Oct. 17, 1939. N. SCHWARTZ 2,176,380

RESPIRATOR

Filed Nov. 30, 1936

Fig. 1.

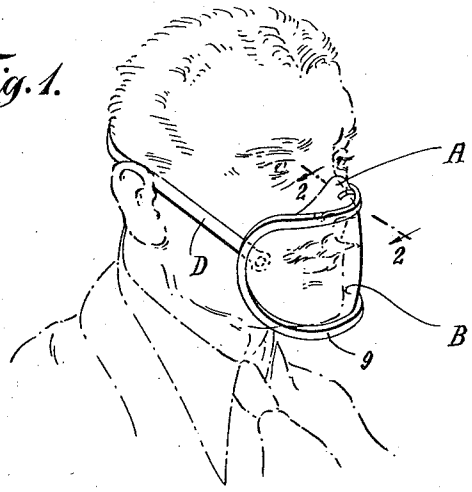


Fig. 2.

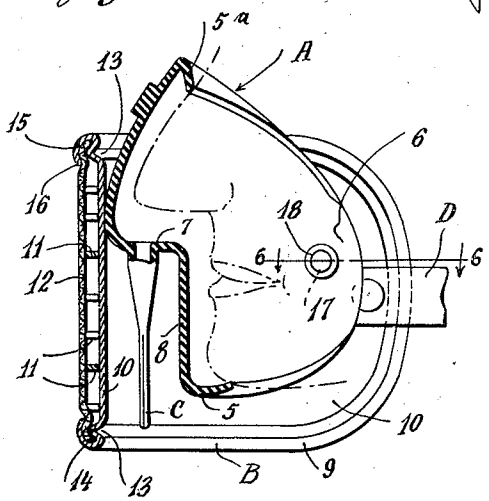
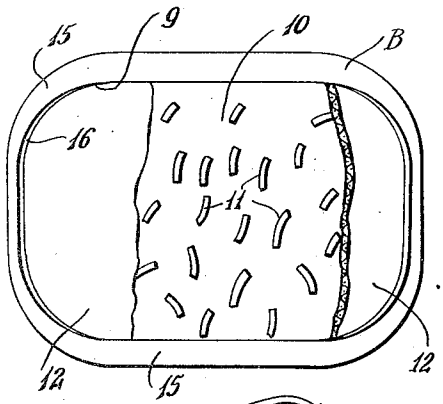


Fig. 3.



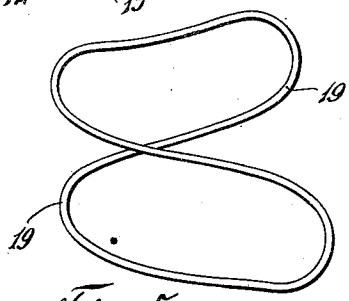


Fig. 5.

Fig. 4.

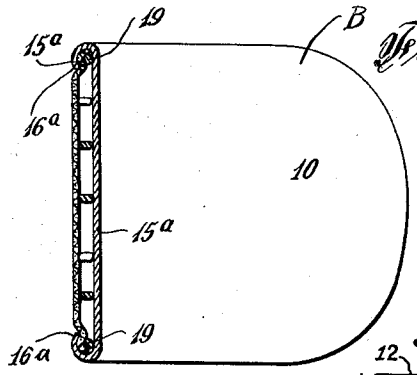


Fig. 6.



INVENTOR

Nathan Schwartz

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2,176,380

UNITED STATES PATENT OFFICE

2,176,380

RESPIRATOR

Nathan Schwartz, New York, N. Y.

Application November 30, 1936, Serial No. 113,323

2 Claims. (Cl. 128—146)

This invention relates to filter type respirators adapted to cover the nose and mouth of the wearer for the purpose of protection against dust fumes and injurious gases and is a modification of my copending application for Letters Patent Serial No. 111,754.

The invention broadly aims to provide a respirator of minimum size and weight while affording a maximum area of filtration and also to facilitate the replacement of the filter material and also to provide increased security at the marginal attachment of the filter material and also to provide facilities for comfort at the face engaging section.

More particularly the invention resides in providing a flanged arrangement at the chin section for engaging the chin below the submaxillary region. The advantage obtained by this manner of construction is that it permits the head band to be fastened at the top of the head instead of at the back of the neck. Some wearers are annoyed by the head band being secured at the back of the neck and also at times certain individuals have susceptibility for boil formations at the back of the neck.

Another feature is an additional security provided at the marginal attachment of the filter material, namely the filter material is provided with clasps that impinge thereat at both sides.

Another feature is that the area of filtration is increased because the filter material is raised from its supporting wall directly at its marginal attachment thereby providing for filtration at the said part as well as at the remaining filtration area. The means provided for raising the filter material has an additional function which is to impinge on the said filter material and thereby tighten the clasp thereon.

Another feature is that the filter unit is convex in its lateral aspect and level in its vertical aspect which shape permits the provision of a large filter pad.

With the above recited and other objects in view reference is had to the following description and accompanying drawing in which there is exhibited one example or embodiment of the invention, while the claims define the actual scope of the same.

In the drawing:

Figure 1 is a perspective view of the improved respirator in applied position.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is the front view of the filter unit with parts broken away to show protrusion spacing means attached to the inner side of the casing wall.

Figure 4 is a modified form of the filter unit, in section, showing a spacing element attached to the marginal area.

Figure 5 is a perspective view of the spacing element prior to its attachment at its applied position.

Figure 6 is a section on line 6—6 of Figure 2, showing in detail the means of connection of the body portion of the respirator with the filter unit.

Referring to the drawing by character reference, A designates the face piece of the respirator, B designates the filter unit, C designates the valve and D the head band.

The face piece A of the respirator is preferably constructed of molded elastic rubber or its equivalent and has flanges provided at the chin part 5 and also at the nose part 5a. The flange 5 at the chin part is directed at an acute angle with relation to the respirator face piece A, and it engages the chin of the wearer at its lower part, that is, at the submaxillary region. The face piece A has flaps 6 at the cheek area of the face for flat contact with the face when in applied position.

The face piece has a horizontal set back below the nose line which set back has an upper horizontal wall 7 and a vertical wall 8. There is an opening in the horizontal wall 7 for connection with an exhalation valve C.

The head band D has means provided at the cheek portion 6 of the face piece for attachment therewith, and is directed backward and upward to fasten at the occipital area of the head, thereby securing the face piece of the respirator to the face of the wearer.

There are two forms of filter units in this improved respirator. In the first form the casing 9, of the filter unit B, has an anterior convexity. The wall 10, of the casing 9, curves forward in the lateral position, while in its vertical position it is substantially plumb. The said wall 10 has protrusion elements 11 which are preferably of flat or of oval wires attached at the forward or anterior side of the said wall, for the purpose of spacing the filter material from the wall 10. At the marginal portion of the wall 10, there is an indent 13, which causes a protrusion 14, which protrusion 14 is directed outwardly to impinge upon the filter material 12, at the edges thereof and also to raise the said material 12 and thereby space it from the said wall 10 at the said marginal portion.

The casing 9 in the first form has a marginal flange 15 directed outward and the said flange 15 is inturned at 16 to impinge upon the filter material 12. The said casing is preferably made of light aluminum material or its equivalent.

The casing 9 connects with the face piece A by means of registering holes 17 at the side areas and the said holes are connected by means of eyelets 18.

It is therefore to be noted that the filter material 12 is removably secured at the marginal area of the casing by a clasping arrangement, namely the protrusion 14 impinging thereon from one side and the inturned flange 16 impinging it from the other side. Also it is to be noted that the protrusion 14 has an added function which is to raise the filter material and space the same from the wall 10 and thereby cause the filtration to be free and unobstructed at such marginal area.

It is to be noted that the marginal formation of the casing 9, in the first form of the invention is as follows: There is an angular forwardly directed marginal rim, the edge of the rim being directed outward, thereby forming an outward extension. The periphery of the said outwardly directed extension is curved inwardly, thereby forming the inturned flange 15 and 16. Thus an inwardly directed groove is formed between the said outward extension and the said inturned flange. Filter material is inserted within the said inwardly directed groove. The insertion is done by finger manipulation or by a small tool, such as a penknife, small screw-driver or a letter opener. It is to be noted that the casing of the filter unit is preferably of a light metal as aluminum and the marginal rim is substantially rigid to effectively space the filter material 12 at its marginal portion. The filter material is secured firmly but removably in the said groove. The easiest way to remove the said filter is to place a finger in the eyelet hole and press the material outward and the material readily snaps out of its mounting.

In the second form of this invention the spacing means at the marginal area is a wire 19. The said wire is adjusted to the said marginal area of the casing 9 preferably by soldering the said wire to the casing wall 10 at the said marginal area. The said wire 19 functions as the protrusion 14 functioned in the first form. Namely, it spaces the filter material 12 from the wall 10 and also impinges the filter 12 at one side. The flange 15a in this form is also inturned 16a as was in the first form, and impinges the filter material 12 at the opposite side and thus a clasping arrangement is provided which removably and efficiently secures the filter material at the said marginal area. The second form is clearly illustrated in Figure 4. Both first and second forms provide efficient securing means for the filter material and they both have definite usefulness because certain manufacturing plants are better equipped to make the first form and other manufacturing plants are equipped to make the second form. The shape of the filter unit in the second form is the same as in the first form.

It is to be understood that the clasping arrangements herein described are practical for use in circular, oval or any shaped filter units also any contoured shapes, such as convex, concave or other horizontal or vertical designs. The edges of the filter material are inserted between the inturned flange and the rear protrusion by means of a flat instrument, such as a letter opener or a small screw driver. The filter material is secured thereat and held tightly between the flange and the protrusion, but it may be removed upon pressure, namely, by pushing the finger or a dull instrument through the eyelet opening and pressing on the filter material from within outwards. This pressure causes a dislocation of the insertion and the removal of the filter pad.

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

1. A respirator, a body portion connected to a filter unit having filter material and a wall with an inwardly directed peripheral groove and a circumferential wire attached to the rear side of the said groove, the edges of the said filter material being inserted in the said groove and removably secured thereat by the said wire impinging upon the marginal portion of the said material.

2. In a respirator, a body portion connected to a filter unit having a filter pad and a wall with an inwardly directed peripheral groove and a circumferential wire located in the said groove, the said pad being removably mounted in the said groove in a confronting and a spaced relation to the said wall and the said wire arranged in the said groove in a manner whereby it impinges upon the edges of the said pad to removably secure the said edges in the said groove and also to maintain a leak proof joint thereat.

NATHAN SCHWARTZ.