June 3, 1952 R. A. BERMAN 2,599,521

RESPIRATORY DEVICE

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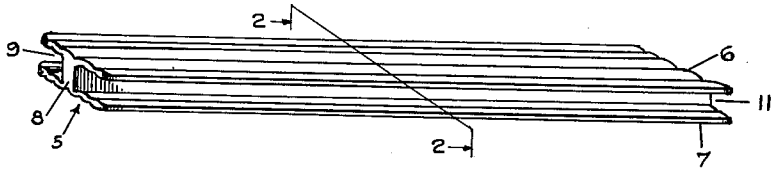


Fig. 1

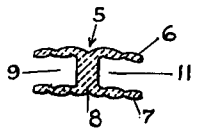


Fig. 2

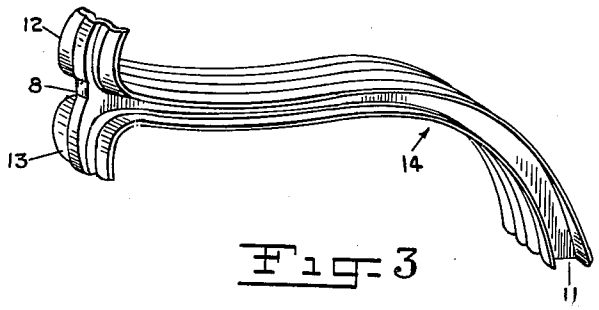


Fig. 3

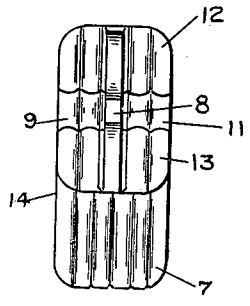


Fig. 4

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RESPIRATORY DEVICE

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7 Claims. (Cl. 128—208)

1

This invention relates to a respiratory device, and relates more particularly to a respiratory airway, employed in the practice of surgery and medicine, for insertion in the mouth and pharynx of a patient to insure normal breathing. More precisely, my invention contemplates a respiratory airway for insertion in the mouth and pharynx to provide passageways through the mouth through which air may enter and be expelled in breathing when the patient is under the influence of an anesthetic or when natural respiration is rendered difficult by reason of the collapse of the walls of the pharynx or by the obstruction of the pharynx by the tongue sliding back.

Respiratory airways of the type to which the airway of my invention belongs have heretofore been made of metal or hard rubber and were provided with a single passageway running longitudinally thereof. Since it is often necessary for the anesthetist or physician to insert the airway quickly, the metal or hard rubber airway would often cause lacerations of the patient's mouth, tongue and pharynx.

Another factor which contributed to lower the efficiency of these prior airways was the fact that they were difficult to clean the passageway of mucous and other foreign matter. Due to the pharyngeal bend in the airways it was impossible to look through the passageway from opening to opening to see whether foreign bodies were present or whether the mucous had been cleared away by cleaning and sterilization operations.

It is an important object of my invention to provide an improved respiratory airway which will be free from the above mentioned and other disadvantages and which will be especially simple in construction and efficient in use.

In one aspect my invention comprises a respiratory airway having two coextensive passageways open along the full length thereof and separated by a rib. The use of open passageways makes for easy cleaning under direct vision; it is impossible in the respiratory airway of my invention for any mucous or other foreign matter to go undetected.

Another object of my invention is the provision of a novel method of preparing the respiratory airway of my invention.

Other objects of my invention, together with certain detals of construction and combinations of parts, will be apparent from the following description and will be pointed out in the appended claims.

In the drawing, wherein a preferred embodiment of my invention is shown,

2

Figure 1 is a perspective view of a length of material from which my respiratory airway is formed,

Figure 2 is a cross-sectional view taken along line 2—2 in Figure 1,

Figure 3 is a perspective view of my novel respiratory airway, and

Figure 4 is an end elevational view of the respiratory airway with a front view of the flanges.

Like reference numerals indicate like parts throughout the several views of the drawing.

Referring now to the drawing for a detailed description of my invention, the reference numeral 5 indicates a length of material employed in preparing the respiratory airway of my invention, and comprises two substantially parallel surfaces 6 and 7 separated by a median rib or center bar 8 to form two longitudinal slots 9 and 11. The surfaces 6 and 7 may be smooth, as shown, for greater strength and rigidity.

Any suitable material may be employed for making element 5. For example, I may employ a relative soft elastomer, such as natural or artificial rubber, a cellulose ester, such as cellulose acetate, cellulose propionate or cellulose butyrate, a cellulose ether such as ethyl cellulose or benzyl cellulose, acrylic resins such as methyl methacrylate, or other suitable synthetic materials. However, I prefer to use polyethylene, a polymer of ethylene which is a solid characterized by being tough, light in weight, extremely low in water absorption and moisture permeability, and resistant to alkalies, acids and oxygenated solvents. Polyethylene can be injection and compression molded and has a softening point of from 220 to 240° C. and, accordingly, readily lends itself to my novel method of forming the respiratory airway of my invention, as will now appear.

While my respiratory airway may be formed by injection or compression molding, I prefer to prepare it as follows: The element 5 is formed in relatively long lengths by extruding thermoplastic material, such as polyethylene, through a suitable die in the form of an H-bar. A strip of the desired length is cut from a longer length of the material and the center bar 8 is slit longitudinally through substantially the center thereof for a distance of about one half of an inch. The element 5 is then subjected to the action of heat at a temperature which softens the same, the surfaces 6 and 7 at the slit end turned at right angles to form flanges 12 and 13, and the body portion bent to form the pharyngeal contour 14.

As is well known, the respiratory airway is usually inserted into the mouth as soon as anesthesia has been induced. The structure of my respiratory airway, with its two substantially large passageways, is such that adequate air space is present. Moreover, when polyethylene is employed as the base material of my respiratory airway, the airway is relatively soft, resilient and therefore non-traumatic. Furthermore, the polyethylene being soft, breakage or chipping of the patient's teeth is prevented. The center bar 8 acts as a bite block, thus preventing the closing of the passageways 9 and 11 by the clamping of the teeth.

It will be noted by reference to the cross section on Fig. 2 that the upper and lower surfaces or flanges 6 and 7 have running longitudinally of the device a series of ridges and grooves extending along the major axis. These ridges and grooves may be prepared by the shape of the extrusion die utilized.

The elements 6 and 7 may be regarded as plates connected together but separated by the central bite block 8 or they may be regarded as the legs of an H or a double U.

These thin plastic plates 6 and 7, as shown with the grooves and ridges as illustrated in Figs. 1, 2 and 4, contribute to the airway construction.

The embodiment of my invention shown and described herein is to be considered merely illustrative, as my invention is susceptible to variation, modification and change within the spirit and scope of the appended claims.

I claim:

1. A respiratory airway for insertion in the mouth and pharynx, comprising an elongated flat body of rectangular H-shape cross section with elongated parallel laterally extending legs, said body having a plurality of longitudinally extending passageways open at the ends and along the length thereof.

2. A respiratory airway for insertion in the mouth and pharynx, comprising a curved elongated flat body of rectangular H-shape cross section with elongated parallel laterally extending legs, said body having a plurality of longitudinally extending passageways open at the ends and along the length thereof.

3. A respiratory airway for insertion in the mouth and pharynx, comprising an elongated flat body of rectangular H-shape cross section with elongated parallel laterally extending legs, said body having a plurality of longitudinally extending passageways open at the ends and along the length thereof, an integral bar extending along the longitudinal axis of said body for separating said passageways, and flanges at one end of said body.

4. A respiratory airway for insertion in the mouth and pharynx, comprising two substantially parallel curved thin flat plates, and a bar extending along the longitudinal axis of and constituting a central connection between said plates, separating said plates and forming two passageways open at the ends and along the length thereof, said plates being curved at one end thereof to form oppositely disposed flanges.

5. A respiratory airway for insertion in the mouth and pharynx, comprising two substantially parallel curved thin flat plates, and a bar extending along the longitudinal axis of and constituting a central connection between said plates and integral with said plates, separating said plates and forming two passageways open at the ends and along the length thereof, said plates being curved at one end thereof to form oppositely disposed flanges.

6. A respiratory airway for use in surgery for insertion in the mouth and pharynx of a patient to provide passageways through the mouth and pharynx through which the patient may normally breath under influence of an anesthetic and when natural respiration is rendered difficult by reason of the collapse of the walls of the pharynx or sliding back of the tongue, consisting of two flat closely spaced parallel thin plates having a central bar vertical to and connecting said plates and sufficiently thick and strong to resist the pressure of the bite.

7. The airway of claim 6 in which the plates at the end of the airway are turned away from each other at an angle of 90 degrees so that they will be substantially in the same plane with one-half of the central bar being attached to each of the plates, said airway being formed of a polyethylene.

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