July 19, 1960 W. R. GRIFFIN 2,945,495

NASAL IRRIGATOR

Filed March 5, 1958

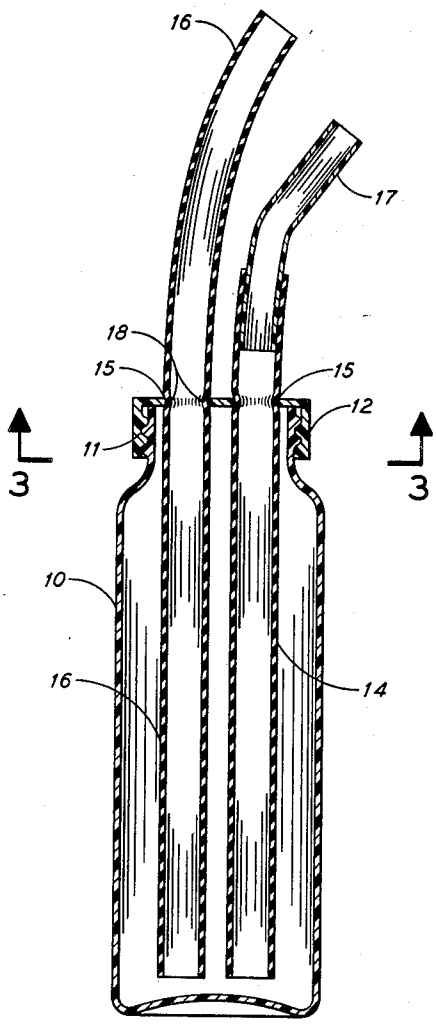

FIG. 2

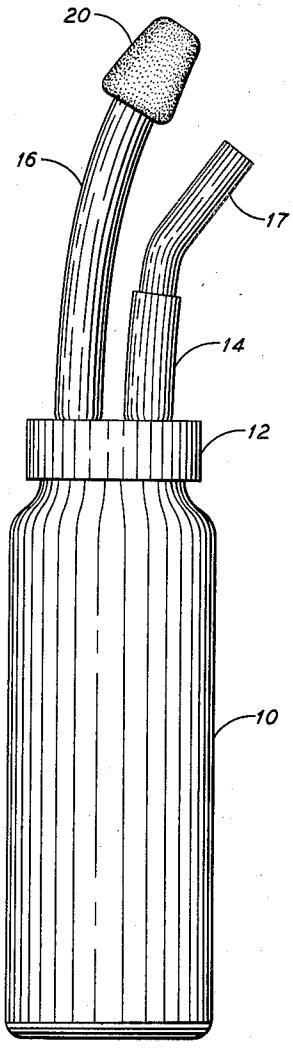

FIG. 1

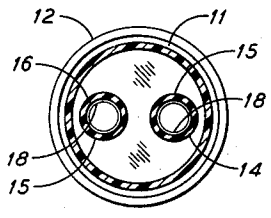

FIG. 3

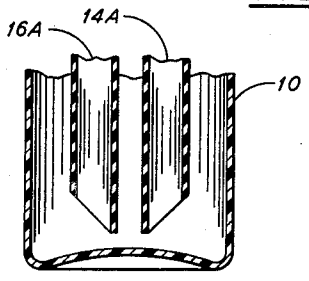

FIG. 4

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NASAL IRRIGATOR

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1 Claim. (Cl. 128—250)

The present invention relates to nasal irrigators and more particularly to self-administrable nasal irrigators.

The invention has for an object providing a nasal irrigator that is readily adjustable for self-administration, but safely limits the fluid pressure that can be applied to that exertable by the user's own lung power. In a preferred form of the invention, said nasal irrigator includes a hand-holdable reservoir bottle closed by a threaded cover member that has a pair of openings, or passageways, formed or drilled therein. A pair of slidable flexible hoses having diameters slightly larger than the holes in the cover are sealed by their own resiliency in the holes so that upon pulling the hoses their length may be adjusted relative to the bottle to fit any user's mouth and nostrils. One of said hoses extends sufficiently above the cover to enter a nostril of the user while the other hose is curvable to enter the user's mouth so that he may force fluid in the bottle into the one nostril by flowing the flushing fluid from one nasal passage into the other through the nasal turbinates. Desirably, the upper end of the hose entering the user's mouth has a mouth piece attached for facilitating its use. Additionally, the upper end of the hose entering the user's nasal passage is covered to prevent sharp edges on the hose from irritating the nasal membranes.

While nasal or sinus irrigators for flowing salt solutions and the like through nasal and sinus passages have been known before, they have generally included a hand-operable bulb and tube arrangement for forcing fluid from a basin, bottle or the like from an enlarged portion of the bulb into the nose of a user. Such systems are both awkward to use and painful, if not hazardous to the user when too great pressure is applied to the irrigating solution. Excessive fluid pressures are difficult to avoid with such systems since the hydraulic leverage or amplification can be in excess of that safe for application to the sensitive membranes and tissues of the nasal and sinus passages. The force that can be generated by simple hand and finger pressures applied to a squeeze bulb can be excessive for such a function.

In contrast to such unwieldy systems that are unpleasant or painful to the user, I have found that the danger of excessive fluid pressure that can be applied to an irrigating solution can be greatly reduced by pressurizing the solution with the user's own lung power. (As used herein, "lung power" of course includes the air pressure exertable by the user's lungs and diaphragm.) Such pressure is inherently limited to a few pounds per square inch, approximately 5, so that by direct application of the user's power to blow a fluid from a reservoir into the nasal passages the danger of excessive pressures to the nose and sinus is avoided. In accordance with the invention, my nasal irrigator includes a hand-held tubular reservoir bottle that can be filled with an irrigating solution by removal of a top cover that pressure seals the bottle. A pair of flexible hose members are sealed in the cover by their own resilience in a pair of holes formed therein. Since facial dimensions are different for each

user, the flexible hoses are made slidable by slight elongation to permit ready adjustment relative to each other so that one tube easily enters a nostril of the user while the other enters his mouth.

Further objects and advantages of the present invention will become apparent from the following detailed description taken in conjunction with the accompanying drawing wherein:

Fig. 1 is a side view of one form of a nasal irrigator made in accordance with the present invention;

Fig. 2 is a vertical cross-sectional view of a similar form of nasal irrigator;

Fig. 3 is a cross-sectional plan view taken in the direction of arrows 3—3 in Fig. 2;

Fig. 4 is a partial vertical cross-sectional view of the lower end of the reservoir illustrating an alternative form for the lower ends of the flexible hoses.

Referring now to the drawing and in particular to Figs. 1 and 2, it will be seen that the self-administered nasal irrigator includes a tubular reservoir bottle **10** that can be held in the user's hand. Bottle **10** is conveniently formed of a relatively stiff plastic material so that breakage in sink, lavatories and like is obviated but so that deformation will not occur under slight external or internal pressure. To form a relatively pressure-tight enclosure for the irrigant solution to be placed in bottle **10**, a cover member **12** is secured to the upper end of bottle **10** by screw threads **11** that are molded or cut in the mating surfaces forming one end of the cylinder. As shown, cover member **12** is made as large as conveniently possible to make filling of bottle **10** easy for the user.

Fluid from reservoir bottle **10** is forced into one of the nasal passages of the user through flexible hose **16**, which desirably is capped by a nose piece **20** formed of a soft resilient material. A separate material such as the sponge rubber indicated in Fig. 2 can be used, but I prefer to roll one end of tubing **16** back on itself to form a non-irriating end. It is particularly to be noted that irrigating hose **16** is sealed into communication with reservoir **10** by one of the pair of holes **15** in cover member **12**. Holes **15** are made slightly smaller than the undeformed outer diameter of flexible hoses **14** and **16**. The deformation of hose **16**, for example, is indicated by the collar section **18** in Figs. 2 and 3. Desirably, hoses **14** and **16** are sufficiently flexible and resilient so that the user can adjust the upper ends of the hoses to his own facial dimensions simply by applying tension thereto on either side of cover **12**. Of course, only one of the hoses need be made flexible in this way if the range of the user's dimensions is limited. As further indicated in the drawing, tube **16** is relatively thin so that its upper end will extend well up into the user's nasal passage and as near as possible to the nasal turbinates that become congested when the user suffers from sinusitus or other sinus disorders. Thus, the turbinates can be flushed rather than sprayed.

Hose **14** may include a mouth piece so that when the user applies the desired pressure-limited force to the liquid solution out of reservoir **10**, hose **14** easily engages the mouth when hose **16** is inserted in sealing engagement with the nasal passage. In a preferred manner of construction, the upper end of flexible hose **14** includes a glass or plastic mouth piece **17** that is bowed in approximately its center to permit easy access to the user's mouth. The relative spacing between mouth piece **17**, if used, and cap or nose piece **20**, where used, requires an easy adjustability to accommodate physical differences of users.

To prevent possible blockage of either hose when adjusted vertically in bottle **10**, it is desirable to cut the lower ends of hoses **14** and **16** at any suitable angle to

their axes; more simply, the lower ends **16A** and **14A** in Fig. 4 may be said to be cut on the bias. Thus, if either hose is pushed down too far into pressure reservoir **10**, neither the air nor fluid conduits are blocked off. While hose **14** has been shown to be approximately the same length as hose **16**, the air pressure hose can terminate anywhere within reservoir **10** so long as its engagement with cover **12** prevents the hose from being blown out of sealing engagement with hole **15**. In its simplest form, hose **14** can be made as shown in Figs. 1 and 2.

In operation, the user removes cover **12** and fills reservoir **10** with a nasal irrigating solution, such as common salt or baking soda dissolved in water. He then adjusts the length of hose **16** and inserts the upper end of that hose into sealing engagement with one nostril and blows through air pressure hose **14** to force the liquid into the nasal and sinus passages. Drainage of the irrigating solution will be through the opposite nostril of the user since when he applies pressure in this manner since his throat will be substantially blocked off by the blowing action. For reverse flushing the same procedure is then repeated through the other nostril.

While bottle **10** is conveniently refilled by removal of cover **12**, it will be apparent that my nasal irrigator can be constructed so that filling is through an enlarged bottom cover. In such construction, hoses **14** and **16** engage a fixed end wall of cylindrical bottle **10**.

Other modifications and changes in the exact construction of a lung-power limited nasal and sinus passage irrigator will become apparent from the foregoing description without departing from the inventive concept. All such modifications and changes falling within the scope of the following claim and its obvious equivalents are intended to be included therein.

I claim:

A hand-held, self-administrable nasal passage irrigator that is lung-power limited to the user thereof comprising

a hand-holdable reservoir bottle for containing a nasal irrigating fluid, a cover member threadably engaging said bottle to form a sealing wall for said reservoir bottle, said cover member having at least a pair of passageways formed therein, a pair of elongated, resilient hoses in said passageways having outer diameters that are slightly greater than said passageways to form an air-pressure seal therearound but small enough to permit vertical adjustment by applying tension to either end of said hoses, one of said hoses extending from adjacent the bottom of said bottle and terminating at a length above said cover member sufficient only to permit upward pressure on said bottle by the user to force deep entry into one nostril to make a fluid seal therewith during use, the end of said hose within said bottle being severed on the bias to prevent closure of said end when against the bottom of said bottle, the upper end of said hose for engaging the user's nostril having an integrally formed cap portion to prevent scraping of the user's nasal membrane, and the other of said hoses extending into said reservoir bottle sufficient only to permit air pressure to be exerted on the upper portion of said bottle, said other hose terminating adjacent the end of said nostril engaging hose to form a mouth piece for ready entry into the user's mouth whereby the user can control the pressure applied to the fluid while holding said nostril engaging hose in contact with his nasal passage by holding said reservoir bottle in his hand.

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