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(54) Improved system for air conditioning living spaces

(57) Improved system for air conditioning living spaces that incorporates a system for circulating conditioned water. The system comprises a tray (1) to which a sound-absorbing web is adhesively bonded, a panel (3) of capillary tubes through which conditioned water circulates, a layer of insulating material (4) being provided on this panel (3) to prevent energy losses, and it is characterized in that the layer of insulating material (4) is adhesively bonded over its entire edge to the inner perimeter of the tray (1).

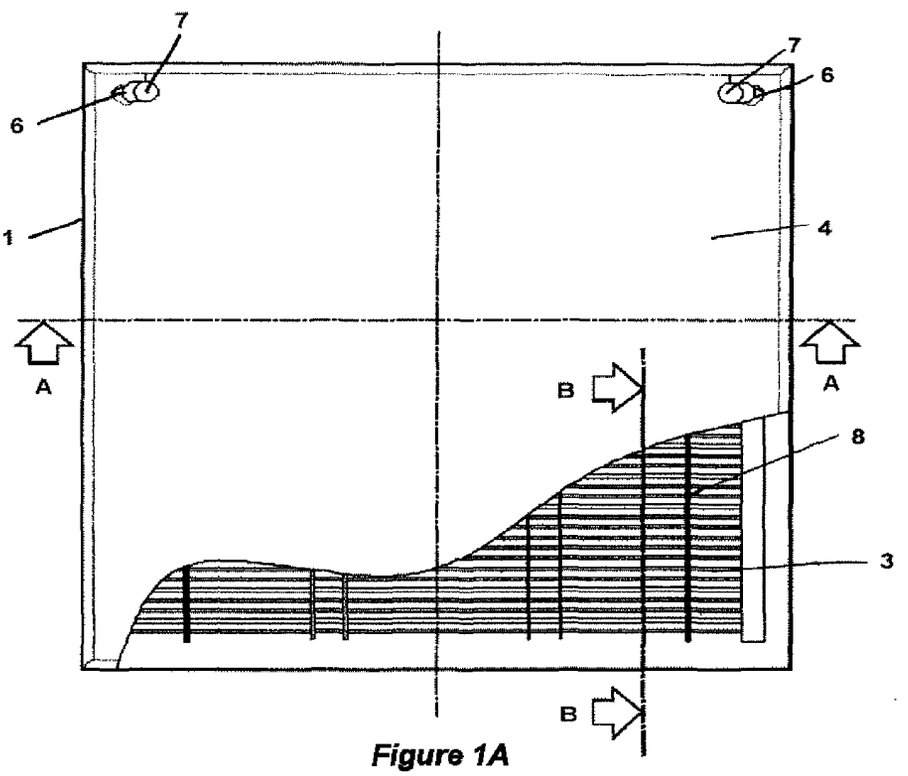

Figure 1A

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Description

[0001] The present invention relates to an improved system for air conditioning living spaces, said air conditioning being achieved by means of the incorporation of a system for circulating conditioned water to a metal false ceiling.

Prior Art

[0002] In the majority of cases, the air conditioning of areas or living spaces is currently achieved by means of the circulation of cooled air that gains access to the various living spaces via a series of grids incorporated into the ceiling of said living spaces.

[0003] Thus, for example, European patent 0 548 480 filed on 6 October 1992 in the name of Hewing GmbH, refers to a cooling ceiling equipped with a system of tubes through which cooling water flows, which ceiling is easy to assemble and dismantle and in which there is heat transmission between the ceiling elements and the cooling tubes.

[0004] In its European patent 0 651 107, Hewing GmbH refers to a cooling ceiling for conditioning ambient air using a pipe system through which cooling water circulates. This ceiling is distinguished in that the joining elements can be fitted with greater structural freedom.

[0005] European patent 0 518 245, filed on 6 June 1992 in the name of Gebrüder Trox GmbH, protects a cooling ceiling for cooling the air in a premises. This ceiling consists of heat-conducting rails through which cooling water passes and which are suspended from a natural ceiling of the building's structure.

[0006] Furthermore, systems for air conditioning living spaces are also known which consist of a metal tray, a climate-control system and an insulating material, with a panel of capillary tubes through which water circulates at a suitable temperature for air conditioning the living space. These air-conditioning systems are mounted *in situ*, the panel of capillary tubes being adhesively bonded to the tray and the insulating material being placed on top.

Detailed description of the invention

[0007] The present invention aims to substantially improve upon all that is currently known in relation to the air conditioning of areas or living spaces, and for this purpose the new air-conditioning system proposed by this application, which incorporates a system of conditioned circulation to a false ceiling, comprises a tray optionally provided with perforations, to which a sound-absorbing web is adhesively bonded, a panel of capillary tubes through which conditioned water circulates, a layer of insulating material being placed on this panel to prevent energy losses, characterized in that the layer of insulating material is adhesively bonded over its entire edge to the inner perimeter of the tray.

[0008] According to the invention, the layer of insulating material has its own perforations through which panel connectors that join the panel to the main pipe network emerge.

[0009] It is also a characteristic of the invention to apply an adhesive bead over the panel of capillary tubes so that it adhesively bonds said panel to the tray without being interposed between the two elements. This results in an intimate contact between the capillary tubes of the panel, guaranteeing the system's good performance.

Description of a preferred embodiment

[0010] An explanation will be given below, with the aid of the accompanying drawings, of a preferred embodiment of the improved system for air conditioning living spaces that is the subject of this application, and it should be understood that said description does not in any way aim to limit the scope of the present invention.

[0011] With reference to Figure 1A, the latter shows a top plan view of an air-conditioning system according to the invention. Figures 1B and 1C show views of sections A-A and B-B, respectively, in Figure 1A. The air-conditioning system consists of a metal tray (1) of variable dimensions that may or may not have perforations. A web, namely a fabric composed of glass and cellulose fibres, may be adhesively bonded to said tray (1) to improve sound absorption. Over this web is a panel (3) of capillary tubes, which in the preferred case would be made from plastic, through which water circulates at a suitable temperature for air conditioning the living space. Over this panel (3), to prevent energy losses, there is a layer of insulating material (4) (preferably a rubber compound) that is adhesively bonded over its entire edge to the inner perimeter of the tray (1). This layer of insulating material (4) has perforations (6) via which connectors (7) of the panel (3) for joining this panel (3) to the main pipe network emerge.

[0012] Figure 1C shows a view, on line B-B in Figure 1A, of the air-conditioning system. In this figure it is possible clearly to see the adhesive bead (8) over the panel (3) of capillary tubes such that it adhesively bonds said panel (3) to the tray (1) without being interposed between the two elements.

[0013] In sum, the air-conditioning system that is the subject of the invention, which is provided fully assembled, offers a series of advantages, namely:

- the aesthetic and mechanical properties of a metal false ceiling;
- climate control (cooling and heating) for the living space in which it is to be installed;
- simple fitting;
- ability to be fitted in all types of buildings, including those with special requirements, for example requirements in terms of air purity and fire protection.

[0014] It should be understood that the aforesaid is simply a description of a preferred embodiment of the air-conditioning system that is the subject of this application. A number of variations and modifications will be obvious to those skilled in the art and all of these should be regarded as included within the scope of the present invention, which is limited solely by the attached claims.

Claims

1. Improved, fully assembled system for air conditioning living spaces by means of the incorporation of a system for circulating conditioned water to a false ceiling, which comprises a tray (1) optionally provided with perforations, to which a sound-absorbing web is adhesively bonded, a panel (3) of capillary tubes through which conditioned water circulates, a layer of insulating material (4) being placed on this panel (3) to prevent energy losses, **characterized in that** the layer (4) of insulating material is adhesively bonded over its entire edge to the inner perimeter of the tray (1).

2. Air-conditioning system according to Claim 1, **characterized in that** the insulating layer (4) has its own perforations (6) through which connectors (7) of the panel (3) emerge.

3. Air-conditioning system according to Claims 1 and 2, **characterized in that** an adhesive bead (8) is applied over the capillary-tube panel (3), adhesively bonding the latter to the tray (1).

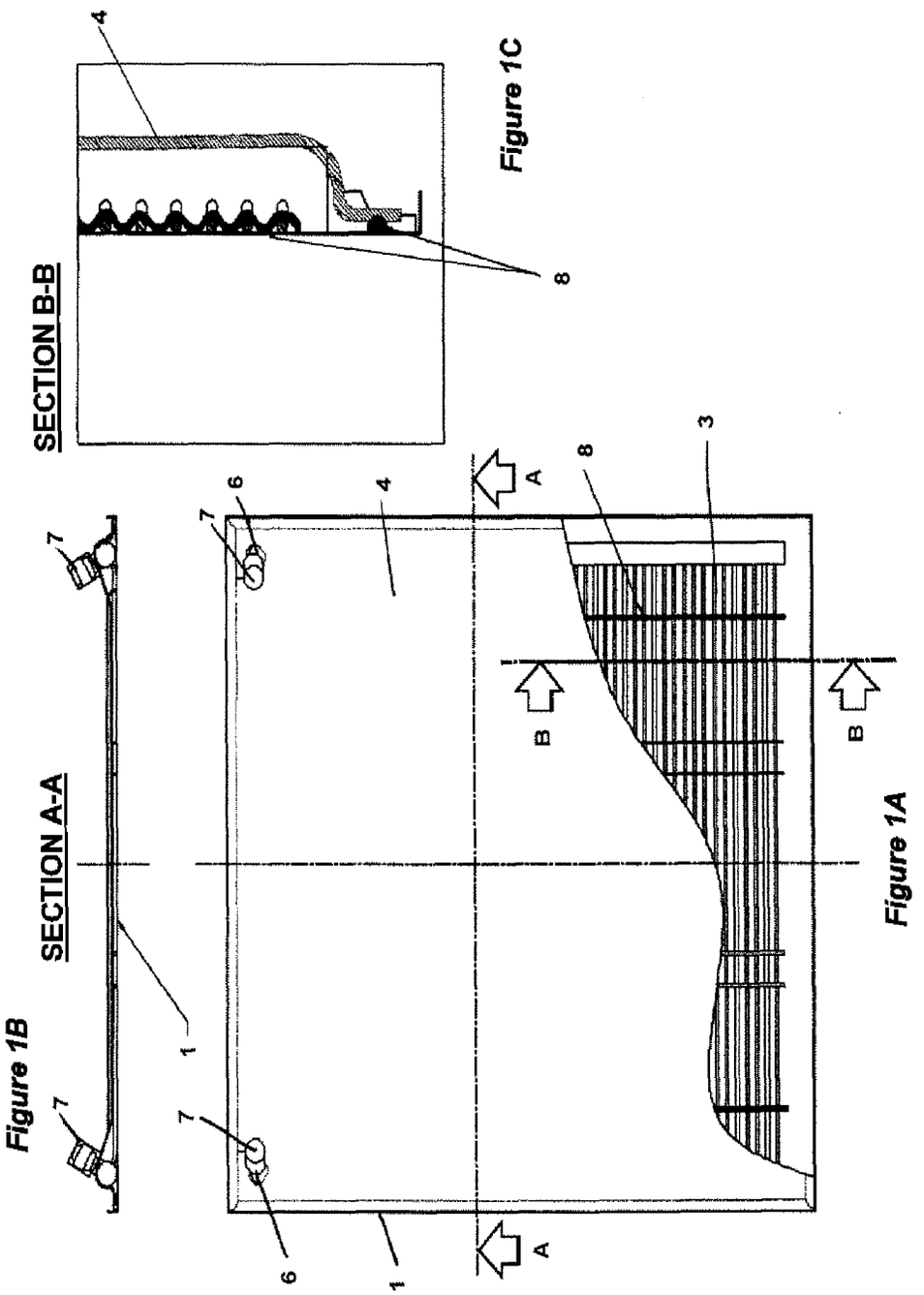

Figure 1C

Figure 1B

Figure 1A

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 38 1020

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)
F24F
F24D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	6 July 2005	Gonzalez-Granda, C

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 38 1020

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