



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
23.12.2015 Bulletin 2015/52

(51) Int Cl.:
E04F 13/08 ^(2006.01) **E04F 13/14** ^(2006.01)

(21) Application number: **14200360.7**

(22) Date of filing: **26.12.2014**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA ME

(72) Inventor: **Torres del Rosario, Carlos**
28250 Madrid (ES)

(74) Representative: **Bugnion Genève**
Bugnion S.A.
Conseils en Propriété Industrielle
Route de Florissant 10
Case Postale 375
1211 Genève 12 (CH)

(30) Priority: **18.06.2014 ES 201400497 U**

(71) Applicant: **Knauf Industries Gestion**
68600 Wolfgantzen (FR)

(54) **Panel for external thermal façade insulation with ceramic cladding**

(57) A panel (1) for external thermal façade insulation with ceramic cladding, manufactured in expanded polystyrene or any other type of synthetic foam, by moulding or machining, with a design comprising a ceramic panel and tile joining system, crisscrossed by main channels (2) and wherein the flanges (9) of the ceramic tiles (7) or plates (6), plus the adhesive mortar (5) which surrounds them, are housed, characterised in that it is additionally configured with other, narrower secondary channels (3) connected in a transverse arrangement with the main channels (2), and in that the edges of the channels have a markedly rounded profile to facilitate the free dispersion in all directions of the adhesive mortar (5) which sits between the panel and the ceramic tiles, and in that from the side faces of the main channels (2) emerge flanges (4) as devices to support the ceramic tiles aligned with the insulation panel during adhesive mortar setting time.

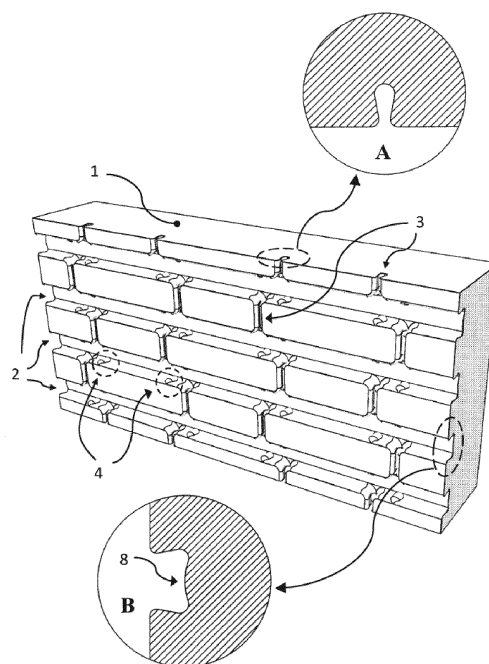


Fig. 1

Description

FIELD OF THE INVENTION

[0001] This invention pertains to the building sector and relates in particular to external thermal façade insulation systems consisting of insulation panels with ceramic tiling or plating.

BACKGROUND OF THE INVENTION

[0002] Among the different types of cladding which an external thermal façade insulation system can have are those consisting of ceramic tiles and plates which simulate facing bricks. In all systems, the ceramic pieces are directly glued to the insulation panels such that, if the adhesive were to fail, the pieces could become detached and fall down, with the resulting risk of causing personal injuries. Thus, this kind of ceramic cladding is usually used in buildings which are one or two-storey high at the most. As set out below, the insulation panel which is the object of this invention helps to satisfactorily solve the safety problem posed by known ceramic claddings, for which it makes use of and improves the system for the mechanical joining of corrugated synthetic-foam panels and ribbed ceramic tiles described in the same applicant and inventor's patent with publication number ES2457992. Hence, this new panel constitutes an industrial development derived from said patent.

DISCLOSURE OF THE INVENTION

[0003] The panel (1) of the invention will be preferably manufactured in expanded polystyrene, although it can also be made of any other synthetic foam suitable for the intended use. The panel is configured in the shape of a plate crisscrossed by a series of parallel main channels (2), having a dovetail cross section, and of other secondary channels (3) arranged transversely to the main channels. The parallel main channels are wider since they have to house the flanges or ribs (9) which the ceramic tiles have plus the adhesive mortar which surrounds them, whereas the secondary channels (3) are narrower because they only have to hold a thin partition of adhesive mortar. The secondary channels (3) are connected with the main channels (2) in order to assemble as a whole a reticular, adhesive mortar structure which multiplies the anchoring and joining effect among the different pieces that make up the insulation system. The edges of the channels take on markedly rounded shapes so as to facilitate the dispersion of the adhesive mortar that is displaced when the flanges or ribs (9) of the ceramic tiles (7) or plates (6) are inserted in the main channels (2) of the panels. From the sides of the main channels of the panel emerge projections (4) that support the ceramic pieces aligned with the panel. Other, additional characteristics are that the bottom (8) of the main channels may have a bulging or convex shape, which permits expand-

ing the depth of the footprint - to boost the anchoring effect of the dovetail - without having to increase the average thickness of the adhesive mortar layer as a result, and also that some special panels (1.2) may have a fluted edge (10) to extend the grooves in the main channels at inside corners.

[0004] In an optional manner, the edges of the panels may have grooves for attaching hidden staples; in addition, the back thereof may be embossed or grooved in order to increase the surface in contact with the façade wall adhesion mortar.

DESCRIPTION OF THE DRAWINGS

[0005]

Figure 1 shows a standard panel (1) in perspective, crisscrossed by the main channels (2) and the secondary channels (3), plus the protruding flanges (4) for aligning and supporting the ceramic pieces; additionally, two enlarged detailed views A and B of the dovetail cross sections of the respective channels are included. Detailed view A corresponds to the narrow secondary channels and detailed view B corresponds to the wider main channels and the convex bottom (8).

Figure 2 shows a panel (1) in perspective clad with ceramic plates (6) simulating facing bricks. A cut has been made in the cladding materials to render the flanges or ribs (9) of the ceramic plates and the intermediate adhesive mortar layer (5), which coheres the entire assembly whilst filling the joints between plates, visible.

Figure 3 is a typical cross section of a panel (1) with a cladding of ceramic plates (6) and the intermediate adhesive mortar layer (5) which coheres all the pieces.

Figure 4 shows a panel (1) in perspective with a large-sized ceramic tile (7) attached thereto. A cut has been made in the cladding materials to render the flanges (9) of the tiles and the intermediate adhesive mortar layer visible.

Figure 5 is a typical cross section of a panel (1) with an attached ceramic tile (7) and the intermediate adhesive mortar layer (5).

Figure 6 shows a special corner panel (1.2) with groove extension channels (10) on one of its edges.

PREFERRED EMBODIMENTS

[0006] In a preferred embodiment - with an 'in situ' execution of the work, the naked insulation panels are glued to the façade wall of the building with adhesive mortar of

the same type and quality as that used in any other external insulation system having expanded polystyrene panels. The panels must then be secured by means of mechanical fasteners, which may consist in well-known devices such as hidden staples and/or plastic-shank wall plugs with a racket-shaped head. Next - using a brick trowel, the main channels of the panels are filled up to the edge with an adhesive mortar of a doughy consistency and, afterwards, the ceramic tiles or plates are stuck such that the longitudinal flanges or ribs thereof become submerged in the adhesive mortar. As the ribs sink in the adhesive mortar, the latter is displaced and forced to flow in all directions, thereby filling the secondary channels whilst forming a thin intermediate layer between the surface of the panel and the ceramic pieces. An intelligent design of all involved pieces which takes into account the ideal amount of the volume of displaced adhesive mortar will even allow for there to be enough excess mortar left to fill up the exposed joints between ceramic pieces. The flanges which emerge from the side faces of the main channels of the panel help to centre and support the ceramic pieces in their right position during the mortar setting time. The final result is a façade insulated and clad with ceramic tiles or plates which, under normal conditions of use, cannot become detached since they are attached by means of an efficient joining system of both a chemical and a mechanical nature.

[0007] In another preferred embodiment, it would also be possible to prefabricate the panels in a workshop, with the tiles or plates already assembled and glued to the insulation panels, their placement being then adapted to the characteristics in question.

Claims

1. A panel (1) for external thermal façade insulation with ceramic cladding, manufactured in expanded polystyrene or any other type of synthetic foam, by moulding or machining, with a design comprising a ceramic panel and tile joining system, crisscrossed by main channels (2) and wherein the flanges (9) of the ceramic tiles (7) or plates (6), plus the adhesive mortar (5) which surrounds them, are housed, **characterised in that** it is additionally configured with other, narrower secondary channels (3) connected in a transverse arrangement with the main channels (2), and **in that** the edges of the channels have a markedly rounded profile to facilitate the free dispersion in all directions of the adhesive mortar (5) which sits between the panel and the ceramic tiles, and **in that** from the side faces of the main channels (2) emerge flanges (4) as devices to support the ceramic tiles aligned with the insulation panel during adhesive mortar setting time.
2. A panel for external thermal façade insulation with ceramic cladding according to claim 1, **character-**

ised in that the bottom of the main channels (2) has a convex shape (8).

3. A panel for external thermal façade insulation with ceramic cladding according to claim 1, **characterised in that** one of its edges is fluted (10) to extend the groove of the main channels (2) at the inside corners formed where two panels meet.

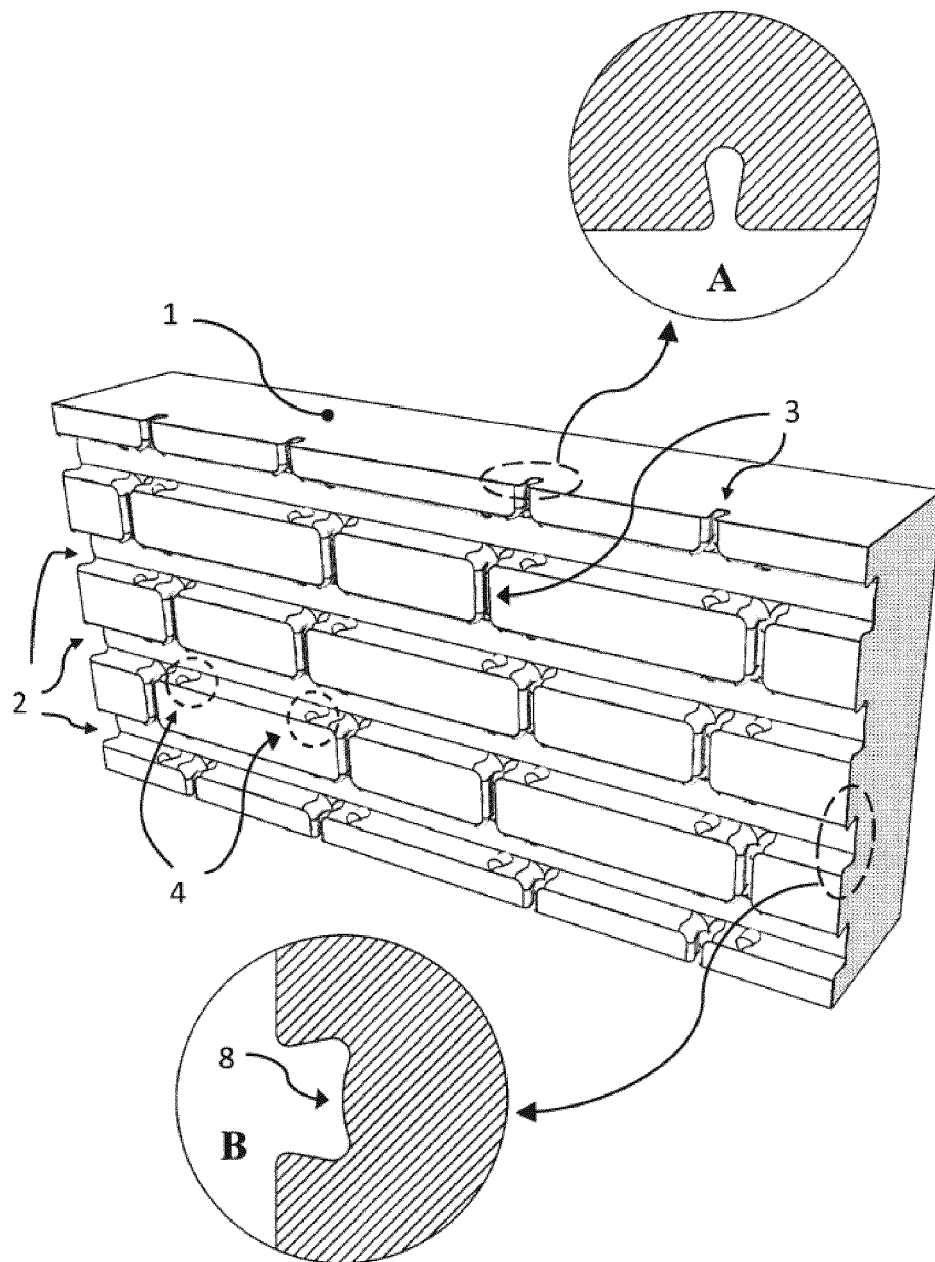


Fig. 1

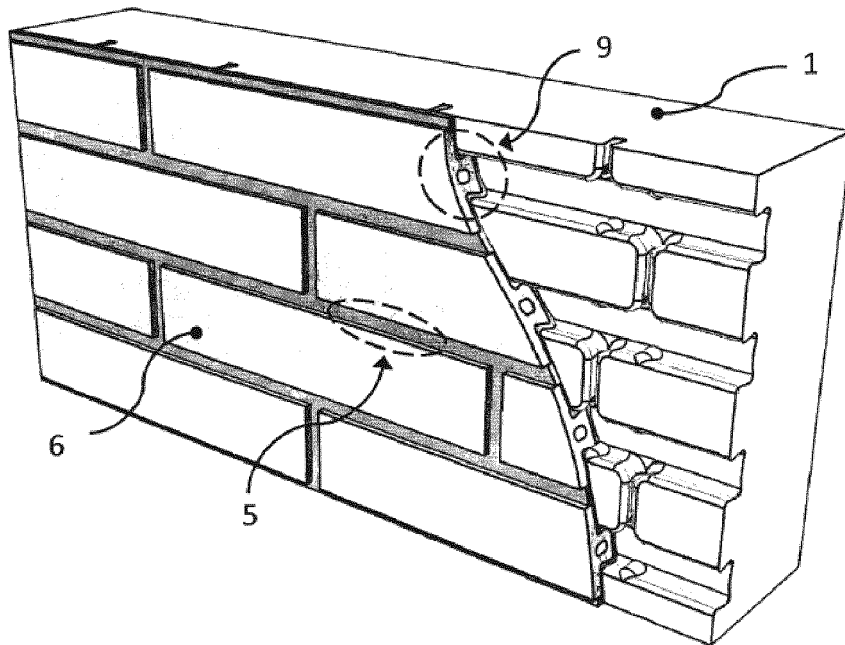


Fig. 2

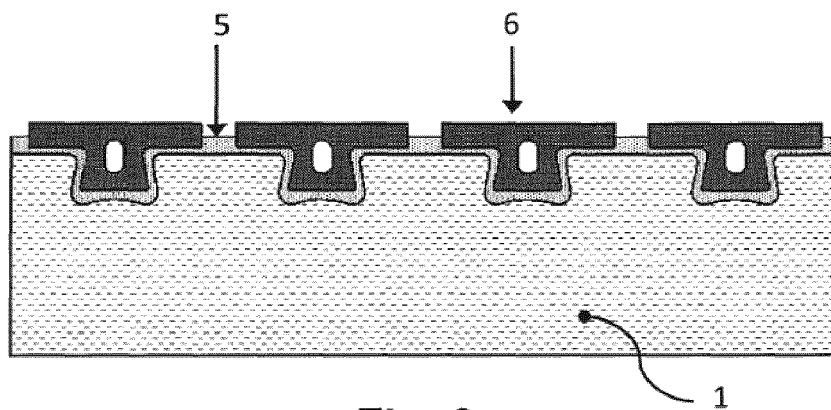


Fig. 3

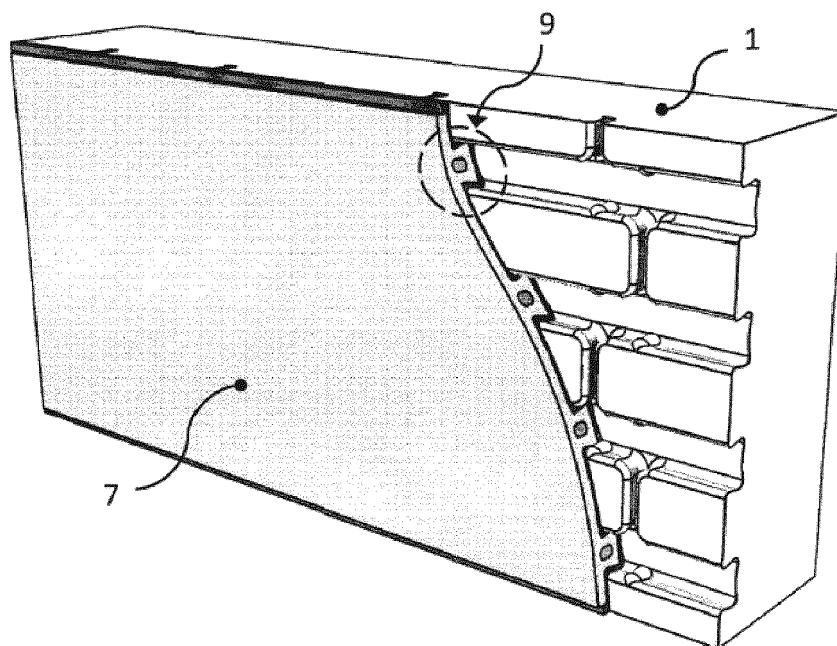


Fig. 4

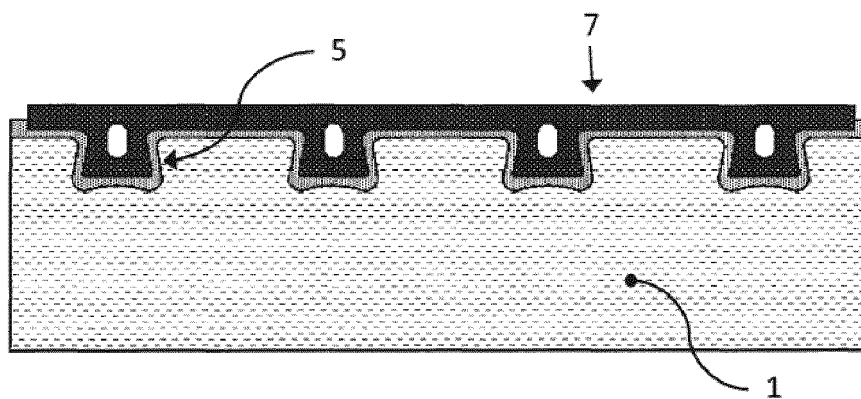


Fig. 5

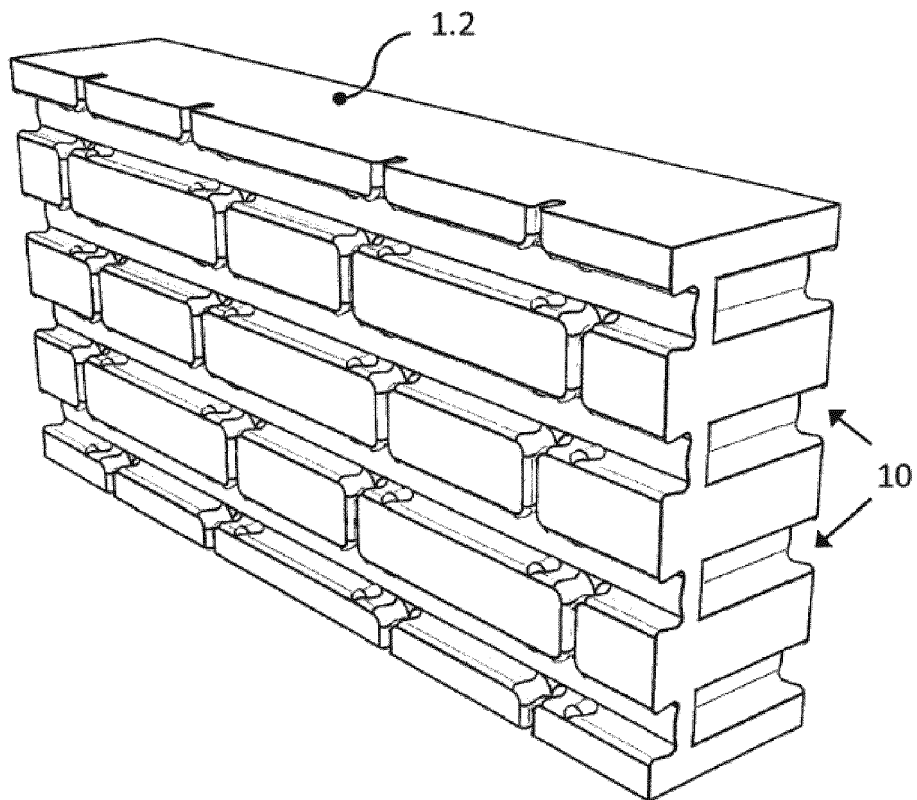


Fig. 6



EUROPEAN SEARCH REPORT

Application Number
EP 14 20 0360

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	WO 2009/094778 A1 (OLDCASTLE BUILDING PRODUCTS CA [CA]; BOUCHARD MICHEL [CA]) 6 August 2009 (2009-08-06) * page 7, line 19 - line 24 * * page 4, line 14 - line 16 * * page 6, line 25 - line 26 * * figures 4,7 * * claim 1 * * page 9, line 13 - line 17 * * page 5, line 6 - line 7 * * page 8, line 24 - line 27; claim 2 * * page 12, line 13 - line 16 *	1-3	INV. E04F13/08 E04F13/14
Y	BE 424 722 A (MAISON HELMAN SA) 31 December 1937 (1937-12-31) * page 2, paragraph 2 * * page 3, paragraph 6 - paragraph 7 * * claims 1-2; figures 2-4 * * claim 3 *	1,2	
Y	US 4 700 527 A (PARDO J) 20 October 1987 (1987-10-20) * figures 15-16 * * claims 17,19 *	3	TECHNICAL FIELDS SEARCHED (IPC) E04F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 13 July 2015	Examiner Estorgues, Marlène
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	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 14 20 0360

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

13-07-2015

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2009094778 A1	06-08-2009	CA 2711619 A1	06-08-2009
		EP 2268871 A1	05-01-2011
		US 2010326010 A1	30-12-2010
		US 2014075873 A1	20-03-2014
		WO 2009094778 A1	06-08-2009

BE 424722 A	31-12-1937	NONE	

US 4700527 A	20-10-1987	NONE	

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- ES 2457992 [0002]