

United States Patent

Kelly et al.

[15] 3,685,428

[45] Aug. 22, 1972

[54] **GRILLE**

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[22] Filed: **April 29, 1970**

[21] Appl. No.: **32,890**

[52] U.S. Cl.98/110

[51] Int. Cl.F24f 13/14

[58] Field of Search.....98/101, 107, 110, 121

[56] **References Cited**

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[57] **ABSTRACT**

A heavy duty industrial grille with a frame having adjacent inwardly facing grooves each with parallel end and side sections. A resilient strip of bearing material is provided in end sections of one groove and in side sections of the other and each strip has a series of bearing openings therein which receive bearing studs at end portions of air directing vanes. The vanes are arranged in first and second series at right angles with respect to each other and at least one series of vanes has an associated connecting link and actuator for gang adjustment.

5 Claims, 3 Drawing Figures

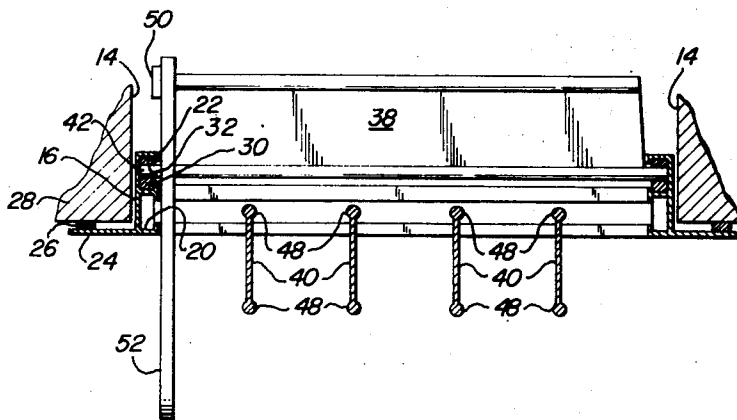


FIG. 1

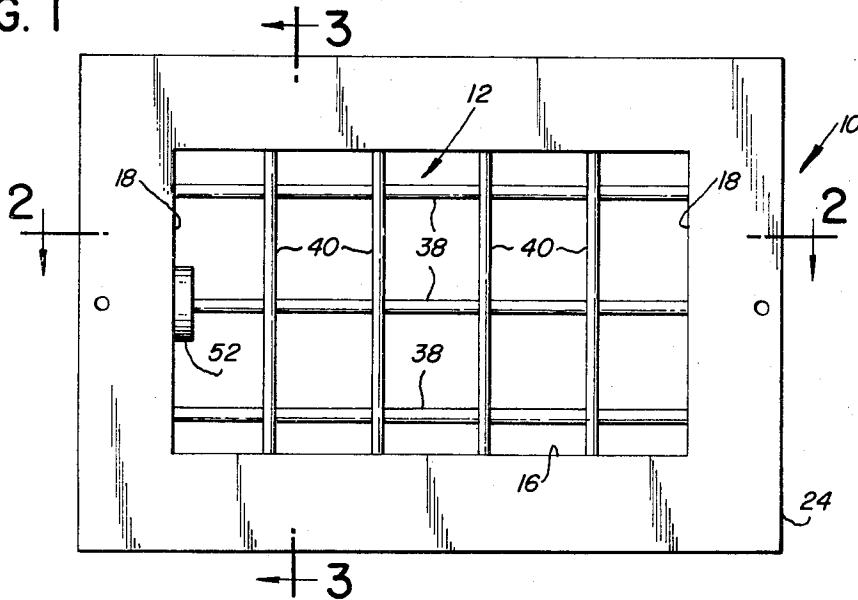


FIG. 2

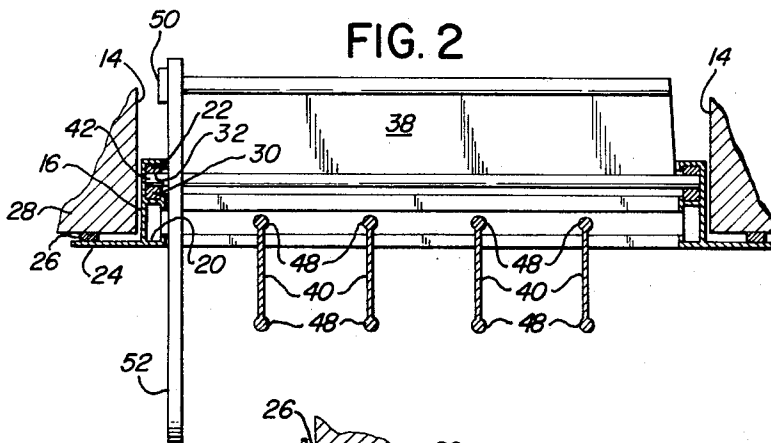
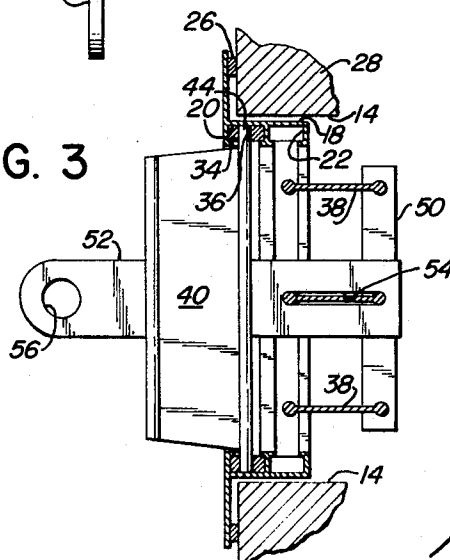


FIG. 3



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GRILLE

BACKGROUND OF THE INVENTION

Various types of air handling grilles have heretofore been available but many such grilles have been constructed of sheet metal and have not exhibited the high degree of structural integrity and durability required for heavy duty industrial use.

SUMMARY OF THE INVENTION

It is the general object of the present invention to provide a heavy duty grille for industrial use which is so constructed as to be dependable and durable in use and which is yet manufactured at economic advantage.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a plan view of the grille of the present invention.

FIG. 2 is a longitudinal section taken generally as indicated at 2—2 in FIG. 1.

FIG. 3 is a transverse section taken generally as indicated at 3—3 in FIG. 1.

DESCRIPTION OF PREFERRED EMBODIMENT

Referring particularly to FIG. 1, it will be observed that the grille of the present invention takes a rectangular form and comprises a frame 10 and an air directing vane section 12 therewithin. The frame 10 is adapted to be mounted within an opening 14 as illustrated in FIGS. 2 and 3 and the grille handles a flow of air which may pass outwardly from the opening as when the opening represents an exit or discharge portion of air conditioning duct work, etc. Conversely, the grille is usable for the inflow of air from a room or other enclosure to the opening 14.

The frame 10 is preferably formed of an aluminum extrusion and comprises side sections 16, 16 and end sections 18, 18. The side and end sections 16, 16 and 18, 18 are identical in cross section so as to be readily formed from an elongated extrusion severed into lengths of the desired dimension and joined at the corners in rectangular form. Adjacent and similar first and second grooves 20, 22 are formed in the frame and extend thereabout through both end and side sections thereof. The grooves 20, 22 open inwardly or toward the center of the frame and are adapted to receive bearing members as will be explained in detail hereinbelow.

At a front surface thereof, the frame 10 has an integrally formed outwardly projecting flange 24 which is particularly adapted for mounting the frame in an opening such as 14. Preferably, a mounting gasket is provided at 26 as best illustrated in FIGS. 2 and 3. When desired, the frame 10 can be readily reversed so that the flange 24 is arranged at a rear portion thereof with the body portion of the frame including the grooves 20, 22 extending forwardly therefrom. In such case, the flange has its opposing surface attached to a member such as the member 28 in FIGS. 2 and 3 and the grille projects substantially forward from the opening 14 defined by the member 28.

The aforementioned bearing members preferably comprise resilient plastic strips each provided with a series of equally spaced bearing openings. Thus, referring to FIG. 2, first and second end bearing members 30, 30

are disposed in the grooves 22, 22 and a single pair of small bearing openings are shown therein at 32, 32. In FIG. 3, side bearing members 34, 34 are shown respectively in the grooves 20, 20 and each of said bearing members has a series of small openings 36, 36 formed therein, one such pair of openings being shown.

A first series of parallel and elongated air directing vanes is indicated at 38, 38 in FIG. 1 and a second series of similar vanes is indicated at 40, 40. The vanes 38, 38 are somewhat longer than the vanes 40, 40 and extend between the end bearing members 30, 30 with three such vanes provided in the grille shown. Four vanes 40, 40 are shown and are somewhat shorter than the vanes 38, 38 extending between the side bearing members 34, 34. Each of the vanes 38, 38 and 40, 40 has a small bearing stud 42 projecting from each end thereof. The studs 42, 42 are entered respectively in the bearing openings, the studs 42, 42 of the vanes 38, 38 being entered in the openings 32, 32 of the bearing members 30, 30 and the studs 44, 44 on the vanes 40, 40 being entered in the bearing openings 36, 36 in the bearing members 34, 34. Each of the studs 42, 42 and 44, 44 has a diameter slightly larger than the bearing opening with which it is associated, such that the studs are maintained in tight engagement with the walls of the bearing openings whereby to provide for frictional retention of the vanes in adjusted angular positions. A nominal pressure exerted on a vane will cause the vane to be readily adjusted angularly but the frictional retaining force is so selected to provide for ease of adjustment and yet prevent inadvertent or unintended vane dislodgement.

It will be readily seen that the bearing members 32, 34 can comprise sections severed from a single elongated resilient plastic strip having the bearing openings preformed. Similarly, the vanes 38, 38 and 40, 40 can be provided with a single extrusion die. Preferably, and as shown, each of the vanes is of uniform cross section and is symmetrical with enlarged cylindrical ribs extending along each side edge thereof. The cylindrical ribs or enlargements are indicated at 48, 48 and it will be observed that the aforementioned studs 42, 42 and 44, 44 represent mere extensions thereof, the remaining portions of the vanes having been cut back to expose the studs. The provision of uniform and symmetrical sections contributes to manufacture at economic advantage. Quite obviously, the vanes can be formed from elongated strips from a single extrusion die merely through the exercise of appropriate transverse cutting operations.

Further, the arrangement of the vanes 38, 38 and 40, 40 with respect to the bearing members 32, 32 and 34, 34 and their respective grooves is desirably compact and yet provides for a high degree of versatility in the control of the air stream emitted from the grille. The side edges of the vanes which carry the aforementioned bearing studs are arranged in adjacent relationship and the free side edges of the vanes extend in opposite directions therefrom. Thus, the vanes are supported for angular adjustment with the frame grooves 20, 22 and bearing members 32, 34 in adjacent relationship and with the vanes projecting forwardly and rearwardly therefrom to effectively control the direction of air flow in both side-to-side and end-to-end directions.

Preferably, and as shown, at least one series of the air directing vanes is adapted for gang adjustment. The series of vanes 38, 38 has an actuating link 50, best illustrated in FIG. 3, which interconnects the vanes and which has associated therewith an actuator 52. The actuator 52 has an elongated slot 54 at a rear portion thereof which receives one of the vanes 38 and an opening 56 is provided at a forward portion of the actuator. The forward portion of the actuator projects through the front of the grille for ease of access and it will be apparent that an appropriate tool can be entered in the opening 56 whereby to swing the actuator in an arcuate direction and to effect gang adjustment of the vanes 38, 38 to a desired angular position.

We claim:

1. An air handling grille comprising a rectangular frame adapted to be mounted in an opening for the passage of air therethrough, said frame defining adjacent first and second inwardly open grooves which extend along the inner surface of the frame and which have opposing parallel end sections and opposing parallel side sections, a first pair of similar resilient bearing members respectively secured in the end sections of said first groove with small bearing openings in the respective members in alignment, a second pair of similar resilient bearing members respectively secured in said side groove with small bearing openings in the respective members in alignment, a first parallel series of similar elongated air directing vanes each adjustable through a substantial angle about an axis extending along one longitudinal edge thereof, and each of said air directing vanes being provided with similar oppositely projecting bearing studs with axes substantially coincident with said pivoting axis and which studs are larger in diameter than said bearing openings, the studs of each vane being entered in aligned bearing openings in said first bearing members and in tight substantially

360° engagement with walls thereof whereby frictionally to retain the vane in adjusted angular positions, and a second parallel series of similar elongated air directing vanes each adjustable through a substantial angle about an axis extending along one longitudinal edge thereof, and each of said air directing vanes being provided with similar oppositely projecting bearing studs with axes substantially coincident with said pivoting axis and which studs are larger in diameter than said bearing openings, the studs of each of said vanes being entered in aligned bearing openings in said second bearing members and in tight engagement with walls thereof whereby frictionally to retain the vane in adjusted angular positions, and said first and second series of vanes being arranged substantially at right angles with respect to each other.

2. An air handling grille as set forth in claim 1 wherein each of said air directing vanes has an integral cylindrical enlargement extending along one side edge thereof and projecting beyond the end thereof, said projecting end portions of said cylindrical enlargements forming the aforesaid bearing studs.

3. An air handling grille as set forth in claim 2 wherein each of said air directing vanes has an integral cylindrical enlargement extending along each side edge thereof.

4. An air handling grille as set forth in claim 2 wherein said first and second series of vanes have their side edges which carry said bearing studs in adjacent relationship with their free side edges extending in opposite directions therefrom.

5. An air handling grille as set forth in claim 4 wherein at least one of said first and second series of vanes has a connecting link attached thereto for gang adjustment thereof, and wherein said connecting link has an actuator connected thereto and projecting from the front of the grille for easy access.

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