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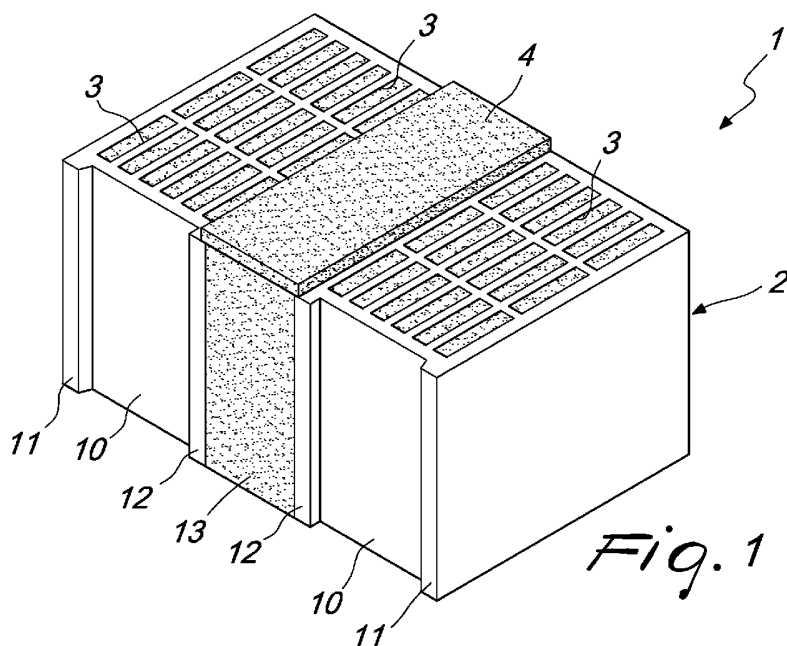
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(54) Title: HOLLOW BRICK WITH THERMAL INSULATION, PARTICULARLY FOR PROVIDING STRUCTURAL MASONRY



(57) Abstract: A hollow brick (1) with thermal insulation particularly for providing structural masonry, which has a body (2) that forms a plurality of hollow channels (3) in which expanded plastic material is arranged. On the upper face of the body (2) there is a strip (4) of expanded plastic material; the brick comprises, at least one internal vertical face, at least two recesses (10) that are separated by a partition (13) made of expanded plastic material and form, in cooperation with the internal vertical face of a laterally adjacent brick, receptacles for introducing connecting mortar, which forms a vertical joint.

HOLLOW BRICK WITH THERMAL INSULATION, PARTICULARLY FOR PROVIDING STRUCTURAL MASONRY

Technical Field

The present invention relates to a hollow brick with thermal insulation, particularly for providing structural masonry.

Background Art

As is known, thermally insulated bricks are already commercially available which, for energy saving in the construction sector, are provided in practice by introducing in the hollow channels expanded plastic material which provides thermal insulation.

Experimental tests that have been performed have shown that the weak link of resistance to the passage of heat in a wall is the bedding mortar used to mutually connect the bricks.

For solving this problem, a brick has already been marketed which has, on its upper face, a strip made of thermally insulating material, which in practice interrupts the thermal bridge by extending on a horizontal plane.

As regards the internal vertical connection, i.e., the connection between the bricks arranged side by side, male and female interlocking portions are typically provided on the vertical walls, thus providing structural masonry that is suitable in non-seismic areas, but is not suitable for providing masonry in seismic areas due to the lack of the vertical joint.

Disclosure of the Invention

The aim of the invention is to solve the problem described above by providing a hollow brick with thermal insulation particularly for providing structural masonry that makes it possible to reach the desired value of thermal insulation, at the same time obtaining the possibility to use it in seismic areas.

Within this aim, an object of the invention is to provide a hollow brick in which it is possible to provide for the application of a vertical mortar joint at the vertical faces of the block, without however creating a

thermal bridge between the inside and the outside.

Another object of the present invention is to provide a hollow brick which, thanks to its particular constructive characteristics, is capable of giving the greatest assurances of reliability and safety in use.

5 Another object of the present invention is to provide a hollow brick with thermal insulation particularly for providing structural masonry, which can be obtained easily starting from commonly commercially available elements and materials and is also competitive from a merely economical point of view.

10 This aim, as well as these and other objects that will become better apparent hereinafter, are achieved by a hollow brick with thermal insulation particularly for providing structural masonry, which has a body that forms a plurality of hollow channels in which expanded plastic material is arranged, on the upper face of said body there being further provided a strip of
15 expanded plastic material, characterized in that it comprises, at at least one internal vertical face, at least two recesses that are separated by a partition made of expanded plastic material which form, in cooperation with the internal vertical face of a laterally adjacent brick, receptacles for introducing connecting mortar.

20 **Brief description of the drawings**

Further characteristics and advantages of the present invention will become better apparent from the description of a preferred but not exclusive embodiment of a hollow brick with thermal insulation particularly for providing structural masonry, illustrated by way of non-limiting example
25 with the aid of the accompanying drawings, wherein:

Figure 1 is a schematic perspective view of the hollow brick according to the invention;

Figure 2 is a perspective view of a plurality of bricks arranged side by side;

30 Figure 3 is a top plan view of the side-by-side arrangement of the

bricks;

Figure 4 is a bottom view of a brick according to the invention.

Ways of carrying out the Invention

With reference to the figures, the hollow brick with thermal
5 insulation particularly for providing structural masonry, generally designated by the reference numeral 1, comprises a body 2, which is typically obtained by extrusion and has a percentage of hollows, understood as a ratio between void and solid, which is for example lower than 45%.

The hollow channels, designated by the reference numeral 3, are
10 advantageously filled with expanded plastic material, of the type of graphite-treated polystyrene, as described in patent application MI2008A000302, by the same Applicant, hereby incorporated by reference.

At the upper face of the brick 1 there is a strip 4 made of expanded plastic material, preferably consisting of graphite-treated polystyrene, which
15 runs along the central region, so as to provide a separation between the inside and the outside, interrupting the thermal bridge created by the bedding mortar that provides the horizontal joint for the connection of the bricks arranged above.

One of the particularities of the invention is that at at least one
20 internal vertical face there are recesses 10 which, toward the outer edges, are delimited by outer lips 11 and, toward the inner edges, by inner lips 12, between which there is a partition 13, also made of expanded plastic material such as graphite-treated polystyrene.

The internal lips 12 have, on their facing sides, undercuts 14 that act
25 as elements for retaining the partition 13.

The recesses 10 have the particularity that they form, in cooperation with the internal vertical face of a laterally adjacent brick, receptacles for the insertion of connecting mortar, generally designated by the reference numeral 20, which in practice provides joints for vertical connection among
30 the various bricks, leading to the obtainment of masonry that is suitable for

use in seismic regions.

With the solution described above, therefore, complete separation of the thermal bridge produced by the mortar is provided both in the horizontal plane, since the strip 4 in practice interrupts the horizontal mortar joint, which is as high as said joint, and on the vertical joint, since the partition 13 also has a height that is equal to the height of the joint, in order to interrupt the continuity of the connecting element made of mortar that is provided at the vertical joint.

With the arrangement described above it is therefore possible to obtain masonry with high structural characteristics while lowering considerably the heat transmittance coefficient, since the vertical joint is interrupted as well, consequently reducing any possible transmission of heat through the mortar.

From what has been described above it is therefore evident that the invention achieves the proposed aim and objects, and in particular the fact is stressed that a hollow brick is obtained which, despite being obtainable with traditional methods for obtaining bricks, can have considerably improved structural characteristics.

The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

All the details may further be replaced with other technically equivalent elements.

In practice, the materials used, as long as they are compatible with the specific use, as well as the contingent shapes and dimensions, may be any according to requirements.

The disclosures in Italian Patent Application No. MI2008A001614 from which this application claims priority are incorporated herein by reference.

Where technical features mentioned in any claim are followed by

reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

CLAIMS

1. A hollow brick (1) with thermal insulation particularly for providing structural masonry, having a body (2) that forms a plurality of hollow channels (3) in which expanded plastic material is arranged, on the
5 upper face of said body (2) there being further provided a strip (4) of expanded plastic material, characterized in that it comprises, at an internal vertical face, at least two recesses (10) that are separated by a partition (13) made of expanded plastic material and form, in cooperation with the internal vertical face of a laterally adjacent brick, receptacles for introducing
10 connecting mortar (20).

2. The hollow brick according to claim 1, characterized in that it comprises outer lips (11), which are directed toward the outer edges of said at least one internal vertical face, and inner lips (12), which delimit each one of said recesses (10).

15 3. The hollow brick according to one or more of the preceding claims, characterized in that said partition (13) is arranged between said internal lips (12).

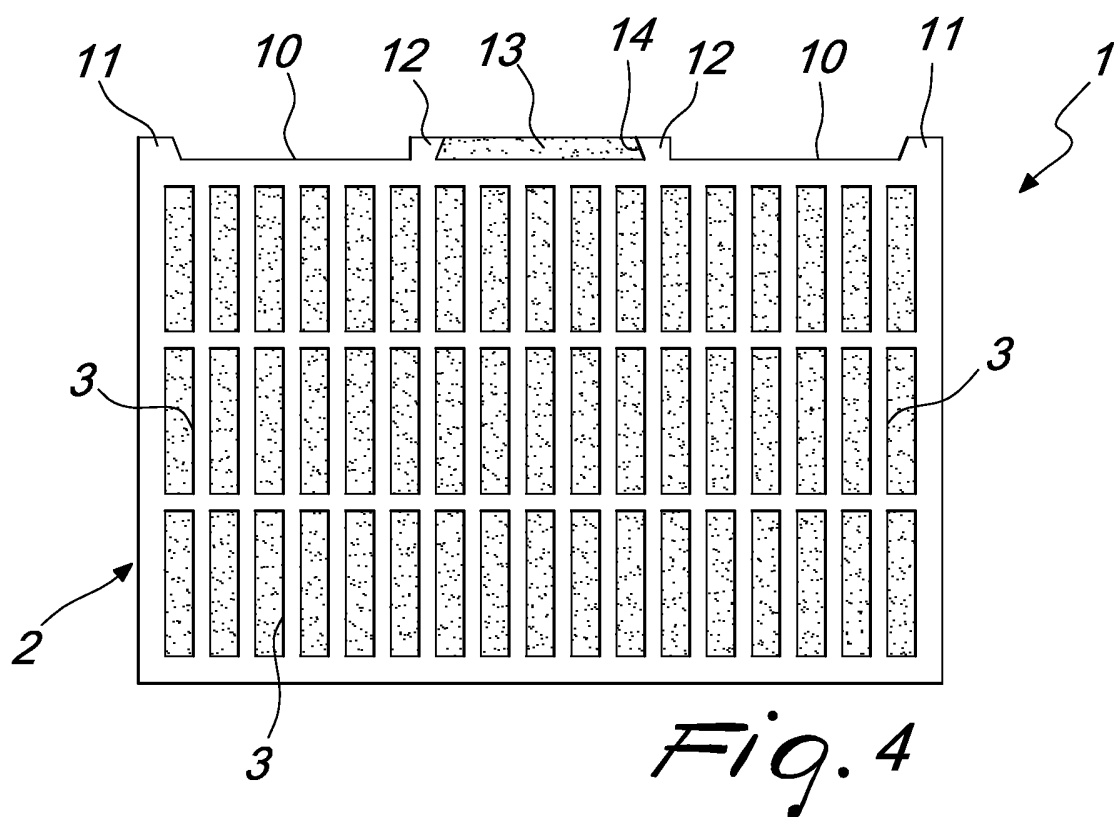
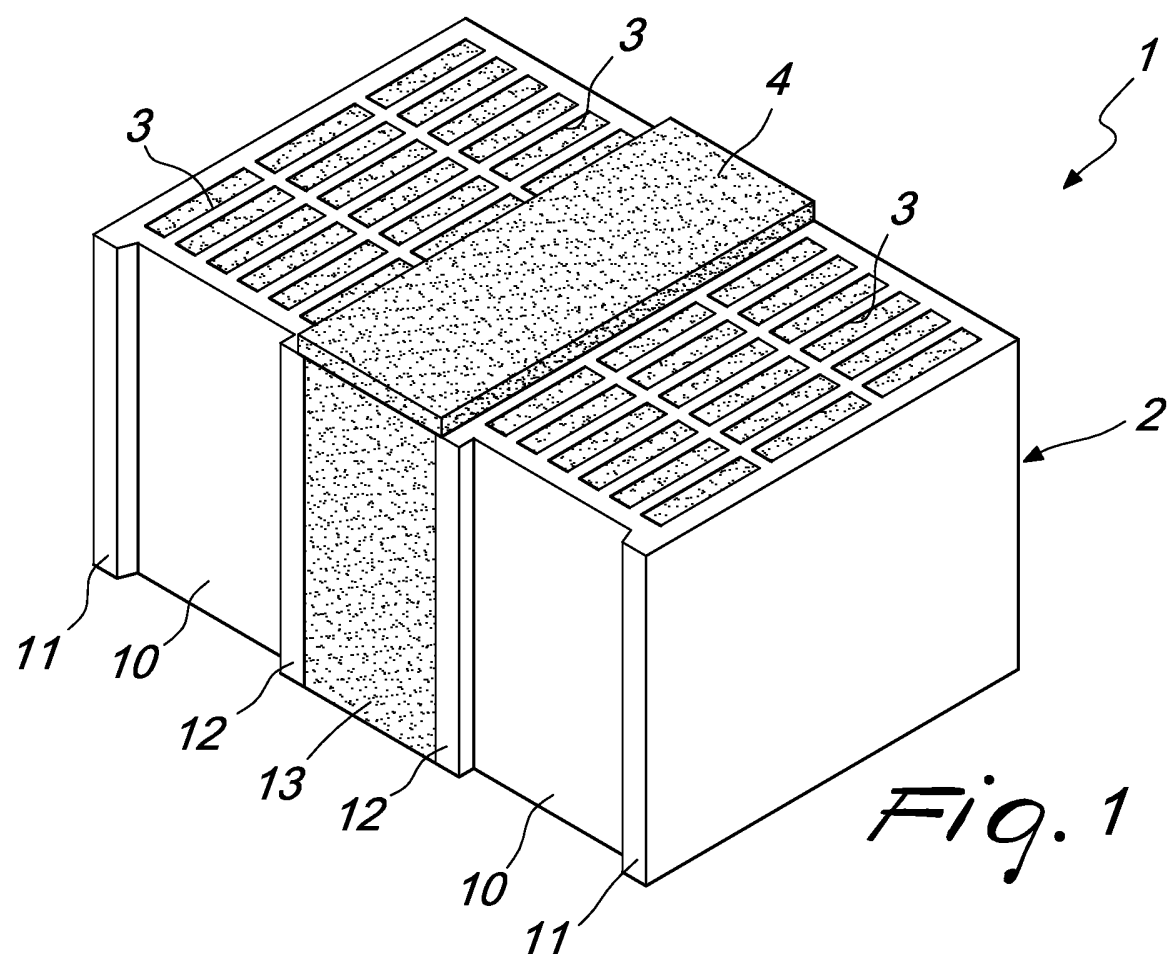
4. The hollow brick according to one or more of the preceding claims, characterized in that said inner lips (12) form, on the side of said partition
20 (13), an undercut (14) that is suitable to act as an element for retaining said partition.

5. The hollow brick according to one or more of the preceding claims, characterized in that said strip (4) provided on said upper face is superimposed on the end of said partition (13).

25 6. The hollow brick according to one or more of the preceding claims, characterized in that said body (2) has the internal vertical face that lies opposite the one provided with said recesses (10) which is substantially flat.

7. The hollow brick according to one or more of the preceding claims, characterized in that said expanded plastic material consists of graphite-
30 treated polystyrene.

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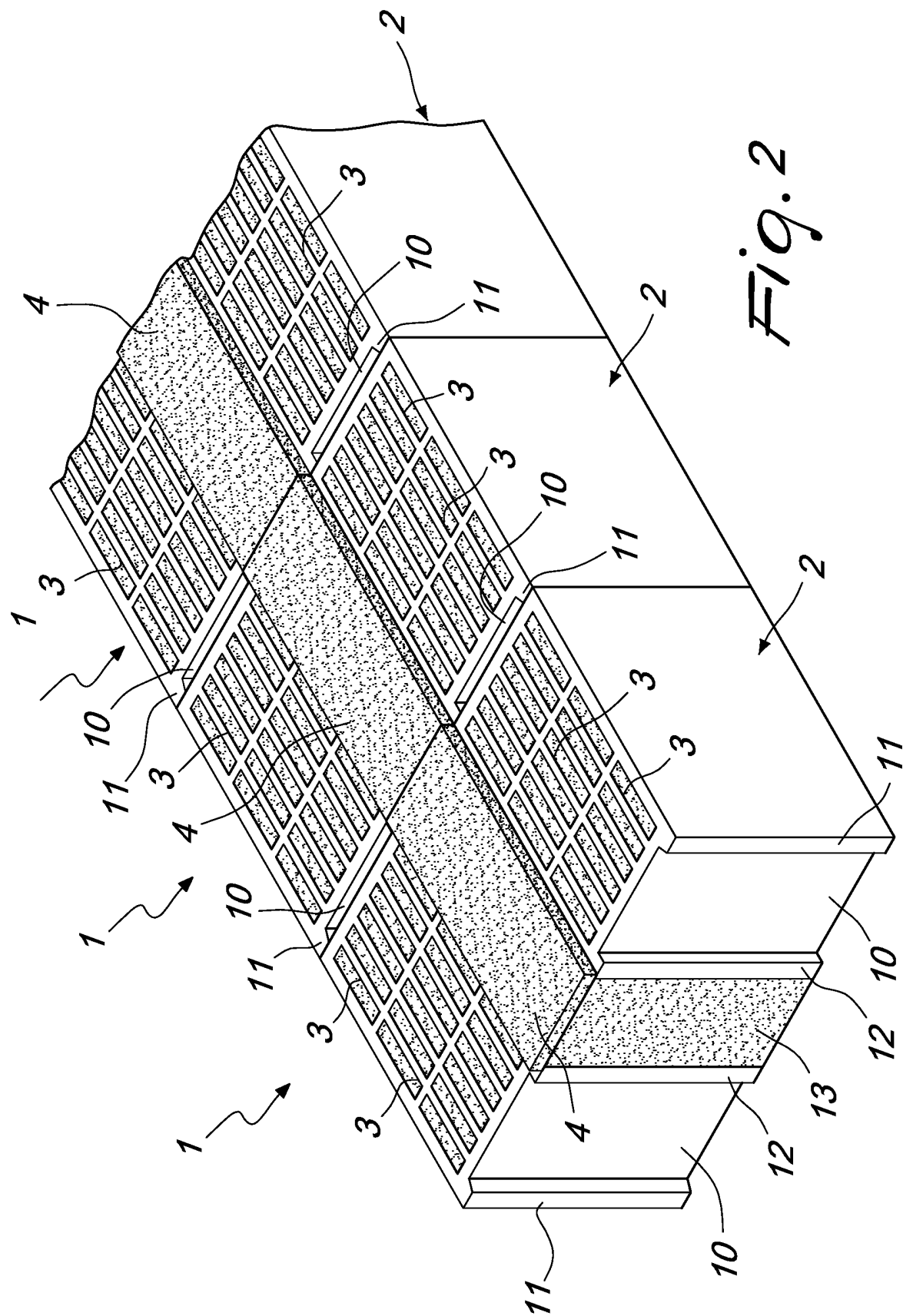


Fig. 2

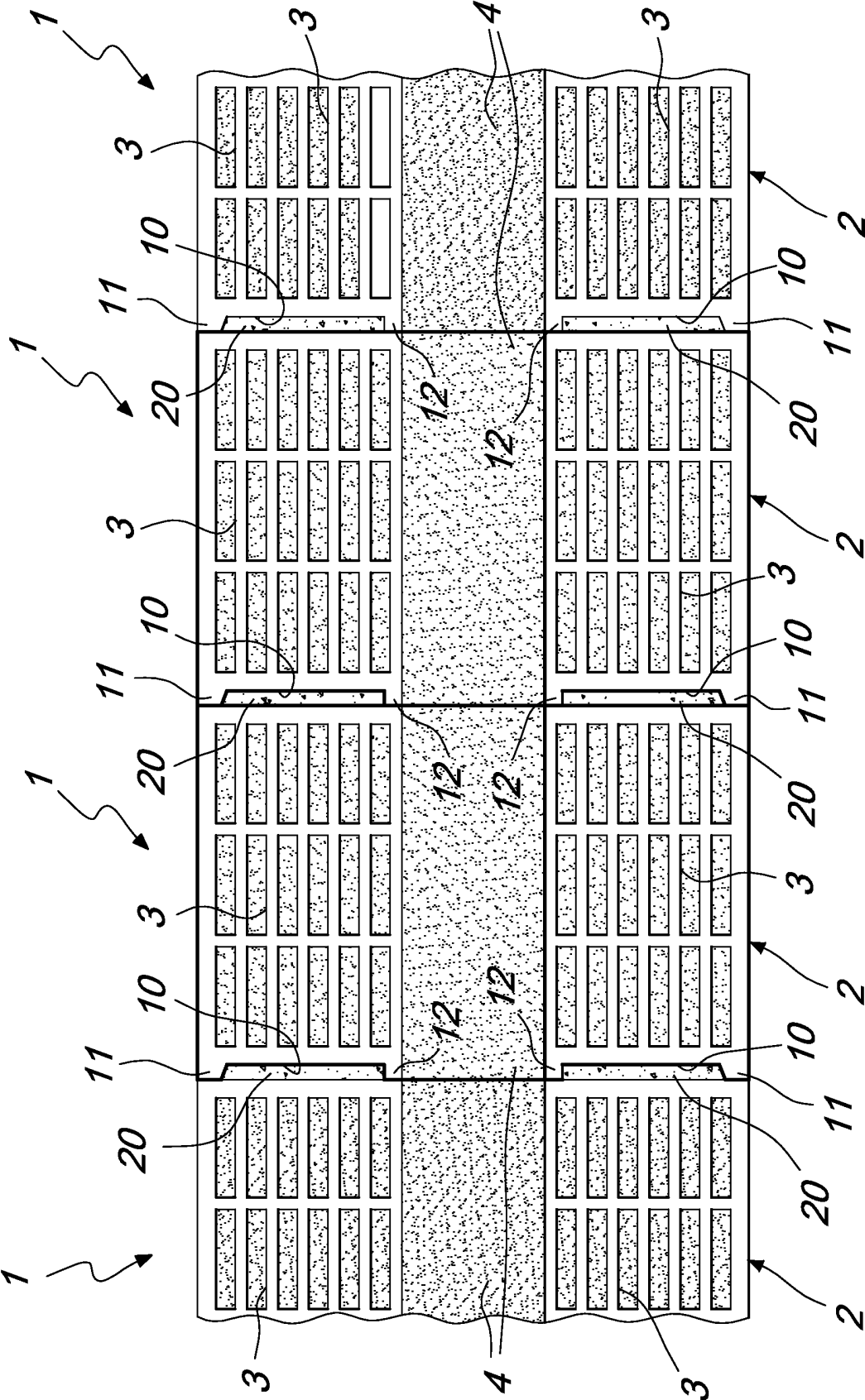


Fig. 3

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2009/061355

A. CLASSIFICATION OF SUBJECT MATTER

INV. E04B2/14 E04B2/26 E04B2/28 E04C1/40 E04C1/41
ADD. E04B2/02

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)
E04B E04C

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

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☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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- *&* document member of the same patent family

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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2009/061355

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A	AT 381 535 B (WUTTE FRIEDRICH [AT]; RABITSCH PAUL [AT]) 27 October 1986 (1986-10-27) page 2, line 1 - line 5 page 2, line 32 - page 3, line 3; claim 1; figure 1 -----	1-7
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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