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2,209,054

MACHINE FOR CIRCULATING CLEAN, DEODORIZED, AND STERILIZED AIR

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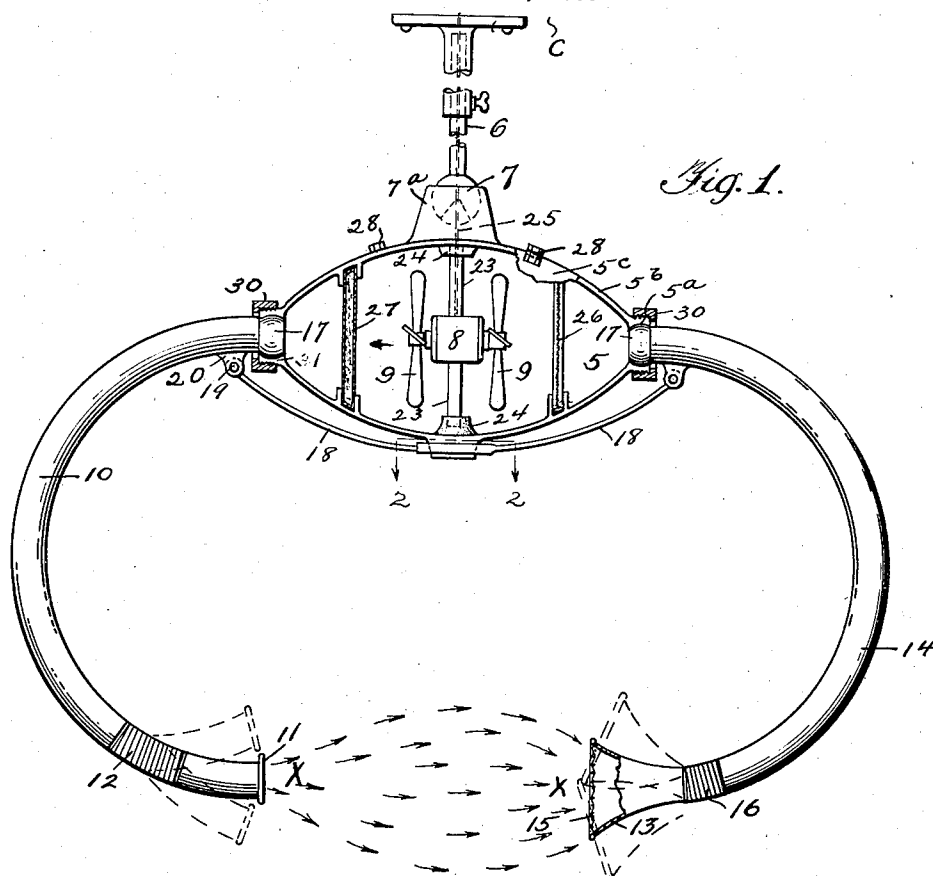


Fig. 1.

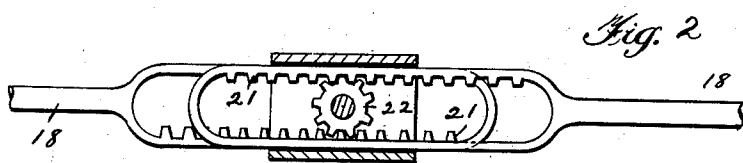


Fig. 2

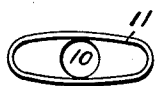


Fig. 3

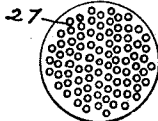


Fig. 4

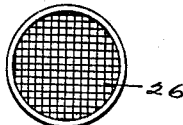


Fig. 5

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MACHINE FOR CIRCULATING CLEAN, DE-ODORIZED, AND STERILIZED AIR

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3 Claims. (Cl. 98—1)

This invention relates to a machine for circulating clean, deodorized air through a given area, and its object is to provide means for so localizing and directing a flow of air of this sort that highly aseptic and protective conditions may be maintained over limited areas in which various operations, such as surgical operations, dental work, barbering, manicuring, eye, ear, nose and throat treatments, and the like are being carried out.

Not only does the device of the present invention aid in maintaining aseptic conditions and preventing contamination, but it eliminates body odors from both the operator and the subject, either those from the breath; proceeding from the respiratory and digestive tracts; or any other body odors, such as the odor of perspiration and the like. Further objects and advantages of the invention will be set forth in the detailed description which follows.

In the accompanying drawing, wherein like numerals designate corresponding parts throughout the several figures of the drawing:

Figure 1 is a view partly in elevation and partly in section of a machine constructed in accordance with the invention;

Fig. 2 is a fragmentary sectional view upon line 2—2 of Fig. 1;

Fig. 3 is a detailed front view of the outlet end of the discharge tube hereinafter described;

Fig. 4 is a detailed view of a perforate air conditioning member hereinafter described, and

Fig. 5 is a detailed view of the fine screen located at the entrance end of the air conditioning casing.

In the drawing, 5 designates a control and treatment casing that is suspended from a telescopic rod 6 from a ceiling or other support, indicated at C. A ball and socket joint 7, at the lower end of the telescopic rod, renders it possible to swing the casing 5 to varying angles and inclinations. A fan motor 8, within the casing, actuates the fans 9, which propel air through the casing in the direction indicated by the arrow.

The air is discharged through a discharge tube 10 which is downwardly and inwardly curved and terminates in a mouth of preferably oval formation, indicated at 11. The tube 10 may have a flexible section 12 in its length to adapt the mouth to be capable of a local deflection or twisting action.

The air discharged from the tube 10 in the form of a semi-sheet travels across the zone X—X, which is the zone to be protected, and the air is drawn into a funnel 13, which constitutes the mouth of the intake air tube 14. A screen or

filter 15 spans the mouth 13. The mouth 13 may also be connected with its tube 14 through the medium of a flexible section 16, so that the mouth may be capable of a localized flexing or twisting action.

The tubes 10 and 14 are connected to the casing 5 by ball and socket joints indicated at 17. The mouths 11 and 13 of the tubes may be moved toward and from each other upon these ball and socket connections by any desired means. One such means consists of a pair of links 18, the outer ends of which are pivotally connected at 19 to ears 20 upon the tubes and the inner ends of which are provided with racks 21 which mesh with a pinion 22. Thus, movement of one tube is translated into a corresponding movement of the other tube, and the mouths of the tubes may be adjusted toward or from each other.

The motor 8 is supported upon standards 23, said standards in turn being engaged in blocks of rubber 24, upon the inside of the casing 5. If desired, the conducting wire from the motor 8, indicated at 25, may be led downwardly through the telescopic tube, the ball of the ball and socket joint 7, and the uppermost standard 23. A fine screen or filter 26 spans the casing 5 between the point of entrance of the air and the adjacent fan 9. A second screen or filter 27 spans the casing 5 between the other fan and the entrance to the outlet tube 10.

The filter 27 may vary widely in its nature. It may consist of a body of simple filtering material such as that so widely used in air conditioning systems, or it may consist of a body of deodorizing material such as activated charcoal, or it may consist of a body of asepticizing material such as any of the numerous and well known antiseptic and germicidal materials upon the market.

The casing 5 is preferably made in two halves 5^a, 5^b, connected by hinges 28 for convenience of access to the parts within the casing. After the two halves of the casing are shut together and the sockets 5^a of the ball and socket joint 17 are closed upon the ball-like ends of the tubes 10 and 14, collars 30 are screwed upon the neck-like extensions 31 of the casing, and this holds the casing closed. The female member 7^a of the ball and socket joint 7 is carried wholly by the rear half of the casing section in such manner as not to interfere with the opening of the front half of the casing upon the hinges 28.

It is clear that by virtue of the arrangement described, a powerful flow of air may be maintained through the zone X—X. The air flow may

be controlled as to strength by control of the fan speed in the common way. We are, of course, aware of the fact that it is common practice to filter the air delivered through air conditioning systems to operating rooms. However, more than this is needed to accomplish the objects that we seek to accomplish. The mere delivery of conditioned air to an operating room does not relieve the patients of the objectionable body odors of the surgeons and attendants, nor does it relieve the surgeons and attendants of the body odors of the patients.

Neither does it guard against contamination and the transmittal of harmful germs of various kinds from surgeon or attendant to the patient or vice versa. By the arrangement herein shown and described, we are able to so localize and direct the flow of air that all of the air moved by the fans is delivered through such a restricted zone that within that zone the velocity of the air is such that the objects herein recited are accomplished in a way in which they have never before been accomplished.

Without restricting ourselves to any particular field of use for this device, we may point out that in dentistry our arrangement prevents the inhaling by the operator of various types of dust created by different procedures of the anterior grinding of teeth with abrasives; polishing gold fittings; grinding of dentures, etc. In barbering, our arrangement prevents the inhaling of foreign particles such as hair and the like. When used in conjunction with a manicurist's table, it prevents the inhaling of foreign particles such as sand, dust, filings, etc. The apparatus is also of great utility in the treatment rooms of undertakers.

Over the surgical operating table, it prevents body odors or the breath of the patient, the attendants or the surgeons from contacting any other person. Thus, it aids in the prevention of the spreading of contagious diseases of any nature and especially diseases of the respiratory system. Further, the flow of air aids in eliminating the danger of small foreign particles dropping into the operative field, and thereby enables the surgeon to work more freely.

The term "conditioning," as used in the accompanying claims, is to be construed broadly to mean any treatment of air to filter it, to deodorize it, to asepticize it, or otherwise.

It is to be understood that the invention is not limited to the precise arrangement set forth, but that it includes within its purview such changes as fairly come within either the terms or the spirit of the appended claims.

Having described our invention, what we claim is:

1. A device of the character described comprising a casing having a fan located therein, a pair of curved tubes extending from the opposite ends of said casing and connected thereto by ball and socket joints, a pair of links, the outer ends of which are pivotally connected to said tubes adjacent the ball and socket joints, overlapping racks carried by the inner ends of said links, a pinion with which both of said racks mesh, an air propelling fan within the casing, and a pair of confronting mouths upon said tubes, as and for the purposes set forth.

2. A device of the character described comprising a casing having a fan located therein, disposed to propel air lengthwise through said casing, a pair of tubes extending from the opposite ends of said casing and curved to direct their ends toward each other, flexible joints between the inner ends of said tubes and the ends of said casing, a pair of links, the outer ends of which are pivotally connected to the tubes adjacent the said flexible joints, a common operating member for the said links supported upon the underside of said casing, and connections between said operating member and the free ends of said links, constructed upon manipulation of said member to draw the mouths of the tubes toward each other or force the mouths of the tubes away from each other.

3. A structure as recited in claim 2, in combination with means for supporting said casing from its top central portion by a universal joint to thereby permit bodily twisting movement of said casing in all directions.

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