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(58) Field of Search:
INT CL **E02B, E02D, E04B, E04C**
Other: **SEARCH - PATENT**

(54) Title of the Invention: **A construction block**
Abstract Title: **Interlocking construction blocks with internal chamber(s) suitable for use in temporary fence or flood barrier**

(57) An interlocking construction block 100 suitable for use in a temporary fence or flood barrier having an upper wall 101 and an underside wall 102, one having a male protrusion 115-118 the other having a complementary female recess 125-128, at least two side walls 103, 104, the upper, lower and side walls together defining a volume, the volume housing a chamber 131, 132 or elongate channels which may extend vertically 152-156 or horizontally 142, 144. The chamber(s) may be hollow spherical voids, optionally fillable with water once in situ, making the the blocks lightweight for easy assembly and reducing materials for manufacture and transport. The channels may receive wire for securing the blocks together or may be suitable for receiving parts of wire fencing panels for use as a security fence base system. The blocks may be plastic material or concrete. Also claimed is a system using multiple blocks and a system including blocks and an elongate support member e.g. wire, rebar, receivable in the channels.

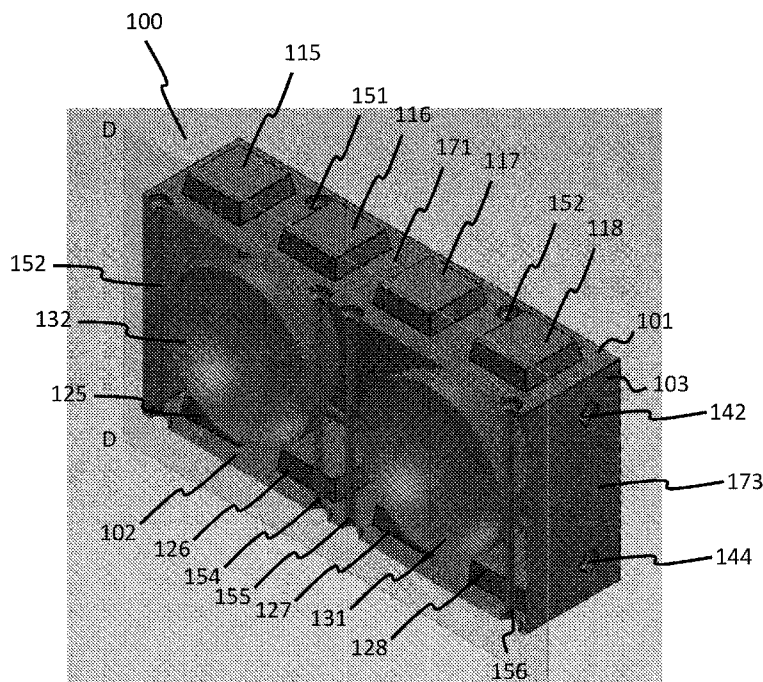


FIG. 7

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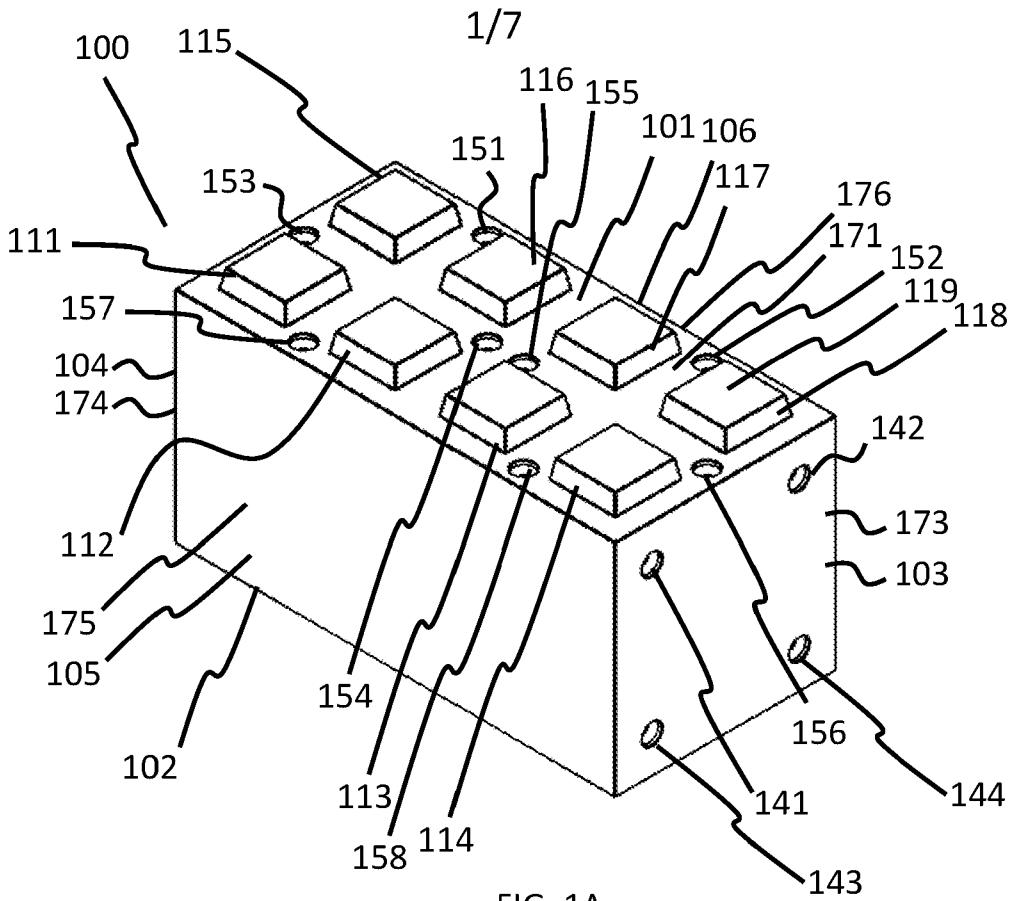


FIG. 1A

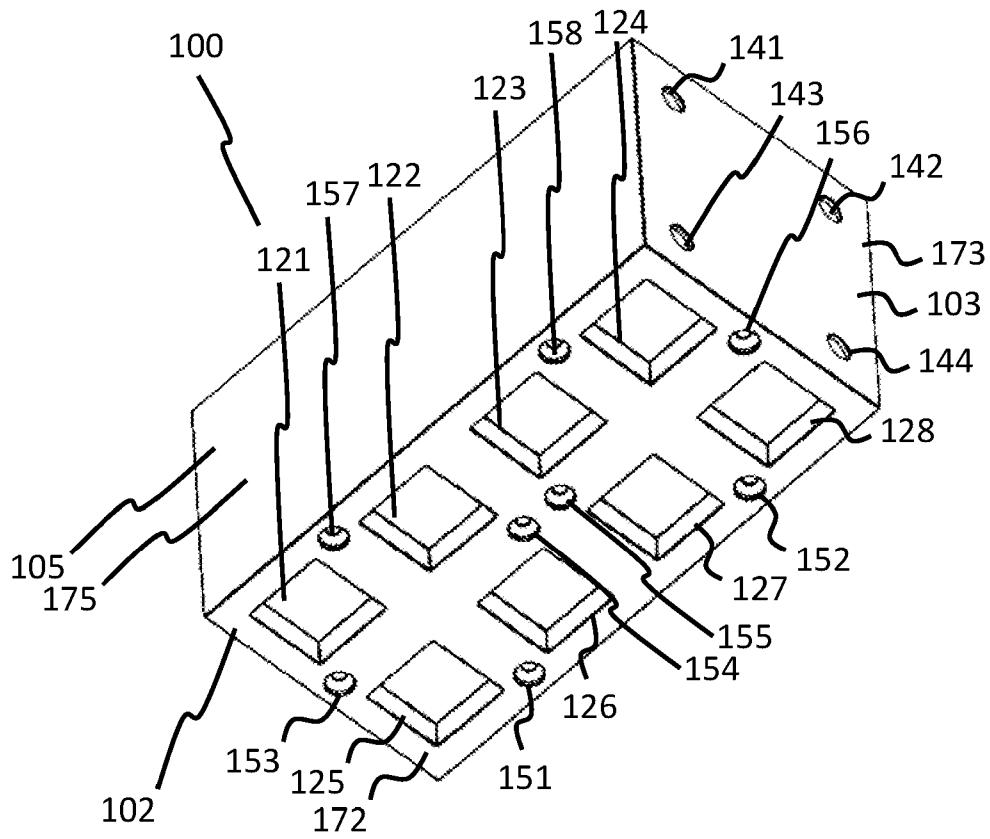


FIG. 1B

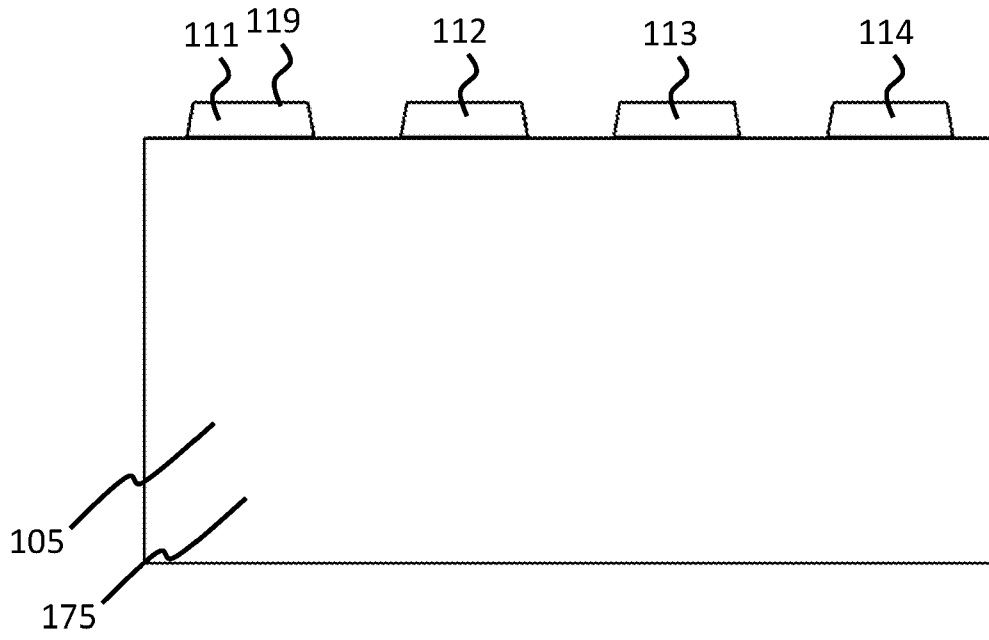


FIG. 2

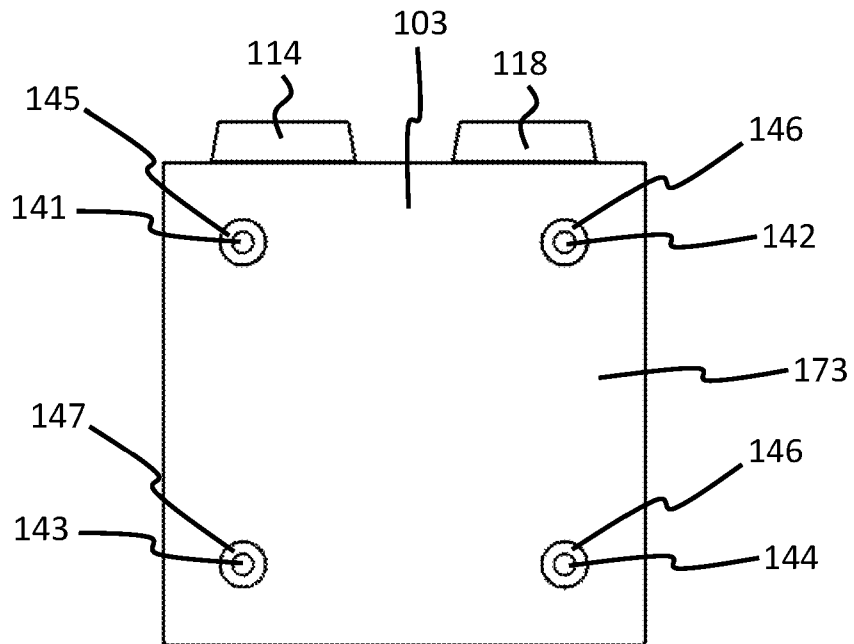


FIG. 3

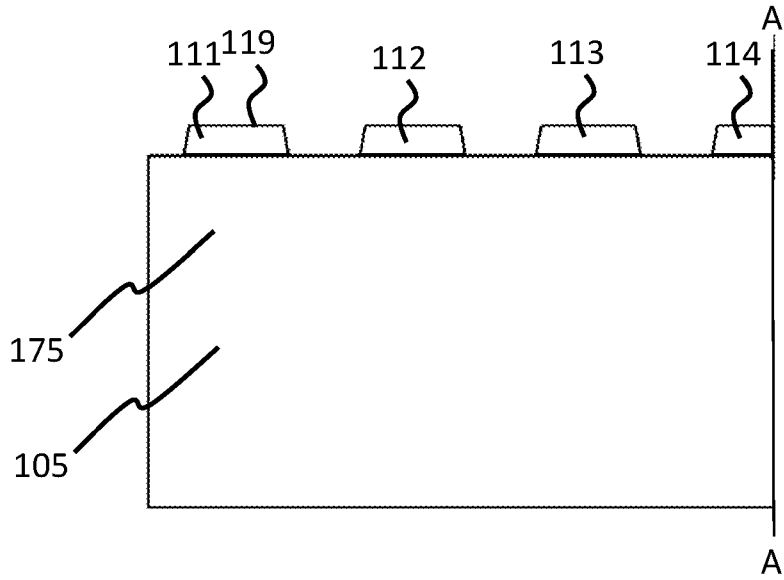


FIG. 4A

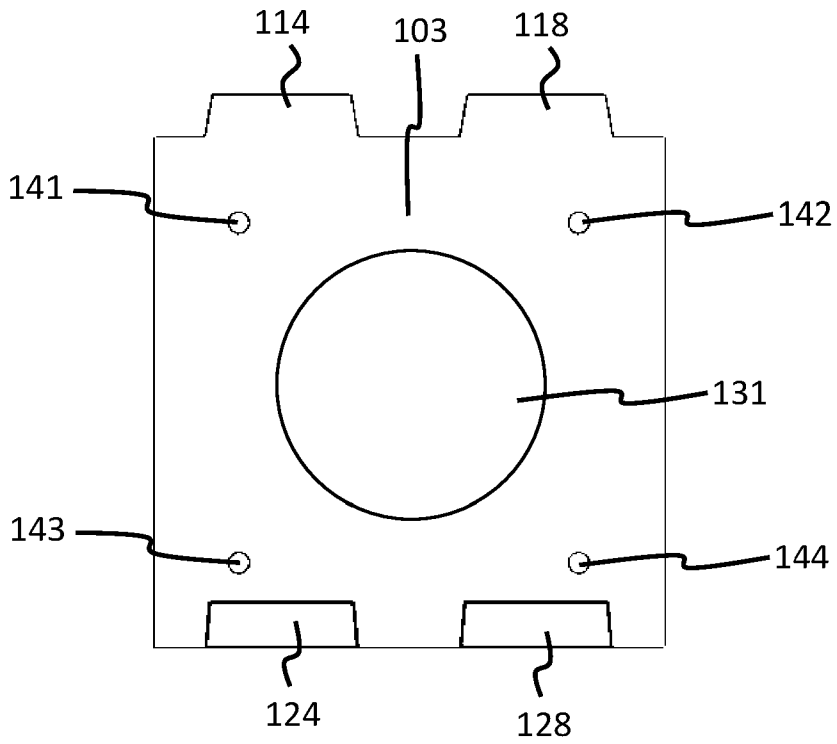


FIG. 4B

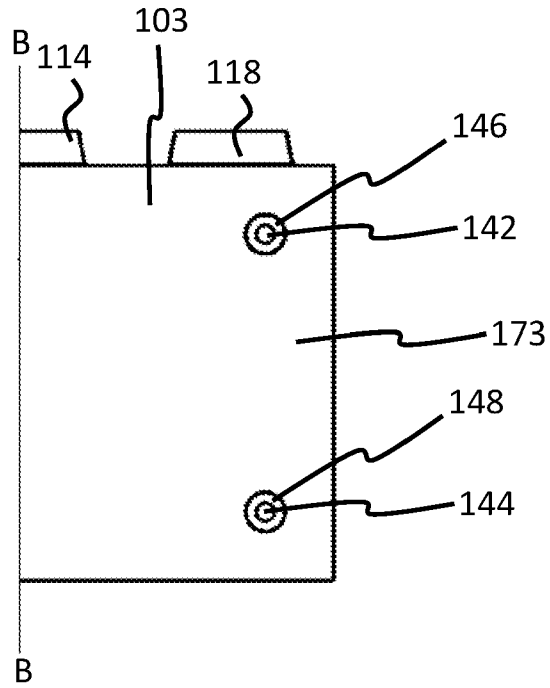


FIG. 5A

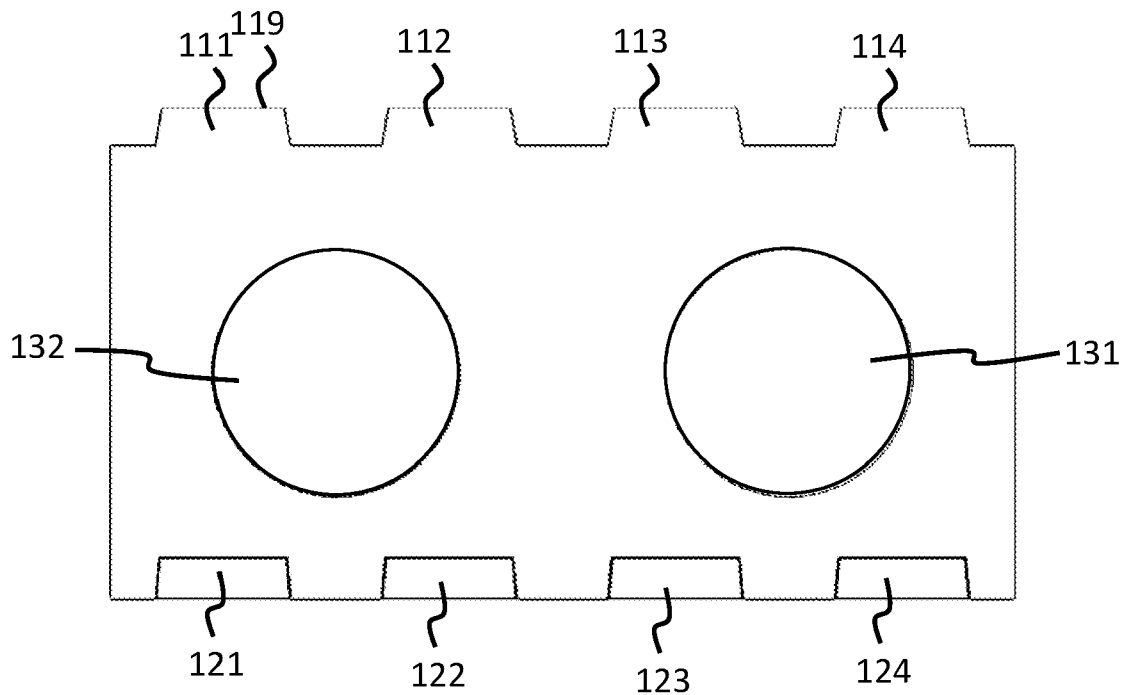


FIG. 5B

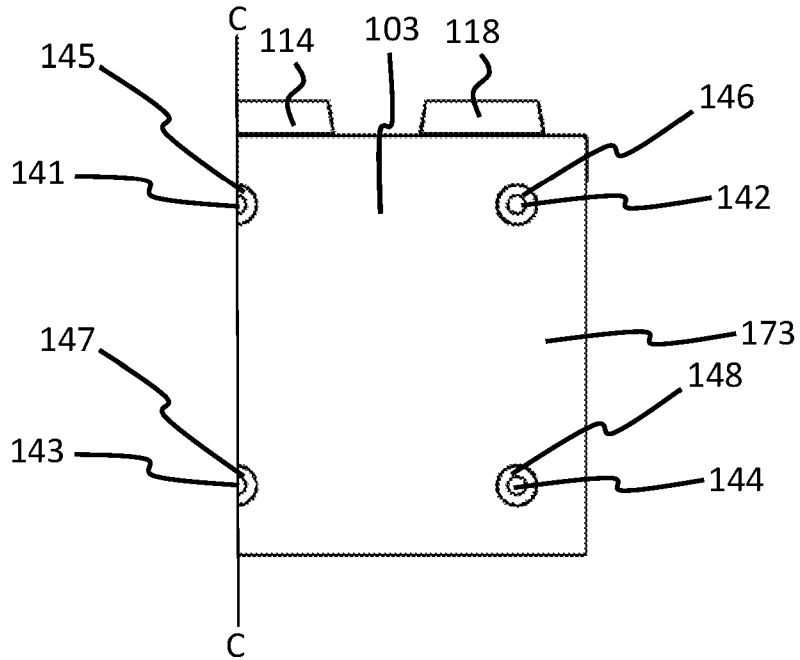


FIG. 6A

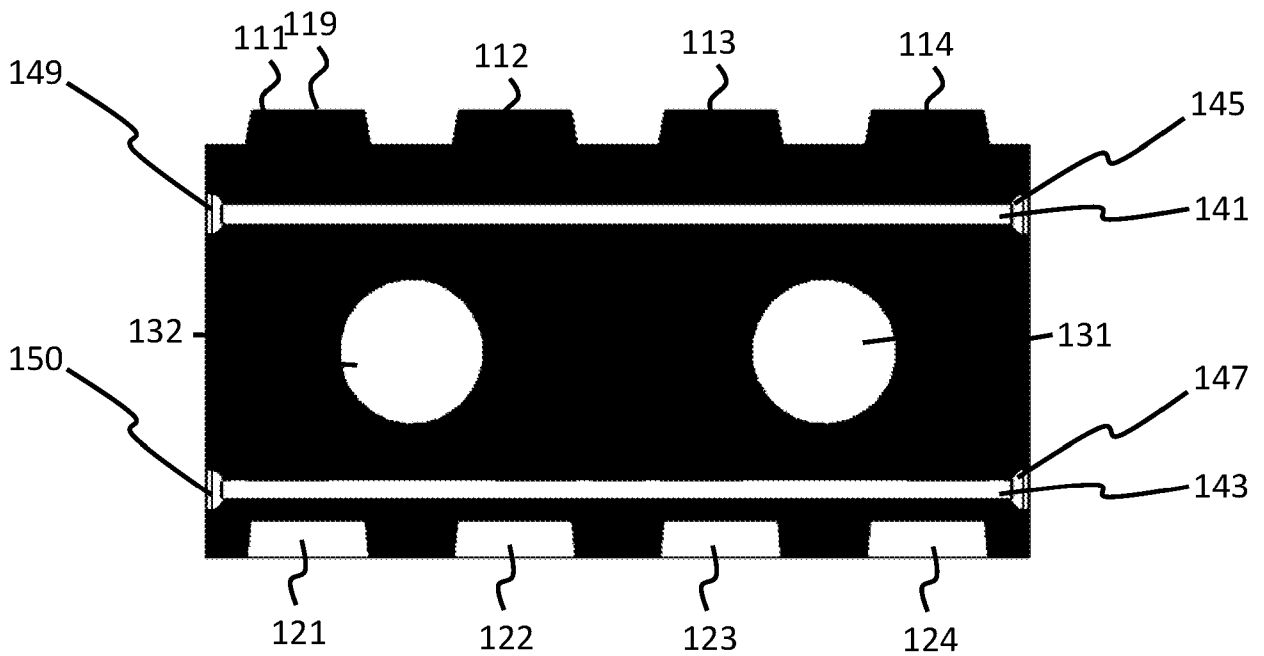


FIG. 6B

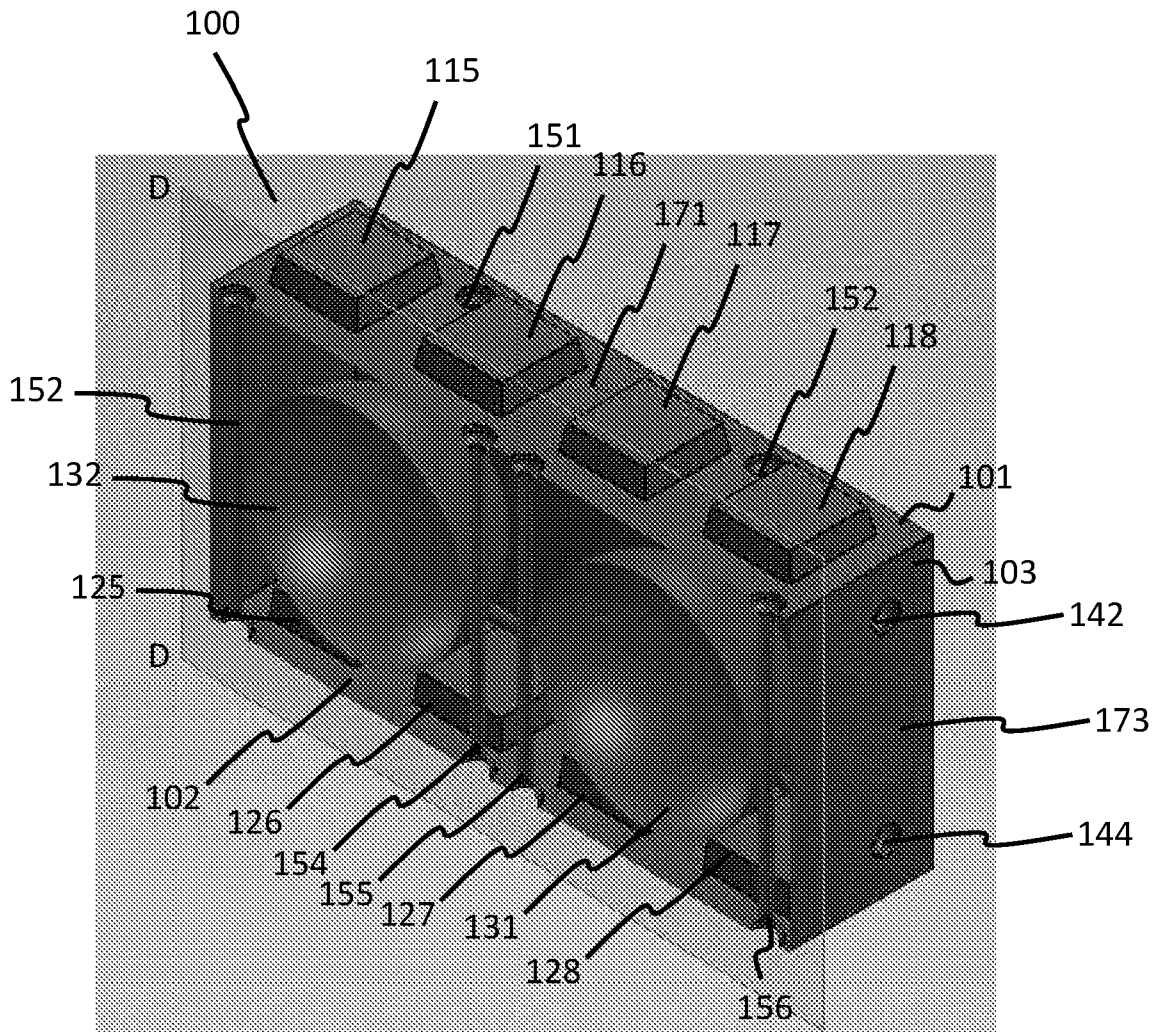


FIG. 7

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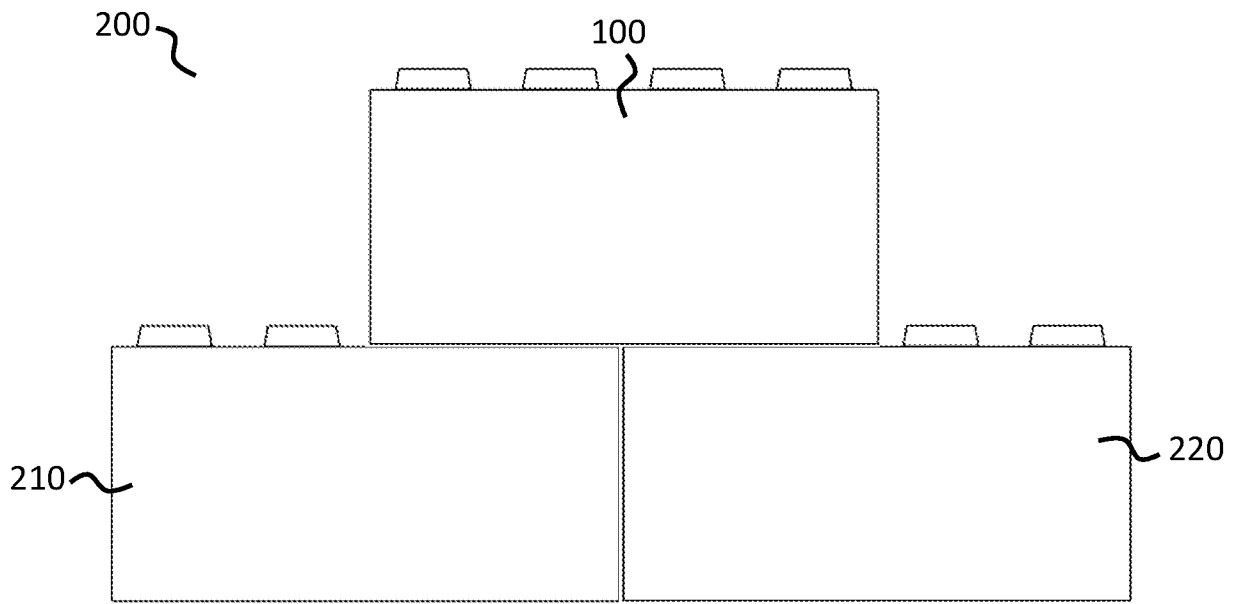


FIG. 8



The following terms are registered trade marks and should be read as such wherever they occur in this document:

“HERAS” pg. 11

TITLE

A construction block

5 TECHNOLOGICAL FIELD

Examples of the disclosure relate to a construction block. Some relate to a construction block for use in a temporary barrier.

10 BACKGROUND

Construction blocks can be used to construct a barrier, such as a wall or a fence.

BRIEF SUMMARY

15 According to various, but not necessarily all, examples there is provided a construction block, for use in a temporary barrier, comprising: an upper wall and an underside wall, wherein the upper wall comprises at least one male portion and the underside wall comprises at least one female portion, or the upper wall comprises at least one female portion and the underside wall comprises at least one male portion; a plurality of side
20 walls, each side wall extending between the upper wall and the underside wall, wherein the plurality of side walls, the upper wall and the underside wall define a volume; and at least one chamber located in the volume.

At least part of the at least one chamber may be substantially spherical. The at least
25 one chamber may be substantially spherical.

The at least one chamber may comprise at least 5% of the volume of the construction block.

30 The construction block may comprise a length, a width and a height, the length being the same or greater than the width and the same or greater than the height; and the at least one chamber may be located in the volume such that the centre of the at least

one chamber is located substantially at the centre of the width and/or the height of the construction block.

5 The at least one chamber may be completely enclosed within the volume. The at least one chamber may extend to an opening of at least one side wall of the plurality of side walls.

10 The at least one male portion may be tapered. The at least one male portion may be tapered such that the male portion narrows in a direction away from the upper wall or underside wall. The at least one male portion may be substantially cuboidal in shape.

15 The at least one female portion may be tapered. The at least one female portion may be tapered such that the female portion narrows in a direction away from the upper wall or underside wall. The at least one female portion may be substantially cuboidal in shape.

20 The plurality of side walls may comprise a first side wall and a second side wall; and the construction block may comprise at least one elongate channel that extends through the volume from the first side wall to the second side wall.

The at least one elongate channel may extend through the volume without intersecting the at least one chamber.

25 The at least one elongate channel may extend through the volume such that the at least one elongate channel is substantially equidistant from the at least one chamber and the upper wall or underside wall.

The at least one elongate channel may be substantially cylindrical.

30 The at least one elongate channel may comprise an opening at the first side wall and the at least one elongate channel narrows from the opening.

The at least one elongate channel may extend through the volume from the upper wall to the underside wall. The at least one elongate channel extending through the volume

from the upper wall to the underside wall, may be configured to receive at least one elongate support member.

5 According to various, but not necessarily all, examples there is provided a construction block, for use in a temporary barrier, comprising: an upper wall and an underside wall, wherein the upper wall comprises at least one male portion and the underside wall comprises at least one female portion, or the upper wall comprises at least one female portion and the underside wall comprises at least one male portion; and first and second side walls, wherein the first and second side walls, the upper wall and the
10 underside wall define a volume; and at least one elongate channel extending through the volume from the first side wall to the second side wall.

According to various, but not necessarily all, examples there is provided a system comprising: the construction block according to any preceding claim; and a further
15 construction block comprising: an upper wall and an underside wall, wherein the upper wall comprises at least one male portion and the underside wall comprises at least one female portion, or the upper wall comprises at least one female portion and the underside wall comprises at least one male portion; a plurality of side walls, each side wall extending between the upper wall and the underside wall, wherein the plurality of
20 side walls, the upper wall and the underside wall define a volume; and at least one chamber located in the volume.

The at least one male portion of the construction block may be configured to be received by the at least one female portion of the further construction block.
25

The at least one female portion of the construction block may be configured to receive the at least one male portion of the further construction block.

According to various, but not necessarily all, examples there is provided a system
30 comprising: the construction block according to claims 14 to 18; and at least one elongate support member, wherein the at least one elongate channel is configured to receive at least part of the at least one elongate support member.

BRIEF DESCRIPTION

Some examples will now be described with reference to the accompanying drawings in which:

- 5 FIG. 1A shows an upper perspective view an example construction block;
- FIG. 1B shows a lower perspective view of the example construction block;
- FIG. 2 shows a side view of the example construction block;
- FIG. 3 shows another side view of the example construction block;
- FIG. 4A shows the side view of FIG. 2 with a cross-section A-A;
- 10 FIG. 4B shows the cross-section A-A of FIG. 4A;
- FIG. 5A shows the side view of FIG. 3 with a cross-section B-B;
- FIG. 5B shows the cross-section B-B of FIG. 5A;
- FIG.6A shows the side view of FIG. 3 with a cross-section C-C;
- FIG. 6B shows the cross-section C-C of FIG. 6A;
- 15 FIG. 7 shows an upper perspective view of the cross-section D-D; and
- FIG. 8 shows a side view of an example system of construction blocks.

DETAILED DESCRIPTION

- 20 Embodiments of the invention relate to a construction block 100 for use in a temporary barrier. At least one construction block 100 may be used as part of a fence or a wall, such as a flood defense system.

- 25 A temporary barrier may be required to be assembled quickly and easily and to be lightweight. Advantageously, completion of the assembly of the temporary barrier using the construction block 100 of the present invention is straightforward and might not require the use of tools. Advantageously, the construction block 100 may include a chamber, making it relatively lightweight. Advantageously, making the construction
- 30 block 100 lightweight means that manufacture and/or transportation of the construction block 100 require less carbon emissions. Furthermore, in at least some implementations, multiple instances of the construction block 100 may be coupled (directly or indirectly) to form the temporary barrier. For example, multiple instances of the construction block 100 can be stacked on top of one another and/or multiple instances of the construction block 100 can be placed next to each other.

FIG. 1A shows an upper perspective view of an example construction block 100 and FIG. 1B shows a lower perspective view of the example construction block.

5 The construction block 100 comprises an upper wall 101 and an underside wall 102. The upper wall 101 may comprise at least one male portion/protrusion 111-118. The at least one male portion extends outwardly from an external surface 171 of the upper wall 101. In the illustrated example, the external surface 171 is generally planar in shape.

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The underside wall 102 may comprise at least one female portion/recess 121-128. The at least one female portion 121-128 extends inwardly into an external surface 172 of the underside wall 102. In the illustrated example, the external surface 172 is generally planar in shape.

15

The upper wall 101 may comprise at least one female portion 121-128 that extends inwardly into the external surface 171 of the upper wall 101 instead of or in addition to the at least one male portion 111-118. The underside wall 102 may comprise at least one male portion 111-118 that extends outwardly from the external surface 172 of the

20

One or both of the upper wall 101 and the underside wall 102 may comprise an array of male portions 111-118, an array of female portions 121-128 or a mixture of the two. In each case, the portions may be arranged in columns and rows, for instance. In the

25 illustrated example, the upper wall 101 comprises an array of male portions 111-118 and the underside wall 121-128 comprises an array of female portions 121-128. Eight male portions 111-118 are shown as part of the upper wall 101 and eight female portions 121-128 are shown as part of the underside wall 102 in the figures by way of example, but any number of male portions 111-118 and/or female portions 121-128

30 could be present.

Each male portion 111-118 may extend from the upper wall 101 in a direction away from the external surface 171 of the upper wall 101. Each male portion 111-118 may be formed by a portion of the upper wall 101. Each male portion 111-118 may be

formed by a portion that does not form part of the upper wall 101. Each male portion 111-118 may extend from the underside wall 102 in a direction away from the external surface 172 of the underside wall 102. Each male portion 111-118 may be formed by a portion of the underside wall 102. Each male portion 111-118 may be formed by a portion that does not form part of the underside wall 102.

Each male portion 111-118 may be tapered. For instance, each male portion 111-118 may be tapered such that the male portion narrows in a direction away from the upper wall 101 or the underside wall 102. The tapering may be such that the male portion 111-118 narrows in a direction away from the external surface 171 of the upper wall 101 or the external surface 172 of the underside wall 102. Each male portion 111-118 may comprise a proximal end and a distal end. The proximal end of each male portion 111-118 may comprise a part of the male portion 111-118 that extends furthest from the external surface 171 of the upper wall 101 and/or the external surface 172 of the underside wall 102. The distal end of each male portion 111-118 may comprise a part of the male portion that is nearest to the external surface 171 of the upper wall 101 and/or the external surface 172 of the underside wall 102.

Each female portion 121-128 may extend from the underside wall 102 in a direction into the construction block 100. Each female portion 121-128 may be formed by a portion of the underside wall 102. Each female portion 121-128 may be formed by a portion that does not form part of the underside wall 102. Each female portion 121-128 may extend from the upper wall 101 in a direction into the construction block 100. Each female portion 121-128 may be formed by a portion of the upper wall 101. Each female portion 121-128 may be formed by a portion that does not form part of the upper wall 101.

Each female portion 121-128 may be tapered. Each female portion 121-128 may be tapered such that the female portion 121-128 narrows in a direction away from the upper wall 101 or the underside wall 102. Each female portion 121-128 may be tapered such that the female portion 121-128 narrows in a direction away from the external surface 171 of the upper wall 101 or the external surface 172 of the underside wall 102. Each female portion 121-128 may comprise a proximal end and a distal end. The proximal end of each female portion 121-128 may comprise a part of the female portion

121-128 that extends furthest from the external surface 171 of the upper wall 101 and/or the external surface 172 of the underside wall 102. The distal end of each female portion 121-128 may comprise a part of the female portion 121-128 that is nearest to the external surface 171 of the upper wall 101 and/or the external surface
5 172 of the underside wall 102.

FIGs. 1B, 4B and 5B illustrate that each female portion 121-128 is wider at the end of the female portion 121-128 that is nearest to the external surface 172 of the underside wall 102. Each female portion 121-128 may be substantially cuboidal in shape. In the
10 illustrated example, each female portion 121-128 is shaped as a frustum of a rectangular prism. Each female portion 121-128 may be substantially similar in shape to each male portion 111-118.

The construction block 100 comprises a plurality of side walls 103-106. Each of the
15 plurality of side walls 103-106 may include an external surface 173-176 defining the exterior of the side wall 103-106. In the illustrated example, four side walls 103-106 are provided. Each side wall 103-106 of the plurality of side walls 103-106 extends between the upper wall 101 and the underside wall 102. In the illustrated example,
20 each of the four side walls 103-106 extends from the upper side wall 101 to the underside wall 102. It should be understood that each side wall does not necessarily have to extend from the upper side wall 101 to the underside wall 102.

The plurality of side walls 103-106, the upper wall 101 and the underside wall 102
25 define a volume. In the illustrated example, the volume is defined by the four side walls 103-106, the upper wall 101 and the underside wall 102.

The construction block 100 may form any suitable shape. In the illustrated example, the construction block 100 is substantially cuboidal in shape. The external surfaces 171-176 of the walls 101-106 of the construction block 100 may form any suitable
30 shape. In the illustrated example, the external surfaces 171-176 of the walls 101-106 are substantially rectangular in shape. In the illustrated example, the construction block 100 is configured such that the external surface 171 of the upper wall 101 is substantially parallel with the external surface 172 of the underside wall 102. In the illustrated example, the construction block 100 is configured such that the external

surface 173 of the first side wall 103 is substantially parallel with the external surface 174 of the second side wall 104. In the illustrated example, the construction block 100 is configured such that the external surface 175 of the third side wall 105 is substantially parallel with the external surface 176 of the fourth side wall 106. The external surfaces 171, 172 of the upper wall 101 and underside wall 102 are substantially orthogonal to the external surfaces 173-176 of the four side walls 103-106. The external surfaces 173, 174 of the first side wall 103 and second side wall 104 are substantially orthogonal to the external surfaces 171, 172, 175, 176 of the third and fourth side walls 105-106 and to the upper and underside walls 101-102.

10

FIG. 2 shows a side view of the example construction block 100. Each of the male portions 111-118 of the upper wall 101 comprises an upper surface 119. The upper surface 119 of one of the male portions 111 has been labelled with the reference numeral 119 in FIG. 2.

15

The upper surface 119 of each of the male portions 111-118 may be substantially flat. The upper surface 119 is at the distal end of each male portion 111-118. Each male portion 111-118 is wider at the proximal end of the male portion 111-118 that is nearest to the upper wall 101 than at the distal end. Each male portion 111-118 may be substantially cuboidal in shape. In the illustrated example, each male portion 111-118 is shaped as a frustum of a rectangular pyramid.

20

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The upper surface 119 may be substantially parallel with the external surface 171 of the upper wall 101 and/or the external surface 172 of the underside wall 102. The upper surface 119 may be substantially rectangular in shape.

30

In use, a plurality of the construction blocks 100 described above and illustrated in FIGs. 1 to 8 may be used as part of a system. Each male portion 111-118 of the upper wall 101 of a first construction block 100 may be configured to be received by each female portion 121-128 of a second construction block 100. Each male portion 111-118 may be configured such that when the male portion(s) 111-118 of the first construction block 100 is received by each female portion 121-128 of the second construction block 100, lateral movement between the first construction block 100 and the second construction block 100 is prevented. The second construction block 100

may be stacked on top of the first construction block 100. Any number of construction blocks 100 may be stacked on top of one another. For example, a third construction block 100 may be stacked on top of the second construction block 100 in the same manner that the second construction block 100 is stacked on the first construction block 100.

The plurality of side walls 103-106 may comprise a first side wall 103 and a second side wall 104. FIG. 3 shows a side view of the first side wall 103 of the example construction block 100. The construction block 100 may comprise at least one elongate channel 141-144 that extends through the volume from the first side wall 103 to the second side wall 104. The construction block 100 may comprise any number of elongate channels 141-144. In the illustrated example, the construction block comprises four elongate channels 141-144 that extend through the volume from the first side wall 103 to the second side wall 104. The elongate channels 141-144 may be substantially cylindrical. The elongate channels 141-144 may be configured to receive at least part of an elongate support member (not shown). The elongate support member may comprise at least one of wire, rebar or metal rope.

FIG. 4A shows the side view of FIG. 2 with a cross-section A-A and FIG. 4B shows the cross-section A-A of FIG. 4A. FIG. 5A shows the side view of FIG. 3 with a cross-section B-B and FIG. 5B shows the cross-section B-B of FIG. 5A. As referred to above, FIG. 5B shows the cross-section of the female portions 121-128.

Each elongate channel 141-144 may comprise an opening 145-148 at the first side wall 103. The opening 145-148 may be wider than at least part of the elongate channel 141-144. Each elongate channel 141-144 may narrow inwardly from the opening 145-148. As illustrated in FIGs. 4A, 5A and 6A, the opening 145-148 may be substantially circular. The opening 145-148 is configured such that an elongate support member can be more easily received by the elongate channel 141-144.

Each elongate channel 141-144 may be configured such that the cross-section of the elongate channel 141-144 is the same or substantially similar in shape and/or size to the cross-section of the elongate support member. This ensures that when at least part of the elongate support member is received by the elongate channel 141-144, the fit

between the elongate support member and the elongate channel 141-144 is tight, thereby providing a more rigid barrier.

FIG.6A shows the side view of FIG. 3 with a cross-section C-C and FIG. 6B shows the
5 cross-section C-C of FIG. 6A. FIG. 6B illustrates a cross-section of the two elongate channels 141-144 and the openings 145-152 of those elongate channels 141-144. As the elongate channels 141-144 are substantially cylindrical, the cross-section of the elongate channels 141-144 are substantially rectangular. The elongate channels 141-144 may be substantially parallel to the external surface 171 of the upper wall 101.
10 The elongate channels 141-144 may be substantially orthogonal to the external surface 173 of the first side wall 103. The elongate channels 141-144 may extend horizontally from the first side wall 103 to the second side wall 104.

As illustrated in FIG. 6B, the openings 145-152 are tapered. The openings 145-152
15 may be tapered such that the openings 145-152 narrow in a direction into the construction block 100. For example, the openings 141-144 illustrated in the first side wall 103 are configured such that the openings 141-144 narrow in a direction from the external surface 173 of the first side wall 103 to the elongate channels 141-144. The shape of the other elongate channels 141-144 and openings 145-152 illustrated in
20 FIGs. 3, 4B, 5A and 6A may be substantially similar in shape to the elongate channels 141-144 and openings 145-152 illustrated in FIG. 6B.

The construction block 100 may comprise at least one elongate channel 151-158 (such as a plurality of elongate channels 151-158) that extends from the upper wall 101 to the underside wall 102. Hereinafter the elongate channels 151-158 that extend from the upper wall 101 to the underside wall 102 are referred to as vertical elongate channels 151-158. Each vertical elongate channel 151-158 may be configured to receive at least one elongate support member. The construction block 100 may comprise any number of elongate channels 151-158 that extend from the upper wall
25 101 to the underside wall 102. As best shown in FIGs. 1 and 2, the illustrated example construction block 100 comprises eight elongate channels 151-158 that extend from the upper wall 101 to the underside wall 102. FIG. 7 shows an upper perspective view of the cross-section D-D.
30

FIG. 7 illustrates that the vertical elongate channels 151-158 that extend from the upper wall 101 to the underside wall 102 may comprise substantially the same shape as the elongate channel 141-144 that extends from the first side wall 103 to the second side wall 104.

5

The vertical elongate channels 151-158 may be substantially parallel to the external surface 173 of the first side wall 103. The elongate channels 151-158 may be substantially orthogonal to the external surface 171 of the upper wall 101. The elongate channels 151-158 may extend vertically from the upper wall 101 to the underside wall

10

At least one of the vertical elongate channels 151-158 that extend from the upper wall 101 to the underside wall 102 may be configured to receive a lifting pin as disclosed in UK patent application number 2000028.7 which is hereby incorporated by reference.

15

The at least one vertical elongate channel 151-158 being configured in this manner provides the effect of the construction block 100 being easily attachable to and detachable from an apparatus for lifting the construction block 100 into position for use as part of a barrier.

20

At least one of the vertical elongate channels 151-158 that extend from the upper wall 101 to the underside wall 102 may be configured to receive at least a portion of a security type fence panel such as a Harris (HERAS) fencing panel. One or more construction blocks 100 in combination with at least one security type fencing panel may be configured to provide at least part of a high security fence. For example, a plurality of construction blocks 100 may be configured to provide a base for a high security fence. At least one security type fence panel may be received by at least one of the construction blocks 100 providing the base. Advantageously, a plurality of construction blocks 100 providing the base of a high security fence increases the height and improves the rigidity of the high security fence.

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The construction block 100 may comprise at least one chamber 131, 132 located in the volume defined by the walls 101-106. The construction block 100 may comprise any number of chambers 131, 132 located in the volume. In the illustrated example,

two chambers 131, 132 are located in the volume. FIGs. 4B, 5B, 6B and 7 illustrate the chambers 131, 132. The chambers are best shown in FIG. 7.

Each chamber 131,132 or the combination of chambers 131, 132 may comprise at least 5% of the volume of the construction block 100. When only a single chamber is present, it may comprise between 1% and 50% (possibly between 10% and 40%, and preferably between 20% and 30%) of the volume of the construction block 100. Where a plurality of chambers 131, 132 is present, they may comprise between 1% and 50% (possibly between 10% and 40%, and preferably between 20% and 30%) of the volume of the construction block 100.

Matter may be located in one or more of the chambers 131, 132 that has a lower density than at least some parts of the rest of the construction block 100. For instance, the matter located in one or more of the chambers 131, 132 may have a lower density than the upper wall 101, the underside wall 102 and/or the side walls 103-106 of the construction block 100.

At least some of the upper wall 101, the underside wall 102 and/or the side walls 103-106 of the construction block 100 may be formed from a plastics material or concrete, for example.

The matter that is located in chamber(s) 131, 132 may be solid or a fluid (a liquid or a gas). The chamber(s) 131, 132 may merely have air located therein, such that each chamber 131, 132 is a cavity (defining a void). Alternatively, the chamber(s) 131, 132 could have a liquid therein (e.g., water) and/or a solid therein (e.g., a lightweight solid such as polystyrene)

In some examples, one or more of the chambers 131, 132 may be initially define a cavity and matter may subsequently be introduced into the chamber(s) 131, 132 (e.g., by a user), such as a liquid (e.g., water) or a solid (e.g., polystyrene). In this regard, the one or more chambers 131, 132 may be suitable for storing such matter.

The construction block 100 having at least one chamber 131, 132 located in the volume provides the benefit that the construction block 100 is relatively lightweight in comparison to construction blocks that do not comprise a chamber 131, 132.

5 Each chamber 131, 132 may be any shape. Each chamber 131, 132 may be any regular or irregular three-dimensional shape. During testing, the inventor has found that at least part of the chamber 131, 132 being substantially spherical reduces the loss of structural integrity of the construction block 100 caused by the presence of the chamber 131, 132.

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At least part of each chamber 131, 132 may be substantially spherical. Each chamber 131, 132 may be substantially spherical. FIG. 7 shows that the two chambers 131, 132 are spherical.

15 Each chamber 131, 132 may be completely enclosed within the volume. Each chamber 131, 132 may be inaccessible. Each chamber 131, 132 being completely enclosed within the volume ensures that debris does not ingress into the chamber 131, 132, for example, during use as part of a barrier.

20 At least some of the chambers 131, 132 may extend to an opening (not shown) of a side wall 103-106 of the plurality of side walls. For example, when the construction block 100 is being used as part of a flood defense system, when the flood defense system is being installed, a chamber 131, 132 may comprise air. Once the flood defense system has been installed, that chamber 131, 132 may be filled with a
25 substance denser than air (e.g., a fluid such as water).

One, some or all of the chambers 131, 132 may be filled with a substance that is denser than air prior to the construction block 100 being used as part of the flood defense system. The opening may be configured to receive a nozzle. A chamber 131, 132 may
30 be filled with water once the construction block 100 is being used a part of the flood defense system, for example, by the flood water via the aforementioned opening. Upon the flood defense system being uninstalled, the water may be removed from the chamber(s) 131, 132 via the opening.

The construction block 100 may comprise a length, a width and a height, wherein the length is the same or greater than the width and is the same or greater than the height. The length of the construction block 100 may be defined by the third and fourth side walls 101, 102 that extend from the first side wall 103 to the second side wall 104. The
5 width of the construction block 100 may be defined by the first side wall 103 and/or the second side wall 104 extending from the third side wall 105 to the fourth side wall 106. The height of the construction block 100 may be defined by the by any of the side walls 103-106 extending from the upper wall 101 to the underside wall 102.

10 Each chamber 131, 132 may be located such that the centre of the chamber 131, 132 is located substantially at the centre of the width of the construction block 100. Each chamber 131, 132 may be located such that the centre of the chamber 131, 132 is located substantially at the centre of the height of the construction block 100. FIG. 4B illustrates that the centre of the chamber 131, 132 is located substantially at the centre
15 of the width of the construction block 100. FIG. 4B also illustrates that the centre of the chamber 131, 132 is located substantially at the centre of the height of the construction block 100.

Each chamber 131, 132 may be located such that the centre of mass of the
20 construction block 100 is located substantially at the centre of the width of the construction block 100. Each chamber 131, 132 may be located such that the centre of mass of the construction block 100 is located substantially at the centre of the height of the construction block 100. Each chamber 131, 132 may be located such that the centre of mass of the construction block 100 is located substantially at the centre of
25 the length of the construction block 100. Advantageously, locating the chamber 131, 132 in such a manner improves the stability of the construction block 100.

The construction block 100 may comprise a different number of chambers 131, 132 from that illustrated in the figures. The chambers 131, 132 may be different from each
30 other in shape and/or size. The construction block 100 may, for example, comprise a chamber 131, 132 that is completely enclosed with the volume and a chamber 131, 132 that is connected to an opening of at least on side wall 103-106.

One, some or all of the elongate channels 141-144 may be configured such that the elongate channels 141-144 extend through the volume without intersecting a chamber 131, 132. One, some or all of elongate channels 141-144 may be configured such that the elongate channels 141-144 extend through the volume and intersects a chamber
5 131, 132.

One, some or all of the elongate channels 141-144 may be arranged to extend through the volume such that that or those elongate channels 141-144 are substantially equidistant from one or multiple chambers 131, 132 and the upper wall 101 and/or the underside wall 102. FIG. 4B shows four elongate channels 141-144. Each of the four
10 elongate channels 141-144 is located such that the elongate channel 141-144 is substantially equidistant from each chamber 131, 132 and the upper wall 101 and/or the underside wall 102. Each of the four elongate channels 141-144 is located such that the elongate channel 141-144 is substantially equidistant from each chamber 131,
15 132 and the third side wall 105 and the fourth side wall 106.

One, some or all of the vertical elongate channel 151-158 may be configured such that the vertical elongate channels 151-158 extend through the volume without intersecting the chamber 131, 132. One, some or all of the vertical elongate channels 151-158 may
20 be configured such that the vertical elongate channels 151-158 extend through the volume and intersects the chamber 131, 132.

FIG. 8 shows a side view of an example system of three construction blocks 100, 210, 220. The system comprises the construction block 100, a second construction block
25 210 and a third construction block 220. The second construction block 210 and the third construction block 220 are substantially similar to the construction block 100.

FIG. 8 shows that the second construction block 210 is aligned with and positioned adjacent to the third construction block 220. The second construction block 210 and
30 the third construction block 220 form a horizontal barrier. The second construction block 210 and the third construction block 220 may be connected via an elongate support member. The elongate support member may be received by an elongate channel 141-144 of each of the second and third construction blocks 210, 220. The

second and third construction blocks 210, 220 being connected via the elongate support member provides a more stable structure of construction blocks 100, 210, 220.

FIG. 8 shows that the construction block 100 is stacked on top of the second and third construction blocks 210, 220. The male portion 111-118 of each of the second and third construction blocks 210, 220 are each being received by the female portion 121-128 of the construction block 100. The construction block 100 and the second construction block 210 form a vertical barrier. At least some of the elongate channels 151-158 of the first construction block 100 are aligned with at least some of the elongate channels 151-158 of the second construction block 210 and/or third construction block 220. The construction block 100 may be connected to the second construction block 210 via an elongate support member. The elongate support member may be received by the vertical elongate channel 151-158 of each of the construction block 100 and the second construction block 210. The construction block 100 may be connected to the third construction block 220 via an elongate support member. The elongate support member may be received by the vertical elongate channel 151-158 of each of the construction block 100 and the third construction block 220. The construction block 100 being connected via the elongate support member to either or both of the second and third construction blocks 210, 220 provides a more stable structure.

The construction blocks 100, 210, 220 may be mutually interchangeable parts with the system 200. For example, each of the construction blocks 100, 210, 220 could replace and/or be replaced by each of the other constructions blocks 100, 210, 220. Whilst FIG. 8 illustrates three construction blocks 100, 210, 220, it should be understood that any number of construction blocks 100, 210, 220 can be arranged to form at least part of a barrier.

The construction block 100 may be integrally formed. The construction block 100 being integrally formed improves the strength of the construction block 100. The construction block 100 may be formed around a mould that is substantially similar in shape to the chamber 131, 132. For example, the chambers 131, 132 illustrated in the figures may be formed by blow moulding two spherical moulds and then forming the construction block 100 around the two spherical moulds.

The term 'comprise' is used in this document with an inclusive not an exclusive meaning. That is any reference to X comprising Y indicates that X may comprise only one Y or may comprise more than one Y. If it is intended to use 'comprise' with an
5 exclusive meaning then it will be made clear in the context by referring to "comprising only one..." or by using "consisting".

In this description, the wording 'connect', 'couple' and 'communication' and their derivatives mean operationally connected/coupled/in communication. It should be
10 appreciated that any number or combination of intervening components can exist (including no intervening components), i.e., so as to provide direct or indirect connection/coupling/communication. Any such intervening components can include hardware and/or software components.

15 In this description, reference has been made to various examples. The description of features or functions in relation to an example indicates that those features or functions are present in that example. The use of the term 'example' or 'for example' or 'can' or 'may' in the text denotes, whether explicitly stated or not, that such features or functions are present in at least the described example, whether described as an
20 example or not, and that they can be, but are not necessarily, present in some of or all other examples. Thus 'example', 'for example', 'can' or 'may' refers to a particular instance in a class of examples. A property of the instance can be a property of only that instance or a property of the class or a property of a sub-class of the class that includes some but not all of the instances in the class. It is therefore implicitly disclosed
25 that a feature described with reference to one example but not with reference to another example, can where possible be used in that other example as part of a working combination but does not necessarily have to be used in that other example.

Although examples have been described in the preceding paragraphs with reference
30 to various examples, it should be appreciated that modifications to the examples given can be made without departing from the scope of the claims.

Features described in the preceding description may be used in combinations other than the combinations explicitly described above.

Although functions have been described with reference to certain features, those functions may be performable by other features whether described or not.

- 5 Although features have been described with reference to certain examples, those features may also be present in other examples whether described or not.

The term 'a', 'an' or 'the' is used in this document with an inclusive not an exclusive meaning. That is any reference to X comprising a/an/the Y indicates that X may
10 comprise only one Y or may comprise more than one Y unless the context clearly indicates the contrary. If it is intended to use 'a', 'an' or 'the' with an exclusive meaning then it will be made clear in the context. In some circumstances the use of 'at least one' or 'one or more' may be used to emphasis an inclusive meaning but the absence of these terms should not be taken to infer any exclusive meaning.

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The presence of a feature (or combination of features) in a claim is a reference to that feature or (combination of features) itself and also to features that achieve substantially the same technical effect (equivalent features). The equivalent features include, for example, features that are variants and achieve substantially the same result in
20 substantially the same way. The equivalent features include, for example, features that perform substantially the same function, in substantially the same way to achieve substantially the same result.

In this description, reference has been made to various examples using adjectives or
25 adjectival phrases to describe characteristics of the examples. Such a description of a characteristic in relation to an example indicates that the characteristic is present in some examples exactly as described and is present in other examples substantially as described.

30 The above description describes some examples of the present disclosure however those of ordinary skill in the art will be aware of possible alternative structures and method features which offer equivalent functionality to the specific examples of such structures and features described herein above and which for the sake of brevity and clarity have been omitted from the above description. Nonetheless, the above

description should be read as implicitly including reference to such alternative structures and method features which provide equivalent functionality unless such alternative structures or method features are explicitly excluded in the above description of the examples of the present disclosure.

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Whilst endeavoring in the foregoing specification to draw attention to those features believed to be of importance it should be understood that the Applicant may seek protection via the claims in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not emphasis has
10 been placed thereon.

I/we claim:

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CLAIMS

1. A construction block, for use in a temporary barrier, comprising:
an upper wall and an underside wall, wherein the upper wall comprises at least one
5 male portion and the underside wall comprises at least one female portion, or the upper
wall comprises at least one female portion and the underside wall comprises at least
one male portion;
a plurality of side walls, each side wall extending between the upper wall and the
underside wall, wherein the plurality of side walls, the upper wall and the underside
10 wall define a volume; and
at least one chamber located in the volume.
2. The construction block according to claim 1, wherein at least part of the at least
one chamber is substantially spherical.
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3. The construction block according to claim 2, wherein the at least one chamber
is substantially spherical.
4. The construction block according to any of the preceding claims, wherein the
20 at least one chamber comprises at least 5% of the volume of the construction block.
5. The construction block according to any of the preceding claims, wherein the
construction block comprises a length, a width and a height, the length being the same
or greater than the width and the same or greater than the height; and
25 the at least one chamber is located in the volume such that the centre of the at least
one chamber is located substantially at the centre of the width and/or the height of the
construction block.
6. The construction block according to any of the preceding claims, wherein the
30 at least one chamber is completely enclosed within the volume.
7. The construction block according to claims 1 to 5, wherein the at least one
chamber extends to an opening of at least one side wall of the plurality of side walls.

8. The construction block according to any of the preceding claims, wherein the at least one male portion is tapered.

5 9. The construction block according to claim 8, wherein the at least one male portion is tapered such that the male portion narrows in a direction away from the upper wall or underside wall.

10 10. The construction block according to any of the preceding claims, wherein the at least one male portion is substantially cuboidal in shape.

11. The construction block according to any of the preceding claims, wherein the at least one female portion is tapered.

15 12. The construction block according to claim 11, wherein the at least one female portion is tapered such that the female portion narrows in a direction away from the upper wall or underside wall.

20 13. The construction block according to any of the preceding claims, wherein the at least one female portion is substantially cuboidal in shape.

25 14. The construction block according to any of the preceding claims, wherein the plurality of side walls comprises a first side wall and a second side wall; and the construction block comprises at least one elongate channel that extends through the volume from the first side wall to the second side wall.

15. The construction block according to claim 14, wherein the at least one elongate channel extends through the volume without intersecting the at least one chamber.

30 16. The construction block according to claim 14 or 15, wherein the at least one elongate channel extends through the volume such that the at least one elongate channel is substantially equidistant from the at least one chamber and the upper wall or underside wall.

17. The construction block according to claims 14, 15 or 16, wherein the at least one elongate channel is substantially cylindrical.

18. The construction block according to claims 14 to 17, wherein the at least one elongate channel comprises an opening at the first side wall and the at least one elongate channel narrows from the opening.

19. The construction block according to any of the preceding claims, further comprising at least one elongate channel extending through the volume from the upper wall to the underside wall.

20. The construction block according to claim 19, wherein the at least one elongate channel, extending through the volume from the upper wall to the underside wall, is configured to receive at least one elongate support member.

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21. A construction block, for use in a temporary barrier, comprising:
an upper wall and an underside wall, wherein the upper wall comprises at least one male portion and the underside wall comprises at least one female portion, or the upper wall comprises at least one female portion and the underside wall comprises at least one male portion; and
first and second side walls, wherein the first and second side walls, the upper wall and the underside wall define a volume; and
at least one elongate channel extending through the volume from the first side wall to the second side wall.

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22. A system comprising:
the construction block according to any preceding claim; and
a further construction block comprising:

an upper wall and an underside wall, wherein the upper wall comprises at least one male portion and the underside wall comprises at least one female portion, or the upper wall comprises at least one female portion and the underside wall comprises at least one male portion;

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a plurality of side walls, each side wall extending between the upper wall and the underside wall, wherein the plurality of side walls, the upper wall and the underside wall define a volume; and
at least one chamber located in the volume.

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23. The system according to claim 22, wherein the at least one male portion of the construction block is configured to be received by the at least one female portion of the further construction block.

10

24. The system according to claim 22 or 23, wherein the at least one female portion of the construction block is configured to receive the at least one male portion of the further construction block.

25. A system comprising:

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the construction block according to claims 14 to 18; and
at least one elongate support member, wherein the at least one elongate channel is configured to receive at least part of the at least one elongate support member.

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Examiner: Mr Tom Simmonds

Claims searched: 1-25

Date of search: 9 May 2024

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-25	ES 2555633 A1 (UNION FAMILIAR CONSTR UFACON SL) See Figures noting interlocking blocks with pair of open-ended cavities 12 and elongate channel 13 for receiving elongate support members 2.
X	1-25	US 5536111 A (DOERNEMANN) See Figure 6 noting interlocking hollow plastic block with upper/lower walls 20/22 and side walls 12/14, the walls defining a volume comprising an opened ended chamber, the blocking including channels 24 extending through the block (walls and chamber).
X	1-25	US 9145249 B2 (ADAMS) See Figures noting interlocking fluid fillable blocks with internal cavity/chamber and channels passing through volume for receiving elongate support members.
X	1-25	US 4436447 A (CROWE) See Figures noting interlocking blocks with bores (channels) 12 extending through the block volume, anchoring wires 14 passing through bores.
X	1-25	US 6571525 B2 (COLEMAN) See Figures noting interlocking block system with channels extending through central volume, wherein rebars 68 can be passed through channels.
X	1-25	US 2007/0154265 A1 (STAUFFACHER et al.) See Figure noting interlocking block system with hollow internal chambers.
X	1-25	CN 211548339 U (YIWU YONGAN NOVEL WALL MAT CO LTD) See Figures noting interlocking block system with internal spherical cavities.
X	1-25	CN 111648493 A (ZHEJIANG DINGXING CONSTRUCTION CO LTD) See Figure noting interlocking blocks with horizontal and vertical channels extending through both ways.
X	1-25	WO 2014/125490 A2 (JARDIN NETHERLANDS BV) See Figures noting interlocking block with hollow internal chambers and tapered cuboid interlocking



		projections/recesses.
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Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

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Worldwide search of patent documents classified in the following areas of the IPC

E02B; E02D; E04B; E04C

The following online and other databases have been used in the preparation of this search report

SEARCH - PATENT

International Classification:

Subclass	Subgroup	Valid From
E04B	0002/18	01/01/2006
E02B	0003/10	01/01/2006
E02D	0029/02	01/01/2006
E04C	0001/39	01/01/2006