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C. G. ALLANDER

3,380,369

SYSTEM FOR VENTILATING CLEAN ROOMS

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FIG. 1

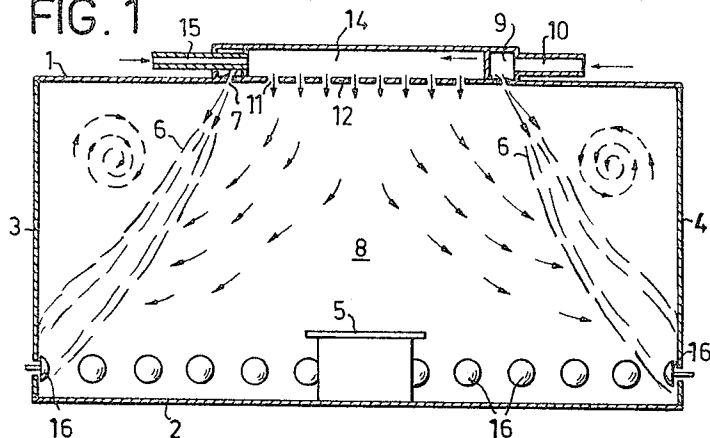


FIG. 2

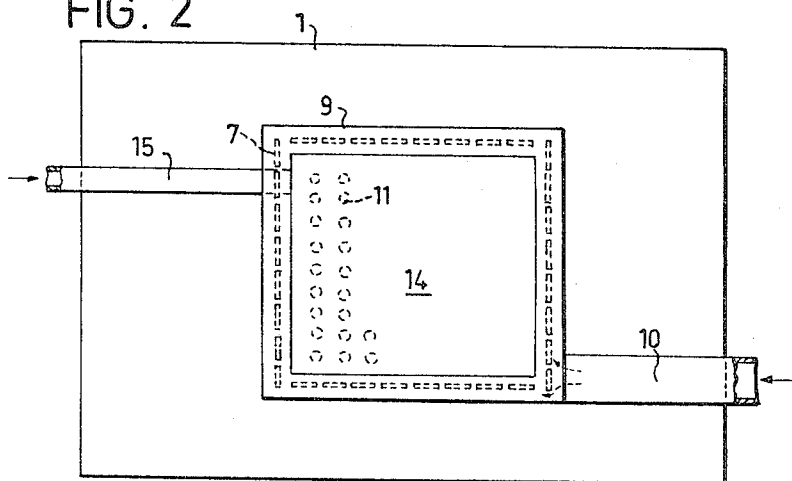
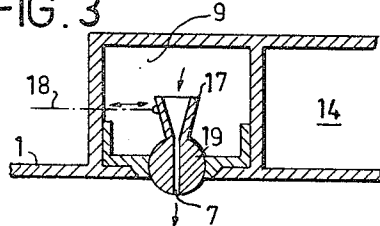


FIG. 3



INVENTOR.
CLAES GUSTAF ALLANDER
BY
Young & Thompson
ATTYS.

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SYSTEM FOR VENTILATING CLEAN ROOMS

Claes Gustaf Allander, Kometvagen 9, Taby, Sweden

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2,308/65

3 Claims. (Cl. 98—36)

ABSTRACT OF THE DISCLOSURE

A room requiring a high purity of the air such as an operating room in a hospital is provided with a bounded space, for instance around the operating table, separated from the remainder of the room by an air curtain. Ventilated air of high purity is supplied to the bounded space through a perforated ceiling of said space, and the boundary air is supplied through a slot line encompassing said perforated ceiling. The air is exhausted through outlets near the floor of the room.

In rooms, for instance in hospitals, where high purity of the air has to be maintained, the amounts of ventilating air are very high if the air is to be sufficiently pure. Satisfactory removal of impurities requires a velocity of air of 0.7 to 1 foot per second in the room. At lower velocities there prevail uncontrollable conditions due to thermal disturbances. A velocity of the air of 0.7 to 1 foot per second usually corresponds to 200 to 400 changes of air per hour. For instance, in operating-rooms 15 to 25 changes per hour are usually obtained. Such rooms are ventilated in accordance with the thinning-out principle. It is absolutely necessary in such a room to prevent the entrance of impurities because an entering particle may statistically turn up anywhere in the room. At present these rooms are usually provided with air locks which are expensive. In many clean rooms, among others in operating-rooms in hospitals, high purity is required within part only of the room, for instance around the operating-table. If a zone of pure air can be maintained in this part of the room the requirements for large numbers of air changes as well as the need for air locks can be dispensed with. The object of this invention is to present a technical solution which renders possible the provision and maintenance of a pure zone in a room.

In its broadest aspect the invention is characterized by a curtain of flowing air provided between an air slot and exhausting means and separating said zone from the remaining part of the room, and by means for supplying air within said separated zone.

Additional features of the invention will appear from the following description of an embodiment diagrammatically illustrated in the accompanying drawing. FIG. 1 is a vertical sectional view of a room having a pure zone in accordance with the invention, FIG. 2 is a top plan view of the room, and FIG. 3 is a sectional view of a modified detail.

A zone of pure air is to be created above and around an operating-table 5 in a room having a ceiling 1, floor 2 and walls 3 and 4. To this end there is provided a curtain 6 of air flow from slots 7 to exhausting means, said slots and said exhausting means being disposed such that the air curtain separates a part 8 of the room from the remaining part of the room. In the embodiment illustrated, the slots 7 are provided in the ceiling and form outlets from a rectangular duct 9 located above the ceiling. The duct 9 may be annular, polygonal or have any suitable shape encompassing a region of the ceiling. The duct 9

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receives air through a conduit 10. Within the region of the ceiling confined by the duct 9 the ceiling is perforated so as to form a great number of small air outlet apertures 11 in the bottom 12 of a box 14 which receives air through a conduit 15. The air exhausting means is disposed at the lower part of the room and is represented by a plurality of outlets 16 in the walls of the room near the floor.

Into the jet curtain of primary air coming from the slots 7 there is drawn secondary air from the apertures 11 and from the part of the room that surrounds the jet curtain. If the amount of air supplied from said apertures 11 is less than half the total amount of secondary air which can be drawn in, the jet curtain arriving from the slots 7 will tend to contract itself with the result of insufficient control of the pure zone within the curtain. For this reason the quantity of air supplied through the perforated ceiling should amount to at least that volume.

If the room is provided with a ventilating system of the kind described a pure zone can be maintained in the part 8 of the room without the necessity of air locks at the entrance or exit of the room. It is even possible to leave the doors of the room open.

The invention is not limited to the embodiment illustrated in the drawing. The air slots 7 may be defined by adjustable guide members 17 (FIG. 3) which permit control of the direction of flow of the air from the slot. The guide members are adjustable by means of control members 18 by means of which the guide members 17 can be turned about pivots 19. The air slots may be provided in the lower part of the room and exhausting means may be provided in the ceiling. However, the embodiment illustrated is more advantageous with respect to the introduction of additional air from the apertures 11.

What I claim is:

1. A ventilated room having a ceiling and a floor and side walls extending between the ceiling and the floor and encompassing the room, air supply slot means extending through and encompassing a region of said ceiling horizontally spaced from all said side walls, means for supplying air under positive pressure through said slot means and into the room, and exhaust means for air outlet adjacent said floor and encompassing at least a portion of the room thereby to induce the flow of a current of air from said slot means to said exhaust means with the curtain of air forming a continuous curtain enclosing on all lateral sides a portion of space in the room and separating that space from the remainder of the room on all lateral sides.

2. A ventilated room as claimed in claim 1, said portion of the ceiling encompassed by said slot means having an area substantially less than the area of the ceiling which is outside said slot means.

3. A ventilated room as claimed in claim 1, the portion of said ceiling which is encompassed by said slot means being perforated, and means for supplying air to said perforated ceiling portion for induction into said curtain of air.

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MEYER PERLIN, *Primary Examiner*.