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(71) Applicant: **Koolair, S.A.**
28936 Mostoles (Madrid) (ES)

(72) Inventor: **Susarte Torrijos, José, Tomás**
28936, MOSTOLES (Madrid) (ES)

(74) Representative: **Carpintero Lopez, Francisco et al**
Herrero & Asociados, S.L.
Alcalá 35
28014 Madrid (ES)

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(54) **Heat-adjustable diffuser for heating/air conditioning installations**

(57) The invention relates to a heat-adjustable diffuser for heating/air conditioning installations, comprising a frame for fixing to a wall on which a pivoting finned core of an air diffuser is assembled for the automatic orientation of the outlet flow according to the temperature of said flow, wherein the automatic orientation of the diffuser is established by means of a heat-expandable element capable of impinging on a lever acting on the body with fins

to cause the pivoting, according to its expansion or contraction caused by the heating or cooling of the air, wherein on the frame for fixing there are fixed two L-shaped side plates integrally joined to one another by means of a transverse profile for the support of the automatic positioning mechanism; additionally comprising a graduation scale indicating the pivoting degrees of the body with fins and means for limiting the pivoting in both directions.

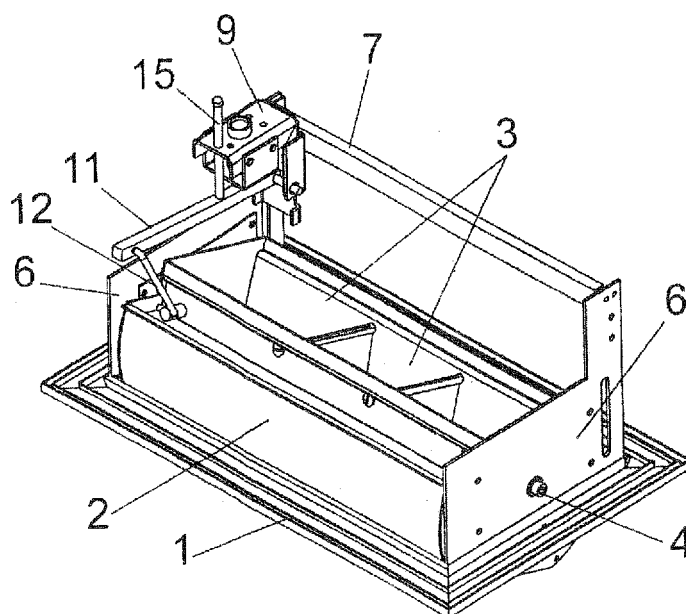


FIG. 3

Description

Object of the Invention

[0001] The present invention relates to a heat-adjustable diffuser for heating/air conditioning installations, provided to automatically perform the orientation of the body in which the finned core of the air diffuser is arranged, which orientation will be performed depending on the air exiting through said fins.

[0002] The object of the invention is to simply and effectively achieve the pivoting limits in either direction of the body of the finned core of the diffuser.

[0003] Obviously, the field of application of the invention is comprised within the industrial sector dedicated to the manufacture and installation of air conditioning apparatuses, used indistinctly for heating and/or cooling.

Background of the Invention

[0004] The equipment and/or apparatuses used indistinctly for heating and cooling include a pivoting body in which the finned core of the air diffuser is arranged, which body is assembled on a casing or frame which is fixed in an opening of the wall or conduit. Said body with fins allows, in its pivoting, orienting the air flow outlet upwards or downwards, with a certain inclination, depending on whether the apparatus works as a cooler or as a heater.

[0005] Said orientation was performed manually with the drawbacks and problems which may arise and which are not necessary to mention.

[0006] Currently, this pivoting and corresponding adjustment of the body of the diffuser is performed automatically, depending on the temperature of the air exiting through the finned core of the diffuser, and in this sense, Spanish utility models U 200601710 and U 200800465 of the same applicant can be mentioned. Specifically, utility model 200601710 essentially describes an automatic positioning mechanism for the body with the fins, according to the outlet temperature, the mechanism being provided to detect the outlet air temperature and, in combination with a heat-expandable element, to be able to carry out the impingement of the latter on a lever connected with the body with the fins to establish the greater or lesser pivoting of the latter and thus cause one orientation or another of the outlet fins.

[0007] In addition, utility model 200800465 essentially describes a specific and advantageous embodiment of a stop element for limiting the inclination in either direction of the mentioned body with fins.

Description of the Invention

[0008] The proposed diffuser, following the structural and conceptual line established in the two utility models mentioned in the previous section and belonging to the same applicant, has a series of particularities and innovations which affect the way to assemble the automatic

positioning mechanism and the means for limiting the pivoting of the finned core corresponding to the diffuser itself.

[0009] Specifically, the diffuser is of the type in which its finned core is pivotably assembled on a casing or frame fixed to the wall or conduit, and is connected with the automatic positioning mechanism for said finned core, having as a first novelty feature the incorporation of a pair of side and rear plates fixed to the frame by means of any suitable system, between which plates a transverse profile is integrally joined, together forming a support for the mentioned automatic positioning mechanism.

[0010] Another novelty feature relates to stop means for limiting the pivoting of the body with fins, said means being formed, for limiting the pivoting in a heating operation, by a screw with a checknut which is fitted in a groove provided in one of the side plates of the support, which screw can move along this groove and impinge on the body with fins to establish the limit of the pivoting of the latter, the definitive position of the screw being consolidated by means of tightening the checknut provided therein.

[0011] In relation to the means for limiting the pivoting of the finned core in the cooler function, they are formed by another screw with a checknut, assembled in this case in a profile belonging to the support of the automatic operation mechanism, which screw at its free end is opposite a lever belonging to this automatic positioning mechanism, such that in the pivoting in the cooler function, the end of said screw will form a stop against the mentioned lever, thus limiting said pivoting of the finned core.

[0012] Another novelty feature consists of the finned core having in its outer surface, in correspondence with the upper part of one of its side parts, a scale indicating the degrees which the body can pivot in either direction, which scale has an intermediate mark "0" corresponding to the horizontal position of the body with fins, and from that intermediate mark it has two scales on both sides which will indicate the degrees which the body with fins can pivot to orient such fins with either inclination, downwards or upwards, depending on whether the air discharge is hot or cold, respectively. The angular pivoting movement will preferably be comprised between -20° and +20°, with the possibility of occupying intermediate positions according to the temperature of the air exiting through the finned core.

Description of the Drawings

[0013] To complement the description which will be made below and for the purpose of aiding to better understand the features of the invention according to a preferred practical embodiment thereof, a set of drawings is attached as an integral part of said description, in which the following has been depicted with an illustrative and non-limiting character:

Figure 1 shows a depiction according to a general front perspective of the diffuser of the invention on the frame fixed to a wall or conduit. The scale with which the finned core is provided for the air outlet can be seen in this figure.

Figure 2 shows a perspective depiction of the assembly of the diffuser without the finned core, allowing the view of the novel essential parts thereof, with the exception, obviously, of the scale included in the finned core not depicted in this figure.

Figure 3 shows a depiction corresponding to a perspective view of the assembly of the previous figure anterior with the finned core assembled.

Figure 4 shows a side view of the assembly of the diffuser depicted in the previous figure.

Preferred Embodiment of the Invention

[0014] As can be seen in the mentioned figures, the heat-adjustable diffuser of the invention comprises, as is conventional, a frame (1) forming the casing for fixing to the wall or conduit (5), as depicted in Figures 1 and 2. A core (2) with air outlet diffuser fins (3) is pivotably assembled on said frame (1), the assembly being performed through two opposite side screws (4) acting as a pivoting shaft of the actual core (2).

[0015] Respective side plates (6) forming the actual support for the body (2) are integrally joined in a suitable manner on the frame (1), and in which plates (6) the screws (4) acting as a pivoting shaft for the body (2) are precisely arranged. These side plates (6) have a rear notch in a straight or curved dihedron (according to size), determining an "L" shape of the actual plates (6), being stiffened with one another through the smaller branches of this considered L-shaped configuration by means of a transverse profile (7).

[0016] As seen in Figure 1, the upper part of the body (2) includes a scale (8) corresponding to the pivoting degrees in either direction of the body (2), because as has already been mentioned, the diffuser is applicable in air conditioning installations for both hot air and cold air, and depending on whether the function is a heating function or a cooling function, the body (2) and with it the air outlet diffuser fins (3) must be oriented downwards or upwards, respectively, since hot air must be directed downwards so that it later moves upwards, and the cold air must be directed upwards so that it later moves downwards, due to the different density thereof and to achieve in both cases leveling and homogenizing the ambient temperature.

[0017] As a novelty feature of the invention, the mentioned scale (8) allows knowing the pivoting degree of the body (2) and therefore the inclination of the diffuser fins (3), in either direction, being able to be placed at the necessary inclination according to the outlet air temperature, between the intermediate point "0" corresponding to the horizontal and the points of, for example, +20° and -20° corresponding to the positions of operation as a

cooler and as a heater, respectively.

[0018] The diffuser includes the automatic positioning mechanism which has already been mentioned in the previous section, which is formed by a support (9) fixed to one of the side plates (6) and to the transverse profile (7), this automatic positioning mechanism being complemented with a heat-expandable element (10) which, when heated, expands and impinges on a lever (11) to which a rod (12) acting on the body (2) is articulated, causing the pivoting of the latter in a downward direction, whereas when the air is cold, the heat-expandable element (10) contracts and stops acting on the lever (11), whereby the rod (12) stops acting on the body (2), the pivoting in the opposite direction of the body (2) being caused, based on a spring associated with the lever (11).

[0019] In addition to the side plates (6) and the transverse profile (7) as support means forming part of the novelty features of the diffuser which is being described, and the actual graduated scale (8), the stop means for limiting the pivoting in either direction of the core (2) with air outlet diffuser fins (3) are also included as a novelty.

[0020] Specifically, in the pivoting in the downward direction for the heating function, the means for limiting said pivoting are formed by a screw (13) with a fixing checknut, this screw (13) having play on a groove (14) provided to that effect in one of the side plates (6), such that by moving the screw through this groove, the end of the former will impinge on the body (2), establishing the pivoting limit, at which time the checknut of the screw (13) will be tightened to fix the latter in the mentioned position.

[0021] The pivoting in the opposite direction, for the cooling function, is performed by means of a screw (15), also with a checknut for locking it, which screw (15) will impinge on the lever (11) to form the limiting stop in the upward pivoting direction.

Claims

1. Heat-adjustable diffuser for heating/air conditioning installations, comprising a frame for fixing to the wall or conduit on which a finned core of an air diffuser is assembled such that it can pivot in either direction, by means of which core it is possible to automatically orient the outlet air flow depending on the temperature of said air, the automatic orientation being established by means of a positioning mechanism based on a heat-expandable element capable of impinging on a lever acting on the body with fins to cause the pivoting in either direction of the latter, depending on the expansion or contraction of said heat-expandable element and caused by the heating or cooling of the air, **characterized in that** on the frame for fixing to the wall there are fixed two L-shaped side plates integrally joined to one another by means of a transverse profile, together determining a support for the automatic positioning mecha-

nism; a graduation scale indicating the pivoting degrees in either direction of the body with fins furthermore having been provided, also having means for limiting the pivoting in both directions of the actual finned core, according to its operation as a heater or as a cooler. 5

2. Heat-adjustable diffuser for heating/air conditioning installations according to claim 1, **characterized in that** the graduation scale is provided at the upper part of one of the ends of the finned core. 10

3. Heat-adjustable diffuser for heating/air conditioning installations according to claim 1, **characterized in that** the means for limiting the pivoting of the body with fins, in its function as a heater, are formed by a screw with a fixing checknut, which screw is movable in a groove provided to that effect in one of the side support plates fixed to the frame of the diffuser, with the particularity that the free end of said screw is opposite the actual body with fins, abutting against the latter to establish the corresponding downward pivoting limiter of such body with fins. 15
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4. Heat-adjustable diffuser for heating/air conditioning installations according to claim 1, **characterized in that** the means for limiting the pivoting of the body with fins, in its function as a cooler, are formed by a screw with a fixing checknut, which screw is assembled on the respective support of the automatic positioning mechanism for the body with fins, having the opposite free end of such screw on the lever acting as means for pivoting such body with fins, said end of the screw on the mentioned lever acting as a stop to establish the upward pivoting limiter of the actual body with fins. 25
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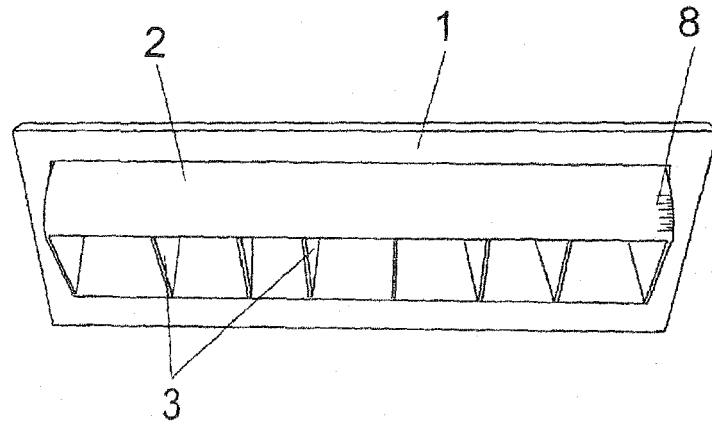


FIG. 1

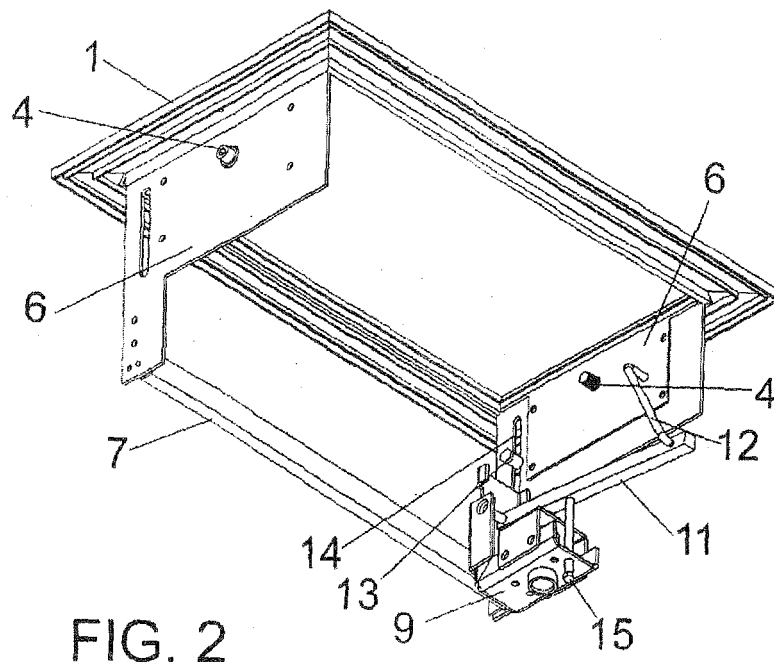


FIG. 2

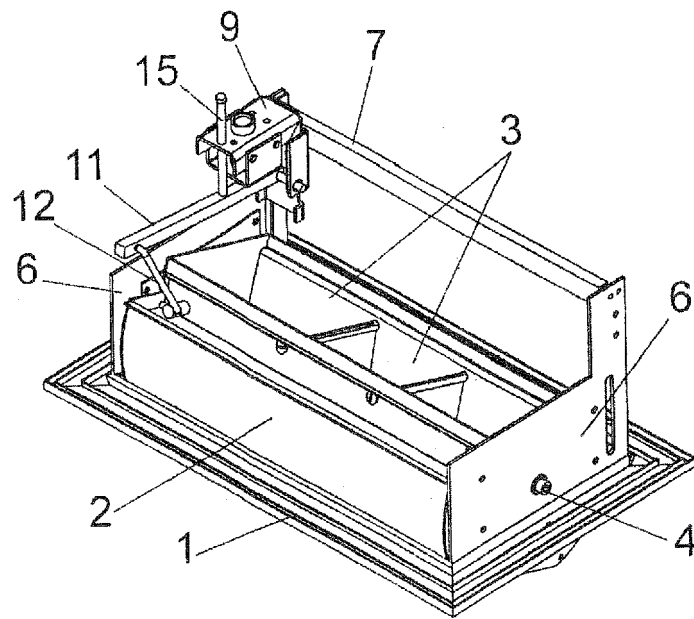


FIG. 3

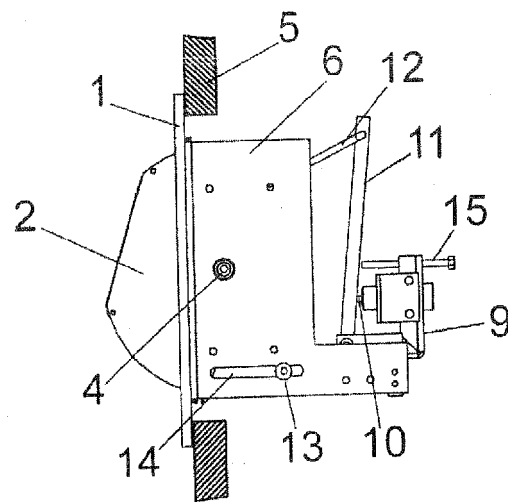


FIG. 4

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- ES 200601710 U [0006]
- ES 200800465 U [0006]
- ES 200601710 [0006]