

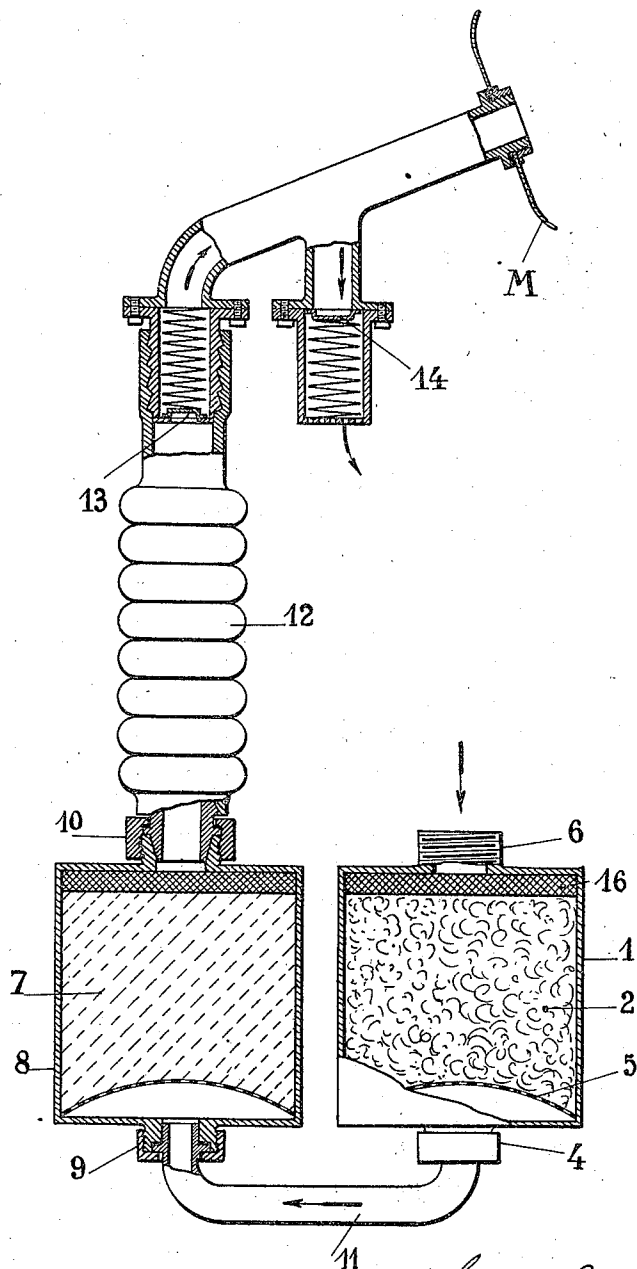
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RESPIRATORY DEVICE

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UNITED STATES PATENT OFFICE.

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RESPIRATORY DEVICE.

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To all whom it may concern:

Be it known that I, HENRI GUILLEMARD, a citizen of the Republic of France, and residing at 57 Rue Pierre Corneille, Lyon, Department of the Rhone, France, have invented a certain new and useful Respiratory Device, of which the following is a specification.

This invention relates to a respiratory device for protection against carbon monoxide and other deleterious gases, and its object is to provide an apparatus affording an efficacious protection, which can be readily applied in practice and can be kept for any length of time.

The apparatus according to the invention is applicable in all cases in which the air to be respired is submitted successively to two reagents, one of which designated as the oxidizing reagent in the following description is designed to destroy the deleterious gases and especially the carbon monoxide, while the second, designated as absorbent reagent, is designed to absorb the noxious volatile products resulting from the reaction and to prevent them from entering the lungs. The device applies more particularly to the cases involving the destruction of the carbon monoxide by employing on the one hand a mixture of iodic acid or anhydride, or iodates (or equivalents) with sulphuric acid, for the purpose of oxidizing the carbon monoxide at the ordinary temperature, and on the other hand an absorbent substance or compound such as oxylon, caustic alkali, or a peroxide such as oxylithe, etc., for the purpose of absorbing among others the iodine vapor given off by the action of the carbon monoxide on the first-mentioned reagent.

The apparatus is so designed as to insure the perfect preservation of the same as well as of the reagents, and especially of the oxidizing reagent, by preventing in an absolute manner all possibility of a mixture of the oxidizing and the absorbent reagent, at the same time preventing the water or a volatile part of one reagent from reaching the other reagent and thus modifying the latter by effecting combinations which would be injurious for the proper preservation of the apparatus.

The accompanying drawing shows a preferred constructional form of respiratory device according to the invention.

A container 1 which contains the oxidizing reagent 2 is provided with two orifices, an upper orifice 6 for the admission of air, and a lower orifice provided with a threaded neck 4. The reagent substance is held upon a perforated double bottom or other permeable member 5, and is maintained tightly packed in the container by being covered at the top by a cushion such as shredded metal, wire gauze or other similar resilient and permeable retaining means 16. The absorbent reagent is disposed in like manner in a second container 8 which is also provided with a threaded neck 9 and an upper threaded connection neck 10.

When in use, the two containers 1 and 8 are connected by a U-tube 11 to which the containers are screwed at their necks 4 and 9.

The flexible tube of the mask M is connected to the neck 10 by a screw coupling. This tube contains two automatic valves disposed in any suitable manner, one valve 13 being employed to allow the air to pass from the absorbing container 8 to the mask while preventing its movement in the opposite direction, the second valve being disposed at one side of the preceding path in order to allow the gas which is expelled from the mask during the expiration to pass out into the atmosphere, but preventing any outside air from entering directly into the mask.

These automatic valves can each be constituted for instance by a disk which is normally held upon its seat by a light spiral spring and thus hermetically closes the conduit in the inoperative direction while causing no appreciable hindrance to inspiration or expiration.

The container 1 holds the oxidizing reagent which is carried by a suitable supporting substance permeable to air, providing the greatest possible surface of contact between the air passing through the same and the chemical substance forming the reagent. For instance, if the oxidizing reagent consists of a mixture of iodic acid or anhydride and sulphuric acid, it is preferable to make use of small grains of pumice stone impregnated with the above-mentioned substances in the following manner. The grains of pumice stone are shaken up in a well-dried bottle with the proper quantity of sulphuric acid, and when the sul-

phuric acid has been absorbed by the pumice stone, a suitable amount of iodic anhydride is introduced into the bottle, shaking up again with the pumice stone grains in order that the iodic anhydride shall adhere to the surface of the grains. The container 1 is then filled up with a quantity of the grains which have been thus prepared.

The container 8 is also filled with an absorbent reagent which can be prepared in a similar manner.

It will be noted that the oxidizing and absorbent reagents are disposed in two separate containers which are absolutely distinct and are connected together only when the device is in actual use, by means of a suitable tube 11. In this way there is no danger of causing a mixture of the two reagents. The water which might be contained in the absorbent reagent can not come in contact with the iodo-sulphuric compound, this action giving rise to an acid liquid which would attack the container and would also cause the said compound to lose its oxidizing power.

As soon as the apparatus is out of use, it is taken apart by removing the containers 1 and 8 from their connecting pipe 11, and the containers are closed by means of threaded stoppers fitting into their necks (to this end the orifice 6 is also provided with a threaded neck). In this manner there will be no danger of a mixture or an alteration of the chemical products and they will remain in a good state of preservation save for their consumption in actual use.

Moreover, the use of a set of automatic valves so disposed that the entering air is obliged to pass through the two reagent containers while the products of expiration

are expelled immediately to the outside, will act to prevent the absorbent product from becoming saturated with water by reason of the moisture of the air of expiration which is sent out while the apparatus is in use.

It is of course understood that the present arrangement is given only by way of example, and that the device can be constructed in any desired alternative form without departing from the principle of the invention.

Claims:

1. A respiratory device comprising a container holding an oxidizing material capable of the oxidation of carbon monoxide, a second container holding an absorbent for carbon dioxide, a connection from the first container to the second, and a valved connection adapted to connect the second container to a respiratory mask.

2. A respiratory device comprising a container holding an oxidizing material capable of the oxidation of carbon monoxide, a second container holding an absorbent for carbon dioxide, a connection from the first container to the second, a valved connection adapted to connect the second container to a respiratory mask, said containers being provided with threaded inlet and outlet necks providing for the ready attachment of the said connections or for closure by means of threaded caps.

In testimony whereof, I have signed my name to this specification.

HENRI GUILLEMARD.

Witnesses:

JULIAN KEMBLE SMEDBERG,
LOUIS ESCHER.