



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
21.04.2004 Bulletin 2004/17

(51) Int Cl.7: **F24F 13/06**

(21) Application number: **03380229.9**

(22) Date of filing: **15.10.2003**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR**
Designated Extension States:
AL LT LV MK

(72) Inventors:
• **Muller, Rainer Schako Metall. F. Chad KG
7201 Kolbingen (DE)**
• **Quiros Fernandez, Julio
Schako Metall. F. Chad KG
7201 Kolbingen (DE)**

(30) Priority: **15.10.2002 ES 200202361**

(71) Applicant: **SHAKO METALLWARENFABRIK
FERDINAND SCHAD KG
78600 Kolbingen (DE)**

(74) Representative: **Carpintero Lopez, Francisco
HERRERO & ASOCIADOS, S.L.
Alcalá, 35
28014 Madrid (ES)**

(54) **Air conditioning diffuser louvers**

(57) Attached to the ends of a tubular louver (1) with a triangular profile are corresponding stems (5), made of plastic as the louver (1) itself, having ribs (7) in the sense of their generatrices for a perfect fit, which ribs (5) emerge as a single piece from corresponding hollow

end support plates (6), also made of plastic, in whose intermediate flat chamber are housed corresponding metal sheets (9) that are attached by harpoon-shaped recesses (11) to openings (12) of the plates (6) and are provided with an orthogonally bent lip (10) meant to facilitate its attachment to the base plate of the diffuser.

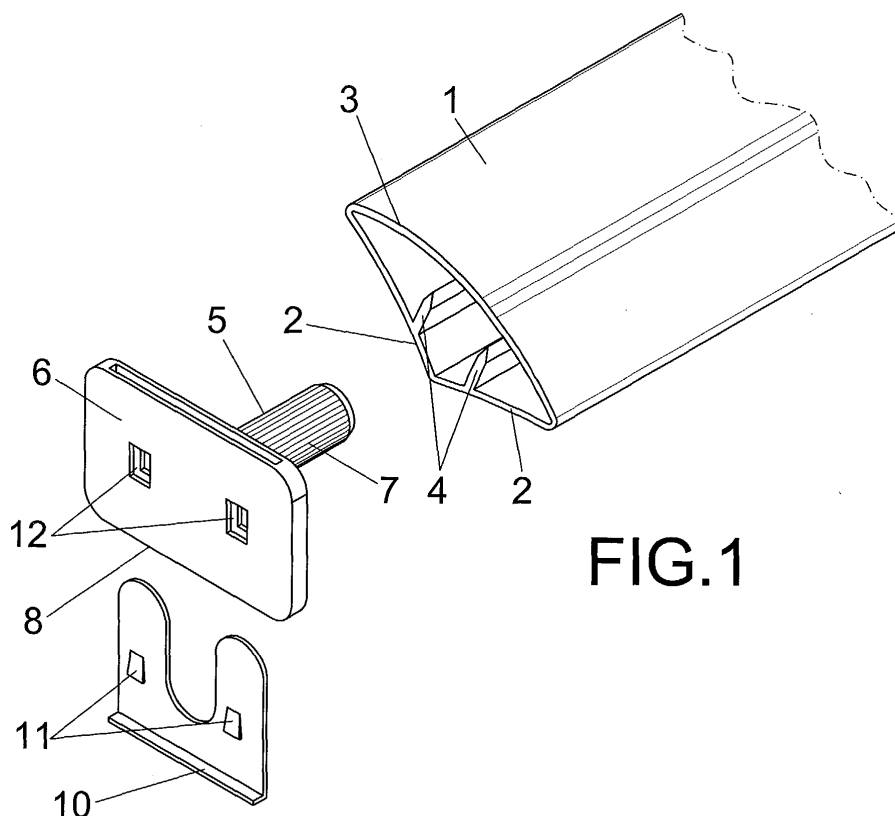


FIG.1

Description

OBJECT OF THE INVENTION

[0001] The present invention relates to a louver specifically conceived as an air deflector for use in air conditioning diffusers, specifically as a swivelling deflector.

BACKGROUND OF THE INVENTION

[0002] It is common for certain air conditioning diffusers to have individually independent deflection louvers, so that each one can adopt the optimum position for directing the hot or cold air stream in a given direction. This is particularly useful in circular diffusers, in which the air outlets adopt radial positions about an imaginary centre.

[0003] A diffuser of this type appears in the invention Patent ES 2,110,136 in which established on each diffuser opening are two parallel lids or supports coupled to said opening by a bayonet system, between which laminar supports is established a shaft about which revolves the deflection louver, embodied in a hollow profile with an inner groove for coupling said shaft.

[0004] This solution suffers from a drawback mainly centred about the following aspects:

- Although the deflection louver is generally made of plastic, its swivelling shaft is metallic, so that problems result from the different thermal expansion coefficients of these materials.
- The attachment of the supports to the base plate is not as reliable as would be desirable, as the grooves established in the supports for coupling them to the plate openings provide a weak coupling on said plate due to the tendency of the supports to swivel sideways.
- The louver configuration makes the air outlet area change with the inclination angle of said louvers, which hinders the correct operation and performance of the installation.
- Problems also exist in the attachment of the metallic shaft to the end supports, which are preferably made of plastic.

DESCRIPTION OF THE INVENTION

[0005] The louver disclosed by the invention solves the aforementioned problem in a fully satisfactory manner, as regards the various issues discussed.

[0006] For this purpose, more specifically and according to one of the characteristics of the invention, its shaft is fragmented into two short end segments that emerge and are joined to the corresponding supports or plates, which as the latter and the louver itself are made of plastic, so that their installation is faster and easier, without any expansion problems as all components are made of the same material.

[0007] The aforementioned shafts are also provided with ribs in their longitudinal sense that improve their grip inside the hollow space of the louver itself.

[0008] According to another characteristic of the invention, the operative face of the louver itself, this is, that facing the air outlet opening, has a curved-convex shape with a curvature that maintains a constant air flow and outlet resistance regardless of the position of said louver.

[0009] It is also considered that the end laminar supports, made of plastic as stated before, incorporate a flat and intermediate chamber open on the side by which it is coupled to the base plate, inside which runs a metal sheet with its free and outwardly emergent edge having an orthogonal elbow that greatly improves the attachment of the louver as a whole to the base plate, said supports also being provided with small transverse and intermediate openings in which are coupled dies of the metal sheets which, allowing their coupling to the corresponding chambers, block them in the insertion end position, which facilitates a fast coupling between the metal sheets and the plastic envelope of the end supports.

DESCRIPTION OF THE DRAWINGS

[0010] As a complement of the description being made and in order to aid a better understanding of the characteristics of the invention, according to an example of a preferred embodiment, a set of drawings is accompanied as an integral part of the description where for purposes of illustration only and in a non-limiting manner the following is shown:

Figure 1 shows a perspective exploded view of an air conditioning diffuser louver constructed according to the object of the present invention.

Figure 2 also shows a perspective view of the same assembly of the previous figure, properly installed.

Figure 3 shows, finally, a sectional view of a detail of the assembly of the previous figure.

PREFERRED EMBODIMENT OF THE INVENTION

[0011] In view of the described figures, it can be seen that the air conditioning diffuser louvers disclosed by the invention consists of a tubular louver (1) with a cross section tending towards an isosceles triangle whose legs (2) are facing outwards and are curved-convex in shape, while its asymmetric side (3) meant to face the air outlet opening is curved-convex, with a suitable curvature to allow the outlet section or flow to remain constant in any position or orientation of the louver (1) itself.

[0012] Said louver (1) also incorporates internally, emerging from its equal sides (2), a pair of partitions (4) that act as retaining means for a stem (5) that emerges from a pair of laminar end supports (6), made of plastic

as the stem (5) itself and the assembly of the louver (1), so that the two stems (5) fit tightly in the ends of the louver (1), coaxially, thereby constituting the swivelling axis for said louver (1) allowing its optimum orientation at each instant.

[0013] To suitably stabilise the louver (1) itself on the supports (6) at any position of the former, the stems (5) performing shaft functions incorporate a plurality of ribs (7) in the sense of their generatrices, determining a pressure coupling inside the louver (1) as well as establishing a stepped rotation for the position changes of the louver (1).

[0014] The plastic supports (6) are hollow, incorporating a flat intermediate chamber that is open on the edge (8) by which it adapts to the base plate, being meant to receive inside them corresponding metal sheets (9), whose free edge meant to be left outside the corresponding support (6) is provided with an orthogonal end elbow (10) to facilitate their attachment to said base plate.

[0015] The metal sheets (9) are definitively stabilised inside the supports (6) in the same operation of housing or installing the latter by the existence in each sheet of a pair of dies (11), that define corresponding harpoon-shaped louvers which are elastically deformed when installing the sheet (9) and elastically restore their shape when they reach small side openings (12) operationally provided in the supports (6) that act as stops for said recesses (11).

4. Air conditioning diffuser louvers, according to previous claims, **characterised in that** the end supports (6) are hollow, incorporating an intermediate chamber coupled, by its edge (8) adapting it to the base plate, to a metal sheet (9) provided on its area emerging from the corresponding support (6) with an orthogonal elbow (10) for its attachment to the base plate.

5. Air conditioning diffuser louvers, according to claim 4, **characterised in that** each metal sheet (9) incorporates recesses defining flaps (11) for locking onto the openings (12) operationally established in the corresponding support plate (6).

Claims

1. Air conditioning diffuser louvers, of the type in which the louver itself adopts a tubular configuration and is mounted with freedom of rotation about a pair of end supports, embodied as sheets having means of attachment to the base plate of the diffuser, **characterised in that** said end supports (6), embodied as corresponding plastic plates, incorporate corresponding stems (5) emerging from its inner face as a single piece that together constitute the swivelling shaft of the louver (1) itself, which is also made of plastic with the same heat expansion coefficient as the supports (6) and their stems (5).
2. Air conditioning diffuser louvers, according to claim 1, **characterised in that** said stems (5) of the end supports (6) incorporate ribs or protrusions (7) in the sense of their generatrices, which enhance their angular grip inside the louvers (1) themselves.
3. Air conditioning diffuser louvers, according to previous claims, **characterised in that** the louver (1) itself has a curvature on its convex face (3), opposite the air outlet openings, such that the air flow section remains constant regardless of the louver orientation.

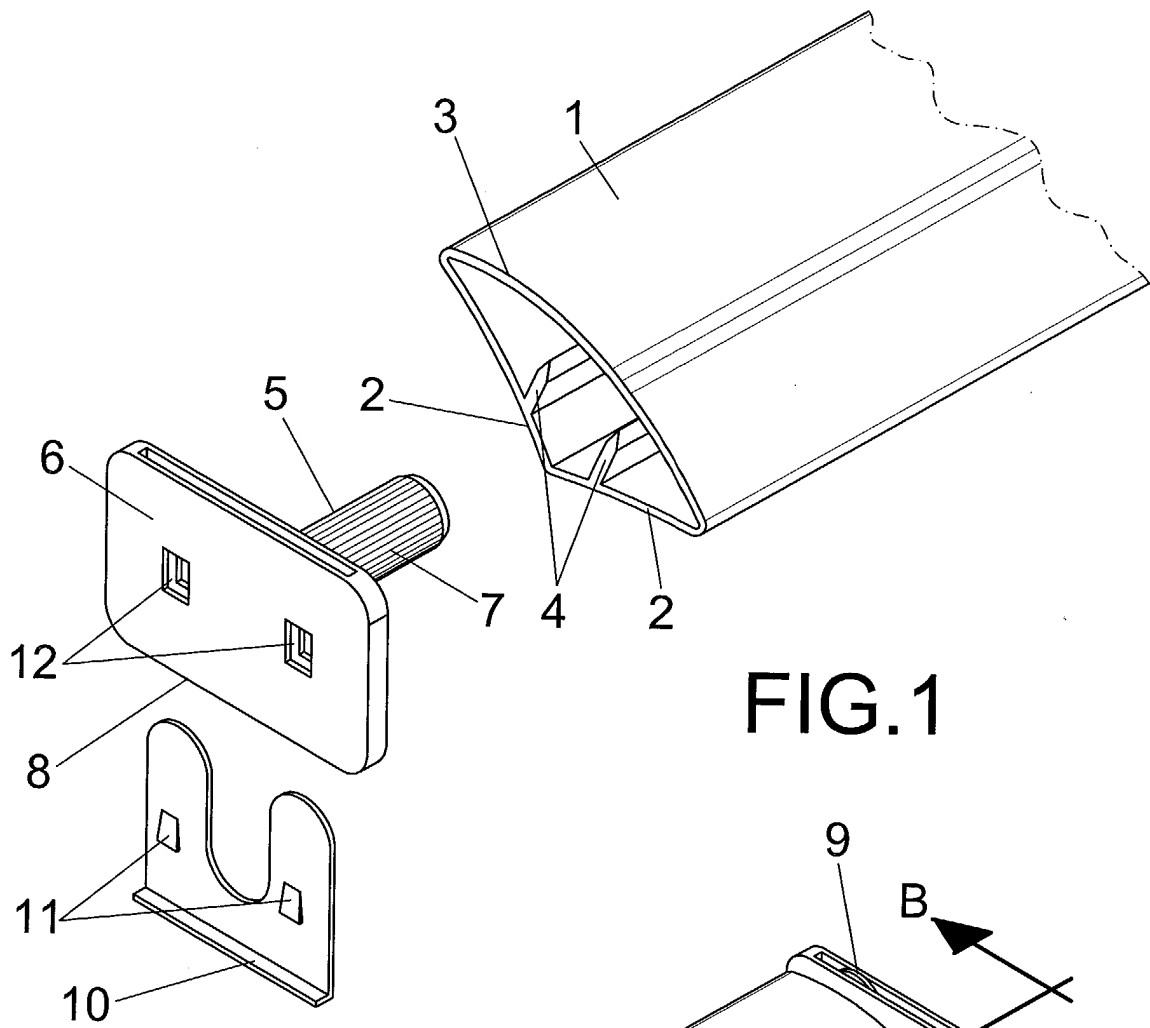


FIG.1

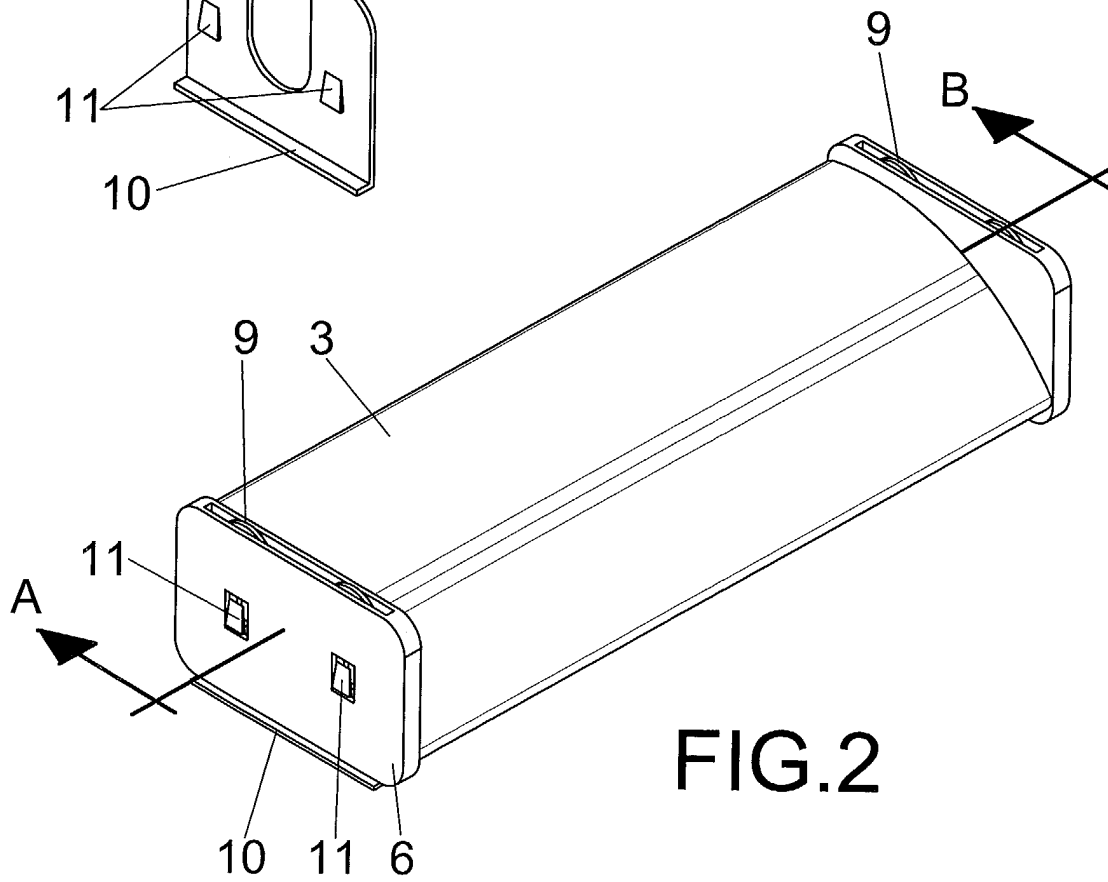


FIG.2

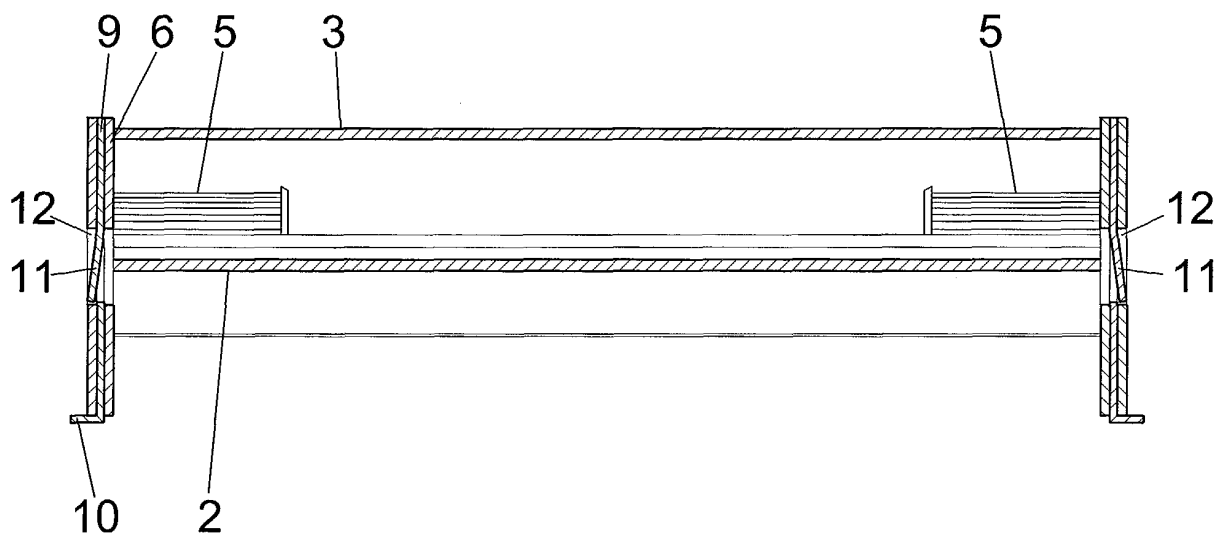


FIG.3
A-B