June 26, 1945. J. B. BIEDERMAN 2,378,971

RESPIRATORY FILTERING DEVICE

Filed Aug. 28, 1941

Fig. 1.

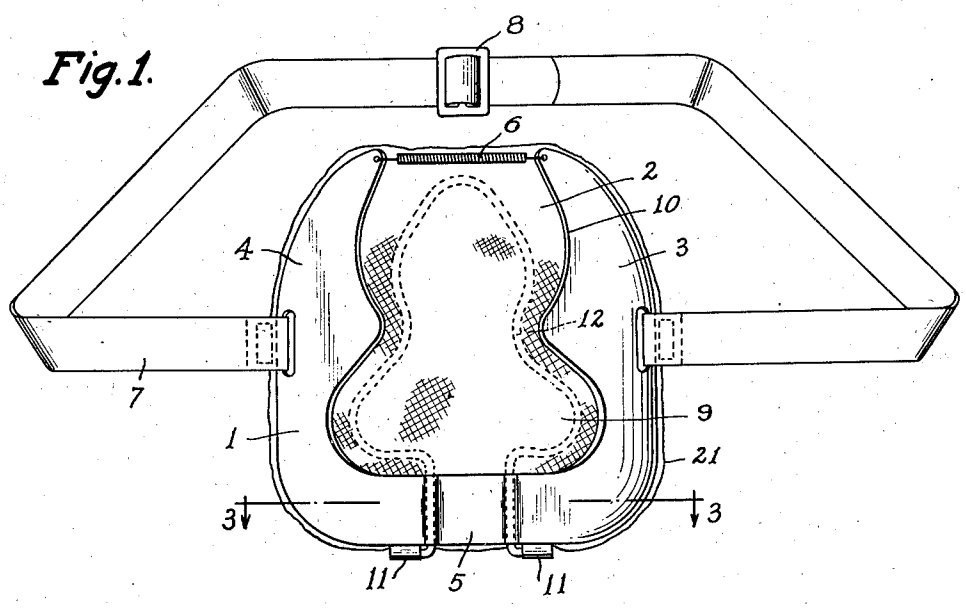
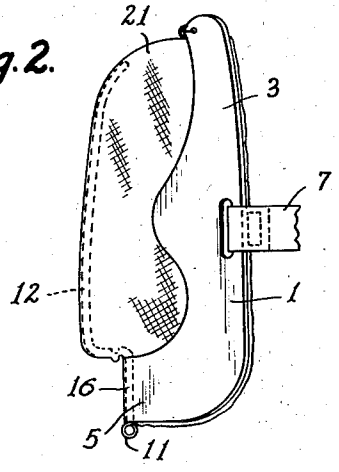


Fig. 2.



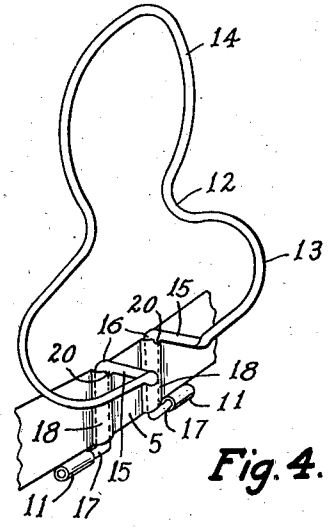
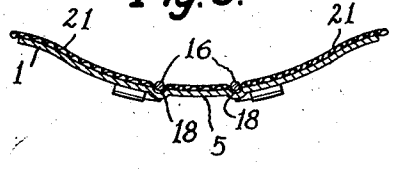


Fig. 4.

Fig. 3.



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RESPIRATORY FILTERING DEVICE

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Application August 28, 1941, Serial No. 408,627

6 Claims. (Cl. 128—146)

The present invention relates to respiratory filtering devices.

The principal object of the present invention is to provide a simple, inexpensive and efficient filtering device to cover the external respiratory organs, that is, the nose and mouth of the user.

Various masks and nasal filters have been provided for the purpose of filtering air breathed by the users in certain occupations, as well as by persons afflicted with certain disorders of the respiratory system. The present invention provides a device of a highly efficient construction adapted for the uses mentioned and one which is of great simplicity of construction, as well as inexpensive in manufacture.

Further objects of my invention will appear from the followig detailed description thereof.

In the drawing:

Figure 1 is a front elevation of a respiratory device constructed in accordance with this invention.

Figure 2 is a side view of the device.

Figure 3 is a section on line 3—3 of Figure 1.

Figure 4 is a perspective of the extension frame.

The numeral 1 indicates a framework which may be made of any suitable thin material such as metal, or if desired of some plastic material, and is of irregular U-shape. If of metal construction, it is preferably of metal which is noncorrosive. The frame 1 has an irregular opening 2 between arms 3 and 4 which extend upwardly from the lower section 5. The frame 1 is generally of concave construction as indicated in Figures 2 and 3 and is adapted to rest on the face witht the lower section 5 resting against the front of the chin and the arms 3 and 4 against the cheeks on either side of the mouth and nose of the wearer. Similar results may be obtained by a flat framework of flexible or resilient construction. The front ends of the arms 3 and 4 are connected by means of a coiled spring 6. A securing strap 7 has its ends secured in the arms 3 and 4 respectively and is adapted to pass around the head of the wearer, a buckle 8 being provided to secure the free ends of the strap and to provide for adjustment. The lower portion 9 of the opening between the arms 3 and 4 is adapted to be disposed around the mouth of the wearer and the upper and somewhat restricted portion 10 is adapted to receive the nose of the wearer when the device is in use; the spring 6 rests over the nose approximately at the bridge, the flexibility of the spring permitting it to adapt itself to the contour thereof.

Mounted on bearings 11—11 of the lower section 5 of the frame 1 is a metal or wire extension frame 12 which is bent to form sections 13 and 14 respectively, somewhat approximating the contour of the openings 9 and 10 of the frame 1, but both being smaller in extent and the upper part of the section 14 being closed and bent forwardly as shown in Figure 4. The frame 12 is carried by horizontal arms 15—15 which extend from vertical sections 16—16, the lower ends of which bend outwardly as shown at 17—17 to fit into the bearings 11—11 as clearly shown in Figure 4 of the drawing. The lower section 5 of the frame 1 is preferably provided with channels 18—18 into which the vertical section 16—16 fit, so as to be flush with the rear side of section 5 when the frame 12 is in upright or operative position. The vertical sections 16—16 are provided with bosses 20—20 which snap over the upper edges of the channels 18—18 so as to secure the frame 12 in operative position. In order to permit such action the wire of the framework is, of course, slightly springy so that the bosses 20—20 snap automatically over the upper edges of the channels when the frame 12 is raised.

The numeral 21 indicates a sheet of filtering fabric, such as cotton or other suitable material, which is of approximately the shape of the frame 1 and slightly larger in area than same, and which is adapted to be secured between the frame 1 and the extension frame 12. In order to use the device, the material 21 is placed in position in back of the frame 1 when the extension frame 12 is lowered. The frame 12 is then raised and snapped into position. The frame 12 by reason of its forward extension extrudes the material through the openings in the frame 1, and the whole device may then be placed on the face of the wearer as above indicated and the material thus serves as an effective filtering agency in front of the nose and mouth of the wearer, as well as a seal between the frame 1 and the skin of the wearer. It is also contemplated that certain medicaments may be used on the filtering fabric if desired for the treatment of disease or for its more efficient operation in the exclusion of dust and similar substances. It should be understood, of course, that each time the device is used, a new filtering fabric 21 is preferably used.

It will thus be seen that in the construction above described and illustrated in the drawing, I have provided an extremely simple and inexpensive device which is readily adapted for the purpose indicated. It will be understood further that numerous changes may be made in details of construction, as well as in the shape of the

various parts, without departing from the spirit and scope of the invention as defined in the appended claims.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A filtering device comprising a U-shaped frame adapted to fit below and at both sides of the external respiratory organs of a person with said organs extending through the opening between the arms thereof, an extrusion frame adapted to extend through said U-shaped frame between its arms, a sheet of filtering material adapted to be secured by said frames in front of said organs and against the underside of the U-shaped frame arms and a resilient connection between the upper free ends of said first frame.

2. A filtering device comprising a U-shaped frame adapted to fit below and at both sides of the external respiratory organs of a person, an extension frame hingedly secured to the lower portion of said first frame, a portion of said extension frame being adapted to extend between the arms of said first frame, and a sheet of filtering material adapted to be secured by said frames and extruded by said extension frame through said first frame between its arms and a resilient connection between the upper free ends of said first frame.

3. A filtering device comprising a U-shaped frame adapted to fit below and at both sides of the external respiratory organs of a person, an extension frame hingedly secured to the lower portion of said first frame, a portion of said extension frame being adapted to extend between the arms of said first frame, and a sheet of filtering material adapted to be secured by said frames and extruded by said extension frame through said first frame between its arms, a resilient connection between the upper free ends of said first frame and means for locking said extension frame in extruding position.

4. A filtering device comprising a first frame adapted to fit the face of a person around the external respiratory organs, but said frame having an opening for said organs, an extension frame carried by and arranged to extend through said first frame in front of said organs and a sheet of filtering material adapted to fit between said first frame and wearer and to be projected through the opening in said first frame by said extension frame.

5. A filtering device comprising a first frame adapted to fit the face of a person around the external respiratory organs, but said frame having an opening for said organs, an extension frame hingedly secured to said first frame and having a portion adapted to extend through the first frame opening in front of said organs and a sheet of filtering material adapted to be secured by said frames, whereby a portion of said filtering material lies between the first frame and the person's face and the central portion of the filtering material is extruded by said extension frame through said first frame opening.

6. A filtering device comprising a first frame adapted to fit the face of a person around the external respiratory organs, but said frame having an opening for said organs, an extension frame hingedly secured to said first frame and having a portion adapted to extend through the first frame opening in front of said organs, a sheet of filtering material adapted to be secured by said frames, whereby a portion of said filtering material lies between the first frame and the person's face and the central portion of the filtering material is extruded by said extension frame through said first frame opening and means for locking said extension frame to said first frame in extruding position.

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