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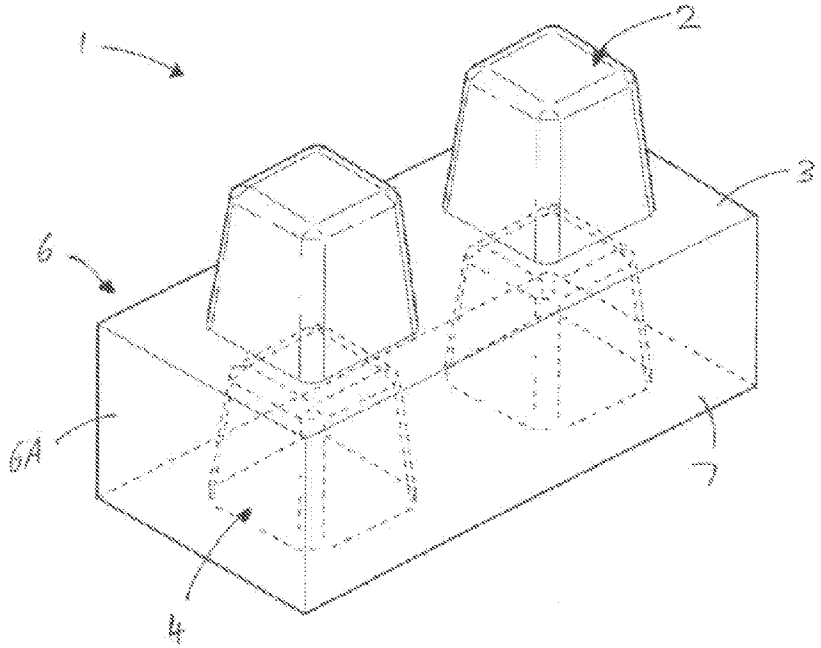
(54) Title: BUILDING BLOCK



(57) Abstract: The invention includes a generally parallelepiped-shaped building block which has at least one male engaging formation defined on a first side thereof and at least one complimentary shaped female engaging formation defined on an opposed second side thereof , the engaging formations are shaped and configured to permit at least a portion of the, or each, male engaging formation of a similar building block to be received within the, or each, female engaging formation, thereby aligning and leveling the blocks relative to each other.

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BUILDING BLOCK

FIELD OF THE INVENTION

This invention relates to a building block, in particular a building block which is self-levelling and self-aligning.

BACKGROUND TO THE INVENTION

Many types of building blocks have been used in the past. These include basic rectangular bricks which are simply stacked and bonded with mortar. More complex building blocks have also been developed, including blocks with specific shapes which are supposed to allow for more accurate alignment of the blocks. Some of these blocks also rely on precise geometrical dimensions to position blocks relative top each other, which in theory works well but often in practice does not because of an inability to manufacture these blocks with the designed tolerances. This often leads to unstable structures and deterioration of structures.

In some instances the dimensions to which these blocks have been designed do not allow enough space for expansion and shrinking due to heat and cold, as an example. This may also lead to deterioration of a structure built from such blocks.

OBJECT OF THE INVENTION

It is an object of the invention to provide a building block which at least partly overcomes the abovementioned problem.

SUMMARY OF THE INVENTION

In accordance with this invention there is provided a generally parallelepiped-shaped building block having at least one male engaging formation defined on a first side thereof and at least one complimentary shaped female engaging formation defined on an opposed second side thereof, the engaging formations being shaped and configured to permit at least a portion of the, or each, male engaging formation of a similar building block to be received within the, or each, female engaging formation, the engaging formations shaped and configured to at least align engaged blocks with each other, and preferably also to level engaged blocks with each other.

There is further provided the building block to have six faces, comprising four side faces, an operatively upper face and an operatively lower face, and preferably for two of the sides faces to be generally square in shape and for the remaining two side faces to be generally rectangular in shape, the two square side faces comprising end faces of the block.

There is further provided for the engaging formations to be defined on the upper and lower faces, and preferably for the male engaging formation to be defined on the upper face and the female engaging formation on the lower face.

There is further provided for the, or each, male engaging formation to comprise a protrusion, and for the, or each, female engaging formation to comprise an aperture, and in a preferred embodiment for the male engaging formation to extend from the upper face and for the female engaging formation to extend into the lower face.

There is also provided for the protrusion extends to a height above the upper face that is greater than the depth to which the aperture extends into the lower face, so that a protrusion of one block is only partly receivable within an aperture of another block, to engage therewith, thereby providing for a predetermined gap to be defined between the upper face of the one block and the lower face of the other block.

The invention also provides for the protrusions and the complimentary shaped apertures to be round, square, alternatively hexagonal or octagonal in cross section, or of other suitable shape.

There is further provided for the protrusion to be in the form of a truncated pyramid, its truncated end and sides operatively being in abutment with the end and sides, respectively, of the complimentary shaped aperture.

There is further provided for the end of the truncated pyramid to be complimentary shaped to the end of the aperture, and preferably for the two ends to be flattened, to operatively level engaged blocks with each other.

There is also further provided for the respective sides of the truncated pyramid and the aperture to be complimentary shaped, and preferably to be flattened, to operatively align engaged blocks with each other.

In a preferred embodiment in which the protrusions have corners, each corner is flattened to an edge and further preferably the apertures have complimentary flattened corners.

There is still further provided for the building block to preferably have a pair of male engaging formations and a pair of female engaging formations.

There is further provided for the protrusion to extend to about 60 mm, and more preferably about 40 mm, above the upper face of the building block, and for the aperture to extend to about 50 mm, and more preferably to about 30 mm, into the lower face of the building block, operatively providing a gap of about 10 mm between the upper and lower faces of engaging building blocks which may be filled with mortar.

There is further provided for a preferred embodiment of a block according to the invention to have a height of about 75 mm.

According to a further feature of the invention there is provided a finishing block complimentary to building blocks as defined above, the finishing block comprising a generally parallelepiped-shaped building block having at least one female engaging formation defined on a first side thereof, the female engaging formation being shaped and configured to permit at least a portion of the, or each, male engaging formation of a similar building block to be received within the, or each, female engaging formation.

According to a still further feature of the invention there is provided base complimentary to a plurality of building blocks as defined above, the base comprising a strip having a series of protrusions extending from it, the protrusions being complimentary shaped to apertures of the building blocks as defined above, to operatively be used a base layer for a structure onto which buildings blocks as defined above may be secured by means of mortar.

The invention also provides for a construction system comprising at least a plurality of building blocks as defined above, and preferably including a base and a layer of finishing building blocks engaged with each other by means of the complimentary engaging formations and secured to each other by means of mortar.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the invention is described below by way of example only and with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a building block in accordance with this invention;

Figure 2 is a side elevation of the building block of Figure 1;

Figure 3 is a perspective view of two building blocks of Figure 1 on top of which a third block of Figure 1 is located in engagement with the two bottom blocks and with mortar filling the gap between the blocks; and

Figure 4 is a side elevation of the building blocks of Figure 3.

DETAILED DESCRIPTION OF THE INVENTION

A building block (1) is shown in Figures 1 and 2. The block (1) is generally parallelepiped shaped and has two male engaging formations (2) one an operatively upper face (3) thereof, as well as two female engaging formations (4) on an operatively lower face (5). The block (1) also has four side faces (6, 7), of which two are end faces (6A, 7A).

The upper face (3) and lower face (5) are opposed faces. The male (2) and female formations (4) are shaped and configured to permit only a portion of each male formation (2) to be received within a female formation (4).

The male formation (2) comprises a truncated square pyramid (8) which extends from the upper face (3) of the block (1). The female formation (4) comprises an aperture (9) which extends into the lower face (5) and which is complementary shaped to the truncated pyramid (8).

The height to which the pyramid (8) extends above the upper face (3) is greater by a small amount than the depth to which the aperture (9) extends into the lower face (5), to provide a gap (10) which may be filled with mortar (11) during construction of structure made form the blocks (1).

As is shown in Figures 3 and 4, a structure (12) may be formed with a plurality of the building blocks (1) stacked on each other with the male formations (2) of two blocks (13A, 13B) extending into the apertures (4) of one block (14) above it. The design of the block (1) ensures that they are all aligned consistently, both horizontally and vertically. The blocks (13A, 13B, 14) are levelled to each other by means of the flat ends of the truncated pyramids (8, 9), and the blocks are aligned with other by means of the flattened side faces of the

pyramids (8, 9). The aperture (9) is referred to as a pyramid here since it is a negative of a pyramid.

As mentioned above, a gap (10) is defined between adjoining blocks (13A and 13B). There is also a gap (15) between the end faces of neighbouring blocks (14A, 14B). These gaps (10, 15) may be filled with mortar (11, 16) as per normal procedure during construction.

It is therefore apparent that the block (1) design ensures consistent alignment, and that the gaps (10, 15) between adjoining blocks are also consistent. This ensures consistent strength in a wall made from the blocks and also adds to the aesthetic appeal of the structure (12). When completed, a structure built with blocks according to the invention will appear like a conventional brick wall, which adds to the appeal of using these blocks.

The construction is also simplified significantly since the blocks are self-aligning and self-levelling. This means it is possible for unskilled workers, to construct a house, for example. By making use of a base layer which includes a series of spaced apart truncated pyramids extending from it, it is possible to essentially form the foundation layer for a wall. Once the base layer is level and straight, it is possible for unskilled workers to construct the remainder of the structure.

The engaging formations also provide greater strength to a structure constructed using these blocks, since lateral movement is not only restricted by the mortar between blocks but also the engaged formations.

This makes it possible to construct a structure which is stronger than one constructed from conventional bricks or blocks, with less skilled labour and obtain better results in terms of how straight and level the construction is.

It will be understood that this is only one embodiment of the invention. It is possible to alter some aspects of the embodiment without departing from the scope of the invention.

CLAIMS

1. A generally parallelepiped-shaped building block having at least one male engaging formation defined on a first side thereof and at least one complimentary shaped female engaging formation defined on an opposed second side thereof, the engaging formations shaped and configured to permit at least a portion of the, or each, male engaging formation of a similar building block to be received within the, or each, female engaging formation.

2. A building block as claimed in claim 1 in which the engaging formations are shaped and configured to align and level engaged blocks with each other.

3. A building block as claimed in claim 2 in which the block has six faces, including four side faces, an operatively upper face and an operatively lower face; two of the sides faces are generally square in shape and comprise end faces of the block, and the remaining two side faces are generally rectangular in shape.

4. A building block as claimed in any one of claims 1 to 3 in which the engaging formations are defined on the upper and lower faces of the block.

5. A building block as claimed in claim 4 in which the male engaging formations are formed on the upper face and the female engaging formations are formed on the lower face of the block

6. .A building block as claimed in claims 4 or 5 in which the, or each, male engaging formation comprises a protrusion, and the, or each, female engaging formation comprises an aperture.

7. A building block as claimed in claim 6 in which the, or each, male engaging formation extends from the upper face and the, or each, female engaging formation extends into the lower face.

8. A building block as claimed in claim 7 in which the, or each, protrusion extends to a height above the upper face that is greater than the depth to which the, or each, aperture extends into the lower face, so that a protrusion of one block is only partly receivable within an aperture of another block, to engage therewith, thereby

providing for a predetermined gap to be defined between the upper face and the lower face of the engaged blocks respectively.

9. A building block as claimed in any one of claims 6 to 8 in which the protrusions and the complimentary shaped apertures are round, square, hexagonal or octagonal, or of other suitable shape, in cross section.

10. A building block as claimed in any one of claims 6 to 9 in which the protrusion comprises a truncated pyramid, its truncated end and sides operatively being in abutment with the end and sides, respectively, of the complimentary shaped aperture.

11. A building block as claimed in claim 10 in which the complimentary shaped truncated ends of the protrusion and aperture are flattened to operatively level engaged blocks with each other.

12. A building block as claimed in claims 10 or 11 in which the sides of the protrusion and the aperture are flattened, to operatively align engaged blocks with each other.

13. A building block as claimed in claims 10 to 12 in which the truncated pyramids of forming the protrusion and aperture have corners and the corners are flattened to edges.

14. A building block as claimed in any one of claims 1 to 13 which includes a pair of male engaging formations and a pair of female engaging formations.

15. A building block as claimed in any one of claims 6 to 14 in which the, or each, protrusion extends to about 60 mm above the upper face of the building block and the aperture extends to about 50 mm in the lower face of the building block, operatively providing a gap of about 10 mm between the upper and lower faces of engaging building blocks which may be filled with mortar.

16. A building block as claimed in any one of claims 6 to 14 in which the, or each, protrusion extends to about 40 mm above the upper face of the building block and the aperture extends to about 30 mm in the lower face of the building block,

operatively providing a gap of about 10 mm between the upper and lower faces of engaging building blocks which may be filled with mortar.

17. A building block according to claim 15 or 16 which has a height of about 75 mm.

18. A finishing block complimentary to building blocks as claimed in claims 1 to 17, the finishing block comprising a generally parallelepiped-shaped building block having at least one female engaging formation defined on a first side thereof, the female engaging formation being shaped and configured to permit at least a portion of the, or each, male engaging formation of a similar building block to be received within the, or each, female engaging formation.

19. A base complimentary to a plurality of building blocks as claimed in claims 1 to 18, the base comprising a strip having a series of protrusions extending from it, the protrusions being complimentary shaped to apertures of the building blocks in claims 1 to 18, to operatively be used a base layer for a structure onto which such buildings blocks may be located and secured by means of mortar.

20. A construction system comprising at least a plurality of building blocks as claimed in claims 1 to 17, a base as claimed in claim 19 located under beneath the lowermost row of engaged building blocks and a layer of finishing building blocks as claimed in claim 18 located on top of, and secured to by means of mortar, the uppermost row of building blocks according to claims 1 to 17.

21. A wall constructed by means of a construction system as claimed in claim 20.

22. A building block substantially as herein described with reference to Figures 1 and 2.

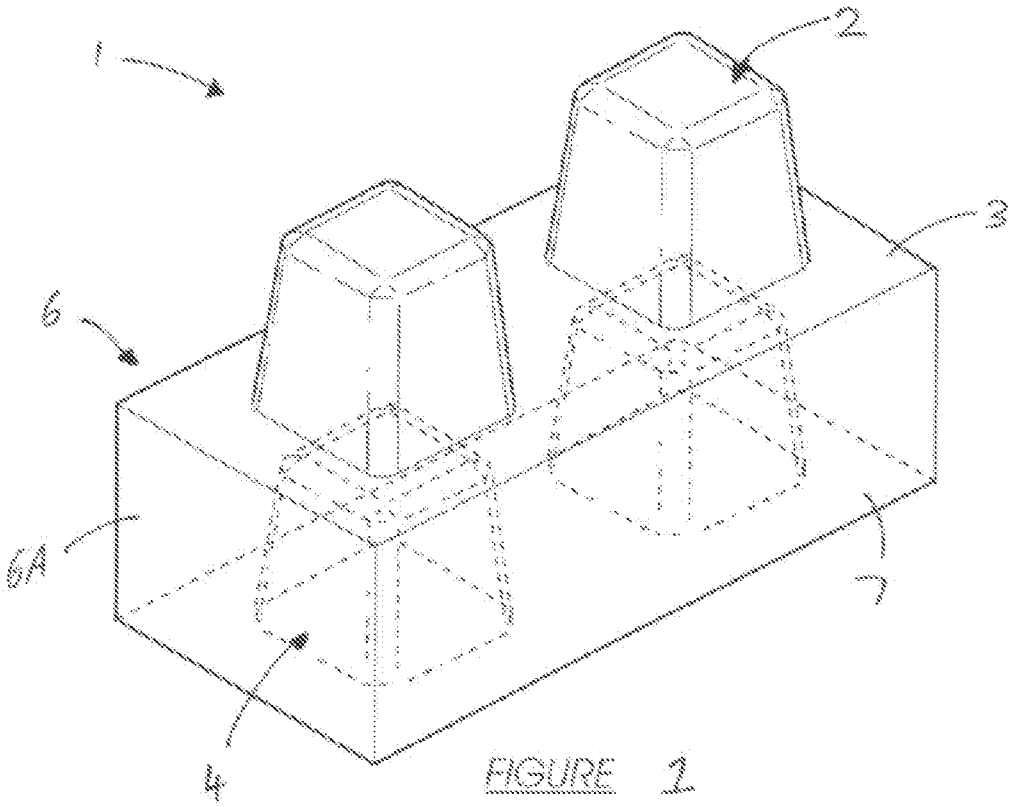

FIGURE 1

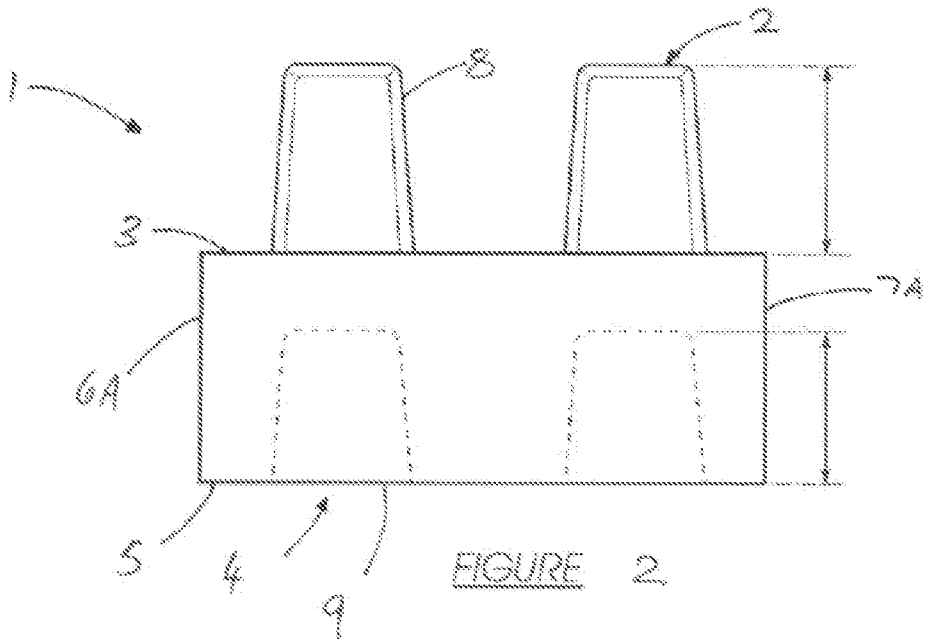

FIGURE 2

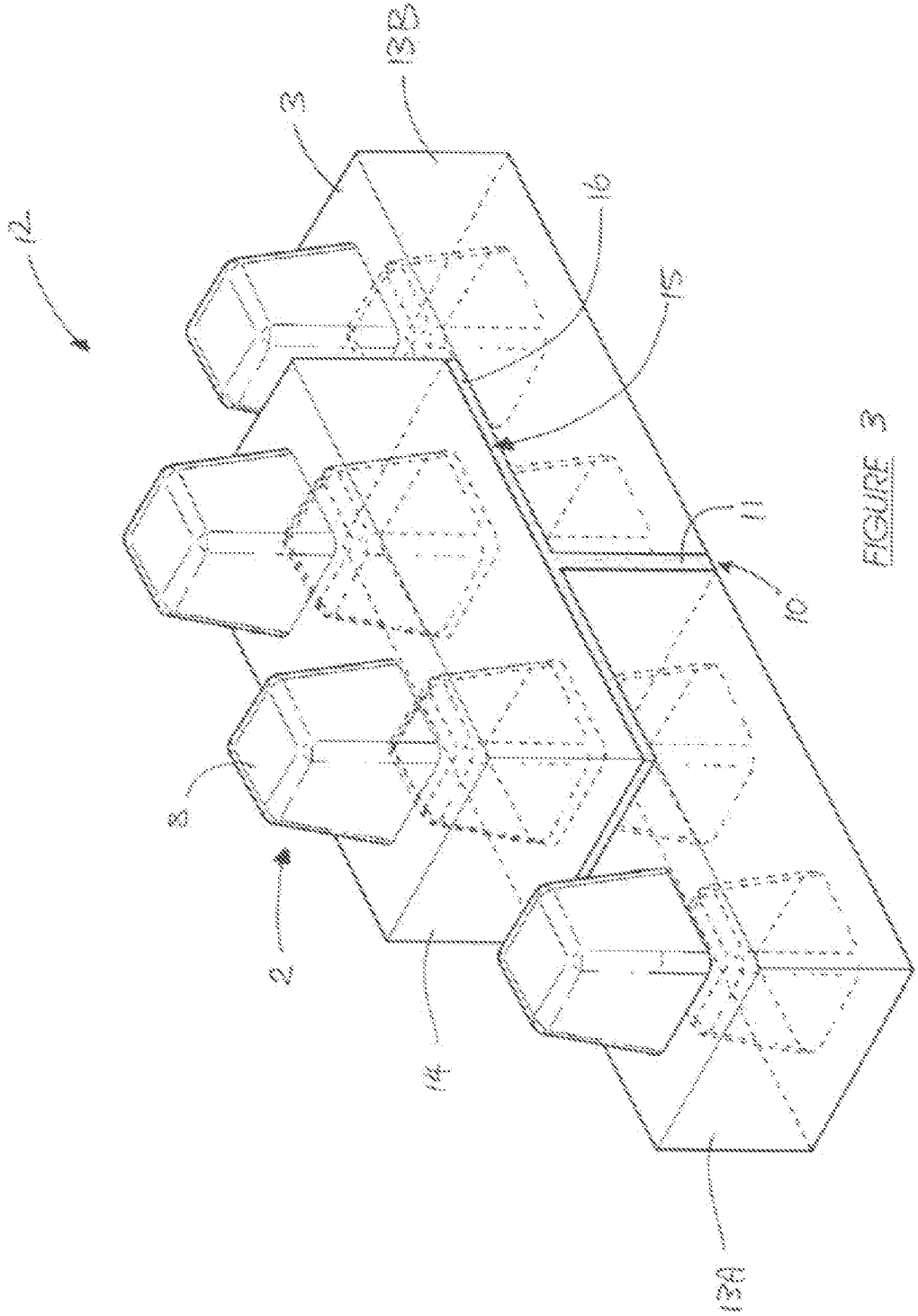

FIGURE 3

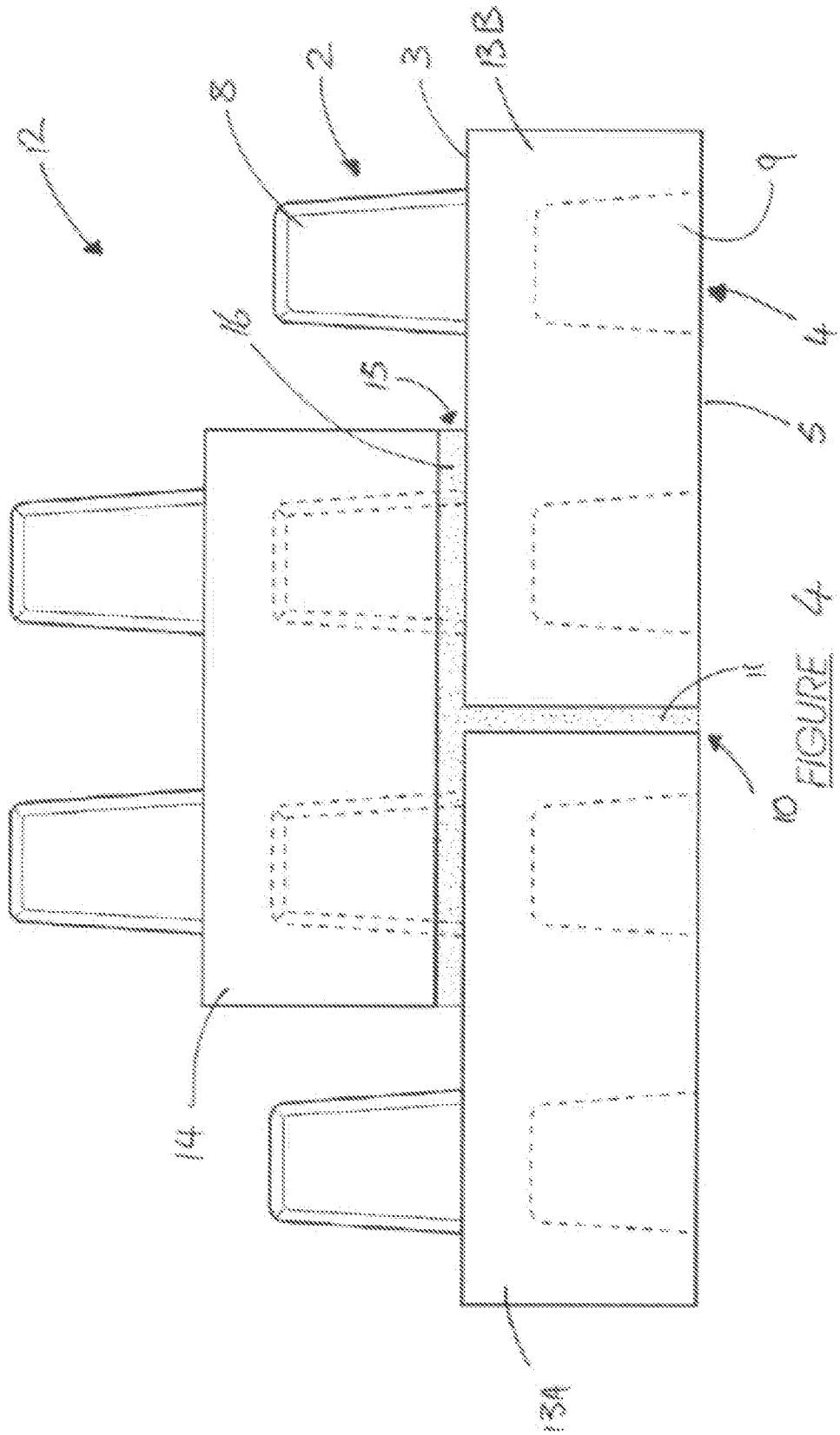

FIGURE 4

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2007/050582

A. CLASSIFICATION OF SUBJECT MATTER
INV. E04B2/08
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

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.
X	DE 38 10 934 A1 (RUDOLF PETER GMBH & CO KG KIES [DE]) 12 October 1989 (1989-10-12) column 2, lines 65-67; figures 1-3	1,2,4-7, 9-14, 18-21
X	FR 2 550 568 A3 (PIAZZA GIOVANNI [FR]) 15 February 1985 (1985-02-15) page 2, line 10 - page 3, line 23; claim 1; figures	1,2,4-9, 14,18-21
X	WO 00/15916 A (NIKO IGOR [SK]) 23 March 2000 (2000-03-23) page 1, lines 6,7, paragraph 3; figures 1-5	1-4,6,9, 14,18
X A	US 6 578 338 B1 (NANAYAKKARA LAKDAS [US]) 17 June 2003 (2003-06-17) figures 1-3,6	1,2,4,6, 9,14 7

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

☒ See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
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Name and mailing address of the ISA/	Authorized officer
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2007/050582

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