

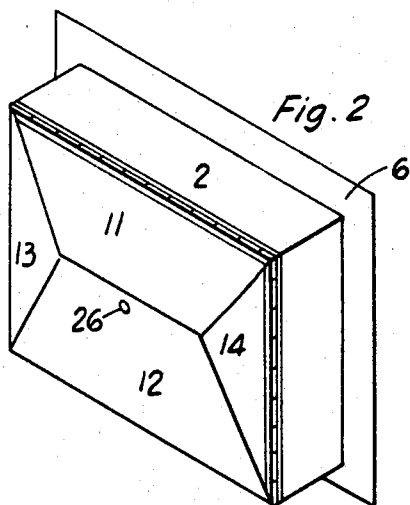
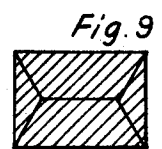
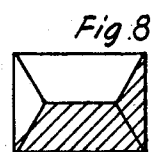
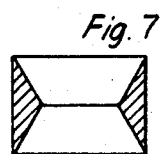
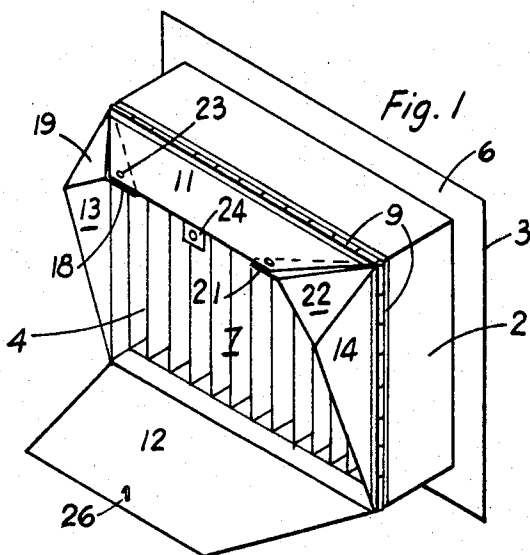
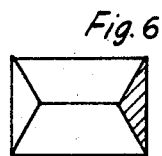
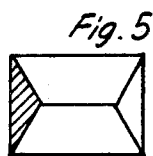
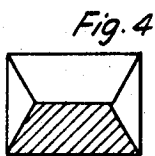
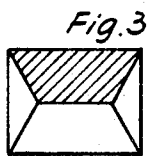
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DIRECTIONAL CONTROL AIR DIFFUSER

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DIRECTIONAL CONTROL AIR DIFFUSER

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ABSTRACT OF THE DISCLOSURE

A directional air diffuser assembly including a flow-through housing having vanes pivotally mounted along the peripheral edge of the downstream outlet in successive side-by-side edge-surrounding relationship, the vanes being of larger surface area than the outlet so that the free edges of the vanes coincide and contact when in closed position outside the plane determining such downstream outlet.

The present invention relates to apparatus for distributing air into selected spaces, and more particularly, to a directional control air diffuser assembly for distributing air into selected spaces in variable directions of flow, and in variable volumes.

In accordance with the present invention, an economical, straightforward, efficient to operate and maintain directional control air diffuser is provided which can be built with a minimum of parts and material and which operates with a maximum of efficiency to permit air to be conducted into a selected space in any one of a number of possible flow paths as a particular situation might require. In addition, the present invention provides a directional control air diffuser arrangement which can be used to control the volume of air introduced into a selected space as well as the direction in which such air is introduced. Further, the present invention provides an air diffuser arrangement which can be readily set up and installed in an existing duct system with the vanes set in any one of a number of preselected positions and which can be readily removed and collapsed for storage or shipment.

Various other features of the present invention will become obvious to one skilled in the art upon reading the disclosure set forth hereinafter.

More particularly, the present invention provides a directional control air diffuser assembly comprising: a flow-through housing having an upstream inlet face connectable to an air supply duct and a downstream outlet face spaced from the inlet face to project into a served space into which air is to be introduced; and a plurality of air distribution vanes pivotally mounted along the peripheral edge of the housing defining the downstream outlet face thereof, the vanes having a combined total surface area larger than the surface area of the downstream outlet face with each vane being geometrically shaped so that the edges of adjacent vanes coincide outside the plane determining the downstream face of the housing to permit air to be directionally channeled into the served space and to permit air to be shut off from such space in accordance with the pivotal position of the vanes.

It is to be understood that various changes can be made in the arrangement, form, and construction of the apparatus disclosed herein by one skilled in the art without departing from the scope or spirit of the present invention.

Referring to the drawing which discloses one advantageous embodiment of the present invention:

FIGURE 1 is an isometric view of a novel directional

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control air diffuser assembly with the vanes in one possible open position;

FIGURE 2 is an isometric view of the apparatus of FIGURE 1 showing the vanes of the assembly in closed position;

FIGURE 3 is a reduced schematic view of the inventive assembly showing the upper vane in open position;

FIGURE 4 is a reduced schematic view of the inventive assembly showing the lower vane in open position;

FIGURE 5 is a reduced schematic view of the inventive assembly showing the left side vane in open position;

FIGURE 6 is a reduced schematic view of the inventive assembly showing the right side vane in open position;

FIGURE 7 is a reduced schematic view of the inventive assembly showing both the right and left side vanes in open position;

FIGURE 8 is a reduced schematic view of the inventive assembly showing the bottom and right side vanes in open position; and

FIGURE 9 is a reduced schematic view of the inventive assembly showing all vanes in open position.

Referring to the drawing, there is disclosed a flow-through housing 2 having an upstream inlet face and a downstream outlet face 4 spaced from the inlet face 3 to project into a space to be served. Housing 2 can be made from any one of a number of suitable gas impervious materials, and advantageously, a thin gauged rolled sheet metal can be used. It is to be noted that inlet face 3 is connectable to an air supply duct (not shown) and that flange 6 surrounding upstream inlet face 3 serves to form a seal along the wall on which the diffuser assembly is mounted.

If desired, a suitable air filter unit 7, which can be of pleated type to provide a maximum amount of filter media to a fluid stream to be treated, can be disposed in housing 2 so as to extend across downstream outlet face 4. As will be observed in FIGURES 1 and 2 of the drawing, a plurality of air distribution vanes are pivotally mounted by means of leaf hinges 9 along the peripheral edge of housing 2 which defines downstream outlet face 4. In the disclosed embodiment of the drawing, it will be noted that the downstream peripheral edge of housing 2 is polygonal in shape and specifically, rectangular. In such embodiment, four vanes including top and bottom vanes 11, 12, respectively, and side vanes 13 and 14 are utilized. These vanes have a combined total surface area larger than the surface area of the downstream outlet face 4 and each vane is geometrically shaped so that when pivoted to closed position, the edges of adjacent vanes coincide outside the plane determining the downstream face 4 of housing 2 to permit air to be directionally channeled into the served space or to permit air to be shut off therefrom in accordance with the vanes moved.

As can be seen in FIGURE 2 of the drawing, when side vanes 13 and 14 are in fully closed position, the exposed surface of each of these vanes is triangular in shape. It also will be noted that the exposed surface of each of the vanes 11 and 12 is of trapezoidal nature.

Referring to FIGURE 1 of the drawing, it will be noted that side vanes 13 and 14 are each provided with successive triangular setoff portions 18, 19 and 21, 22, respectively, these setoff portions serving to be overlapped by top vane 11 to support such top vane. In this connection a suitable detent member 23 is provided to hold the side vanes and the top vane in fast position. It further will be noted that these successive triangular portions serve to permit an adjustment of the opening, the vanes 13 and 14 being folded in toward face 4 a further amount to have vane 11 rest on vane portions 19 and 22 with vane 12

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open when it is desired to reduce the opening but not completely close it. Finally, it is to be noted that top vane 11 is provided with apertured tab portion 24, the aperture of this tab portion serving to receive rotatable detent 26 mounted on bottom vane 12. When bottom vane 12 is pivoted into closed position so that the edge thereof is adjacent the edge of top vane 11, detent 26 engages in the aperture of tab 24. It then only is necessary to rotate detent 26 to hold the entire unit in fully closed position.

In the arrangement abovedescribed, it can be seen that it is readily possible to open and close the vanes in any one of a number of combinations as disclosed in FIGURES 3 to 9 to control the air flow path and volume in a desired manner. It further can be seen that it is possible to readily detach the entire diffuser assembly from the air duct to which it is mounted, collapse the vanes and to store the assembly in compact form or to package the assembly for ready shipment.

The invention claimed is:

1. A directional control air diffuser assembly comprising: a flow-through housing having an upstream inlet face connectable to an air supply duct and a downstream outlet face spaced from said inlet face to project into a served space into which air is to be introduced; and a plurality of air distribution vanes pivotally mounted in successive side-by-side relation in a common plane along the peripheral edge of said housing defining said downstream outlet face thereof to surround said peripheral edge, said vanes having their other edges free and having a combined total surface area larger than the surface area of said downstream outlet face with each vane being geometrically so shaped that the free edges of adjacent vanes coincide and contact when in closed position outside the plane determining said downstream face of said housing to permit air to be directionally channeled into said served space and to permit air to be shut off therefrom in accordance with the pivotal position of said vanes.

2. The apparatus of claim 1, certain of said vanes hav-

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ing offset edge portions to engage in overlap relation with and support the edge of a vane adjacent thereto when pivoted into closed position and to permit for adjustment and fastening of the outlet opening.

3. The apparatus of claim 1, said housing having a unit filter member disposed therein to extend across the downstream outlet face thereof.

4. The apparatus of claim 1, said peripheral edge of said housing defining said downstream outlet face being polygonal in shape.

5. The apparatus of claim 1, said peripheral edge of said housing defining said downstream outlet face being rectangular in shape and having four vanes pivotally mounted thereto along the respective four sides thereof with at least two of said vanes of opposite disposition having exposed surfaces of triangular configuration when in fully closed position.

6. The apparatus of claim 5, the other two of said vanes of opposite disposition having exposed surfaces of trapezoidal configuration when in fully closed position.

7. The apparatus of claim 5, said oppositely disposed vanes having exposed surfaces of triangular configuration when fully closed including successive and correspondingly offset edge portions of lesser triangular configuration to engage in overlap relation with and support the vane intermediate thereof and to permit adjustment of the outlet opening.

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