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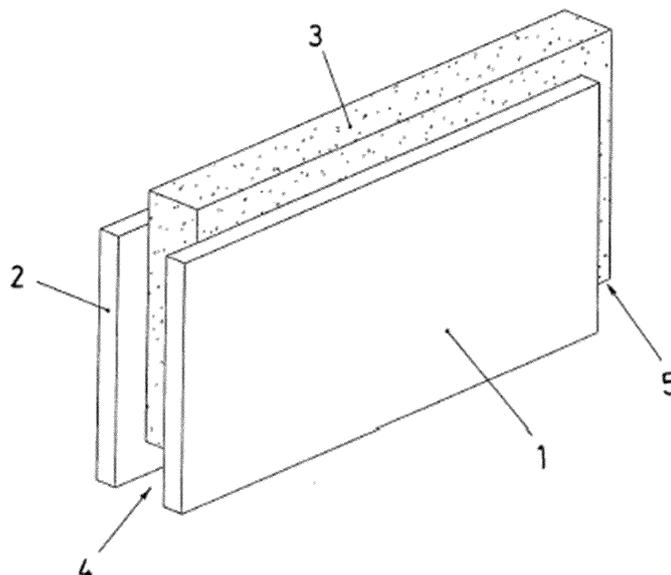
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(54) **CONSTRUCTION BLOCK AND METHOD FOR CONSTRUCTING SAID BLOCK**

(57) The present invention relates to a block for construction formed by two outer plates (1 and 2) of identical or different finish materials, between which there is included an intermediate core (3) formed by one or several layers of insulating materials, said intermediate core (3)

being tucked in according to recesses (4) with respect to the plates (1 and 2) on at least one edge of the contour and projecting in a reciprocal manner according to projections (5) on at least another edge of the contour.



**Fig.1**

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## Description

### Technical Field

**[0001]** The present invention relates to building construction works, proposing a block and a method of construction which allow building inner or outer walls in an advantageous manner with respect to building same with conventional construction elements.

### State of the Art

**[0002]** In building wall construction, ceramic bricks or concrete blocks which are bonded to one another by means of plaster or cement mortar are conventionally used, the walls being formed between the reinforced concrete columns and beams which are the components of the previously built structural framework of the building.

**[0003]** Consequently, constructions are slow and costly due to the work required to place the bricks or blocks, fixing them with the bonding material and the time necessary for said bonding material to dry.

**[0004]** The use of large-sized panels is also known, with which panels constructions are faster because the number of members to be placed is much smaller, but this solution requires the use of machinery for manipulating the panels with which the constructions are performed since the weight thereof makes manual handling difficult and they cannot be handled by a single operator in any case.

**[0005]** The members used in all those conventional solutions furthermore result in very heavy constructions, therefore a very strong structural framework is required to withstand the load of the building; whereas the actual weight of the members also means that operator work is very costly due to the effort necessary for handling said construction members.

**[0006]** On the other hand, the nature of ceramic and concrete members furthermore results in constructions made with these members being unsatisfactory in terms of heat and sound insulation, therefore when effective insulation is required it is necessary to build walls with a double partition, defining an intermediate chamber, where an insulating material can be arranged.

### Object of the Invention

**[0007]** According to the invention, a block for construction is proposed with which walls and even floor slabs can be built in a more advantageous manner than with ceramic bricks, concrete blocks and conventional panels, overcoming the drawbacks of the constructions made with these members.

**[0008]** The block object of the invention comprises two facing outer plates, between which there is arranged an insulating intermediate core formed by a layer of insulating material or several layers of identical or different insulating materials, the intermediate core being tucked in

with respect to the outer plates on at least one edge of the contour and projecting in a reciprocal manner on at least another edge.

**[0009]** The outer plates can be of the same material or of different materials, the formation of said outer plates with structural finish materials being envisaged such that a finished outer surface is defined with the same blocks in the construction of application.

**[0010]** The intermediate core can define one or more open grooves along its edges for housing plumbing pipes or for the passage of cables, thereby allowing the assembly of service installations in the constructions of application using the block, while at the same time forming the walls, such that operators from other professions do not have to later intervene in order to include said pipes of service installations in the walls that are built.

**[0011]** It is also envisaged that the intermediate core can have through holes that are horizontal or vertical with respect to the placement position of the block during application for the inclusion of strips or the formation of reinforced concrete reinforcement joists or posts.

**[0012]** Similarly, the intermediate core can leave free spaces between the outer plates in the formation of the block, defining gaps serving both for the inclusion of wood pillars and beams, and for permanent formwork for forming reinforced concrete beams or pillars inside the actual walls that are built. In this case, the edges of the outer plates of the block are envisaged with shapes to establish a tongue and groove fitting between the corresponding outer plates of the contiguous blocks in the constructions of application, thus defining assembly rigidity which allows withstanding the expansive force of the concrete having that formwork function for forming pillars or beams inside the blocks of the construction.

**[0013]** The bonding between the blocks in the constructions of application is established by adhesion by means of an adhesive, for example, a non-degradable expansive polyurethane adhesive, whereby the erection of the constructions of application is very clean and does not define a heat bridge between the faces of the walls that are built.

**[0014]** A system of construction with considerable advantages over conventional systems of construction which use ceramic bricks, concrete blocks or large-sized panels is thus obtained for the same purposes, among which the following must be highlighted, for example: erect

- It makes erecting and tearing down constructions faster and easier.
- It facilitates and speeds up the work of assembling service installations in the construction.
- The constructions are much more lightweight, reducing the load of partition walls and other resistant members of the constructions.
- It requires less ergonomic effort from operators making the constructions because they have to bear less weight for manipulating the blocks to be placed.

- Erecting and tearing down the constructions are much cleaner, generating less waste with a lower weight as well as being recyclable.
- The structure of the construction blocks by itself defines good heat and sound insulation qualities, less wall thicknesses being required.
- By using the actual blocks for forming the walls as a permanent formwork for pillars and beams, construction is faster and more perfect finishes are obtained.

**[0015]** Structural features and a method of construction which allow cost savings in terms of labor, waste management, auxiliary means, work execution time and energy in the use of the buildings that are built are therefore obtained with the proposed block; the constructions furthermore being very environmentally friendly in any of the production, erection and tearing down phases thereof.

#### Description of the Drawings

##### **[0016]**

Figure 1 shows a perspective view of a basic embodiment of the proposed construction block.

Figures 2, 3 and 4 are, respectively, a bottom plan view, a side front view and an end profile view of said construction block depicted in the preceding Figure 1.

Figure 5 is an example of the proposed construction block with a different arrangement of the intermediate core.

Figure 6 is an example of the proposed construction block with a groove along the upper edge of the intermediate core.

Figure 7 is an example of the proposed construction block with the intermediate core formed by a composition of several layers of insulating and/or reinforcement material.

Figure 8 is an example of the proposed construction block with an acoustic sheet included between the intermediate core and one of the outer plates.

Figure 9 is an example of the proposed construction block with a vertical through hole going through the intermediate core.

Figure 10 is an example of the proposed construction block with the intermediate core provided with open gaps on the vertical end edges.

Figure 11 is an example of the proposed construction block with the intermediate core formed by several layers and divided into two individual longitudinal sections, the outer plates having tongue and groove formations on the upper and lower edges.

Figure 12 is an example of the proposed construction block with another arrangement of the intermediate core between the outer plates.

Figure 13 is another embodiment of the proposed

construction block with the intermediate core formed by several layers.

Figure 14 is another embodiment of the proposed construction block with another arrangement of the intermediate core formed by several layers.

Figure 15 is an embodiment of the proposed construction block according to an angular configuration.

#### 10 Detailed Description of the Invention

**[0017]** The object of the invention relates to a block for construction, particularly for the construction of partitions or walls in buildings, as well as the method which is carried out to make constructions with said block.

**[0018]** The proposed block comprises two facing outer plates (1 and 2) between which there is included an insulating intermediate core (3) fixed to said outer plates (1 and 2) by means of an adhesive.

**[0019]** The outer plates (1 and 2) can be of one and the same material or of different materials, the formation thereof with construction materials directly defining a finished or semifinished outer surface, such as wood, plaster, floor tiles, glazed tiles, cement-wood, plywood, melamines, etc., being envisaged.

**[0020]** The intermediate core (3) can in turn comprise a single layer of insulating material or several layers of identical or different insulating materials, for example, cork, gutex, extruded polystyrene, expanded polystyrene, rock wool, elastomeric sheets, etc.

**[0021]** Therefore, the structural formation of the block object of the invention is envisaged such that the intermediate core (3) is tucked in with respect to the outer plates (1 and 2) on at least one of the edges of the contour, defining recesses (4) and projecting in a reciprocal manner on at least another edge of the contour, defining projections (5), as seen in Figures 1 to 5, without the depicted embodiments being limiting.

**[0022]** Therefore, for erecting the constructions of application the block can be associated with other identical or similar blocks, consecutively fitting the projections (5) of one block in the correlative recesses (4) of the consecutive block, after gluing one of the parts of the fitting; a formation of the constructions to be made thus being able to be established in successive rows of blocks in a very simple and fast manner, because the fitting between the consecutive blocks defines the precise positioning thereof to obtain the composition of a perfectly level continuous outer surface, a strong enough assembly of the building being obtained at the same time.

**[0023]** Both inner and outer walls or partitions can thus be built, the use of a non-degradable specific adhesive being envisaged for bonding the blocks depending on the sites of application.

**[0024]** On the other hand, in relation to other structural members of the buildings of application, the constructions that are formed according to the invention can be fixed by means of rails nailed or screwed to the structural

members of the building, fitting the blocks of the construction on said rails by means of the recesses (4) of the edge thereof, whereby obtaining a very easy-to-make and perfectly finished trim for the walls or partitions that are constructed with respect to the structural members of the building; with the possibility of releasing the fastening in those trims, removing the fitting rails for changing the position of the walls or partitions that are built, even being able to move them to another location, without needing to destroy them and reconstruct them in the new location.

**[0025]** The intermediate core (3) can be provided with one or more open grooves (6) along at least one of its edges as can be seen in Figure 6 for housing plumbing pipes or for the passage of cables, such that the pipes for plumbing installations, electrical installations, communication installations, etc., can be placed in the constructions of application when erecting the construction, including said pipes in the grooves (6) of the block provided for that purpose when said blocks are placed in the construction, whereby the erection of the construction ends with the pipes for service installations included therein, without other operators having to later make chases for introducing said pipes.

**[0026]** According to the heat and sound insulation conditions required in the constructions of application, the intermediate core (3) of the blocks can comprise one or more insulating layers, for example, including an acoustic sheet (7) between the intermediate core (3) per se and at least one of the outer plates (1 or 2), as in the embodiment of Figure 8; or the actual intermediate core (3) can be made up of several layers (3.1) of identical or different insulating materials, which can be adhered directly to one another or with one or several layers of separation (3.2), for example plywood, acting as a structural reinforcement, as in the embodiment of Figure 7.

**[0027]** The intermediate core (3) can also be provided with one or more through holes (8) going through it vertically or longitudinally according to the placement position of the block when erecting the constructions of application, as in the embodiment of Figure 9; or with open gaps (9) on the edges, as in the embodiment of Figure 10; to include through said holes (8) or through said gaps (9), reinforcement strips for reinforcing the constructions of application or for forming reinforced concrete joists or posts inside the blocks in the constructions of application.

**[0028]** Likewise, the intermediate core (3) can be formed by individual sections, gaps (10) being located between the outer plates (1 and 2), as in the embodiment of Figure 11; and the intermediate core (3) can also be arranged leaving a wide gap (11) between the outer plates (1 and 2) that is longitudinal or vertical according to the placement position of the block in the constructions of application, as in the embodiments of Figures 12, 13 and 14, which allows forming wood or reinforced concrete beams or pillars inside the blocks through said gaps (10 and 11) in the constructions of application using the blocks themselves as permanent formwork.

**[0029]** In those embodiments of using the blocks as a permanent formwork to form reinforced concrete beams or pillars, for the assembly of the constructions of application to have the strength necessary to withstand the expansive forces of the concrete in the gaps (10 and 11), the outer plates (1 and 2) of the blocks are envisaged with tongue and groove formations (12) on the edges, as seen in Figures 11, 13 and 14.

**[0030]** In any case, the dimensions of the block can vary in length, height and thickness up to maximum dimensions that are determined by ease of handling, since the block according to the invention is envisaged as an element that can be handled manually with ease by a single operator, and not as a large-sized panel that would not allow that ease of handling.

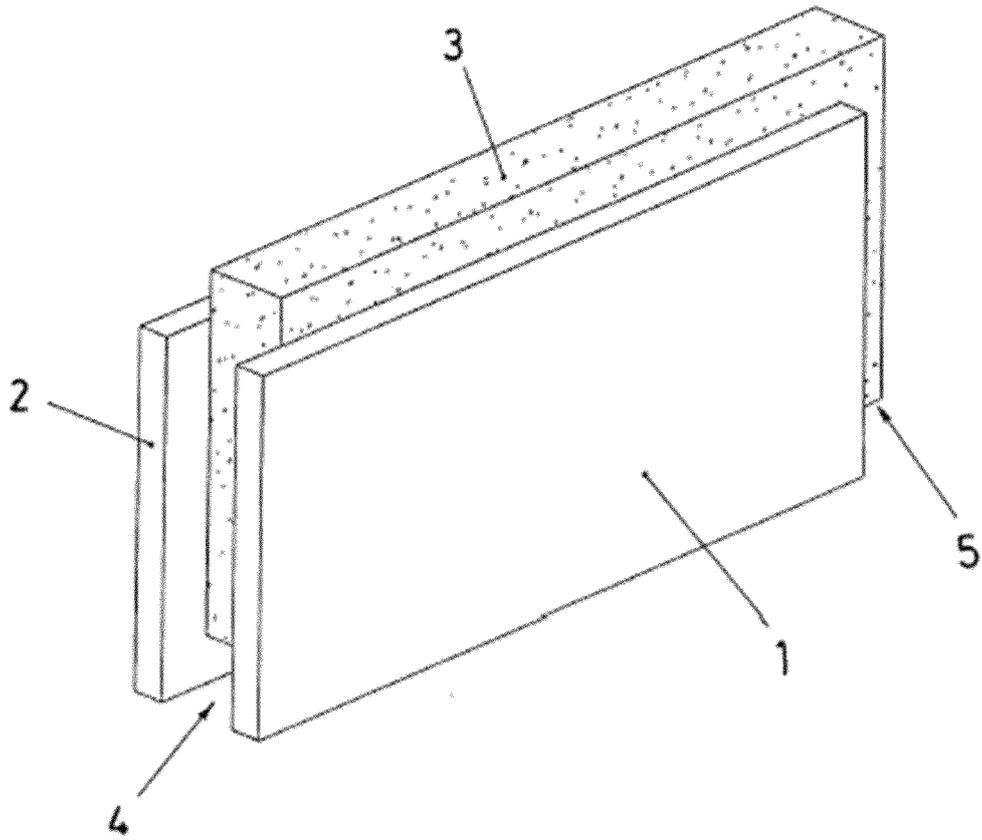
**[0031]** Likewise, the block can have different configurations in its general shape, complying with the structural formation characteristics according to the invention, with two outer plates (1 and 2) of identical or different materials and an intermediate core (3) formed by one or several layers of identical or different insulating materials; even being able to define angular shapes, as seen in the example of Figure 15, for the continuous construction of walls or partitions with corner joints.

#### Claims

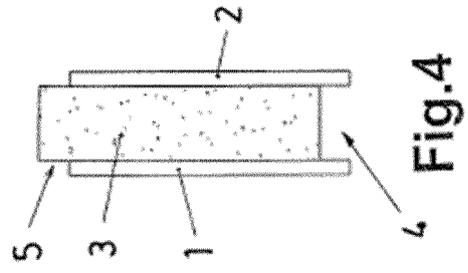
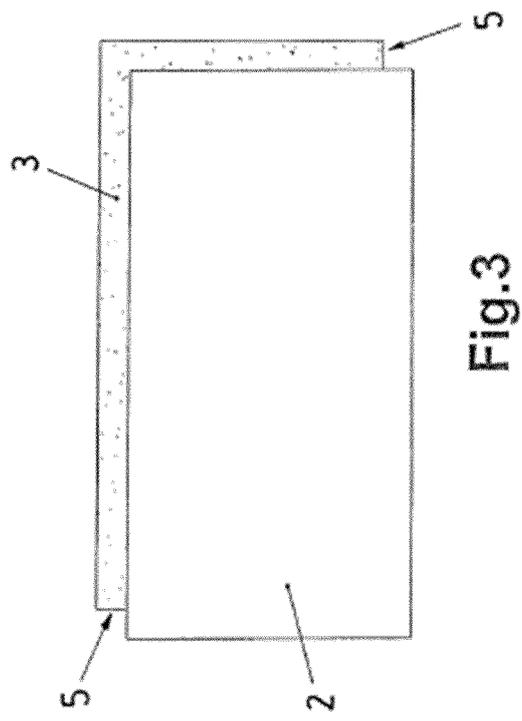
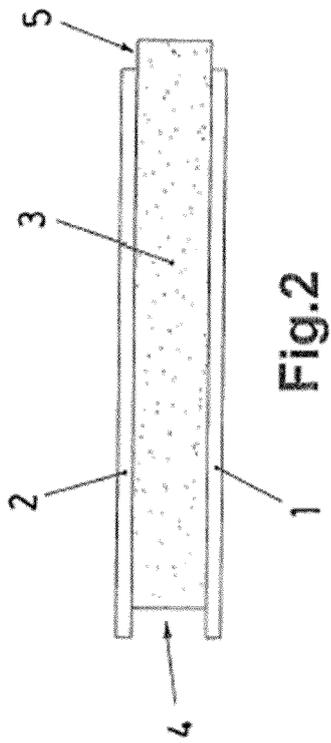
1. A block for construction comprising a structuring formed by layers, **characterized in that** it comprises two facing outer plates (1 and 2) formed by identical or different finish materials, between which there is included an intermediate core (3) fixed to said plates (1 and 2) by adhesion and formed by at least one layer of insulating material, said intermediate core (3) being tucked in with respect to the outer plates (1 and 2) on at least one of the edges of the contour, defining recesses (4), and projecting in a reciprocal manner with respect to said outer plates (1 and 2) on at least another edge of the contour, defining projections (5).
2. The block for construction according to claim 1, **characterized in that** the intermediate core (3) comprises a composition formed by several layers (3.1) of identical or different insulating materials, with the different layers (3.1) directly attached to one another or with one or several layers of separation (3.2) between them.
3. The block for construction according to claims 1 and 2, **characterized in that** the intermediate core (3) has one or more grooves (6) along at least one of its edges for housing pipes of service installations in the constructions of application.
4. The block for construction according to claim 1, **characterized in that** an acoustic sheet (7) is included

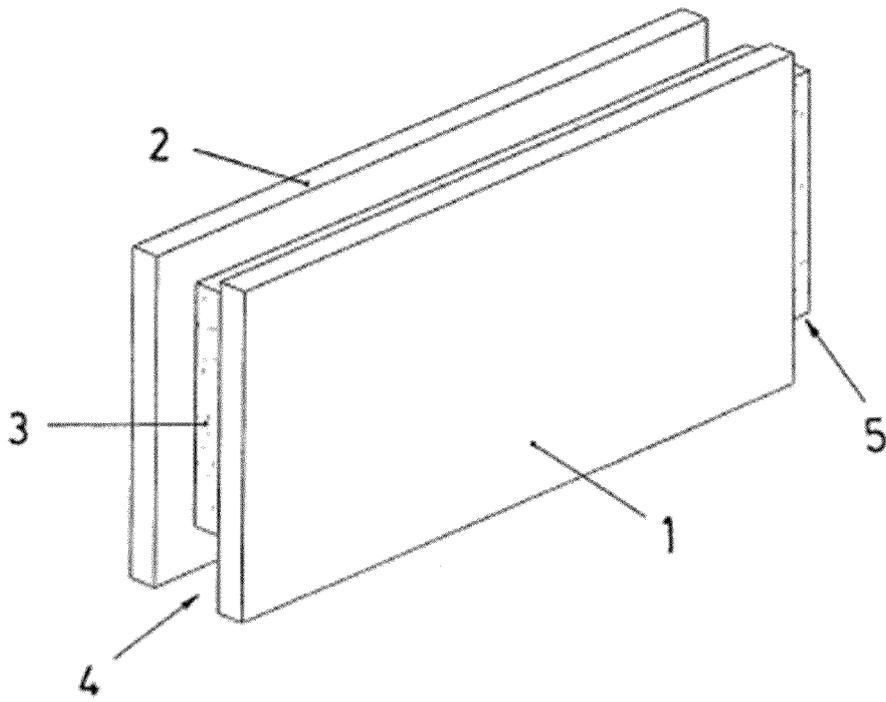
between the intermediate core (3) and at least one of the outer plates (1 or 2).

5. The block for construction according to claim 1, **characterized in that** the intermediate core (3) has through holes (8) going through it or open gaps (9) on the edges to include reinforcement strips inside the blocks or to form reinforced concrete joists or posts in the constructions of application. 5  
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6. The block for construction according to claim 1, **characterized in that** the intermediate core (3) is made up of individual sections defining gaps (10) between the outer plates (1 and 2) for forming wood or reinforced concrete pillars or beams inside the blocks in the constructions of application. 15
7. The block for construction according to claim 1, **characterized in that** the intermediate core (3) is arranged in a position leaving a wide gap (11) between the outer plates (1 and 2) for forming wood or reinforced concrete pillars or beams inside the blocks in the constructions of application. 20
8. The block for construction according to claim 1, **characterized in that** the outer plates (1 and 2) have on their edges tongue and groove formations (12) for fitting the correlative plates (1 and 2) of the consecutive blocks to one another in the constructions of application. 25  
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9. A method of construction with a structured block according to the preceding claims, using blocks formed by two outer plates (1 and 2), between which there is included an intermediate core (3) of insulating material defining recesses (4) and projections (5) with respect to the outer plates (1 and 2) on at least some edges of the contour, **characterized in that** the erection of the constructions of application is performed by successively arranging the blocks, fitting the projections (5) of one block into the recesses (4) of the consecutive block, after gluing one of the parts of the fitting, the pipes for service installations being incorporated when erecting the construction by means of housing said pipes in grooves (6) of the intermediate cores (3) of the corresponding blocks, and forming beams or joists and pillars or posts inside the blocks through the hole or gaps (8, 9, 10, 11) defined through same, while erecting the construction. 35  
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10. The method of construction according to claim 9, **characterized in that** the assembly of the construction is fastened at its ends by means of rails fixed to the structural members of the buildings of application, the corresponding blocks for construction fitting on said rails by means of the recesses (4) thereof. 55

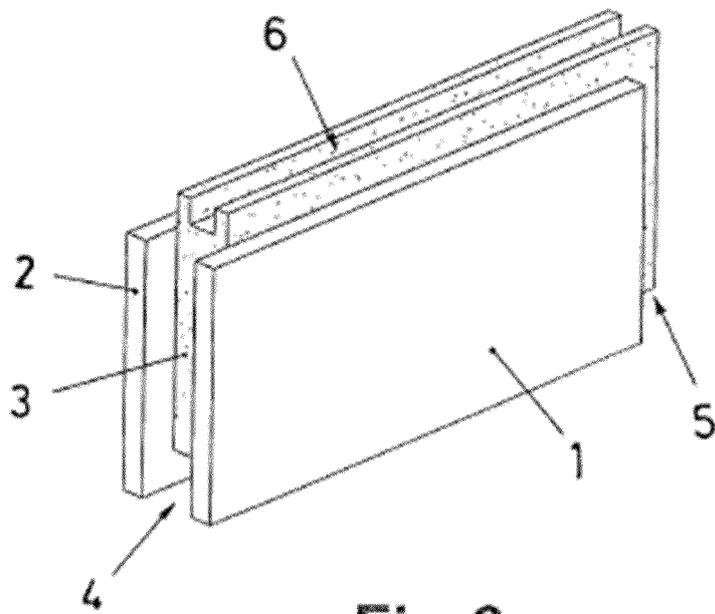


**Fig.1**

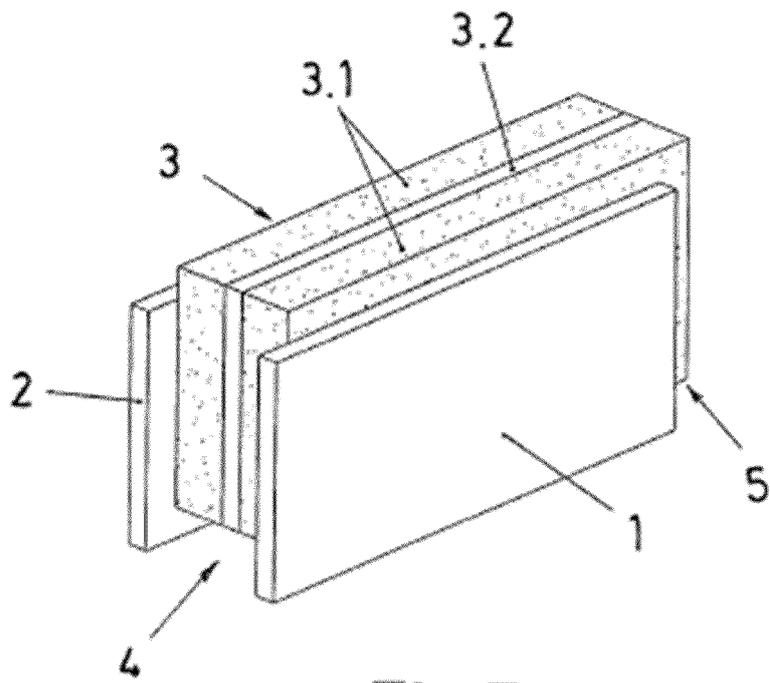




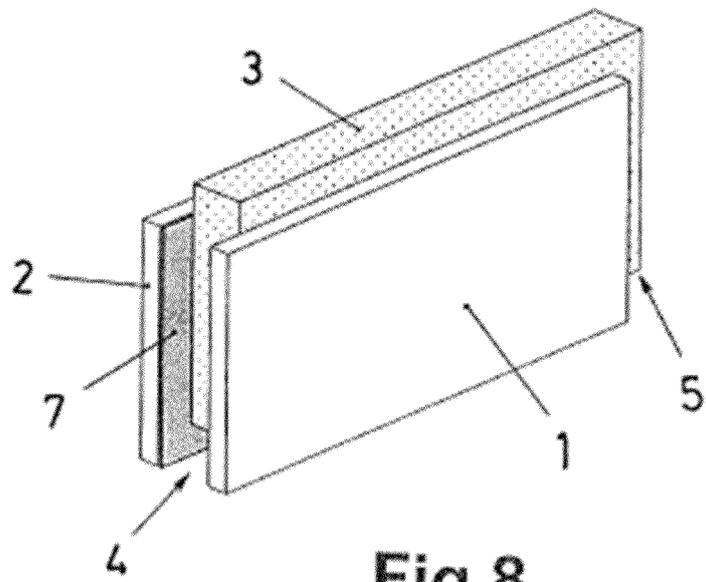
**Fig.5**



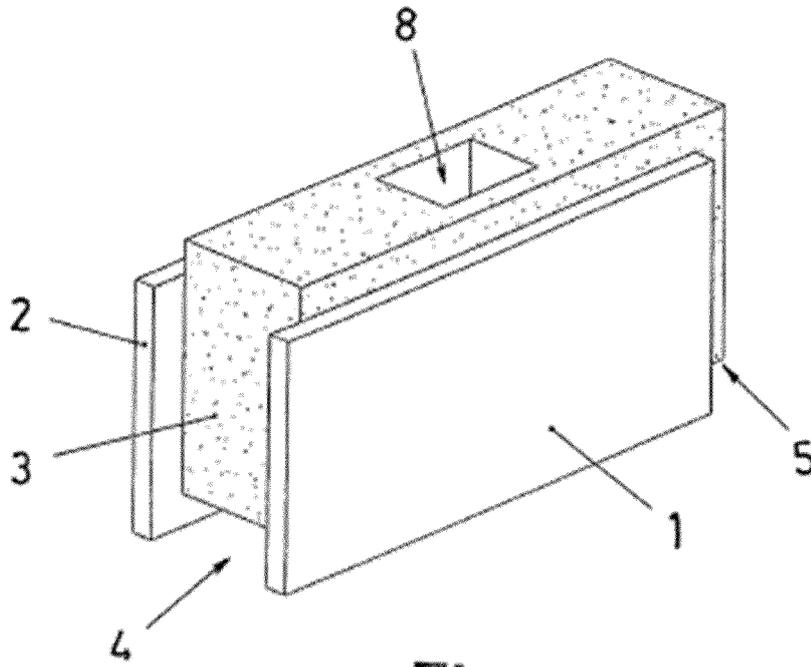
**Fig.6**



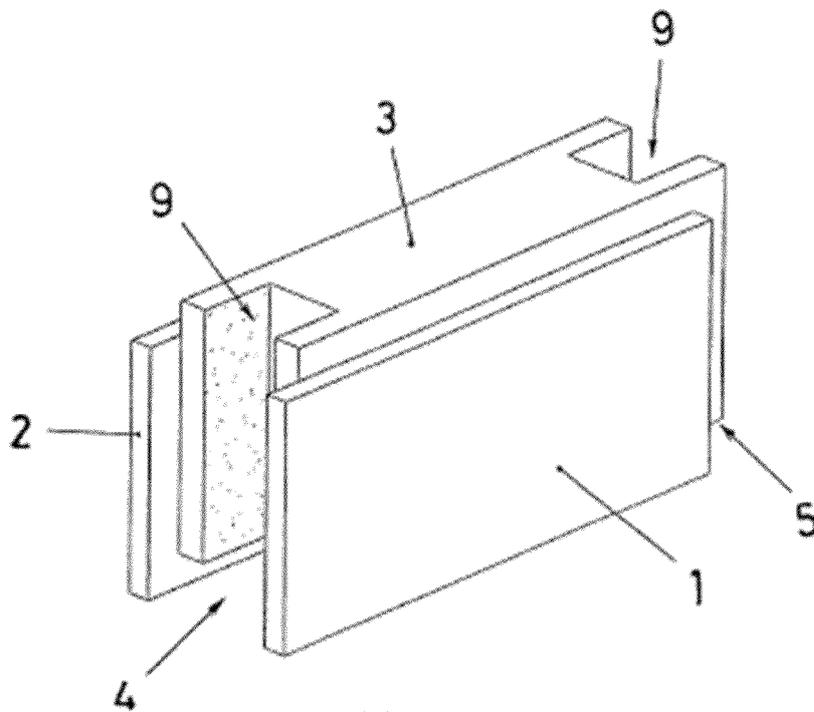
**Fig.7**



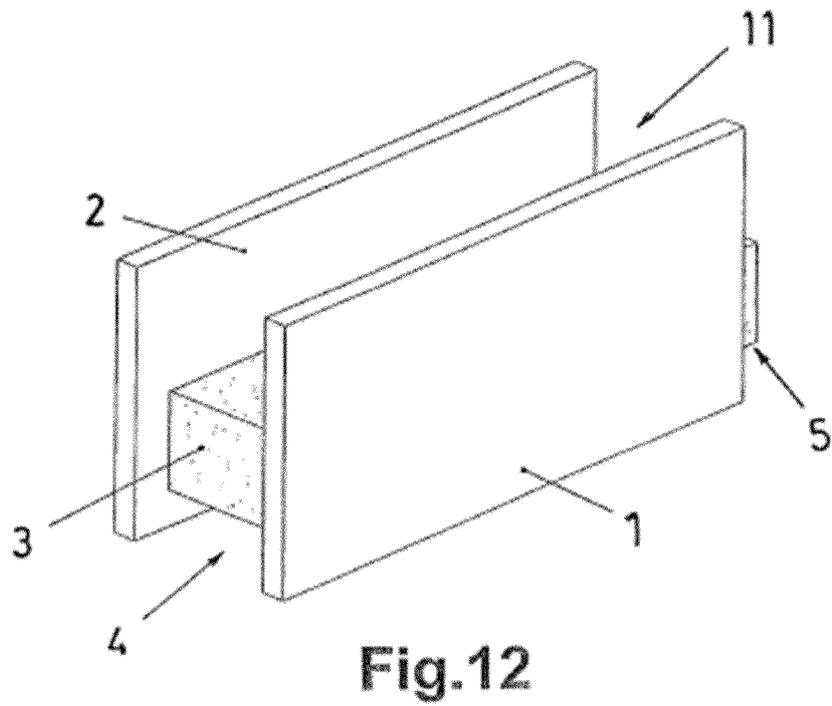
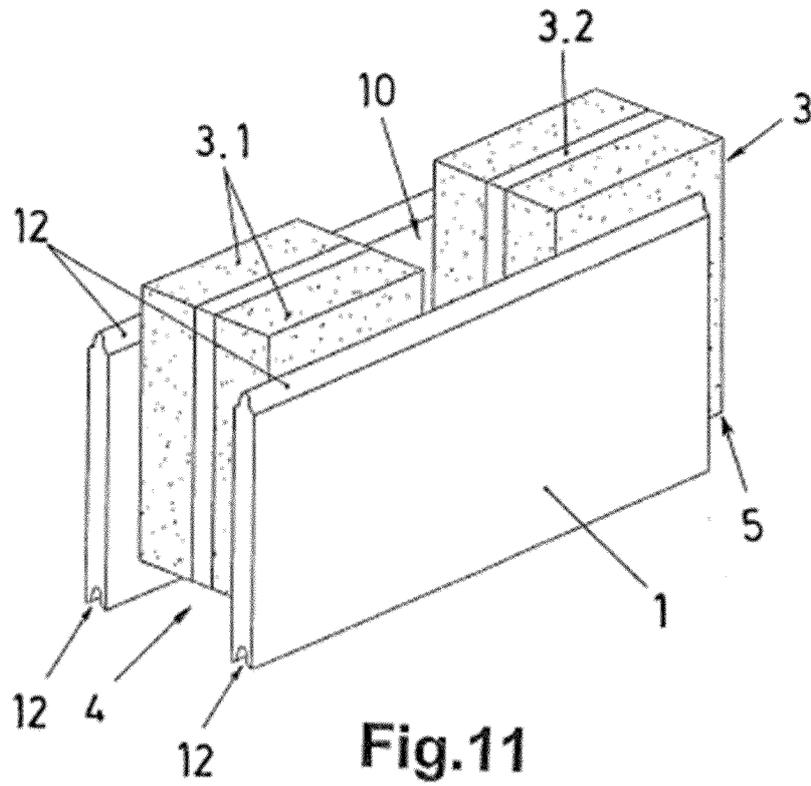
**Fig.8**

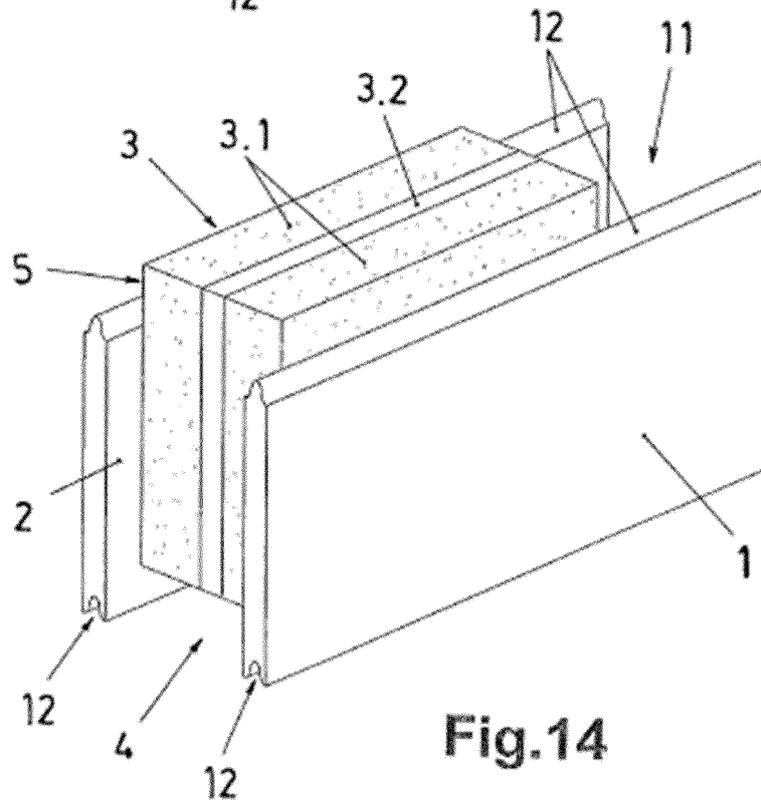
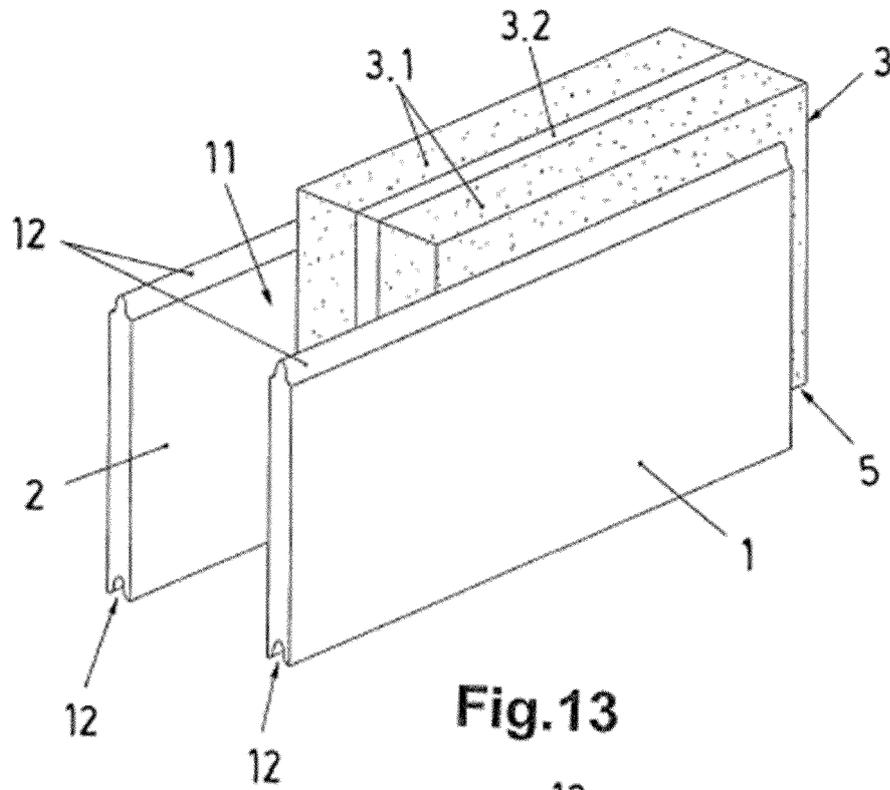


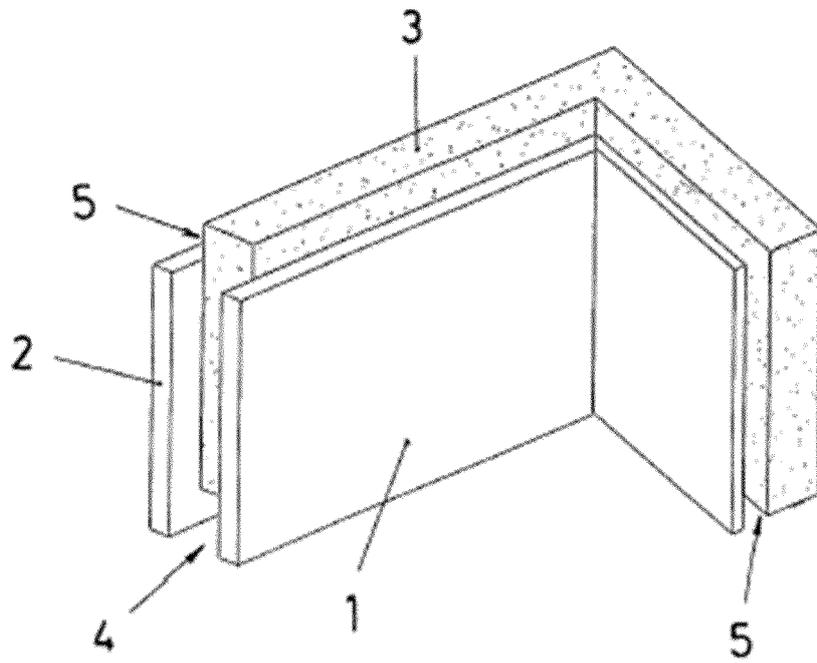
**Fig.9**



**Fig.10**







**Fig.15**

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/ES2012/000157

## A. CLASSIFICATION OF SUBJECT MATTER

**See extra sheet**

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)  
E04C, E04B

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 practicable, search terms used)

EPODOC, INVENES

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A		2,8,9
Y	EP 209993 A2 (SNITOVSKY) 28/01, page 3, line 28 - page 11, line 8; figures.	1-7
Y	US 4557094 A (BELIVEAU) 10/12/1985, page 4, line 9 - page 10, line 25; figures.	1-7
Y	US 6205726 B1 (HOADLEY) 27/03/2001, column 2, line 56 - column 7, line 34; figures.	1-7
A		9
A	CH 692993 A5 (FRINORM AG) 15.01.2003 & Abstract from DataBase EPODOC. Retrieved of EPOQUE; AN CH-204598-A	1,8

 Further documents are listed in the continuation of Box C. See patent family annex.

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Date of the actual completion of the international search  
21/09/2012Date of mailing of the international search report  
(01/10/2012)

Name and mailing address of the ISA/

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International application No. PCT/ES2012/000157
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C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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*E04B2/38* (2006.01)