



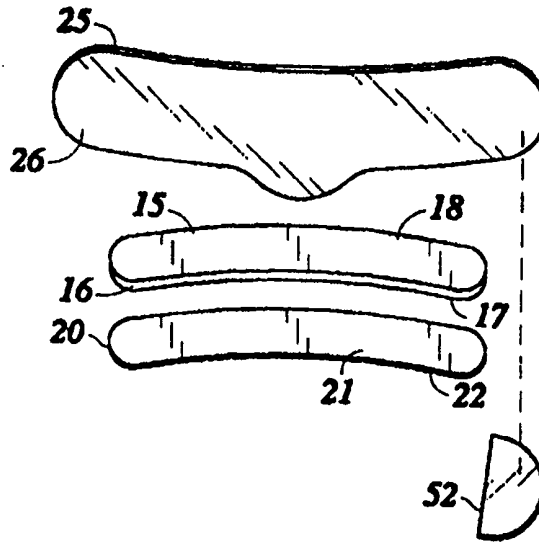
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(54) Title: NON-LINEAR NASAL DILATOR

(57) Abstract

The present invention is a nasal dilator (10) including an arcuate spring member (15), an arcuate pad (23) with adhesive (20) thereon, where the spring is inset centrally in the pad. The pad may include a protrusion (106) to facilitate centralizing the dilator on the nose in use. There can be several overlapping release liners (52) to facilitate use of the dilator.



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NON-LINEAR NASAL DILATOR

BACKGROUND OF THE INVENTION

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This invention relates to dilators for the nose. In particular, the invention is concerned with a dilator to urge the nasal passages of the nose open during breathing.

One known form of dilator used for this purpose is in the nature of a band for extension over the nose from one nasal passage, over the bridge of the nose, to the other
10 nasal passage. This pad is formed of a flexible material which has sandwiched with it a resilient spring material. Both the flexible material and the spring are normally planar. When the pad is placed on the nose, it sticks to the skin of the nose, and the action of the spring causes the nasal passages to be urged open.

In the Applicant's experience, the known dilator is not as effective as it could be. In
15 particular, the nasal passages are not urged open as much or as little as they could usefully and safely be opened. Also, the currently known device consists of multiple components forming the pad in a sandwich relationship with the spring. Therefore, the fabrication of such a dilator arrangement is unduly complicated.

There is a need to provide a pad system for a dilator for location over the nose which
20 minimizes the disadvantages of known systems.

SUMMARY OF THE INVENTION

By this invention there is provided a dilator which has advantages over known
25 dilators.

According to the invention a nasal dilator includes an elongated normally planar spring member for bridging a human nose. The spring member has an outer edge and opposite flat surfaces and is for extending over a bridge of the nose and for being urged from the planar position so as to engage the user's nose. The tension in the spring will act to
30 cause the dilation of the nasal passages, as the spring tries to move back towards its planar state. The spring member has an outer edge having a high point for location substantially centrally over the bridge of the nose and low points to either side of the high point. Preferably, the low points depend downwardly from the high point. The high point and low point terminology is used to indicate a non-linear profile.

There is also a flexible pad having a surface area and peripheral edge. The pad, which is made of a breathable material, engages the spring member, which is a polyflex material, and extends around the spring member. Preferably, the spring and the pad are relatively arcuate or curved in shape, along their respective longitudinal sides. As such, the dilator has a non-linear profile.

There is an adhesive between the spring member and the pad such that the spring member on one of its entire engaging surfaces wholly adheres with the pad. A surface perimeter area of the pad is formed between the outer edge of the spring member and the peripheral edge of the pad. The surface perimeter area includes an adhesive for adhering to skin of the nose.

When the spring member is located over the bridge of the nose, the opposite flat surfaces of the spring member extend over the bridge of the nose and at least partly beyond the bridge of the nose. In this manner, the spring extends over the nasal passages on both sides of the bridge.

In some embodiments, when in use on the nose, there are only the spring member, the adhesive pad, and the adhesive between the pad and the spring member. When in position on the nose, a flat surface of the spring member without adhesive engages directly on the nose. In some other embodiments, there is also an adhesive on the surface area of the spring adjacent to the bridge of the nose, so the spring member adheres to the nose.

When there is a pad, the pad includes a protrusion from one side and substantially centrally located between the pad ends for facilitating centralized placement of the pad on the nose. The protrusion includes a rounded perimeter and is formed from one side of the pad, and the protrusion extends longitudinally between about one sixth and about one quarter of the length of the one side of the pad. The ends of the pad are rounded.

In different forms there may only be the spring for engagement on the nose. Further, there could be forms where the spring is located on the pad on the opposite side of the pad intended for engagement with the nose, and here the pad wholly adheres to the nose.

In different embodiments, there are situations where at least one of, and preferably all of the components, namely pad, adhesive and spring are substantially transparent, translucent, clear, a flesh-like color or shade so as to effectively blend with the skin of wearer. In other preferred situations the pad is effectively colored or rendered ornate or patterned, at least on its surface removed from the nose side.

The dilator can be at least partly formed of transparent or clear material so as to enhance its cosmetic appearance on the nose. Ornamentation can be provided to one surface

of the spring thereby to be visible through a transparent pad. Alternatively or additionally, the pad can be imprinted with ornamentation.

In yet other preferred forms of the invention, the pad is substantially transparent, and the spring is colored or patterned on its surface removed from the nose. The pattern can be a product logo. Coloring can represent a team color. The spring can be at least partly visible through the pad.

When unattached to the nose, the spring member and pad, has a natural position which is planar. This planar position is contrary to a curvature formed by location of the spring member over the bridge of the nose and adjacent to the nasal passages. Alternatively, the natural position is with a curvature contrary to the shape of the curvature formed from one nasal passage over the bridge to the second nasal passage. The contrary curvature acts to place an increased amount of spring action on the dilator so that the dilation action on the nasal passages is enhanced when in use.

A dilator with a curved or arcuate shape allows a better ergonomic fit onto the nose compared to nasal dilators of linear design or construction. Further, a dilator with rounded ends provide a more comfortable fit to the nose compared to dilators whose ends have sharp or more defined corners. The protrusion advantageously enables the user to more easily position the dilator on the nose.

Because the spring of the dilator does not extend the full length of its attached pad, the dilator is able to accommodate or fit greater diversity of nose sizes (since the spring remains in contact with the alar or soft tissue of the nose) compared to other dilators of comparable length whose springs traverse the length of the pad.

The invention is further described with reference to the accompanying drawings.

25

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an underview of the dilator showing adhesive on the pad and on the spring, where the spring is for location between the nose and the pad.

FIG. 2 is an underview of a different embodiment of the dilator where the spring is for location on the side of the pad opposite the side engaging the nose.

FIG. 3 is a side view of the dilator, being a spring and pad on the nose, and wherein the spring is located between the pad and the nose.

FIG. 4 is a side view of a third embodiment of the dilator on the nose, namely dilator which is a spring without the pad.

FIG. 5 is an exploded perspective top view of the components of FIG. 1 making up the dilator.

FIG. 6 is a cross-sectional view through the nose showing a dilator in a relatively removed position before usage and the nasal passages closed.

5 FIG. 7 is a cross-sectional view through the nose showing a dilator in position on the nose and the nasal passages opened.

FIG. 8 is a diagrammatic view of a construction procedure for manufacturing the dilator.

10 FIG. 8A illustrates side views of the dilator respectively at two different die positions in the construction procedure.

FIG. 9 is a view of multiple dilators mounted on a release liner.

DETAILED DESCRIPTION OF THE INVENTION

15 A nasal dilator 10 prevents the outer wall tissue 11 of first and second nasal passages 12 and 13, respectively, of a human nose 14 from drawing in during breathing.

SPRING

20 The dilator 10 includes an elongated arcuately shaped resilient spring 15 for bridging the human nose 14. The spring member is shaped between a high point 100 for location substantially centrally over the bridge of the nose and low points 102 and 104 to either side of the high point 100 and for depending downwardly from the high point 100. The spring member 15 can be formed of a synthetic resinous material. The spring member 15 has an outer edge 16 and opposite flat surfaces 17 and 18. The surface 17 extends over a bridge 19
25 of the nose 14.

The spring material 15 is formed of about 0.010 inch clear polyester film or clear polyethylene terephthalate film or polystyrene film. An acrylic adhesive carrier 20 can be a double-sided adhesive coated polyethylene film having a thickness of about .0015" liner for die cutting is provided on one side of spring 15. The adhesive is indicated by numerals 21
30 and 22.

In other situations, the film is white or colored on at least one of surfaces 17 or 18. The surface 18 can have a logo pattern printed on the face. Alternatively, different patterns, shapes, words, and letters can be used.

The spring **15** is clear, durable, and has dimensional stability. It is resistant to mild acids, alkalis, and salt. Further, the spring **15** can be fungus, water and corrosion-resistant.

PAD

5 The dilator **10** includes a flexible adhesive pad **23** having a surface area **24** and peripheral edge **25**. The pad **23** engages the spring member **15** and extending around the spring member **15**. The pad defines a shape between a high point **106** for location substantially centrally over the bridge **19** of the nose and low points **108** and **110** to either side of the high point **100** and for depending downwardly from the high point. The pad
10 includes a protrusion **112** from one side **114** of the pad and substantially centrally located between the ends **34** for facilitating centralized placement of the pad **23** on the nose. The protrusion **112** includes a rounded perimeter **116** and is formed from one side **114** of the pad **23**, and the protrusion extends in length between about one sixth and about one quarter of the length of the one side of the pad. Also, the ends **34** of the pad **23** are rounded.

15 The pad material **23** is preferably from Avery Dennison Specilaties Tape Division, Chicago, Illinois 60693. The product is a tan elastic polyurethane tape coated on one side with an acrylate adhesive **26**, or a non-woven polyethylene film material coated on one side with an adhesive such as an acrylic adhesive. The tape is supplied on a paper liner with the liner on the inside of the roll.

20 In other situations, the pad material is substantially transparent, translucent, clear or colored, for instance, to conform to a flesh color or tone.

When the pad **23** is transparent and the spring is colored, patterned or imprinted with a logo or the like, this imprintation is visible through the transparent pad **23**. Thus, when worn on the nose **14**, there is the appearance of a colored device, in part in whole, or of
25 different combinations of pad and spring. The spring can thus be used as carrier of a message and not only for its resilient characteristics.

The backing of the tape is nonwoven of tan-colored polyurethane fibers. The adhesive **26** is a hypoallergenic, pressure-sensitive acrylate.

30 **SPRING AND PAD**

The spring member **15** occupies about 20% to about 60% of the surface area **24** of the pad **23**. The spring member **15** is centrally located in the surface area **24** of the pad **23**.

The peripheral edge 25 of the pad 23 effectively defines two portions of narrow width 26 and a central broad width 27. The broad width 27 which incorporates the protrusion 112 is substantially for location over the bridge 19 of the nose 14. The narrow widths 26 are substantially for location centrally over the nasal passages 12 and 13 of the nose 14.

The spring member 15 defines a width 28. The width 28 of the spring member 15 being about one-half to three-quarters of the width of narrow width 26 of the pad 23. The pad 23 is an elongated element with rounded ends 34.

The spring member 15 defines a length 31 and the pad 23 defines a length 32. The spring member 15 is centrally located along the length 32 of the pad 23. The length 31 of the spring member 15 is between about one-half to three-quarters of the length 32 of the pad 23.

The spring member 15 and the pad 23, respectively, include ends 33 and 34. The ends 33 of the spring member 15 are located inwardly from the ends 34 of the pad member 23.

ADHESIVE & LINER

The adhesive 26 is located between the spring member 15 and the backing of the pad 23 such that the entire engaging surface 18 of the spring member 15 wholly adheres with the pad 23.

In the embodiments using a transparent or clear pad 23, it is desirable to have the adhesive 26 substantially clear in color. This is particularly the case where there is an imprintation on the spring surface 18.

A surface perimeter area 30 of the pad 23 is formed between the outer edge 16 of the spring member 15 and the peripheral edge 25 of the pad 23. The surface perimeter area 30 includes the adhesive 26 for adhering to skin of the nose 14.

The surface area 17 of the spring 15 includes an adhesive carrier 20 for adhering to the skin of the nose 14.

The adhesive carrier system is preferably No. 1509, Double Coated Medical Tape on Liner from 3M Company, 3M Center, St. Paul, Minnesota. This product is a double-coated transparent polyethylene film, coated on both sides with a hypoallergenic, pressure-sensitive, acrylate adhesive, supplied on a paper liner. The double coated tape is wound with the liner on the outside of the roll.

The carrier is transparent 3 mil polyethylene film; the adhesive is hypoallergenic, pressure-sensitive acrylate; and the liner is bleached Kraft-Glassine paper, silicone coated on both sides.

5 USING THE DILATOR

As illustrated in FIG. 3 when the spring member 15 is located over the bridge 19 of the nose 14, the opposite flat surfaces 17 and 18 (shown in FIG. 5) of the spring member 15 extend over the bridge 19 of the nose 14 and at least partly beyond the bridge 19 on both sides of the bridge 19.

10 In use on the nose 14, there are only the spring member 15, and the adhesive pad 23. There is the adhesive 26 between the pad 23 and the spring member 15, and selectively, in one form of the invention there is also the adhesive carrier 20 on the surface 17 of the spring member 15.

When the pad member 23 is located on the nose 14 of a wearer, the ends 33 of the
15 spring 15 are urged outwardly as indicated by arrows 135 to separate from the skin covering the nasal passages 12 and 13 of the wearer. The pad 23 is lifted in part from the outer wall tissue 11 to open the nasal passages 12 and 13 in the vicinity of the ends 33 of the spring member 15. When in position on the nose 14, a flat surface 17 of the spring member 15 engages directly on the nose 14 through an adhesive 22.

20 Also as shown in FIG. 7, there is a force 135 which is applied to the skin of the outer wall tissue 11 of the nose 14 from positions along a line 136 where the pad adheres to the nasal skin. This line 136 is slightly removed from the perimeter of the spring 15, and the force 135 is directed at different angles from the nose. The pulling force 135 is spread broadly around the nasal skin and increases the overall opening force on the nasal passages
25 12 and 13.

As illustrated in FIG. 2 there is embodiment where the spring member 15 is placed on the opposite side of the pad 23. In this embodiment the entire adhesive surface 126 of the pad engages the nose and the spring member 15 is remotely located on the opposite side of the pad.

30 In FIG. 4 they have shown an embodiment where only the spring member 15 is used on the nose. In this embodiment, adhesive 21 is provided on one side of spring 15. There is no pad 23 use in that embodiment.

DILATOR PRIOR TO USAGE

When unattached to the nose **14**, the spring member **15** and pad **23** have a natural position which is substantially planar, namely contrary to a curvature formed by location of the spring member **15** over the bridge **19** of the nose **14** and adjacent to the nasal passages **12** and **13**. The resilient spring member **15** and pad **23** preferably have a planar position **36** contrary to the shape of the curvature **37** formed from one nasal passage **12** over the bridge **19** to the second nasal passage **13**. The planar position **36** acts to place a requisite amount of spring action on the dilator **10** so that the dilation action on the nasal passages **12** and **13** is imparted when in use as the spring tries to return to its planar position.

MANUFACTURING THE DILATOR

The method of manufacturing for the dilator **10** requires the resilient spring member **15** to be die cut and located as an island within the surface area **30** of the pad **23**.

The various materials: spring **15**, pad **23**, and adhesive **20**, are provided, respectively, on rolls **41**, **42** and **43** of material. The resilient spring **15** is formed of a ribbon material **44** which is die cut at **45** from ribbon material **44**. The pad **23** is die cut at **46** from a second ribbon **47** of material. The release liner **152** removed from the pad **23** is removed as a ribbon to the waste liner roll **53**.

The ribbon of resilient material **44** and pad material **47** are adhesively joined together in a webbing operation. The adhesive material **43** in the form of a ribbon **48** is fed into a position at die **45** on one side of the ribbon material **44** so as to place an adhesive on the ribbon material **44** for the spring. The adhesive system **20** is cut at die **45** to conform with the spring **15**.

Adhesive **26** on the one side of the pad ribbon material **47** sticks the spring ribbon material **44** to the pad ribbon material **47** at the die **46**.

Non-adhering materials, **49**, and **51** removed from the respective die cuts **45** and **46** are removed as ribbons of waste material. The material **49** is the unused ribbon material **44**, namely the unused resilient material, and unused adhesive **48** which is die-cut **45**. The material **51** is the spring **15**, the pad **23**, and the adhesive **20** which is die-cut **46**. FIG. 8A illustrates the sandwiched components of the dilator at the die positions **45** and **46** respectively.

A liner **52** is also provided to cover the adhesive **26** of the pad **23** not covered by the spring **15**. The liner is the leftover after the die-cut **45** of the resilient adhesive combination. When in use, the liner **52** is removed to expose the adhesive surface **26** and spring **15**. The liner **52** is formed as the paper backing for the two sided adhesive **21** and **22** on carrier **20**. The liner **52** is formed as the base of the roll of material **43** for the adhesive ribbon **48**.

In some cases, the adhesive ribbon material **48** affixed to the spring ribbon material **44** may be avoided. There may be only the adhesive pad material **47** and the spring ribbon material **44** and a liner provided by a different ribbon material from roll **43**. Thus only a paper type liner may be provided from roll **43**. In such a situation there is no two sided coated tape.

Multiple dilators **10** are formed in a nested series in the manufacturing process through dies **45** and **46**. They are then cut and separated at die **54** prior to packaging.

As shown in FIG. 9, three dilators **10** are adhesively mounted onto a release liner. There is a first release liner **200** for securing the dilator prior to use, and a second release liner **52** engaging a tip portion of the pad **23**, namely less than the whole pad. The second release liner **52** overlaps the first release liner **200** thereby to facilitate release of the pad **23** from the first release liner **200**. This is the format on which the dilators leave the manufacturing process. The dilators are stacked in adjacent relationship on the first release liner **200**. At the one end of each flexible pad, there is a second release liner **52** which is located at the tip of the pad **23**. This second release liner **52** is sandwiched between the flexible pad **23** and the first release liner **200**, and facilitates removing the entire dilator together with the second release liner **52** from the first release liner **200** when each dilator is to be used. The second release liner **52** is then removed from the adhesive end **26** of the flexible pad **23** when the user places the dilator the nose. The liners **200** and **52** are a silicone-coated kraft paper. This tab would be added to the pad raw material just before the raw material is laminated to the nylon spring. Roller **60** has the tab material which is directed along line **61** to roller **46** for lamination. Other ways can be used for adding the tab, for instance, it can be added off-line to the pad before the sandwiching of the different components.

EXAMPLE DILATORS

Two examples of a dilator configuration are described. In the first example, the characteristics are as follows:

5 Example 1: This would be a dilator suitable for the size of an average male's nose.
The straight length (32) of the pad from end to end is about 2.25 inches.
The straight length (31) of the spring from end to end is about 1.69 inches.
The radius of the arcuate sides of the pad is about 2.85 inches.
The radius at the rounded ends of the pad is about 0.3 inches.
10 The width (28) of the spring member is about 0.25 inches.
The height of the protrusion from the one side of the pad is about 0.14 inches.
The radius of the protrusion is about 0.36 inches.

Example 2: This would be a dilator suitable for the size of an average female's nose.
15 The straight length (32) of the pad from end to end is about 1.87 inches.
The straight length (31) of the spring from end to end is about 1.40 inches.
The radius of the arcuate sides of the pad is about 2.37 inches.
The radius at the rounded ends of the pad are about 0.25 inches.
The width (28) of the spring member is about 0.23 inches.
20 The height of the protrusion from the one side of the pad is about 0.12 inches.
The radius of the protrusion is about 0.30 inches.

GENERAL

25 Many other forms of the invention exist, each differing from others in matters of detail.

In some cases, the dilator prior to use is planar. For instance, in some uses of the dilator on the nose, there are may be elements in addition to the basic spring member, the adhesive pad, and the adhesive between the spring and the nose skin. Also, there are situations where the adhesive on the spring for engaging the nose is unnecessary.

30 In one aspect of the nasal dilator 10, all the components located on the nose 14 are substantially transparent translucent or clear. Thus, the spring 15 is transparent as are the adhesive carrier 20 and adhesive layers 21 and 22. So too is the pad 23 and adhesive 26 transparent. Thus, when the dilator 10 is located on the nose, it substantially blends with the

nose color and/or is substantially invisible. As such, the dilator **10** is a cosmetic improvement over prior dilators.

In other situations, the pad may be partly transparent, or translucent, so that the spring can be seen through the pad. In yet other situations, the pad and/or spring can be
5 made of different target colors to provide colorful combinations of pad and spring. Further, although the pad is indicated to be plastic, there could be situations where it is formed of cotton or some other material.

In other situations the pad is ornamented. The pad is selectively not transparent, and the spring can not be seen when worn. In other situations, the one surface of the spring is
10 ornamented and this ornamentation can be seen through the transparent pad. The dilator can be printed and/or tinted by any known process. This can be, for instance, silk screening, flexography, or gravure.

Although the invention in its mode with at least partly transparent components has been described with reference to two components, a pad and a spring with adhesive as
15 required, there could be situations where there are multiple springs and/or pads. In some case, the springs may be located on the pad on the side removed from the nose. A further covering element may cover the spring. Further there are situations where there are only a spring and there are situations where the spring is located on the remote side of the pad, namely opposite to the side of the nose.

20 The resilient member and other components of the dilator can be packaged in a bent, curved or straight condition, and can be in that static planar condition before dilator application to the nose.

In some other situations, instead of applying the adhesives on a 3 inch film, it can be coated onto the pad.

25 Also, there can be situations where only one side of the pad and/or one side of the spring are curved or has a non-linear profile. There can be situations where the pad profile is curved and the spring profile is straight, or alternatively the pad profile is straight and the spring profile is curved. Although the examples show curved sides, there can be situations where the sides are straight, but are downwardly directed from the high point or apex
30 intended to be centrally over the nose. Instead of a protrusion, there could be a cut out in the pad for indicating centralization, and instead of being at the top side it could be at the underside.

There could also be situations where the dilation is intended to be used with the high point towards the end of tip of the nose and the sides depend in a sense upwardly towards

the alar or soft tissue of the nose. In such a configuration, the profile of the dilator is in a sense reversed. Thus, the apex or high point is at the "bottom" or lower portion of the nose and the low points are at a location "above" the apex.

In yet other forms of the invention, there may be only a single layer dilator having a
5 spring with the defined profile and adhesive to secure the spring to the nose.

In yet other situations, there could be multiple high points and low points in the non-linear profile.

The invention is to be determined solely in terms of the following claims.

What Is Claimed Is:

1. A nasal dilator for preventing outer wall tissue of nasal passages of a human
5 nose from drawing in during breathing, comprising:

an elongated spring member for bridging a human nose, the spring member having
an outer edge and opposite flat surfaces and being for extending over a bridge of the nose
and being for engaging the user's nose, wherein the spring member has an outer edge having
a high point for location substantially centrally over the bridge of the nose and low points to
10 either side of the high point;

a flexible pad having a surface area and peripheral edge, the pad being for engaging
the spring member and extending around the spring member so that there is a surface
perimeter area of the pad formed between the outer edge of the spring member and the
peripheral edge of the pad, the spring being inset from the peripheral edge of the pad
15 substantially around the pad, and wherein the surface perimeter area includes an adhesive
for adhering to skin of the nose; and

an adhesive means between the spring member and the pad such that the spring
member on one of its flat surfaces adheres with the pad, the arrangement being such that
when the spring member is located over the bridge of the nose, the opposite flat surface of
20 the spring member extends over the bridge of the nose and at least partly beyond the bridge
on both sides of the bridge, and the surface perimeter area of the pad adheres to the skin of
the nose.

2. A dilator as claimed in claim 1, wherein the adhesive means for permitting
25 the pad to adhere to the skin of the nose is effected by having the spring member occupy
between about 25% to about 50% of the surface area of the pad.

3. A dilator as claimed in claim 1 wherein the adhesive means for permitting
the pad to adhere to the skin of the nose is effected by having the spring member be
30 centrally located in the surface area of the pad, and the surface of the spring member be
between about one-quarter to about half of the surface area of the pad.

4. A dilator as claimed in claim 1 wherein the adhesive means for permitting
the pad to adhere to the skin of the nose is effected by having the spring member define a

length and the pad define a length, the spring member being centrally located along the length of the pad, and the length of the spring member be between about one-half to about three-quarters of the length of the pad.

5 5. A dilator as claimed in claim 1 wherein the pad defines a shape between a high point for location substantially centrally over the bridge of the nose and low points to either side of the high point and for depending downwardly from the high point.

10 6. A dilator as claimed in anyone of claims 1 to 5 wherein, in use on the nose, there are the spring member, the adhesive pad, the adhesive between the pad and the spring member, and means for adhering such spring member directly to the user's nose including an adhesive on the spring member.

15 7. A dilator as claimed in claim 1 wherein, when in position on the nose, a flat surface of the spring member engages directly on the nose.

20 8. A dilator as claimed in claim 1 wherein the spring member and the pad respectively include ends, the ends of the spring member being located inwardly from the ends of the pad member such that when the pad member is located on the nose of a wearer, the ends of the spring are urged outwardly and separate from skin covering the nasal passages of the wearer, such that the pad is lifted in part from the nasal passages in the vicinity of the ends of the spring member.

25 9. A dilator as claimed in claim 1 wherein the spring member is a resilient member, the spring member having being die cut and located as an island within the surface area of the pad.

30 10. A dilator as claimed in claim 1 wherein the spring is formed of a material die cut from a first ribbon, and the pad is die cut from a second ribbon, and the ribbons are adhesively joined together in a webbing operation, and wherein non-adhering materials removed from the die cuts are removed as ribbons of waste material.

11. A nasal dilator for preventing outer wall tissue of nasal passages of a human nose from drawing in during breathing, comprising:

an elongated curved spring member for bridging a human nose, the spring member having an outer edge and opposite flat surfaces and being for extending over a bridge of the nose;

5 a substantially curved flexible pad having a surface area and peripheral edge, the pad being for engaging the spring member and extending around the spring member so that there is a surface perimeter area of the pad formed between the outer edge of the spring member and the peripheral edge of the pad whereby the spring is inset from the peripheral edge of the pad at least partly in relation to the pad, and wherein the surface perimeter area includes an adhesive for adhering to skin of the nose.

10

12. A nasal dilator for preventing outer wall tissue of nasal passages of a human nose from drawing in during breathing comprising:

an elongated substantially planar spring member for bridging a human nose, the spring member having an outer edge and opposite flat surfaces and being for extending
15 over a bridge of the nose and being for engaging the user's nose, wherein the spring member has an outer edge having a high point for location substantially centrally over the bridge of the nose and low points to either side of the high point; and

an adhesive for adhering the spring to skin of the nose, and the spring being for being urged under tension from its planar position to thereby engage the skin of the nose,
20 such that tension in the spring when it engages the nose tends return the spring to a planar relationship and thereby cause dilation of the nasal passages with which the spring adheres.

13. A nasal dilator as claimed in claim 12 including a flexible pad having a surface area and peripheral edge, the pad being for engaging the spring member and
25 extending around the spring member so that there is a surface perimeter area of the pad formed between the outer edge of the spring member and the peripheral edge of the pad, the spring being inset from the peripheral edge of the pad substantially around the pad, and wherein the surface perimeter area includes an adhesive for adhering to skin of the nose.

30 14. A nasal dilator comprising:

an elongated spring member for bridging a human nose;

a substantially curved flexible pad having a surface area, the pad being for engaging the spring member and extending beyond the spring member so that there is a surface area of the pad formed between the outer edge of the spring member and the curved

peripheral edge of the pad, and wherein the surface area includes an adhesive for adhering to skin of the nose;

an adhesive between the spring member and the pad such that the spring member adheres with the pad, the arrangement being such that when the spring member is located over the bridge of the nose, the spring member extends over the bridge of the nose and at least partly beyond the bridge on both sides of the bridge, and the surface area of the pad adheres to the skin of the nose; and

wherein the pad includes an element on one side and substantially centrally located between the ends for facilitating centralized placement of the pad on the nose, the element being an integral portion of the pad and being located along the curved peripheral edge so as to be an irregularity of the curved peripheral edge.

15. A nasal dilator comprising:

a substantially arcuate elongated spring member for bridging a human nose;

a substantially arcuate flexible pad having a surface area, the pad being for engaging the spring member and extending beyond the spring member so that there is a surface area of the pad formed between the outer edge of the spring member and the peripheral edge of the pad;

adhesive means with the pad, the adhesive means being between the spring member and the pad such that the spring member adheres with the pad, the arrangement being such that when the spring member is located over the bridge of the nose, the spring member extends over the bridge of the nose and at least partly beyond the bridge on both sides of the bridge; and

wherein the adhesive means permits the pad to adhere to the skin of the nose by having the spring member centrally located in the surface area of the pad.

16. A dilator as claimed in any one of claims 1, 11, 12, 14, or 15 wherein at least one of the spring member, the flexible pad, or the adhesive between the spring member and the pad is substantially transparent or translucent.

17. A nasal dilator as claimed in any one of claims 1, 11, 12, 14, or 15 wherein at least two of the spring member, flexible pad, are substantially transparent or translucent.

18. A nasal dilator as claimed in any one of claims 1, 11, 12, 14, or 15 wherein the spring member, flexible pad, and adhesive are all substantially transparent or translucent.

5 19. A dilator as claimed in claim 1 wherein the pad and the spring have rounded ends.

20. A nasal dilator for preventing outer wall tissue of nasal passages of a human nose from drawing in during breathing, comprising:

10 an elongated substantially arcuate spring member for bridging a human nose, the spring member having an outer edge and opposite flat surfaces and being for extending over a bridge of the nose and being for engaging the user's nose;

15 a substantially arcuate flexible pad having a surface area and peripheral edge, the pad being for engaging the spring member and extending around the spring member so that there is a surface perimeter area of the pad formed between the outer edge of the spring member and the peripheral edge of the pad, the spring being inset from the peripheral edge of the pad substantially around the pad, and wherein the surface perimeter area includes an adhesive for adhering to skin of the nose;

20 an adhesive means between the spring member and the pad such that the spring member on one of its flat surfaces adheres with the pad, the arrangement being such that when the spring member is located over the bridge of the nose, the opposite flat surface of the spring member extends over the bridge of the nose and at least partly beyond the bridge on both sides of the bridge, and the surface perimeter area of the pad adheres to the skin of the nose, and

25 wherein, in use on the nose, there are the spring member, the adhesive pad, the adhesive between the pad and the spring member, and means for adhering such spring member directly to the user's nose including an adhesive on the spring member.

30 21. A nasal dilator for preventing outer wall tissue of nasal passages of a human nose from drawing in during breathing, comprising:

an elongated substantially arcuate spring member for bridging a human nose, the spring member having an outer edge and opposite flat surfaces and being for extending over a bridge of the nose;

a substantially arcuate flexible pad having a surface area and peripheral edge, the pad being for engaging the spring member and extending around the spring member so that there is a surface perimeter area of the pad formed between the outer edge of the spring member and the peripheral edge of the pad whereby the spring is inset from the peripheral edge of the pad substantially around the pad, and wherein the surface perimeter area includes an adhesive for adhering to skin of the nose and for adhering the spring member to the pad; and

the pad includes a protrusion from one side and substantially centrally located between the ends for facilitating centralized placement of the pad on the nose.

22. A dilator as claimed as claimed in claim 21 wherein the protrusion includes a rounded perimeter and is formed from one side of the pad.

23. A dilator as claimed in claim 22 wherein the protrusion extends between about one sixth and one quarter of the length of the one side of the pad.

24. A dilator as claimed in claim 22 and wherein the ends of the pad are rounded.

25. A dilator as claimed in claim 23 and wherein the ends of the pad are rounded.

26. A nasal dilator for preventing outer wall tissue of nasal passages of a human nose from drawing in during breathing comprising:

an elongated substantially arcuate spring acting in operative position to adopt a curvature formed by location over a bridge of the nose and adjacent to the nasal passages; and

a flexible pad being for engaging the spring member, the pad including an adhesive for adhering to skin of the nose and for adhering the spring member to the pad; and the spring being for engaging the skin of the nose.

27. A nasal dilator for preventing outer wall tissue of nasal passages of a human nose from drawing in during breathing, comprising:

a substantially elongated arcuate spring member for bridging a human nose, the spring member being for extending over a bridge of the nose and wherein the spring member is a resilient member;

a substantially arcuate pad having a surface area and peripheral edge, the pad being for engaging the spring member and extending with spring member; and

an adhesive between the spring member and the pad such that the spring member adheres with the pad and extends over and beyond the bridge of the nose on both sides of the bridge, and the surface area of the pad on one surface adhering to the skin of the nose.
5 there being only the spring, the pad and the adhesive.

28. A nasal dilator as claimed in claim 27 wherein, when in position on the nose, a flat surface of the spring member with adhesive engages directly on the nose.
10

29. A nasal dilator as claimed in claim 27 wherein, when in position on the nose, a flat surface of the pad with adhesive engages directly on the nose, and the spring is on the opposite side of the pad.

30. A dilator as claimed in any one of claims 1, 11, 12, 14, 15, 19, 21, 26, or 27 wherein:

the flexible pad is made of breathable material;

the spring member is selectively a polyflex material synthetic resinous material or a polyester film;

the flexible pad is an elastic polyurethane tape coated with an adhesive or, alternatively, the pad is made of nonwoven polyurethane fibers;

the adhesive is a hypoallergenic, pressure-sensitive acrylate; and

the surface of the spring includes an adhesive carrier made of a polyethylene film.

31. A dilator as claimed in any one of claims 1, 11, 12, 14, 15, 19, 21, 26, or 27 wherein the flexible pad is made of breathable material.

32. A dilator as claimed in any one of claims 1, 11, 12, 14, 15, 19, 21, 26, or 27 wherein the spring member is selectively a polyflex material, synthetic resinous material, or a polyester film.
30

33. A dilator as claimed in any one of claims 1, 11, 12, 14, 15, 19, 21, 26, or 27 wherein the flexible pad is an elastic polyurethane tape coated with an adhesive, or alternatively, the pad is made of nonwoven polyurethane fibers.

34. A dilator as claimed in any one of claims 1, 11, 12, 14, 15, 19, 21, 26, or 27 wherein the adhesive is a hypoallergenic, pressure-sensitive acrylate.

5 35. A dilator as claimed in any one of claims 1, 11, 12, 14, 15, 19, 21, 26, or 27 wherein the surface of the spring includes an adhesive carrier made of a polyethylene film.

36. A dilator as claimed in any one of claims 1, 11, 12, 14, 15, 19, 21, 26, or 27 including a first release liner for securing the dilator prior to use, and including a second
10 release liner engaging a portion of the pad less than the whole pad, and whereby the second release liner overlaps the first release liner thereby to facilitate release of the pad from the first release liner.

37. A nasal dilator for preventing outer wall tissue of nasal passages of a human
15 nose from drawing in during breathing comprising:

an elongated substantially planar spring member for bridging a human nose, the spring member having an outer edge and opposite flat surfaces and being for extending over a bridge of the nose and being for engaging the user's nose, wherein the spring member has an outer elongated edge that is non-linear; and

20 an adhesive for adhering the spring to skin of the nose, and the spring being for being urged under tension from its planar position to thereby engage the skin of the nose, such that tension from its planar position to thereby engage the skin of the nose, such that tension in the spring when it engages the nose tends return the spring to a planar relationship and thereby cause dilation of the nasal passages with which the spring adheres.

25 38. A nasal dilator as claimed in claim 37 including a flexible pad having a surface area and peripheral edge, the pad being for engaging the spring member and being such that there is a surface perimeter area of the pad and wherein the surface area includes an adhesive for adhering to skin of the nose.

30 39. A nasal dilator as claimed in claim 38 wherein the pad is non-linear and extends with the spring member.

40. A nasal dilator comprising:

an elongated spring member for bridging a human nose, the spring member having an outer edge;

5 a substantially flexible pad having a surface area and a peripheral edge of the pad, the pad being for engaging the spring member and extending such that there is substantial symmetry between the outer edge of the spring member and the peripheral edge of the pad;

10 adhesive means with the pad, the adhesive means being between the spring member and the pad such that the spring member adheres with the pad, the arrangement being such that when the spring member is located over the bridge of the nose, the spring member extends over the bridge of the nose and at least partly beyond the bridge on both sides of the bridge; and

wherein the adhesive means permits the pad to adhere to the skin of the nose.

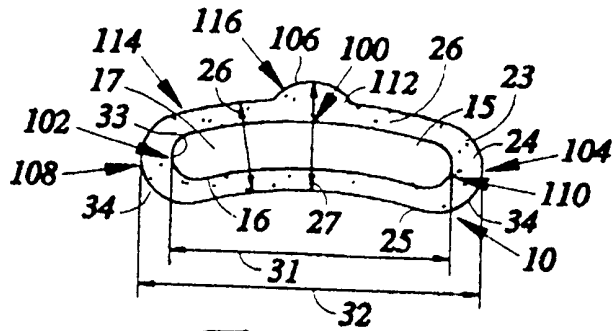


Fig. 1

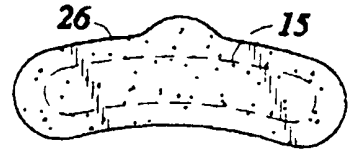


Fig. 2

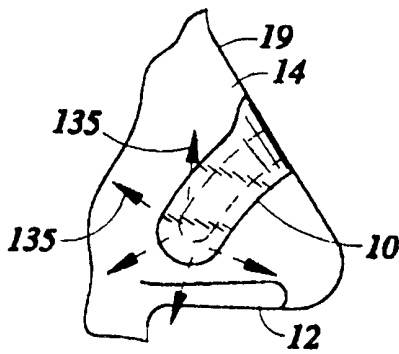


Fig. 3

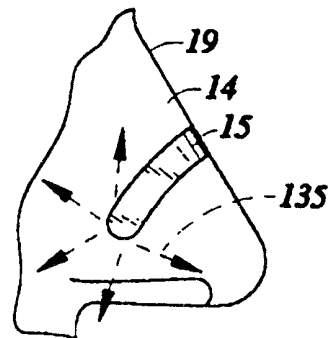


Fig. 4

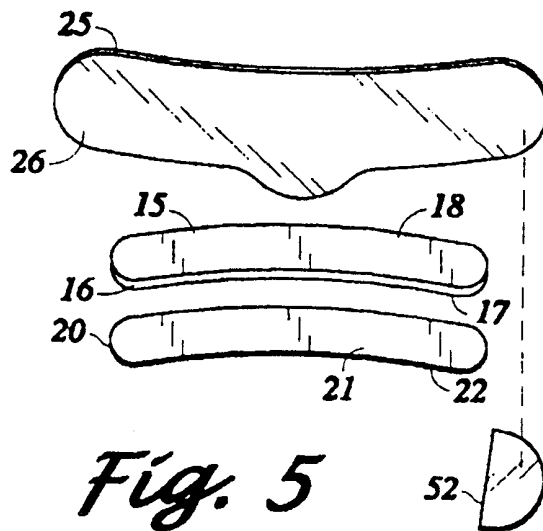


Fig. 5

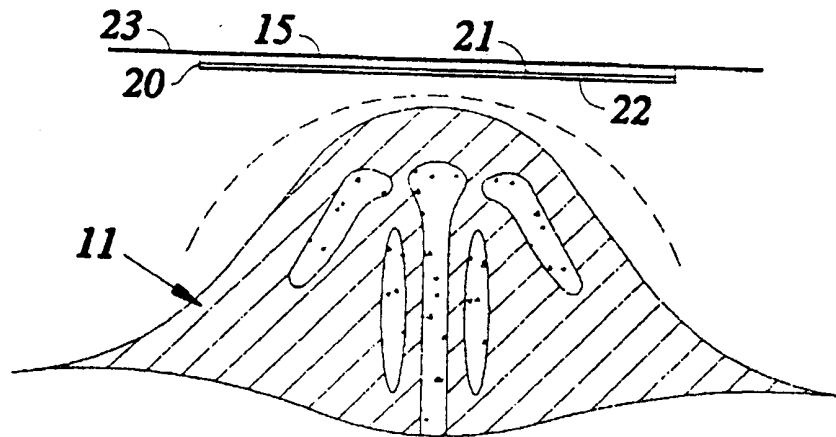


Fig. 6

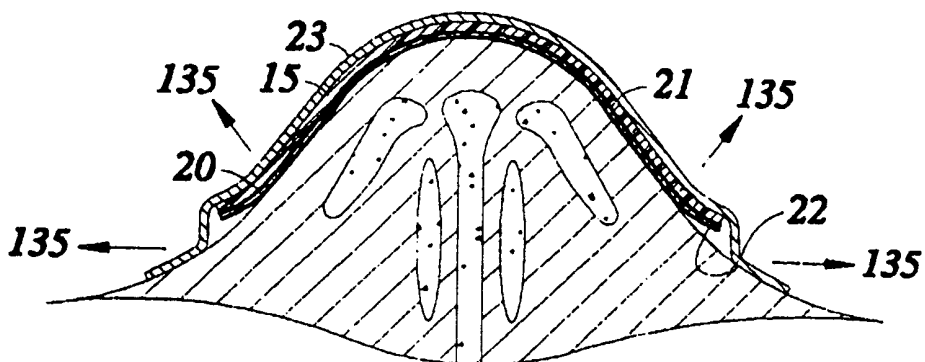


Fig. 7

Fig. 8 and 8A

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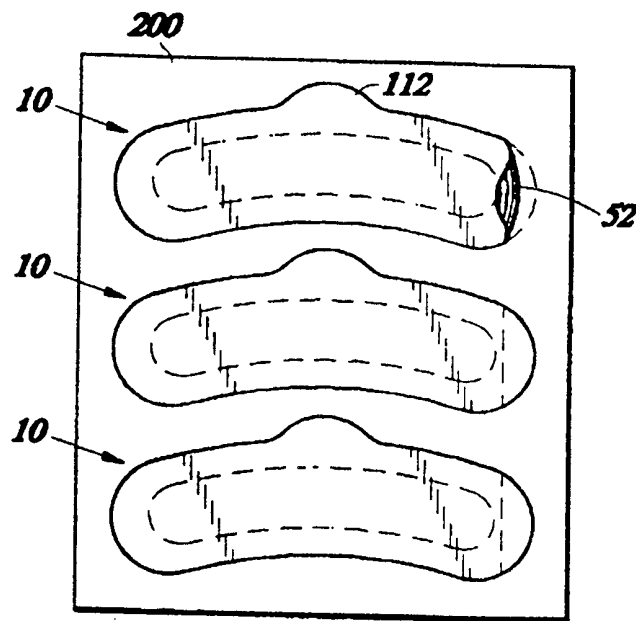


Fig. 9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/25245

A. CLASSIFICATION OF SUBJECT MATTER
 IPC(6) : A61F 5/08; A62B 7/00; A61M 15/00, 16/00
 US CL : 128/200.24, 207.18; 606/199, 204.45
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
 Minimum documentation searched (classification system followed by classification symbols)
 U.S. : 128/200.24, 207.18, 912, DIG 26; 606/191, 196, 199, 204.45; 602/54, 56, 58

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,546,929 A (MUCHIN) 20 August 1996, entire document.	1-20, 30-36
Y,P	US 5,769,089 A (HAND et al) 23 June 1998, entire document.	1-20, 22-25, 30-36
X	ES 289561 A (IRIARTE) 11 October 1985, entire document.	1-15, 19, 21, 26-28, 37-40
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Y		16-19, 22-25, 29-36
Y,P	US 5,752,511 A (SIMMONS et al) 19 May 1998, entire document.	22-25

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
E earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*&* document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 19 JANUARY 1999	Date of mailing of the international search report 23 FEB 1999
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Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer <i>Kimberly L. Asher</i> KIMBERLY L. ASHER Telephone No. (703) 308-0332
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/25245

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,706,800 A (CRONK et al) 13 January 1998, entire document.	29
Y	US 5,476,091 A (JOHNSON) 19 December 1995, entire document.	30-36
Y	US 5,553,605 A (MUCHIN) 10 September 1996, entire document.	16-18