

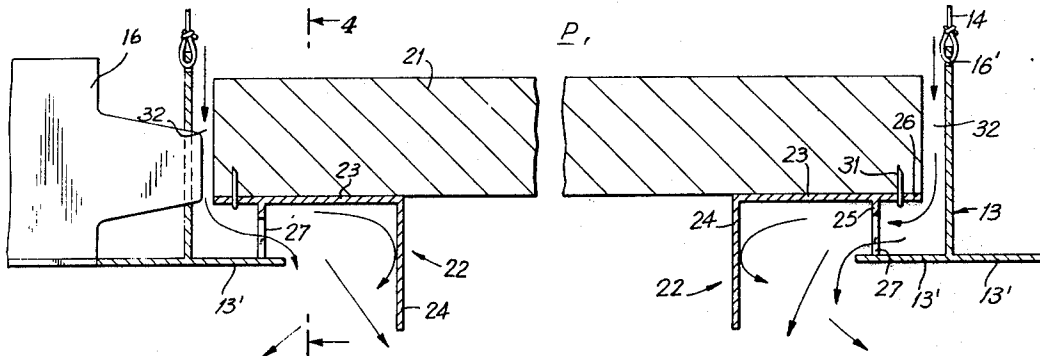
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[54] **VENTILATING CEILING CONSTRUCTION**
3 Claims, 5 Drawing Figs.

[52] U.S. Cl..... 98/40;
 52/303
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 [50] Field of Search..... 98/40D, 40,
 40DL; 52/37, 13, 303

ABSTRACT: The invention relates to a ventilating ceiling construction in which a grid is suspended below the main ceiling of a room, the grid-supporting panels which form a suspended ceiling that defines a plenum chamber with respect to the main ceiling, ventilating elements being associated with the periphery of said panels to provide passageways for flow of air under pressure from the plenum chamber into the room below the suspended ceiling.



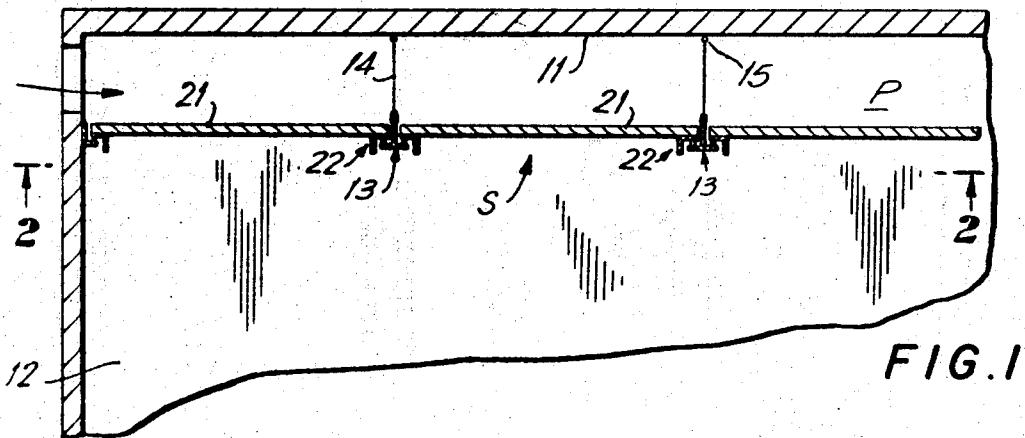


FIG. 1

FIG. 2

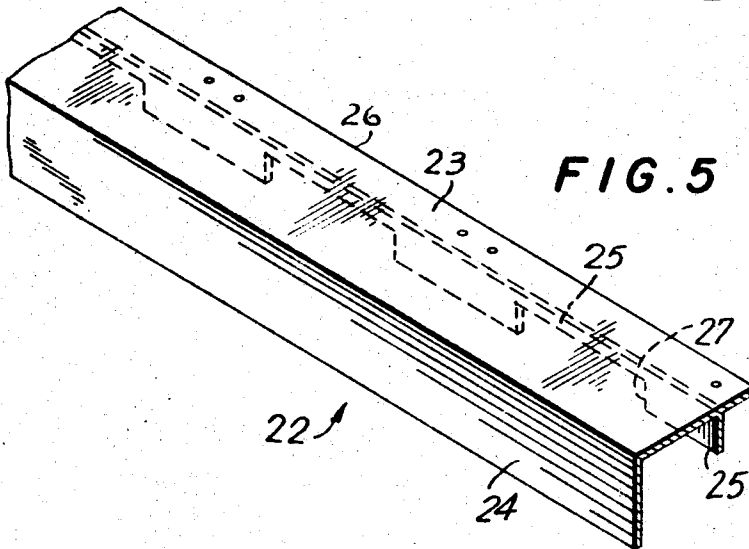
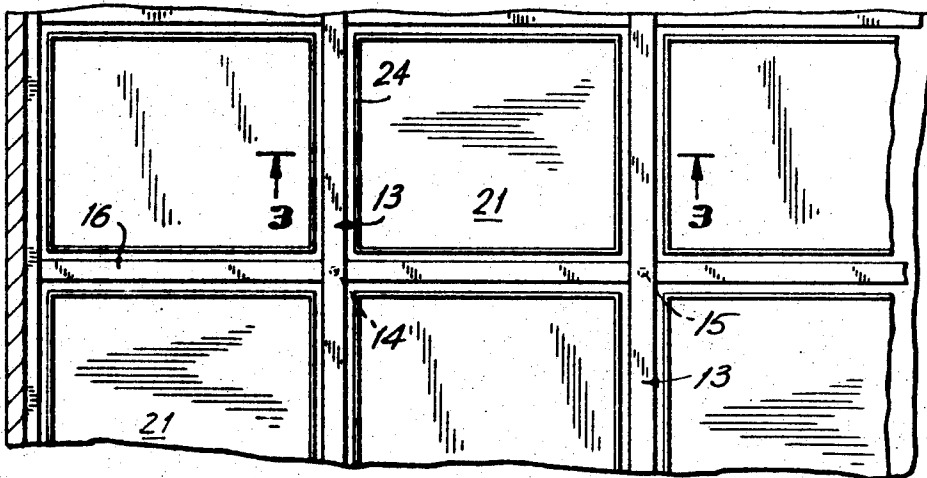


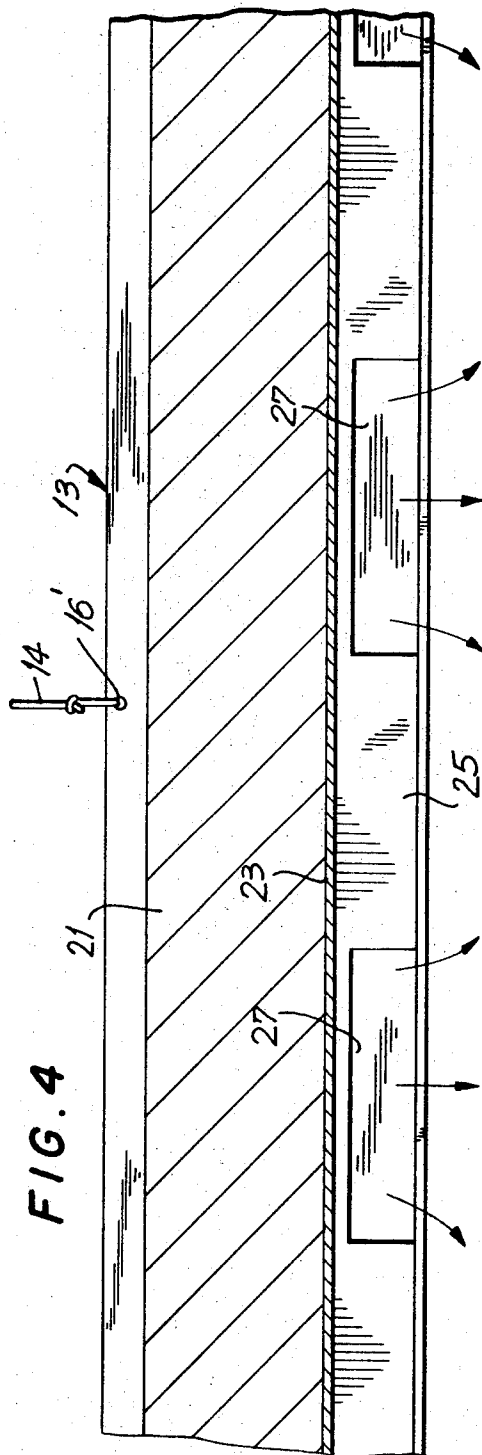
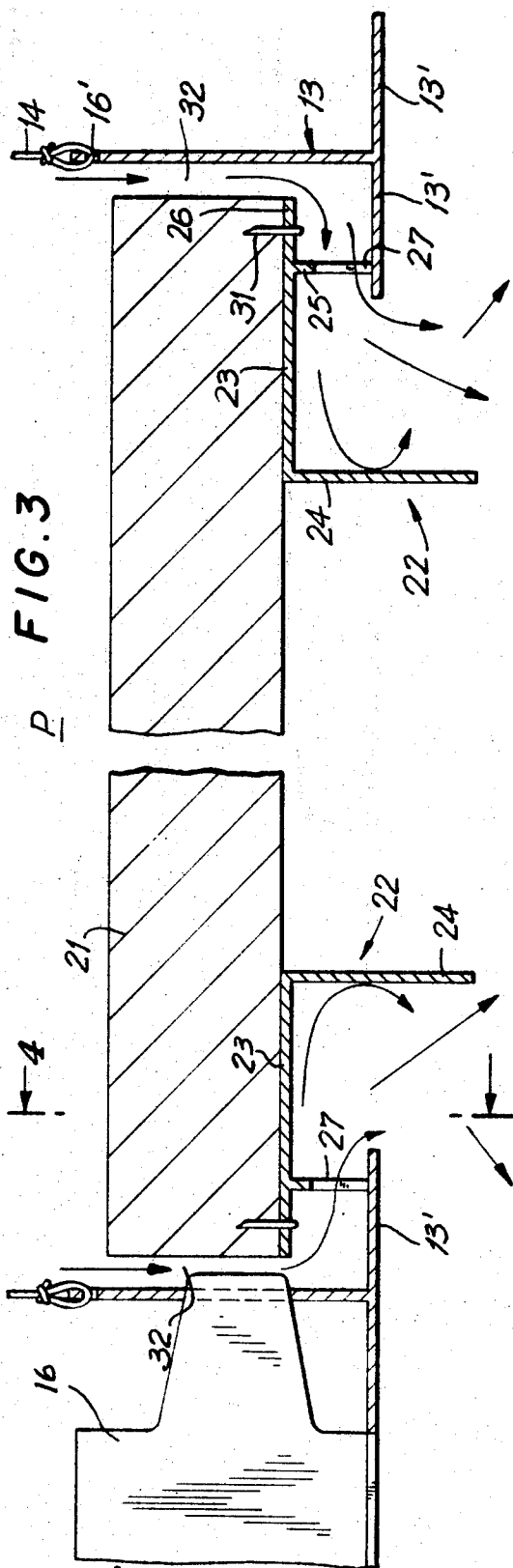
FIG. 5

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VENTILATING CEILING CONSTRUCTION

As conducive to an understanding of the invention, it is noted that ventilating ceiling constructions have been provided in which the grid supporting the ceiling panels or boards has apertures for flow of air therethrough. Where a conventional nonventilated supporting grid is provided with conventional nonperforated ceiling boards, conversion of such suspended ceiling into a ventilating ceiling normally would require substantially complete replacement of the installation, with attendant relatively great cost.

Where with a conventional supporting grid, openings are provided for flow of air, by having through-perforated ceiling boards, since such boards are generally punched and not drilled, there is very little material removed when the holes are made. Due to temperature and humidity cycles and because of the built in memory of the fibers in the board, they tend to protrude back into the holes, so that the holes fill up and become filters rather than passageways. As the air generally carries entrained dust and dirt particles and the holes rapidly fill up as more and more dust or dirt particles accumulate, the amount of air flow is reduced and hence the efficiency of such a perforated type ventilating ceiling becomes less and less with the passage of time.

It is accordingly among the objects of the invention to provide a ventilating unit that can be combined with a standard nonthrough-perforated ceiling panel or board, supported by a standard nonventilated suspended grid installation and can convert such standard installation into a ventilating ceiling installation with no modification of the supporting grid structure or of the ceiling panels other than the incorporation of the unit which is the subject of the present invention, which may readily be accomplished by even an unskilled workman with the use of relatively simple tools which are readily available.

According to the invention, these objects are accomplished by the arrangement and combination of elements hereinafter described and more particularly recited in the claims.

In the accompanying drawings in which is shown one of various possible embodiments of the several features of the invention,

FIG. 1 is a transverse sectional view with parts broken away, of a room incorporating a ceiling installation according to the invention hereof,

FIG. 2 is a view taken along line 2-2 of FIG. 1,

FIG. 3 is a transverse sectional view on a greatly enlarged scale taken along line 3-3 of FIG. 2,

FIG. 4 is a sectional view taken along line 4-4 of FIG. 3, and

FIG. 5 is a perspective view of the ventilating unit according to the invention.

Referring now to the drawings, the ventilating ceiling construction includes a suspended ceiling S which is hung from the main ceiling 11 of a room or chamber 12.

The suspended ceiling S includes a conventional grid which may comprise a plurality of spaced parallel longitudinal beams 13 substantially T-shaped in cross section, suspended from the ceiling 11 by means of wires 14 attached at one end to the ceiling as at 15 and at their other end as at 16 to the vertical leg of each of the T-shaped members 13.

Extending at right angles to the longitudinal beams 13 are spaced parallel transverse members 16 which also preferably are T-shaped in cross section and are secured at their ends to an associated longitudinal beam 13.

As a result of the arrangement above described, which is conventional, a plurality of rectangular areas are provided which may illustratively be 2 feet by 2 feet or 2 feet by 4 feet in dimensions. Each of said areas has an inwardly extending peripheral ledge defined by the horizontal leg 13' of a T-shaped member 13, which ledge normally supports the periphery of a ceiling board 21 generally an acoustical board.

Since the ceiling construction just described is conventional and well known in the art, no further description thereof is believed necessary.

According to the invention, a ventilating unit 22 is provided, illustratively an elongated strip substantially L-shaped

in cross section and preferably extruded from a suitable plastic.

As is clearly shown in FIGS. 3 and 5, the L-shaped ventilating unit has a top wall 23 with a depending leg 24. A spacer leg 25 also depends from the top wall 23, being positioned inwardly of its free edge 26 and of height less than the height of the depending leg 24. The spacer leg 25 is preferably an integral part of the elongated ventilating unit and formed during the manufacture thereof as a continuous strip. Thereafter, the spacer leg 25 may be notched by a suitable tool to provide a plurality of openings 27 along the length thereof.

To incorporate the ventilating unit 22 into the ceiling installation, it is merely necessary to secure a length of ventilating unit 22 to the periphery of the ceiling board 21 to extend preferably the entire length thereof. Thus, to mount a ventilating unit 22 along each of the four edges of the ceiling board 21, proper lengths of the ventilating unit are selected and the ends are mitered so that when secured to the ceiling board a continuous frame will be provided around its entire periphery. Although the ventilating units 22 can be secured to the ceiling board 21 in any suitable manner, in the embodiment shown, it is merely necessary to affix the top wall 23 of the ventilating unit 22 to the ceiling board 21 by stapling as at 31 so that the notched spacer leg 25 will be positioned outwardly of the depending leg 24.

The ceiling board with the ventilating units secured thereto may then be installed in the grid in conventional manner so that the spacer legs 25 will rest on the inward extending legs 13' of the grid which define the support ledge around each rectangular area of the grid.

Since the length and width of the ceiling board 21 is slightly less than the corresponding dimensions of each rectangular area in which the ceiling board is mounted, the resultant clearance will define a passageway 32 from the plenum chamber P above the ceiling boards through the notches or openings 27 in the spacer leg 25 to the room below the suspended ceiling. Consequently, the air in the plenum chamber, which will be under a static pressure, will be forced through each passageway 32 and the openings 27 against the depending leg 24 which will serve as a baffle to deflect the air downwardly at an angle, for more effective diffusion thereof through the room.

With the construction above described, in a given chamber or room it is a relatively simple matter to convert the ceiling installation to adapt the room for different uses. Thus, for example, when a room is used for a secretarial area, with a given air flow of 1,000 cubic feet per minute (c.f.m.), into the plenum chamber, 25 percent of the ceiling boards may be equipped with the ventilating units 22 above described to maintain a desired static pressure in the plenum chamber for adequate flow of draft-free cooled air into the room. If the same room should be used with computers that develop substantial heat and the air flow is increased to 2,000 c.f.m. due to the fixed size of the openings 27 in the units 22 the resultant increase in the static pressure in the plenum chamber would cause the velocity of the air flow through the openings 27 to be substantially increased causing undesirable drafts in the room with resultant discomfort to its occupants. In addition, due to the relatively small number of openings 27 in comparison to the much greater volume of air, the quantity of cold air flowing into the room would be reduced with resultant lack of efficient cooling action.

This problem is readily resolved by merely increasing the number of ceiling boards that are equipped with the ventilating units, to say, double the amount so that the desired air flow into the chamber can be accomplished with optimum velocity.

Thus, the relatively simple ventilating unit provided by applicant permits ready modification of a conventional ceiling installation to convert the latter from a nonventilated to a ventilated installation with controlled air flow as desired.

Since any conventional ceiling board can readily be adapted as above described, and used to form a ventilating ceiling construction, no special inventory of ceiling boards need be main-

tained by a manufacturer. If for some reason it is desired to remove the ceiling board and use them in another area, they can be used as part of a ventilating ceiling construction or if desired, the ventilating units may readily be removed and the ceiling board used in conventional manner.

As many changes could be made in the above construction, and many apparently widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. In a room having a main ceiling, a grid suspended from said ceiling and defining a plurality of adjacent rectangular openings each having inwardly extending supporting means, said grid comprising a plurality of longitudinal and transverse bars, each in the form of an inverted "T", the portion of the crosspiece of each bar associated with each rectangular opening, defining said inwardly extending supporting means and forming a peripheral ledge, a rectangular board positioned in each of said openings, said grid and said boards defining a suspended ceiling, the region between said main ceiling and said suspended ceiling forming a plenum chamber, means intervening between said inwardly extending supporting means and the periphery of the associated rectangular board, vertically to space the periphery of said board from said supporting means, said spacer means comprising an elongated strip secured to the periphery of the board and having an elongated leg depending therefrom and positioned inwardly of one edge of said strip and having its lower edge resting on said ledge, 30

said depending leg having a plurality of passageways for flow of air therethrough along the length thereof from said plenum chamber into the room beneath the suspended ceiling, and a second elongated leg defining a deflector, depending from the other edge of said strip.

2. The combination set forth in claim 1 in which the lower edge of said edge of said deflector leg lies in a plane below the lower edge of said spacer leg.

3. In a room having a main ceiling, a grid suspended from said ceiling and defining a plurality of adjacent rectangular openings each having inwardly extending supporting means, a rectangular board positioned in each of said openings, said grid and said boards defining a suspended ceiling, the region between said main ceiling and said suspended ceiling forming a plenum chamber, means intervening between said inwardly extending supporting means and the periphery of the associated rectangular board, vertically to space the periphery of said board from said supporting means, an elongated ventilating unit substantially L-shaped in cross section having an elongated supporting leg secured to the periphery of said rectangular board, an elongated deflector leg extending at right angles to said supporting strip and depending from one edge thereof and positioned inwardly of said periphery, and an elongated strip depending from said supporting leg inwardly of its other edge, said strip defining said spacer means, said spacer means having passageways for flow of air therethrough from said plenum chamber into the room beneath the suspended ceiling.

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