United States Patent

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[72] Inventor **John G. Thorne**
Hollywood, Fla.

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[73] Assignee **Miller Industries, Inc.,**
Miami, Fla.

[54] **DIFFUSER STRUCTURE**
1 Claim, 7 Drawing Figs.

[52] **U.S. Cl.** **62/110,** 98/121
[51] **Int. Cl.** **F24f 13/08**
[50] **Field of Search** ..... 98/110, 121; 189/36 HX; 49/73, 74, 75, 76, 77, 78-94; 85/36

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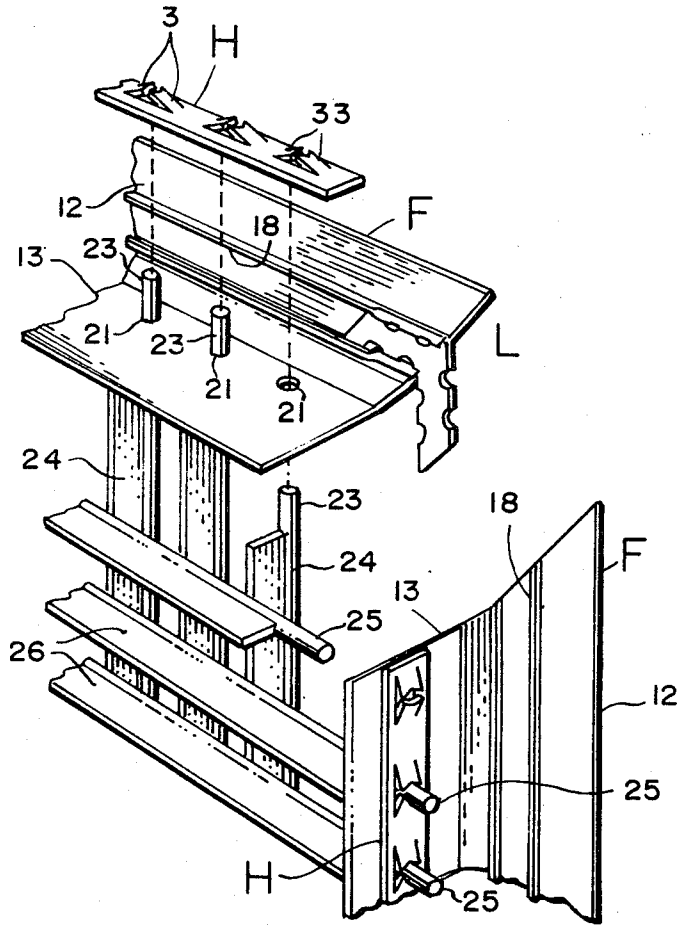
Primary Examiner—Meyer Perlin
Assistant Examiner—W. C. Anderson
Attorney—Salvatore G. Militana

ABSTRACT: A diffuser having a frame made of L-shaped members corner lock means securing the L-shaped members together, a plurality of louvers extending between the L-shaped members, the louvers having pins mounted at their end portions extending through openings in the frame members and an elongated flat multiblade-holding strip extending along the frame members having pairs of resilient finger portions engaging the louver pins and securing the louvers against the inadvertent rotation thereof.



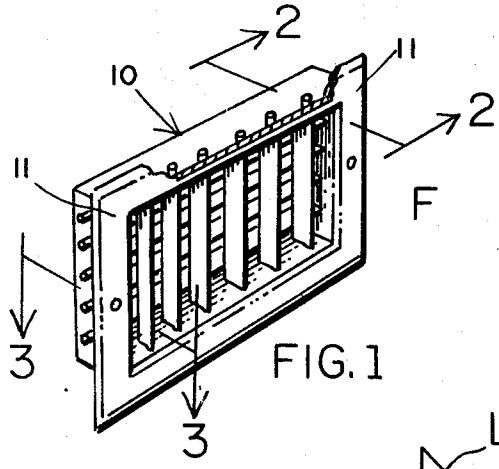


FIG. 1

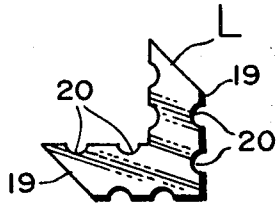


FIG. 6

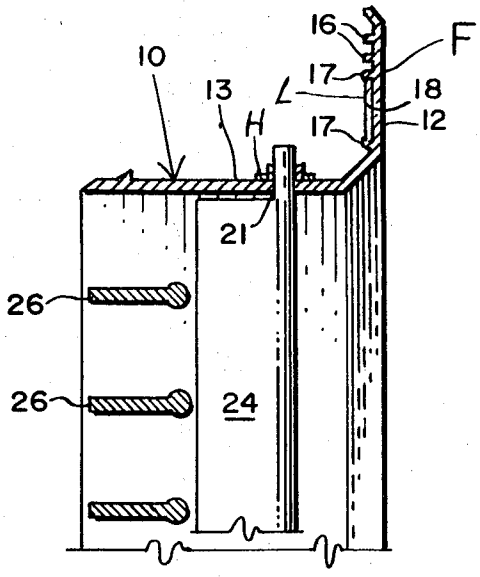


FIG. 2

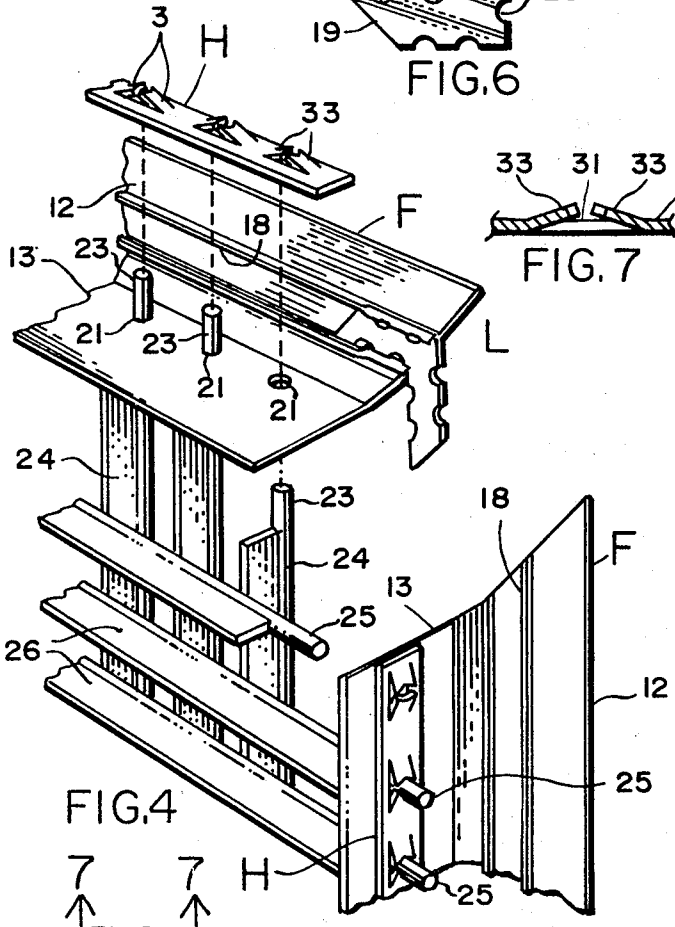


FIG. 4

FIG. 7

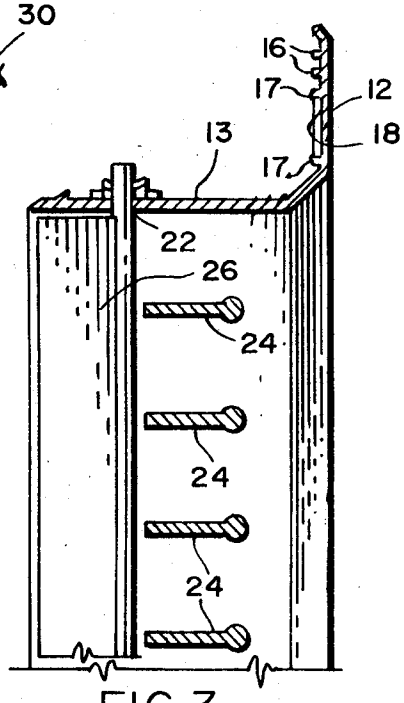


FIG. 3

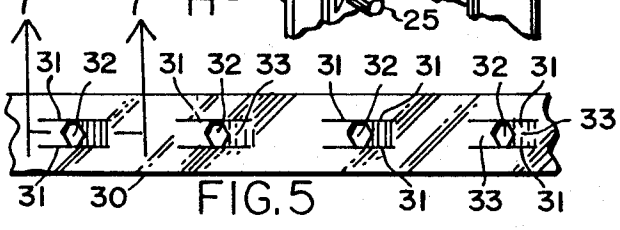


FIG. 5

INVENTOR
JOHN G. THORNE
BY
Salvatore G. Militana
ATTORNEY

DIFFUSER STRUCTURE

This invention relates to diffusers, grilles and the like and is more particularly directed to a diffuser structure having a plurality of multiblade-holding members.

A principal object of the present invention is to provide a diffuser with a multiblade holder which exerts an even and positive tension on the shafts or trunnions thereof at all arcs of their positions whereby the louvers remain in the position that they are set notwithstanding the forces exerted by the flow of air therethrough.

Another object of the present invention is to provide a diffuser with adjustable louvers therein having a multiblade holder or clip strip that maintains the louvers firmly without vibration in the angle of adjustment desired yet permits the simple change in adjustment when desired.

A further object of the present invention is to provide a diffuser with corner locks and multiblade holder that effect a strong, rigid structure with louvers or blades therein that cannot slip out of position in the diffuser frame.

A still another object of the present invention is to provide a diffuser that is simple in construction, very readily assembled and therefore economical in cost.

With these and other objects in view, the invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing forming a part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawing but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

IN THE DRAWING

FIG. 1 is a perspective view of a diffuser constructed in accordance with may invention.

FIGS. 2 and 3 are fragmentary cross-sectional views taken along the lines 2—2 and 3—3 respectively of FIG. 1.

FIG. 4 is a fragmentary exploded view of a corner assembly of my diffuser.

FIG. 5 is a plan view of a portion of the multiblade holder.

FIG. 6 is a plan view of a corner lock.

FIG. 7 is a cross-sectional view taken along the line 7—7 of FIG. 5.

Referring to the drawing wherein like numerals are used to designate similar parts throughout the several views, the numeral 10 refers to a diffuser constructed in accordance with my invention and consisting of frame members F, mitered at their ends 11 and fastened together by lock members L.

The frame members F consist of an L-shaped extruded member having leg portions 12 and 13, the leg portion 12 forming the facia of the diffuser and the leg portion 13 forming the support for the two sets of louvers 24 and 26. On the rear surface of the leg portion 12 are a plurality of ridges 16 for strengthening the frame member leg portion 12 and a second pair of spaced ridges 17 forming a slot 18 for receiving the lock member L. The lock member L consists of a pair of leg portions 19, 19 set at right angle with each other having a plurality of semicircular openings 20 positioned along the edges thereof. The width of the leg portions 19, 19 are approximately equal to the width of the slots 18 so that they fit within the slots 18 and when the mitered joints 11 are placed together and the ridges 17, 17 are deformed as by peening at the position of the openings 20, the frame members F become locked together.

The leg portions 13 of the frame members F are provided

with a plurality of equally spaced bores 21 and 22, the bores 21 being on the pair of frame members F opposite each other to receive stub shafts or pins 23 of louvers 24. The bores 22 are positioned on the other pair of frame members F that are positioned in apposing relation to receive stub shafts 25 mounted on the ends of louvers 26. The louvers 25 extend at right angle to the louvers 26 and thereby permit the controlling of the flow of air therethrough to any desired direction or combination of directions.

In order to maintain the louvers 24, 26 firmly in the desired position so as to be unaffected by the flow of air therethrough, there is mounted along the leg portions 13 of the frame members F a multiblade-holding strip H engaging each of the louver pins 23. The holding strip H which extends the full length of each of the frame members leg portions 13 consists of a length of spring steel type member 30 and is provided with a series of equally spaced parallel slots 31 are punched therein. Then a centrally positioned opening 32 is punched in the middle of each pair of slots 31 and engaging the slots 31 to permit the fingers 33 to be forced outwardly above the plane of the strip member 30 as best shown by FIG. 7. The openings 32 are smaller than the diameter of the pins 23, 25 so that when the pins 23, 25 are forced through the openings 32 the fingers 33 will engage the sidewall of the pins 23, 25 to resist any turning movement of the louvers 24, 26.

In the normal assembly of the frame members F they are cut to their proper lengths from a length of extruded member and mitered as shown. The louvers 24 and 26 are then placed in spaced parallel position with their respective shafts or pins 23, 25 inserted into openings 21, 22 of the frame members F. The latter are positioned with their mitered ends 11 in contact relation and the corner-locking members L placed in the slots 18. The ridges 17, 17 are then peened to deform the metal into the openings 20 and lock the frame members F together. Then four lengths of the holding strips H are cut from a length of same. The pins 23, 25 of the louvers 24, 26 are inserted into the openings 32 and the holding strips H are forced toward the leg portions 13 of the frame members F until the holding strips H are in contact relation with the leg portions 13. The louvers 24, 26 may now be revolved about their respective pins to any desired adjustment. Since the resilient fingers 33 frictionally engage the pins 23, 25, the louvers 24, 26 require a good bit of force in order to rotate them to a different position.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A diffuser comprising a plurality of substantially L-shaped frame members having mitered end portions, corner lock means securing said frame members together at said mitered end portions to form a substantially rectangular frame, a plurality of substantially equally spaced and parallel louvers extending between said frame members, said frame members having openings, stub shafts mounted on each end of each of said louvers and extending through said openings, a substantially flat and elongated multiblade-holding member extending along each of said frame members, said holding members having a plurality of pairs of finger portions struck from said flat member, extending at an oblique angle from said holding member and having free ends extending toward each other and disposed in spaced relation to each other and securing said stub shafts to prevent the inadvertant rotation thereof, said corner lock means having a substantially L-shaped member with openings along both edges along its full length, said frame member having a pair of substantially parallel and spaced ridges forming a slotted portion receiving said corner lock means, and locking said corner lock means in said slotted portion upon deforming said ridges at said openings on said corner lock means.