

Nov. 16, 1965

G. J. SWEENEY
CEILING DIFFUSER

3,217,626

Filed April 30, 1962

2 Sheets-Sheet 1

FIG. 2

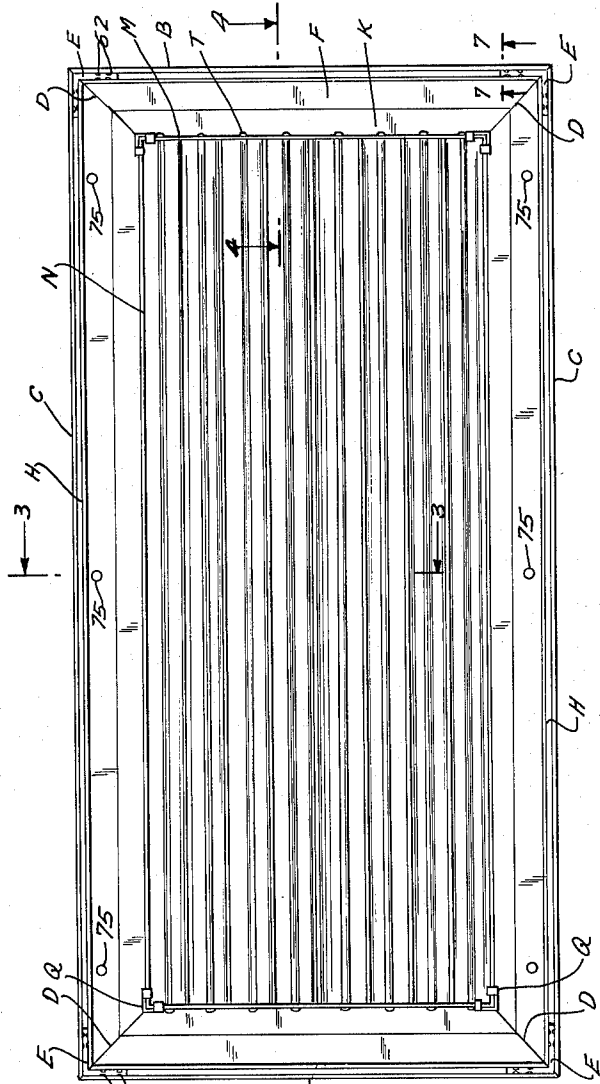


FIG. 1

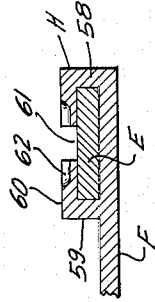
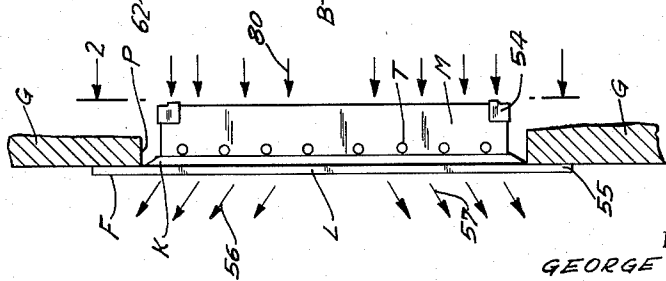


FIG. 7

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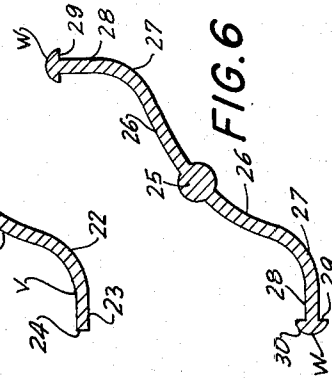
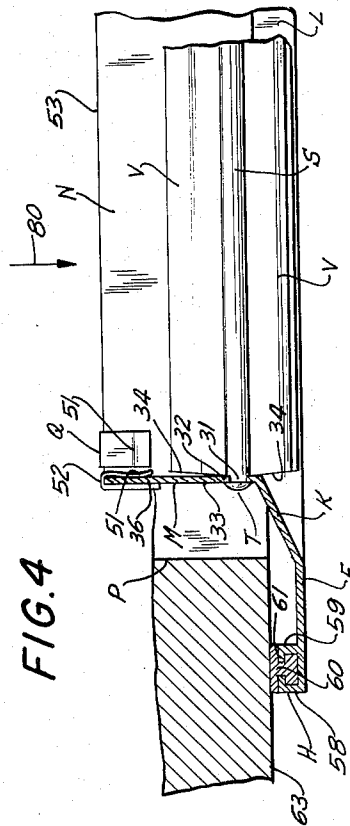
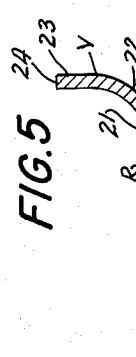
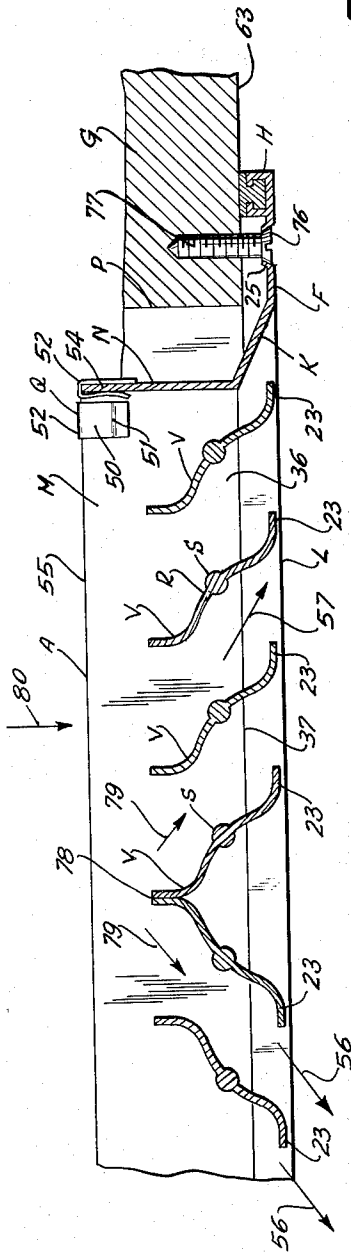
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CEILING DIFFUSER

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4 Claims. (Cl. 98-40)

The present invention relates to a ceiling diffuser and it particularly relates to a diffuser for controlling the flow and direction of air into a room through the ceiling.

It is among the objects of the present invention to provide a simple extruded ceiling diffuser construction which will be devoid of welding connections and may be made of relatively thin welded parts and which will be relatively sufficiently rigid and durable as to withstand considerable handling and mounting and be reliable in operation over long periods of time.

Another object is to provide a readily adjustable ceiling diffuser in which the blades may be adjusted by hand or tool in which the frame and blades both may be formed of extruded parts and readily assembled together with welding or said metal forming, cutting, punching or shaping operations.

A further object is to provide a simple rigid durable ceiling diffuser installation for admitting either hot or cold air with adjustable vane control which will enable the flow to take place from side to side.

Still further objects and advantages will appear in the more detailed description set forth below, it being understood, however, that this more detailed description is given by way of illustration and explanation only and not by way of limitation, since various changes therein may be made by those skilled in the art without departing from the scope and spirit of the present invention.

In accomplishing the above objects, it has been found most satisfactory to form the diffuser of a simple rectangular frame formed of four single extruded cross sections with an outside flush flange to be fitted against the wall which is parallel to the wall and inwardly directed transverse flanges extending inwardly through the opening in the wall and carrying the closely spaced vane elements.

A particular feature of the present invention resides in the fact that there are provided inside of the diffuser a plurality of compound vane elements with a central enlarged axial rod portion pivotally mounted in the opposite transverse inwardly directed flanges of the frame elements and which have outwardly curved portions acting to scope the incoming air and direct it to the sides of one or more of the sides of the diffuser construction.

The flush flanges of the frame elements are desirably provided with edged channels which act both to receive sealing strips as well as corner key elements to hold the frames together.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangements of parts as hereinafter more specifically described and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which fall within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:

FIG. 1 is an end elevational view showing the diffuser mounted upon the wall.

FIG. 2 is an inside plane view of the diffuser of FIG. 1.

FIG. 3 is fragmentary transverse sectional view upon the line 3-3 of FIG. 2.

FIG. 4 is a transverse fragmentary sectional view upon the line 4-4 of FIG. 2.

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FIG. 5 is an enlarged transverse sectional view of a single blade upon an enlarged scale as compared to FIGS. 3 and 4.

FIG. 6 is an alternative form of the blade.

FIG. 7 is a transverse sectional view upon the line 7-7 of FIG. 2 upon an enlarged scale as compared to FIG. 2 showing the holding key.

Referring to FIGS. 1 to 4, there is shown a frame A composed of two short extruded elements B and two long extruded elements C which may have the same cross section and are extruded as a continuous strip and then cut at 45° angles as indicated at D in FIG. 2 and abutted against each other and held in position by a right angular key E.

Each of the sections are provided with the outside flush flange F mounted upon the wall G with the edge channels H which may receive the keys E as well as the intermediate gaskets J.

The flush flanges F at their inner edges have the oblique intermediate portions K which form a well on their outlet side L of the diffuser.

From the oblique well forming portions K, there extends inwardly the vertical transverse flanges M and N which extend into the wall opening P, around which the flush flange F extends.

Removable clips Q may be used to hold the abutting ends of the flanges M and N together at the corners of the frame construction.

The blades R to which this invention is particularly directed have a central pivotal portion S with peened ends T on the outside faces of the flanges M and N, and they have the curved outwardly extending blade portions U.

In the alternative form of the blade V as shown in FIG. 6, the outer ends may have enlarged baffle portions W to increase turbulence in the air flow.

Referring particularly to the blade form shown in FIGS. 5 and 6, the blade has a central axial portion 20 of cylindrical cross section with the curved inside portions 21 forming the central scoop portion 22 and terminating in the edges 23 which may be cut off sharply as indicated at 25 in FIG. 5.

In the alternative form shown in FIG. 6, the central cylindrical portion 25 has the outwardly inside curved portions 26 of the scooped portions 27 which continue into the outwardly curved portions 28.

The curved portions 28 terminate in the edge cylindrical beads W which have the inside baffle faces 29 and the semi-circular outside face 30.

The central axial pivot rod portions 28 extend as indicated at 31 through the openings 32 and their peened faces are frictionally pressed against the outside face 33 of the flange M.

The edges of the blade are obliquely cut off as indicated at 34 so that the inside portions of the cut 35 will closely contact and bear against the inside face 36 of the flange M.

The blade portions 21-22-23 and 26-27-28 will be flexible, and they will be reinforced by the relatively rigid central pivot axial rod S.

It will be noted that the pivotal mounts at 31 are inside of the inner edge 37 of the well formed by the oblique portions K and that the blades extend at one side into the well formed by the oblique blade portions K and on the other side between the flanges M and N.

Normally, the blades R should at all times be positioned at their outer portions 23 as shown in FIG. 3 and will be inside of the well formed by the oblique sides K.

The clips Q may have the inside spring fingers 50 which will be turned inwardly as indicated at 51, and they have the top ends 52 which extend over the inlet edges 53 of the frame.

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On the outside face, they have a bridge 54 which connects the two clips together around the corners 55 of the diffuser as best shown in FIG. 1.

These compound curved vanes R and V may be positioned in any desired arrangement to give either blow side or at one side of the frame, and as shown in FIG. 3, they are designed to give a blow to both sides as indicated by the arrows 56 and 57 in FIGS. 1 and 3.

The flush flange members F terminate in a channel H which has the outside flange portion 58, the inside flange 59 and the inwardly directed flanges 60 having a central slot 61.

As shown in FIG. 7, the channel between the walls 58, 59 and 60 will receive the right angular key member E and the edges of the flange portions 60 may be strapped inwardly as indicated at 62 to hold said key firmly in position.

Between the keys the channel H will carry the gasket J which will contact the face 63 of the wall as shown in FIGS. 3 and 4 and assure proper sealing.

The conical opening 75 as shown in FIG. 3 will receive the heads 76 of the attachment screws 77 to enable the grille to be mounted upon the wall.

The applicant has thus provided a simple rigid readily installed compound curved blade ceiling diffuser in which the blades R and V may be readily adjusted by tool or by hand and in which they are most conveniently positioned in the outside portion of the grille but inside of a well formed by the oblique sides K.

As shown in FIG. 3, the outer curved portions 22 may be positioned parallel to the flush flange F in the position shown in FIG. 3, and the central inside edges may contact at 78 to form a combined central element as shown in FIG. 3 which will divert the air to both sides as indicated by the arrows 79.

These blades may be turned through an angle of 180° to 360° to give a wide variety of diffusion patterns and instead of the concave portions facing the incoming streams, it is possible that the convex portions may also be facing the incoming streams indicated by the arrows 80 in FIGS. 1, 3 and 4.

The oblique well formed by the side walls K will permit the air to expand as it is passing out of the diffuser and aid the expansion pattern indicated by the arrows 56 and 57 in FIG. 1.

Although a two way blow is shown in FIGS. 1 to 4, this may be converted into a three or four way blow arrangement.

As many changes could be made in the above ceiling diffuser, and many 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 shall be interpreted as illustrative and not in a limiting sense.

Having now particularly described and ascertained the nature of the invention, and in what manner the same is to be performed, what is claimed is:

1. A ceiling or wall diffuser having an inlet side and

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an outlet side for controlling the flow and direction of air into a room through a wall and having a rectangular frame formed of side and end frame walls each provided with an outside flush flange to be fitted against the wall, said frame walls extending inwardly through the opening in the wall, a plurality of parallel axial rods mounted for rotation in the inwardly directed end walls, a vane element on each of said rods, said vane elements having outwardly curved portions on each side of said rods, each portion being convexly curved in one direction and concavely curved in the other direction, the outer edge portions of each of the vane elements terminating in outwardly inclined planes facing in the same direction.

2. A diffuser as set forth in claim 1, wherein the vanes are so spaced as to be rotatable through 180 degrees independently of each other so that the air flow can be directed to either side of the frame.

3. A diffuser as set forth in claim 1 wherein the flush flange on each of the walls is beveled on its inner edge.

4. A rectangular frame ceiling or wall diffuser provided with a plurality of double curved vanes to direct incoming air and change its direction from 45 to 90° for insertion in an opening in the ceiling or wall, comprising two side and two end frame elements, each element having an outside horizontal flush flange to overlie the periphery of the ceiling or wall opening and transverse inwardly directed vertical flanges extending through and beyond said opening, said transverse flanges on said end elements having a row of openings positioned just inside the plane of the ceiling or wall, a plurality of parallel closely spaced double curved rotatable adjustable vanes having central integral cylindrical cross section pivot shaft portions with integral end extensions mounted in said openings and having outwardly extending curved vane portions, on each side of each shaft portion, each vane portion on both sides of said shaft being convexly-concavely curved and facing in the same direction, the outer edge portion of each vane terminating in outwardly inclined planes in the same direction from the shaft, whereby when the vanes are turned to a position where they are parallel to each other and are inclined with respect to the air flow one of the inclined edges of each vane and be substantially parallel to the direction of air flow and the other inclined edge of each vane will be positioned adjacent and parallel to the plane of the flush flanges, said vanes on each side of the shaft portions having the same curvature.

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