July 9, 1957 HIDEO KASHIMA 2,798,483

RESPIRATOR

Filed April 15, 1954

Fig. 1.

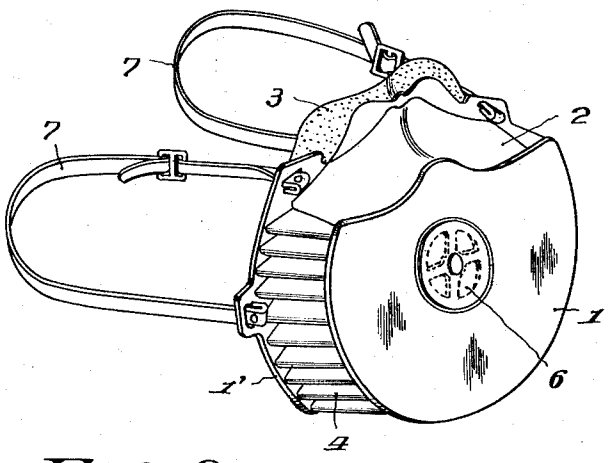


Fig. 2.

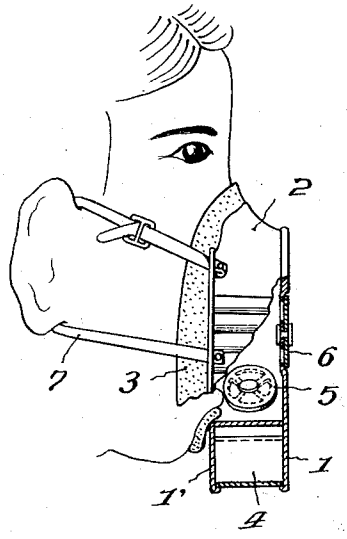
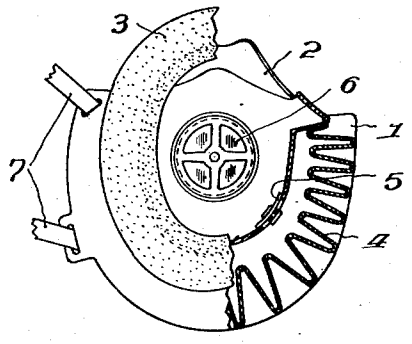


Fig. 3.



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2,798,483

RESPIRATOR

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Claims priority, application Japan May 1, 1953

3 Claims. (Cl. 128—146)

The present invention relates to an improved respirator.

The object of this invention is to provide an improved respirator which is very simple, small and light and permits comfortable breathing, has a high action and provides clean air for inhalation.

Said object of this invention has been accomplished by employing filtrating paper having a good filtrating action and a large filtrating surface and by combining skilfully three parts, that is, a filtrating part, a breathing part and an attaching part.

According to this invention, the three parts have been constructed as follows.

The filtrating part consists of front and rear thick plates such as thick-boards or metal plates and a chrysanthemum shaped filter-paper having many plaits, the paper being held between the two plates.

The breathing part consists of a thin plate which is formed so that the human nose and mouth may be covered comfortably thereby and breathing and speaking may be easily accomplished, said part being provided with at least one aspirating valve capable of admitting only the air being inhaled through the filtrating part and at least one expirating valve capable of exhausting the expirated gas directly into the open air. The expirating valve and the aspirating valve may be attached on the front plate of the filtrating part and on the thin plate forming the breathing part, respectively.

The attaching part consists of an attaching piece capable of being secured in an air-tight manner to the filtrating and breathing parts, and strings for supporting the respirator on the ears or occipital region to hold it on the face airtightly.

The present invention will be more easily understood by reference to the following description taken in connection with the accompanying drawing, wherein:

Fig. 1 is a perspective view of an embodiment of this invention.

Fig. 2 is a partly sectioned side view of the respirator illustrated in Fig. 1 showing it in position on human face.

Fig. 3 is a partly sectioned back view of the respirator illustrated in Figs. 1 and 2.

Referring to the drawing, the respirator consists of a filtrating part, a breathing part 2 and a face attaching part 3. The filtrating part consists of front and rear thick-boards or metal plates 1 and 1' and a filter-paper 4 held between the plates. The paper 4 is impregnated with any lacquer diluted by a suitable medical liquid and is formed in chrysanthemum shape having many plaits, a part of the paper being out off at the upper part thereof.

The breathing part 2 is formed by a thin metal plate so that the human nose and mouth may be covered comfortably thereby and breathing and speaking may be easily accomplished. In the part 2 are arranged aspirating valves 5 capable of admitting only the air aspirated through the filter-paper 4. To the plate 1 is attached an expirating valve 6 capable of exhausting the expirated gas directly into the open air.

The attaching part 3 is made of a sponge-gum attached airtightly to the filtrating part and to the breathing part 2 and is provided with strings 7 for supporting the respirator on the ears or occipital region to hold it on the face airtightly.

The action of the respirator described above is as follows.

When air is aspirated by the human nose, the aspirating valves 5 open and the expirating valve 6 closes, so that the aspirated air is suctioned into the inside of the breathing part 2 through the aspirating valves 5 after it has been filtrated at the surface of the filter-paper 4.

The aspirated air admitted as above enters easily into the nose.

On the other hand, when expiration occurs, the expirated gas can be easily exhausted outwards through the expirating valve 6 into the open-air.

In the embodiment of this invention, the aspirating valve and expirating valve may be omitted without decrease in the respirating function and with accompanying simplification of the construction. In this case, however, some expirated gas will be commingled within the aspirated air resulting in a slight heating of the air and in a reduction of the freshness of the air. Therefore, it is preferable to provide the aspirating and expirating valves.

The size, weight and complexity of a respirator are mainly defined by the filter. According to the respirator of this invention, however, the filter is very small, light and simple and the filtrating surface is very large due to the chrysanthemum shape of the filter-paper, as will be understood from the drawing and description thereof, in comparison with the usual respirators heretofore in use. Therefore, the respirator of this invention is very excellent and suitable for employment in working places such as, for example, cement factories, fibrous factories, coal mines, etc.

Since it is obvious that many changes and modifications can be made in the above-described details without departing from the nature and spirit of this invention, as defined in the appended claims it is not limited within said illustration.

I claim:

1. A respirator comprising, in combination, a front wall and a substantially parallel rear wall, said rear wall being partly cut away centrally thereof to receive the nose and mouth of the wearer and being provided with a face sealing portion adapted to overlie the adjacent portions of the wearer's face, the upper portions of said walls being joined by a top wall and a pleated paper filter having its pleats perpendicular to said walls and comprising a linear strip extending between the ends of said top wall and between said front and rear walls.

2. A respirator comprising, in combination, a body comprising a front wall and a substantially parallel rear wall defining a breathing chamber, said rear wall being partly cut away centrally thereof to admit the nose and mouth of the wearer into the breathing chamber, the upper portions of said walls being joined by a top wall to overlie the wearer's nose, and a pleated paper filter having its pleats perpendicular to said walls confined between said front wall and said rear wall and comprising a linear strip extending between the ends of said top wall at the periphery of said breathing chamber.

3. A respirator comprising, in combination, a body comprising a front wall and a substantially parallel rear wall defining a breathing chamber, said rear wall being partly cut away centrally thereof to admit the nose and mouth of the wearer into the breathing chamber, the upper portions of said walls being joined by a top wall to overlie the wearer's nose, and a pleated paper filter having its pleats perpendicular to said walls confined be-

tween said front wall and said rear wall and comprising a linear strip extending between the ends of said top wall at the periphery of said breathing chamber, said breathing chamber being provided with an inhalation valve communicating with said paper filter and being provided with an exhalation valve.

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