

[72] Inventor **Robert H. Sand**
Canton, Connecticut
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[73] Assignee **The Vulcan Radiator Company**
Hartford, Connecticut
a corporation of Connecticut

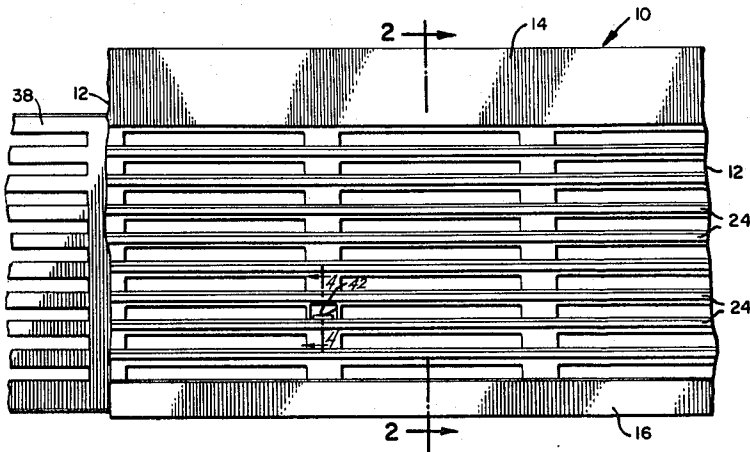
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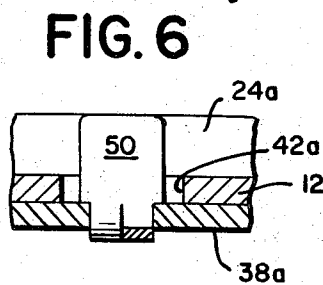
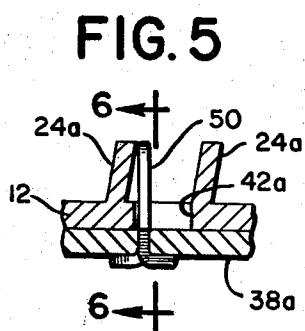
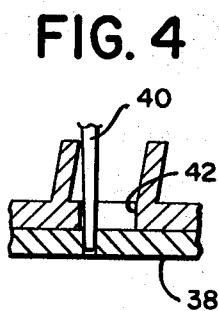
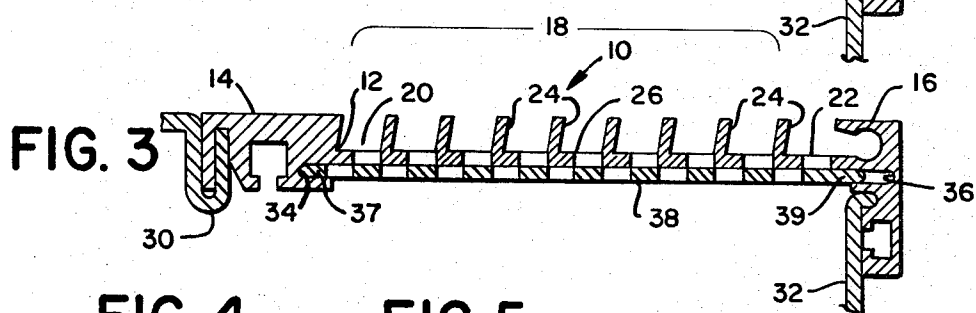
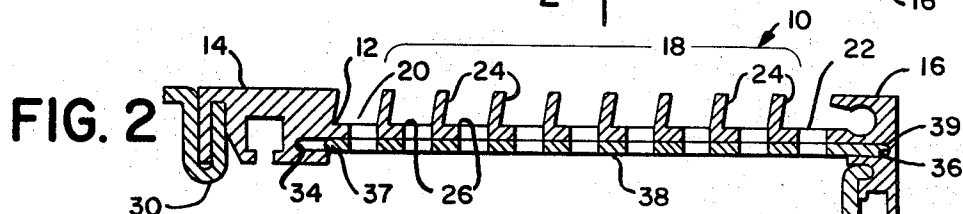
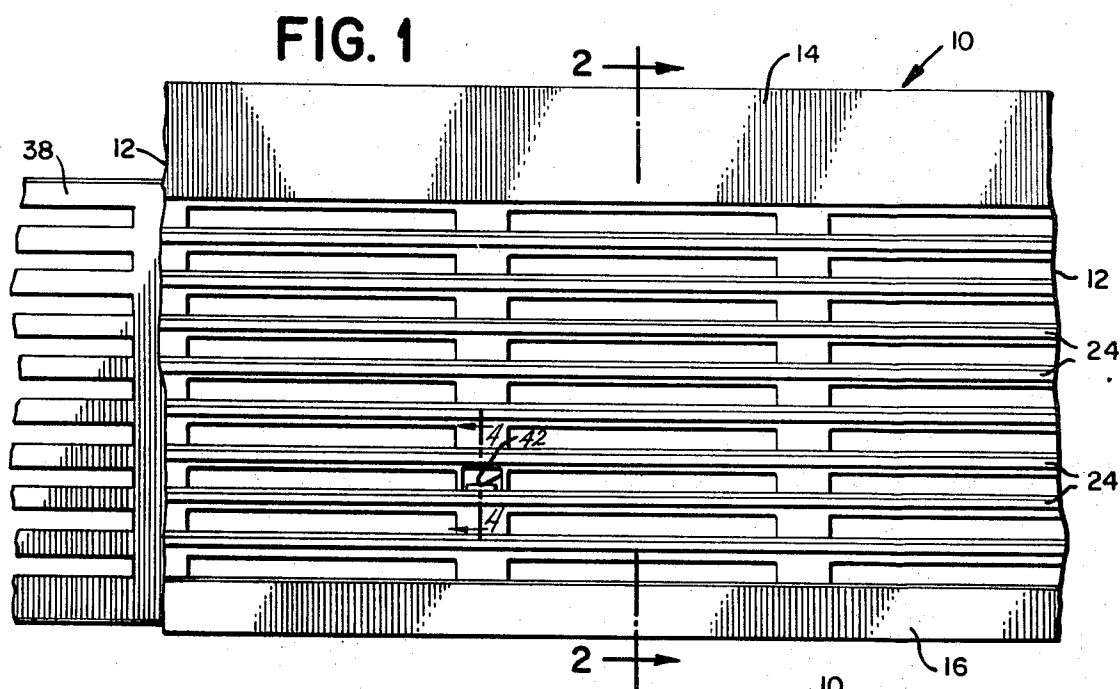
Primary Examiner—Meyer Perlin
Attorney—McCormick, Paulding and Huber

[54] **LOUVERED VALVE**
6 Claims, 6 Drawing Figs.
[52] U.S. Cl..... **98/103,**
98/41, 98/108, 98/121
[51] Int. Cl..... **F24f 13/06**
[50] Field of Search **98/40, 41,**
108, 103, 121

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ABSTRACT: A slide valve is disclosed for use in an elongated enclosure, and has a fixed valve body with side portions for receiving panels or other sections of the enclosure. The valve body includes elongated louvers connected to one another in a single extrusion by integral web portions, which web portions have a pattern of apertures therein. A flat valve element has a corresponding pattern of apertures, and is slidable laterally in the valve body between maximum and minimum flow condition positions. The side edges of the flat valve element are slidably received in opposed grooves in the side portions of the valve body just below the web portions thereof. Manually operated means is also provided for pre-positioning the valve element from outside the enclosure.





INVENTOR
ROBERT H. SAND

BY *McComick, Paulding & Huber*
ATTORNEYS

LOUVERED VALVE

BACKGROUND OF THE INVENTION

Designers concerned with the regulation and control of air flow entering an area to be heated, or cooled, have been concerned with simplifying the control of both the volume and direction of air flow in these systems, as well as with the appearance of the resulting assembly, for both domestic and industrial heating and cooling systems. Enclosure designs have been proposed heretofore wherein the means for regulating the volume of air flow has been combined with the means for controlling the direction of its flow as it enters the surrounding room. U.S. Pat. No. 3,426,668 issued to Hofmeister February 11, 1969 represents one such design wherein a valve body is carried by an enclosure, and defines a central air flow portion which is adapted to slidably receive a valve element having apertures corresponding to similar apertures defined in the central valve body. However, in this design, both the valve body and the valve element must be made by an extrusion process. Another disadvantage to the construction disclosed in Hofmeister can be attributed to the fact that the air directing louvers are defined on the movable valve element rather than on the fixed valve body. As a result of this configuration, that is as a result of the fact that the valve element can be adjustably positioned to vary the air flow through the valve body, it will be apparent that the elongated louvers tend to become canted in the valve body and hence are not always arranged in line with the elongated appearance of the overall enclosure, a factor tending to detract from the desired longitudinal appearance of the overall installation. Still another disadvantage to the Hofmeister construction can also be attributed to the fact that the louvers are defined in the movable valve body. Since these louvers are necessarily exposed, and since they are attached and carried by the valve element itself which is movably received in the fixed valve body, anyone passing by the enclosure and touching the louvers or coming in contact with them is apt to change the desired adjustment which may have been pre-set by maintenance personnel. The louvered valve assembly to be described herein seeks to avoid the various disadvantages outlined hereinabove for the Hofmeister valve construction, and to do so in a unit which is less expensive to manufacture because of the use of a single extrusion in place of the two extruded members in the Hofmeister construction.

SUMMARY OF THE INVENTION

This invention relates generally to louvered valve assemblies for use in regulating the flow of air from an enclosure of the type used in present day air-conditioning and/or heating systems, and deals more particularly with a valve assembly wherein the louvers themselves are fixed with respect to the flat enclosure, and wherein a flat valve element is provided for varying the air flow achieved through the louvered portion of the valve body.

A general object of the present invention is to provide a louvered valve assembly which is economical to manufacture on a mass production basis, and which operates simply and efficiently to regulate both the direction and flow of air from a heating or air-conditioning enclosure without the need for additional internal dampers or the like for completely controlling fluid flow.

A more specific object of the present invention is to provide a louvered valve assembly of the foregoing character wherein the louvers are not connected to the movable valve element in the assembly, whereby the propensity for the preadjusted position of the valve element to be inadvertently changed either by accident or otherwise is eliminated.

A further object of the present invention is to provide a louvered valve assembly wherein the slidable valve member can be selectively moved with respect to the fixed valve body to partially or completely block the flow of air therethrough, and wherein the valve element can be moved to regulate the volume of air flowing through the valve assembly, and permit

the volume of flow to be selectively changed between a maximum flow, or open condition, and a zero flow, or closed condition. Means is also provided for retaining the valve element in a desired position between the maximum and minimum flow conditions.

A still further object of the present invention is to provide a valve assembly wherein the louvers or air deflecting vanes are so arranged as to guide or deflect the flow of air in a predetermined path with respect to the fixed enclosure. More particularly, the louvers are arranged on a fixed valve body, but in a manner which assures that any air flowing through the valve assembly necessarily will be deflected in the desired direction. Accordingly, the louvers cannot become canted with respect to the fixed enclosure and especially with respect to adjacent valve assemblies or sections as in some prior art designs.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a plan view of a valve assembly embodying the features of the present invention, being shown in a valve open condition.

FIG. 2 is a cross sectional view of the valve assembly shown in FIG. 1, being taken on the line 2—2 of that view.

FIG. 3 is a sectional view of the valve assembly shown in FIG. 1, being similar to FIG. 2, except that the valve assembly is shown in its closed condition.

FIG. 4 is a cross sectional view of a portion of the louvered valve body and its associated slide valve as indicated generally on the line 4—4 of FIG. 1, and also shows the bit end of a conventional screwdriver as it might be used for adjustably positioning the valve element with respect to the valve body.

FIG. 5 is a view generally similar to FIG. 4 but showing an alternative construction wherein a tab member is permanently secured to the movable valve element for replacing the function of the screwdriver shown in FIG. 4.

FIG. 6 is a sectional view taken on the line 6—6 of FIG. 5.

DETAILED DESCRIPTION

Turning now to the drawing in greater detail, the valve assembly shown in the drawing and indicated generally by the reference number 10 comprises a fixed valve body 12 having longitudinally extending side portions 16 and 14 which may comprise the front and rear edges respectively of the overall enclosure with which the valve assembly of the present invention is adapted to be used.

The valve body 12, shown in section in FIG. 2, comprises a central flow control portion 18 integrally connected to the side portions 14 and 16 by the generally flat web portions 20 and 22. The flow control central portion 18 of the valve body also includes a plurality of upwardly extending louvers 24, 24 integrally connected to one another by a plurality of intermediate integrally formed web portions 26, 26. The louvers 24, 24 are inclined slightly with respect to a direction normal to the plane defined by the web portions 26, 26 so as to direct the air flow away from this normal direction.

The left hand side portion 14 of the fixed valve body includes an upper surface which is generally aligned with the corresponding upper surface of the right hand side portion 16, and these surfaces define a plane which is generally parallel to the plane defined by the integral web portions 26, 26 and which plane is also generally in line with the upper edges of the louvers 24, 24. This overall design feature contributes to the aesthetic appearance of the valve assembly itself, an appearance which is further enhanced by the fact that all of these louvers 24, 24 are defined in the fixed portion of the valve body so as not to become canted or otherwise misaligned with the elongated side portions 14, 16. With further reference to the left hand side portion 14, a mounting strip is indicated generally at 30 and can be seen to readily adapted for being received in a downwardly open receptacle defined by the extruded side portion 14. Similarly, the right hand side portion 16 may be suitably shaped in its lower region for receiving a member of the type shown generally at 32. The

strip 30 is adapted for attachment to an adjacent wall in the room to be heated or ventilated. Both side portions 14 and 16 and the portion 18 therebetween may be conveniently extruded of aluminum or similar material.

With reference to the central flow control portion 18 of the fixed valve body 12, the side portions 14 and 16 can be seen to define a pair of longitudinally extending lateral opposed grooves 34 and 36 having innermost surfaces which are spaced laterally from one another by a predetermined distance to permit lateral or transverse sliding movement of a generally flat valve element 38. The valve element 38 comprises a flat member which need not be extruded as is the case with the valve body defining the louvers described hereinabove, and it is an important feature of the present invention that the flat valve element 38 have laterally spaced side edges which are slidably received in the grooves 34 and 36 respectively so that the element can be moved laterally between first and second positions abutting one and then the other of said innermost grooved surfaces. More particularly, when the valve element is in its first position, as shown in FIG. 2, a first pattern of apertures defined in the web portions 26, 26 of the fixed valve body are aligned with a second pattern of apertures defined in the valve element 38 so that a maximum air flow condition is provided in the valve assembly for passing a maximum volume of air flow. When the valve element 38 is slid to its second position, wherein the aperture patterns are not aligned with one another, a no-flow condition is achieved for the valve assembly as shown in FIG. 3. It should be noted that in both the open and closed positions shown in FIGS. 2 and 3 respectively the louvers 24, 24 of the valve body are not moved, and hence cannot become canted or misaligned with the elongated side portions 14 and 16 of the valve body so as to detract from the aesthetic appearance of the resulting enclosure. By the same token, it will also be apparent that the slidable valve element 38 cannot be tampered with so as to change or otherwise alter the desired position of the valve element in a particular installation or room.

In further accordance with the present invention, means is provided for moving the valve element 38 between its first and second positions to open and close the resulting valve assembly. Said means if preferably adapted to be manipulated from outside the enclosure, and in FIG. 4 a conventional screwdriver tip or bit 40 is adapted for insertion through a small opening 42 provided for this purpose in the fixed valve body. The location of this opening 42 is best shown in FIG. 1, and it is noted that this opening 42 has a lateral width somewhat greater than the lateral width of the air flow apertures themselves. A smaller opening is provided in the valve element for receiving the screwdriver tip as shown in FIG. 4, and these openings are so arranged with respect to one another as to permit moving of the valve element between its first and its second positions.

FIGS. 5 and 6 show an alternative arrangement for achieving adjustment of the position of a flat valve element 38a from outside the enclosure, and differs slightly from the arrangement shown in FIG. 4 in that a permanent tab member 50 is permanently attached to the valve element 38 and has an upwardly extending portion loosely received in an opening 42a in the web portion of the fixed valve body. As so constructed and arranged one can reach between the fixed louvers 24a, 24a, and grasp the tab member 50 for sliding the tab member together with the flat valve element 30a between the first and second positions referred to hereinabove with respect to the other view described hereinabove.

As a result of the hidden nature of the flat valve element 38 utilized in the louvered valve assembly of the present invention, it is very unlikely that the position thereof with respect to its fixed valve body will be altered by accident or by

unauthorized occupants or users in a room equipped with an enclosure featuring the present novel valve assembly. In the event that some means is required to retain the valve member 38 in a particular position between the maximum and minimum flow conditions referred to hereinabove, the side positions thereof indicated generally at 37 and 39 may be crimped or deformed slightly at assembly with the valve body 12 so as to provide a degree of frictional engagement force therebetween which must then be overcome in any attempt to reposition the valve element 38 in its associated valve body. By so crimping or deforming spaced portions of the side edges 37 and 39 of the valve element 38 means is provided for frictionally engaging the sliding valve element and thereby releasably retaining said valve member in a predetermined position with respect to its associated valve body.

I claim:

1. A louvered slide valve assembly for use in an elongated enclosure to control the flow of air, and comprising an elongated valve body with longitudinally extending side portions including means for mounting said body to the enclosure, said side portions defining a pair of aligned top surfaces, an elongated flow control central portion of said valve body having spaced louvers with their upper edges in line with said aligned side portions, laterally extending web portions of said valve body for integrally connecting the lower edges of said louvers to one another and to said side portions, said side portions of said valve body further defining a pair of longitudinally extending laterally opposed grooves below said web portions, said grooves having innermost surfaces spaced laterally from one another by a predetermined distance, a flat valve element below said louver defining central portion of said valve body, said valve element having laterally spaced side edges slidably received in said grooves respectively so that said element can be moved laterally between first and second positions abutting one and then the other of said innermost groove surfaces, a first pattern of apertures defined in the web portions of said valve body, a second pattern of apertures in said valve element, said patterns of apertures being so arranged that they are in approximate alignment with one another when said valve element is in said first position and out of alignment with one another in said second position to define maximum and minimum flow conditions for the valve assembly.

2. A valve assembly according to claim 1 and further characterized by means for moving said valve element between said first and second positions externally of the enclosure.

3. A valve assembly according to claim 2 wherein said means comprises aligned openings in said web portion and in said valve element, said web portion opening having a lateral width at least as great as the lateral width of its air flow apertures, and said opening in said valve element being so shaped as to receive a screwdriver or the like for moving said valve element between said first and second positions.

4. A valve assembly according to claim 2 wherein said means comprises aligned openings in said web portion and in said valve element, said web portion opening having a lateral width at least as great as the lateral width of its air flow apertures, and a tab member secured in said valve element opening and extending upwardly through said web portion opening for use in moving said valve element between said first and second positions.

5. A valve assembly according to claim 1 wherein said louvers are inclined with respect to a direction normal to the plane of said aligned top surfaces of said valve body side portions.

6. A valve assembly according to claim 5 wherein said flat valve element is arranged parallel to said plane of said top surfaces of said valve body side portions.