United States Patent [19]

Crain

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[54] **APPARATUS FOR APPLYING MEDICATION OR THE LIKE TO HUMAN NASAL PASSAGES**

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[52] **U.S. Cl.** **128/173,** 128/206, 239/219

[51] **Int. Cl.** **A61m 11/00**

[58] **Field of Search** 128/173, 198, 194, 193, 128/192, 206, 209, 185, 172; 239/219, 220, 221

[56] **References Cited**

UNITED STATES PATENTS

1,488,356	3/1924	Linke	239/219
2,607,571	8/1952	Hession, Jr.	128/173 R X
2,763,510	9/1956	Nicola	239/220
3,001,524	9/1961	Maison et al.	128/173 R
3,324,852	6/1967	Iwai	128/173 R

FOREIGN PATENTS OR APPLICATIONS

150,224	2/1953	Australia	128/173 R
1,389,559	1/1965	France	128/193
916,196	1/1963	Great Britain	128/173 R

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Assistant Examiner—Lee S. Cohen

[57] **ABSTRACT**

Apparatus for applying a solution in particle form to a body cavity such as the nasal passage for medicinal, therapeutic and hygiene purposes. An electrically powered battery operated pump is provided in a solution holding housing which is provided with a tubular opening into which the nose of the user for example, is inserted. The actuation of the pump disperses particles of the solution in the housing toward the nose of the user. A small opening to the atmosphere is also provided in the tubular opening to enable the user to deeply inhale, thereby drawing the solution particles deep into the nasal passages.

4 Claims, 5 Drawing Figures

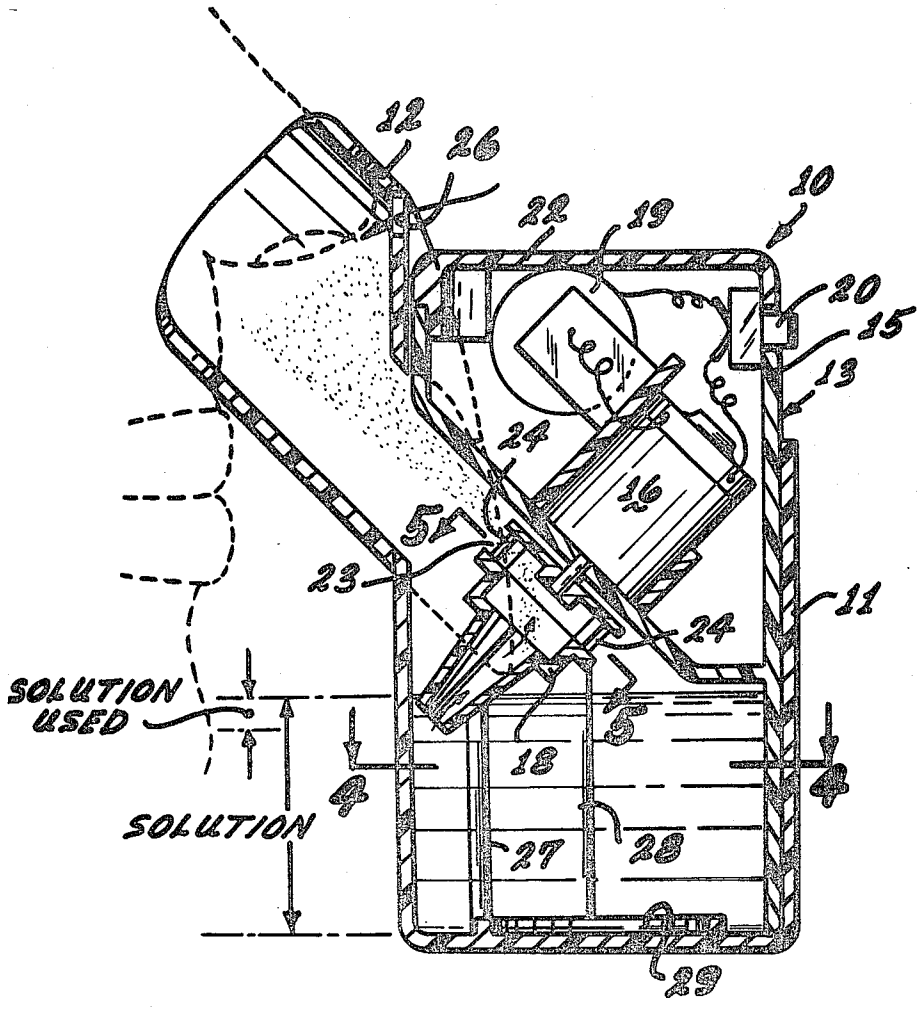


FIG. 1

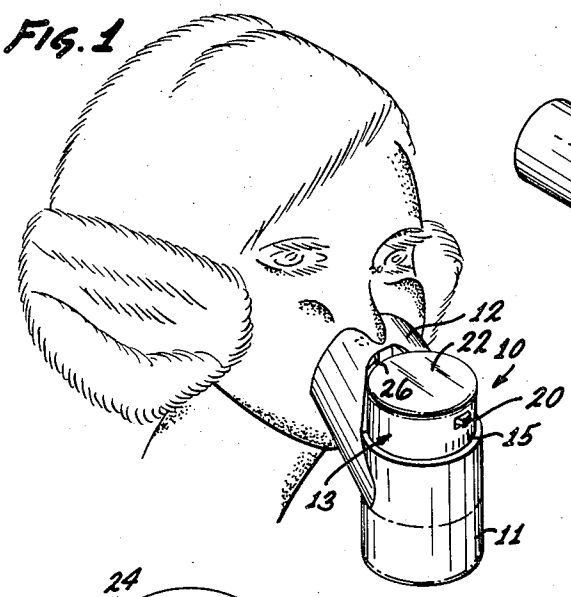
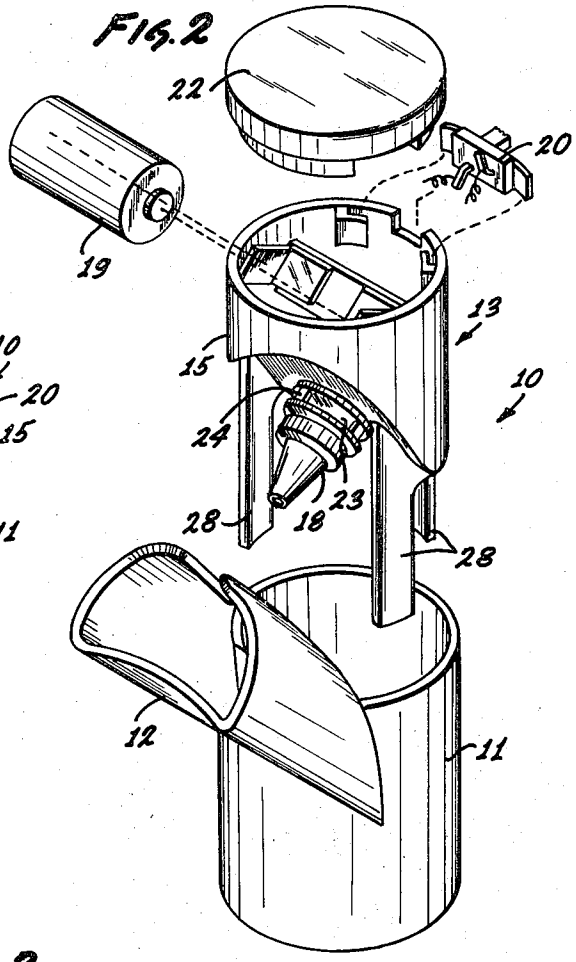


FIG. 2



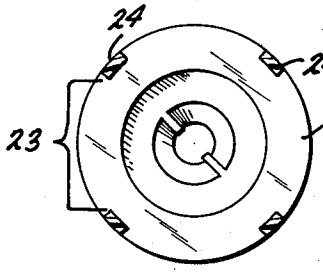


FIG. 5

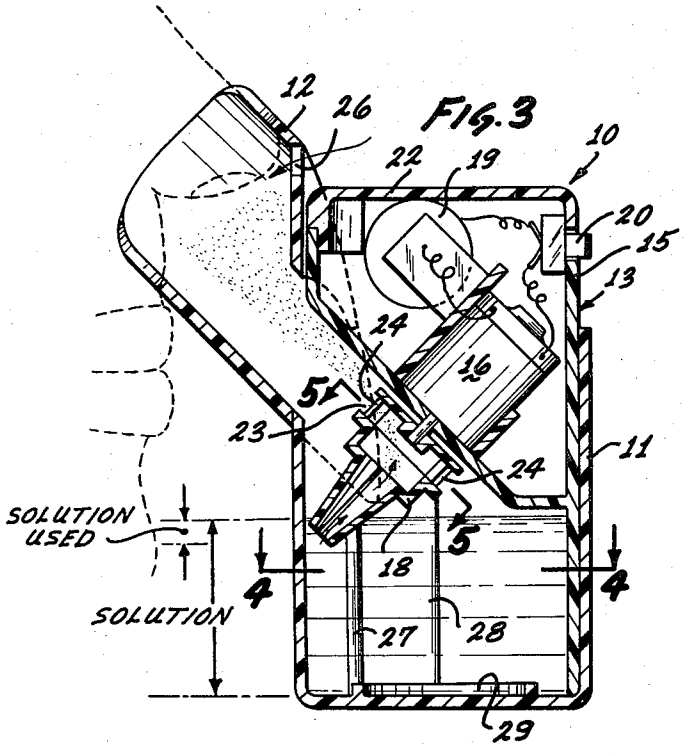


FIG. 3

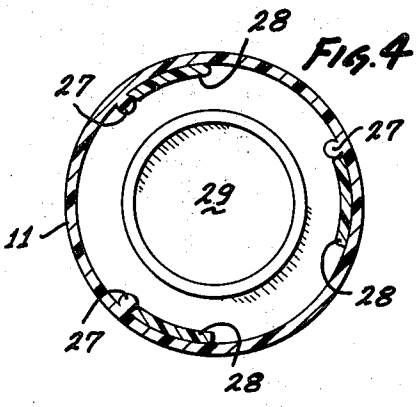


FIG. 4

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APPARATUS FOR APPLYING MEDICATION OR THE LIKE TO HUMAN NASAL PASSAGES

BACKGROUND OF THE INVENTION

The present invention relates generally to nasal hygiene and more particularly, to an improved apparatus for applying medication, cleansing, and other therapeutic fluids to the nasal passages.

Throughout the United States and the rest of the world, there are large numbers of individuals who are afflicted with sinus conditions, respiratory allergies and other discomforts of the nasal passages from viral infections, irritating air polution, and the like.

While many different types of devices for applying mists, sprays and vapors to the nasal passages and respiratory tract are known in the prior art, for one or more reasons, they possess inherent objectionable features with respect to their use, operation, and versatility.

There are a large number of inhalers available or known in the prior art which essentially consist of a housing for a medicated vapor emitting chemical which is in communication with a receptacle that is inserted into or fits over the nostrils so that when the user inhales, the medicated vapors are drawn into the nasal passages. While devices of this type provide certain benefits, the amount of vapor applied to the nasal passages is very unpredictable due to the amount of vapor being dependent on the degree of inhaling of the user, and of the depletion of the vapor emitting chemical. There are also a number of nasal medications available in a container so as to be sprayed into the nostrils, however, in many instances, it has been found that certain medications applied by vapor inhaling or spray while providing initial and temporary relief, tend to eventually dry out sensitive nasal membranes and diminish effectiveness.

Another method of applying medication to the nasal passages is by vaporizers which generate a steady output of steam in a sick room which is laden with some form of medicated vapors. Apparatus of this type utilize submersed electrical elements having a current applied thereto which results in converting a medicated laden reservoir of water into steam. While satisfactory results may be obtained by these types of devices in a sick room, they present considerable problems after they have been in use for prolonged periods as the emersed contacts tend to diminish in conductivity resulting in a substantial reduction in the efficiency of the apparatus if not in a total failure.

More recently, a number of vaporizers have become available which utilize cool water and tend to disperse same much in the manner as a humidifier does by interjecting the medicated solution into a path of flowing air. This type of apparatus has been found to yield satisfactory results when a large area is required to be laden with a medicated vapor. However, in apparatus of this type designed for individual inhalation it has been found to be extremely difficult to control the rate of application of the medicinal or therapeutic vapor due to the large amounts of air that must be passed over same.

In addition to the hereinbefore discussed problems encountered with prior art devices for applying medication and therapeutic chemicals to the nasal passages, the majority of these devices with the exception of the vapor inhalation and medicinal spray products, require an electrical outlet for their operation. In addition,

many of the prior art devices cannot utilize salt water which when warm has been found to possess certain therapeutic and other desirable properties in relieving various types of discomfort in the nasal passages.

SUMMARY OF THE INVENTION

Accordingly, it is the general aim of the present invention to provide a new and improved apparatus for applying medicinal, therapeutic and cleansing solutions to the nasal passages which is compact, portable and yet more effective than apparatus that has heretofore been available. A related object of the invention is to provide an improved apparatus which is capable of thoroughly cleansing nasal passages in a fast and efficient manner to reduce the discomforting effects of pollutants, dryness, smoking and dried or thickened mucous.

It is another object of the invention to provide a relatively low cost, power operated apparatus that may be readily disassembled for refilling purposes, and which enjoys a greater life expectancy than does conventional power operated apparatus of this type.

While the present invention is concerned with the application of medicinal, therapeutic and cleansing solutions to the nasal passages, it is nevertheless, an object of the invention to provide an improved apparatus which enables the user to quickly and conveniently prepare the solution desired to be applied to the nasal passages and to maintain the solution at a desired temperature range during the use of the apparatus.

BRIEF DESCRIPTION OF THE DRAWINGS:

Other objects and advantages of the present invention, along with the interrelationship between the elements of the preferred embodiment, will become more apparent when considered in connection with the specification and accompanying drawings in which:

FIG. 1 is a perspective view of an exemplary nasal passage hygiene unit embodying the features of the present invention and here showing said unit in use;

FIG. 2 is an exploded view of the hygiene unit shown in FIG. 1;

FIG. 3 is a side elevation sectional view depicting the hygiene unit shown in FIG. 1 in operation;

FIG. 4 is a sectional view, taken substantially along the line 4—4 of FIG. 3; and

FIG. 5 is a sectional view, taken substantially along the line 5—5 of FIG. 3.

While the present invention is susceptible of various modifications and alternative constructions and can be used with various types or solutions such as of a medicinal, therapeutic of cleansing nature, and can be utilized for applying solutions of such nature to various portions of the anatomy, illustrative embodiments are shown in the drawings and will hereinafter be described in detail. It should be understood, however, that it is not intended to limit the invention to the particular embodiment disclosed, but, on the contrary, the intention is to cover all equivalents and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

DESCRIPTION OF THE PREFERRED EMBODIMENT:

Referring now to FIGS. 1 and 2, an exemplary hygiene unit for dispersing medicinal, therapeutic or cleansing solutions in the upper nasal passage, gener-

ally indicated at **10**, is illustrated, the unit including cylindrical housing **11** having a lower portion which serves as a reservoir for the solution to be applied to nasal passages, a nose piece **12** which receives the nose of the user and accommodates the surrounding portion of the user's face to form an effective seal with the lower portion thereof in communication with and extending upwardly from the housing **11**, and an electrically powered pump **13** for dispersing the solution in the housing **11** towards the nasal passages of the user. As here shown, the pump **13** includes a housing **15** which is slidably received by and generally coaxial with the housing **11**, the fractional high speed battery operated motor **16** (FIG. 3) mounted on said housing, an impeller **18** rotatably mounted on the shaft of the motor **16** and depending downwardly into the lower portion of the housing **11**, and a battery **19** and switch **20** operatively connected to the motor whereby a user can selectively actuate the pump by closing switch **20.**

In order to both close the upper portion of the pump housing **15** and yet maintain access to the interior of the housing for replacing the battery or other maintenance, a cover **22** movably attachable to the upper portion of the pump housing is provided.

In accordance with one of the important aspects of the present invention, provision is made for dispersing a solution, usually water based, towards the upper nasal passage of the user in a steady and effective directed rate of dispersal. This is accomplished by utilizing an impeller which in operation, picks up the solution from the lower portion of the housing **11** and certrifugally slings or throws the solution in a droplet solution towards the nostrils of the user which are inserted into the nose piece **12.**

As best seen in FIG. **3**, the impeller **18** includes an elongated tapered opening with its smaller diameter end depending downwardly below the level of the solution in the lower portion of the housing **11** and its upper and larger diameter end opening into a 360° spaced opening **23** which is supported by four strut members **24** as shown in section in FIG. **5.** Still referring to FIG. **3**, the opening **23** in the upper portion of the impeller **28** has the effect of slinging the solution located in the lower portion of the housing **11** and drawn up through the tapered lower portion of the impeller in a generally 360° direction at right angles to the shaft of the motor **16** and by virtue of aligning the opening **23** of the impeller **18** with the major axis of the nose piece **12**, the solution drawn up into the impeller and dispersed out of the opening **23**, will be directed upwardly into the nose piece and correspondingly into the nostrils of the user.

In order to enable the user to inhale with his nose inserted into the nose piece **12** thereby facilitating the dispersed solution being drawn up into the nasal passage area, a vent hole **26** (FIG. **3**) is provided and is specifically sized to prevent an excessive amount of dispersed solution from entering the nostrils irrespective of how hard or deeply the user inhales while his nose is in the nose piece **12.** It will be readily appreciated by those skilled in the art that this feature is particularly advantageous inasmuch as it prevents considerable discomfort which could be caused if an excessive amount of dispersed solution were drawn into the nostrils since the most probable result would be a portion of said solution going down the throat of the user.

While the impeller **18** can be provided so as to dispersing the solution in any desired size, it has been found that a dispersal of droplets rather than a fine mist or vapor yields highly desirable results with the instant device and it is found that the droplets are both freely drawn into the nasal passage when the user inhales the ambient air through the opening **26**, and additionally tends to enable heated solutions to maintain its desired temperature range for a longer period since the droplets have a substantially smaller amount of surface area than a corresponding mist or vapor. Inasmuch as many of the solutions utilized with a device of the instant type are applied to the nasal passage in a warm or hot state, this feature is of particular importance.

Furthermore, by providing a substantial reservior for the solution at the lower portion of housing **11**, the temperature of the solution is further able to be maintained at a desired range for a longer period of time. In connection with the solution in the reservoir, it will be seen in FIG. **3** that the water or other solution utilized in the instant apparatus is able to diminish in volume slightly during use of the device and the impeller will still be capable of picking up the solution. While in use, the dispersed solution entering the nasal passage tends to flow back and return to the reservoir, it will be appreciated that some is lost and accordingly to utilize the instant device for a longer period, the user could tip his head back slightly, thus insuring that the lower portion of the impeller is submerged even if a slight amount of fluid below the operating level shown in FIG. **3** is lost.

To insure that the pump housing is inserted in a manner whereby the impeller will be disposed in its proper operating position, the housing **11** is provided with a plurality of spaced ribs **27** (FIG. **4**) which serve to index the legs **28** of the pump housing **15.**

Inasmuch as one of the most common solutions utilized with devices of the instant type is a warm saline solution, a cup **29** is integrally formed in the base of the housing **11** so that when this cup is filled with salt and the lower portion of the housing **11** is filled with warm water to its designated level indicated in FIG. **3**, a saline solution of conventional strength will result thereby significantly simplifying the overall use of the instant device.

While the exemplary device has been described in connection with dispersing solution for therapeutically treating or cleaning the nasal passages by virtue of being drawn up into same along with ambient air entering through opening **26**, it will be readily apparent to those skilled in the art that the instant device without opening **26** could be modified for use in applying dispersed solutions to other portions of the anatomy without departing from the spirit and scope of the present invention.

I claim:

1. Apparatus for projecting droplets of a solution into the nasal passages comprising:

a housing including an upper portion and a lower portion, said lower portion being adapted to serve as a reservoir for said solution and said upper portion being adapted to receive a pump therein;

conduit means extending outwardly from an upper portion of said housing located above said lower portion, said conduit means having a first end thereof affixed to and opening into said housing and extending upwardly and outwardly therefrom

and a second end remote from said housing and adapted to surround the nasal passages intended to be provided with the solution in droplet form;

centrifugal pump means supported within said upper portion of housing and including an impeller depending into said lower portion of said housing whereby when solution is placed therein, the lower portion of said impeller upon rotation will draw the solution into same and the upper portion of said impeller will disperse the solution in droplet form into and through said conduit means and into a nasal passage surrounded by second end thereof, said upper portion of said impeller disposed substantially perpendicular to and in alignment with the major axis of said conduit means and adjacent to said first end and proximate to said second end thereof;

a support connected to said pump means removably inserted into said lower portion, and supporting said pump with the lower end of said impeller immersed in said solution; said support being independent of said impeller;

an electric motor operatively connected to said impeller; and

means to power said motor.

2. The apparatus as set forth in claim **1** wherein the means to power said motor is a replaceable battery and a switch to activate said motor.

3. The apparatus as set forth in claim **1** wherein said conduit means is provided with an opening to the atmosphere whereby, when the apparatus is in actuation, the user by inhaling through his nose through said opening thereby assists the particles of solution being dispersed through the conduit means being drawn deep into the nasal passages.

4 The apparatus as set forth in claim **1** wherein said lower portion of said housing includes integral cup means of a volume substantially less than the solution capacity of said housing to provide means for mixing predetermined water based solution for use in the apparatus.

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