AIR INLET DEVICE

Birger Larkfeldt, Odensjo, Barnarp, Sweden, assignor to Akkobelaget Svenska Flakfabriken, Stockholm, Sweden
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ABSTRACT OF THE DISCLOSURE

An air inlet device comprising a duct having a series of rectangular openings, each covered by a perforated plate. The plate is mounted for sliding displacement into partial registry with the openings to provide a slot along one edge whereby the air flow from the duct is exhausted partially through the perforated plate and partially through the slot. Regulation of the width and location of the slot affords regulation of the direction of the air flow from the distribution duct.

The present invention relates to a device for supplying air to rooms, and is particularly adapted for use in operating rooms. The present invention is an improvement upon the device disclosed in U.S. Patent Number 3,150,584.

The U.S. Patent Number 3,150,584 discloses an arrangement for ventilating and air conditioning operating rooms and similar localities where the air is injected diagonally through the rooms. The air is delivered in the corner between the ceiling and one wall of the room and is exhausted at the floor adjacent the opposite wall. By this location of the supply and exhaust openings, a diagonal air flow is obtained, which has proved advantageous with regard to the risk of infection. The supply opening extends the length of the room as a continuous row of a plurality of closely-spaced supply openings along the wall and is covered by a perforated screen. This arrangement provides the air with the same velocity and direction from all of the supply openings.

However, it has now proved difficult to maintain a diagonal air flow in operating rooms, because of the heat-producing sources existing in such rooms, such as the heart-lung machine, the light fittings, etc., which induce substantial transverse flow and consequently, disturb the diagonal air flow. Nor can the disturbance be compensated for by increasing the air quantity, since the velocity within the operating area should not exceed 0.3 meter per second.

A primary object of the present invention is to provide a substantially-diagonal air flow through the room without exceeding the allowed value of the air velocity. This is obtained by a distributing duct having an outlet opening and a perforated plate having a shape corresponding to the opening. By displacing the perforated plate in one direction or the other into partial registry with the opening to form an open slot at one edge or the other of the opening, the air flow through the slot will depend on the width of the slot. Different air flows result in different "throws" of the air jet, which thus can be given the necessary guidance in order to maintain substantially-diagonal air flow within the entire part of the operating room. Also the direction of the air jet is determined by the width of the slot. According to the invention, the slot is formed between two surfaces substantially perpendicular to each other, one of the surfaces being a flange parallel to the air flow and the other being of the plate which is substantially perpendicular to the air flow. When the slot is wide, the air current is not influenced by the plate, but the narrower the slot is, the more the slot influences the air current, and when the width of the slot is about 3 mm. or below, the plate will guide the air in the direction of the plate side. On the other hand, at widths larger than 3 mm., the air guidance dominates from the flange surface parallel to the air current.

The invention will now be more fully described with reference to the accompanying drawings wherein:

FIG. 1 is a cross section through a device according to the invention;
FIG. 2 is a front view of the air supply system; and
FIG. 3 is a sectional view through a room embodying a system according to FIG. 2.

As shown in the drawings, an inlet duct 1 injects air into a distributing duct 2, which is provided with rectangular openings entirely or partly covered by perforated plates 3. Each plate is adjustably arranged in guide rails 4, which at the same time, serve to retain the plate 3 in the desired position. By means of a handle 5, the plate can easily be pushed up or down in front of the opening so that a slot 6 is formed either at the top or at the bottom edge, when the end of the plate is displaced beyond one or the other end edge of the opening. The air supply device according to the invention can suitably be used for ventilating an operating room 7. The air supply openings are here arranged in the corner between the side wall and the ceiling of the operating room in the form of a continuous row, with a perforated plate for each opening. An air discharge opening 9 is provided in the diagonally-opposite corner of the room.

While a particular embodiment of the present invention has been herein illustrated and described, it is not intended to limit the invention to such disclosure, but changes and modifications may be made therein and thereto within the scope of the following claims.

I claim:
1. A device for directing and supplying air into a room comprising a distributing duct provided with an air intake opening and at least one rectangular outlet opening, a perforated plate having a length and width corresponding to the length and width of said opening for covering said opening and affording air flow therein through, parallel guiding rails disposed on opposite sides of said outlet opening to slidably support said perforated plate for longitudinal movement along the plane of said outlet opening in both directions from a position in full registry with said opening to positions in partial registry with said opening, and handle means on said plate whereby said plate can be slidably pushed up or down to obtain a free outlet slot of variable width between either one of the ends of the plate and the adjacent edge of the opening, the width of the slot determining the proportions of the supplied air flowing through said slot and said plate respectively.
2. A device according to claim 1, wherein said distributing duct is disposed along on side wall of the room close to the ceiling and has a free wall facing the room provided with a plurality of outlet openings arranged side-by-side in a row, and each covered by a separate perforated slidable plate.
3. A device according to claim 1, wherein said duct disposed along on side wall of the room close to the ceiling and has a free wall facing the room disposed diagonally to said side wall and ceiling, said opening being disposed in said free wall.
4. A device according to claim 3, wherein said duct has flanges projecting inwardly from the upper and lower edges of said opening substantially parallel to the air flow through said opening.

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ROBERT A. O'LEARY, Primary Examiner.

W. E. WAYNER, Assistant Examiner.