Jan. 15, 1952 H. E. CURRY ET AL 2,582,529

MEDICAMENT APPLICATOR

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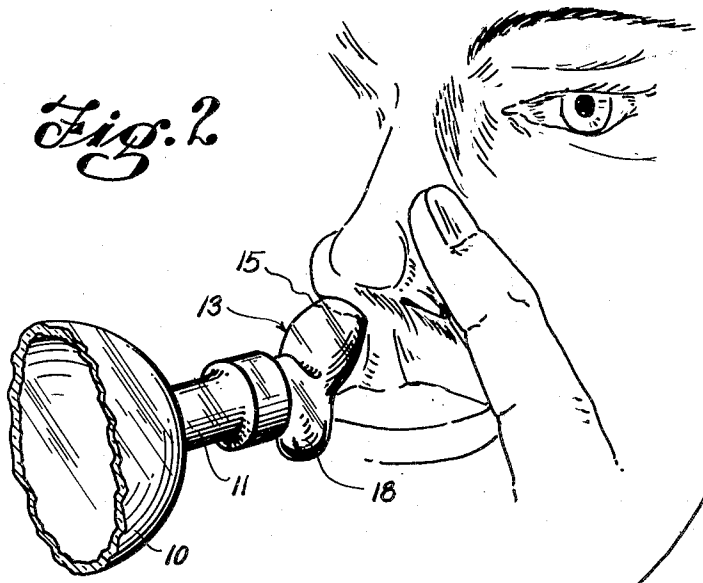
Fig. 2.



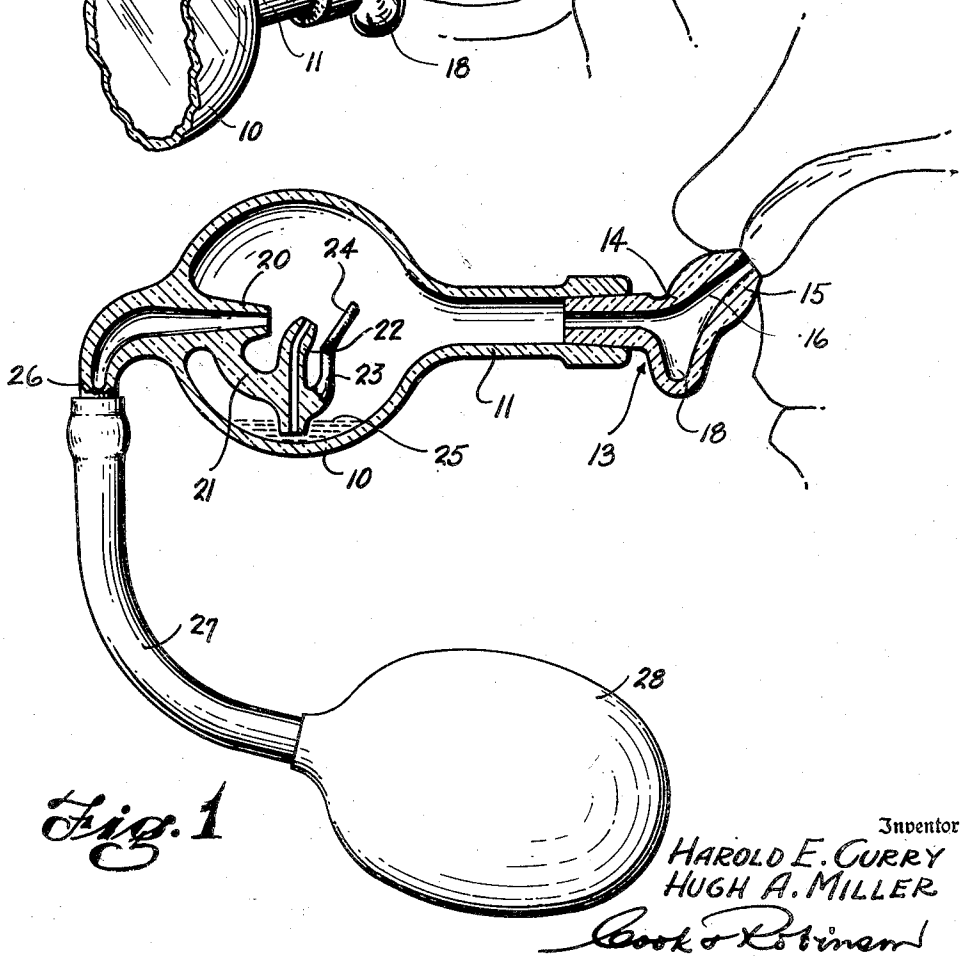


Fig. 1.

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MEDICAMENT APPLICATOR

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3 Claims. (Cl. 128—173)

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This invention relates to means for the administration or application of a liquid medicament to the cranial cavities of the human body and for loosening or freeing and removal of matter, such as mucus, therefrom and for massaging the membrane tissues of the cavities. More specifically stated, the present invention relates to means for the atomization of a liquid medicament and the application thereof, through the nasal passages, to the cranial cavities, for example to the sinuses as is desirable for the treatment of sinus infection. Also, a means whereby, simultaneously and in conjunction with the application of the atomized medicament, the membrane tissues will be subjected to treatment similar to massaging as an aid in the freeing of mucus, and in addition thereto a partial vacuum will be created in the atomizer to draw out from the sinuses and other cranial cavities the mucus and other infectious matter which may be present.

It is the principal object of this invention to provide a safe and simple form of applicator which includes a tubular member that may be inserted into the human nostril as a connector between a chamber of the applicator in which the medicament will be atomized and in which chamber plus and minus air pressures may be created to facilitate the application of the medicament, to produce the massaging effect and to extract the infectious matter from the cranial cavities.

Another object of this invention is to provide an applicator for self-administration of a medicament by the person desiring or requiring treatment; which applicator is small in size, simple in construction and devoid of pressure-regulating valves or other devices which would tend to complicate the use or add to expense of manufacture.

It is also an object of this invention to provide an applicator which does not require the utilization of a gaseous means, other than air, for the transmission of an atomized medicament to the cranial cavities.

A further object of the invention is to provide an applicator which may be carried in a small container to thereby facilitate its availability for use wherever and whenever the need of treatment may arise.

A still further object of the invention is to provide an applicator that will effectively perform its required function but which is relatively simple in construction and inexpensive in cost of manufacture.

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Other objects of the invention reside in the details of construction of the various parts embodied in the device, in their combination, relationship and mode of use as will hereinafter be fully described.

In accomplishing the above and other objects of the invention, we have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein:

Fig. 1 is a longitudinal sectional view of the present applicator, illustrating its mode of application for use.

Fig. 2 is a perspective view of a part of the applicator as applied to one of the human nostrils for use.

The present device comprises, essentially, an atomizing chamber wherein a selected medicament may be vaporized or atomized, and a resilient pressure and suction bulb of rubber or the like, whereby, in the intended use of the device, the cavities being treated may alternately be placed under slight vacuum and under mild pressure of air and the atomized medicament conveyed to these cranial cavities.

In the administration of a medicament, such as for example, penicillin, or any other selected liquid medicament that may be atomized, we prefer to employ a flask type atomizer like or of the general character of that described and illustrated in United States Patent No. 2,111,841, issued March 22, 1938. However, it is to be understood that the invention is not to be restricted or limited by the character or type of atomizing flask which may be employed.

The atomizer which we have herein shown comprises a bulb, or flask, substantially of spherical form, designated in its entirety by reference numeral 10. The flask may be made of glass, or other suitable material, and has a tubular discharge neck or tube 11 of substantial length and diameter extending from one side thereof. The neck 11 is open at its outer end for easy flow of the air bearing medicament. A plug or fitting 13 is fitted in the open outer end of the neck and an air-tight connection is achieved for reasons which will hereinafter become readily apparent. The plug or fitting 13 may be formed from hard rubber, glass, plastic or other suitable material. The outer end portion of the plug is formed with a neck 14 which terminates in a substantially conically tapered enlargement 15 which is so shaped that it may be easily applied to a nostril and disposed tightly therein, thus to provide for the application of the medicament

to the treated areas through the nasal passages; it being noted that this fitting 13 is formed with an axial passage 16 of substantial diameter from end to end thereof.

Cast as an integral part of the plug or fitting 13 is a discharge bowl or cup 18 which opens upwardly into the passage 16 and into which mucus or other infectious matter which is drawn off from the cranial cavities into the passage or channel 16, will drain. This cup is integral with the fitting 13 and located at the under side thereof, between the inner end of the enlargement 15 and the outer end of that portion that is fitted in the neck 11 of the applicator.

Cast integrally with and extended into the bulb 10 at a location opposite to and in axial alignment with the neck 11, and pointed toward it, is an air delivery nozzle 20. Supported from the nozzle by an integral branch 21 is a vertically extending capillary tube 22 which is open at both ends and terminates, at its lower end, slightly above the bottom of the flask or bulb 10, with reference to its position of normal use as seen in Fig. 1. At its upper end, the capillary tube terminates directly in the line of delivery of the air from the nozzle 20 and preferably has this end portion curved in a direction away from the nozzle. Supported from the capillary tube 22 by a branch 23, is a flat-surfaced baffle 24 which is set directly in the line of discharge from the nozzle but at an angle of about 45 degrees.

A supply of liquid medicament is contained in the flask and of sufficient amount to rise to a level a short distance above the lower end of the tube 22 when the device is held as in Fig. 1. The medicament is designated by numeral 25.

It is preferred that the nozzle 20 be cast or formed integrally with the flask 10 as shown in Fig. 1. To the outer end portion 26 of the nozzle, one end of a flexible rubber tube 27 is applied. To the opposite end of the rubber tube, a suction and pressure bulb 28 is attached. It is preferred that a flexible, soft rubber bulb be employed, and the size and shape thereof may vary as desired or required but should be such as to permit a person to readily grasp it in one hand and to compress and release it with ease and rhythmic movement of the fingers.

When the flask and the integral parts are so constructed and related in position as hereinbefore described, and when the atomizer is held and applied as is shown in Fig. 1, the capillary tube 22 extends into the liquid medicament 25 contained in the flask. The delivery of the air from the nozzle 20 upon compression of the bulb 27 creates a condition of partial vacuum about the upper end of the capillary tube 22, whereby liquid medicament will be drawn up through the tube channel and into the air jet and blown by the jet of air against the baffle 24 and thereby become atomized. The atomized medicament suspended in the air will then be carried out through the neck 11 under pressure of the incoming air and forced through the channel of fitting 13 into the nasal passage for delivery to the cranial cavities which require treatment.

The application of the medicament by use of the applicator might also be through the mouth in a like manner. However, it is not our intent that this particular applicator should be so used, and the primary purposes of use of this applicator could not be achieved by such application.

The applicator constructed and assembled as herein described may be easily and readily used for treatment of infections in the cranial cavities

in the following manner: The flask 10 is held in one hand with the part 15 of fitting 13 inserted into a nostril and one finger of the same hand is employed to tightly close the other nostril as is illustrated in Fig. 2. Air may then be forcibly discharged from the nozzle 20 by compressing the bulb 28 and thereby causing medicament in the flask to be atomized and carried in air through the neck 11 to the nasal passages and cranial cavities to be treated. The air, having been forced out of the bulb 28 and the flask 10 in the application of the medicament, a partial vacuum in the bulb and flask is created upon release of the bulb, which will in turn cause a suction or pulling effect in the cavities to which pressure has been applied. Thus by alternately compressing and releasing the bulb, conditions of pressure and vacuum will be established in sequence, and incident thereto, the liquid medicament will be atomized and applied, and the cavities placed alternately under condition of plus and minus air pressure that effects a massaging of the membranes and aids in the removal or draining off of mucus and augments the entry of the medicament-laden air. Further, the sequence of pressure and suction upon the infected tissues of the cranial cavities, which causes the massaging effect upon the tissues, also increases the extent of penetration of the liquid medicament into the pores of the tissues.

It is not the intent that the invention be restricted in any way to the type or details of construction of the atomizer that has been illustrated and described, but that the invention be considered broadly as the combination of a pressure and suction bulb and atomizer, operable by the person to be treated and capable of performing the atomizing of the liquid medicament and application thereof substantially as specified.

It is to be noted that the atomizing process and application is accomplished by a simple, inexpensive device which may be easily carried about from one place to another and does not require a complex system of a pump and valves to accomplish the desired effects and results, nor does it require a supply of a gaseous medium to carry the atomized medicament to the cranial cavities to be treated.

Though we have illustrated the fitting 13 which provides one nostril plug, an alternative fitting may be used wherein two plugs are provided and adapted to be inserted into the nostrils simultaneously. When a fitting employing two nostril plugs is employed, the creation and maintenance of the suction pressure may be easily and readily controlled by opening and closing the mouth during the treatment.

We have also illustrated the bowl or cup 18 cast as an integral part of the fitting 13. An alternative of this construction may be used wherein the bowl or cup is removably applied or connected to the fitting in a desired or convenient manner. Making the bowl removable will permit easier cleaning thereof when such may be required.

Having thus described our invention, what we claim as new therein and desire to secure by Letters Patent is:

1. An applicator for the massaging and draining of cranial cavities, comprising a closed chamber, means in the chamber for the atomization of a liquid medicament; said chamber having an outlet member designed for application in air-tight connection to a nostril of the user, a resilient rubber bulb connected with the chamber

and operable, upon being collapsed and allowed to return to normal form, to create alternate conditions of pressure and suction in the chamber which will be transmitted through said outlet member and nostril to the area under treatment; said outlet member comprises a tubular fitting adapted to be removably applied at one end to the chamber and at its other end to the nostril, and formed between its ends with a discharge bowl for the collection of drainage from the treated area.

2. An applicator for the massaging and draining of cranial cavities comprising a chamber, passages extending horizontally and communicating with opposite portions of the chamber, atomizing means in said chamber mounted between the passages and in cooperating relation to one passage, an air bulb connected with the last mentioned passage and operable to force air through the chamber across the atomizing means and out through the second passage when compressed and then expand and draw air inwardly through the second passage, and a nozzle adapted for air-tight application to a nostril of a person using the atomizer, said nozzle being formed with an air passage communicating with the second passage and intermediate the length of its passage being formed with a downwardly extending bowl communicating with the air passage for receiving drainage matter carried inwardly through the nozzle during expansion of the bulb.

3. The structure of claim 2 wherein the bulb is connected with the chamber by a flexible rubber tube of a length adapting the bulb to be grasped in one hand of the user and held in a position allowing a finger of the said hand to be disposed in closing engagement with a nostril while actuating the bulb with fingers of the said hand and holding the applicator with the other hand of the user.

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