July 7, 1936. H. J. WEAVER 2,046,664

NASAL FILTER

Filed Nov. 7, 1935

Fig. 1.

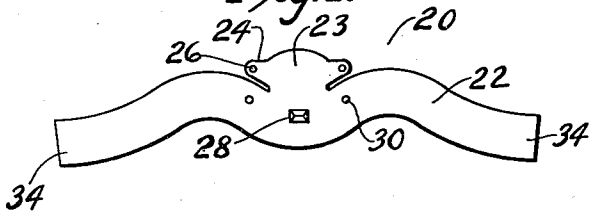


Fig. 2.

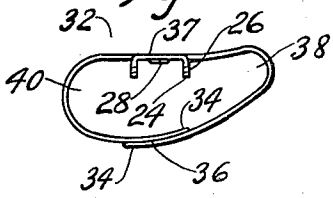


Fig. 3.

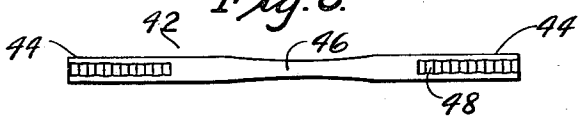


Fig. 4.

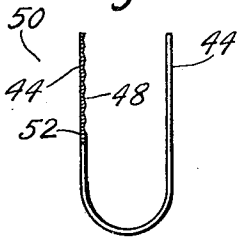


Fig. 5.

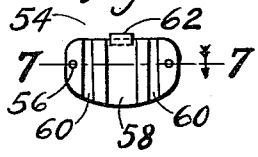


Fig. 6.

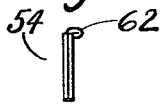


Fig. 7.

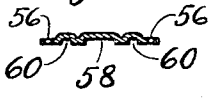


Fig. 12.

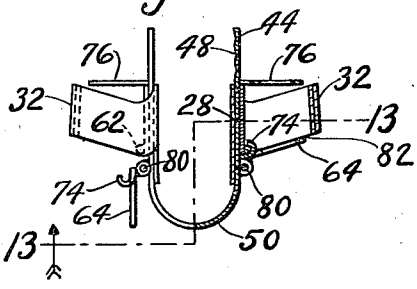


Fig. 8.

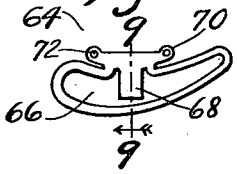


Fig. 9.

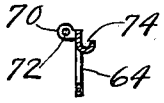


Fig. 10.



Fig. 11.

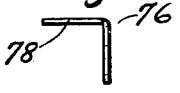


Fig. 13.

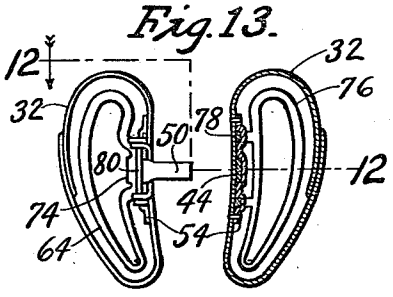


Fig. 14.



INVENTOR

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2,046,664

NASAL FILTER

Harrison J. Weaver, Columbus, Ohio, assignor to The Nasal Filter Co., Columbus, Ohio, a corporation of Ohio

Application November 7, 1935, Serial No. 48,708

6 Claims. (Cl. 128—148)

This invention relates to nasal filters, and particularly to that type of nasal filtering device which comprises a frame which is inserted and retained within the nostrils, the frame having means for holding a pair of renewable filtering mats.

Due to the prevalence of certain infectious diseases such as hay fever caused by the inhalation of dust and pollen, devices of this type have met with great interest, yet they have not heretofore become commercially successful mainly because the almost infinite variation in human nasal structures has made it impossible to construct a device which would fit more than one person, if the fitting had the necessary accuracy to meet the requirements of both comfort and appearance.

The sizes of the nostrils of different humans vary greatly. A considerable number of persons are found having one nostril larger than the other. The lower outer edges of the nostrils are often considerably higher than the septum which separates them. In other cases the lower edges of the nostrils are on a line with the lower edge of the septum. In still other cases the lower edge of one nostril is somewhat more elevated with respect to the septum than the lower edge of the other nostril.

It is therefore the object of this invention to provide a nasal filter which will, when the parts composing it are made up in a limited number of sizes, be easily adjusted and fitted with slight skill and labor to meet one or more of the variations indicated, to the end that accurate fitting of the device will permit it to be worn with perfect comfort and substantial invisibility.

This object is attained in the structure hereinafter described and shown in the drawing, wherein,

Fig. 1 is an outline view of a sheet metal blank, two of which are to be bent, one right and one left, to provide the two elongated rings which fit into the nostrils.

Fig. 2 is a bottom view of one of the nostril rings as formed from a blank, Fig. 1.

Fig. 3 is an outline view of the sheet metal blank from which the U shaped yoke member which connects the two nostril rings is formed.

Fig. 4 is an elevation of the yoke member after it is bent to shape, a small part being shown in section.

Fig. 5 is a side elevation of a guide plate one of which is to be attached to the inside of each nostril ring to receive the yoke member and to provide means for holding the grids.

Fig. 6 is an edge elevation of the guide plate shown in Fig. 5.

Fig. 7 is a cross section taken thru Fig. 5 at 7—7.

Fig. 8 is an outline view of a sheet metal blank from which the lower grids are formed.

Fig. 9 is a cross section thru a lower grid on the line 9—9 of Fig. 8, but after the blank Fig. 8 has been bent.

Fig. 10 is an outline view of a blank from which the upper grids are formed.

Fig. 11 is an edge view of an upper grid as formed from a blank Fig. 10.

Fig. 12 shows the complete device partly in elevation and partly in section as on the line 12—12 of Fig. 13.

Fig. 13 shows part bottom view and part section as on the line 13—13 of Fig. 12.

Fig. 14 is a plan view of one of the mats which are inserted in the nostril rings.

For clearness the drawing is made to a scale larger than the device itself.

The device herein shown is of the type comprising two metal rings fitting the lower edges of the nostril openings, the rings being held in proper relation to each other by a bridge or yoke piece which connects one ring to the other, the yoke piece extending downwardly from one ring around the septum of the nose and back to the other ring. Grids extend across the top and bottom openings of the rings for retaining a pair of mats of suitable felted filtering material. The lower grids are hinged to facilitate insertion and removal of the mats.

This general type of nasal filter is already known in the art, the improvements being herein directed to a structure comprising means whereby the several parts may be made up in a limited number of sizes, then parts of different sizes selected and combined to provide an almost unlimited variety of completed devices. To facilitate description of the assembled devices, the separate parts thereof will first be described.

The sheet metal nostril ring blank **20** is of a somewhat serpentine outline as at **22**, with a lateral projection **23** having two small hinge ears **24** thru which the hinge pin holes **26** extend. A small sharp projection is raised on the surface at **28** preferably by making an indentation from below at the time the blank is cut. Rivet holes **30** extend thru the blank to admit the rivets which hold the guide member, hereinafter described, to the nostril ring. The serpentine shape of the blank **20** results in the ring made therefrom being tilted up at the outer edge as seen in Fig.

12. The blanks **20** are preferably made up in several sizes.

At **32**, Fig. 2, is shown a bottom view of the ring for the left nostril as formed from the blank **20**. The ring for the right nostril is formed by bending precisely the same blank oppositely. The hinge ears **24** are here shown bent at right angles to the blank. The ring is somewhat kidney shaped being narrower at **38**, where it must fit into the front portion of the nostril, than it is at **40**. The ends **34** of the blank **20** overlap at **36** whereby a given size ring may be adjusted to a larger or smaller size. It is important that the overlap at **36** be opposite the point **37** at which the ring is supported on a yoke which connects the two rings.

At **42** of Fig. 3 is shown the blank from which the U shaped yoke is made. This blank is wider at the ends **44** than at the middle portion **46**, the portion **46** being narrowed mainly because it is the only portion that is visible and is therefore made narrower in order to keep it as inconspicuous as possible. A series of saw tooth like indentations **48** extend crosswise of the blank in both of the ends **44**. The completed yoke **50**, Fig. 4, is made by appropriately bending the blank **42**. A portion is broken away at **52** to more clearly show the indentations **48**. These indentations cooperate with the raised projection **28**, Figs. 1 and 2, together forming detent means for maintaining a selected relation between the ring **32** and the yoke **50** when they are assembled one with the other. The yoke **50** may, like the rings **32**, be made in several sizes.

In order to keep the rings **32** and the yoke **50** properly positioned relative to each other, the guide plate **54**, Fig. 5, is provided and attached by means of small rivets to the inside of the rings, rivet holes **56** in the plate and rivet holes **30** in the blank **20**, Fig. 1, being provided for this purpose.

Three parallel grooves are formed in one side of plate **54** (see Fig. 7), the middle groove **58** being of a size to slidably receive the wider ends **44** of the blank **42**, Fig. 3, and the smaller grooves **60** being for a purpose to be hereinafter disclosed. A latch lug **62** extends laterally from one edge of the plate.

Fig. 8 shows the blank **64** for the lower or hinged grid one of which closes the lower open side of each ring. This blank conforms to the shape of the ring but is somewhat smaller. The center of the grid is cut away as at **66** but there is left a strip **68** extending. Two hinge ears **70** having hinge pin holes **72** extend oppositely. In the completed grid, Fig. 9, the strip **68** has been bent to form a latch hook **74** while the ears **70** are bent at right angles to the grid.

The upper grid is formed from a blank **76**, Fig. 10. This blank is similar to, but smaller than, the blank **64**, and instead of hinge means, it has the rigid holding prongs **78** extending from one edge. These prongs are bent substantially at right angles to the grid as in Fig. 11. The prongs are slightly tapered so as to fit into the grooves **60** of the guide plate **54**, Figs. 5 and 7, tightly.

In assembling the various formed parts to compose a complete device a guide plate **54**, Fig. 5, may first be riveted to the inside of each nostril ring **32** as in Fig. 13. An upper grid **76** may next be secured in place by pressing the tapered prongs **78** into the tapered grooves **60**, Fig. 7, of the guide plate. A lower grid **64** is secured to each ring by inserting a hinge pin **80** (see Fig. 13) thru the holes **72**, Fig. 9, and the holes **26**, Fig. 2,

When this hinge pin is so inserted, the lower grid **64** may be swung on the hinge to open or closed position as shown in Fig. 12. In the closed position the latch hook **74** springs over the latch lug **62** and holds the grid closed. A slight pull with the thumb nail on the outer edge as at **82** of a lower grid will spring the latch open and permit the grid to swing on the hinge.

Each ring is preferably first thus assembled with a guide plate and a top and bottom grid, after which right and left rings are pressed over the upwardly extending legs **44** of the yoke **50**, the legs passing thru the slots **58**, Fig. 7, of the guide plates **54**. The saw toothed serrations **48** cooperate with the projection **28**, Fig. 2, and thereby hold the yoke and the rings in whatever respective relation they are placed.

In fitting a patient with the filter herein shown, a yoke is first selected which is most nearly the width of the patient's septum. It is then bent slightly to exactly the desired width. The size of each nostril is then ascertained and the proper ring selected for each side. In many cases one ring will be larger than the other. A ring of a given size may be altered slightly by bending, both in length and width, due to the overlapping ends **34**, Fig. 2. After having thus fitted the yoke and the two nostril rings separately, the legs **44** of the yoke may be inserted in the slots **58**. The depth of the insertion of the yoke with respect to the rings must be found by trial. Where the lower edge of one nostril is slightly higher than the lower edge of the other, this must be compensated for by a proper difference in the location of the rings on the legs of the yoke.

The ultimate adjustment must be such that when the rings **32** are inserted in the nostrils just far enough to conceal them, the bottom of the yoke must be pressed closely against the bottom edge of the septum. If when all adjustments are made the ends **44** of the U extend too far upwardly, they may be clipped off.

When it is considered that the filter herein described is intended to be worn at all times during the continuance of the pollen season, both in public and private, the importance of providing a device which may be fitted as above indicated with minimum effort and cost will be apparent, for, if the rings are slightly too large, they are not only uncomfortable but they give the patient what seems to him a grotesque appearance. On the other hand if the rings are too small they do not properly retain themselves in place. Furthermore if the bottom of the yoke does not lie tightly against the bottom of the septum it becomes very conspicuous and attracts undue attention. However, with a limited number of sizes of yokes and rings an almost infinite number of combinations may be made as above indicated and fitted with slight expenditure of time to insure complete comfort and substantial invisibility.

The mat **84**, Fig. 14, is produced by cutting, with sharp dies, from layers of loosely felted lamb's wool, shapes conforming to the inside of the several sizes in which the rings **32** are made. The wool is employed in preference to other fibrous materials because it has very little tendency to mat together when it becomes moistened, lends itself readily to medication, and has good mechanical straining properties.

Lamb's wool is now commercially obtainable for nasal filtering, but is provided in the form of slugs intended to be inserted directly in the nostrils. The objection, however, to using lamb's

wool in this manner is first, that it must be packed relatively close to provide a slug which will hold itself in the nostril, and second, that contact of the wool directly with an already inflamed nostril lining is in itself irritating.

It is therefore important that the wool be very loosely felted to provide free respiration, that the mats be cut with very sharp dies to insure that no fibres extend beyond the edges of the mats, and that the rings for holding the mats hold them completely out of contact with the membrane linings of the nostrils and hold them so that they may not be drawn upward or blown out by the respiratory function.

Having described an embodiment of my invention, I claim:

1. A nasal filter comprising a U shaped yoke having one leg extending upwardly into each nostril, a ring composed of a strip in oval form with free ends in overlapping contact fitted into the inside of each nostril, the rings being supported upon the legs of said yoke and each being independently movable vertically thereon, and means adapted to hold the rings to their respective legs in whatever position thereon they may be placed.

2. The structure defined in claim 1 wherein the overlaps are substantially opposite the point of support of the ring on the yoke.

3. The structure defined in claim 1 in which there is a lightly felted mat in each ring, and means to hold the mats within the rings.

4. A nasal filter comprising a U shaped yoke the bottom of which lies against the bottom of the septum, and the legs of which extend one upwardly into each nostril, a ring fitted to the inside of each nostril, guideways in the edges of the rings slidably receiving the legs of the yoke, the rings being thereby independently movable vertically on said legs, and means adapted to retain the rings in any position on said legs to which they may be moved.

5. The structure defined in claim 4 in which there are transverse serrations in the legs of the yoke and corresponding transverse means in the guideways for engaging said serrations and maintaining the said rings in their respective vertical positions on the said legs.

6. The structure defined in claim 1 in which there is a hinged grid closing on one side of each ring, the hinge being substantially opposite the point of overlap of the said rings.

HARRISON J. WEAVER.