Sept. 15, 1942. C. H. DOCKSON ET AL 2,296,150

RESPIRATOR MEANS

Filed Dec. 2, 1937

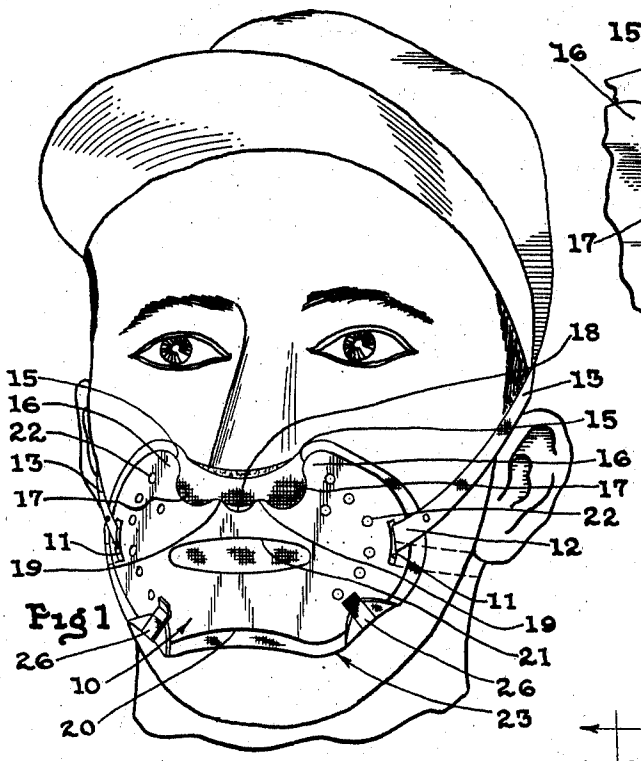


Fig 1

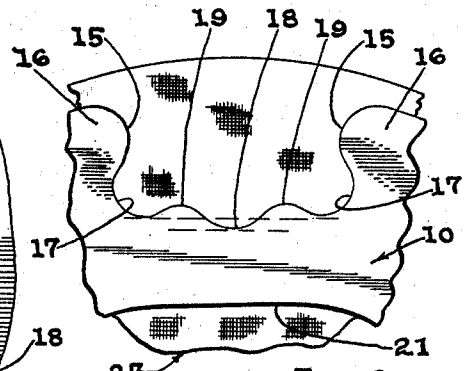


Fig 2

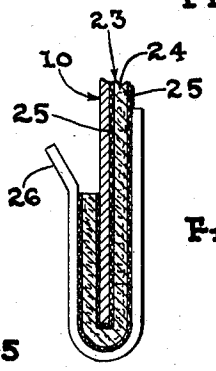


Fig 6

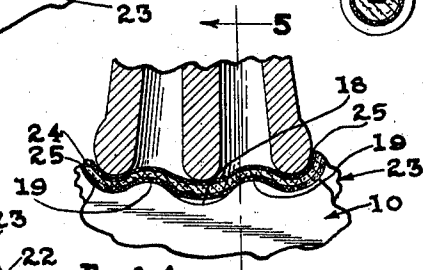


Fig 4

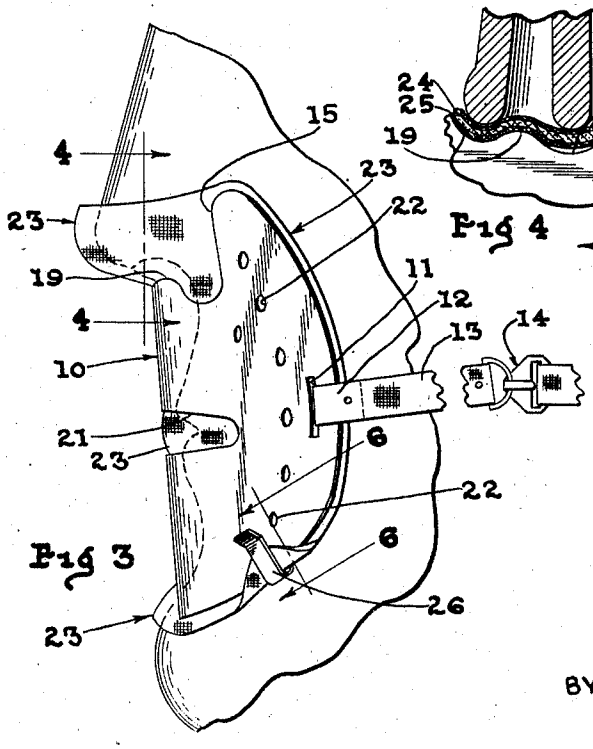


Fig 3

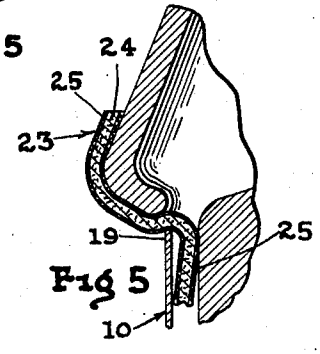


Fig 5

Charles H. Dockson
AND
Harold S. Davis
INVENTORS
BY Freeman, Sweet, Albrecht and Wiedman
ATTORNEYS

Patented Sept. 15, 1942

2,296,150

UNITED STATES PATENT OFFICE

2,296,150

RESPIRATOR MEANS

Charles H. Dockson, Detroit, and Harold S. Davis, Grosse Pointe Park, Mich., assignors to The Martindale Electric Company, Lakewood, Ohio, a corporation of Ohio

Application December 2, 1937, Serial No. 177,736

5 Claims. (Cl. 128—146)

This invention relates to respirator means, more particularly to the type of respirator means for removing deleterious substances from air inhaled or exhaled by a person using the respirator means, and the principal object of this invention is to provide new and improved respirator means of this character.

In the drawing accompanying this specification, and forming a part of this application, there is shown, for purposes of illustration, one form which the invention may assume, and in this drawing:

Figure 1 illustrates the embodiment of the invention in position on the face of a user,

Figure 2 is a fragmentary plan view of the embodiment before being positioned on the face of a user,

Figure 3 shows a fragmentary profile of the user, with the embodiment in position,

Figure 4 is a fragmentary sectional view corresponding substantially to the line 4—4 of Figure 3,

Figure 5 is a fragmentary sectional view corresponding substantially to the line 5—5 of Figure 4, and

Figure 6 is a fragmentary enlarged sectional view corresponding substantially to the line 6—6 of Figure 3.

The embodiment of the invention comprises a plate 10, formed of any suitable flexible material. In this particular instance, the plate is formed of soft rolled aluminum. The plate 10 is generally oval-shaped in plan view, and has arcuate slots 11 at its sides for receiving loops 12 formed on strips 13, which strips may be formed of resilient material, and may be readily connectable and disconnectable by means of a clasp connection 14.

Referring particularly to Figures 1 and 2, the top margin of the plate 10 is recessed as shown at 15, providing a nose receiving portion. The contour of the recessed margin 15 is preferably formed by a series of merging curves, so as to avoid sharp corners which might cause injury to a user. The entrance to the recess 15 is provided by a pair of spaced rounded portions 16, which are adapted to be disposed at opposite sides of the wearer's nose, these portions 16 merging with substantially semicircular auxiliary recesses 17, which in turn merge with a common auxiliary recess 18. Rounded crests or projections 19 are formed intermediate the auxiliary recesses 17 and 18, these projections 19 being spaced apart a distance substantially corresponding to the spacing of a user's nostrils. The bottom of the auxiliary recess 18 is below the bottoms of the auxiliary recesses 17, as shown by the dash lines in Figure 2.

The lower margin of the plate 10, referring to Figure 1, is recessed as at 20, to provide clearance for a portion of the user's chin. Intermediate the recesses 15 and 20, is an elongated aperture 21, adapted to be positioned adjacent the user's mouth. A plurality of smaller apertures 22 are formed adjacent the side margins of the plate 10, as best shown in Figure 1.

Means pervious to air are attached to the plate 10, and as here shown, this means comprises a pad 23, formed of fibrous material 24, such as cotton or the like, interposed between layers of fabric material 25, such as gauze or the like. The pad 23 is also preferably oval-shaped, and of a slightly greater overall size than the plate 10, and this pad overlies one side of the plate 10. Portions of the pad 23 are rolled over the adjacent margins of the plate 10, and spring clips 26 engage the pad 23 at the rolled-over portions, to hold the pad 23 to the plate 10. It will be obvious that the pad 23 can be readily removed, and another similar pad attached to the plate 10.

Before the respirator means is positioned on the user's face, the plate 10 and pad 23 are preferably flat, as shown in Figure 2. In use, the respirator means is held to the user's face, by connecting the strips 13 to each other by engagement of the clasp connection 14, the connected strips forming a band about the user's head, as shown in Figures 1 and 3. The arcuate slots 11 are so constructed and arranged to permit the band to adjust itself to different head shapes, and additionally, the slots provide for adjustment of the loops 12 of the strips 13, so that the band can be worn above the user's ears, as shown in full lines in Figure 1, or this band can be worn below the user's ears, as shown in dotted lines in this figure, without causing objectionable twisting of the loop portions 12 adjacent the slots 11.

The pad 23 lies against the face of a user, and the nose of the user extends through the recess 15 of the plate 10. The adjacent portion of the pad 23 is forced through the recess 15, and is caused to overlie the nostrils of the user and the adjacent part of the nose, as shown in Figures 1, 3, and 5. The projections 19 urge the adjacent portions of the pad 23 into the nostrils of the user, as shown in Figures 4 and 5, these portions of the pad 23 bearing against surfaces of the nostrils, and substantially seal the nostrils to the extent that substantially all air passing through the nasal passages must pass through the adjacent portions of the pad 23. As best seen in Figure 4, the bottom of the auxiliary recess 18 is proportioned with respect to the projections 19 and the bottoms of the auxiliary recesses 17, so that substantially no pressure is brought to bear by the marginal surface of the auxiliary recess 18 against the outer sur-

face of the cartilage separating the nasal passages.

The pad 23 covers the aperture 21, and also forms a covering adjacent the chin recess 20 to protect the chin of the user from contact with the plate 10 at this point. The pad 23 also covers the smaller apertures 22, but permits ventilation of the user's face adjacent these apertures. Because of the flexible nature of the plate 10 and pad 23, the respirator means forms itself to closely follow the adjacent contour of the face, and substantially all air inhaled or exhaled by the wearer of the respirator means must pass through the pad 23.

It will be obvious that the pad 23 removes deleterious substances from the air inhaled by a user, either through the nose or mouth, while at the same time, also removes deleterious substances which may be exhaled by the user, either through the nose or mouth. The pad 23 may be impregnated, if desired, with any suitable means to improve its filtering qualities, and may, in some instances, be impregnated with a suitable medicament for germicidal purposes.

It will be apparent to those skilled in the art that we have accomplished at least the principal object of our invention, and it also will be apparent to those skilled in the art that the embodiment herein described may be variously changed and modified, without departing from the spirit of the invention, and that the invention is capable of uses and has advantages not herein specifically described; hence it will be appreciated that the herein disclosed embodiment is illustrative only, and that our invention is not limited thereto.

We claim:

1. Respirator means, comprising: plate means, adapted to fit that portion of the face of a wearer adjacent the nose, said plate means having a recess adapted to pass the nose, the defining margin of said recess being so formed to provide a pair of projections spaced-apart a distance substantially corresponding to the spacing of the nostrils of a wearer; means pervious to air, adapted to be interposed between said plate means and the face of a wearer and to overlie the nostrils of the wearer when said respirator means is in operative position; and means for holding said respirator means in operative position on the face of a wearer, said holding means being constructed and arranged to engage the head of the wearer, and to exert an upward pull on said plate means, so that said projections urge portions of said pervious means into the respective nostrils of a wearer.

2. Respirator means, comprising: plate means, adapted to fit that portion of the face of a wearer adjacent the nose, said plate means having a recess adapted to pass the nose, the defining margin of said recess being so formed to provide a pair of projections spaced-apart a distance substantially corresponding to the spacing of the nostrils of a wearer, and an auxiliary recess between said projections; means pervious to air, adapted to be interposed between said plate means and the face of a wearer and to overlie the nostrils of the wearer when said respirator means is in operative position; and means for holding said respirator means in operative on the face of a wearer, said holding means being constructed and arranged to engage the head of the wearer, and to exert an upward pull on said plate means, so that said projections urge portions of said pervious means into the respective nostrils of a wearer, said auxiliary recess being of sufficient size so that the cartilage separating the nasal passages is substantially free of pressure produced by the upward pull of said holding means.

3. A respirator, comprising: support means, defining an area subtending the mouth of a wearer when the respirator is in position on the wearer; filter means, constructed to be disposed between said support means and the face of the wear; and said support means comprising a pair of projections spaced apart a distance corresponding substantially to the spacing of the nostrils of a wearer and constructed and arranged to press portions of said filter means within the nostrils of the wearer when the respirator is in position on the wearer; and holding means, comprising means adapted to engage the head of a wearer spaced from the nostrils of the wearer, constructed to hold the respirator in position on a wearer with said projections pressing portions of said filter means within the nostrils of the wearer.

4. A respirator, comprising: support means, defining an area subtending a portion of the face of a wearer when the respirator is in position on the wearer; filter means, constructed to be disposed between said support means and the face of the wearer; and said support means comprising a pair of projections and a portion connecting said projections, said projections being spaced apart a distance corresponding substantially to the spacing of the nostrils of a wearer and constructed and arranged to press portions of said filter means within the nostrils of the wearer when the respirator is in position on the wearer, and said connecting portion being so constructed and arranged with respect to said projections as to exert substantially no pressing force against that part of said filter means intermediate said spaced projections; and holding means, comprising means adapted to engage the head of a wearer, constructed to hold the respirator in position on a wearer with said projections pressing portions of said filter means within the nostrils of the wearer.

5. A respirator, comprising: support means, defining an area subtending a portion of the face of a wearer when the respirator is in position on the wearer; filter means, constructed to be disposed between said support means and the face of the wearer, and having at least a portion in overlying relation with respect to the nostrils of the wearer; and said support means comprising a pair of projections spaced apart a distance corresponding substantially to the spacing of the nostrils of a wearer, and each of said projections being constructed and arranged to press that portion of said filter means overlying a respective nostril slightly inwardly of such nostril so that such filter portion engages the marginal surface defining the nostril and thus prevents air passing through the nostril other than through said air-pervious means; and holding means, comprising means adapted to engage the head of a wearer, constructed to hold the respirator in position on a wearer with said projections pressing portions of said filter means within the nostrils of the wearer.

CHARLES H. DOCKSON.
HAROLD S. DAVIS.