Panel for providing curtain walls

A panel (10) for providing curtain walls comprising
- a first internal thermally insulating layer (11),
- a second external infilling layer (12),
- at least one spacer body (13), which is interposed between the first and second layers, is fixed to both by corresponding fixing means, and is designed to form a ventilation air space.

Fig. 2
Description

[0001] The present invention refers to a panel for providing curtain walls.
[0002] Nowadays for containing the energy costs of air-conditioning the interiors of buildings, both residential and industrial, basically two types of measures are adopted.
[0003] A first type of measure involves laying a series of adjacent thermally insulating panels, designed to form what is known as a "coat", on the outside surfaces of the perimeter walls of a building.
[0004] Such thermally insulating panels, for example made of high density rock wool, are fixed to the outside surfaces by means of special and known adhesive glues or mortars, and are then mechanically secured to the walls by means of dowels.
[0005] Over these panels an infilling and a finishing are carried out, for example by performing a reinforced smoothing, i.e. with a net on the inside to reinforce the smoothing, and finally a painted finishing.
[0006] This "coat" system, although widely appreciated and widespread, has acknowledged drawbacks, such as maintaining the interior living spaces and eliminating the phenomenon of thermal bridges, and it also has some limitations.
[0007] The main limitation of the coat system is that it does not prevent water from settling on the outside surface of the building, thus altering the thermal efficiency calculations. The risk of infiltrations also remains, for example through the joining areas of two adjacent insulation panels, as well as the risks of formation of condensation on the inside surfaces of the building itself.
[0008] A second type of measure involves the provision of what is known as a curtain wall.
[0009] The provision of a curtain wall requires

- a layer of thermally insulating panels, to be placed on the outside surface of a wall of the building; such panels can be made of mineral wool, mineralised wood fibre, polystyrene, polyurethane, or other similar and equivalent material; such thermally insulating panels are applied to the wall with dowels, made of nylon, steel or aluminium, or with a combined technique of gluing and dowels;

- a metal structure, to be anchored to the wall, to support an external façade of cladding, such façade being laid on such structure at a preset distance from the layer of thermally insulating panels so as to form a gap for the passage of air.

[0010] The support structure simultaneously forms the width of the gap and provides the support for the external façade.
[0011] The curtain gap is open on the top and on the bottom to allow the ventilation of the system, so as to determine a "chimney effect" that is such as to cause an ascending air current which disperses the water vapour coming from the interior spaces, and which therefore eliminates the humidity on the surface of the layer of thermally insulating panels and from the wall of the building.
[0012] The curtain wall also constitutes a barrier against excessive solar irradiation and it limits the transmission of external noise towards the interior of the building.
[0013] The gap is compartmentalised, i.e. subdivided into vertical channels, by means of the support structure, to prevent the triggering of air currents in a substantially horizontal direction, which can lead to sound disturbances and annoying vibrations, and contribute to increase in the risks of propagation of fire;

- an external façade, made from slabs fastened to the support structure.

[0014] The cladding slabs can be made of various different materials: metallic materials, special plastic materials, concrete, stone or fake stone, ceramic, wood and the like.
[0015] The advantages that are obtained with the measure of providing a curtain wall are the advantages obtained from "coat" insulation, i.e. an increase in the thermal and acoustic insulation of the interior spaces, elimination of thermal bridges, protection of the walls from atmospheric agents and infiltrations of humidity, the ability to carry out the measure without inconveniencing the residents of the building because work is only carried out on the outside of the building, together with a further and greater advantage in comparison to coat insulation: the ventilation gap ensures that any humidity that may be present in the gap itself, either because it comes out from the walls of the building or because it enters from outside the external façade, is easily eliminated, thus increasing the comfort of the interior spaces and reducing the risk of the formation of condensation on the interior surfaces of the building.
[0016] Other advantages of the curtain wall, as noted above, are the barrier to solar irradiation and to the transmission of sounds from the outside to the interior of the building.
[0017] This second type of curtain wall measure thus ensures excellent thermal insulation both in summer and in winter, with consequent energy savings in terms of reduced energy consumption for air conditioning in summer and for heating in winter.
[0018] Notwithstanding the advantages of providing a curtain wall, as described above, it is however complex and therefore burdensome both in terms of raw materials and in terms of labour and construction time, since it is first necessary to apply the layer of thermally insulating panels onto the walls of the building, then assemble the support structure for the slabs that form the façade, and finally attach the actual façade slabs to this structure.
[0019] The aim of the present invention is to provide a panel for providing curtain walls that makes it possible to build curtain walls more rapidly and economically than
in the known art.

[0020] Within this aim, an object of the invention is to provide a panel that assures thermal insulation to the standards of the panels for providing "coat" coverings of the known type.

[0021] Another object of the invention is to provide a panel that can be dimensioned so as to adapt to geometric needs as well as according to the thermal insulation and protection requirements of the building on which it is to be used.

[0022] A further object of the invention is to provide a panel for providing curtain walls that is structurally simple and easy to use, can be made using known systems and technologies, and at low cost.

[0023] This aim, as well as these and other objects which will become better apparent hereinafter, are achieved by a panel for providing curtain walls, that comprises

- a first internal thermally insulating layer,
- a second external infilling layer,
- at least one spacer body, which is interposed between said first and second layers, is fixed to both by corresponding fixing means, and is designed to form a ventilation air space.

[0024] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a preferred, but not exclusive, embodiment of the panel for providing curtain walls according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

- Figure 1 is a perspective view of a panel according to the invention;
- Figure 2 is an exploded perspective view of the panel in Figure 1;
- Figure 3 is a cross-section view of an installed panel.

[0025] With reference to the figures, a panel for providing curtain walls according to the invention is generally indicated in figure 1 with the reference number 10.

[0026] The panel 10 comprises

- a first internal thermally insulating layer 11, to be placed on the outside surface of a wall of a building;
- a second external infilling layer 12,
- at least one spacer body 13, which is interposed between the first 11 and second 12 layers, is fixed to both by corresponding fixing means, and is designed to form a ventilation air space.

[0027] The first thermally insulating layer 11 is constituted, for example but not necessarily so, by a slab of rock wool.

[0028] The second layer 12 is constituted, again for example but not necessarily so, by a slab of rock wool 13, and therefore is also thermally insulating.

[0029] The second layer 12 can also be non-thermally insulating.

[0030] The spacer body 13 is constituted, in the embodiment of the invention described herein for the purposes of non-limiting example of the invention, by a sheet of metallic material which is corrugated, i.e. folded so as to form laterally adjacent ventilation channels 16.

[0031] This sheet of metallic material is preferably made of aluminium, but it is understood that it can also be made of other metallic materials as well as other equivalent non-metallic materials, such as wood or plastic.

[0032] The panel of metallic material has first mutually coplanar portions 17, which are meant to face one of the two first or second layers, and second portions 18, which also are mutually coplanar and are meant to face the other one of the two first or second layers.

[0033] The first 17 and second 18 portions are formed alternately and are joined by intermediate portions 19 that define the thickness of the ventilation air space, i.e., of the ventilation channels 16.

[0034] These intermediate portions 19 each represent a plurality of openings 20, shown in the figures as being rectangular but understood as also being conceivable in other shapes, which are adapted to connect the laterally adjacent channels 16.

[0035] The edges 21 of the metal sheet are folded in an S-shape, with an intermediate portion that is also provided with openings 20.

[0036] The means of fixing the spacer body 13 to the two first 11 and second 12 layers are constituted by layers of adhesive, first layers 23 for the fixing of the first portions 17 to the first thermally insulating layer 11, and second layers 24 for the fixing of the second portions 18 to the second external layer 12.

[0037] Similarly, the opposite faces of the edges 21 are also glued to the first and second layers.

[0038] Figure 3 shows a cross-section of a panel fixed to a wall, with two identical panels 10a and 10b flanking it.

[0039] The panel 10 is fixed to a wall 30 with systems that are known and similar to a panel for providing "coat" coverings.

[0040] It can be seen, for example, that the panel 10 is fixed by means of a layer of special adhesive mortar and then secured with dowels 29, designed to mechanically secure the entire panel 10 to the wall 30.

[0041] The panel 10 must be installed in such a way that the channels 16 are arranged in a substantially vertical direction, i.e. so that they run from the bottom upwards.

[0042] The flanking identical panels 10a and 10b can be arranged in such a way that the channels 16 of an upper panel are arranged at the channels 16 of the identical lower panel, or they can be staggered; in both cases ascending paths are determined for the air in the gap between the first layers and the second layers.

[0043] The external façade formed by the flanked second layers 12 is to be refinished, for example with a smoothing layer 14, possibly with a reinforcement net.
inside, which is not shown and is understood to be of a type that is in and of itself known.

[0044] On the smoothing layer 14 the finishing layer 15 is applied, for example by means of a coat of paint.

[0045] In practice it has been found that the invention fully achieves the intended aim and objects.

[0046] In particular, with the invention a panel for providing curtain walls has been provided that makes it possible to build curtain walls more rapidly and economically than in the known art.

[0047] Indeed, by applying a series of such identical panels according to the invention to an outside wall of a building, with the channels 16 oriented from the bottom upwards a plurality of communicating chimneys is formed, for the circulation of the air in the gap.

[0048] A curtain wall provided by using similar panels 10 according to the invention is installed in a much shorter time than curtain walls of known types, since it is not necessary to assemble any support structure for the external facade, and it is not necessary to attach the slabs of the external facade to the support structure.

[0049] Moreover, with the invention a panel has been provided that makes it possible to provide curtain walls with performance levels that are not inferior to those of curtain walls of known types.

[0050] Moreover, with the invention a panel has been provided that can be dimensioned so as to adapt to geometric needs as well as to the thermal insulation and protection requirements of the building on which it is to be used, such a panel being capable of being made with first 11 and second 12 layers of materials and properties that are variable according to requirements, as well as with spacer bodies 13 of a shape and thickness that are such as to form channels for the air, as well as gaps, of the desired width.

[0051] Moreover, with the invention a panel for providing curtain walls has been provided that is structurally simple and easy to use, can be made using known systems and technologies, and at low cost.

[0052] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims. Moreover, all the details may be substituted by other, technically equivalent elements.

[0053] In practice the materials employed, as well as the dimensions and the contingent shapes, may be any according to requirements and to the state of the art.


[0055] Where technical features mentioned in any claim are followed by reference signs, such reference signs have been inserted for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A panel (10) for providing curtain walls, characterized in that it comprises
   - a first thermally insulating layer (11),
   - a second external infilling layer (12),
   - at least one spacer body (13), which is interposed between said first and second layers, is fixed to both by corresponding fixing means, and is designed to form a ventilation air space.

2. The panel according to claim 1, characterized in that said first thermally insulating layer (11) is constituted by a slab of rock wool or other similar and equivalent slab.

3. The panel according to one or more of the preceding claims, characterized in that said second layer (12) is formed by a slab of rock wool or other similar and equivalent material.

4. The panel according to one or more of the preceding claims, characterized in that said spacer body (13) is constituted by a sheet of metallic material which is corrugated, i.e., folded so as to form laterally adjacent ventilation channels (16).

5. The panel according to claim 4, characterized in that said sheet of metallic material is made of aluminium or other metallic materials as well as other equivalent non-metallic materials, such as wood or plastic.

6. The panel according to claim 5, characterized in that said metal sheet has first mutually coplanar portions (17), which are meant to face one of the two first or second layers, and second portions (18), which also are mutually coplanar and are meant to face the other one of the two first or second layers.

7. The panel according to the preceding claims, characterized in that said first and second portions (17, 18) are formed alternately and are joined by intermediate portions (19) that define the thickness of the ventilation air space, i.e., of the ventilation channels (16).

8. The panel according to the preceding claims, characterized in that said intermediate portions (19) each have a plurality of openings (20), which are adapted to connect the laterally adjacent channels (16).

9. The panel according to the preceding claims, characterized in that said edges (21) of the sheet of metallic material are folded in an S-shape, with an intermediate portion that also is provided with open-
10. The panel according to the preceding claims, characterized in that said means for fixing the spacer body (13) to the two first and second layers (11, 12) are constituted by layers of adhesive (23, 24).
## DOCUMENTS CONSIDERED TO BE RELEVANT

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The present search report has been drawn up for all claims

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**Place of search**: Munich  
**Date of completion of the search**: 24 January 2011  
**Examiner**: Beucher, Stefan

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**CATEGORY OF CITED DOCUMENTS**

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For more details about this annex: see Official Journal of the European Patent Office, No. 12/82
REFERENCES CITED IN THE DESCRIPTION

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