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(54) **INHABITABLE CONSTRUCTION**

(57) The purpose of the present invention is a habitable construction formed from a series of pre-cast concrete panels, arranged adjacently through tongue and groove connection, which rest on a floor which constitutes the base of the construction and which are fixed by means of a metal structure defined by pillars and approved profiles which connect the perimeter, where a layer of insulating material, such as expanded polyurethane, polystyrene or similar is projected onto the interior part of the pre-cast concrete panels, which is followed by an air chamber and finished with an interior finish panel, ensuring in this way the horizontal stability of the construction due to the tongue and groove connection, in addition to forming the connection at the corners by simply facing the pre-cast concrete panels at 90°, with one panel turned 180° in respect of the adjacent one.

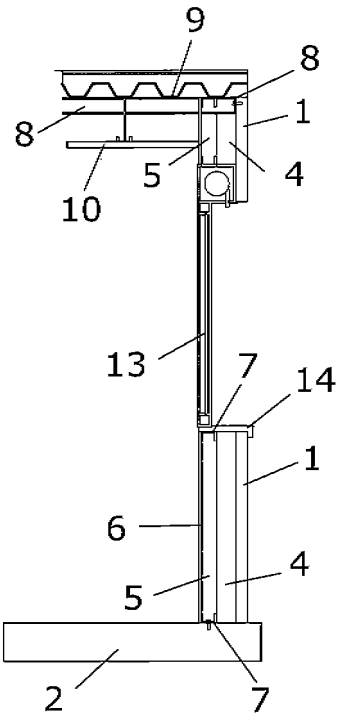

FIG.1

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Description

OBJECT OF THE INVENTION

[0001] The present invention describes a habitable construction formed from a series of pre-cast concrete panels, arranged adjacently with a tongue and groove connection which rest on a floor which constitutes the base of the construction, and on which they are fixed by means of a metal structure defined by officially approved pillars and profiles which join the perimeter.

[0002] In the interior part of the pre-cast concrete panels a layer of insulating material is projected, such as expanded polyurethane, polystyrene or similar, which is followed by an air chamber, and with the inside wall provided with an interior finish panel.

[0003] Due to this special configuration, the horizontal stability of the construction is ensured, due to the tongue and groove connection, in addition to the fact that the corners can be joined simply by facing the pre-cast concrete panels at 90°, with one slab turned 180° in respect of the adjacent slab.

BACKGROUND TO THE INVENTION

[0004] Constructions made from pre-cast concrete plates overlapping each other to form the walls of the construction are well known in the state of the art.

[0005] These include Spanish patent with publication number ES2144908 referring to a "block panel" building system for manufacturing homes and their basic elements.

[0006] In the previous system it is necessary to use reinforced pre-stressed concrete columns placing the pre-cast concrete block panels between them. Furthermore, the columns are provided with channels for sliding the block panels between two columns.

[0007] And, in addition, the walls of the building system are formed by an arrangement of block panels placed on top of each other, so that the execution time is extensive, as a section of wall requires a large number of block panels with each being superimposed onto the previous one.

[0008] All these disadvantages are overcome by the invention described herein, as, due to the fact that it is formed from a series of pre-cast concrete panels, arranged adjacently with tongue and groove connection fixed on a metal structure to which the remaining layers of the construction are applied, there is no need for columns with channels on which to slide the panels, nor is there a need for various panels per section of wall.

DESCRIPTION OF THE INVENTION

[0009] The present invention describes a habitable construction formed from a series of pre-cast concrete panels, arranged adjacently with a tongue and groove connection which rest on a floor which constitutes the base of the construction and on which they are fixed by means of a metal structure.

[0010] The construction is provided with at least one wall formed by pre-cast concrete panels, arranged adjacently with tongue and groove connection, on the inside of which a layer of insulating material is projected which is followed by an air chamber, and the inside wall is finished with a panel providing an interior finish.

[0011] Profiles are attached to the upper part of the pre-cast concrete panels on which the ceiling of the construction rests, onto which concrete may be poured to form the ceiling base and on which the roof structure or upper storey is built, as the construction may have one or several floors, following which a false ceiling is attached to the ceiling which contributes to the final aspect of the interior construction.

[0012] A layer of mortar or some other material used for external finish is projected onto the external face of the pre-cast concrete panels such as stone, ceramic etc., providing the external aspect of the construction.

The windows or doors are formed between two contiguous panels of pre-cast concrete, so that in the case of the window, it rests on both panels thus distributing the stress.

[0013] The horizontal stability of the construction is ensured due to the tongue and groove connection, in addition to the fact that the corners can be joined simply by facing the pre-cast concrete panels at 90°, with one panel turned 180° in respect of the adjacent panel and anchored to a metal structure.

[0014] To summarise, the habitable construction comprises a floor or foundation and walls and is **characterised in that** at least one wall is constituted on the outside by pre-cast concrete panels arranged adjacently by tongue and groove connection, and resting on the floor or foundations, where the internal face is provided with a projected layer of insulating material followed by an air chamber and finished with a panel of interior finish.

DESCRIPTION OF THE DRAWINGS

[0015] The present descriptive report is supplemented by a series of drawings, illustrative of a preferred embodiment but not, however, restricting the invention in any way.

[0016] Figure 1 shows a cross section of an embodiment of the invention showing the constituent elements forming the walls and roof of the construction.

[0017] Figure 2 shows a perspective view of the upper zone of one of the corners of the construction which is the zone on which the construction ceiling rests.

[0018] Figure 3 shows a detailed perspective view of the tongue and groove connection of two panels of pre-cast concrete.

[0019] Figure 4 shows a perspective view of the habitable construction of the present invention and a detail of the tongue and groove connection of a corner.

PREFERRED EMBODIMENT OF THE INVENTION

[0020] In view of the aforementioned description, the present invention refers to a habitable construction where at least one wall is formed from a series of pre-cast concrete panels (1) arranged adjacently and with a tongue and groove connection (1.1) which rests on a concrete floor (2) which constitutes the base of the construction.

[0021] In order to fix the tongue and groove connection (1.1) a row (3) of cement is laid in its interior to prevent displacement of one panel (1) onto another (1) during construction, ensuring tightness of the joints, and additionally anchoring through screws and bolts to a metal structure of pillars (15) and metal profiles (8).

[0022] In order to form the corners of the construction two pre-cast concrete panels are faced at 90°, turning one panel (1) 180° with respect to the adjacent one (1) which is then reinforced by a metal pillar (15).

[0023] A layer of insulating material (4) is projected internally on the panels (1) of pre-cast concrete which is preferably expanded polyurethane, followed by an air chamber (5) and finishing the interior of the wall with a panel of interior finish which is preferably laminated plaster.

[0024] Profiles (7) are fixed to the lower and upper part of the air chamber (5) defining the width thereof (5), which rest on the layer of insulating material (4) and serve as support to the interior finish panel (6).

[0025] Metal profiles (8) are anchored to the upper part of the pre-cast concrete panels (1) which meet in the metal pillars (15) placed at the corners where the construction ceiling (9) is supported, on which concrete is poured for forming the ceiling (9) which serves as a base for the roof or for the upper storey, as the construction may have one or several floors, and on which a false laminated plaster roof (1) is anchored.

[0026] In the external groove (1.1.1) remaining after having joined two panels (1), a band of glass fibre webbing is applied before projecting the cement covering (12) on the external part of the panels (1).

[0027] The windows (13) or doors are formed between two contiguous panels (1) of pre-cast concrete, so that in the case of the window (13), it rests on a sill (14) placed on both panels (1) thus distributing the stress.

[0028] The essential nature of this invention is not altered in any way by variations in materials, form, shape and arrangement of the component elements which are described in a manner which is in no way restrictive but which is sufficient for an expert to proceed to its reproduction.

Claims

1. Habitable construction comprising a floor (2) and walls, **characterised in that** at least one wall is constituted on the outside by pre-cast concrete panels (1) arranged adjacently by tongue and groove connection (1.1)and resting on the floor (2) and held by a metal structure, where the internal face is provided with a projected layer of insulating material (4) followed by an air chamber (5)and finished with a panel of interior finish (6).

2. Habitable construction according to claim 1 **characterised in that** the lower and upper part of the air chamber (5) profiles (7) are fixed, defining the width thereof (5), which rest on the layer of insulating material (4) and serve as support to the interior finish panel (6).

3. Habitable construction according to claim 1 **characterised in that** the metal structure consists of metal profiles (8) anchored to the upper part of the pre-cast concrete panels (1) which meet in the metal pillars (15) placed at the corners where the construction roof (9) is supported, on which concrete is poured for forming the ceiling (9) which serves as a base for the roof or for the upper story as the construction may have one or several floors and on which a false laminated plaster roof (10) is anchored.

4. Habitable construction according to claim 1 **characterised in that** in order to fix the tongue and groove connection (1.1)a row (3) of cement is placed in its interior, which prevents displacement of a panel (1) over another (1) during construction, thus ensuring the tightness of the joints.

5. Habitable construction according to claim 4 **characterised in that** in the external groove (1.1.1) remaining after having joined two panels (1), a band of glass fibre webbing is applied before projecting the cement covering (12) on the external part of the panels (1).

6. Habitable construction according to claim 4 **characterised in that** the projected panel of insulating material (4) is expanded polyurethane, polystyrene or similar.

7. Habitable construction according to claim 1 **characterised in that** the interior finish panel (6) is made from laminated plaster.

8. Habitable construction according to claim 1 **characterised in that** the windows (13) or doors are formed between two contiguous panels (1) of pre-cast concrete, so that in the case of the window (13), it rests on a sill (14) placed on both panels (1) thus distributing the stress.

9. Habitable construction according to claim 3 **characterised in that** in order to form the corners of the construction, two pre-cast concrete panels (1) are faced at 90° , turning one panel (1) 180° with respect to the adjacent one (1) which are then reinforced by

a metal pillar (15).

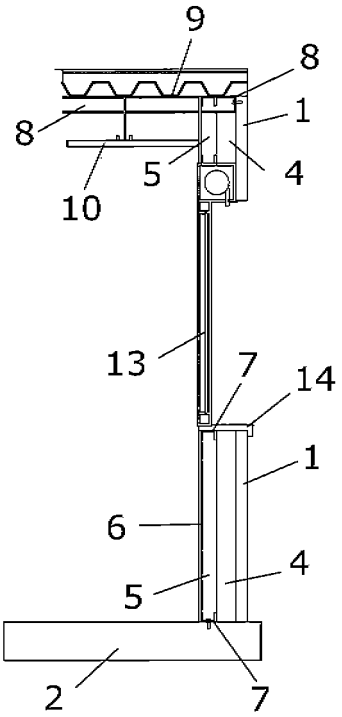

FIG.1

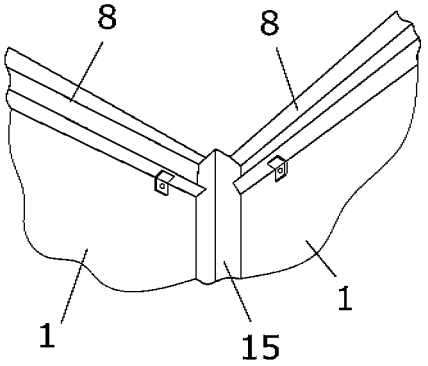

FIG.2

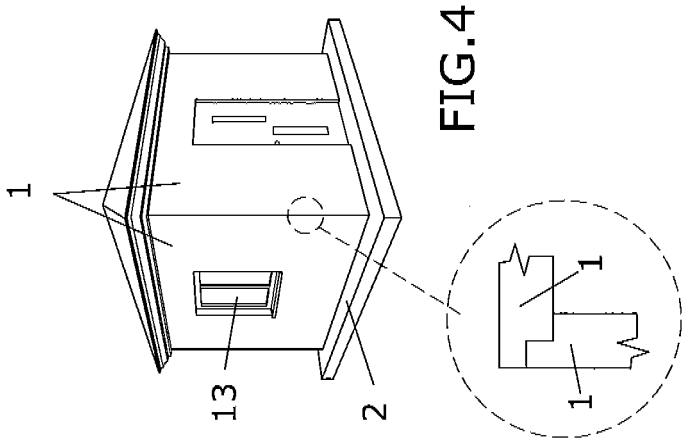

FIG.4

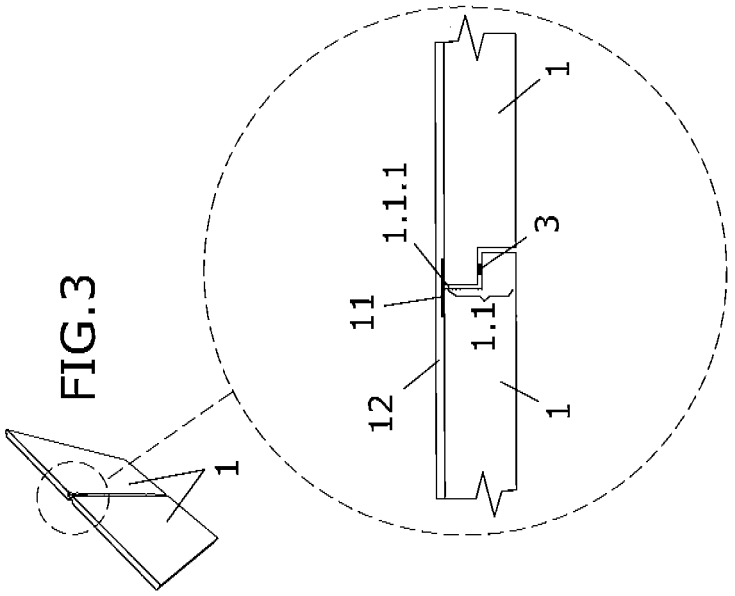

FIG.3

INTERNATIONAL SEARCH REPORT

International application No
PCT/ES2008/070004

A. CLASSIFICATION OF SUBJECT MATTER
INV. E04H1/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E04H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 077 795 A (SOUND ATTENUATORS LTD) 23 December 1981 (1981-12-23) claim 1; figures 1-3,5	1-9
A	DE 34 09 232 A1 (HELLBERG WERNER DIPL ING) 10 October 1985 (1985-10-10) page 20, paragraph 1; figure 5	1-9
A	WO 2006/004396 A (CARPET STONES B V [NL]; JANSEN JOHANNES PETRUS [NL]; JANSEN HENDRIKUS) 12 January 2006 (2006-01-12) page 16, paragraph 2; figures 1,7	1-9
A	US 4 633 629 A (BRITZ RICHARD D [US]) 6 January 1987 (1987-01-06) column 5, lines 26-30; figure 4	1-9

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
18 July 2008	25/07/2008

Name and mailing address of the ISA/	Authorized officer
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INTERNATIONAL SEARCH REPORT

International application No
PCT/ES2008/070004

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 335 558 A (CALDWELL CHARLES A ET AL) 22 June 1982 (1982-06-22) column 9, lines 60-62; figure 13	1-9

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/ES2008/070004

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2077795 A	23-12-1981	NONE	
DE 3409232 A1	10-10-1985	NONE	
WO 2006004396 A	12-01-2006	NL 1026545 C2	03-01-2006
US 4633629 A	06-01-1987	NONE	
US 4335558 A	22-06-1982	NONE	

Form PCT/ISA/210 (patent family annex) (April 2005)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- ES 2144908 **[0005]**