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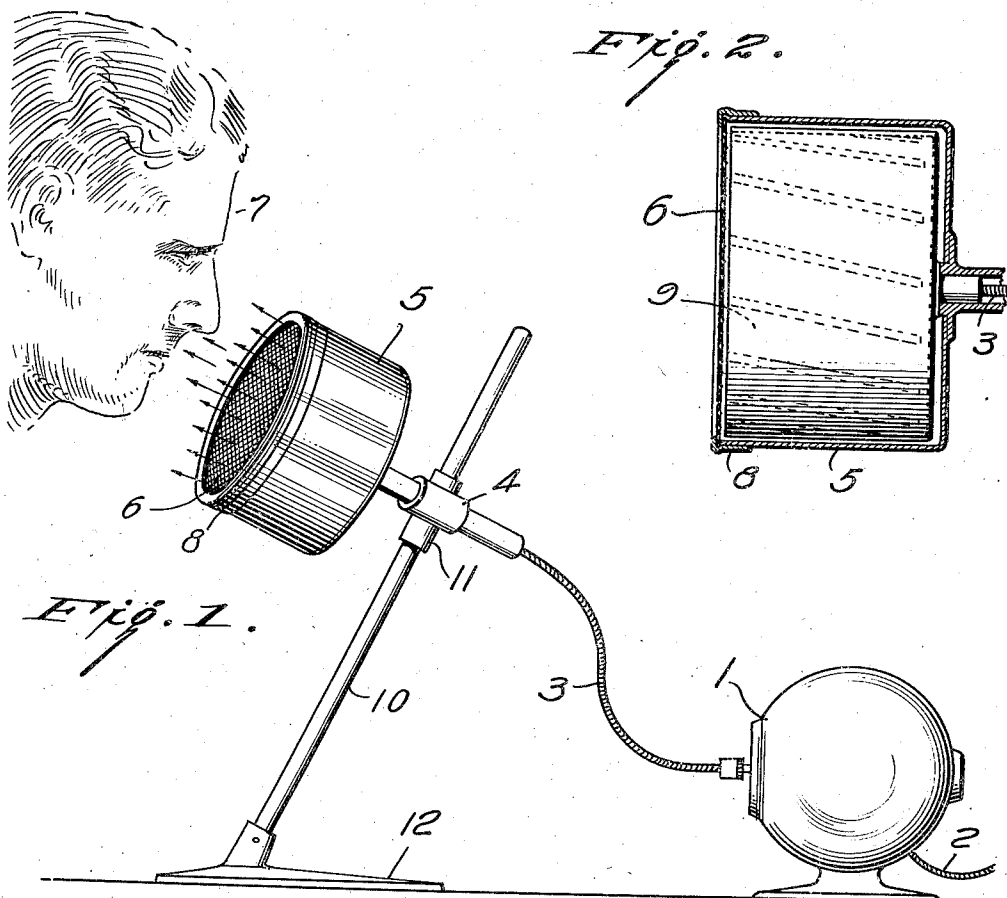
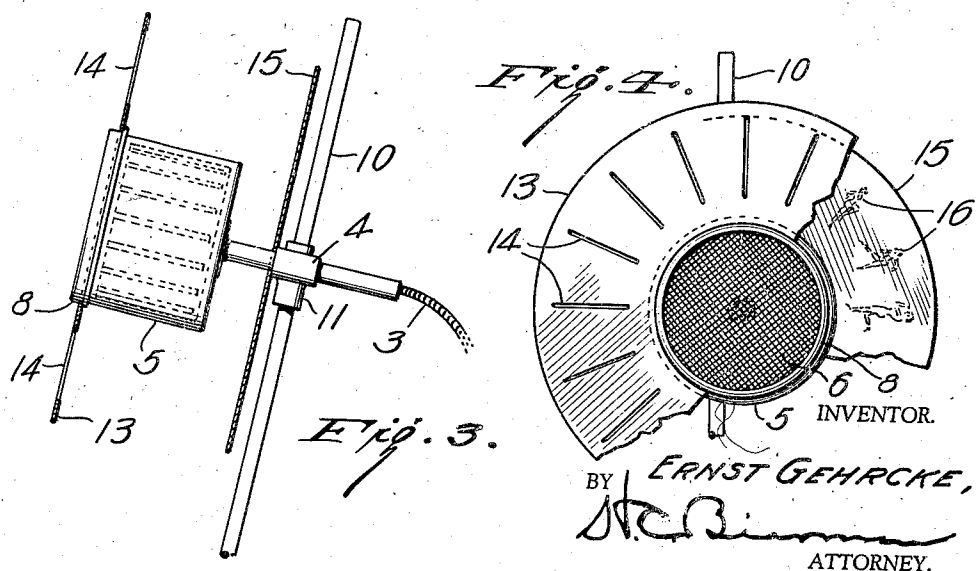
E. GEHRCKE

2,147,435

APPARATUS AND METHOD FOR IMPROVING THE AIR

Filed May 24, 1935

2 Sheets-Sheet 1



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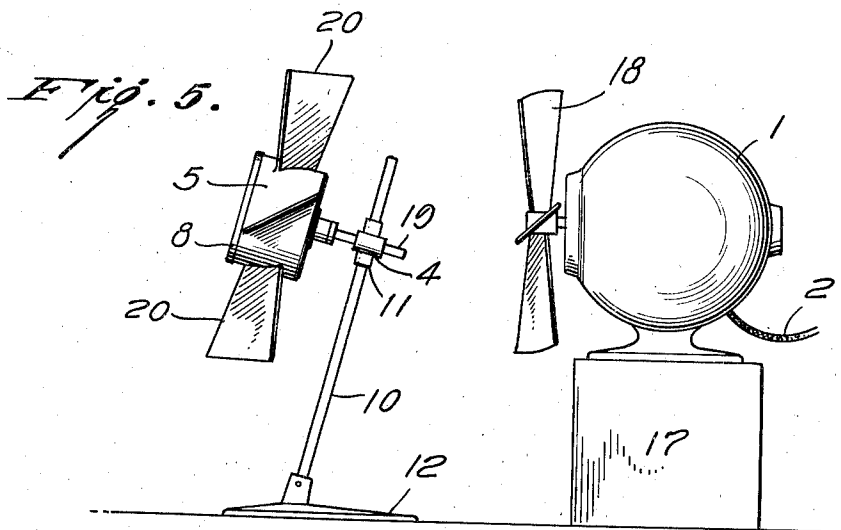
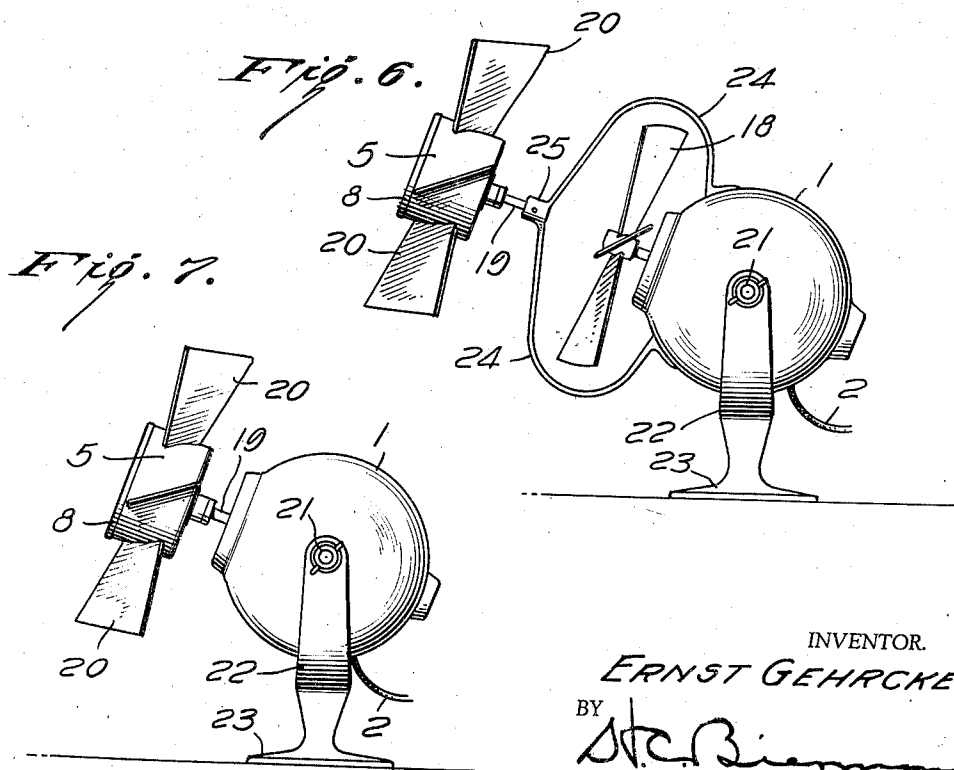
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APPARATUS AND METHOD FOR IMPROVING THE AIR

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2 Sheets-Sheet 2



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APPARATUS AND METHOD FOR IMPROVING
THE AIR

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15 Claims. (Cl. 128-187)

This invention relates to a new apparatus and a method for improving the air, i. e. to produce an artificial climate.

It consists in admixing a powdery preparation in a finely divided state with air. When breathing air pretreated in such a manner, a very agreeable and refreshing sensation is caused. Said powdery preparation may be admixed with air either directly, or in a very simple manner by atomizing the powder applied to a fabric by means of a brush or the like, or better still by means of a special atomizing apparatus which causes introduction of the powder in a finely divided state into the air.

It is known to cause admixture of the active substance with air—for instance, when experimenting with gases, or metal oxides or other substances which are converted into the state of dust to be inhaled by human beings or animals, for instance, for experimental or disinfecting purposes—by producing an air current by means of a blast apparatus, of a fan or the like, said air current blowing the activated air, steam or dust mixture towards the human beings or animals located in a large box or a room or stable respectively. This method, however, requires expensive and complicated arrangements of the apparatus; and furthermore the necessary special room for the breathing living beings has to be of expensive and specific construction.

In general, the previously known method and its application is very often subject to great inconveniences and disadvantages.

All these disadvantages whereby the smallest constituents of a powder which are of great importance when loading the air with the finest dust particles, are by the old methods blown out at once by the blast so as to render impossible any loading of the air with dust for a longer period of time, are overcome by the present invention.

One way of carrying out said new process consists in placing the substance the finest particles of which are to be inhaled, into a suitable container in such a manner that, on moving the same, dust is formed whereby, however, only the finest particles of dust pass into the air and leave the container, for instance, by means of suitably arranged openings. By this means only that part of said substance will be removed in a finely divided state from the container that is intended to be effective in respiration, while all the remainder stays in the container. Thus, also any troublesome soiling of the room wherein the treatment takes place, ceases and the active substance is used as economically as possible.

In the accompanying drawings constituting a part hereof and in which like reference characters indicate like parts,

Fig. 1 is a perspective view of an apparatus adapted for the practice of the present invention;

Fig. 2 is a cross-sectional view of the container shown in Fig. 1;

Fig. 3 is an elevational view, some parts being shown in section, of a modified form of apparatus;

Fig. 4 is a front view of the apparatus shown in Fig. 3, some parts being broken away for clearness; and

Figs. 5, 6 and 7, are elevational views of three modified forms of apparatus.

The desired effect, for instance, is achieved by allowing a container containing the powder to be transformed into dust to rotate around its axis. The Figure 1 represents such a device. In this figure there is shown a motor 1, connected to a suitable source 2 of power and having a flexible shaft 3 passing through sleeve 4 and into the rear of casing 5, which has a screen 6 in the front thereof held in place by ring 8. Secured to shaft 3 is a cylindrical container 9 adjustable in upward and downward direction by means of a support 10 mounted on a base 12 and having an adjusting sleeve 11 and preferably provided at its inner wall with scoops or longitudinal grooves or covered with a rough lining; said container having, for instance, a diameter of 10 cm. and a height of 5 cm., is shown, which is caused to rotate around its axis inclined toward the horizontal, by means of the motor 1 and flexible shaft 3. When using a rapidly running motor it is advisable to diminish the roughness of the inner wall correspondingly. The front side of the container filled with the active substance to be inhaled is either open or closed with a rather coarse wire gauze only. Thus, by suitably controlling the dust formation, the amount being dependent upon the active substance, the special grooves of the container or the scoops arranged therein, the diameter of the same, the speed of rotation of the motor and the like, one obtains the desired result that continuously finest dust passes into the air in front of the opening of the container, while all the larger particles remain in the latter. If one desires to have the strongest effect of this very fine cloud of dust, it is only necessary to keep mouth and nose near the opening of the container as is shown in Figure 1. Said container is fixed to the rotating axis by means of a suitable clamp so that it can be readily exchanged. The rod of the support pref-

erably is placed in an oblique direction whereby not only the larger and heavier particles fall down when rotating the container and hence, remain therein, but whereby furthermore it becomes also unnecessary to move the electro-
 5 motor every time the container is placed higher or lower.

In order to diminish the monotony of the entire procedure on using the apparatus for a long-
 10 er period of time and nevertheless to keep the individual being treated near the opening of the container, it is expedient to impregnate the container with a suitable odoriferous substance or to admix said substance with the substance to be inhaled.

Furthermore, it is very often advisable—as shown in Figure 3—to let the individual look through a concentric disk 13 provided with radial
 15 slits 14 and attached to the edge of the container 6, toward the rotated disk 15 provided with suitable pictures 16 so that in this manner entertaining moving pictures are seen as they are produced, for instance, in the toy known by the name "stroboscope".

When experimenting with animals, there are placed one or more of said described apparatus, for instance, in the corners of the cage wherein
 20 the animals are. Thereby the animal is continuously and uniformly exposed to the action of the dust breathing without having to place the animal, as hitherto necessary, into a special and very often tormenting room to which it is not accustomed. In order to interrupt the experiment, it is only necessary to stop the rotation
 25 of the container without having to remove the apparatus or the animal from the cage.

Another way of carrying out this invention consists in causing a container containing the active substance, not to be moved continuously
 30 but for longer or shorter intervals of time while the dust leaves the container, as described, through suitable openings. Under certain circumstances it will be advisable to cause the apparatus to be rotated, not by an electromotor but, for instance, by hand, thus providing a very
 35 cheap and simple device.

As active substance there is used a powder capable of stimulating respiration and causing a refreshing effect whereby the air is improved.
 40 Certain metal compounds may be used for this purpose, especially metal hydroxides which are not hygroscopic, such as iron, cerium, manganese and the like hydroxides. When admixing with the substance capable of influencing respiration, small amounts of an odoriferous substance, such as, for instance, bergamot oil, eugenol, anise oil and the like, or mixtures of the same, i. e. for instance, when adding 1 part of the odoriferous substance composed of 100 parts
 45 bergamot oil, 1 part eugenol, 1 part anise oil to about 1000 parts of iron hydroxide, shaking the mixture thoroughly and allowing the same to stand for two weeks, a substance for respiratory purposes is obtained having a very refreshing effect on inhaling which is experienced as being very agreeable.

Likewise when animals are to be subjected to the effects of said substance, it is of advantage to mix the substance with a suitable odoriferous
 50 compound so that the animals are attracted by means of their sense of smell to that place where the source of the active dust is. This is of special importance with animals living in the open, for, then the animals run by themselves toward
 55 the active dust cloud.

Still another way of improving the air for animals consists in adding the active metal compound in dust form to the dry food. On feeding the animals, especially poultry, with such a preparation, dust is produced due to the scrap-
 60 ing and stirring of the feed, whereby the dust passes into the lungs where it exerts its favorable action. With fowls it is expedient to provide a dry place protected against rain where the animals may scrape and thereby produce by them-
 65 selves the dust impregnated with the active substance.

A further mode of carrying out the present invention allows the loading of the air even in the largest rooms rapidly and nevertheless intensively with the active dust. This requires
 70 when using the devices described above, operation for a long period of time. Figures 5, 6 and 7 represent different apparatus suitable for this purpose. In principle this embodiment of the invention consists in causing a stream of air to pass the container containing the active substance, in such a manner that the air is continuously led away from the container and is mixed with the air in the room which thereby is provided with the improved air.

In Figure 5, 1 represents an electromotor on a base 17 turning the blades of a fan 18. The air current produced by this fan blows against a container 5 mounted on a shaft 19 in sleeve 4
 75 and containing the powder for respiration, to which container similar fan blades 20 are attached. Thereby the container is caused to rotate in the same manner as when driven by the electromotor with flexible shaft shown in Figure 1. In contrast to the device illustrated in Figure 1, however, a more intensive air current loaded with the active dust leaves the apparatus and causes rapid improvement of the air in the entire room.

In the apparatus of Figure 6 the container 5 with its blades 20 is secured at 25 directly upon a frame 24 attached to the motor itself. Thereby the motor is preferably arranged with pivots 21 on the ends of the frame 22 secured to base 23 so that it may be tilted so that the air current may also be directed obliquely upwardly. This has the advantage, that no powder is scattered around in the room.

The device according to Figure 7 has the container 5 with the blades 20 placed directly upon the axis of the tiltable motor 1. When causing the motor to rotate only slowly, a rather gentle air current is produced by the apparatus. When exposing the face to said air current, besides the improvement of the air also the agreeableness of the moving and refreshing air is experienced. In all the described cases the motor 1 may also be a clockwork and the like.

The method and apparatus described may also be used for combating diseases of the respiratory organs such as tuberculosis, asthma, whooping cough and other diseases of human beings and animals whereby the respiration is impaired. For instance, with human beings infected with tuberculosis or the like, a very noticeable relief in breathing is achieved on exposing the same to the action of the device described above for only two minutes, when using, for instance, iron hydroxide or mixtures of iron hydroxide with cerium oxide and the like. This method enables furthermore a very thorough disinfection of rooms, stables and the like.

Of course, many variations and changes may be made in the construction of the apparatus,

the mode of application and the active substances used by those skilled in the art in accordance with the principles set forth herein in the specification and the claims annexed hereto.

5 What I claim, is:

1. An apparatus for improving the air by loading the same with dust and comprising a container, a powder of a metal compound therein, means for moving said container to cause formation of dust therein, an opening in the upper portion of said container to allow rising dust particles to enter the surrounding air while the powder not converted into dust remains within said container, said apparatus being combined with a display device attached to said container and capable of exciting the attention of the individual to be subjected to a dust treatment.

2. An apparatus for improving the air by loading the same with dust and comprising a container, a powder of a metal compound therein, means for moving said container to cause formation of dust therein, an opening in the upper portion of said container to allow rising dust particles to enter the surrounding air while the powder not converted into dust remains within said container, the container being fastened to a support which may be inclined in such a manner that said container can be moved in an upward and downward direction.

3. An apparatus for improving the air by loading the same with dust and comprising a container, a powder of a metal compound therein which on rotating the container around its axis yields dust, means for causing the container to rotate around its axis, openings in said container through which the finest dust particles are allowed to enter the surrounding air, said openings permitting the powder not converted into dust to remain within said container, and means causing an air current to pass the apparatus so as to continuously lead away the dust produced in the container and to mix it with the surrounding air.

4. An apparatus for improving the air by loading the same with dust, comprising a container containing a powder which on rotating the container around its axis yields dust, said container being provided with blades, means for blowing an air current towards said container to cause pressure on said blades and rotation of the container around its axis, said air current flowing past the container so as to continuously lead away the dust produced in the container and to mix it with the surrounding air.

5. An apparatus for improving the air by loading the same with dust, comprising a container containing a powder which on rotating the container around its axis yields dust, said container being provided with blades, means for blowing an air current towards said container to cause pressure on said blades and rotation of the container around its axis, and means connected with said container which cause the container to rotate, whereby said air current flowing past the openings of said container carries along the dust produced within the container into the surrounding air.

6. An apparatus for improving the air comprising a container, dust producing material therein, said container being provided with an opening to allow exit of dust arising from said material, means at said opening for retaining coarse material, the entire container being mounted for movement causing agitation of the mass of material therein whereby particles of dust arise spontane-

ously, said dust passing out through said opening.

7. An apparatus for improving the air comprising a container, dust producing material therein, said container being provided with an opening to allow exit of dust arising from said material, means at said opening for retaining coarse material, the entire container being mounted for rotation causing agitation of the mass of material therein whereby particles of dust arise spontaneously, said dust passing out through said opening.

8. An apparatus for improving the air comprising a container, dust producing material therein, an exit opening for dust in said container, means at said opening for retaining coarse material, means for agitating said container to cause the formation of dust, said dust passing out through said opening and means outside of said container and attached thereto for attracting the attention of the individual being treated.

9. An apparatus for improving the air comprising a container, dust producing material therein, said container being provided with an opening to allow exit of dust arising from said material, means at said opening for retaining coarse material, the entire container being mounted for movement causing agitation of the mass of material therein whereby particles of dust arise spontaneously, said dust passing out through said opening and means for removing the dust from said opening.

10. A method of improving the air for inhalation purposes which comprises providing a container, placing therein a powdered material having the property of stimulating respiration, moving the entire container to agitate the mass of material in the absence of a current of air within said container to cause the lighter particles of powder to rise within said container, retaining the heavier particles, and allowing said lighter particles to escape from the upper part of said container into the air.

11. A method of improving the air for inhalation purposes which comprises providing a container, placing therein a powdered material having the property of stimulating respiration, moving the entire container to agitate the mass of material in the absence of a current of air within said container to cause the lighter particles of powder to rise within said container, retaining the heavier particles, and allowing said lighter particles to escape from the upper part of said container into the air, and causing a current of air to take up such lighter particles and transport them to an individual to be treated.

12. A method of improving the air for inhalation purposes which comprises providing a container, placing therein a powdered material having the property of stimulating respiration, moving the entire container to agitate the mass of material in the absence of a current of air within said container to cause the lighter particles of powder to rise within said container, retaining the heavier particles, and allowing said lighter particles to escape from the upper part of said container into the air, said powder consisting essentially of compounds of heavy metals.

13. A method of improving the air for inhalation purposes which comprises providing a container, placing therein a powdered material having the property of stimulating respiration, moving the entire container to agitate the mass of material in the absence of a current of air within said container to cause the lighter particles of powder to rise within said container, retaining

the heavier particles, and allowing said lighter particles to escape from the upper part of said container into the air, said powder consisting essentially of about 1000 parts of iron hydroxide to 1 part of an odoriferous substance.

- 5 14. An apparatus for improving the air comprising a container, a powdered material having the property of stimulating respiration therein, means for retaining the heavier particles of said powder in said container, an opening for allowing the escape of the lighter particles and means
10 for moving the entire container to agitate the mass of material, whereby said lighter particles rise in and pass out of said container.

15. An apparatus for improving the air comprising a container, a powdered material having the property of stimulating respiration therein, means for retaining the heavier particles of said powder in said container, an opening for allowing the escape of the lighter particles, means for moving the entire container to agitate the mass of material, whereby said lighter particles rise in and pass out of said container, and means for causing a current of air to flow in proximity to
10 said lighter particles, said flow being outside of said container, to transport the same to an individual to be treated.

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