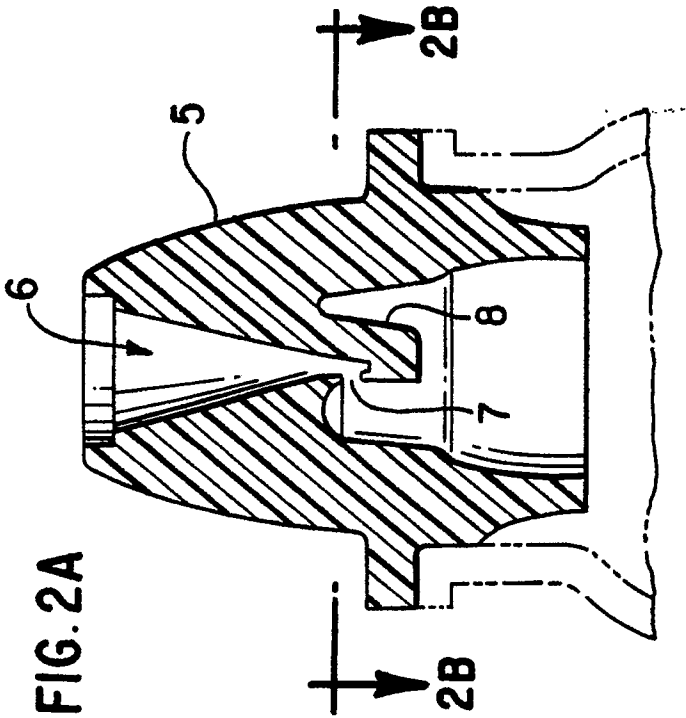
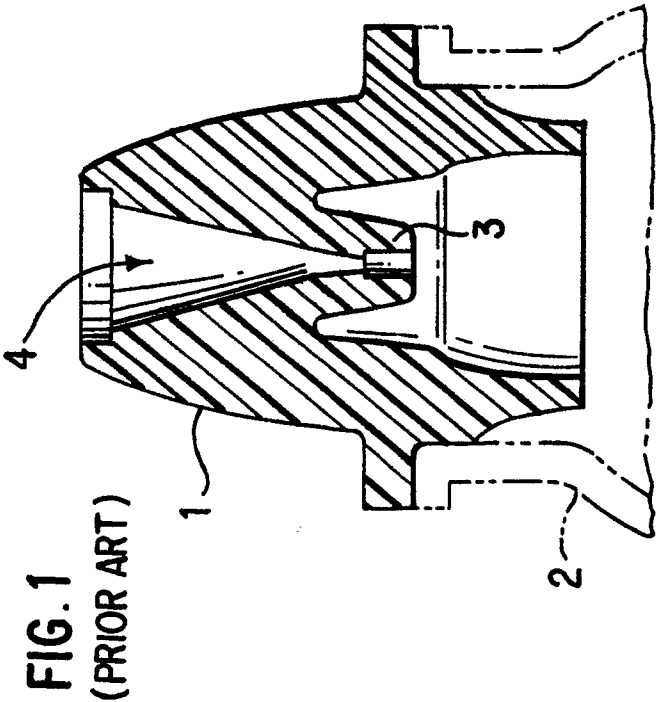
In addition, the cross-section of the orifice can be of any shape such as circular, triangular, semi-circular, irregular or rectangular, preferably the latter, in which case the hydraulic resistance to fluid delivery is determined in part by the dimensions of the rectangle a long and narrow rectangular orifice providing greater hydraulic resistance than a square orifice of the same cross-section area. Re-

gardless of shape, the orifice has a cross-sectional area of about 0.015 to 0.02 mm²

The size and shape of the orifice, 7, can be controlled by simplified molding techniques within desired specifications.

Claims

1. A dropper tip for the controlled delivery of a liquid providing entry to the delivery channel by an orifice that is not concentric with the delivery channel.
2. The dropper tip of Claim 1 wherein the orifice has a cross-sectional area of about 0.015 to 0.02 mm²
3. The dropper tip of claim 2, wherein the cross-section of the orifice is non-circular.





European
Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 90 20 2323

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-2 834 520 (NYDEN) * column 3, line 60 - column 4, line 16; figures 1-5 * - - -	1	B 65 D 47/18
A	GB-A-8 749 52 (ANCHOR GLASS) * figures 2,3 * - - - - -	3	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 65 D
The present search report has been drawn up for all claims			
Place of search Berlin		Date of completion of search 23 October 90	Examiner LORENZ P A
CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons &: member of the same patent family, corresponding document			