



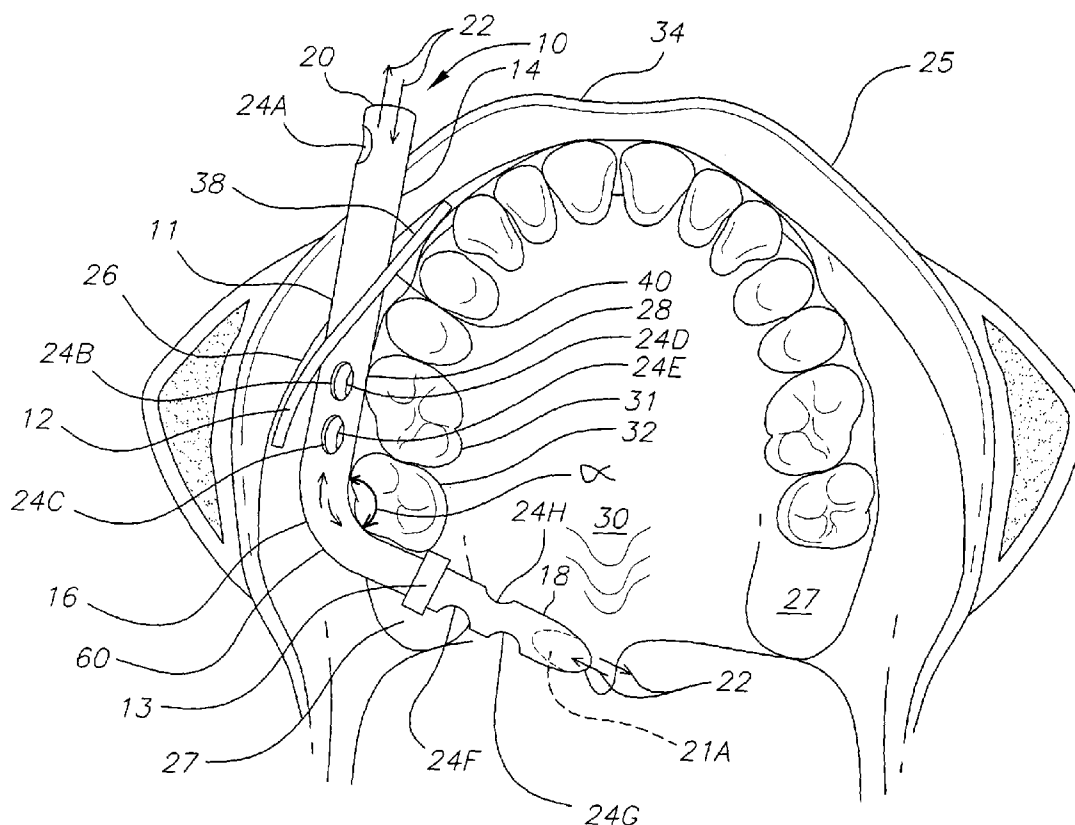
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(19) **United States**(12) **Patent Application Publication**
Miller(10) **Pub. No.: US 2004/0194787 A1**(43) **Pub. Date: Oct. 7, 2004**(54) **ANTI-SNORING DEVICE AND METHOD OF USE**(76) **Inventor: Chipp St. Kevin Miller, Pacific Palisades, CA (US)**

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PASADENA, CA 91109-7068 (US)(21) **Appl. No.: 10/405,782**(22) **Filed: Apr. 1, 2003****Publication Classification**(51) **Int. Cl.⁷ A61F 5/56**(52) **U.S. Cl. 128/848**(57) **ABSTRACT**

An anti-snoring device is provided that includes a flexible hollow tube for insertion into the user's mouth, having proximal and distal ends and an outer perimeter. The tube includes an extraoral segment at its proximal end, an intraoral segment at its distal end and an intermediate segment extending therebetween. The extraoral and intraoral segments each include at least one opening. The extraoral segment is for extending beyond the user's outer lips, the intermediate segment is of a sufficient length for extending along the buccopharyngeal pathway of the user's mouth, and the intraoral segment is of a sufficient length for extending beyond a retromolar space in the user's mouth, into the oropharynx and terminating between the posterior tongue and the soft palate. The anti-snoring device also includes a stop extending from the outer perimeter of the tube on the intraoral segment for securing the intraoral segment within the user's oropharynx. A method of reducing snoring in a user's mouth utilizing the above described anti-snoring device is also provided.



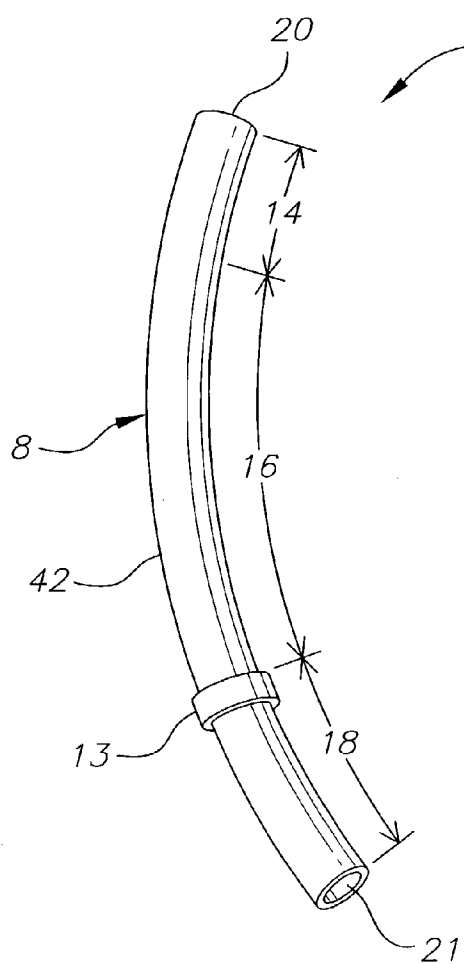


FIG. 1A

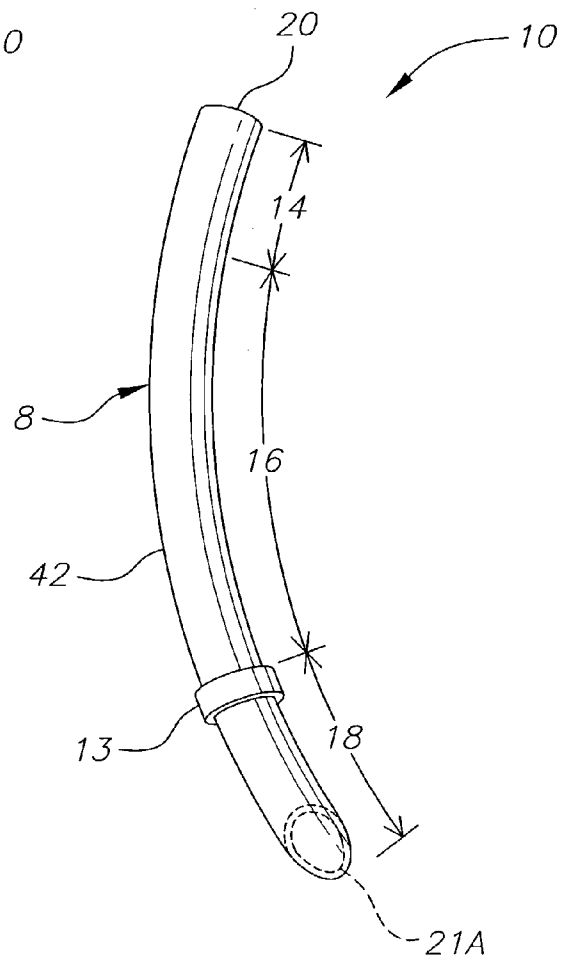


FIG. 1B

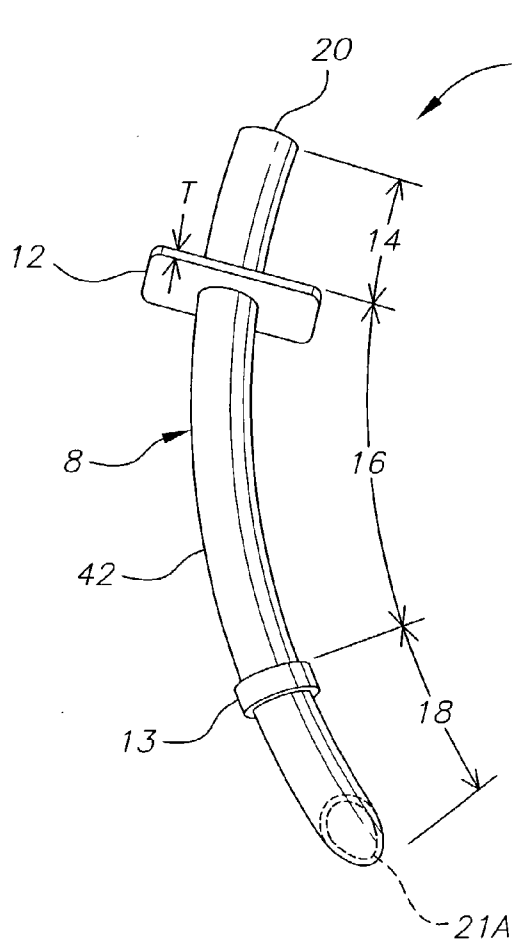


FIG. 1C

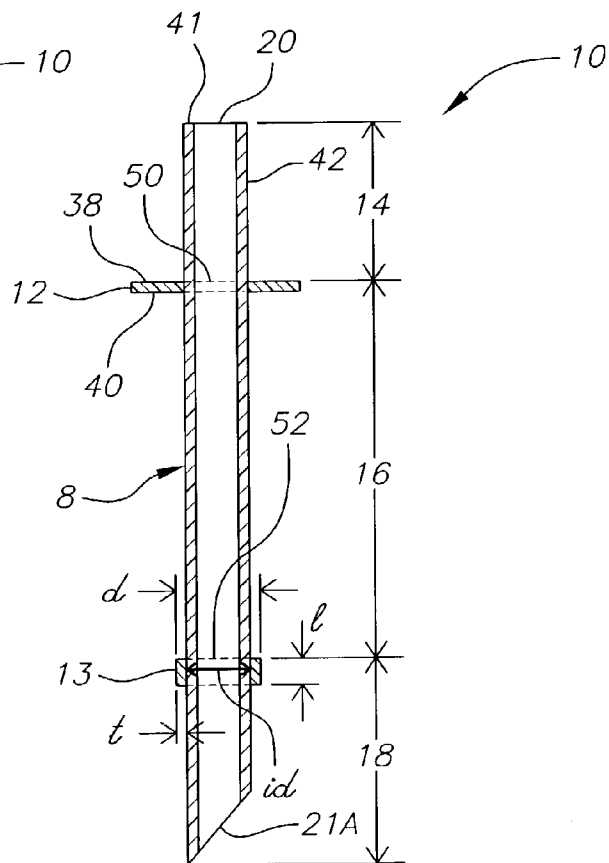


FIG. 1D

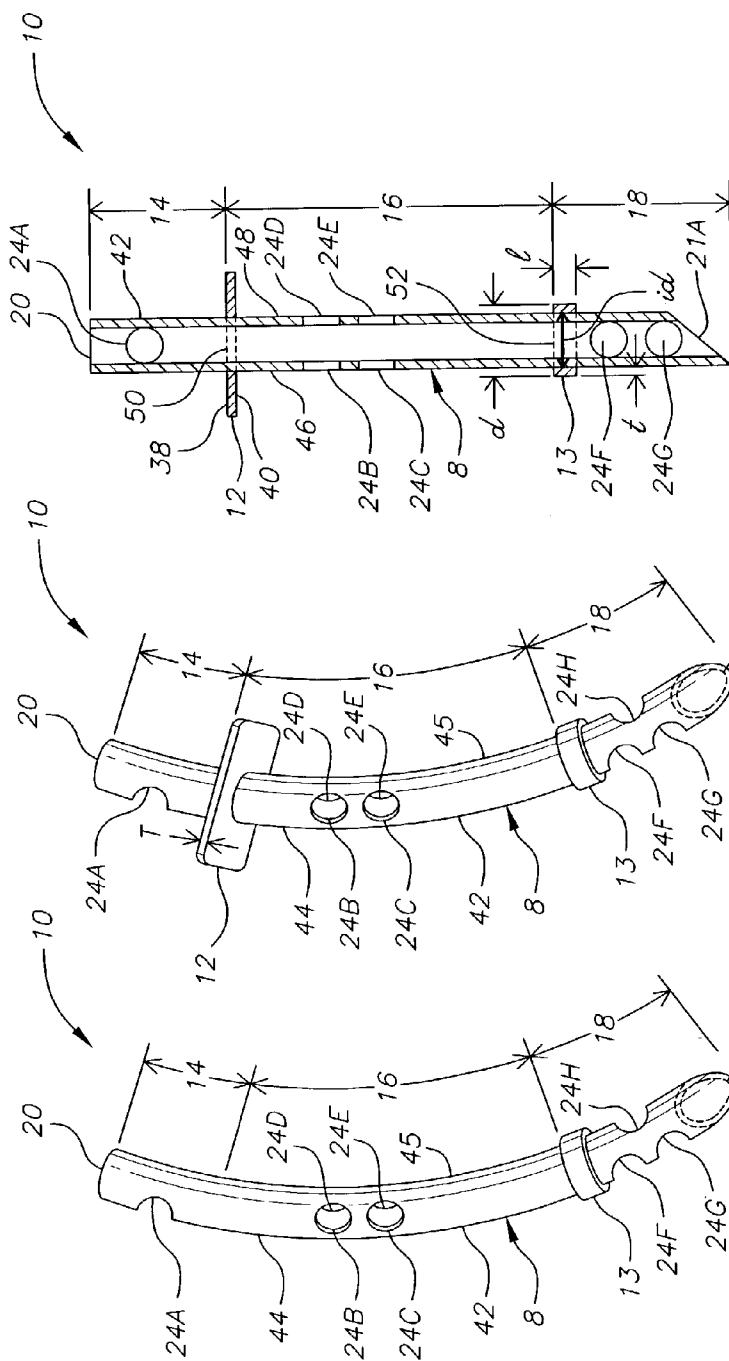


FIG. 2C

FIG. 2B

FIG. 2A

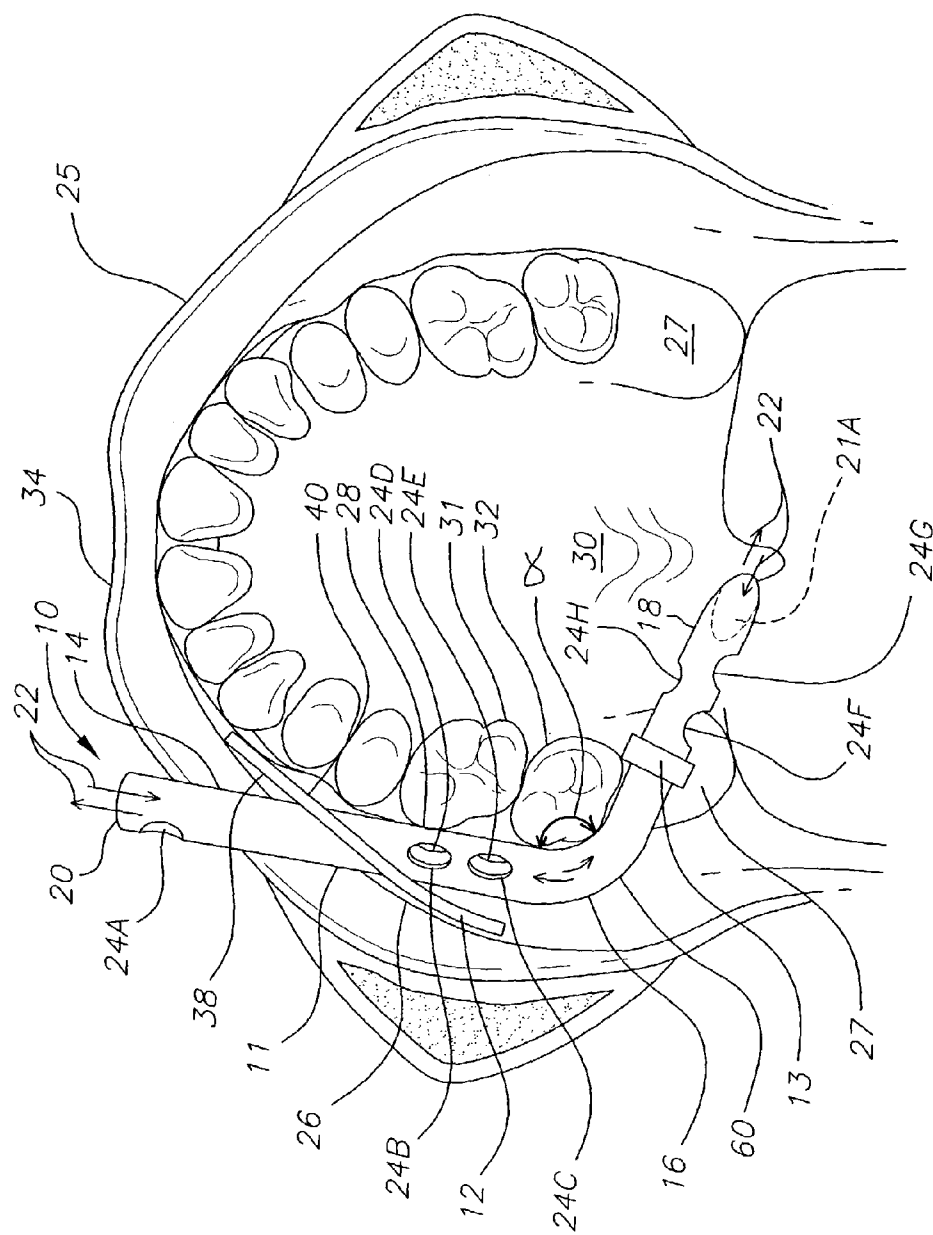
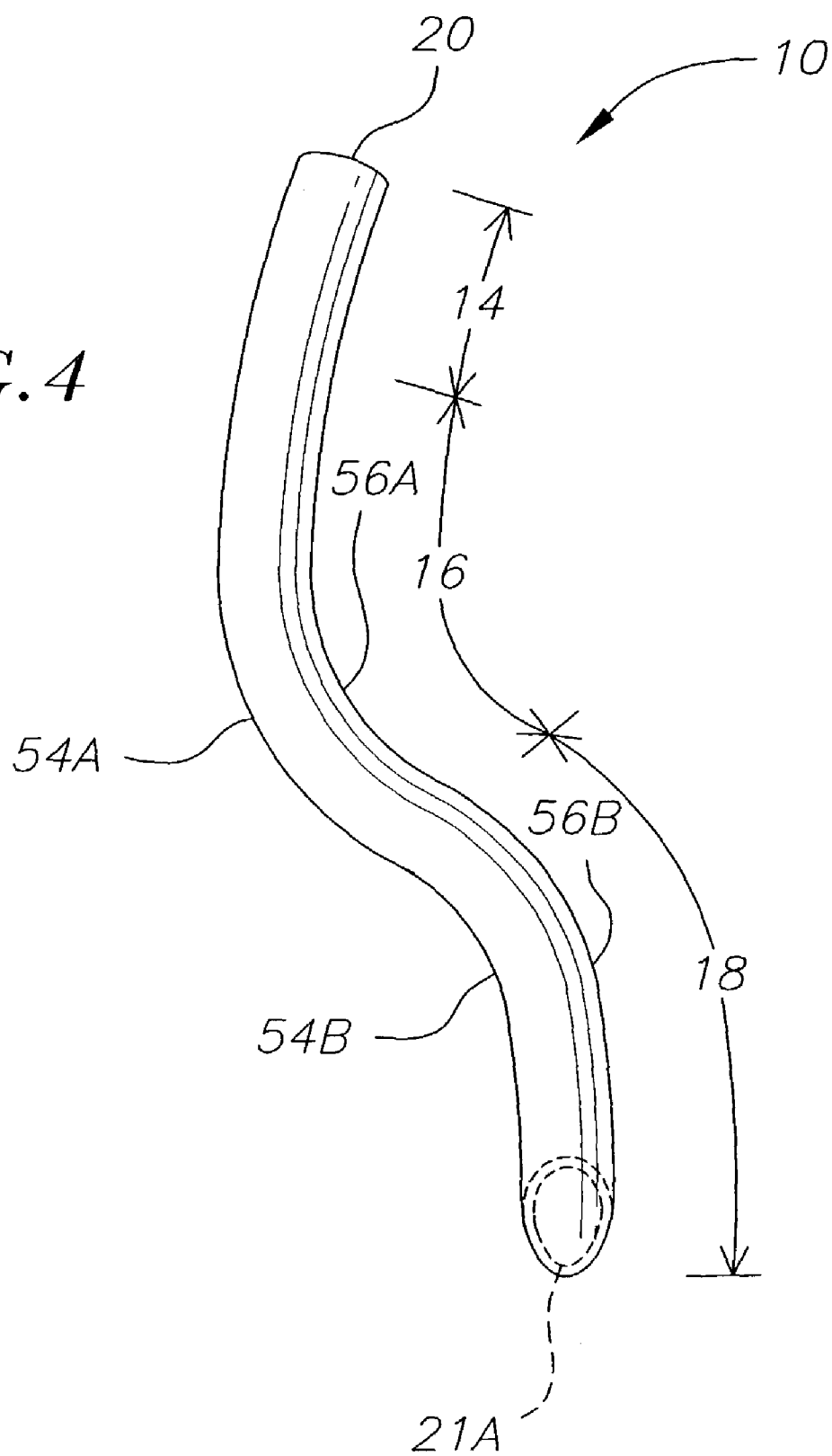


FIG. 3

FIG. 4



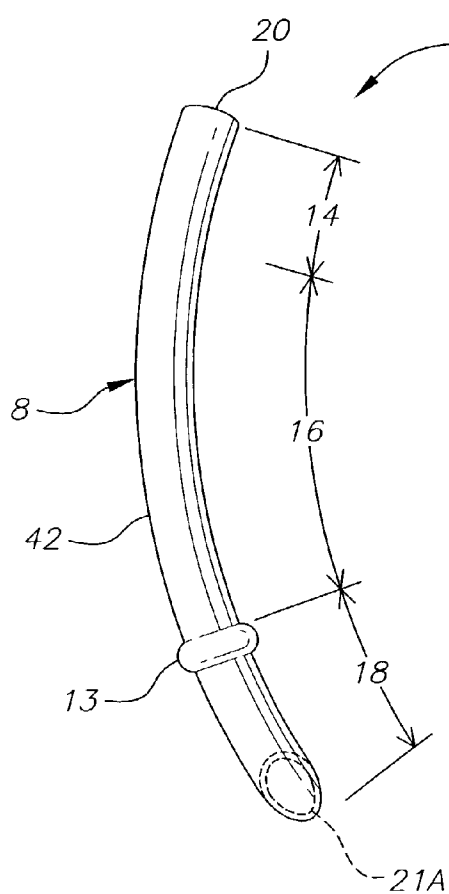


FIG. 5A

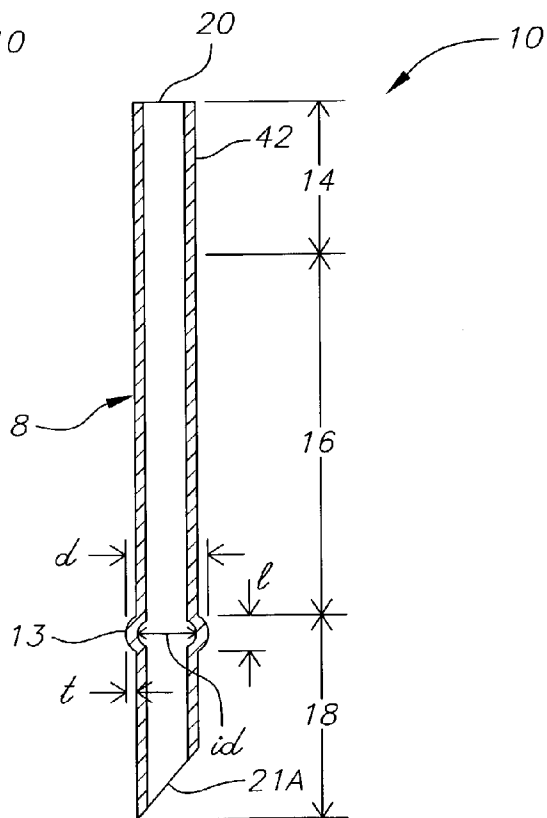


FIG. 5B

ANTI-SNORING DEVICE AND METHOD OF USE

FIELD OF THE INVENTION

[0001] The present invention relates generally to an anti-snoring device for insertion into a user's mouth for providing an unobstructed buccopharyngeal pathway for inspiratory and expiratory airflow to prevent snoring, sleep disordered breathing and/or obstructive sleep apnea.

BACKGROUND

[0002] Sleep Apnea is a common disorder affecting approximately 20,000,000 Americans. Sleep Apnea refers to a cessation of breathing during sleep that lasts at least 10 seconds. Snoring is another common sleep disorder. By conservative estimates, approximately 80,000,000 Americans are afflicted with snoring.

[0003] These sleep disorders cause countless hours of lost sleep and productivity for the afflicted persons, as well as their sleeping partners. In addition, Sleep Apnea is highly associated (50%) with essential hypertension, obesity and heart disease. Moreover, extreme cases of Sleep Apnea can be life threatening.

[0004] Current therapy includes sleep position modification, weight loss, and/or lifestyle changes such as the elimination of alcohol, drug use and/or over-eating. Other therapies include the use of mechanical devices such as oral or nasal devices that augment the airway, surgical procedures to enlarge and stabilize the airway during sleep, and continuous positive airway pressure devices.

[0005] Nasal devices that dilate the anterior nares by external traction or internal splinting have been used with minimal success. Nasal intubation is poorly tolerated and traumatic to the user.

[0006] Current oral devices are typically of two types. One type of oral device involves a tongue retention device that advances and secures the tongue using suction, or mechanical tongue depression and stabilization. However, this type of oral device has limited success and is poorly tolerated by the user. A second type of oral device is a mandibular repositioning device that advances the lower jaw relative to the fixed upper jaw to expand the cross-sectional area of the pharynx thereby improving airflow and preventing collapse. These devices have been variably effective, but commonly have both comfort and compliance problems.

[0007] Surgical treatments are varied and include reconstruction of the palate and uvula, various methods to shrink and stiffen the soft tissue of the upper airway, tonsillectomy, laser treatment, radio frequency tissue reduction, hyoid suspension, and tongue base excision and retention. More radical surgical treatments for severe disorders include tracheotomy and surgical advancement of the upper and lower jaws. Surgical treatments are typically highly expensive, painful, complicated and have varying success rates (typically 40-60%).

[0008] Nasal and/or oral continuous positive airway pressure has been the most successful of the current sleep disorder treatments. However, this treatment is highly expensive and poorly tolerated by many user's who typically find the treatment intrusive and intolerable. Accordingly, a

need exists for an effective, well tolerated, economical treatment for persons afflicted with sleep disordered breathing.

SUMMARY

[0009] In one embodiment, the present invention is an anti-snoring device that includes a flexible hollow tube for insertion into a user's mouth, having proximal and distal ends and an outer perimeter. The tube includes an extraoral segment at its proximal end, an intraoral segment at its distal end and an intermediate segment extending therebetween. The extraoral and intraoral segments each include at least one opening. The extraoral segment is for extending beyond the user's outer lips, the intermediate segment is of sufficient length for extending along the buccopharyngeal pathway of the user's mouth, and the intraoral segment is of sufficient length for extending beyond a retromolar space in the user's mouth, into the oropharynx and terminating between the posterior tongue and the soft palate. The anti-snoring device also includes a stop extending from the outer perimeter of the tube on the intraoral segment for securing the intraoral segment within the user's oropharynx.

[0010] Another embodiment of the present invention includes a method of reducing snoring in a user's mouth. The method includes inserting into the user's mouth a flexible hollow tube that has an extraoral segment at its proximal end, an intraoral segment at its distal end and an intermediate segment extending therebetween, wherein the extraoral and intraoral segments each include at least one opening. The method further includes positioning the extraoral segment of the tube exterior to the user's lips, positioning the intermediate segment of the tube along the buccopharyngeal pathway of the user's mouth and positioning the intraoral segment of the tube beyond a retromolar space in the user's mouth, into the oropharynx and terminating between the posterior tongue and the soft palate.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] These and other features and advantages of the present invention will be better understood by reference to the following detailed description when considered in conjunction with the accompanying drawings wherein:

[0012] **FIG. 1A** is a front perspective view of one embodiment of an anti-snoring device according to the present invention;

[0013] **FIG. 1B** is a front perspective view of another embodiment of an anti-snoring device according to the present invention;

[0014] **FIG. 1C** is a front perspective view of another embodiment of an anti-snoring device according to the present invention;

[0015] **FIG. 1D** is a cross-sectional side view of the anti-snoring device of **FIG. 1C**;

[0016] **FIG. 2A** is a front perspective view of another embodiment of an anti-snoring device according to the present invention;

[0017] **FIG. 2B** is a front perspective view of another embodiment of an anti-snoring device according to the present invention;

[0018] FIG. 2C is a cross-sectional side view of the anti-snoring device of FIG. 2B;

[0019] FIG. 3 is a cross-sectional view of the upper side of a user's mouth having an anti-snoring device according to the present invention inserted therein.

[0020] FIG. 4 is a front perspective view of another embodiment of an anti-snoring device according to the present invention;

[0021] FIG. 5A is a front perspective view of another embodiment of an anti-snoring device according to the present invention; and

[0022] FIG. 5B is a cross-sectional side view of the anti-snoring device of FIG. 5A.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0023] As shown in FIGS. 1A-5, an embodiment of the present invention is an anti-snoring device for insertion into a user's mouth for providing an unobstructed buccopharyngeal pathway for inspiratory and expiratory airflow to prevent snoring, sleep disordered breathing and/or obstructive sleep apnea. Snoring is a common benign condition characterized by noisy harsh breathing during sleep resulting from soft tissue airway collapse and vibration during the respiratory cycle. This creates a dynamic vibratory resonance between the pressure of respiratory effort and the inherent elastic recoil of the soft tissues.

[0024] In the embodiments of FIGS. 1A-5, the anti-snoring device 10 includes a flexible hollow tube 8 having three segments, an extraoral segment 14, an intermediate segment 16, and an intraoral segment 18. The extraoral 14 and intraoral 18 segments each include at least one opening. For example, in the depicted embodiment, the extraoral segment 14 includes an open end 20 and the intraoral segment 18 includes an open end 21.

[0025] As shown in FIG. 3, when the anti-snoring device 10 is inserted into a user's mouth 25 a buccopharyngeal pathway 11 is created for inspiratory and expiratory airflow as illustrated by arrows 22. The buccopharyngeal pathway 11, as used herein, is defined as a pathway extending along an outer surface 28 of the of the user's dentition, between the outer surface 28 of the user's dentition and an inner surface 26 of the user's inner cheek, wherein dentition is defined as the user's teeth and gums in the user's dental arch.

[0026] When the anti-snoring device 10 is positioned as shown, the intraoral segment 18 extends past a retromolar space 27 (defined as an area in the user's upper or lower dentition past the user's last molar or an area past the user's upper and lower dentitions when the user's mouth is closed), enters the oropharynx 30 (defined as the posterior oral cavity behind the user's dentition) and terminates between the posterior tongue and the soft palate. The retromolar space 27 as defined herein is created by the removal or nonexistence of at least the upper and/or lower third molar in the user's mouth 25.

[0027] In the depicted embodiment, the user's mouth contains a first upper molar 31 and a second upper molar 32, but does not contain a third upper molar. The absence of the third upper molar allows the anti-snoring device 10 to cross behind the user's dentition and enter the user's oropharynx

30. Although, the upper teeth are depicted, a depiction of the lower teeth would be substantially similar and is not included herein to avoid duplicity.

[0028] Adjacent to the intraoral segment 18 is the intermediate segment 16. The intermediate segment 16 extends along the buccopharyngeal pathway 11. The intermediate segment 16 may be positioned adjacent to the user's upper dentition, lower dentition or both the upper and lower dentitions, and may pass through the retromolar space 27 in the user's upper dentition, lower dentition or both the upper and lower dentitions, as long as the intermediate segment 16 passes along the buccopharyngeal pathway 11 and the intraoral segment 18 enters the oropharynx 30. The extraoral segment 14 is adjacent to the intermediate segment 16. The extraoral segment 14 extends past the user's lips 34 and outside the user's mouth 25.

[0029] When the anti-snoring device 10 is positioned as described above, the unique buccopharyngeal pathway 11 is created as depicted by arrows 22 for inspiratory and expiratory airflow during sleep. The buccopharyngeal pathway 11 is unique because it utilizes a route of airflow that is typically not used in normal breathing patterns and is not previously described in the medical literature as a route for respiratory airflow. The buccopharyngeal pathway 11 presents a pathway for airflow during normal breathing patterns only when it is "stented" open by the anti-snoring device 10 as described above. The anti-snoring device 10 also allows for the buccopharyngeal pathway 11 to be stented open even with the user's mouth closed and allows the user's dentition to remain in its natural and normal position, while accommodating normal jaw movement. As a result, normal swallowing, throat clearing, yawning, coughing and sneezing are not disturbed when the anti-snoring device 10 is in the user's mouth. In addition, since the intraoral segment 18 is positioned in the posterior oropharynx 30 and terminates on the lateral-posterior tongue the naturally triggered gag reflex is markedly diminished.

[0030] The anti-snoring device 10 eliminates snoring, sleep disordered breathing and obstructive sleep apnea for several reasons. For example, the intraoral segment 18 "stents" open or separates the posterior tongue and the soft tissue of the soft palate, which tend to collapse and vibrate during sleep to create the sound of snoring. The anti-snoring device 10 also allows free flow of air to the posterior oral cavity at a markedly reduced resistance which allows for a decreased vacuum (negative) pressure of inspiration and a reduced pulsion (positive) pressure of expiration.

[0031] The anti-snoring device 10 also contains a flexible outwardly extending stop 13 that forms a portion of the intraoral segment 18. In one embodiment, the stop 13 extends annularly about the tube 8. In another embodiment, the stop 13 extends from the outside diameter of the tube 8, but does not extend annularly about the tube 8. The stop 13 serves to secure the anti-snoring device 10 against anterior displacement, and secures the intraoral segment 18 within the oropharynx 30 of the user's mouth 25. The stop 13 is larger than the retromolar space 27 and therefore prevents retraction therethrough. The stop 13 frictionally secures the intraoral segment 18 within the oropharynx 30 by abutting the last tooth in the retromolar space 27, which in the

depicted embodiment is the second molar **32**, and/or the portions of the jaw bone and/or gums that surround the retromolar space **27**.

[0032] The stop **13** may be adjustable along the length of the tube **8**, for example, by being slidably mounted on the outside diameter **42** of the tube **8**. For example, in the embodiments shown in **FIGS. 1-3**, the stop **13** is a sleeve, that has an inner opening **52** that is slightly smaller than or approximately equal to the outside diameter **42** of the tube **8**. As a result, the stop **13** is frictionally secured to the tube **8**, but can be adjusted by the user along the outside diameter **42** of the tube **8** by the application of an appropriate force. The adjustability of the stop **13** allows the anti-snoring device **10** to conform to the user's particular anatomy and allows the user to vary the length of the tube **8** that enters the oropharynx **30**.

[0033] The stop **13** may have any shape and size as long as it comfortably fits within the oropharynx **30** of the user's mouth and secures the intraoral segment **18** within the oropharynx **30** of the user's mouth **25**. For example, in the embodiments shown in **FIGS. 1-3**, the stop **13** is a sleeve having concentric circular outside and inside surfaces, wherein the outside diameter *d* is approximately 28 French (Fr) to approximately 38 Fr, the inside diameter *id* is approximately 26 Fr to approximately 36 Fr, the length *l* is approximately $\frac{3}{16}$ inch to approximately $\frac{1}{2}$ inch and the thickness *t* is approximately 0.3 Fr to approximately 2.5 Fr, wherein 1 French is a unit of measure equal to 3.01 millimeters.

[0034] In one embodiment, the stop **13** has an outer diameter *d* of approximately 30 Fr, an inside diameter *id* of approximately 28 Fr, a length *l* of approximately $\frac{1}{4}$ inch, a thickness *t* of approximately 1.0 Fr and the tube **8** has an outside diameter **42** of approximately 28 Fr.

[0035] In the embodiments of **FIGS. 1C-1D** and **2B-3**, the anti-snoring device **10** also contains a thin flexible retention diaphragm **12** that forms a portion of the intermediate segment **16**. The retention diaphragm **12** contains a first side **38** that, due to its flexibility, conforms to the user's inner lips and/or inner cheek and a second side **40** that conforms to an outer surface of the user's teeth. The retention diaphragm **12** secures the intermediate segment **16** within the user's buccopharyngeal pathway **11** and prevents anterior displacement of the anti-snoring device **10**. The retention diaphragm **12** also acts as a saliva dam to prevent drooling of naturally occurring saliva developed during sleep.

[0036] The retention diaphragm **12** is adjustable, for example, by being slidably mounted to the outside diameter **42** of the tube **8**. For example in one embodiment, the retention diaphragm **12** includes an opening **50** that is slightly smaller than or equal to the outside diameter **42** of the tube **8**. As a result, the retention diaphragm **12** is frictionally secured to the tube **8**, but can be adjusted by the user along the outside diameter **42** of the tube **8** by the application of an appropriate force. The adjustability of the retention diaphragm **12** allows the anti-snoring device **10** to conform to the user's particular anatomy.

[0037] The retention diaphragm **12** may have any shape and size, as long as it fits comfortably within the user's mouth between the user's inner lips and/or inner cheek and an outer surface of the user's teeth. For example, the

retention diaphragm **12** may be circular, rectangular, square, oval-shaped or any other suitable shape. In the embodiment shown herein, the retention diaphragm **12** has a square outer perimeter or shape, having sides that are approximately $\frac{3}{4}$ inch to approximately $1\frac{1}{2}$ inch. The square shape helps to prevent rotation of the device **10** when it is in use as described above. In the depicted embodiment, the retention diaphragm **12** has an outer perimeter that is square having 1 inch sides, wherein the opening **50** is circular with a diameter of approximately 28 Fr and the tube **8** has an outside diameter **42** of approximately 28 Fr. In the embodiments depicted, the retention diaphragm **12** has a thickness *T* of approximately 0.030 inches to approximately 0.060 inches.

[0038] In the embodiment of **FIGS. 2A-2C**, each of the segments of the tube **8** (the extraoral segment **14**, the intermediate segment **16**, and the intraoral segment **18**) additionally contains side openings or side ventilation openings **24A-24G**. The ventilation openings **24A-24G** serve to maximize airflow that may be restricted, for example by pillows, bed sheets or other objects obstructing the open end **20** of the extraoral segment **14** and/or soft tissue or other objects obstructing the open end **21** of the intraoral segment **18**.

[0039] For added ergonomic effect and comfort, and for proper fitting in the user's mouth, the anti-snoring device **10** depicted in **FIG. 1A-2C** has a preformed bend such that a convex side **44** of the tube **8** and an opposite concave side **45** of the tube **8** are curved to closely follow the shape of a typical user's dentition. For example, in one embodiment the bend approximates an arc of a circle having a radius in the range of approximately 2.5 inches to approximately 5.0 inches, such as 4.0 inches.

[0040] In the depicted embodiment the ventilation openings **24A-24G** are circular in shape with a diameter of approximately 5 mm. In this embodiment, the extraoral segment **14** contains one ventilation opening **24A** disposed on the convex side **44** of the tube **8**, the intermediate segment **16** contains two ventilation openings **24B** and **24C** disposed on an upper **46** side, between the convex **44** and concave **45** sides, of the tube **8**, and two ventilation openings **24D** and **24E** disposed on an opposite lower **48** side of the tube **8**, and the intraoral segment **18** contains two ventilation openings **24F** and **24G** disposed on the convex side **44** of the tube **8** and one ventilation opening **24H** disposed on the concave side **45** of the tube **8**.

[0041] However, the ventilation openings **24A-24G** may have any size and shape and each segment **14**, **16** and **18** may contain any number of ventilation openings **24A-24G** as long as the ventilation openings **24A-24G** allow airflow to enter into the tube **8** and allow sufficient airflow through the tube **8** when the openings **20** and **21** at the extraoral **14** and the intraoral **18** segments are obstructed. The ventilation openings **24A-24G** may also be disposed on the tube **8** at positions other than that shown in **FIGS. 2A-2C**. However, the positions shown minimizes the likelihood that the ventilation openings **24A-24G** will be obstructed.

[0042] For example, positioning ventilation openings in the convex side **44** of the extraoral segment **14** minimizes the likelihood that the user's outer lips will obstruct the ventilation openings in the extraoral segment **14** since the user's lips are adjacent to the concave side **45** of the tube **8** when the anti-snoring device **10** is in use; positioning

ventilation openings between the convex **44** and concave **45** sides in the upper **46** and/or lower **48** sides of the intermediate segment **16** minimizes the likelihood that the inner surface **26** of the user's inner cheek and/or the outer surface **28** of the of the user's dentition will obstruct the ventilation openings in the intermediate segment **16**; and positioning ventilation openings in the concave **45** and the convex **44** sides of the intraoral segment **18** minimizes the likelihood that the user's tongue or soft palate will obstruct the ventilation openings in the intraoral segment **18**.

[0043] The preformed bend of the anti-snoring device **10**, having the convex **44** and the concave **45** sides that are curved to closely follow the shape of a typical user's dentition, facilitates the user in properly inserting the anti-snoring device **10** into the user's mouth and ensures that when the anti-snoring device **10** is inserted properly, the ventilation openings **24A-24G** are properly aligned within the user's mouth. However, as shown in **FIG. 3**, when the user positions the intraoral segment **18** beyond the retromolar space **27** in the user's mouth, into the oropharynx and terminating between the posterior tongue and the soft palate, the intraoral segment **18** may bend inwardly more sharply than the preformed bend for proper placement in the user's mouth. In one embodiment, the above described preformed bend contains an additional inward bend **60** near the junction of the intermediate **16** and intraoral **18** segments as shown in **FIG. 3**. The inward bend **60** is bent at an angle α in the range of approximately 65 degrees to 135 degrees, such as 100 degrees.

[0044] In the embodiment of **FIG. 1A**, the open end **21** of the intraoral segment **18** is cut straight across the tube **8**, i.e. approximately straight across from the upper side **46** of the tube **8** to a lower side **48** of the tube **8**. In the embodiments of **FIGS. 1B-2C**, the open end **21A** of the intraoral segment **18** is angled starting from the upper side **46** of the tube **8** to a lower side **48** of the tube **8** at an angle. In one embodiment, this angle is approximately 45 degrees, however, in other embodiments larger or smaller angles may be used. The angled open end **21A** of the intraoral segment **18** facilitates insertion of the intraoral segment **18** into the retromolar space **27**. In addition, the angled open end **21A** of the intraoral segment **18** makes it less likely that the tongue or soft palate will occlude the open end **21A** when the anti-snoring device **10** is in use.

[0045] In one embodiment, the tube **8** has a predetermined length of approximately 9 cm to approximately 13 cm. Although other lengths may be used, when the tube length is longer than 15 cm the extraoral segment **14** extends too far from the typical user's mouth, which may cause the extraoral segment **14** to bind or become obstructed, and when the tube length is shorter than 9 cm the tube **8** is not long enough for both the extraoral segment **14** to extend from the user's mouth and the intraoral segment **18** to extend into the oropharynx **30** of the user's mouth for a typical user. In one embodiment, the tube **8** has a length of 12 cm.

[0046] In one embodiment, the tube **8**, the retention diaphragm **12** and the stop **13** are each composed of a flexible, elastic material, such as a non-latex polyvinyl chloride material. When the anti-snoring device **10** is composed of a flexible, elastic material, the anti-snoring device **10** is allowed to negotiate the contours of the user's buccopharyngeal pathway **11** while maintaining user comfort. In

addition, the flexibility and elasticity of the anti-snoring device **10** allows for a compression of the anti-snoring device **10** during normal sleeping functions, such as swallowing and teeth clenching, while allowing the anti-snoring device **10** to regain its original dimension when those force are relieved.

[0047] In the depicted embodiments, the outside diameter **42** of the tube **8** is approximately 26 Fr to approximately 36 Fr, the inside diameter **43** of the tube is approximately 24 Fr to approximately 34 Fr, and the thickness **41** of the tube **8** is approximately 0.3 Fr to approximately 2.5 Fr. In one embodiment, the outside diameter **42** of the tube **8** is approximately 28 Fr, the inside diameter **43** of the tube **8** is approximately 26 Fr and the thickness **41** of the tube **8** is approximately 1.0 Fr.

[0048] The outside diameter **42** of the tube **8** may be larger than 36 Fr, but at diameters larger than 36 Fr user comfort begins to decrease. The inside diameter **43** of the tube **8** may be smaller than 26 Fr, but sufficient airflow begins to diminish at 26 Fr. The thickness **41** of the tube **8** may be smaller than 0.3 Fr or larger than 2.5 Fr, but at smaller thicknesses the device **10** becomes too flimsy and a larger thicknesses the device **10** becomes too stiff.

[0049] In one embodiment, all of the outer edges of the tube **8**, the retention diaphragm **12** and the stop **13** are rounded to avoid abrasion or irritation of the user's soft tissue when the device is in use, as described above.

[0050] Any of the embodiments described above may include the preformed shape as shown in **FIG. 5**. In the preformed shape of **FIG. 5**, the tube **8** includes a first concave surface **54A** and an opposite first convex surface **56A** that each integrally adjoin, respectively, a second convex surface **54B** and an opposite second concave surface **56B**, such that the tube **8** is approximately "S-shaped". In one embodiment, the first concave surface **54A** and the first convex surface **56A** are disposed on the extraoral **14** and intermediate **16** segments and the second convex surface **54B** and the second concave surface **56B** are disposed **16** on the intraoral segment **18**.

[0051] In any of the embodiments shown in **FIGS. 1-3**, the stop **13** may be formed as a preformed expansion in the tube **8** (as is shown in **FIGS. 4A and 4B**), that extends from outside diameter **42** of the tube **8**. In one embodiment, the preformed expansion extends annularly about the tube **8**. In another embodiment, the preformed expansion extends from the outside diameter of the tube **8**, but does not extend annularly about the tube **8**.

[0052] In one embodiment shown in **FIGS. 4A and 4B**, the dimensions of the stop **13** when the stop **13** is formed as a preformed expansion in the tube **8** (the outer diameter d , the inside diameter i , the length l , and the thickness t) are approximately the same as the dimensional ranges given above in the embodiments where the stop **13** is a sleeve.

[0053] The preceding description has been presented with reference to various embodiments of the invention. Persons skilled in the art and technology to which this invention pertains will appreciate that alterations and changes in the described structures and methods of operation can be practiced without meaningfully departing from the principle, spirit and scope of this invention. Accordingly, the foregoing description should not be read as pertaining only to the

precise structures described and shown in the accompanying drawings, but rather should be read as consistent with and as support for the following claims, which are to have their fullest and fairest scope.

1. An anti-snoring device for use in a user's mouth comprising:

a flexible hollow tube for insertion into the user's mouth, having proximal and distal ends and an outer perimeter, the tube comprising:

an extraoral segment, which extends to the proximal end of the tube and has at least one opening, for extending beyond the user's outer lips;

an intraoral segment, which extends to the distal end of the tube and has at least one opening, having a sufficient length for extending beyond a retromolar space in the user's mouth, into the oropharynx and terminating between the posterior tongue and the soft palate; and

an intermediate segment, which extends between the extraoral and intraoral segments, having a sufficient length for extending along the buccopharyngeal pathway of the user's mouth; and

a stop extending from the outer perimeter of the tube on the intraoral segment for securing the intraoral segment against movement along a lengthwise direction of the tube within the user's oropharynx.

2. The anti-snoring device of claim 1, wherein the stop comprises an outer perimeter that is larger than the retromolar space and the outer perimeter of the tube is smaller than the retromolar space.

3. The anti-snoring device of claim 1, wherein the stop has a thickness in the range of approximately 0.3 French to approximately 2.5 French.

4. The anti-snoring device of claim 1, wherein the stop is adjustable along the length of the intraoral segment.

5. The anti-snoring device of claim 4, wherein the stop comprises an inner aperture that is slightly smaller than the outer perimeter of the tube to resist movement along the tube and wherein the inner aperture of the stop is slidably mounted along the outer perimeter of the tube when a sufficient force is applied by the user.

6. The anti-snoring device of claim 1, wherein the extraoral segment comprises an open end and wherein the intraoral segment comprises an open end.

7. The anti-snoring device of claim 1, wherein the end of the intraoral segment is angled to facilitate insertion of the intraoral segment into the retromolar space.

8. The anti-snoring device of claim 1, wherein the open end of the intraoral segment is angled starting from an upper side of the tube to a lower side of the tube.

9. The anti-snoring device of claim 1, wherein the tube comprises an outer preformed bend having a convex side and an opposite concave side.

10. The anti-snoring device of claim 1, wherein the intraoral segment comprises at least one ventilation opening.

11. The anti-snoring device of claim 10, wherein the intermediate segment comprises at least one ventilation opening.

12. The anti-snoring device of claim 11, wherein the extraoral segment comprises at least one ventilation opening.

13. The anti-snoring device of claim 9, wherein the extraoral segment comprises an open end and wherein the intraoral segment comprises an open end and at least one ventilation opening disposed on at least one of the convex side and the concave side of the tube.

14. The anti-snoring device of claim 13, wherein the intermediate segment contains at least one ventilation opening disposed on at least one of an upper side between the convex and concave sides of the tube and an opposite lower side of the tube.

15. The anti-snoring device of claim 14, wherein the extraoral segment comprises at least one ventilation opening disposed on the convex side of the tube.

16. The anti-snoring device of claim 1, further comprising a retention diaphragm on the intermediate segment of the tube for securing the intermediate segment within the user's buccopharyngeal pathway.

17. The anti-snoring device of claim 16, wherein the retention diaphragm is flexible and comprises a first side for conforming to the user's inner lips and a second side for conforming to an outer surface of the user's teeth.

18. The anti-snoring device of claim 11, wherein the retention diaphragm is adjustable along the length of the intermediate segment.

19. The anti-snoring device of claim 18, wherein the retention diaphragm comprises an inner aperture that is smaller than the outer perimeter of the tube and wherein the inner aperture of the retention diaphragm is slidably mounted along the outer perimeter of the tube.

20. The anti-snoring device of claim 16, wherein a perimeter of the retention diaphragm around the tube is substantially rectangular in shape.

21. The anti-snoring device of claim 1, wherein the flexible hollow tube and the stop each comprise a non-latex polyvinyl chloride material.

22. The anti-snoring device of claim 16, wherein the retention diaphragm comprises a non-latex polyvinyl chloride material.

23. The anti-snoring device of claim 1, wherein the tube has a preformed outer shape comprising a first portion with a first concave surface and an opposite first convex surface and a second portion with a second convex surface and an opposite second concave surface.

24. The anti-snoring device of claim 1, wherein the stop is formed as a preformed expansion in the tube.

25. An anti-snoring device for use in a user's mouth comprising:

a flexible hollow tube for insertion into the user's mouth, having proximal and distal ends and an outer perimeter, the tube comprising:

an extraoral segment, which extends to the proximal end of the tube and has at least one opening, for extending beyond the user's outer lips;

an intraoral segment, which extends to the distal end of the tube and has at least one opening, having a sufficient length for extending beyond a retromolar space in the user's mouth, into the oropharynx and terminating between the posterior tongue and the soft palate; and

an intermediate segment, which extends between the extraoral and intraoral segments, having a sufficient

length for extending along the buccopharyngeal pathway of the user's mouth; and

a stop extending from the outer perimeter of the tube on the intraoral segment for securing the intraoral segment within the user's oropharynx, wherein the outer perimeter of the stop is larger than the outer perimeter of the tube, and wherein the tube comprises an outer pre-formed bend having a convex side and an opposite concave side.

26. The anti-snoring device of claim 25, wherein the stop comprises an outer perimeter that is larger than the retromolar space and the outer perimeter of the tube is smaller than the retromolar space.

27. The anti-snoring device of claim 25, wherein the stop comprises an inner perimeter that is slightly smaller than the outer perimeter of the tube and wherein the stop has a thickness in the range of approximately 0.3 French to approximately 2.5 French.

28. The anti-snoring device of claim 25, wherein the extraoral segment comprises an open end and wherein the intraoral segment comprises an open end.

29. The anti-snoring device of claim 28, wherein the extraoral segment comprises at least one ventilation opening disposed on the convex side of the tube, wherein the intermediate segment contains at least one ventilation opening disposed on at least one of an upper side between the convex and concave sides of the tube and an opposite lower side of the tube, and wherein the intraoral segment comprises at least one ventilation opening disposed on at least one of the convex side and the concave side of the tube.

30. The anti-snoring device of claim 25, further comprising a retention diaphragm on the intermediate segment of the tube for securing the intermediate segment within the user's buccopharyngeal pathway.

31. A method of reducing snoring in a user's mouth comprising:

inserting into the user's mouth a flexible hollow tube having proximal and distal ends;

positioning an extraoral segment of the tube, which extends to the proximal end of the tube and has at least one opening, exterior to the user's lips;

positioning an intraoral segment of the tube, which extends to the distal end of the tube and has at least one opening, beyond a retromolar space in the user's mouth, into the oropharynx and terminating between the posterior tongue and the soft palate; and

positioning an intermediate segment of the tube, which extends between the extraoral and intraoral segments, along the buccopharyngeal pathway of the user's mouth.

32. The method of claim 31, further comprising securing the intermediate segment within the buccopharyngeal pathway.

33. The method of claim 32, wherein securing the intermediate segment within the buccopharyngeal pathway comprises positioning a retention diaphragm between the user's inner lips and an outer surface of the user's teeth.

34. The method of claim 31, further comprising securing the intraoral segment within the oropharynx.

35. The method of claim 34, wherein securing the intraoral segment within the oropharynx comprises positioning a stop adjacent to a last tooth that is adjacent to the user's retromolar space.

36. The method of claim 31, further comprising separating at least a portion of the posterior tongue and the soft palate by positioning at least a portion of the intraoral segment therebetween.

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