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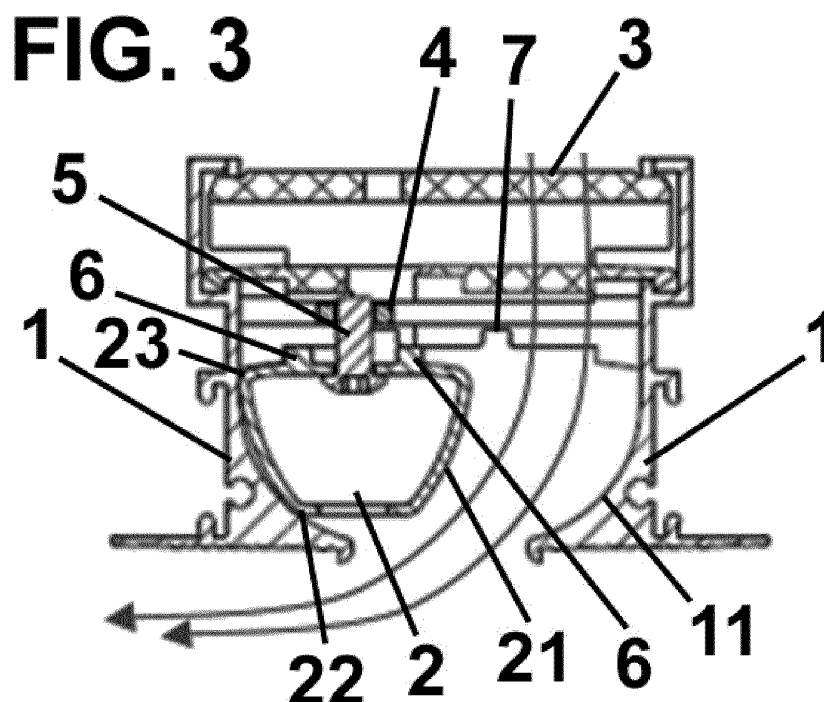
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(54) **DIFFUSER FOR AIR CONDITIONING INSTALLATIONS**

(57) The present invention relates to a diffuser for air conditioning installations comprising a pair of outer profiles (1) and an inner strip (2) located between both outer profiles (1) by means of at least one fixing bridge (3), where said inner strip (2) can be located in a first position and a second position with respect to the fixing bridge (3), wherein in said second position, the inner strip (2) is vertically and horizontally moved with respect to said first

position.

The present invention allows better airflow cooperation, allowing the closure of the air channel in one of the positions to prevent the generation of vortices which compromise the acoustic characteristic, and the opening of the air channel in the other position to balance out the head loss in both positions.



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Description

[0001] The present invention relates to a diffuser for air conditioning installations, the purpose of which is to supply air to the space to be air-conditioned, such that the diffuser is concealed in a ceiling or wall.

Background of the Invention

[0002] Diffusers are commonly used in air conditioning installations for the purpose of orienting the air outlet in a suitable manner.

[0003] These diffusers usually comprise a flat strip which moves horizontally to establish the different winter/summer configurations and which, along with the outer profiles, directs the air.

[0004] These diffusers known today have the drawback of compromising the operation in the cooling position as they allow a vortex to be generated below the deflector element causing the acoustic behavior thereof to become worse, limiting the maximum operating flow which allows assuring acoustic comfort.

[0005] These diffusers are conventionally assembled by means of two outer profiles put together by means of different permanent mechanical connection systems (for example, riveting, connection tubes, screwing, etc.) which require the use of tools, or by means of a sliding part that is embedded in the profile at one end and retains the deflector element.

[0006] Both constructive solutions are difficult to assemble and have a high cost.

[0007] Therefore, an objective of the present invention is to provide a diffuser with a tool-free factory assembly system and a system for directing air with a three-dimensional strip combining transverse movement with vertical position adjustment to obtain a better acoustic and aerodynamic behavior, which allows a larger flow to be driven.

Description of the Invention

[0008] The mentioned drawbacks are solved with the diffuser of the invention which has other advantages that will be described below.

[0009] The diffuser for air conditioning installations according to the present invention comprises a pair of outer profiles and an inner strip located between both outer profiles by means of at least one fixing bridge, where said inner strip can be located in a first position and a second position with respect to the fixing bridge, and is characterized in that in said second position, the inner strip is vertically and horizontally moved with respect to said first position.

[0010] As a result of this feature, the strip allows better airflow cooperation, allowing the closure of the air channel in one of the positions to prevent the generation of vortices which compromise the acoustic characteristic, and the opening of the air channel in the other position

to balance out the head loss in both positions.

[0011] According to a preferred embodiment, said inner strip or said fixing bridge comprises projections which are housed in the first position inside complementary housings of the fixing bridge or the inner strip and located in the second position outside said housings.

[0012] Advantageously, said inner strip is fixed to the fixing bridge by means of a fixing element, said fixing element being horizontally movable in said fixing bridge.

[0013] Furthermore, the side walls of the inner profile are preferably curved, and/or the inner walls of the outer profiles are curved. According to a possible embodiment, the curvature of the outer walls of the inner profile has a radius greater than the curvature of the inner walls of the outer profiles, defining two contacting edges at the operating height of the second position.

[0014] Preferably, in said first position the inner strip is centered horizontally with respect to the outer profiles, and in said second position the inner strip is moved towards an outer profile, with two edges in contact with the side wall of said outer profile, although it may also be possible that only one of the edges is in contact with the side wall of said outer profile.

[0015] Furthermore, in the second position the inner strip is vertically farther away from the fixing bridge than in the first position.

[0016] Advantageously, the fixing bridge is made of a plastic material; however, it could also be made of any suitable material which allows it to be assembled on and disassembled from the two outer profiles without any tools, which speeds up and simplifies the assembly of said profiles as no tools are required for that purpose.

[0017] Furthermore, the assembly of the bridge does not require making holes in the outer part of the profiles, which assures diffuser tightness.

Brief Description of the Drawings

[0018] To better understand the foregoing, drawings in which a practical embodiment is depicted in a schematic manner and only by way of non-limiting example are attached.

Figure 1 is an exploded perspective view of a part of the diffuser according to the present invention; Figure 2 is a sectional view showing the first position in which the inner strip can be located; and Figure 3 is a sectional view showing the second position in which the inner strip can be located.

Description of a Preferred Embodiment

[0019] As shown in Figure 1, the diffuser according to the present invention is designed to be assembled in a ceiling in air conditioning installations and comprises a pair of outer profiles 1 having a desired length, and for the sake of simplicity only a part of the profiles is shown in Figure 1.

[0020] There is located between these outer profiles 1 an inner strip 2 which is used as an aerodynamic strip, the position of which determines the orientation of the air outlet of an air conditioning installation, as will be explained below.

[0021] The inner strip 2 is fixed to the outer profiles 1 by means of one or more fixing bridges 3. To that end, the or each fixing bridge 3, which is preferably made of plastic, is laterally coupled on the outer profiles 1, and a fixing element 5, for example, a screw provided with a nut 4, is used to fix the inner strip 2 to the fixing bridge 3.

[0022] Figures 2 and 3 show the inner strip 2 in first and second positions. Furthermore, it can be seen in these views that the side walls 21 of the inner strip 2 are curved, and the inner walls 11 of the outer profiles 1 are also curved, so as to favor air conduction.

[0023] The first position (Figure 2) corresponds to the winter position, and in this first position the inner strip 2 is located in a position centered horizontally with respect to the outer profiles 1, the air coming out through the two sides thereof, as depicted by means of the corresponding arrows.

[0024] In this first position, projections 6 of the inner strip 2 which are located on its upper face in its usage position are located inside the complementary housings 7 of the fixing bridge 3. As can be seen, these housings 7 are located in the lower part of the fixing bridge 3 in its usage position.

[0025] It must be indicated that said projections 6 may be located in the fixing bridge 3, and in this case, the housings 7 would be located in the inner strip 2, with the projections 6 and housings 7 performing the same function.

[0026] The second position (Figure 3) corresponds to the summer position, and in this second position the inner strip 2 is moved horizontally to be substantially in contact with the inner wall 11 of the outer profile 1. The air therefore comes out only through one side of the inner strip 2, as depicted by means of the corresponding arrows. To that end, and even though the radius of curvature of the side walls 21 of the inner strip 2 is greater than the radius of curvature of the inner walls 11 of the outer profiles 1, edges 22 and 23 of the inner profile 2 assure contact along the entire outer profile 1 according to the depicted embodiment.

[0027] It must be indicated that it is possible that only one of said edges is in contact with the inner wall, where contact along the entire outer profile can also be assured.

[0028] According to the depicted embodiment, in this second position, the projections 6 of the inner strip 2 are located outside the housings 7 of the fixing bridge 3, such that the inner strip 2 is moved vertically with respect to the first position of the inner strip 2, given that the projections 6 contact the lower part of the fixing bridge 3. Therefore, in this second position the inner strip 2 is located at a lower height than in the first position, corresponding to the height of said projections 6 and the housings 7.

[0029] So when the inner strip 2 is located in two positions at a different height, the air channel can be closed in the summer position (second position) in order to prevent the generation of vortices which compromise the acoustic characteristic, and the air channel can be opened in the winter position (first position) to balance out the head loss in both positions.

[0030] Although reference has been made to a specific embodiment of the invention, it is obvious for one skilled in the art that the described diffuser is susceptible to a number of variations and modifications, and that all the mentioned details can be replaced with other technically equivalent details without departing from the scope of protection defined by the attached claims.

Claims

1. Diffuser for air conditioning installations, comprising a pair of outer profiles (1) and an inner strip (2) located between both outer profiles (1) by means of at least one fixing bridge (3), where said inner strip (2) can be located in a first position and a second position with respect to the fixing bridge (3), **characterized in that** in said second position, the inner strip (2) is vertically and horizontally moved with respect to said first position.
2. Diffuser for air conditioning installations according to claim 1, wherein said inner strip (2) or the fixing bridge (3) comprises projections (6) which are housed in the first position inside complementary housings (7) of the fixing bridge (3) or the inner strip (2) and located in the second position outside said housings (7).
3. Diffuser for air conditioning installations according to claim 1 or 2, wherein said inner strip (2) is fixed to the fixing bridge by means of a fixing element (5), said fixing element (5) being horizontally movable in said fixing bridge (3).
4. Diffuser for air conditioning installations according to any one of the preceding claims, wherein the side walls (21) of the inner profile (2) are curved.
5. Diffuser for air conditioning installations according to any one of the preceding claims, wherein the inner walls (11) of the outer profiles (1) are curved.
6. Diffuser for air conditioning installations according to claims 4 and 5, wherein the radius of curvature of the side walls (21) of the inner strip (2) is greater than the radius of curvature of the inner walls (11) of the outer profiles (1).
7. Diffuser for air conditioning installations according to claim 1, wherein in said first position the inner strip

(2) is centered horizontally with respect to the outer profiles (1).

8. Diffuser for air conditioning installations according to claim 1, wherein in the second position the inner strip (2) is moved towards an outer profile (1), substantially in contact with the side wall (11) of said outer profile (1). 5
9. Diffuser for air conditioning installations according to claim 1, wherein in the second position the inner strip (2) is vertically farther away from the fixing bridge (3) than in the first position. 10
10. Diffuser for air conditioning installations according to claim 1, wherein the fixing bridge (3) is made of a plastic material. 15

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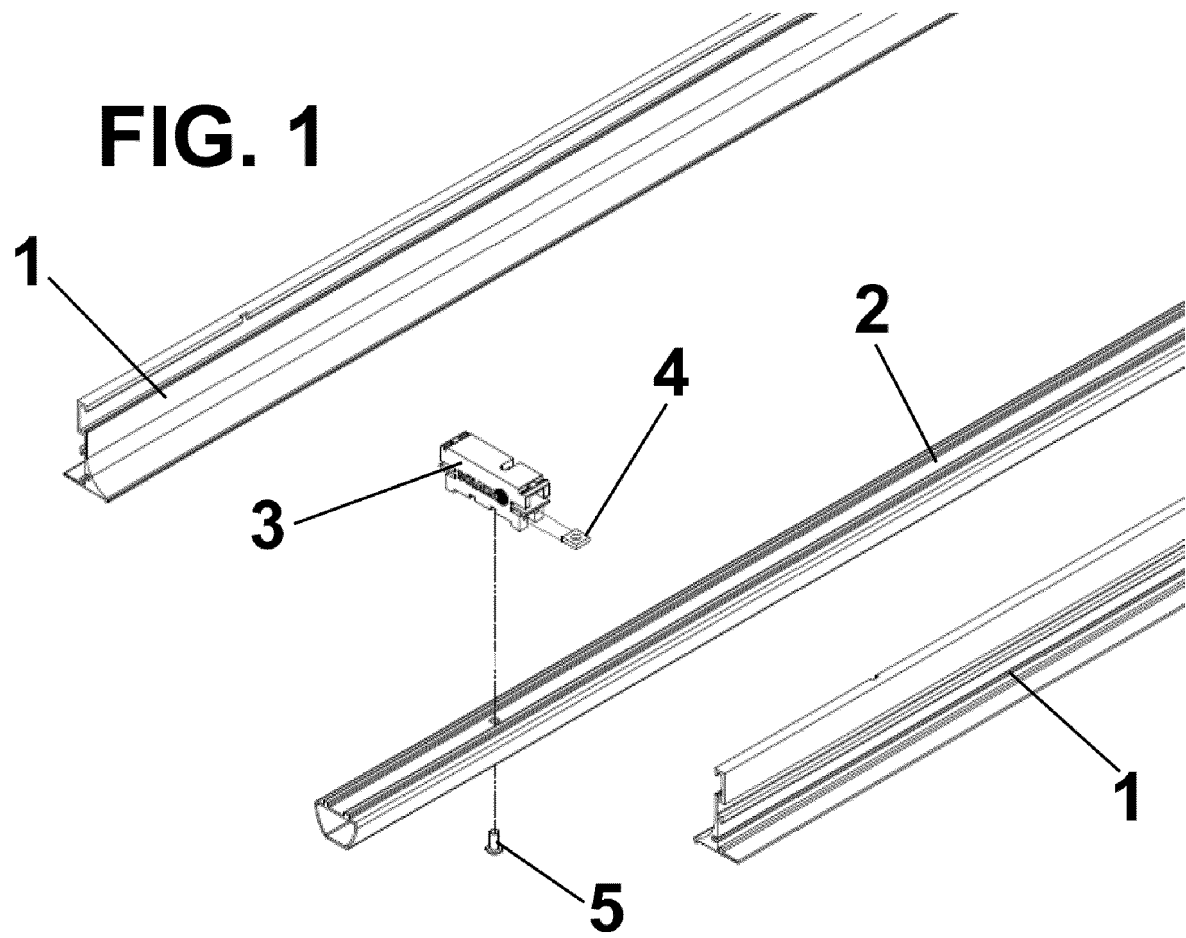
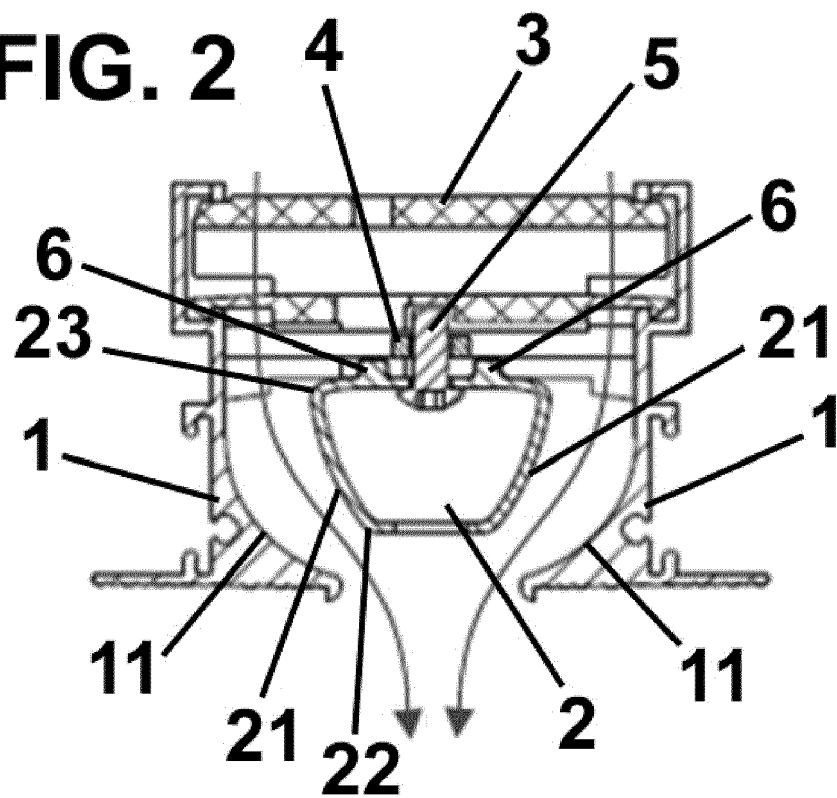
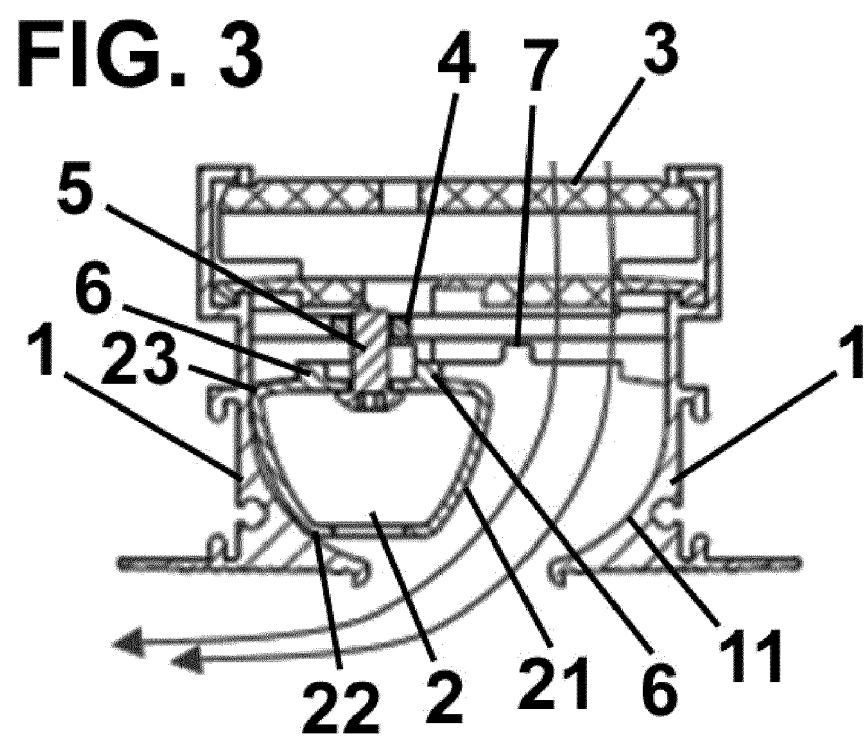


FIG. 2







EUROPEAN SEARCH REPORT

Application Number
EP 19 38 2039

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A	* page 4, line 30 - page 6, line 34; figures 1-9 *	2	
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Place of search		Date of completion of the search	Examiner
Munich		20 May 2019	Salaün, Eric
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82