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(71) Applicant: **Asturiana De Laminados, S.A.**
33695 Pola de Lena (ES)

(72) Inventor: **de Diego, Juan Carlos**
33695 Pola de Lena (ES)

(74) Representative: **González López-Menchero, Álvaro Luis**
Protectia Patentes y Marcas, S.L.
C/ Arte 21, 2°A
28033 Madrid (ES)

(54) **VENTILATED FACADE SYSTEM WITH SELF-SUPPORTING METAL PANELS**

(57) The invention relates to a ventilated façade system with self-supporting metal panels comprising:
- a series of metal panels (1) provided with horizontal edges (2) provided with eyelets (4), and vertical edges (3);
- support clamps (5) and fixing clamps, where the clamps are used for fixing to the façades and as a means of spacing the metal panels (1) from the wall so as to increase the air chamber that generates a chimney effect in the ventilated façade, where the support clamps (5) have two vertical sections (8) that can be accommodated in the eyelets (4) and where said vertical sections (8) are covered by a rubber (9) or similar for vibration and noise absorption.

The ventilated façade system involves lower costs, is easier to assemble and can be installed on existing façades or buildings under renovation, achieving benefits in terms of insulation, energy savings and the disappearance of problems of moisture.

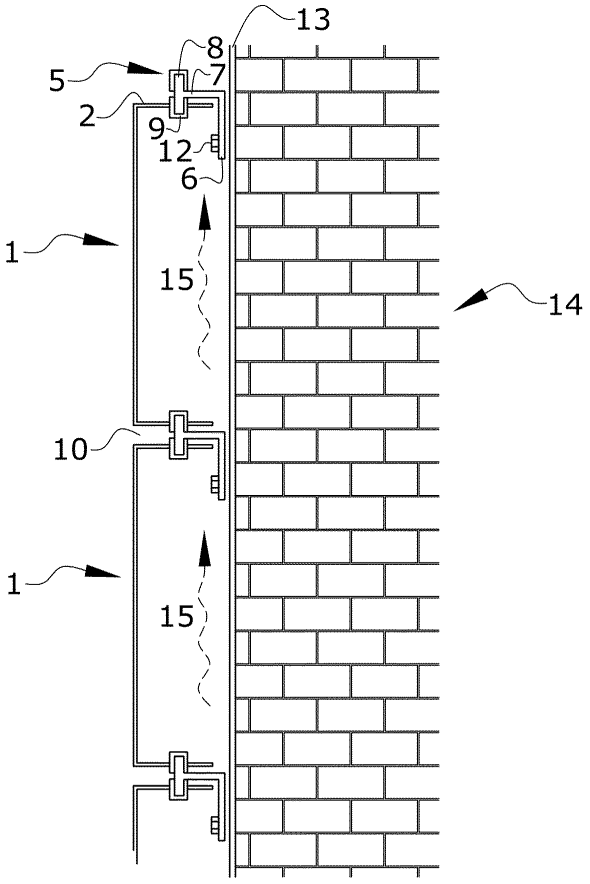

FIG.4

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Description

OBJECT OF THE INVENTION

[0001] The object of the present invention is, as the title of the invention states, a ventilated façade system with self-supporting metal panels, which can be applied on new or existing façades in a simple way and achieving a ventilated façade effect.

[0002] The present invention is characterised by the special design and configuration of each and every one of the parts that make up the façade system object of the invention, achieving a system that is easy to manufacture, easy to install and, thanks to the special tool sold with the system, the panels can be easily adjusted in length, which offers the renovation of buildings or their arrangement in new construction.

[0003] The present invention therefore falls within the scope of ventilated façade systems.

BACKGROUND TO THE INVENTION

[0004] The ventilated façade is a construction system that leaves a ventilated chamber between the cladding and the insulation and considerably reduces thermal bridges and condensation problems. In this way, excellent thermal behaviour is achieved and dampness is avoided. The chamber functions as a chimney by creating convection air currents.

[0005] During the winter, ventilated façades provide thermal stability as they act as a heat accumulator, aided by the thermal insulation layer of the system. In this way, they prevent heat from escaping from the interior, which saves energy.

[0006] Ventilated façades mean energy savings as they improve the energy performance of the building and consequently entail economic savings, in addition to improving the thermal and acoustic coefficient; moreover, they increase user comfort as the system complies with basic health requirements in terms of hygiene, health and environmental protection; and finally, they protect buildings from direct radiation and inclement weather on walls and slabs, protecting them from the pathologies that affect buildings constructed with traditional systems.

[0007] However, for the construction of ventilated façades, stone or ceramics are used, which are heavy, and require important support anchors, which results in both material and installation time costs, in addition to the costs of the stones used in the construction of the façades.

[0008] Therefore, the object of the present invention is to develop a ventilated façade system that involves lower costs both for the material itself and for the complexity of the assembly, developing a ventilated façade system as described below and which is essentially set out in the first claim.

DESCRIPTION OF THE INVENTION

[0009] The object of the present invention is essentially set out in the independent claim and the various embodiments are set out in the dependent claims.

[0010] The object of the present invention relates to a ventilated façade system with self-supporting metal panels comprising the panels themselves, made of, preferably but not limited to, aluminium or zinc, with edges that are almost perpendicular to the main plane, where the horizontal edges have rectangular-shaped eyelets, with the eyelets on the upper edge and the lower edge facing each other.

[0011] It also has support and fixing clamps, where the clamps are preferably made of aluminium and are used on the one hand for fixing the self-supporting metal panels to the façades by means of vertical metal rails and wall anchors, and on the other hand they serve as a means of spacing from the wall to allow for the enlargement of the ventilation chamber which causes the chimney effect in the ventilated façade.

[0012] The chimney effect in the ventilated façade is the response to the heating of the outer layer, in this case the self-supporting metal panels, or in cloudy weather the loss of heat from inside the building. The density of the air changes with respect to the outside. In winter it creates a chimney effect, heating the air between the two layers and making the interior room warmer, separated from the cold outside, as well as expelling the humid air from the interior, thus avoiding condensation on the wall.

[0013] Therefore, the proposed ventilated façade system solves the insulation and chimney effect in ventilated façades, eliminates other problems such as humidity, and is economical, easy to install and allows for the complete renovation of buildings.

[0014] Unless otherwise stated, all technical and scientific elements used herein have the meaning usually understood by a person skilled in the art to which this invention pertains. In the practice of the present invention, processes and materials similar or equivalent to those described herein may be used.

[0015] Throughout the description and the claims the word "comprises" and its variants are not intended to exclude other technical features, additives, components or steps. For those skilled in the art, other objects, advantages and features of the invention will be apparent in part from the description and in part from the practice of the invention.

EXPLANATION OF THE FIGURES

[0016] As a complement to the present description, and for the purpose of helping to make the features of the invention more readily understandable, in accordance with a preferred practical exemplary embodiment thereof, said description is accompanied by a set of drawings constituting an integral part of the same, which by way of illustration and not limitation represent the follow-

ing.

Figure 1 shows a perspective representation of several self-supporting metal panels.

Figure 2 shows a representation of the support and fixing clamps of the metal panels.

Figure 3 shows a representation of a portion of a façade where several technical details can be seen.

Figure 4 shows the section obtained by a vertical plane perpendicular to the façade of a ventilated façade with metal panels such as those that are the object of the invention.

PREFERRED EMBODIMENT OF THE INVENTION

[0017] In view of the figures, a preferred embodiment of the proposed invention is described below.

[0018] Figure 1 shows several self-supporting metal panels (1), preferably rectangular in shape, which have folded edges on their edges with respect to the main plane, forming horizontal edges (2) and vertical edges (3), where the horizontal edges (2) are provided with a series of eyelets (4) or perforations to allow these eyelets to pass through the vertical projections of support clamps (5).

[0019] Figure 2 shows the features of the support clamps (5), which, as can be seen, have a first vertical section (6) provided with fixing means (12); on the upper end of this first vertical section (6) a horizontal section (7) continues perpendicular to the façade and at the free end of which there are two emerging second vertical sections (8), one above the free end of the horizontal section (7) and the other below the free end of the horizontal section (7).

[0020] The two second vertical sections (8) have the particularity of being covered by a rubber (9) or similar for vibration and noise absorption. Given that the metal panels are subject to the action of the wind and in order to prevent them from vibrating, rattling or knocking against the support and fixing clamps, the two second vertical sections (8) are covered with a rubber (9) or elastomeric material capable of absorbing vibrations and they allow the metal panels to be fixed by fitting into the support clamps (5), where said covering could be removable.

[0021] Figure 2 shows the aligned arrangement of metal panels (1) (one of the possibilities) such as those used in the ventilated façade system covered by the invention and, as can be seen in the horizontal joints, there is an interstitial space (10) which acts as an outlet for the interior air; also, in the vertical joints there is a vertical interstitial space (11), although smaller or the same as the horizontal interstitial space (10).

[0022] These small gaps between the adjoining panels create a ventilation effect for the interior air.

[0023] Finally, Figure 3 shows, among other elements, how the support clamps (5) are fixed to the walls (14) by means of metal rails (13), which in turn are fixed to the wall by means of wall anchors, not shown, and thermal insulators.

[0024] It can be seen how inside the panels and thanks to their distance from the wall (14) the hot air generated behind each metal panel (1) rises generating a chimney effect (15), expelling the humid air coming from the interior, thus avoiding condensation on the wall, while in summer the panels act as a parasol keeping the insulation in the shade and separating it from the hot exterior surface exposed to the sun. The chimney effect renews the air and keeps the surface of the insulation cooler.

[0025] Having thus adequately described the nature of the present invention, as well as how to put it into practice, it must be noted that, within its essential nature, the invention may be carried out according to other embodiments differing in detail from that set out by way of example, which the protection sought would equally cover, provided that the fundamental principle thereof is not altered, changed or modified.

Claims

1. A ventilated façade system with self-supporting metal panels **characterised in that** it comprises:

   - a series of metal panels (1), the edges of which are almost perpendicular to the main plane, thus having horizontal edges (2) and vertical edges (3) where the horizontal edges (2) having eyelets (4), the eyelets on the upper and lower edges facing each other.
   - support clamps (5) and fixing clamps, where the clamps serve on the one hand for fixing to the façades and on the other hand they serve as a means of spacing the metal panels (1) from the wall so as to enlarge the air chamber which generates a chimney effect in the ventilated façade, where the support clamps (5) have two vertical sections (8) that can be accommodated in the eyelets (4) and where said vertical sections (8) are covered by a rubber (9) or similar for vibration and noise absorption.

2. The ventilated façade system with self-supporting metal panels according to claim 1, **characterised in that** the support clamps (5) have a first vertical section (6) provided with fixing means (12); on the upper end of this first vertical section (6) a horizontal section (7) continues perpendicular to the façade and at the free end of which there are two emerging vertical sections (8), one above the free end of the horizontal section (7) and the other below the free end of the horizontal section (7).

3. The ventilated façade system with self-supporting

metal panels according to claim 1 or 2, **characterised in that** the metal panels are made of aluminium or zinc or other metals.

4. The ventilated façade system with self-supporting metal panels according to claim 1 or 2 or 3, **characterised in that** the support clamps (5) are made of aluminium.

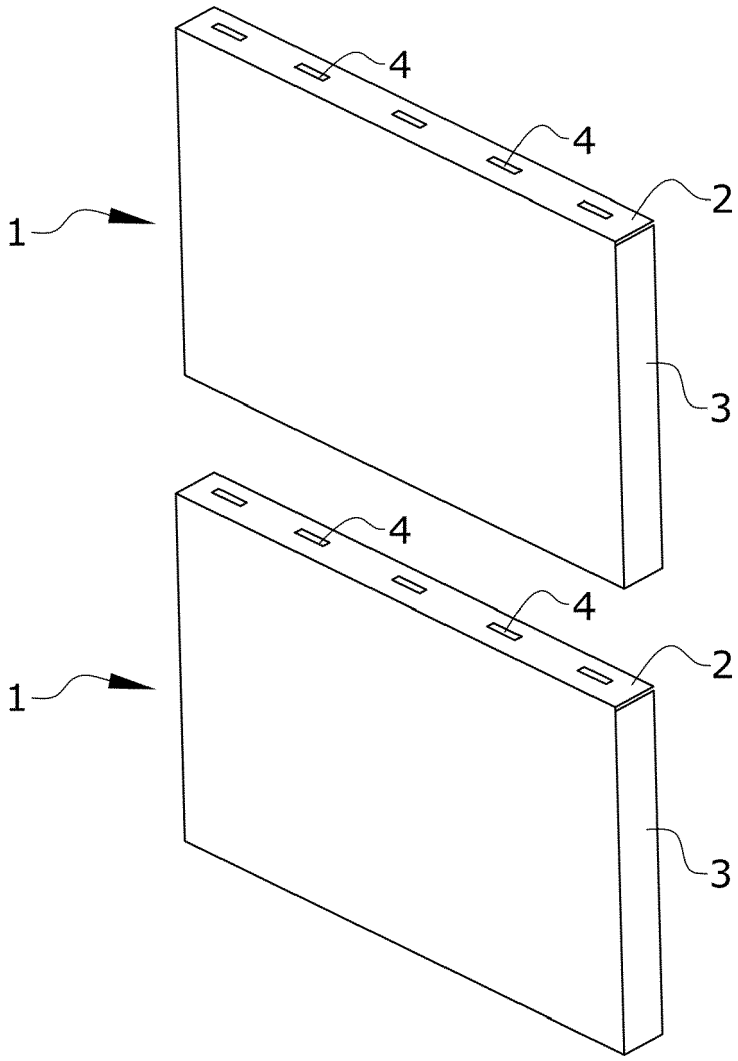

FIG.1

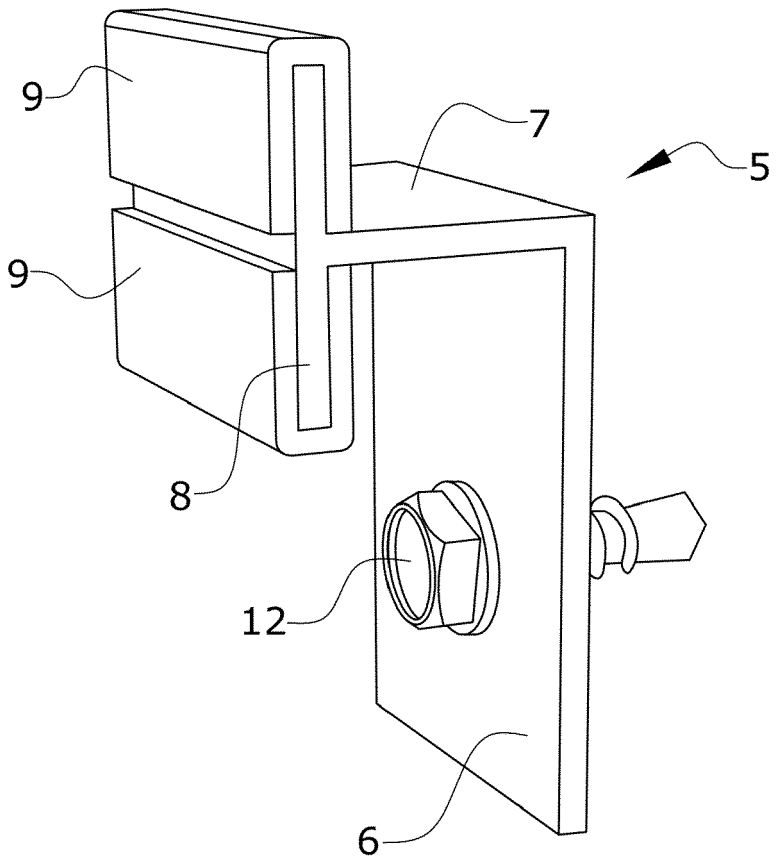

FIG.2

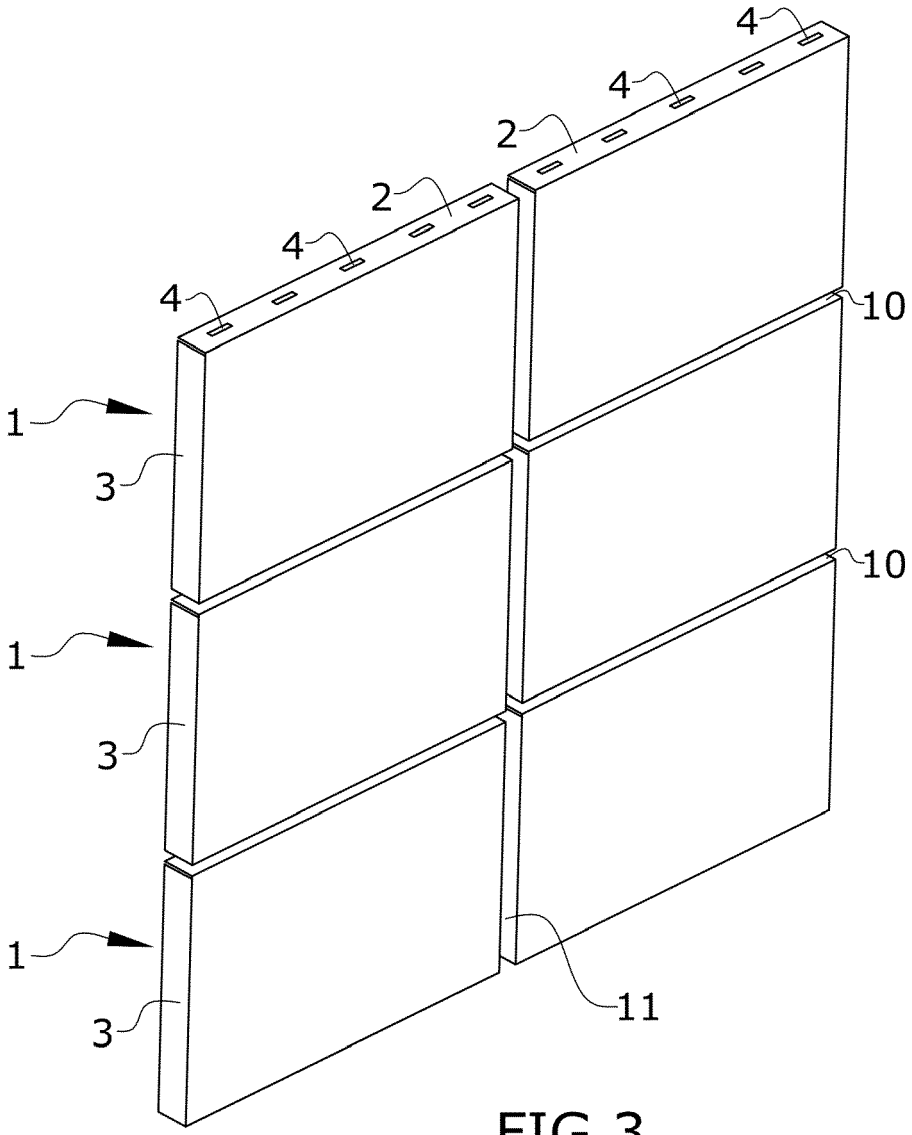

FIG.3

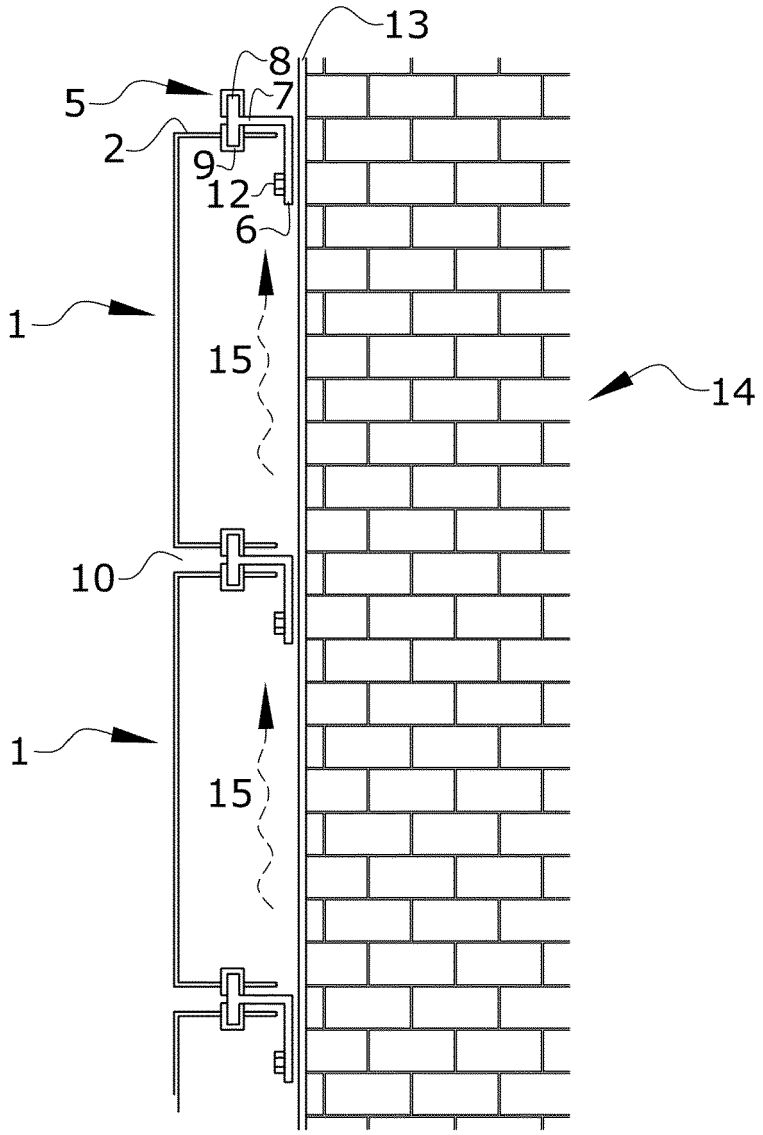

FIG.4

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EUROPEAN SEARCH REPORT

Application Number
EP 21 38 2996

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	KR 2019 0089527 A (SUNG GI IN [KR]) 31 July 2019 (2019-07-31) * paragraph [0024] - paragraph [0034]; figures 1,2 *	1-4	INV. E04F13/08 E04F13/00 E04F13/12
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Y	US 10 260 240 B1 (BILGE HENRY H [US]) 16 April 2019 (2019-04-16) * column 12, line 19 - line 56; figures 9, 10 *	1-4	
Y	DE 41 40 867 A1 (RIEDINGER MMM GMBH & CO KG [DE]) 24 June 1993 (1993-06-24) * column 3, line 18 - line 28; figures 1-5 * * column 5, line 27 - line 30 *	1-4	TECHNICAL FIELDS SEARCHED (IPC)
A	GB 2 352 255 A (JOHNSON BRIAN [GB]) 24 January 2001 (2001-01-24) * abstract; figures 1,2 *	1-4	E04F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	25 March 2022	Khera, Daljit

CATEGORY OF CITED DOCUMENTS

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