United States Patent [19]

King

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[54] **FLEXIBLE NASAL CANNULA**

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[52] **U.S. Cl.** **128/206**

[51] **Int. Cl.** **A61m 15/08**

[58] **Field of Search** ..... 128/206, 207, 198, 128/200, 140 N, 146, 147, 145; 273/80 B; 138/118, 178, DIG. 11

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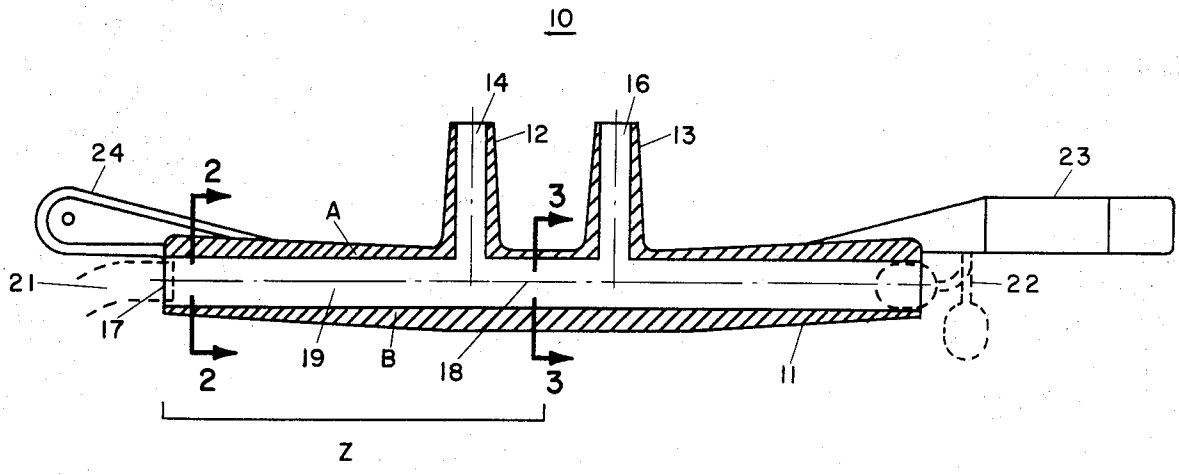
[57] **ABSTRACT**

A flexible nasal cannula adapted for the intake of therapeutic gas from either the right or left side of a patient, wherein the top and bottom wall sections of the cross tube are tapered from the ends to the mid point of the cross tube.

2 Claims, 5 Drawing Figures



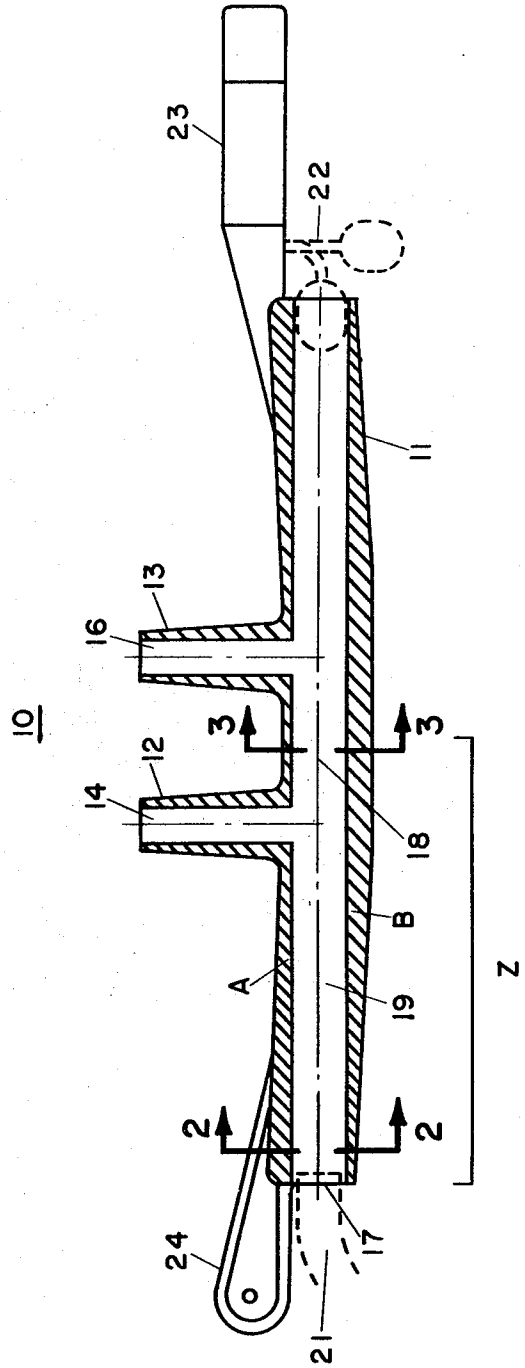


FIG 1

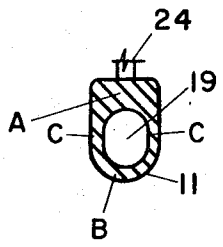


FIG. 2

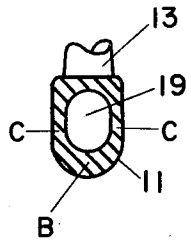


FIG. 3

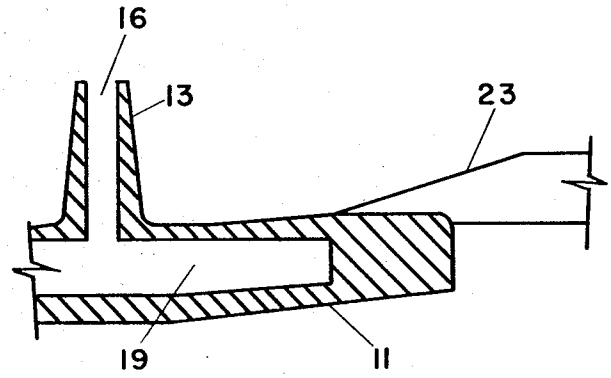


FIG. 5

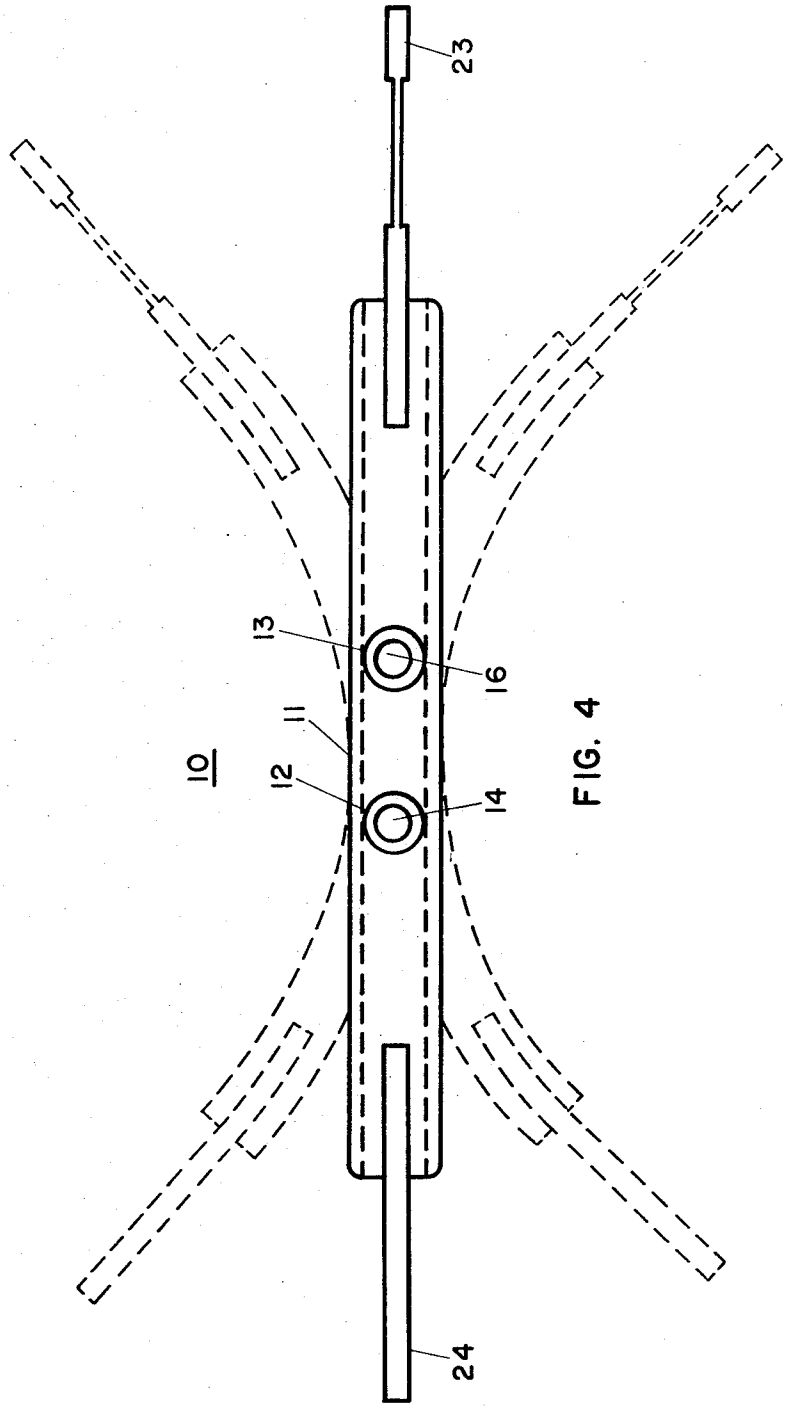


FIG. 4

FLEXIBLE NASAL CANNULA

This invention relates to nasal cannulas. More specifically, it relates to flexible nasal cannulas adaptable for use from either the right or left side of a patient.

Flexible nasal cannulas are known in the art. These prior art cannulas, however, are deficient in that they restrict the intake of therapeutic gas e.g. oxygen to either one side or the other of a cannula cross tube. This necessitates the placing of oxygen tanks or connections on the gas inlet side of the cannula, or the extending of the gas inlet tubing about the patient to make the necessary cannular connections.

It is an object of this invention to provide a flexible nasal cannula which is adaptable to the intake of therapeutic gas into the cross tube of the cannula from either the right or the left side of the cannula with reference to its placement on the patient.

This and other objects of this invention will become apparent from the following detailed description and drawing wherein:

FIG. 1 is a cross sectional view of the nasal cannula of this invention.

FIG. 2 is a cross sectional view of the cannula of FIG. 1 through the lines 2—2.

FIG. 3 is a cross sectional view of the cannula of FIG. 1 through the lines 3—3.

FIG. 4 is a top view of the cannula of FIG. 1.

FIG. 5 is a fragmented view of a preferred embodiment of the cannula of this invention.

Broadly this invention provides a flexible nasal cannula adapted for the intake of therapeutic gases from either the right or left side of a patient, which comprises a cross tube in flow communication with nostril conduits, wherein the top and bottom wall sections of the cross tube are tapered from both ends to the mid section of the cross tube.

This invention will best be understood from the following detailed description.

Referring now to FIG. 1 there is depicted a nasal cannula 10 of this invention, having a cross tube 11, nostril conducts 12 and 13 with orifices 14 and 16.

The flexibility of the cannula of this invention is provided by a tapering of the upper section A and the bottom section B of the wall of the cross tube 11, such that the thickness of section A and section B varies from the end 17 to the mid-section 18 of the cross tube 11. This is illustrated in FIG. 1 at Z and in FIGS. 2 and 3. In FIG. 2, the thickness of the upper section A of the wall of cross tube 11 is greater than that of the lower section B, while in FIG. 3 the thickness of wall sections A and B of the cross tube 11 are reversed, such that section B is thicker than section A. This variation in thickness of sections A and B through cross tube 11 is shown in cross section in FIG. 1, by the area designated as Z. The thickness of side wall section C of cross tube 11 is not tapered and is a constant dimension from end 17 to the mid point 18, and also the inside diameter of the bore 19 of the cross tube 11 is uniform throughout its length. It should be understood that while only the left side of cross tube 11 as shown in FIGS. 1, 2 and 3 has been discussed, the right side of cross tube 11 is identical in all physical respects to the left side and that a discussion of the variation of wall thickness of the left side of cross tube 11 is sufficient for an understanding of the cannula of this invention.

It has been found that satisfactory flexibility may be imported to the cannula of this invention by having the thickness of wall sections A and B vary along their respective lengths from end 17 to mid section 18 by a ratio of about 3 to 1 for section A and about 1 to 3 for section B. That is section A is about 3 times as thick at end 17 as it is at mid section 18, and section B is about one-third as thick at end 17 as it is a mid section 18.

A gas inlet tube may be in flow communication with bore 19 at either end of cross tube 11. In FIG. 1 the inlet gas tube 21 is shown in phantom at the left side of cannula 10 in flow connection with bore 19 of cross tube 11. The open end of bore 19 may be closed with a plug 22, shown in phantom in a closed and open relationship with bore 19 on the right side of cannula 10. Plug 22 may be attached to a strap tab 23 or may be unattached to cannula 10.

A preferred embodiment of the flexible nasal cannula of this invention is shown in FIG. 5, wherein the right end of the bore 19 of cross tube 11 of cannula 10 is sealed. It is understood that either end of bore 19 of cross tube 11 may be sealed and that the right end is shown sealed in FIG. 5 for purpose of illustration and not limitation.

Strap tabs 23 and 24 are illustrative of the type of tabs that may be incorporated into the cannula 10, and other strap tabs will become apparent to those skilled in the art. The only limitation upon the type of strap tab that may be used is that it should not interfere with the flexibility of the cannula.

The flexibility of the cannula of this invention is illustrated in FIG. 4 where in the curvature of the cannula 10 in relation to a patient's face is shown in phantom.

The novel construction of the cannula of this invention, allows for the comfortable fitting of the nostril conduits 12 and 13 into the nasal passages of a patient. Thus section A being thinner than section B at the mid section of cross tube 11 e.g. between conduits 12 and 13, allows the conduits 12 and 13 to incline toward each other where the cannula 10 is curved to fit a patient in the manner shown in phantom in FIG. 4. The conduits 12 and 13 thus adjust to fit the nasal passages of a patient.

The nasal cannula of this invention may be prepared from polymeric material such as polyvinylchloride.

What is claimed is:

1. A flexible nasal cannula comprising in combination a cross tube, a pair of generally parallel upstanding nostril conduits in flow communication with said cross tube, a strap tab mounted at about each end of said cross tube, a plug mounted on one of said strap tabs at one end of said cross tube, said plug being removably and sealingly inserted in said one end, an inlet tube in flow communication with said cross tube end opposite to said plug end, said cross tube having upper, lower and side wall sections, said nostril conduits extending from said upper wall section, said cross tube having said upper and lower sections of its walls tapered from each end to the midsection, such that the thickness of the upper section is greater at the ends than at the midsection and the thickness of the lower section is greater at the midsection than at the ends, and the side walls of said cross tube are of uniform thickness from end to end.

2. A flexible nasal cannula comprising in combination a cross tube having a closed end, a pair of generally parallel upstanding nostril conduits in flow communication with said cross tube, a strap tab mounted at about each end of said cross tube, an inlet tube in flow

communication with the open end of said cross tube, said cross tube having upper, lower and side wall sections, said nostril conduits extending from said upper wall section, said cross tube having said upper and lower sections of its walls tapered from each end to the midsection such that the thickness of said upper section is greater at the ends than the midsection and the thickness of the lower section is greater at the midsection than at the ends, and the side walls of said cross tube are of uniform thickness from end to end.

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