(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 655 758 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
04.03.2020 Bulletin 2020/10

(21) Application number: **11851695.4**

(22) Date of filing: **21.12.2011**

(51) Int Cl.:
E04C 1/00 *(2006.01)* ***E02D 29/02*** *(2006.01)*
E04C 1/39 *(2006.01)* ***E04B 2/02*** *(2006.01)*

(86) International application number:
PCT/CA2011/050796

(87) International publication number:
WO 2012/083457 (28.06.2012 Gazette 2012/26)

(54) CONCRETE WALL BLOCK

BETONWANDBLOCK

BLOC DE PAROI EN BÉTON

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **21.12.2010 US 201061425407 P**
04.11.2011 US 201161555947 P

(43) Date of publication of application:
30.10.2013 Bulletin 2013/44

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Description

Field of the Invention

[0001] The invention relates to concrete blocks, such as wet cast or dry cast concrete blocks for use in the creation of walls, including blocks having an embossed front face. More particularly, the invention relates to concrete blocks with natural stone appearance for use in the creation of curved walls, such as retaining walls.

Background Art

[0002] Concrete blocks are well known for the use in landscaping applications, particularly retaining walls. Various different block configurations or shapes are known. To allow the assembly of curved walls, concrete retaining wall blocks are usually provided with a rearwardly tapered body with sidewalls that are at an angle of less than 90 degrees to the front face of the block. Stacking such blocks side by side with the angled sidewalls of adjacent blocks engaging one another results in a convexly curved wall. Concave curvatures are obtained by stacking the blocks side by side with the front edges touching, while the tapered rear ends are spaced apart. This provides significant flexibility in the creation of curved walls the radius of curvature of the wall being limited solely by the angle of the sidewalls relative to the front face. However, tapered blocks and walls built with such blocks have several drawbacks.

[0003] Straight walls built with stacked blocks of tapered shape have a substantially continuous front face, but include a pattern of multiple gaps in the back face of the wall, due to the angled sidewalls. In fact, even curved walls with a curvature less than the maximum convex curvature allowed by the taper of the blocks will always include this pattern of gaps. Consequently, tapered blocks cannot be used to build freestanding walls, since the appearance of the rear wall will be very different from the front face and will not be aesthetically pleasing due to the pattern of gaps. A freestanding wall with natural appearance on both sides is not achievable with tapered blocks. Thus, a wall block system for building freestanding curved walls is desired, wherein all sides are continuous and have a natural stone appearance.

[0004] The retaining capacity of a retaining wall is determined in part by the mass of the wall. However, the gaps formed in the rear surface of walls made with tapered blocks significantly reduce the overall mass of the wall. Thus, a wall blocks system for freestanding curved walls is desired, which maximizes the mass of the wall and minimizes any gaps between laterally adjacent wall blocks.

[0005] Molding dry cast tapered blocks with converging side walls and an embossed front face is challenging due to the need for stripping the compressed block from the mold. Dry casting uses a no slope concrete mixture which is filled into a mold cavity and compressed to sufficiently pre-consolidate the block to permit handling of the block prior to curing of the concrete mixture. After pre-consolidation, the block is stripped from the mold and transported to a curing station for curing of the concrete mixture. Stripping of the block is achieved by pushing it out of the mold with a stripper shoe which has a dual function. The stripper shoe is used during pre-consolidation to compress the dry cast concrete mixture. After pre-consolidation, the stripper shoe is used for forcing the pre-consolidated block from the mold. To produce blocks with an embossed surface structure or pattern on the front face, the stripper shoe is provided on its dry cast mixture engaging face with a negative of the three-dimensional surface structure to be produced on the block face during pre-consolidation.

[0006] Stripping the pre-consolidated block by pushing it from the mold requires a clear path for the block through the mold, which mandates the use of movable mold walls in the manufacture of tapered, embossed blocks. To facilitate handling and stacking of pre-consolidated embossed blocks and especially to minimize damage to the embossed front face during curing, the embossed blocks are usually manufactured with the front and rear faces oriented up and down in the mold, respectively. That means the sidewalls of the mold must be movable from the angled position required for the shaping of the tapered shape of the block, in order to provide a clear path of the block through the mold. It is also possible to cast a block assembly consisting of a support block connectable with a face block as disclosed in US2007/0292216. Thus, embossed wall blocks for the assembly of curved walls are desired which are more easily manufactured.

[0007] It is now an object of the invention to overcome at least one of the disadvantages associated with known dry cast embossed wall blocks.

Summary of the Invention

[0008] The invention provides a stackable concrete wall block, having a prism shaped body with front and rear faces, in a stacked orientation, top and bottom faces for placement opposite like blocks positioned above and below in a stacked condition of the wall block and at least a pair of side walls for placement opposite a like block placed side by side to the wall block, and a lip protruding from at least one of the sidewalls and coplanar with the front face for spacing the body of the block from the body of a like block placed adjacent thereto. The lateral lip comprises multiple staggered steps, each step defined by two perpendicular walls respectively parallel to the side walls and the rear face of the block. Furthermore, the front face of the block and the lip have an embossed three-dimensional surface structure. The block is preferably a dry cast, embossed concrete block.

[0009] The lip is preferably provided on one or both of the side walls to create lateral spacing between concrete blocks stacked side by side in a wall, while providing the wall with a continuous front face. As is the case with ta-

pered blocks, this spacing allows the assembly of curved walls. However, a prism shaped block with straight side walls and a lip is more easily manufactured than a tapered block with angled side walls, since no movable mold walls are required, when the block is a dry cast block. The lip can be achieved by way of a draw plate which is placed in the mold for filling and compression of the dry cast mixture and is pulled from the mold cavity prior to stripping. The use of draw plates in the manufacture of dry cast concrete blocks is known, but is generally used for the production of three-dimensional structures and/or undercuts on the rear face of the block.

[0010] The lip preferably has a depth which is at the maximum 50% of the overall depth of the block as measured from the front face to the back face and preferably between 5% and 50%, most preferably between 25% and 50%.

[0011] In another preferred embodiment, the dry cast concrete block further includes a connecting structure for connection of a secondary structure, such as a setback pin, a like concrete block, a veneer block, or a filler block to the rear face of the concrete block. Filler blocks are used for covering any rearward gap created in an installed condition by the lip between the block and an adjacent like block. A back to back attachment of a pair of like blocks by way of the connecting structure allows for the assembly of a two sided wall. The connecting structure is preferably a dovetail type connection with one or more female connector members provided in a back surface of the wall block and a corresponding number of complementary male connector members provided on the secondary structure to be connected to the back surface.

[0012] In a further embodiment, the invention provides a set of dry cast concrete blocks including a wall block, a filler block and a connecting structure for connecting the wall and filler blocks in a back-to-back arrangement. The wall block preferably has a prism shaped body with front and rear faces, in a stacked orientation, top and bottom faces for placement opposite like blocks positioned above and below in a stacked condition of the wall block and at least a pair of side walls for placement opposite a like block placed side by side to the wall block, and a lip protruding from at least one of the sidewalls and coplanar with the front face for spacing the body of the block from the body of a like block placed adjacent thereto. Preferably, the front face of the block and the lip have a three-dimensional surface structure, and the filler block has a prism shaped body with generally front, rear, top and bottom faces and generally parallel side walls.

[0013] In a preferred embodiment of the set of concrete blocks, the wall block has an overall width X, n protruding lips, with n=1 or 2 and each lip having a protruding width Y, the wall and filler blocks have the same depth and the overall width of the filler block is between X and X-2nY. The wall and filler blocks may have a different height.

[0014] In another preferred embodiment of the set of concrete blocks, the wall block has an overall width X, n protruding lips, with n=1 or 2 and each lip has a protruding width Y and a depth B. The wall block has a depth A and the filler block has a depth C and the overall width of the filler block is between X and X-n(Y+YC/A-B). The wall and filler blocks may have a different height.

[0015] The connecting structure is preferably in the form of a dovetail type connection with one or more male connector members provided on one of the wall and filler blocks and a corresponding number of female connector members provided on the other of the wall and filler block. Alternatively, the connecting structure may be a separate connector insertable into complementary recesses in the wall and filler blocks. However, any other connecting structure can be used, which is incorporated into or separate from one or both of the wall and filler blocks, as long as the connecting structure renders the wall and filler blocks connectable in a back-to-back orientation.

Brief Description of the Drawings

[0016] The invention will now be further described by way of exemplary embodiments and with reference to the attached drawings, wherein,

Fig. 1 is a perspective view of a pair of wall blocks spaced apart by the lip portion (not covered by the present claims);

Fig. 2 is a perspective view of a pair of wall blocks as shown in Fig. 1, but positioned to touch at the lip and at the rear edge, to form an angled arrangement;

Fig. 3 is a perspective view of a wall block and a filler block in separation and when engaged (not covered by the present claims);

Fig. 4 is a perspective view of a wall and filler block combination as shown in Fig. 3, with the filler block having the same length as the wall block;

Fig. 5 is a schematic illustration of a curved wall assembled with the set of wall and filler blocks of Fig. 3;

Fig. 6 is a schematic illustration of a curved wall assembled with a the set of wall and filler blocks similar in construction as the set of Fig. 3, but with the blocks being longer;

Fig. 7 is a schematic illustration of a curved wall assembled with the different sets of wall and filler blocks of Figs. 5 and 6 (not covered by the present claims);

Fig. 8 is a schematic illustration of a straight wall assembled with the set of wall and filler blocks of Fig. 4;

Figs. 9a to 9c are perspective, front elevation and top plan views of a mold frame arrangement for the dry casting of a set of short and long wall and filler blocks (not covered by the present claims);

Figs. 10a to 10d are perspective, bottom plan, front plan and end elevation views of a wall block with a stepped lip;

Fig. 11 is a schematic illustration of a curved wall assembled with the wall blocks of Figs. 10a to 10d;

Figs. 12a and 12b are a front and top perspective

view and a front plan view of a partial wall including seven (7) stacked blocks in accordance with one aspect of the invention; and

Fig. 13 is a top plan view of the first row of blocks of the partial wall shown in Figs. 12a and 12b.

Detailed Description

[0017] The present application is directed to a wall block for use in retaining walls or freestanding walls, preferably a cast concrete block, more preferably a dry cast, embossed concrete block.

[0018] In an embodiment not covered by the present scope of the claims as illustrated in Figs. 1 and 2, the wall block 100 includes, a prism shaped body 110 with a front face 112, a rear face 114, top and bottom faces 116 and 118 and generally parallel side walls 119. The wall block 100 further includes a protruding lip 120 on at least one of the side walls 119, which lip 120 protrudes from the side wall 119 and is coplanar with the front face 112. The lip 120 can be provided on either one or both of the side walls 119. The spacing created by the lips 120 allows the assembly of straight walls as shown in Fig. 1 or curved walls as shown in Fig. 2, by arranging the wall blocks in such a way that terminal edges of the block at the lip 120 and the rear face 114 touch the respective edges of an adjacent wall block. The protruding length of the lips 120 determines the radius of curvature which can be achieved by placement of the wall blocks 100 side by side in wall with the lips 120 and the bodies 110 of adjacent blocks touching (see Figs. 5-7). The larger the protruding width of the lips, the smaller the minimum radius achievable. Moreover, the shorter the length of the wall block 100, the smaller the minimum radius achievable.

[0019] In the installed condition of the wall block 100, wherein the wall block 100 is stacked with like wall blocks 100 into a wall, the lip 120 provides for spacing between the bodies 110 of adjacent wall blocks 100 placed side by side, while providing the resulting wall with a continuous front surface, as shown in Fig. 1. The front face 112 of the block, which extends over the lip 120, preferably has an embossed three-dimensional surface structure. Preferably the front face 112 is embossed with a surface structure, which provides the wall block 100 and any wall assembled with such wall blocks with the appearance of natural stone. This feature will be described in more detail further below with reference to Figs. 10-13.

[0020] The lip 120 can be provided on either one or both of the side walls 119, preferably both, to create bilateral spacing between the bodies 110 of wall blocks 100 stacked side by side in a straight wall (see Fig. 1), while providing the wall with a continuous front surface. As is the case with tapered blocks, this spacing allows the assembly of curved walls, by arranging the wall blocks in such a way that terminal edges of the front and rear faces 112, 114 of adjacent wall blocks 100 are in engagement (see Fig. 2).

[0021] A wall block 100 with a prism shaped body 110 with parallel side walls 119 is more easily manufactured by dry casting than known, tapered blocks, since no movable mold walls are required.

[0022] In another embodiment not covered by the present claims as illustrated in the Figures, the dry cast wall block 100 further includes a connecting structure 300 for connection of a secondary structure to the rear face 114 of the wall block 100. The secondary structure can be a setback pin, a like block, a different block, or a veneer. The different block is preferably a filler block 200 as shown in Figs. 3 and 4 for covering any rearward gap created in an installed condition by the lip between the block and an adjacent like block. The connecting structure 300 includes at least one pair of interconnecting protruding and recessed elements, most preferably in the shape of a dovetail arrangement (see Figs. 3-8), one of the elements being incorporated into the rear face 114 of the wall block 100 and the other one into the secondary structure. The connecting structure preferably includes multiple alternating protruding and recessed elements 310, 320 in the shape of a repeated dovetail arrangement as shown in Figs. 3 and 4. The filler block 200 is provided for covering any rearward gap created by the lip 120 between the wall block 100 and an adjacent like block 100 in the installed condition. When the wall blocks are installed in a curved configuration, the length of the filler block must be less than the length of the wall block (see Figs. 3 and 5-7), while in a straight configuration the filler block must have the same length as the wall block (see Figs. 4 and 8).

[0023] An embodiment of a filler block 200 not covered by the present claims is illustrated at different lengths in Figs. 3 and 4. The filler block 200 includes a prism shaped body 210 with a front face 212, a rear face 214, top and bottom faces 216 and 218 and generally parallel side walls 219. The filler block 200 further includes a connecting structure 330 which interlocks with the connecting structure 300 on the wall block 100 for connection of the filler block to the rear face 114 of the wall block 100. The connecting structures 300 and 330 are preferably of complementary shape in order to provide for an interlocking of the wall and filler blocks 100, 200.

[0024] In a further embodiment as illustrated in the bottom portion of Figs. 3 and 4, there is provided a set of dry cast concrete blocks including a wall block 100 and a filler block 200. The wall block 100 has a prism shaped body 110 with an embossed front face 112 and generally planar rear, top and bottom faces 114, 116, 118 and generally parallel side walls 119, and a protruding lip 120 extending from at least one of the sidewalls and coplanar with the front face 112 for spacing the body 110 of the wall block 100 from the body of a like block placed adjacent thereto, while providing a continuous front surface. The front face 112 of the wall block 100 and the lip 120 have a three-dimensional surface structure embossed into the front surface by the stripper shoe in the dry cast molding process. The three dimensional structure pref-

erably provides the wall block with a front face 112 having the appearance of natural stone. The filler block 200 has a body 210 shaped as a rectangular prism and having a front face 212, a rear face 214, top and bottom faces 216, 218 and generally parallel side walls 219. The filler block 200 preferably has a three-dimensional surface structure embossed into the front surface 212 by the stripper shoe in the dry cast molding process. The three dimensional structure preferably provides the filler block 200 with a front face 212 having the appearance of natural stone. The wall block 100 further includes a connecting structure 300 and the filler block 200 of the set of blocks includes a connecting structure 330 for connecting the wall and filler blocks in a back-to-back arrangement.

[0025] A pair of interconnected wall and filler blocks 100, 200 is illustrated in each of Figs. 3 and 4. In each pair, the interconnecting structure 300 and 330 is a series of dovetail shaped protrusions 310, 340 alternating with dovetail shaped recesses 320, 350 in the respective rear faces 114 and 214 of the wall and filler blocks 100, 200. The dovetail shaped connectors on the respective rear faces are offset so that a protrusion 310 in the rear face 114 of the wall block 100 engages a recess 350 in the rear face 214 of the filler block 200 and a connector 340 in the rear face 214 of the filler block 200 engages a recess 320 in the rear face 114 in the wall block 100.

[0026] The protruding length Y of the lips 120 determines the radius of curvature which can be achieved by placement of the wall blocks 100 side by side in a wall with the lips 120 and the bodies 110 of adjacent blocks 100 being in engagement. The larger the protruding width Y, the smaller the minimum radius achievable. An angle a is enclosed by the side wall 119 of the wall block 100 and an imaginary line 400 connecting the free end 121 of the protruding lip 120 with the terminal edge 115 of the rear wall 114. This angle is the minimum angle at which adjacent wall blocks can be placed without forming a gap between the blocks at the front face 112. Of course, wall blocks 100 can also be placed side by side in straight alignment to form a straight wall, in which case the protruding lips 120 are in engagement, but the blocks do not touch at the rear face 114, resulting in a space between adjacent wall blocks 100 at the rear face 114. In order to provide the straight wall with continuous front and rear surfaces, filler blocks 200 are used which have the same overall width X as the wall blocks 100, as shown in Figs. 4 and 8. To achieve a curved wall, the wall blocks 100 are placed side by side with the lips 120 in engagement, while the lateral edges 115 of the rear faces 114 are placed closer to one another as in the straight orientation. In a curved wall of minimum radius, the lateral edges 115 of the rear faces 114 of adjacent blocks 100 are in engagement and the blocks are placed at the angle a relative to one another. In order to provide the wall with a continuous rear surface, the width of the filler blocks 200 must then be adapted to fit within the imaginary lines 400 defined on each side of the associated wall block 100 by the angle a, as illustrated in Fig. 4. As will be apparent, the overall width of the filler block 200 then not only depends on the angle a, but also on the depth C of the filler block 200, since the larger the depth, the shorter the overall length required for the block fitting between the imaginary lines 400. The length of the filler block 200 is then determined by the overall width X of the wall block 100, the protruding width Y of the lips 120, the depth B of the lips 120, the depth A of the wall block 100 and the depth C of the filler block 200. Since the angle a is enclosed between the imaginary line 400 and the side wall is the same for both the wall block 100 and the filler block 200, the minimum length D of the filler block 200, which is required for the filler blocks to form a continuous back wall at the smallest radius achievable, can be calculated according to the formula $D = X-n(Y+YC/A-B)$, wherein n is 1 or 2 and defines the number of lips 120 included in the wall block 100, X is the length of the wall block 100, A is the depth of the wall block 100, B is the depth of the lip 120, C is the depth of the filler block 200, Y is the length of the lip 120 and D is the length of the filler block 200. Thus, the length D of the filler block can vary between X (for straight walls) and $X-n(Y+YC/A-B)$ (for a curved wall of minimum radius, as shown in Fig. 5).

[0027] Casting of the lip 120 can be achieved by way of a draw plate 140 (see schematically in Fig. 9b), which is placed in the mold for the wall block. The draw plate is left in the mold for the filling of the mold and compression of the dry cast mixture in the mold and is pulled from the mold cavity prior to stripping of the block. The use of draw plates in the manufacture of dry cast concrete blocks is known.

[0028] The lip 120 preferably has a depth B, measured in a direction parallel to the associated side wall 119, which is a maximum of 50%, preferably between 50% and 5%, most preferably between 50% and 25% of the overall depth A of the wall block 100 as measured from the front face 112 to the back face 114 (see Fig. 3). The larger the depth of the lip 120, the wider a gap 117 between the front faces 112 of adjacent stacked blocks 100 in a curved wall. Thus, in order to minimize the gap 117, it would be preferable to minimize the depth of the lip 120. Yet, the smaller the depth of the lip 120, the harder it is to manufacture the block 100 by dry casting, since the lip 120 may brake or sag during or after demolding and prior to complete setting of the block. Moreover, the minimum radius achievable with stacked blocks 100 including the lip 120 is determined by the protruding length Y, or overhang, of the lip 120, which is the distance the lip 120 protrudes laterally outward from the sidewall 119 of the block 100. The larger the overhang created by the lip 120, the smaller the minimum radius achievable. However, the larger the overhang, the higher the risk of the lip 120 braking or sagging during or after demolding. Consequently, the range of radius achievable by adding a single lip 120 on each side of the block 100 is limited.

[0029] In order to address these limitations to the depth and protruding length of the lip, the invention also provides variant of the block 100 in which a larger total pro-

truding length Y or overhang is achieved by providing a stepped lip 120 including two or more steps 120a, 120b, as illustrated in Figs. 10a to 10d. By dividing the total protruding length or overhang of the lip 120 into multiple, staggered steps 120a, 120b, the chance of the lip braking or sagging during or after demolding is much reduced. Each step 120a, 120b is defined by perpendicular walls respectively parallel to the sidewall 119 and the rear face 114 of the block 100. The protruding length of each step is preferably the same and equal to the total protruding length of the lip divided by the number of steps. The outermost step is coplanar with the front face. Any additional step is located further back towards the rear face 114 and provides a setback or undercut, so that the overall width of the block becomes progressively more narrow with each additional step. By providing the lip with multiple steps, the danger of braking or sagging of the lip during or after demolding is significantly reduced, since the tendency of the lip to brake or sag then becomes directly dependent on the protruding length of the largest step, rather than the overall protruding length of the lip. Since the potential of the lip braking or sagging during or after demolding also directly depends on the depth of the lip, the depth of the outermost step adjacent the front face 112 is preferably larger than the depth of any subsequent step. Moreover, the protruding length of the outermost step is preferably smaller than the protruding length of any subsequent step. When two steps are provided, the protruding length of the outermost step is preferably less than half the protruding length of the subsequent step.

[0030] As illustrated in Figure 10a, the block 100 in one embodiment includes an irregularly shaped front portion 190 and a regularly shaped rear portion 195, the front portion including the embossed front face 112 with an irregularly shaped contour 112a with lateral edges 113. The block of Figure 10a further includes an interconnecting structure 300 for the connection of a secondary structure (not shown), such as a setback pin, a like concrete block, a veneer block, or a filler block, to the rear face 114 of the concrete block. The connecting structure is preferably a dovetail type connection with one or more female connector members 350 provided in a back surface of the wall block and a corresponding number of complementary male connector members provided on the secondary structure to be connected to the back surface 114. Filler blocks when attached by way of the interconnecting structure 300 can be used for covering any rearward gap created in an installed condition by the lips 120a, 120b between the block and an adjacent like block. A back to back attachment of a pair of like blocks by way of the interconnecting structure 300 also allows for the assembly of a two sided free standing wall.

[0031] In one embodiment of the set of concrete blocks for the assembly of curved walls of minimum radius of curvature, the wall block 100, including the protruding lips 120, has an overall width X, protruding lips 120, with n=1 or 2, each lip has a protruding width Y, the wall and filler blocks 100, 200 have the same depth and the overall width of the filler block is between X and X-2nY. The wall and filler blocks may have a different height.

[0032] In another embodiment of the set of concrete blocks, the wall block 100 has an overall width X, including the protruding lips 120, n protruding lips 120, with n=1 or 2 and each lip having a protruding width Y and a depth B, the wall block 100 has a depth A, the filler block 200 has a depth C and the overall width of the filler block 200 is between X and X-n(Y+YC/A-B). The wall and filler blocks may have the same or different heights.

[0033] The connecting structure is preferably in the form of a dovetail type connection with one or more male connector members provided on one of the wall and filler blocks and a corresponding number of female connector members provided on the other of the wall and filler blocks. Alternatively, the connecting structure may be a separate connector insertable into complementary recesses in the wall and filler blocks. However, any other connecting structure can be used, which is incorporated into or separate from one or both of the wall and filler blocks, as long as the connecting structure renders the wall and filler blocks connectable in a back-to-back orientation.

[0034] In another embodiment of the block 100, illustrated in Figures 12 to 13 as block 100a, the block 100 is provided with an embossed front face 112, which includes at least one false joint 180, which may extend at an angle to the top and bottom faces 116, 118. This provides the block with the appearance of a natural stone. In the particular embodiment illustrated, the false joint extends at an angle of about 45 degrees to the top and bottom faces, but other orientations of the false joint at any angle from 0 to 45 degrees are possible. Of course, the front face can include multiple false joints respectively oriented at different angles to the top and bottom faces.

[0035] As illustrated in Figures 12 to 13, the block 100 or 100a can also be provided with irregularly shaped front faces 112 where at least one lateral edge 113 of the front face extends at an angle of up to 45 degrees to the side wall 119. Thus, in this embodiment of the block, the lateral edges 113 of the front face are oriented at an angle of 0 to 45 degrees to the sidewall in order to give the block the appearance of a natural stone. One or both of the sidewalls 119 can also be oriented at an angle other than perpendicular to the top and bottom faces 116, 118, for example at an angle of 70 to 110 degrees to the top or bottom face. However, it is preferred that the angled sides of the block be limited to only a front portion 190 of the block, with a rear portion 195 of the block having parallel sidewalls 119 perpendicular to the top and bottom faces 116, 118, for maximum stability of a wall of stacked like blocks.

[0036] As shown in Fig. 11, the blocks 100 with multiple steps 120a, 120b can also be used to build curved wall, whereby the radius of the curvature achievable is determined by the combined protruding length of all the lips 120a, 120b at each end of the block.

Claims

1. A stackable concrete wall block (100), comprising
a prism shaped body (110) having front and rear faces (112, 114), in a stacked orientation, top and bottom faces (116, 118) for placement opposite like blocks located above or below in a stacked condition of the wall block and at least a pair of side walls (119) for placement opposite a like block placed side by side to the wall block, and
a lateral lip (120) protruding from at least one of the side walls (119) and coplanar with the front face for spacing the body of the wall block from the body of the like block placed side by side thereto, the front face of the block and the lip having an embossed three-dimensional surface structure,
characterized in that the lateral lip comprises multiple staggered steps (120a, 120b), each step defined by two perpendicular walls respectively parallel to the side walls (119) and the rear face (114) of the block (100).

2. The wall block of claim 1, wherein the lip (120) is provided on both of the side walls to create lateral spacing between the bodies of concrete blocks (100) stacked side by side in a straight wall, while providing the wall with a continuous front face.

3. The wall block (100) of claim 1, wherein the lip (120) has a depth, which is at the maximum 50% of the overall depth of the wall block (100) as measured from the front face to the back face.

4. The wall block (100) of claim 3, wherein the lip (120) has a depth between 25% and 50% of the overall depth.

5. The wall block (100) of claim 1, wherein the protruding length of an outermost step furthest from the side wall (119) is larger than the protruding length of any subsequent step.

6. The wall block (100) of claim 5, wherein the protruding length of the outermost step is less than half the protruding length of the subsequent step.

7. The wall block (100) of claim 1, further including a connecting structure for connecting a secondary structure to the rear face (114) of the wall block (100).

8. The wall block (100) of claim 7, wherein the secondary structure is a setback pin, a like block, a different block, or a veneer.

9. The wall block (100) of claim 8, wherein the different block is a filler block (200) for covering any rearward gap created in an installed condition by the lip (120) between the block and an adjacent like block.

10. A set of wall blocks, comprising
a wall block (100) according to any one of the claims 1 to 6;
a filler block (200); and
a connecting structure (300, 320, 350) for connecting the wall and filler blocks (100, 200) in a back-to-back arrangement;
the filler block (200) having a right angular prism shaped body with front, rear, top and bottom faces and generally parallel side walls.

11. The set of wall blocks of claim 10, wherein the wall block (100) has an overall width X, n protruding lips (120), with n=1 or 2 and each lip (120) having a protruding width Y, the wall block (100) has a
depth A, the lip (120) has a depth B, the filler block (200) has a depth C and an overall width of the filler (200)
block is between X and X-n(Y+YC/(A-B)).

12. The set of wall blocks of claim 11, wherein the overall width of the filler block (200) is X-n(Y+YC/(A-B)).

13. The set of wall blocks of claim 10, wherein the front face includes a top edge and a bottom edge respectively oriented towards like blocks stackable above or below the wall block (100) and lateral edges oriented towards like blocks stackable side by side with the wall block (100), at least one of the lateral edges being oriented at an angle of 45 to 90 degrees to the top or bottom edge.

14. The set of wall blocks of claim 13, wherein the body includes a top portion adjacent the front face and a bottom portion adjacent the back face, the front face has an irregularly shaped contour, the top portion having the irregularly shaped contour of the front face and the bottom portion having a polygonal cross section.

Patentansprüche

1. Stapelbarer Betonwandblock (100), umfassend:

ein prismenförmiges Gehäuse (110) mit vorderen und hinteren Flächen (112, 114), in einer gestapelten Ausrichtung, wobei sich obere und untere Flächen (116, 118) zur Platzierung gegenüber ähnlichen Blocks in einem gestapelten Zustand des Wandblocks darüber oder darunter befinden, und mindestens ein Paar von Seitenwänden (119) zum Platzieren gegenüber einem ähnlichen Block, platziert Seite an Seite mit dem Wandblock, und
eine seitliche Lippe (120), die von mindestens einer der Seitenwände (119) vorsteht und koplanar mit der vorderen Fläche zum Beabstan-

den des Körpers des Wandblocks von dem Körper des ähnlichen Blocks ist, der Seite an Seite dazu platziert ist, wobei in die vordere Fläche des Blocks und die Lippe eine dreidimensionale Oberflächenstruktur eingeprägt ist,
dadurch gekennzeichnet, dass die seitliche Lippe mehrere versetzte Stufen (120a, 120b) umfasst, wobei jede Stufe durch zwei senkrechte Wände definiert ist, die jeweils parallel zu den Seitenwänden (119) und der hinteren Fläche (114) des Blocks (100) sind.

2. Wandblock nach Anspruch 1, wobei die Lippe (120) an beiden der Seitenwände vorgesehen ist, um eine seitliche Beabstandung zwischen den Gehäusen der Seite an Seite in einer geraden Wand gestapelten Betonblöcke (100) zu schaffen, während die Wand mit einer kontinuierlichen Frontfläche bereitgestellt wird.

3. Wandblock (100) nach Anspruch 1, wobei die Lippe (120) eine Tiefe aufweist, die maximal 50 % der Gesamttiefe des Wandblocks (100) beträgt, gemessen von der vorderen Fläche zur hinteren Fläche.

4. Wandblock (100) nach Anspruch 3, wobei die Lippe (120) eine Tiefe zwischen 25 % und 50 % der Gesamttiefe aufweist.

5. Wandblock (100) nach Anspruch 1, wobei die vorstehende Länge einer von der Seitenwand (119) am weitesten entfernten äußersten Stufe größer als die vorstehende Länge jeder nachfolgenden Stufe ist.

6. Wandblock (100) nach Anspruch 5, wobei die vorstehende Länge der äußersten Stufe kleiner als die Hälfte der vorstehenden Länge der nachfolgenden Stufe ist.

7. Wandblock (100) nach Anspruch 1, ferner beinhaltend eine Verbindungsstruktur zum Verbinden einer sekundären Struktur mit der hinteren Fläche (114) des Wandblocks (100) .

8. Wandblock (100) nach Anspruch 7, wobei die sekundäre Struktur ein zurückgesetzter Stift, ein ähnlicher Block, ein anderer Block oder eine Verblendung ist.

9. Wandblock (100) nach Anspruch 8, wobei der andere Block ein Füllblock (200) zum Verdecken einer hinteren Lücke ist, die in einem installierten Zustand von der Lippe (120) zwischen dem Block und einem angrenzenden ähnlichen Block geschaffen wurde.

10. Satz von Wandblöcken, umfassend
einen Wandblock (100) nach einem der Ansprüche 1 bis 6;
einen Füllblock (200); und
eine Verbindungsstruktur (300, 320, 350) zum Verbinden der Wand- und Füllblöcke (100, 200) in einer Anordnung Rücken an Rücken;
wobei der Füllblock (200) ein rechtwinkliges, prismenförmiges Gehäuse mit einer vorderen, hinteren, oberen und unteren Fläche und allgemein parallelen Seitenwänden aufweist.

11. Satz von Wandblöcken nach Anspruch 10, wobei der Wandblock (100) eine Gesamtbreite X und n vorstehende Lippen (120) aufweist, wobei n = 1 oder 2 und jede Lippe (120) eine vorstehende Breite Y aufweist, wobei der Wandblock (100) eine Tiefe A aufweist, die Lippe (120) eine Tiefe B aufweist, der Füllblock (200) eine Tiefe C aufweist und eine Gesamtbreite des Füllblocks (200) zwischen X und X - n (Y + YC / (A - B)) ist.

12. Satz von Wandblöcken nach Anspruch 11, wobei die Gesamtbreite des Füllblocks (200) X - n (Y + YC / (A - B)) ist.

13. Satz von Wandblöcken nach Anspruch 10, wobei die vordere Fläche eine obere Kante und eine untere Kante beinhaltet, die jeweils in Richtung ähnlicher Blöcke ausgerichtet sind, die über oder unter dem Wandblock (100) gestapelt sind, und seitliche Kanten, die in Richtung ähnlicher Blöcke ausgerichtet sind, die Seite an Seite mit dem Wandblock (100) stapelbar sind, wobei mindestens eine der seitlichen Kanten in einem Winkel von 45 bis 90 Grad zur oberen oder unteren Kante ausgerichtet ist.

14. Satz von Wandblöcken nach Anspruch 13, wobei das Gehäuse einen oberen Abschnitt beinhaltet, der an die vordere Fläche angrenzt, und einen unteren Abschnitt, der an die hintere Fläche angrenzt, wobei die vordere Fläche eine unregelmäßig geformte Kontur aufweist, der obere Abschnitt die unregelmäßig geformte Kontur der vorderen Fläche aufweist und der untere Abschnitt einen mehreckigen Querschnitt aufweist.

Revendications

1. Bloc de paroi (100) en béton pouvant être empilé, comprenant
un corps en forme de prisme (110) ayant des faces avant et arrière (112, 114), dans une orientation empilée, des faces supérieure et inférieure (116, 118) pour un placement à l'opposé de blocs similaires placés au-dessus ou en dessous dans un état empilé du bloc de paroi et au moins une paire de parois latérales (119) pour un placement à l'opposé d'un bloc similaire placé côte à côte du bloc de paroi, et une lèvre latérale (120) faisant saillie d'au moins une

des parois latérales (119) et étant coplanaire avec la face avant pour espacer le corps du bloc de paroi du corps du bloc similaire placé côte à côte avec celui-ci, la face avant du bloc et la lèvre ayant une structure de surface tridimensionnelle gaufrée, **caractérisé en ce que** la lèvre latérale comprend de multiples crans échelonnés (120a, 120b), chaque cran étant défini par deux parois perpendiculaires respectivement parallèles aux parois latérales (119) et à la face arrière (114) du bloc (100).

2. Bloc de paroi selon la revendication 1, la lèvre (120) étant disposée sur les deux parois latérales pour créer un espacement latéral entre les corps de blocs de béton (100) empilés côte à côte dans une paroi droite, tout en dotant la paroi d'une face avant continue.

3. Bloc de paroi (100) selon la revendication 1, la lèvre (120) ayant une profondeur qui est au maximum égale à 50 % de la profondeur totale du bloc de paroi (100) telle que mesurée de la face avant à la face arrière.

4. Bloc de paroi (100) selon la revendication 3, la lèvre (120) ayant une profondeur comprise entre 25 % et 50 % de la profondeur totale.

5. Bloc de paroi (100) selon la revendication 1, la longueur en saillie d'un cran le plus extérieur le plus éloigné de la paroi latérale (119) étant supérieure à la longueur en saillie de tout cran suivant.

6. Bloc de paroi (100) selon la revendication 5, la longueur en saillie du cran le plus extérieur étant inférieure à la moitié de la longueur en saillie du cran suivant.

7. Bloc de paroi (100) selon la revendication 1, comprenant en outre une structure de liaison pour relier une structure secondaire à la face arrière (114) du bloc de paroi (100).

8. Bloc de paroi (100) selon la revendication 7, la structure secondaire étant une broche de retrait, un bloc similaire, un bloc différent ou un placage.

9. Bloc de paroi (100) selon la revendication 8, le bloc différent étant un bloc de remplissage (200) pour couvrir tout espace vers l'arrière créé dans un état installé par la lèvre (120) entre le bloc et un bloc similaire adjacent.

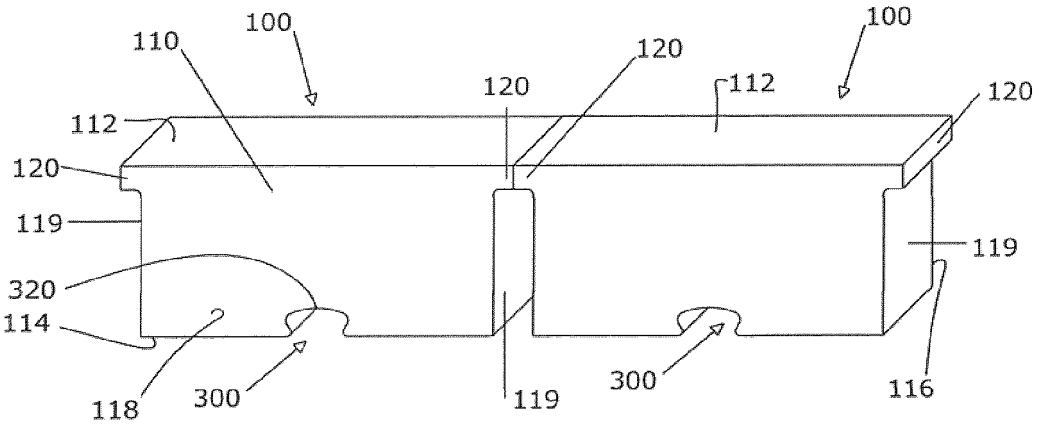
10. Ensemble de blocs de paroi, comprenant
un bloc de paroi (100) selon l'une quelconque des revendications 1 à 6 ;
un bloc de remplissage (200) ; et
une structure de liaison (300, 320, 350) pour relier les blocs de paroi et de remplissage (100, 200) dans une disposition dos à dos ;
le bloc de remplissage (200) ayant un corps en forme de prisme à angle droit avec des faces avant, arrière, supérieure et inférieure et des parois latérales généralement parallèles.

11. Ensemble de blocs de paroi selon la revendication 10, le bloc de paroi (100) ayant une largeur totale X, n lèvres en saillie (120), n=1 ou 2 et chaque lèvre (120) ayant une largeur en saillie Y, le bloc de paroi (100) ayant une profondeur A, la lèvre (120) ayant une profondeur B, le bloc de remplissage (200) ayant une profondeur C et une largeur totale du bloc de remplissage (200) étant comprise entre X et X-n(Y+YC/(A-B)).

12. Ensemble de blocs de paroi selon la revendication 11, la largeur totale du bloc de remplissage (200) étant X-n(Y+YC/(A-B)).

13. Ensemble de blocs de paroi selon la revendication 10, la face avant comprenant un bord supérieur et un bord inférieur respectivement orientés vers des blocs identiques pouvant être empilés au-dessus ou en dessous du bloc de paroi (100) et des bords latéraux orientés vers des blocs identiques pouvant être empilés côte à côte avec le bloc de paroi (100), au moins un des bords latéraux étant orienté à un angle de 45 à 90 degrés par rapport au bord supérieur ou inférieur.

14. Ensemble de blocs de paroi selon la revendication 13, le corps comprenant une partie supérieure adjacente à la face avant et une partie inférieure adjacente à la face arrière, la face avant ayant un contour de forme irrégulière, la partie supérieure ayant le contour de forme irrégulière de la face avant et la partie inférieure ayant une section transversale polygonale.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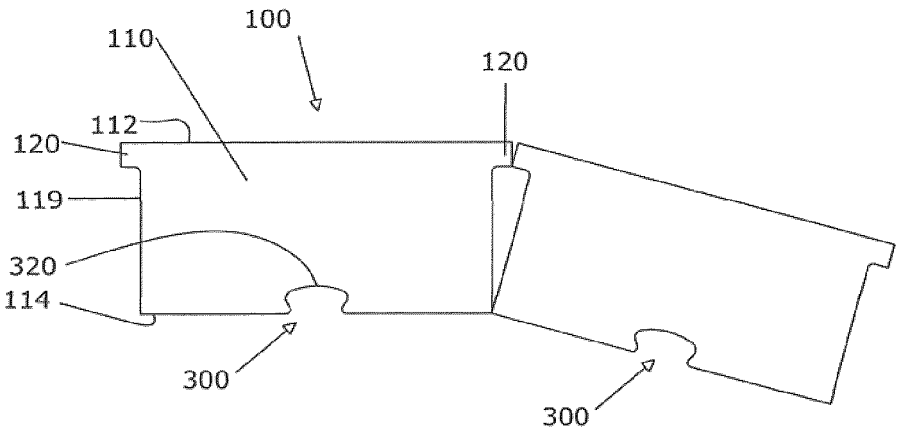
119
300
116

FIG 1


100
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112
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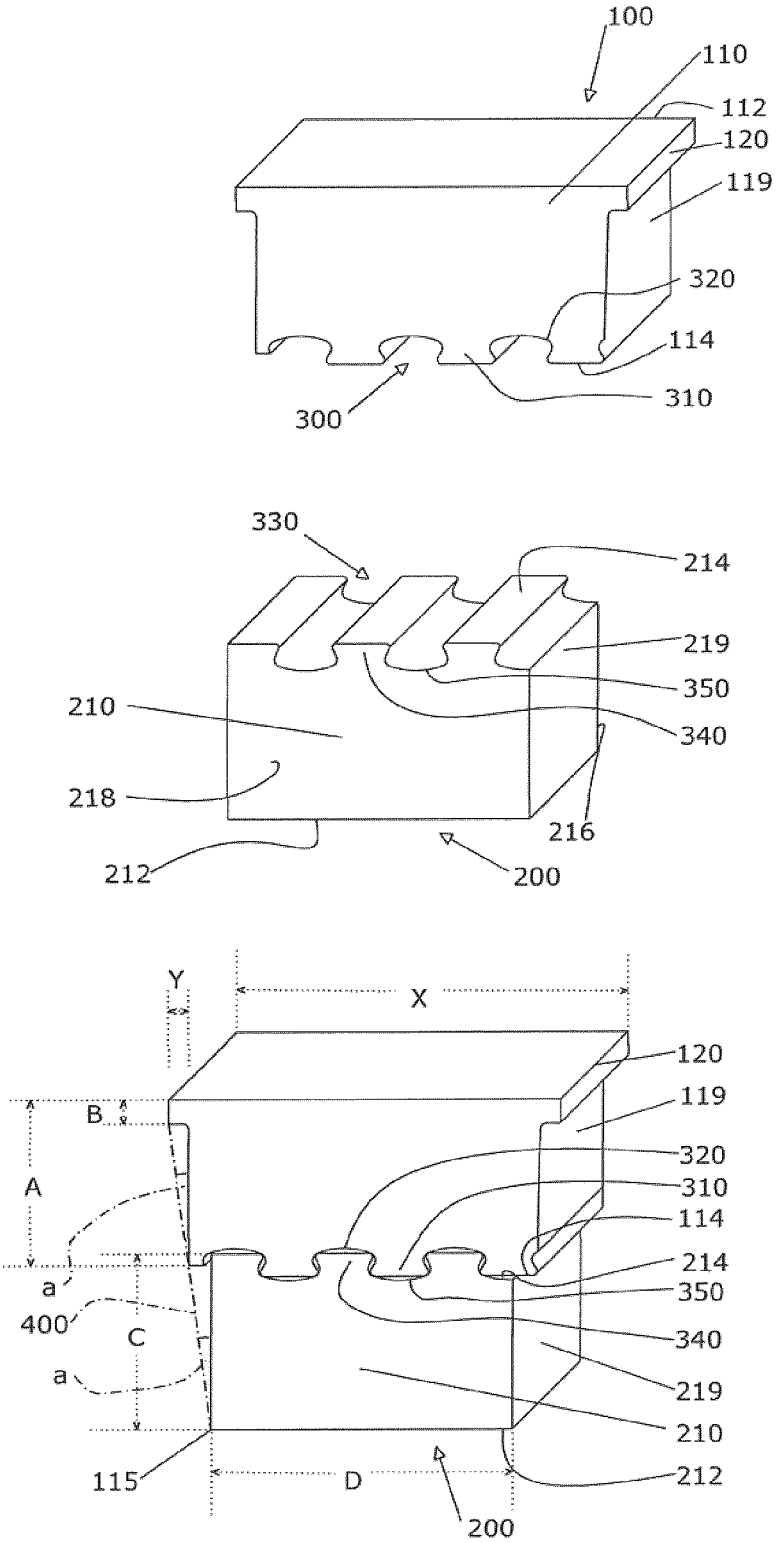
119
320
114
300
300

FIG 2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212
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X
120
119
B
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350
400
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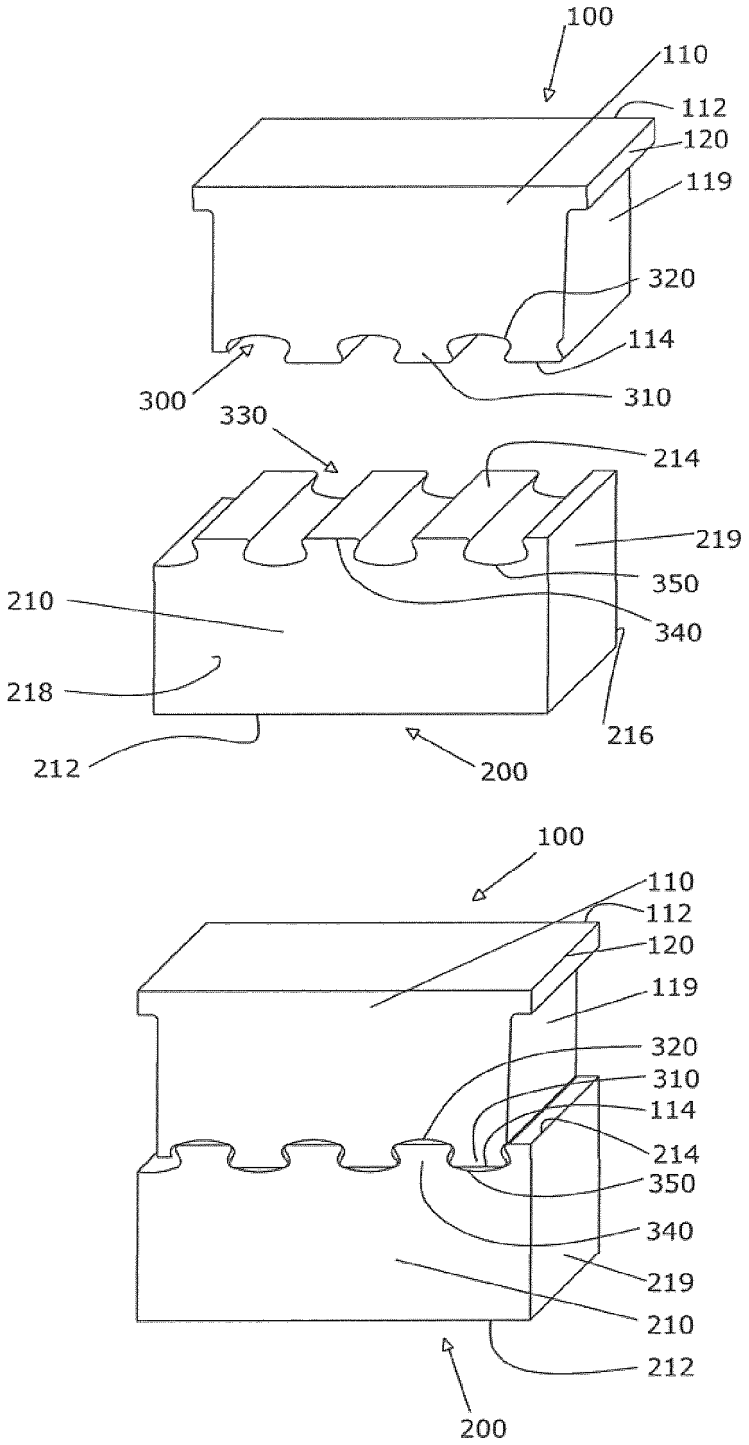
C
219
a
210
115
D
212
200

FIG 3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200

FIG 4

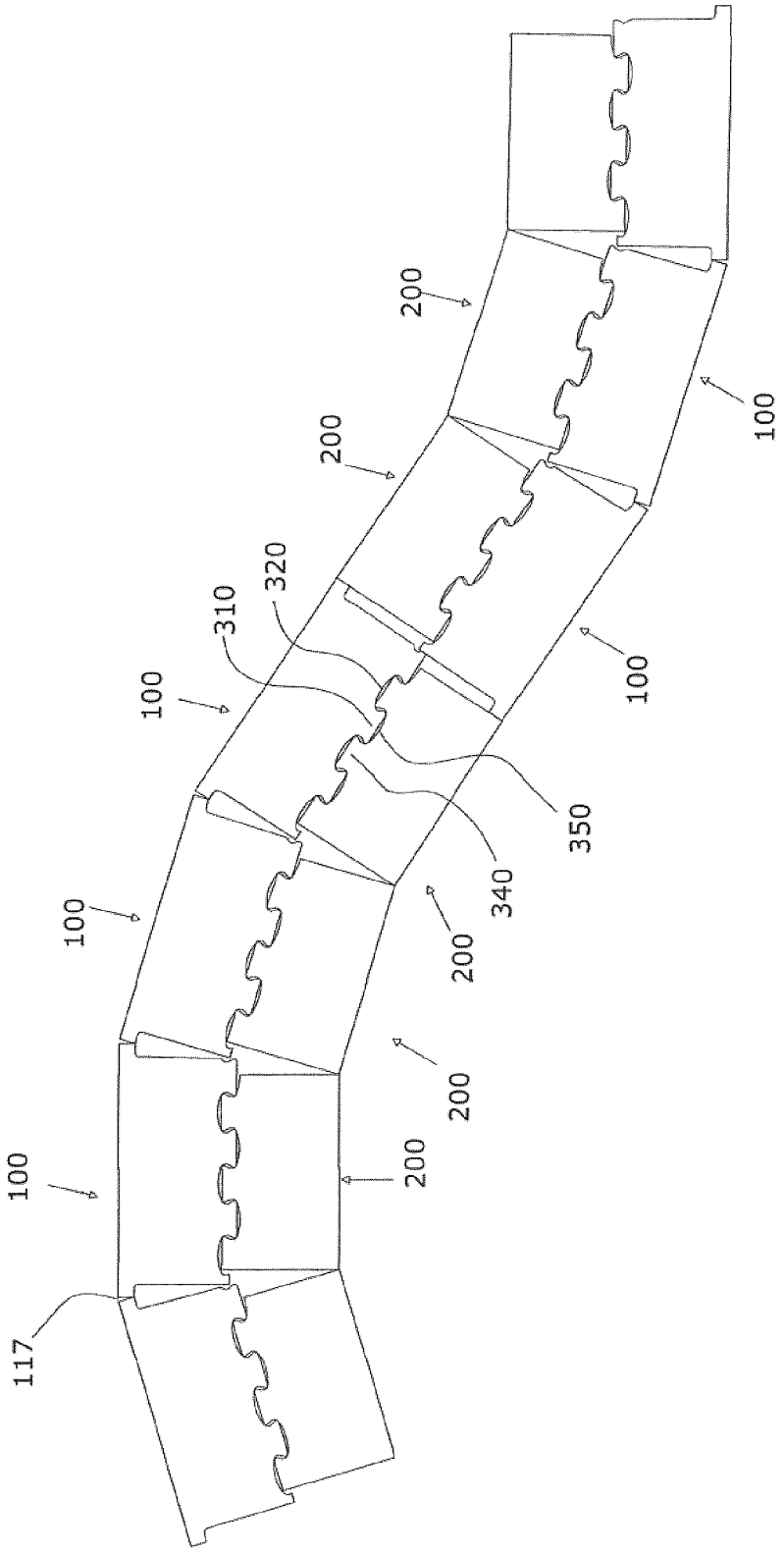

FIG 5

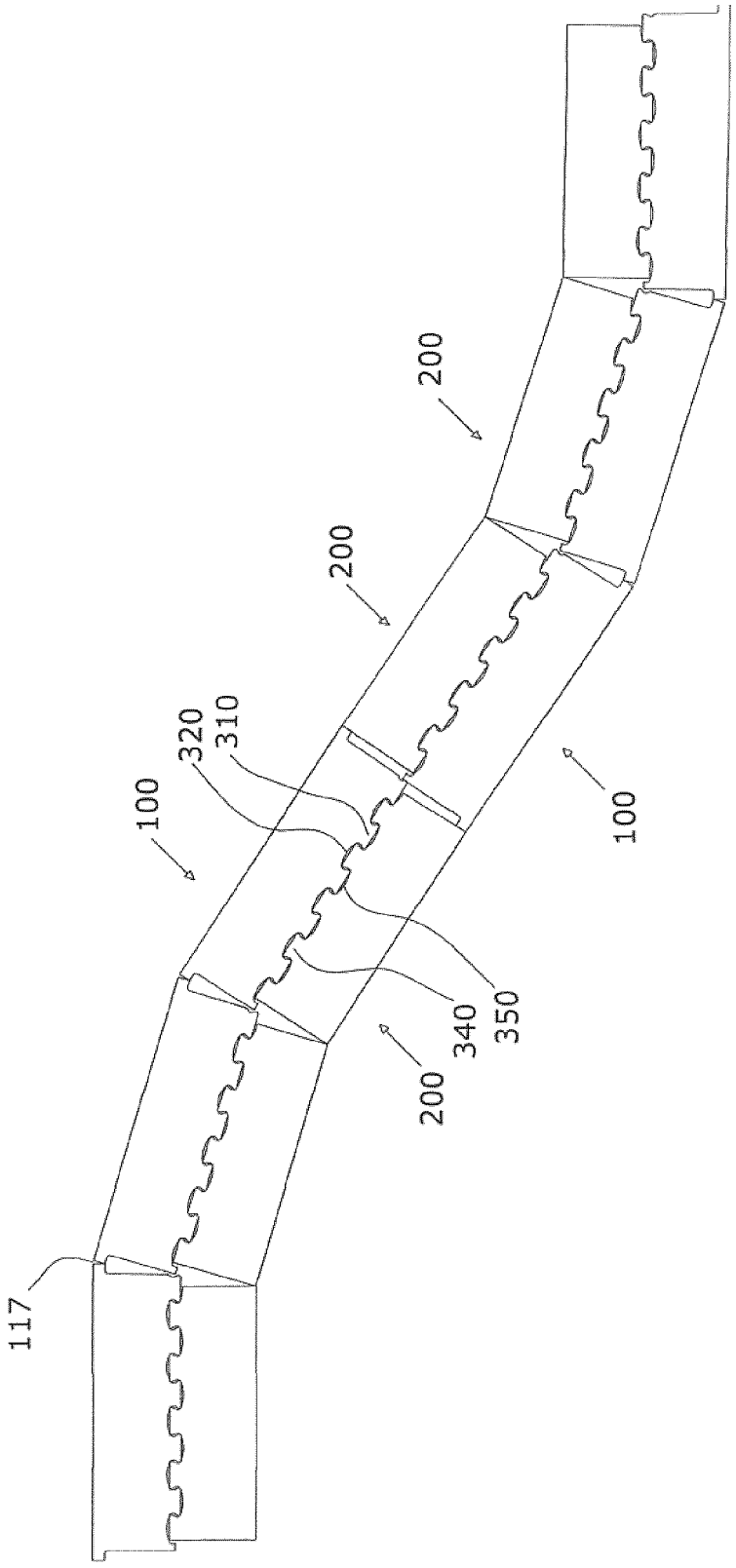

FIG 6

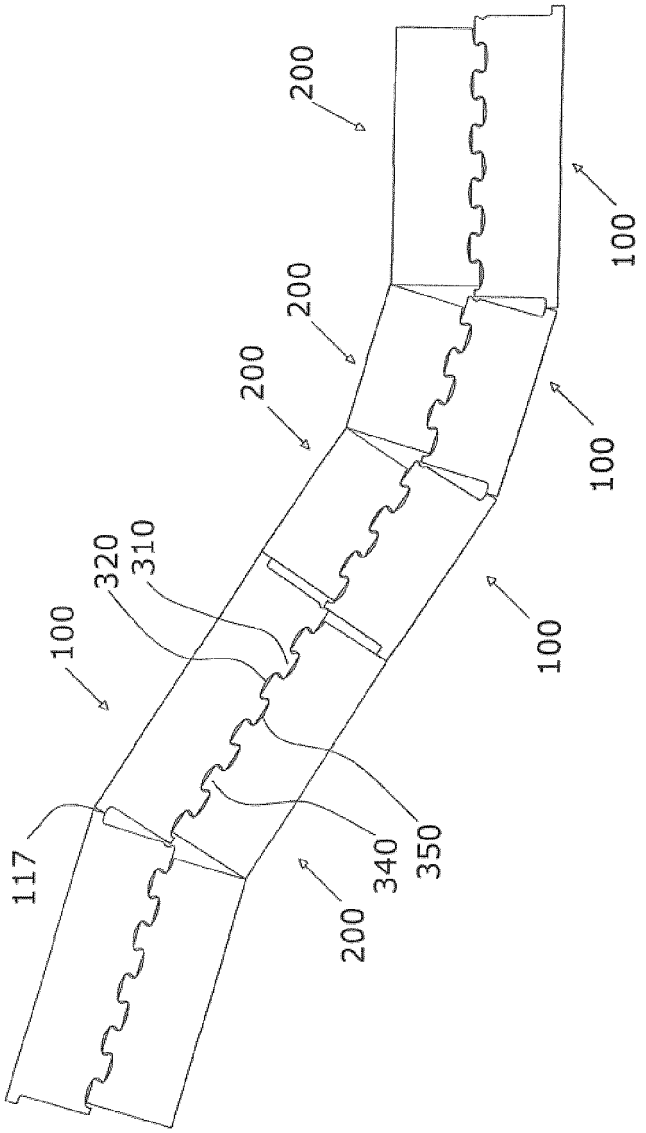

FIG 7

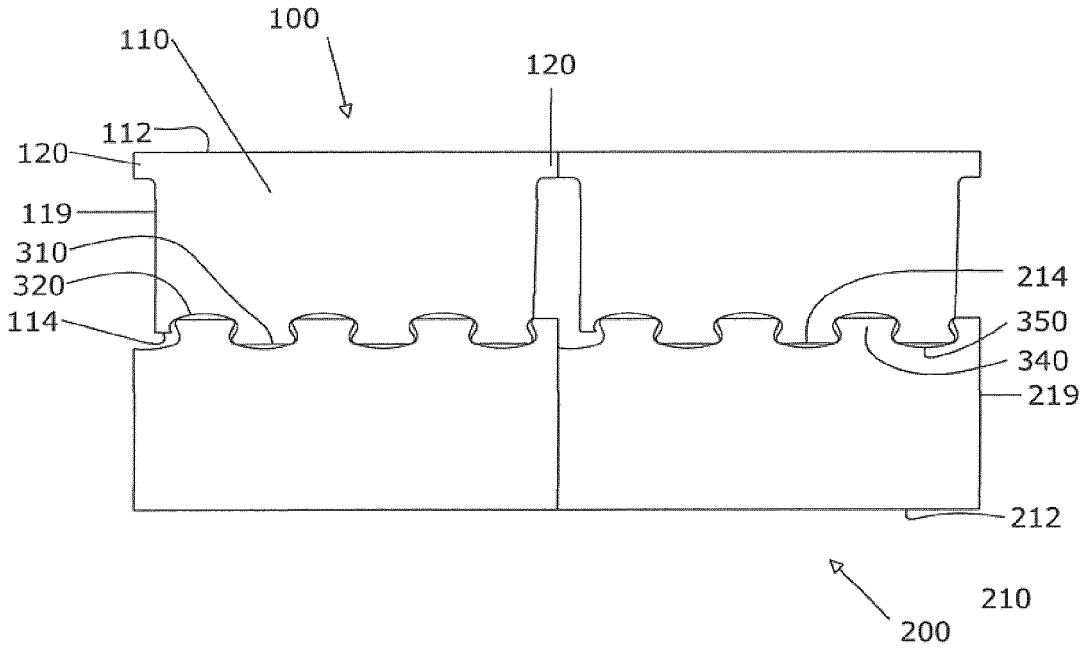

FIG 8

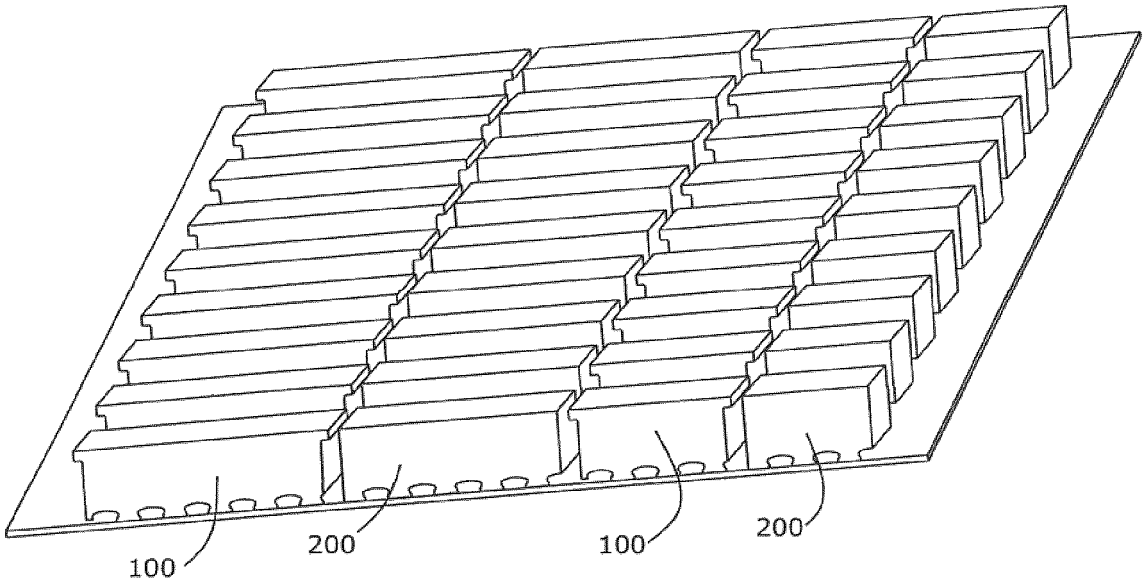

FIG 9a

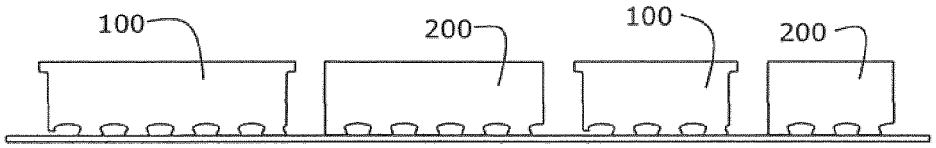

FIG 9b

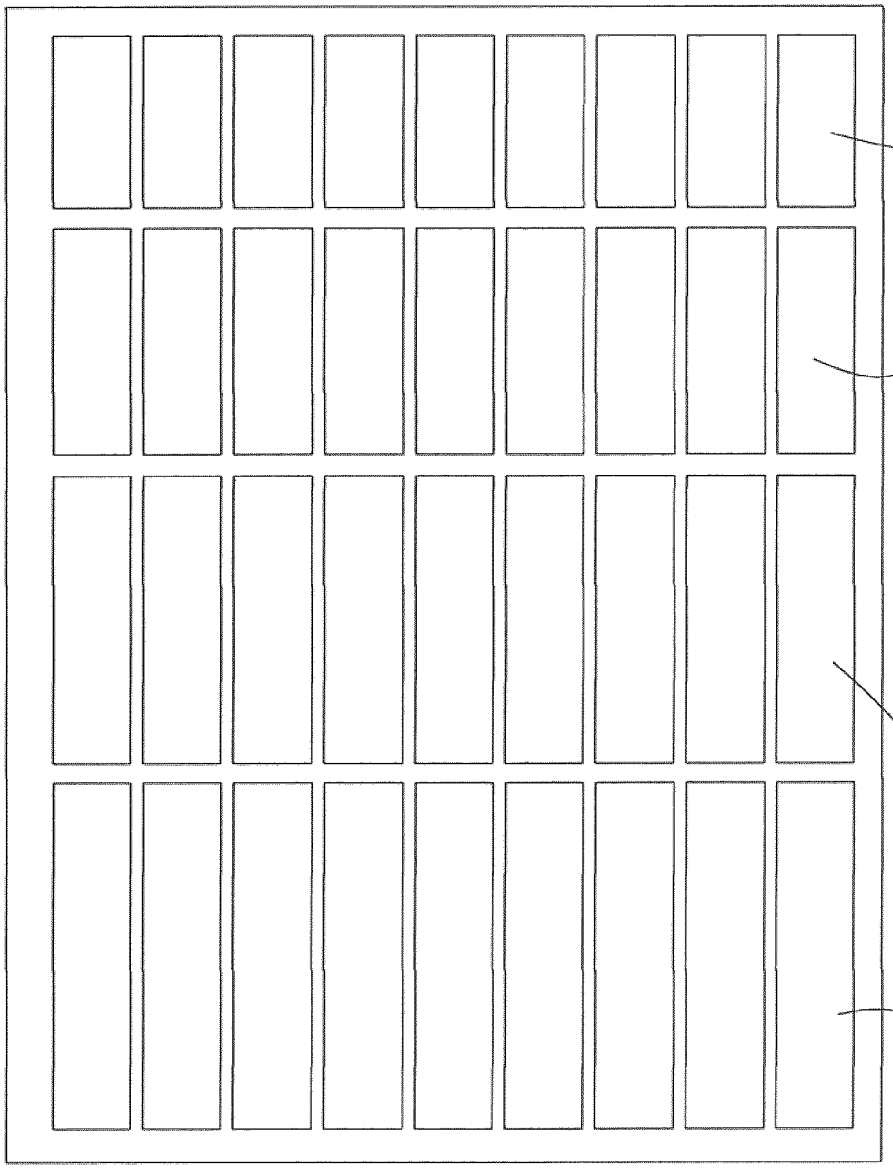

FIG 9c

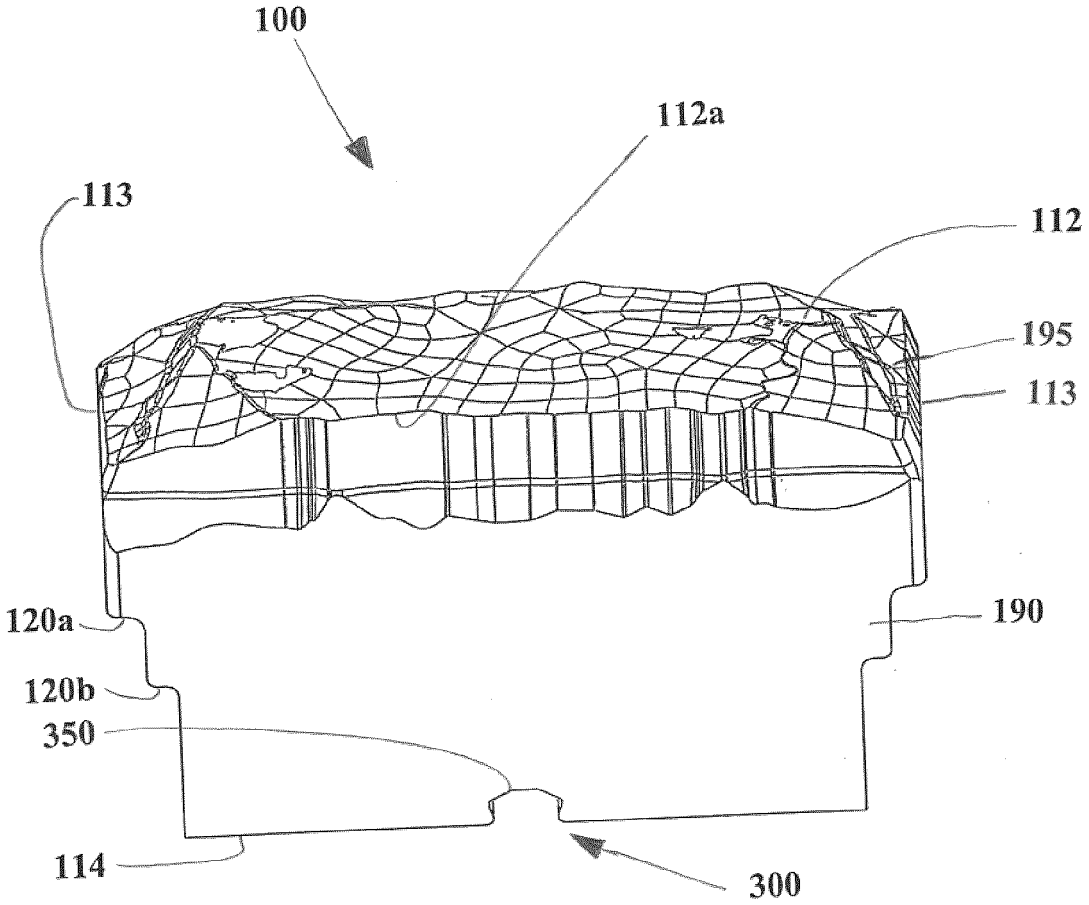

FIG. 10a

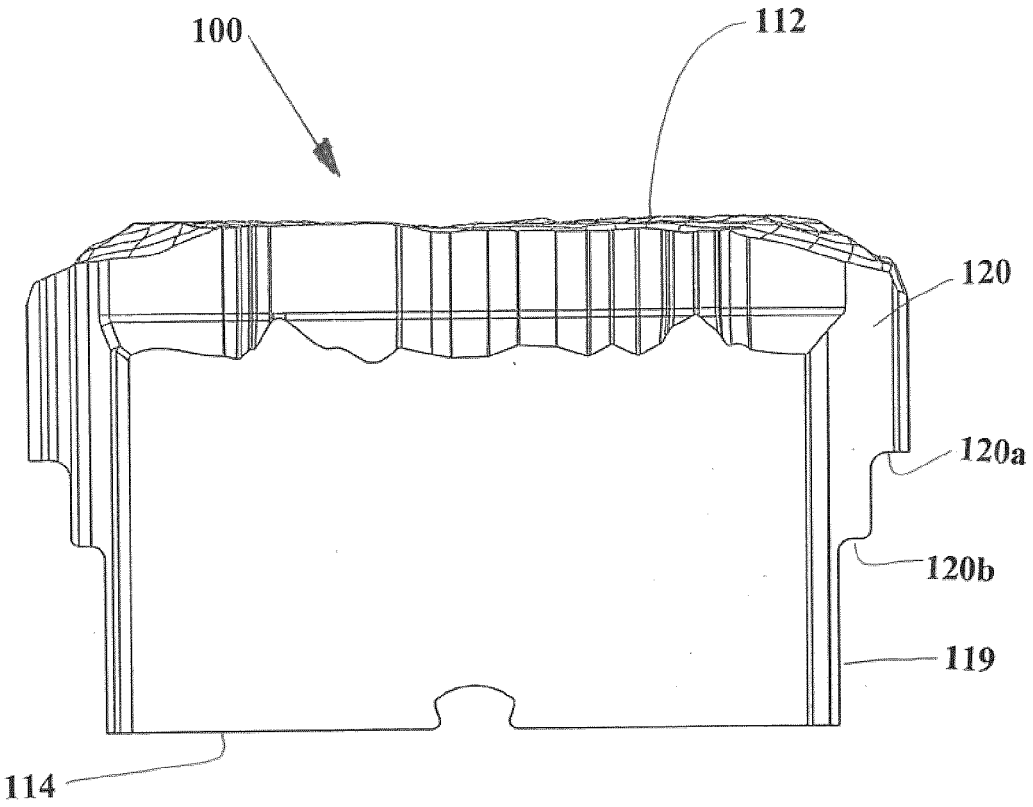

FIG. 10b

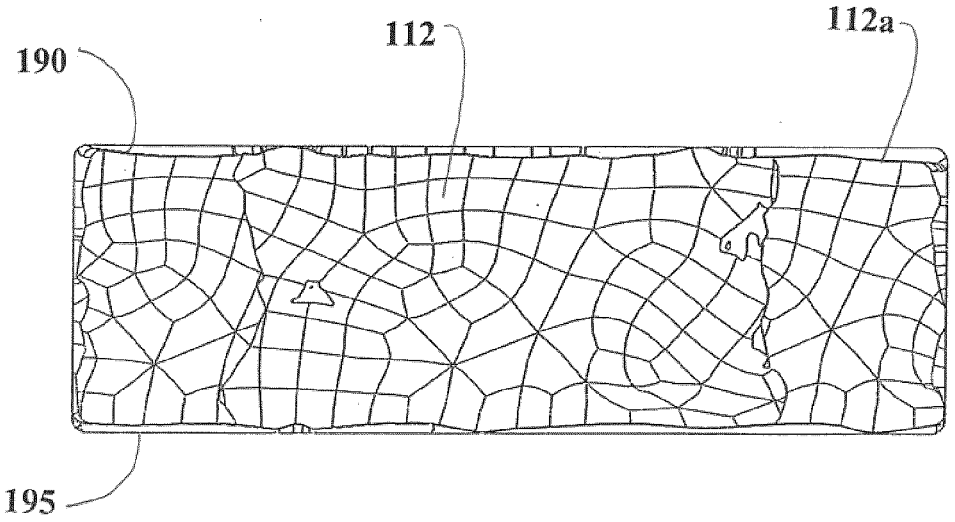

FIG. 10c

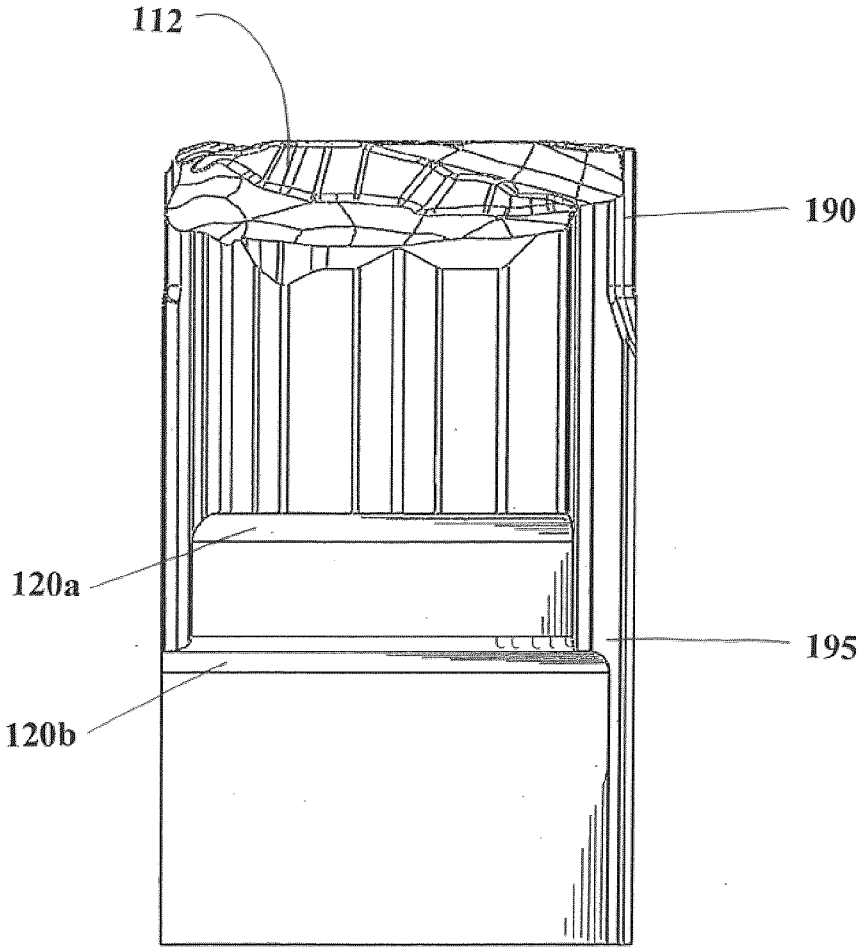

FIG. 10d

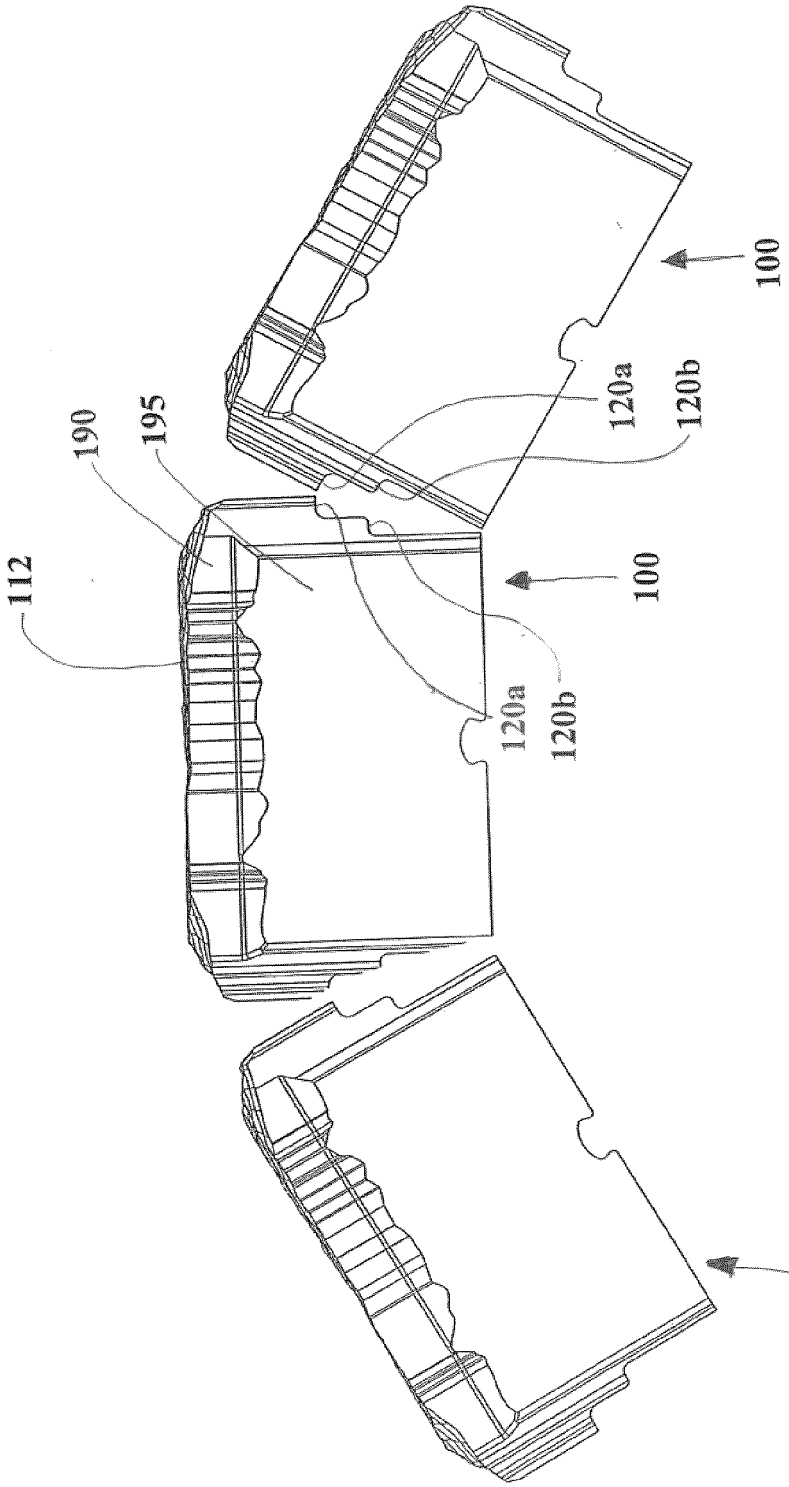

FIG. 11

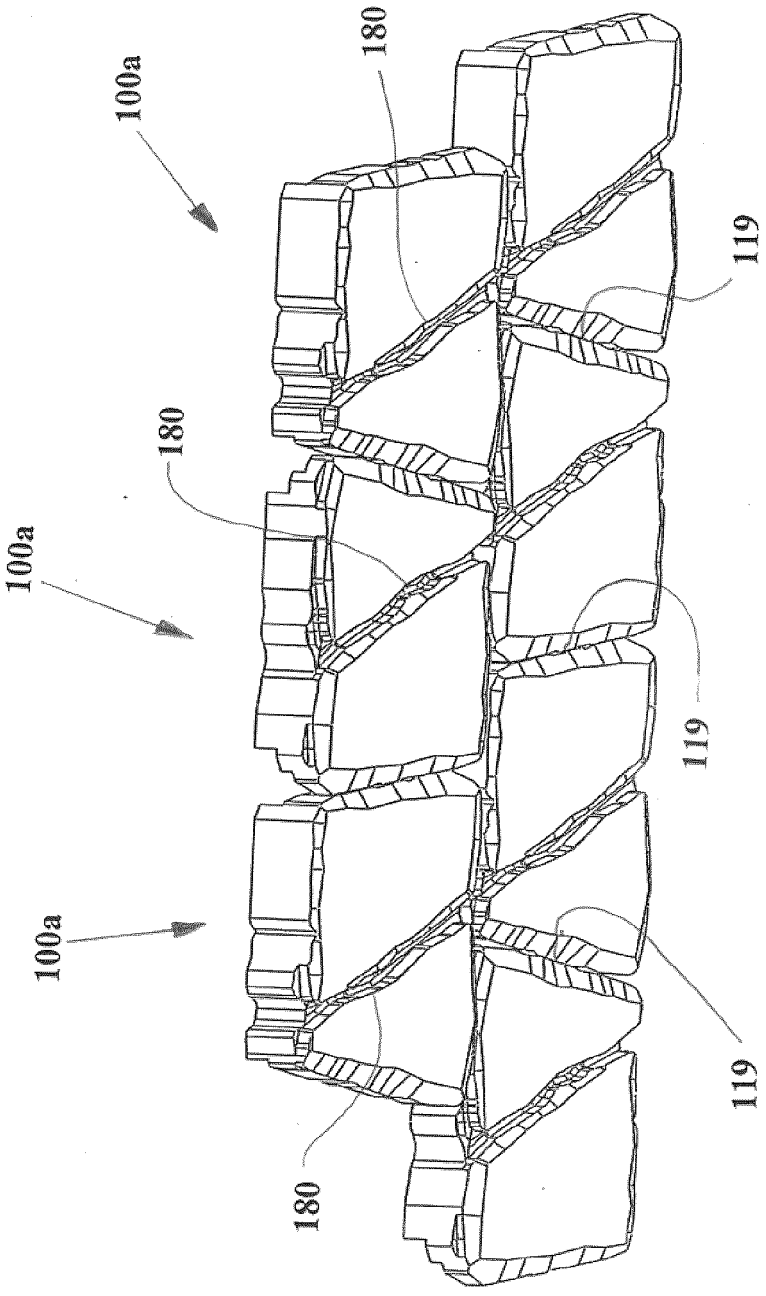

FIG. 12a

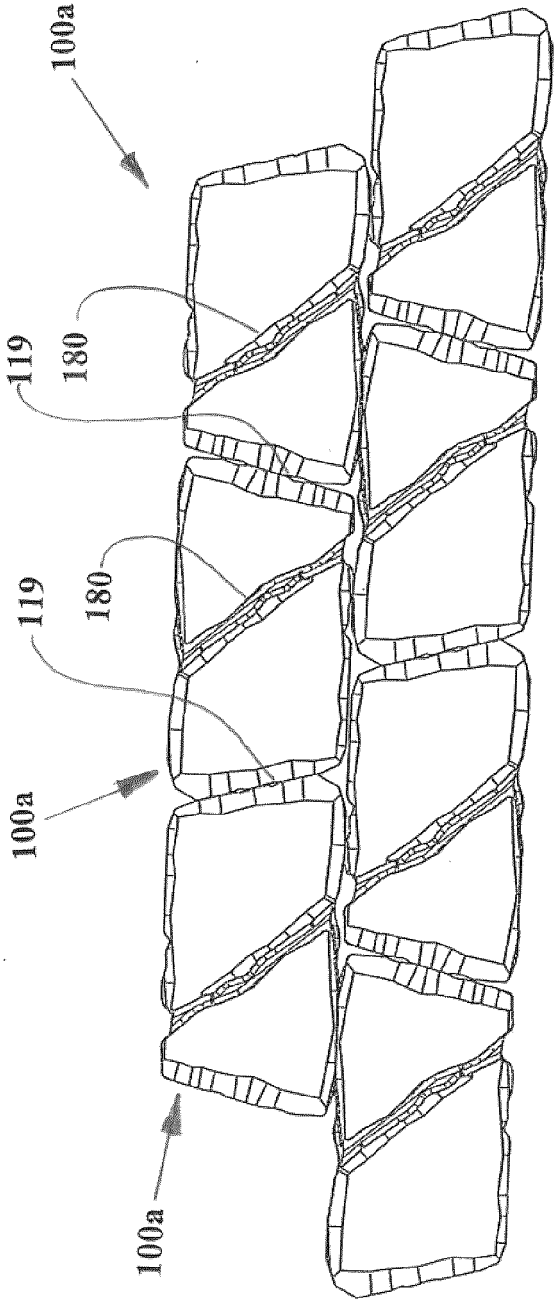

FIG. 12b

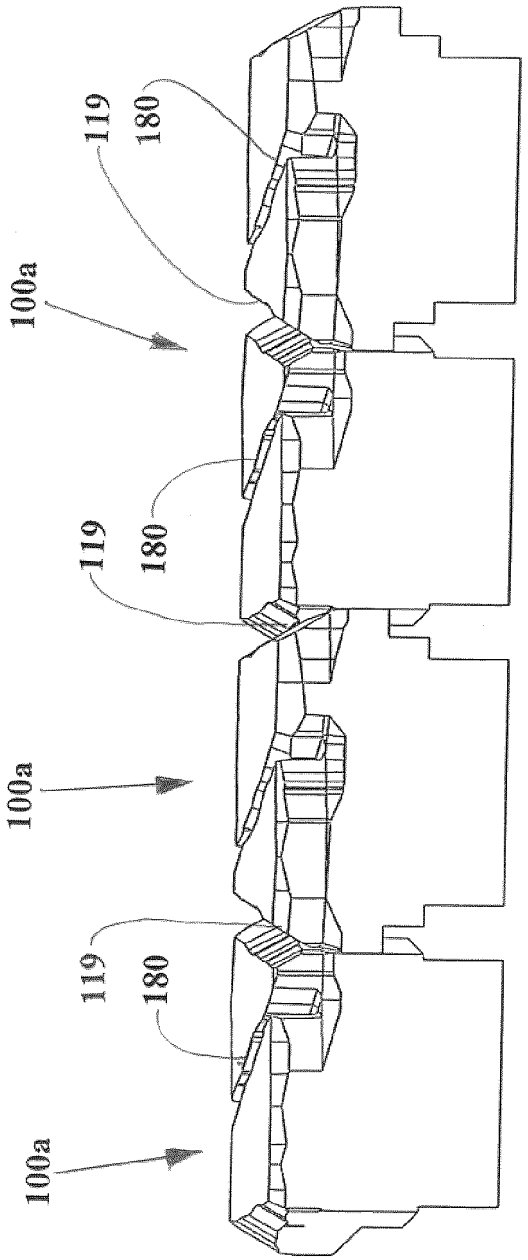

FIG. 13

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 20070292216 A **[0006]**