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(54) **BUILDING BLOCK**

BAUSTEIN

BLOC DE CONSTRUCTION

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## Description

### FIELD OF THE INVENTION

[0001] This invention relates to a building block, in particular a building block which is self-levelling and self-aligning.

### BACKGROUND TO THE INVENTION

[0002] 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 to 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.

[0003] 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.

[0004] One example of a building block can be found in German Patent Publication No. 3810934, which provides a process for using residual concrete from ready-mix concrete. The process includes placing residual concrete in moulds to form concrete building blocks, the blocks having uniformly placed protrusions on one side and corresponding recesses on the opposite side to align adjacent blocks.

[0005] Another example can be found in French Patent Publication No. 2550568, which provides a block for constructing walls. The block has circular based truncated pyramid protrusions on one side and corresponding apertures on the opposite side.

[0006] A further example can be found in US Patent No. 3,394,517, which provides a building module, such as a building brick or block. The module has protrusions extending from its top face and recesses formed in its bottom face.

### OBJECT OF THE INVENTION

[0007] It is an object of the invention to provide a building block which at least partly overcomes the abovementioned problem,

### SUMMARY OF THE INVENTION

[0008] According to a first aspect of the present invention, there is provided a generally parallelepiped-shaped building block for a wall, the block having six faces, including four side faces, an operatively upper face and an

operatively lower face, two of the side faces are generally square in shape and comprise end faces of the block, and the remaining two side faces are generally rectangular in shape, the block having a plurality of male engaging formations in a single row, each male engaging formation comprising a protrusion in the shape of a pyramid having an equilateral polygon base with four sides and a flattened truncated end defined on a first side of the block and one or more complimentary shaped female engaging formations, each female engaging formation comprising an aperture defined on an opposed second side of the block, the engaging formations shaped and configured to permit at least a portion of each male engaging formation of a similar building block to be received within a female engaging formation, characterised in that each 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 and the lower face of the engaged blocks respectively, and the truncated pyramids forming the protrusions and apertures have corners and the corners are flattened to edges.

[0009] Preferably, the engaging formations are defined on the upper and lower faces of the block.

[0010] Preferably, the male engaging formations are formed on and extend from the upper face and the female engaging formations are formed on and extend into the lower face of the block.

[0011] Preferably, the building block includes a pair of male engaging formations and a pair of female engaging formations.

[0012] Preferably, 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.

[0013] Preferably, 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.

[0014] Preferably, the building block has a height of about 75 mm.

[0015] According to a second aspect of the present invention, there is provided a wall constructed by means of building blocks as described above.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0016] 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

[0017] 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 on 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).

[0018] 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).

[0019] 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).

[0020] 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 from the blocks (1).

[0021] 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.

[0022] As mentioned above, a gap (10) is defined between adjoining blocks (13A, 13B and 14). There is also a gap (15) between the end faces of neighbouring blocks (13A, 13B). These gaps (10, 15) may be filled with mortar (11, 16) as per normal procedure during construction.

[0023] 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.

[0024] 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.

[0025] 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.

[0026] 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.

[0027] 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 for a wall, the block having six faces, including four side faces, an operatively upper face and an operatively lower face; two of the side faces are generally square in shape and comprise end faces of the block, and the remaining two side faces are generally rectangular in shape, the block having a plurality of male engaging formations (2) in a single row, each male engaging formation comprising a protrusion in the shape of a pyramid (8) having an equilateral polygon base with four sides and a flattened truncated end defined on a first side of the block and one or more complimentary shaped female engaging formations (4), each female engaging formation comprising an aperture (9) defined on an opposed second side of the block, the engaging formations shaped and configured to permit at least a portion of each male engaging formation of a similar building block to be received within a female engaging formation, **characterised in that** each 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 there-

with, thereby providing for a predetermined gap (10) to be defined between the upper face (3) and the lower face (5) of the engaged blocks respectively, and the truncated pyramids forming the protrusions and apertures have corners and the corners are flattened to edges.

2. A building block as claimed in claim 1 in which the engaging formations are defined on the upper and lower faces of the block.
3. A building block as claimed in claim 2 in which the male engaging formations are formed on and extend from the upper face, and the female engaging formations are formed on and extend into the lower face of the block.
4. A building block as claimed in any one of claims 1 to 3 which includes a pair of male engaging formations and a pair of female engaging formations.
5. A building block as claimed in any one of claims 1 to 4 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.
6. A building block as claimed in any one of claims 1 to 5 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.
7. A building block according to claim 5 or 6 which has a height of about 75 mm.
8. A wall constructed by means of building blocks as claimed in any one of claims 1 to 7.

#### Patentansprüche

1. Baustein in allgemein quaderförmiger Ausbildung für eine Wand, wobei der Baustein sechs Flächen aufweist, zu denen vier seitliche Flächen, eine funktionswirksame obere Fläche und eine funktionswirksame untere Fläche zählen, wobei zwei der seitlichen Flächen allgemein quadratisch ausgebildet sind und Endflächen des Steins umfassen und die restlichen zwei seitlichen Flächen allgemein rechtwinklig ausgebildet sind, wobei der Stein mehrere vorspringende Eingriffsausbildungen (2) in einer ein-

zelnen Reihe aufweist und jede vorspringende Eingriffsausbildung einen Vorsprung in der Form einer Pyramide (8) umfasst, die eine gleichseitige Polygonbasis mit vier Seiten und mit einem abgeflachten kegelstumpffartigen Ende, das an einer ersten Seite des Steins definiert ist, sowie eine oder mehrere komplementäre rückspringende Eingriffsausbildungen (4) aufweist, wobei jede rückspringende Eingriffsausbildung eine Öffnung (9) hat, die an einer entgegengesetzten zweiten Seite des Steins definiert ist, wobei die Eingriffsausbildungen so geformt und konfiguriert sind, dass mindestens ein Abschnitt einer jeden vorspringenden Eingriffsausbildung eines ähnlichen Bausteins innerhalb einer rückspringenden Eingriffsausbildung aufgenommen werden kann, **dadurch gekennzeichnet, dass** sich jeder Vorsprung bis zu einer Höhe oberhalb der oberen Fläche erstreckt, die größer als die Tiefe ist, über die sich die Öffnung in die untere Fläche hinein erstreckt, so dass ein Vorsprung eines Steins nur teilweise innerhalb einer Öffnung eines anderen Steins aufgenommen werden kann, um in diesen einzugreifen, wodurch ein zwischen der oberen Fläche (3) bzw. der unteren Fläche (5) der ineinander greifenden Steine zu definierender vorbestimmter Spalt (10) bereitgestellt wird, und wobei die kegelstumpffartigen Pyramiden, die die Vorsprünge und Öffnungen bilden, Ecken haben und die Ecken zu Kanten abgeflacht sind.

2. Baustein nach Anspruch 1, bei dem die Eingriffsausbildungen an den oberen und unteren Flächen des Steins definiert sind.
3. Baustein nach Anspruch 2, bei dem die vorspringenden Eingriffsausbildungen an der oberen Fläche ausgebildet sind und sich von dort aus erstrecken, und wobei die rückspringenden Eingriffsausbildungen an der unteren Fläche des Steins ausgebildet sind und sich in diese hinein erstrecken.
4. Baustein nach einem der Ansprüche 1 bis 3, der ein Paar vorspringende Eingriffsausbildungen und ein Paar rückspringende Eingriffsausbildungen beinhaltet.
5. Baustein nach einem der Ansprüche 1 bis 4, bei dem sich der oder jeder Vorsprung bis etwa 60 mm oberhalb der oberen Fläche des Bausteins erstreckt und sich die Öffnung bis etwa 50 mm in der unteren Fläche des Bausteins erstreckt, so dass ein funktionswirksamer Spalt von etwa 10 mm zwischen der oberen und der unteren Fläche von ineinander eingreifenden Bausteinen bereitgestellt wird, der mit Mörtel gefüllt werden kann.
6. Baustein nach einem der Ansprüche 1 bis 5, bei dem sich der oder jeder Vorsprung bis etwa 40 mm ober-

halb der oberen Fläche des Bausteins erstreckt und sich die Öffnung bis etwa 30 mm in der unteren Fläche des Bausteins erstreckt, so dass ein funktionswirksamer Spalt von etwa 10 mm zwischen der oberen und der unteren Fläche von ineinander greifenden Bausteinen bereitgestellt wird, der mit Mörtel gefüllt werden kann.

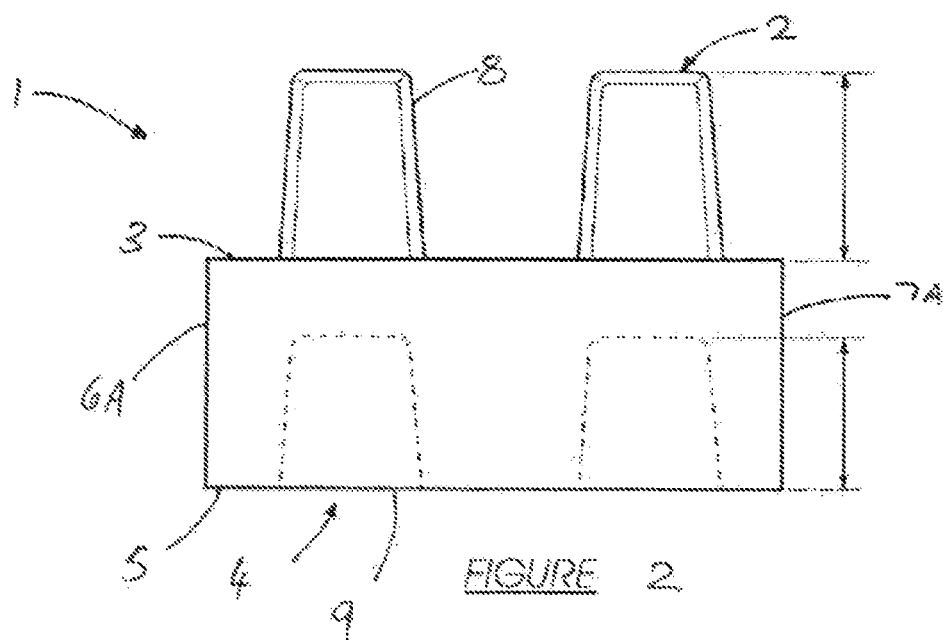
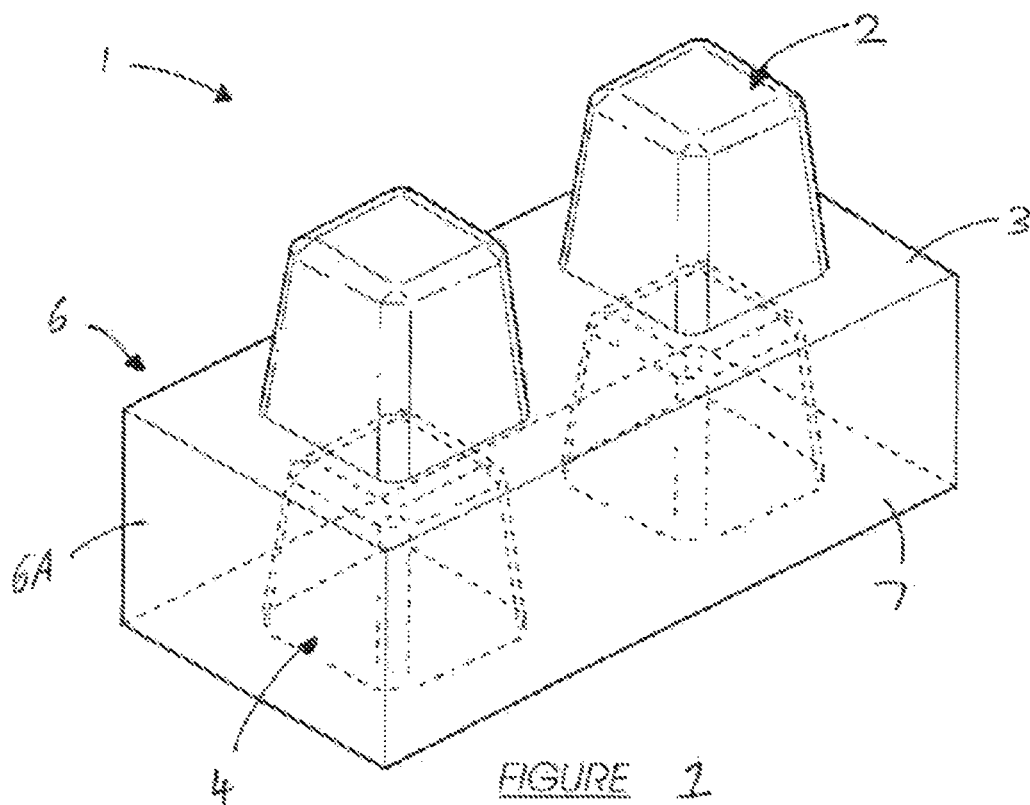
7. Baustein nach Anspruch 5 oder 6, der eine Höhe von etwa 75 mm hat.
8. Wand, die mittels Bausteinen nach einem der Ansprüche 1 bis 7 errichtet wird.

## Revendications

1. Bloc de construction, dans l'ensemble de forme parallélépipédique, pour un mur, le bloc comportant six faces, comprenant quatre faces latérales, une face fonctionnellement supérieure et une face fonctionnellement inférieure ; deux des faces latérales sont dans l'ensemble de forme carrée et constituent les faces terminales du bloc et les deux autres faces latérales sont dans l'ensemble de forme rectangulaire, le bloc comportant une pluralité de formations d'accouplement mâles (2) définies sur une seule file sur un premier côté du bloc, chaque formation d'accouplement mâle comprenant une protubérance (8) en forme de tronc de pyramide comportant une base polygonale équilatérale à quatre côtés et une extrémité tronquée aplatie, et une ou plusieurs formations d'accouplement femelles (4) de forme complémentaire, chaque formation d'accouplement femelle comprenant une ouverture (9) délimitée sur un deuxième côté à l'opposé du bloc, les formations d'accouplement étant formées et configurées pour permettre à au moins une partie de chaque formation d'accouplement mâle d'un bloc de construction semblable de se loger dans une formation d'accouplement femelle, **caractérisé en ce que** chaque protubérance s'étend au dessus de la face supérieure à une hauteur qui est supérieure à la profondeur à laquelle l'ouverture s'enfonce dans la face inférieure, de sorte qu'une protubérance d'un bloc ne peut se loger qu'en partie dans une ouverture d'un autre bloc pour s'accoupler avec elle, assurant de ce fait un intervalle (10) prédéterminé à définir entre la face supérieure (3) et la face inférieure (5) respectives des blocs accouplés, et que les pyramides tronquées constituant les protubérances et les ouvertures ont des sommets qui sont aplatis vers les bords.
2. Bloc de construction selon la revendication 1, dans lequel les formations d'accouplement sont définies sur les faces supérieure et inférieure du bloc.
3. Bloc de construction selon la revendication 2, dans

lequel les formations d'accouplement mâles sont formées sur la face supérieure à partir de laquelle elles s'étendent et les formations d'accouplement femelles sont formées sur la face inférieure à l'intérieur de laquelle elles s'enfoncent.

4. Bloc de construction selon l'une quelconque des revendications 1 à 3, comprenant une paire de formations d'accouplement mâles et une paire de formations d'accouplement femelles.
5. Bloc de construction selon l'une quelconque des revendications 1 à 4, dans lequel la ou chaque protubérance s'étend à environ 60 mm au dessus de la face supérieure du bloc de construction et la/les ouverture(s) s'enfonce(nt) à environ 50 mm dans la face inférieure du bloc de construction, assurant un intervalle fonctionnel d'environ 10 mm entre les faces supérieure et inférieure des blocs de construction qu'on accouple, intervalle qu'on peut remplir avec du mortier.
6. Bloc de construction selon l'une quelconque des revendications 1 à 5, dans lequel la ou chaque protubérance s'étend à environ 40 mm au dessus de la face supérieure du bloc de construction et la/les ouverture(s) s'enfonce(nt) à environ 30 mm dans la face inférieure du bloc de construction, assurant un intervalle fonctionnel d'environ 10 mm entre les faces supérieure et inférieure des blocs de construction qu'on accouple, intervalle qu'on peut remplir avec du mortier.
7. Bloc de construction selon la revendication 5 ou 6 qui a une hauteur de 75 mm.
8. Mur construit au moyen de blocs de construction selon l'une quelconque des revendications 1 à 7.



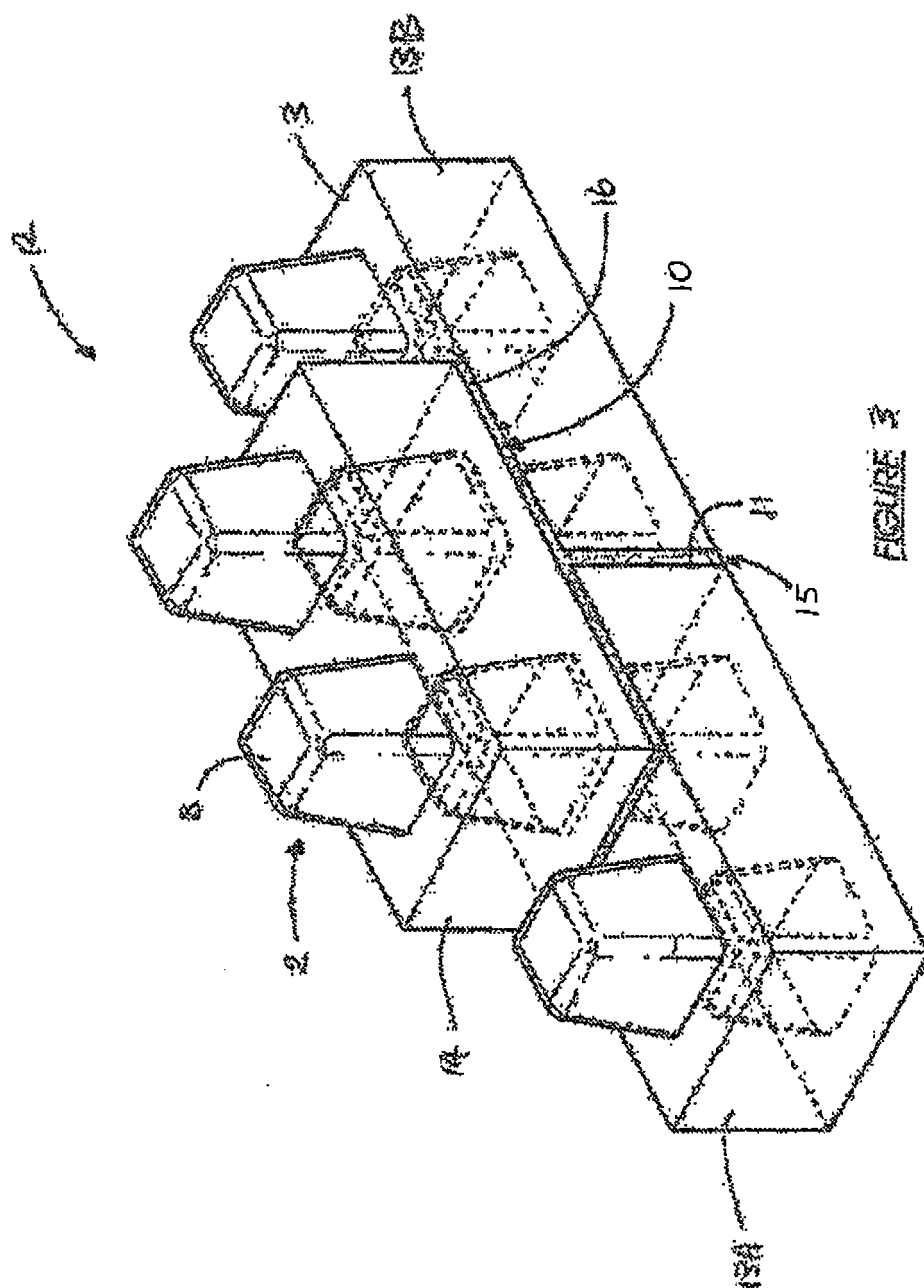
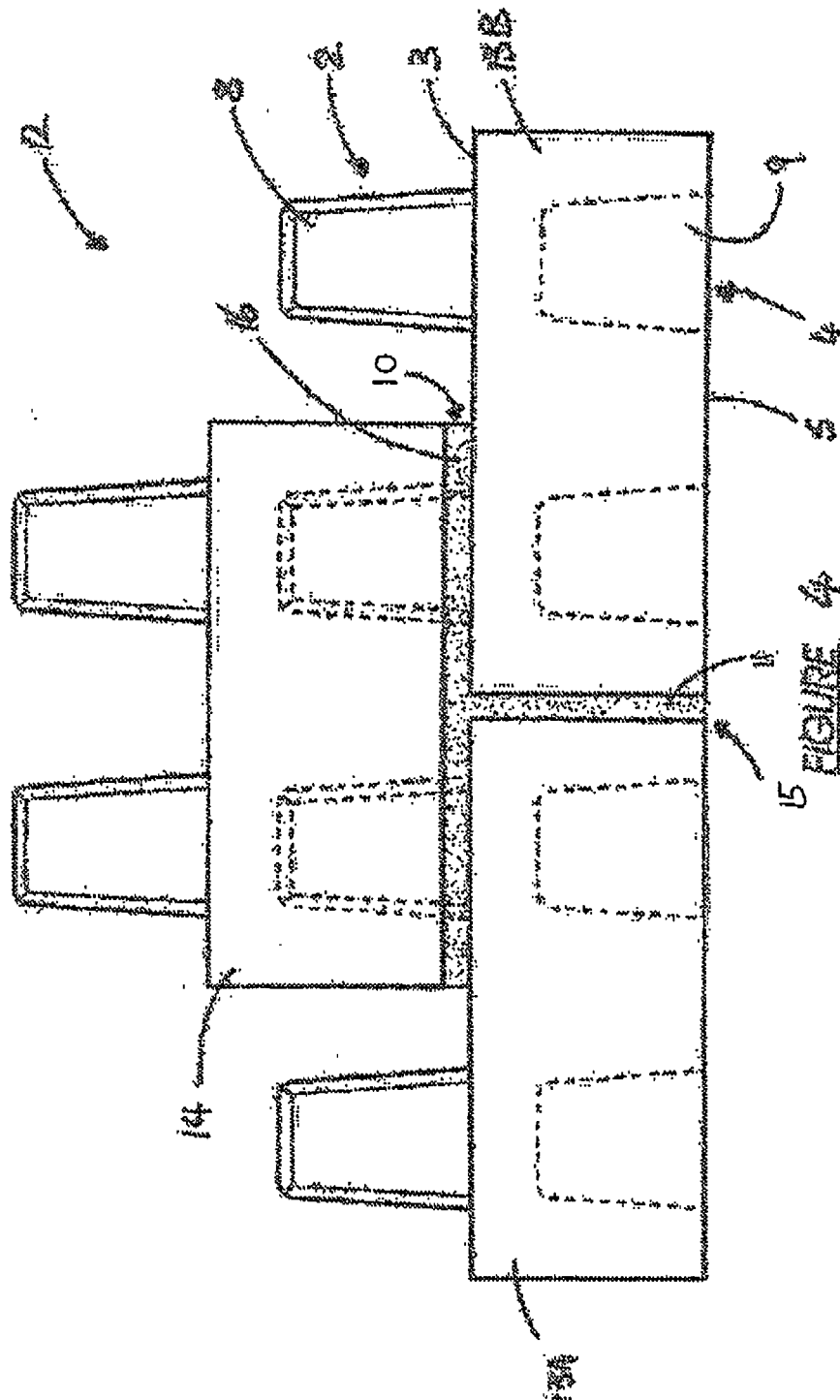


FIGURE 3



**REFERENCES CITED IN THE DESCRIPTION**

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