Jan. 4, 1938. J. A. CONBOIE 2,104,024

AIR CONDITIONED SLEEPING CABINET

Filed Dec. 9, 1935

Fig. 1.

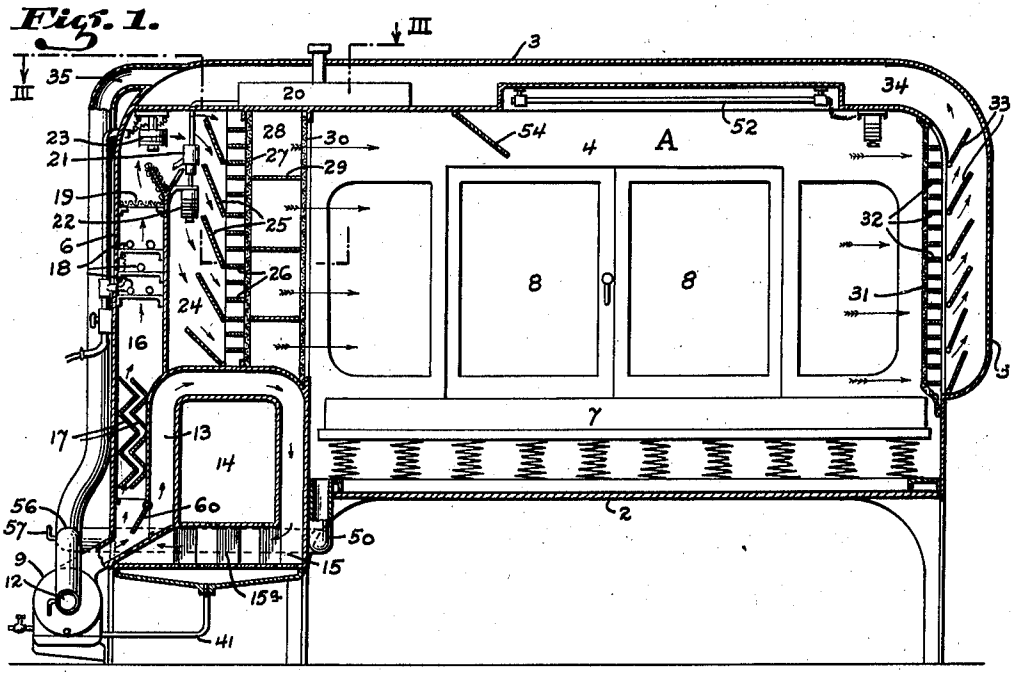


Fig. 2.

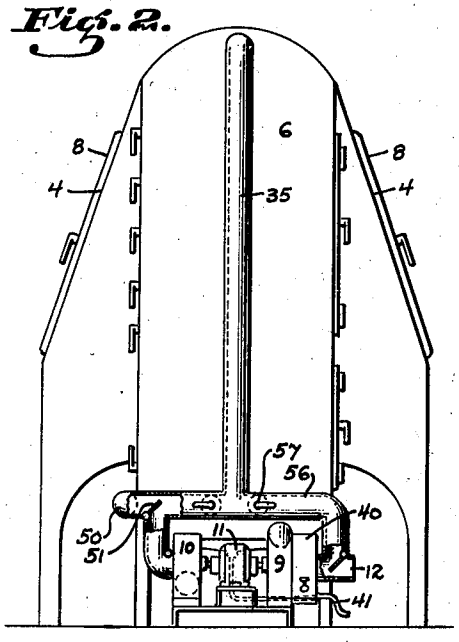


Fig. 3.

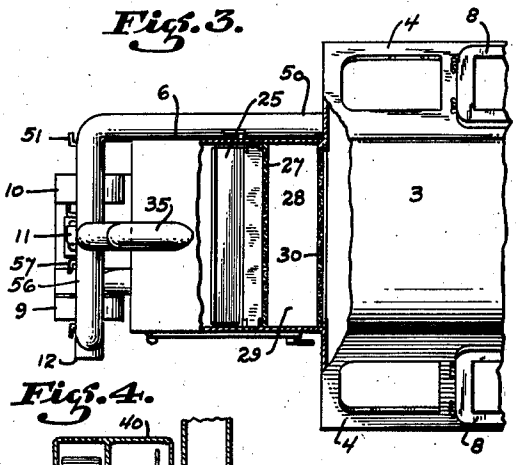
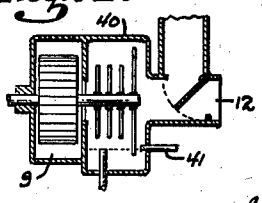


Fig. 4.



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AIR CONDITIONED SLEEPING CABINET

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Application December 9, 1935, Serial No. 53,487

6 Claims. (Cl. 98—1)

This invention relates to an enclosed sleeping cabinet, which is provided with means for maintaining a continuous flow of air therethrough, together with means for cleaning the air and for regulating its temperature and humidity.

The air conditioned cabinet disclosed in this application is intended for treatment of individuals suffering from respiratory diseases, to reduce the temperature of patients suffering from fever brought about by various diseases, and it is also intended for air conditioned and cooled sleeping quarters in climates where the temperature is too warm for comfort.

The object of the present invention is to provide a cabinet to be occupied by a person for sleeping, or by patients, who are to be treated, which is fully enclosed; to provide means for maintaining a continuous flow of conditioned air through the cabinet; to provide means for cleaning the air and for regulating its temperature, pressure and humidity; and, further, to provide means for controlling and directing the flow of air through the cabinet.

The cabinet is shown by way of illustration in the accompanying drawing, in which—

Fig. 1 is a longitudinal, vertical, section of the cabinet;

Fig. 2 is an end view;

Fig. 3 is a plan view partially in section, the section being taken on line III—III of Fig. 1;

Fig. 4 is an enlarged detail view of the air cleaning portion of the apparatus.

Referring to the drawing in detail, and particularly Fig. 1, A indicates the interior of a cabinet which is completely enclosed by a bottom section 2, a top section 3, sides 4—4, and ends 5 and 6. The cabinet contains a bed 7 and doors 8 are provided for entrance and exit.

Practically all the apparatus required, for the circulation and conditioning of the air, is housed within the end of the cabinet indicated at 6. The apparatus employed comprises a pair of rotary blowers, or fans, 9 and 10 driven by a common motor 11 positioned between them. The suction side of the blower 9 takes air from a pipe or duct 12 connected with the exterior of a building, the discharge side of the blower connects with a passage 13 which directs the air around a cooler 14, said cooler being an ice box or a refrigerator unit as desired.

The air, after passing around the cabinet 14, is directed under it, as shown at 15, and it then passes upwardly into a passage 16 in the lower portion of which is mounted a plurality of zigzag shaped plates 17 which function to baffle the air and dampen any sound which might otherwise be transmitted. Positioned directly above the baffle plates 17 are a series of heating units 18 and positioned above the heating units is a humidifier 19 supplied with water from a tank 20, the flow of water being controlled by a valve 21 regulated by a humidistat 22. The electric heater 18 is also controlled, a standard form of thermostat 23 being provided to make or break the circuit through the heating elements, as conditions may demand.

The humidifier consists of a V-shaped trough into which water from valve 21 drops. One side of the trough is covered with a fabric medium and water delivered to the trough is thus taken up by capillary attraction and as the air passes over the cloth it becomes humidified, the amount of humidity imparted to the air being controlled by the humidistat. After the air has been heated and humidified, it enters the compartment 24 in which is mounted a series of angularly disposed pivoted and adjustable deflecting plates 25, and in front of them are disposed a plurality of closely spaced horizontal directing plates 26, said plates forming passages between them which are covered at one end by a permeable fabric 27 which might be referred to as a diffusing cloth. The air, after passing this cloth, enters a chamber 28 which is divided into a series of compartments by means of directing plates 29, the chambers formed between them being again closed by a diffusion cloth or section of fabric 30. The air finally passes through this cloth and into the cabinet and it flows in a substantially horizontal path through said cabinet towards the discharge. Here again is mounted a diffusing cloth 31 and directing plates 32. After the air passes through the diffusing cloth and between the directing plates 32, it is directed upwardly by deflectors 33, which are pivoted and adjustable in a manner similar to the deflectors 25; these deflectors being adjustable to make it possible to maintain a uniform suction between the deflectors 32. The air then passes through a duct 34 formed in the top of the housing and finally enters a pipe or duct 35 which is connected with a suction side of the blower 10. The discharge of the blower is directed into a pipe which connects with the exterior of the building, hence there is a continuous supply of fresh air passing through the cabinet at all times, said fresh air being supplied from the exterior of the building and the depleted or used air being directed to the exterior atmosphere.

The washing of the air to remove dust or any other foreign matter takes place in a housing 40 placed adjacent the suction side of the blower 9.

Within this housing are mounted a series of rotating paddles. Water is delivered to the housing by means of a pipe 41, this pipe being connected with any suitable source of water supply but if ice is employed in the chamber it may be supplied by the water liberated by the ice, said water collecting in a pan in the bottom of the pipe 15 and draining from the pan through the pipe 41 into the housing 40 where it is beaten up into a spray by means of the revolving arms and, as the incoming air passes through this spray, dust and all foreign matter is removed. The air, after passing through the blower, is as previously stated, directed into the passage 13 and then around the cooler 14. Any water carried in suspension should be removed and baffle plates 15a similar to those indicated at 17 are disposed in the passage 15 under the cooler. The air, in passing through and between these plates, impinges against the surface of the same and any moisture carried in suspension will thus collect on said surface and then drain into the pan and will return to the housing 40 which is provided with an overflow to prevent an excessive supply.

No claim is being made in the present instance for the air washer contained within the housing 40, nor for the means for heating and humidifying the air, as numerous forms of such apparatus can be employed. The important feature of the present invention is the apparatus used for directing, diffusing and maintaining a uniform flow of air through the sleeping compartment of the cabinet. The means employed are the adjustable deflectors 25 at the end 6. Here the air first enters the spaced directing plates 26 and 29 and the diffusing cloths 27 and 30. By this arrangement of deflectors and directing plates and by the use of the diffusing cloths a uniform, evenly distributed current of air is maintained in the cabinet, said air flow being substantially horizontal and being sufficiently slow to prevent the sensation of draft. If the temperature is substantially normal, that is, neither too warm nor cold, the cooling unit may be entirely cut out. On the other hand, if the cabinet is used in a warm climate for sleeping purposes the cooling cabinet will obviously be required and it will also be required for patients being treated for fever. For instance, if the head of the patient is being treated, a branch suction pipe 50 is employed. This connects with the head of the bed, as shown in Fig. 1, and the other end connects with the suction pipe 35. A damper is employed, as shown at 51, and is closed when air flow is not required. On the other hand, if the patient is feverish and it is desired to cool the head, damper 51 is partially opened. A portion of the air entering through the cloth 30 will then be directed downwardly over the patient's head and any desired degree of cooling may be obtained.

Where the patient requires warming, the air, of course, can be treated to any degree desired by the electric heating units 18 and by the addition thereto of one or more radiant type electric heaters which may be mounted in the top of cabinet, as indicated at 52. These will deflect radiant heat downwardly against the body of the patient and substantially any degree of heat may thus be maintained, a shield 54 being placed at one end of the radiant heating unit to prevent direct radiation from striking the head of the patient.

By referring to Fig. 2 it will be noted that the suction pipe 35 has a branch 56 connected with the intake 12 of the blower 9. Dampers are mounted in the branch, as shown at 57, and by regulating these dampers part of the air may be recirculated, if desired. Also, by regulation of the dampers the barometric pressure within the cabinet may be increased or decreased; that is, it may be slightly below atmospheric pressure, or slightly above, this being particularly important in the treatment of certain respiratory diseases and other ailments. A damper is also indicated at 60, see Fig. 1, this may be closed and will direct all of the air upwardly through the passage 16 when the cooling unit is not required and in other instances it may be set at a half way point and part of the air may be cooled and the other part directed upwardly, etc.

While certain features of the present invention are more or less specifically described, I wish it understood that various changes may be resorted to within the scope of the appended claims. Similarly, that the materials and finish of the several parts employed may be such as the manufacturer may decide, or varying conditions or uses may demand.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

1. In an enclosed cabinet of the character described having air inlet and discharge openings formed at opposite ends thereof, blower actuated means for delivering air to the inlet openings, means mounted in the inlet openings for uniformly distributing, directing and diffusing the air to maintain the entire body of air flowing at a uniform velocity and in a given direction through the cabinet, said means comprising a pair of spaced diffusing fabrics covering the inlet openings, air directing means between the fabric coverings, stationary air directing means disposed between the air delivering means and the diffusion fabrics, and adjustable air directing means cooperating with the last named air directing means.

2. In an enclosed cabinet of the character described having air inlet and discharge openings formed at opposite ends thereof, blower actuated means for delivering air to the inlet openings, means mounted in the inlet openings for uniformly distributing, directing and diffusing the air to maintain the entire body of air flowing at a uniform velocity and in a given direction through the cabinet, said means comprising a pair of spaced diffusing fabrics covering the inlet openings, air directing means between the fabric coverings, and adjustable air directing means disposed between the diffusion fabrics and the air delivering means.

3. In an enclosed cabinet of the character described having air inlet and discharge openings formed at opposite ends thereof, blower actuated means for delivering air to the inlet openings, means mounted in the inlet openings for uniformly distributing, directing and diffusing the air to maintain the entire body of air flowing at a uniform velocity and in a given direction through the cabinet, said means comprising a pair of spaced diffusing fabrics covering the inlet openings, air directing means between the fabric coverings, adjustable air directing means disposed between the diffusion fabrics and the air delivering means, suction means connected with the discharge openings, and adjustable means disposed between the discharge openings and the suction means to maintain a uniform suction in the discharge openings.

4. In an enclosed cabinet of the character described having air inlet and discharge openings

formed at opposite ends thereof, blower actuated means for delivering air to the inlet openings, means mounted in the inlet openings for uniformly distributing, directing and diffusing the air to maintain the entire body of air flowing at a uniform velocity and in a given direction through the cabinet, said means comprising a pair of spaced diffusing fabrics covering the inlet openings, air directing means between the fabric coverings, adjustable air directing means disposed between the diffusion fabrics and the air delivering means, and means for directing a portion of the flowing air in another direction.

5. In an enclosed cabinet of the character described having air inlet and discharge openings formed at opposite ends thereof, blower actuated means for delivering air to the inlet openings, means mounted in the inlet openings for uniformly distributing, directing and diffusing the air to maintain the entire body of air flowing at a uniform velocity and in a given direction through the cabinet, said means comprising a diffusing fabric covering the inlet openings, stationary spaced air directing means disposed in front of the fabric, and adjustable air directing means cooperating with the stationary means and disposed between said stationary means and the air delivering means.

6. In an enclosed cabinet of the character described having air inlet and discharge openings formed at opposite ends thereof, blower actuated means for delivering air to the inlet openings, means mounted in the inlet openings for uniformly distributing, directing and diffusing the air to maintain the entire body of air flowing at a uniform velocity and in a given direction through the cabinet, said means comprising a diffusing fabric covering the inlet openings, stationary spaced air directing means disposed in front of the fabric, adjustable air directing means cooperating with the stationary means and disposed between said stationary means and the air delivering means, air suction means connected with the discharge openings, and adjustable means disposed between the discharge openings and the suction means to maintain a uniform suction in the discharge openings.

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