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(54) Brick having a plurality of tubular hollows

(57) A construction element (1) for the construction of building structures comprising a first central volume (2) and at least a second lateral volume (3;4), characterized in that said first (2) and at least a second (3;4) volume are adjacent and offset to each other. Further a system for realizing said building structures comprising a plurality of said construction elements is also disclosed.

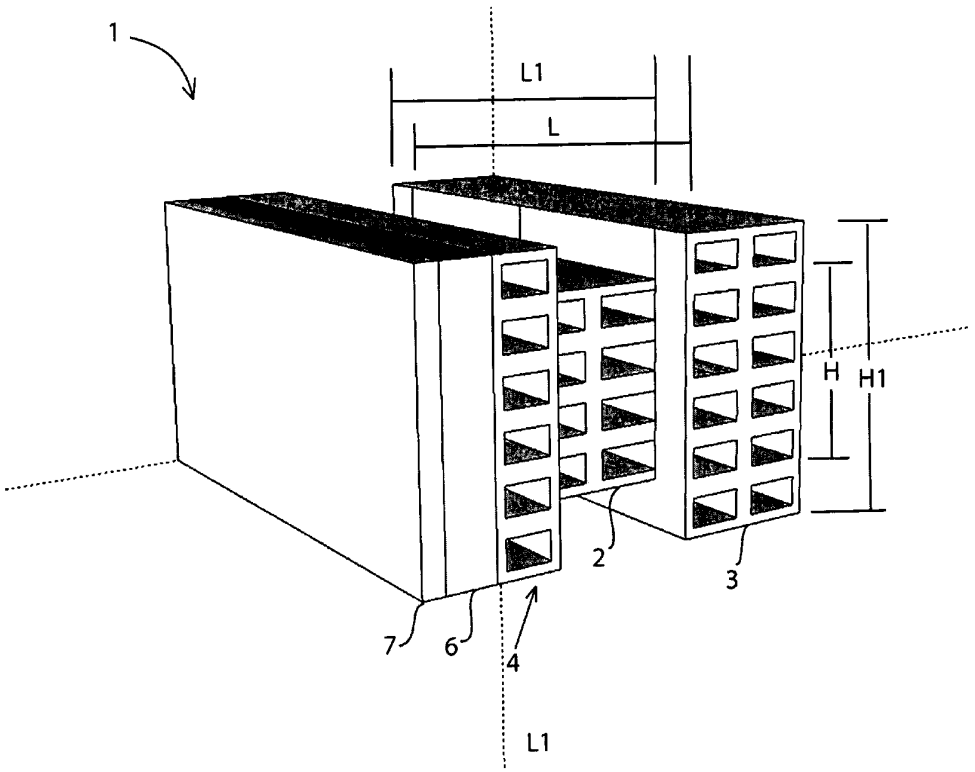

Fig.3

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Description

[0001] The present invention is included in the field of constructions, and particularly concerns a construction element for making building structures and a system for realizing said building structures.

[0002] An important problem in the construction field is that of costs and assembly time: being them due to the labor required, they vary on the basis of the possibility of using the construction elements and of the necessity of providing, within the structures, passages for additional thermal- insulating or acoustic elements and systems.

[0003] Known solutions are prefabricated panels with different sizes, comprising in a single piece all necessary elements to realize a structure; however, they are comprised of expensive materials and require the use of specialized labor for its mounting.

[0004] Thus, main drawback of known technique described in the above are very high costs of materials, designing and realization of the same.

[0005] On the other hand, prefabricated structures comprise materials highly polluting and with a high environmental impact, thus making it impossible an organic control of ventilation within the whole building, limiting to the application of a much lower variety of finishing and coatings with respect to masonry structures.

[0006] Most convenient solution is that of using a traditional perforated or holed brick, having a substantially rectangular shape, by which, thanks to juxtapositions and offsetting, it is possible realizing air chambers and channels for passage of systems. Furthermore, positioning of offset bricks prevents creation of thermal bridges between inside and outside the building. Then, it is possible applying acoustic finishing

[0007] Obviously, said operations provide the use of a much longer time with respect to the time required by adopting the first solution, in any case influencing the final cost of the work.

[0008] It is thus clear the needing of a construction system permitting obviating all the disadvantages of the known art.

[0009] Main object of the present invention is thus that of making the work of the Construction Company easier as far as costs and mounting /installing time are concerned.

[0010] Further object of the present invention is that of making modern a traditional construction element.

[0011] Further object of the present invention is that of being easy to be realized. It is therefore specific object of the present invention a construction element for the construction of building structures comprising a first central volume and at least a second lateral volume, **characterized in that** said first and at least a second volume are adjacent and offset to each other. Furthermore, according to the invention, said first central volume has a first height and said at least a second lateral volume has a second height, said first height being smaller than said second height

[0012] Preferably, according to the invention, said first central volume has a first length and said at least a second lateral volume has a second length, said first length being smaller than said second length.

[0013] Still according to the invention, said first central volume is centrally arranged with respect to said second height and/or with respect to said second length.

[0014] Further, according to the invention, said construction element has a homogeneously arranged holes.

[0015] Always according to the invention said homogeneous arranged hollows comprise a plurality of holes, each having a third height, the difference between said second and first height and/or the difference between said second and first length corresponding to at least the measurement of said third height.

[0016] Furthermore, according to the invention, said first volume has a first base, said at least a second volume has a second base and in that each of said holes has a third base, said first base and second base resulting substantially corresponding to twice said third base (b).

[0017] Preferably, according to the invention, said first height results corresponding to four times said third height, and/or said second height results corresponding to six times said third height.

[0018] Still according to the invention, construction element comprises two second lateral volumes, arranged at the sides of said first volume.

[0019] Further, according to the invention, at least a second lateral volume has a first acoustic finishing layer.

[0020] Always according to the invention, at least a second lateral volume has a second heat-absorbing finishing layer.

[0021] Furthermore, according to the invention, at least a second lateral volume has an incision made beforehand, suitable to facilitate creation of a cavity for passage of cables and/or tubes within the building structure.

[0022] It is further object of the present invention a system for the construction of building structures comprising a plurality of construction elements as described in the above.

[0023] Preferably, the system for the construction of building structures comprises a plurality of tubular elements, preferably having a rectangular section, each suitable for placing between two central volumes of a first and a second juxtaposed construction elements, so as said second lateral volumes of said first construction element exactly match with said second lateral volumes of said second construction element.

[0024] Further, according to the invention, tubular elements have a rectangular cross-section.

[0025] The present invention will be now described, for illustrative, but not limitative, purposes, with particular reference to the enclosed drawings, wherein operation of element and system according to the invention are shown.

[0026] Particularly,

figure 1 is a front view of the construction element

according to the invention;
figure 2 is an isometric view from below of the construction element of figure 1;
figure 3 is an isometric view from above of construction element of figure 1;
figure 4 is a top view of construction element of figure 1;
figure 5 is an isometric vie from below of a part of a structure realizes by the system for realizing building structures according to the invention; figure 6 is an isometric view from the above of the part of the structure of figure 5;
figure 7 shows a further construction element of the system of figure 5; and
figure 8 is a lateral view of the part of structure of figure 5.

[0027] Making reference to figures 1 - 4, construction element according to the invention, generically indicated by reference number 1, has a central volume 2 having a substantially parallepiped shape, with a base B and a height H, a first lateral volume 3, having a substantially parallelepiped shape, having a base B1 and a height H1, and a second lateral volume 4, having a substantially parallelepiped shape, having a base B2 and a height H2.

[0028] According to the preferred embodiment shown in the figures, basis are substantially identical, being B=B1=B2, and heights of lateral volumes H1 and H2 are equal each other and bigger than central volume H, being H1=H2>H.

[0029] Particularly, always according the preferred embodiment shown in the figures, construction element 1 has a homogeneous rectangular hole group, wherein each hole 5 has a height h and a base b, being:
B=B1=B2=2*b;
H=4*h;
H1=H2=H+2*h=6+h;
Central volume 2 being centrally positioned with respect to heights H1 and H2.

[0030] Thus, central volume 2 has two vertical rows, each one comprised of four holes 5, first lateral volume 3 has two vertical rows, each one comprised of six holes 5, with a first acoustic layer 6 and a second thermo-absorbent layer 7 juxtaposed.

[0031] When a plurality of construction elements 1 are put side by side and/or juxtaposed according to the present invention, a space is created between two central volumes 2 of two construction elements placed side by side or juxtaposes each other.

[0032] Central volume 2 has a length L lower than lengths L1 of lateral volumes 3 and 4, so that, when a plurality of construction elements 1 is placed side by side, a space is realized about the four free sides of central volume 2. Making reference to figures 5 - 8, system for realizing building structures according to the invention comprises a plurality of construction elements 1 and a series of tubular elements 8, having a rectangular cross-section, suitable to be inserted between two central volumes 2 of two construction elements 1 and 1' juxtaposed each other, so that lateral volumes 3 and 4 of first construction element 1 exactly match with lateral volumes 3' and 4' of second construction element 1'.

[0033] Thus, particularly, one side of rectangle H of said tubular elements 8 corresponds to the difference between height H1 of second 3 and third 4 lateral volume and height H of first central volume 2.

[0034] The other side of rectangle corresponds to the difference between length L1 of second 3 and third 4 lateral volume and length L of first central volume 2. If tubular element 8 has a squared cross-section, said differences will be equal each other.

[0035] The above permits using the same tubular element 8 either placed horizontally and vertically, thus saving many time, as well as simplifying manufacturing and assembling operation for different pieces.

[0036] Obviously, amount of holes 5 realizing volumes 2, 3, and 4, as well as their proportion, are not relevant, provided that a height and/or base difference exists between two of the volumes 2, 3 and 4, so that while assembling, it is possible fitting them, being it possible inserting or not inserting between them the tubular element 8, and preventing the needing of offsetting them to prevent thermal bridges.

[0037] For example, central volume 2 and one of the lateral volumes 3 or 4 can coincide, construction element being overturned each other to be assembled while realizing a bi-dimensional structure. Thus, height and/or width difference between central volume and lateral volume is such not to require presence of further tubular elements 8 and, at the same time, construction elements according said embodiment of the invention do not need being offset each other, since volumes are already offset.

[0038] Still, according to another embodiment, not shown in the drawings, construction elements according to the invention can be full, i.e. without holes.

[0039] Advantageously, construction element according to the invention can be comprised by traditional extrusion techniques employing brick material, or by a single mold, but it is also possible applying more modern manufacturing techniques.

[0040] Another advantage of the present invention is due to the fact that building structures realized by using the construction element, as well as the relevant system, are mechanically resistant to horizontal stresses, since volumes 2, 3 and 4 are offset each other along every direction.

[0041] Still another advantage of the present invention is that structures realized by using construction elements according to the invention are provided with many functional elements, such as acoustic and/or acoustic layers 6, 7, or spaces for passage of cables or tubes.

[0042] Always advantageously, mounting of a structure realized by construction elements according to the invention is completed much faster that structures realized by using traditional systems and construction elements. Further, coating of some critical points of build-

ings, such as pillars or pavements is facilitated, thanks to the use of a material which is compatible with the same, such as brick material.

[0043] Further advantage of the present invention is due to the predisposition to receive system components even after the realization of the structure, thanks to the presence of incisions along lateral volumes, facilitating creation of cavities for passage of tubes and/or cables, thus preventing the necessity of making breakages through the walls, causing possible failure of the structure and jeopardizing the final efficiency.

[0044] Last, but not least, advantage due to the construction elements and to the relevant construction system is, under an aesthetic point of view, possibility of coating the structure by a wide range of materials and of chromatic finishing.

[0045] Still, even avoiding the coating of the structure, result that can be obtained is that of a masonry, thus reducing maintenance work.

[0046] Present invention has been described for illustrative, but not limitative, purposes, according to a preferred embodiment, but it is to be understood that variations and/or modifications can be introduced by those skilled in the art without departing from the relevant scope, as defined in the enclosed claims.

Claims

1. Construction element (1) for the construction of building structures comprising a first central volume (2) and at least a second lateral volume (3; 4), **characterized in that** said first (2) and at least a second (3; 4) volume are adjacent and offset to each other.

2. Construction element (1) according to claim 1, **characterized in that** said first central volume (2) has a first height (H) and said at least a second lateral volume (3; 4) has a second height (H1), said first height (H) being smaller than said second height (H1), and/or said first central volume (2) has a first length (L) and said at least a second lateral volume (3; 4) has a second length (L1), said first length (L) being smaller than said second length (L1).

3. Construction element (1) according to claim 2, **characterized in that** said first central volume (2) is centrally arranged with respect to said second height (H1) and/or with respect to said second length (L1).

4. Construction element (1) according to any of claims 1-3, **characterized in** having homogeneously arranged hollows.

5. Construction element (1) according to claim 4 (when depending on claim 2 or 3), **characterized in that** said homogeneous arranged hollows comprise a plurality of holes (5), each having a third height (h), the difference between said second (H1) and first height (H) and/or the difference between said second (L1) and first (L) length corresponding to at least the measurement of said third height (h).

6. Construction element (1) according to claim 5, **characterized in that** said first volume (2) has a first base (B), said at least a second volume (3, 4) has a second base (B1, B2) and **in that** each of said holes has a third base (b), said first base (B) and second base (B1, B2) resulting substantially corresponding to twice said third base (b), and/or said first height (H) results corresponding to four times said third height (h), and/or said second height (H1) results corresponding to six times said third height (h).

7. Construction element (1) according to any of claims 1-6, **characterized in** comprising two second lateral volumes (3, 4), arranged at the sides of said first volume (2).

8. Construction element (1) according to any of claims 1-7, **characterized in that** a second lateral volume (3; 4) has a first acoustic finishing layer (6), and/or a second heat-absorbing finishing layer (6).

9. System for the construction of building structures comprising a plurality of construction elements according to any of claims 1-8.

10. System for the construction of building structures according to claim 9, **characterized in** comprising a plurality of tubular elements (8), preferably having a rectangular section, each suitable for placing between two central volumes (2) of a first (1) and a second (1') juxtaposed construction elements, so as said second lateral volumes (3, 4) of said first construction element (1) exactly match with said second lateral volumes (3', 4') of said second construction element (1').

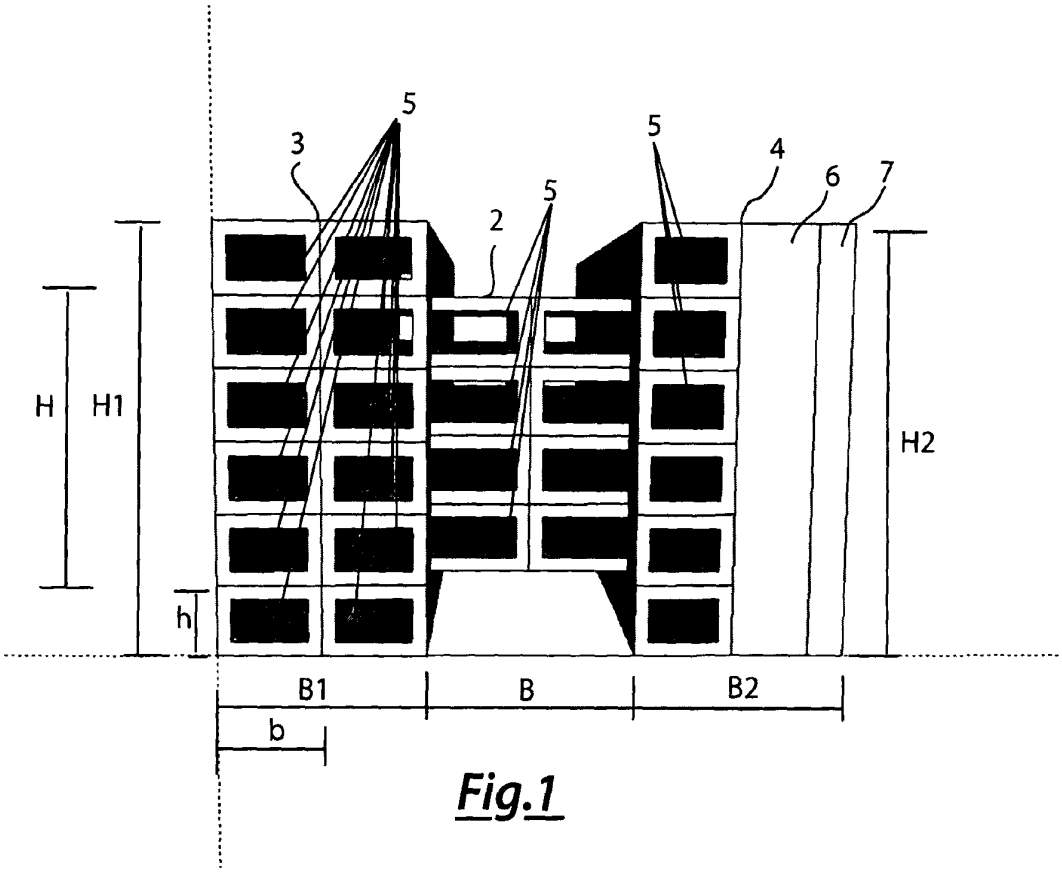

Fig.1

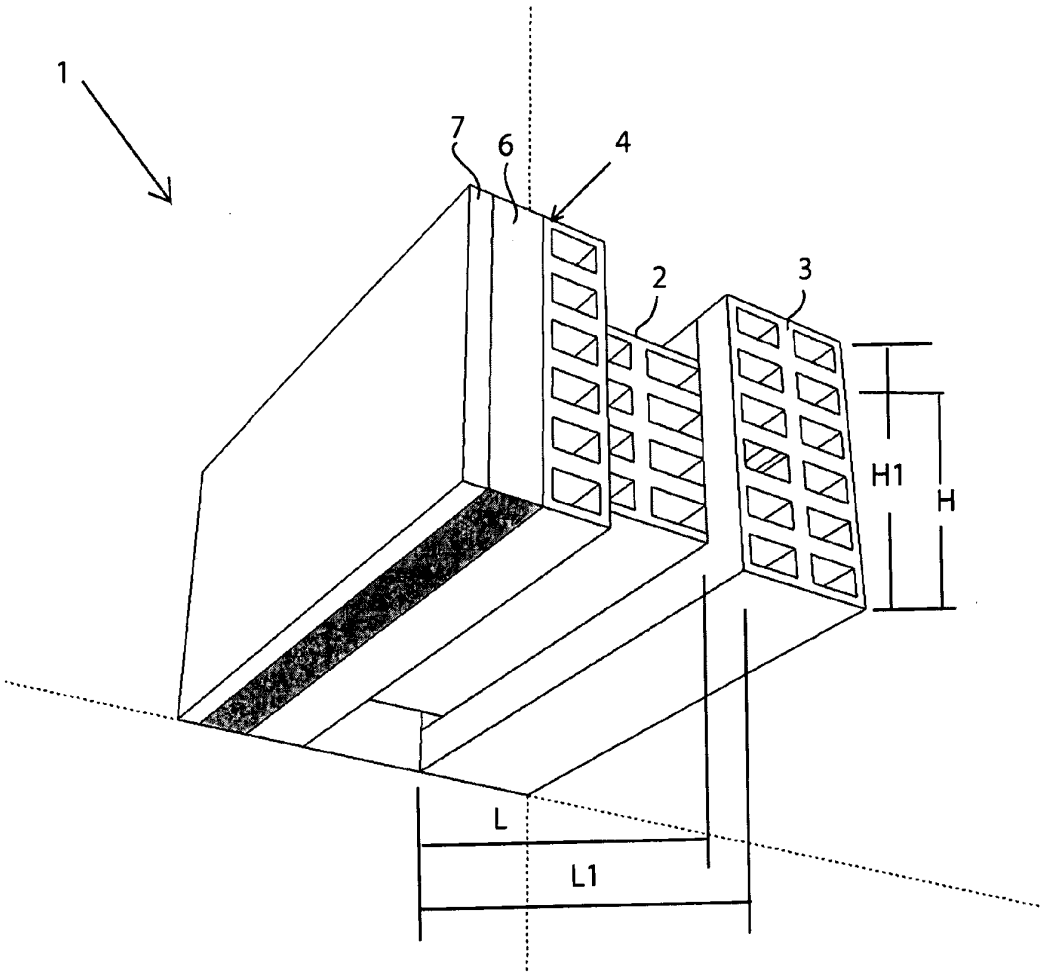

Fig.2

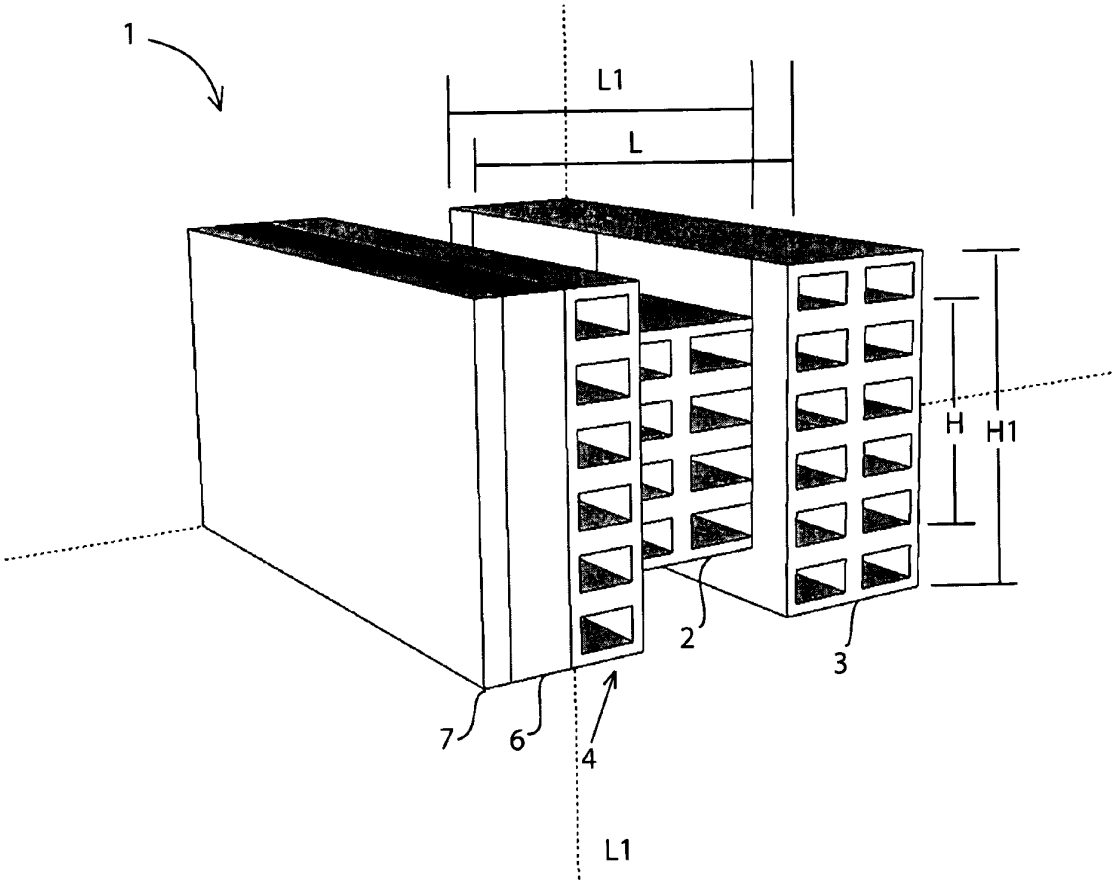

Fig.3

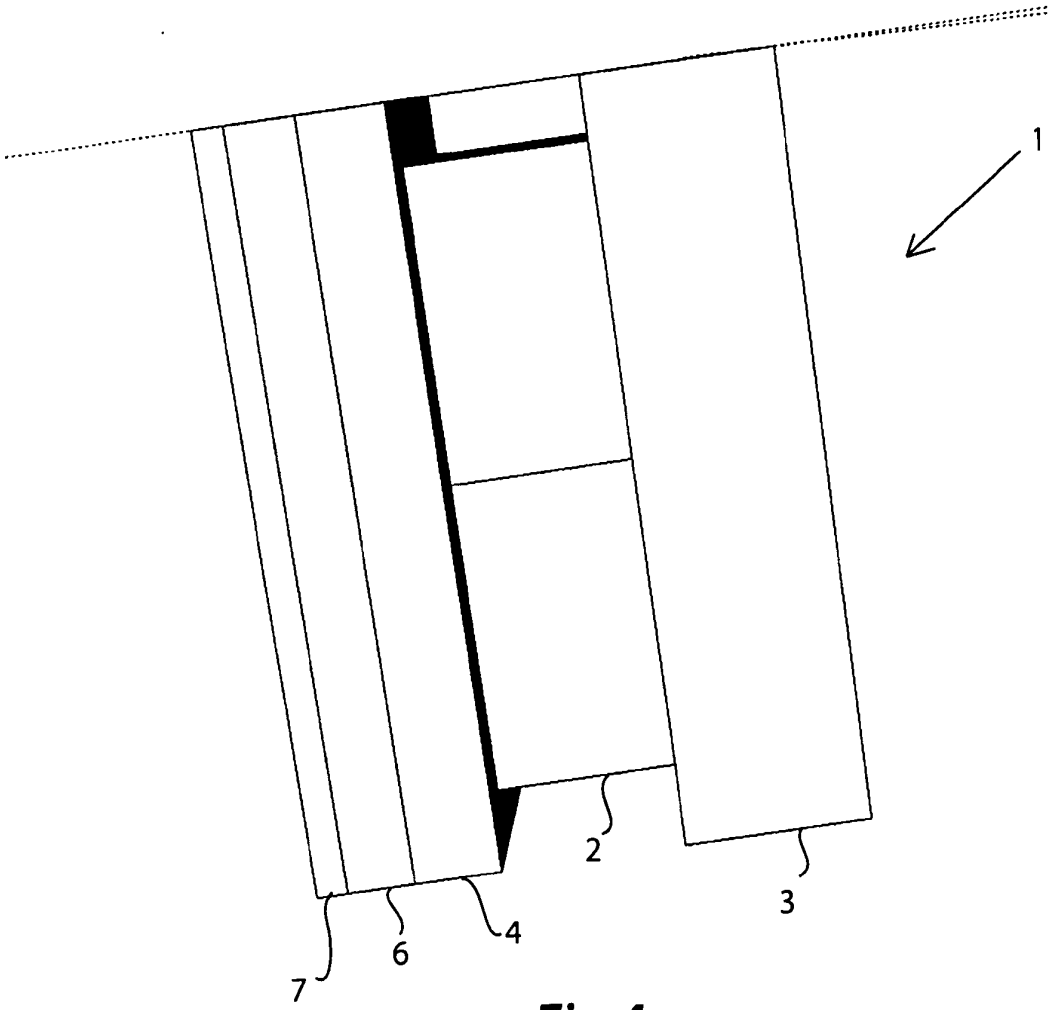

Fig.4

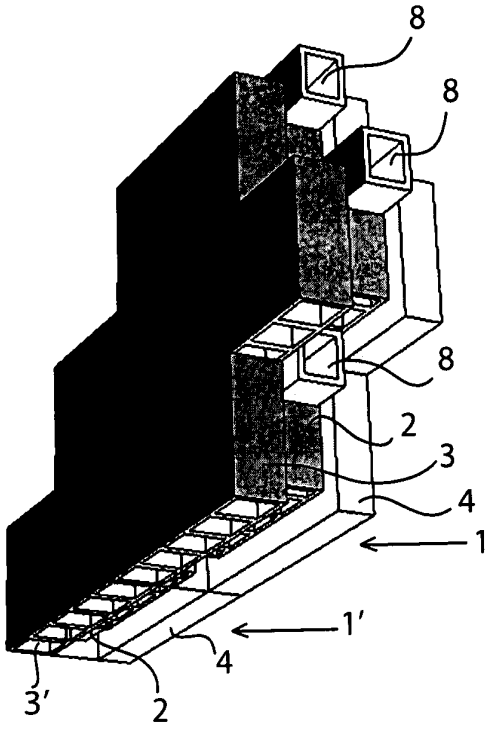

Fig.5

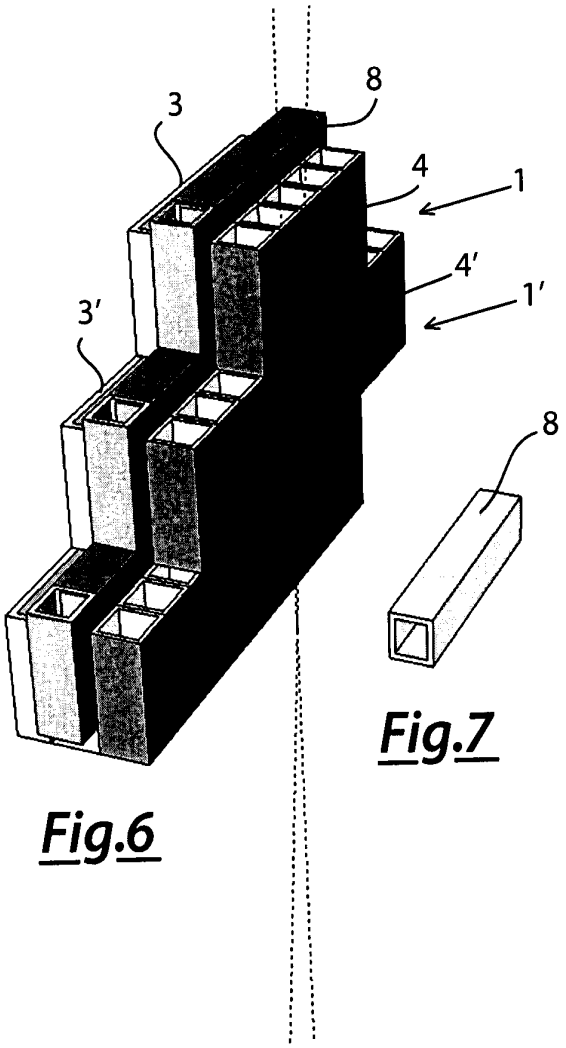

Fig.6

Fig.7

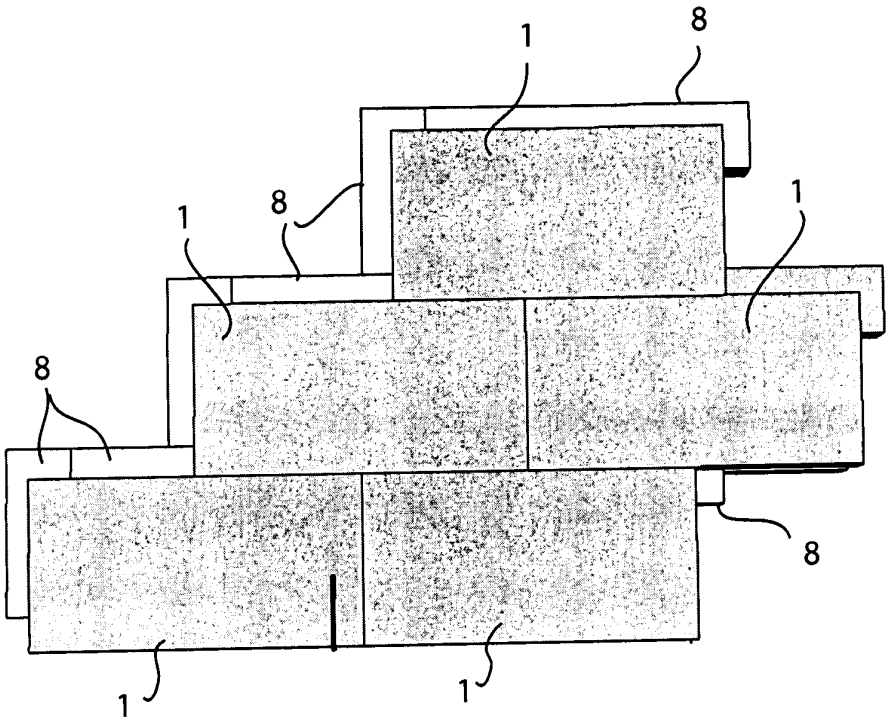

Fig.8

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EUROPEAN SEARCH REPORT

Application Number
EP 12 42 5166

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	FR 2 952 949 A1 (MARTINS BATISTA BERNARDO [FR]) 27 May 2011 (2011-05-27)	1-9	INV.
Y	* page 8, lines 10-31; figure 1b *	10	E04B2/18
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X	DE 296 17 805 U1 (KOENIG SIEGFRIED [DE]) 5 December 1996 (1996-12-05)	1-4,7-9	E04C1/41
Y	* page 3, paragraph sixth - page 4, paragraph second; figures 1,2,4 *	10	

X	WO 00/19032 A1 (KEKANOVIC MILAN [YU]) 6 April 2000 (2000-04-06)	1,4,8,9	
Y	* page 4, lines 5-43; figure 1 *	10	

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Y	* page 7, lines 1-23; figures 2,8 *	10	

Y	DE 17 84 100 A1 (VEIT DENNERT KG BAUSTOFFBETR E) 22 July 1971 (1971-07-22) * page 4, line 19 - page 5, line 9; figure 1 *	10	

TECHNICAL FIELDS SEARCHED (IPC)

E04B
E04C

The present search report has been drawn up for all claims

1

Place of search	Date of completion of the search	Examiner
Munich	1 February 2013	Valenta, Ivar

CATEGORY OF CITED DOCUMENTS

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