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(71) Applicant : **Naude, Stephanus Petrus**
180 Florauna Road
Florauna, Pretoria, Transvaal (ZA)

(72) Inventor : **Naude, Stephanus Petrus**
180 Florauna Road
Florauna, Pretoria, Transvaal (ZA)

(74) Representative : **Warren, Anthony Robert et al**
BARON & WARREN 18 South End Kensington
London W8 5BU (GB)

(54) Building block.

(57) The invention relates to a mortarless interlocking building block (10). The building block comprises a pair of opposed major side faces (12,14), a pair of opposed minor end faces (16,18) and a pair of opposed major upper and lower faces (24,26), the upper or the lower face having a profile, when viewed in a direction normal to the end faces, with an outer semi-channel (82) and an inner full channel (88) alternating with an inner full projection (86) and an outer semi-projection (84). The semi-channel and the semi-projection are half the width of the full channel and the full projection, and the channels and projections extend longitudinally between the opposed end faces (16,18) of the block. The opposed lower or upper face (26,24) of the block is symmetrical about an imaginary axis (38) which extends transversely between opposed side faces to divide the lower or upper face into two equal halves (102,104). Each half has a profile, when viewed normal to the major side faces, comprising a semi-projection (40,42) and a full projection (50,52) alternating with a full channel (44,46) and a semi-channel (48), all of which extend transversely between opposed side faces, and which are complemental with the channels and projections on the opposed respective upper or lower face. A pair of apertures (20,22) extend between the upper and the lower faces, the apertures being divided by an inner web (28) which extends transversely between the opposed side walls (30,32) of the block parallel to the end walls (34,36).

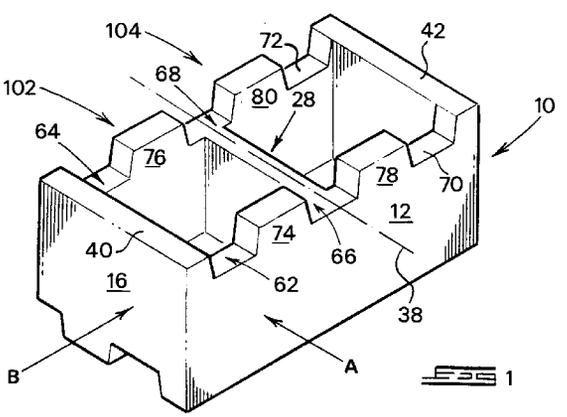

Fig 1

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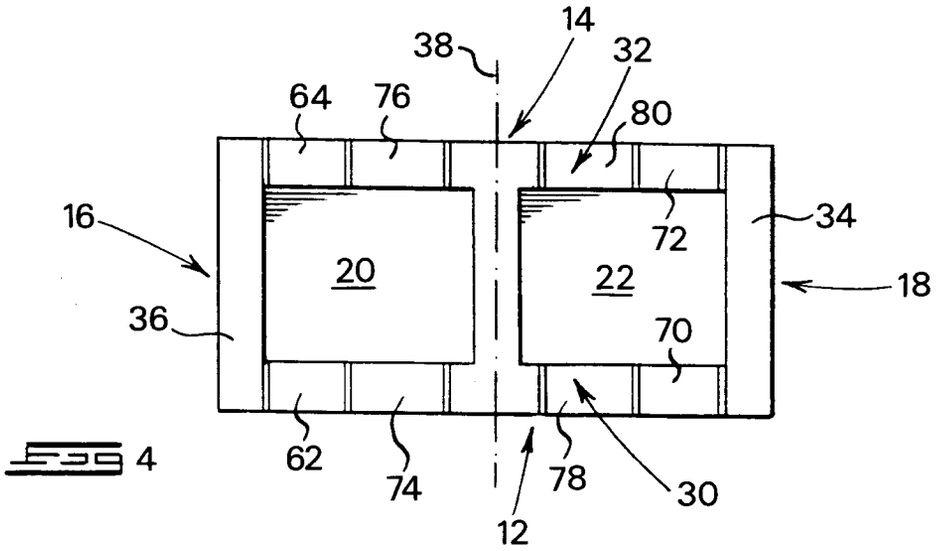

Fig 4

BACKGROUND TO THE INVENTION

This invention relates to a building block.

The prior art is replete with interlocking building blocks of various shapes which are used in the construction of housing. In sub-economic housing, dry stacking building blocks are ideal, as they eliminate the need for cement, and they can be quickly and easily assembled using unskilled labour. A problem associated with dry stacking blocks is that those which interlock sufficiently generally have relatively intricate shapes which are not readily replicated in simple concrete brick moulds. Those blocks which have more basic shapes usually do not interflock sufficiently, and can only be stacked up to a certain level with safety.

SUMMARY OF THE INVENTION

According to the invention there is provided a building block comprising a pair of opposed major side faces, a pair of opposed minor end faces and a pair of opposed major upper and lower faces, the upper or the lower face having a profile, when viewed in a direction normal to the end faces, with an outer semi-channel and an inner full channel alternating with an inner full projection and an outer semi-projection, the semi-channel and the semi-projection being half the width of the full channel and the full projection, and the channels and projections extending longitudinally between the opposed end faces of the block; and the opposed lower or upper face of the block being symmetrical about an imaginary axid which extends transversely between opposed side faces to divide the lower or upper face into two equal halves, each half having a profile, when viewed normal to the major side faces, comprising a semi-projection and a full projection alternating with a full channel and a semi-channel, which extend transversely between opposed side faces, and which are complemental with the channels and projections on the opposed respective upper or lower face.

Preferably, at least one aperture extends between the upper and lower faces, the aperture being defined by opposed side and end walls of the block.

Conveniently, a pair of apertures extends between the upper and the lower faces, the apertures being divided by an inner web which extends transversely between the opposed side walls of the block parallel to the end walls.

The web is located exactly midway along the side walls of the block, so as to define two indentical rectangular apertures.

The one upper or lower face of the block, when viewed normal to one of the side faces, preferably has transversely extending outer semi-projections adjacent the end face and three inner full channels which alternate with two inner full projections so as to provide a crenellated profile.

The uppermost portions of the projections and the semi-projections are conveniently co-planar, and the lowermost portions of the channels are also co-planar.

On the opposed lower or upper face having longitudinally extending projections and channels, the uppermost portion of the projection and the uppermost portion of the semi-projection are also preferably co-planar, and the lowermost portion of the channel and the lowermost portion of the semi-channel are co-planar.

All the longitudinally extending channels and projections on the one upper or lower face are advantageously defined solely by cutting lines which run normal to the end faces of the block.

All the transversely extending channels and projections on the opposed upper or lower face are also advantageously defined solely by cutting lines which run normal to the side faces of the block.

The longitudinally extending projections and channels are preferably defined by respective castellations and indents formed in each of the end walls and the inner web, and the transversely extending projections and channels are defined by similar respective castellations and indents formed in the side walls.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows an isometric view of a building block of the invention;

Figure 2 shows a side view of the block of Figure 1 viewed in the direction of arrow A;

Figure 3 shows an end-on view of the block of Figure 1 viewed in the direction of arrow B;

Figure 4 shows a top plan view of the block of Figure 1;

Figure 5 shows an isometric view of the block of Figure 1 in the inverted position, and

Figure 6 shows a perspective view of part of a wall being built using the blocks illustrated in Figures 1 to 5.

DESCRIPTION OF EMBODIMENTS

The building block 10 illustrated in Figures 1 to 5 is in the basic form of a rectangular parallelepiped, having a pair of opposed major side faces 12 and 14 and a pair of opposed minor end faces 16 and 18. A pair of rectangular cavities 20 and 22 extend through the block 10 from the upper face 24 to the lower face 26 thereof. The cavities 20 and 22 are divided by a central web 28 and are bounded by parallel side walls 30 and 32 and parallel end walls 34 and 36. The web 28 extends between the side walls 30 and 32 and is parallel to the end walls 34 and 36.

As can be seen more clearly in Figure 2, the upper

face is crenellated and is symmetrical about an axis 38 which extends transversely between the opposite side walls 30 and 32, and which bisects the central web 28. As is clear from Figure 2, the upper face 24 has a profile when viewed in the direction of arrow A with outer semi-projections or ribs 40 and 42 extending the width of the block. Located between the ribs 40 and 42 are side channels 44 and 46 and a central channel 48, the channels alternating with full projections 50 and 52. Both the channels 44, 46 and 48 and the projections 50 and 52 are frusto-triangular in form.

The uppermost faces 56 of the projections 50 and 52 and the semi-projections 40 and 42 are co-planar and lie in a plane indicated in broken outline at 58. The lowermost faces of the channels 44,46 and 48 are also co-planar and lie in a plane indicated in brocken outline at 60 which is spaced from and parallel to the plane 58. The width W1 of each full, or major projection 50 and 52 is exactly twice the width W2 of the semi-projections 40 and 42. The semi-projections 40 and 42 have a profile which is identical to the profile of one of the full projections 50 and 52 once it has been perpendicularly bisected. With the upper face 24 in view, as is shown in Figures 1 and 4, the full channels 40, 46 and 48 and the full projections 50 and 52 do not extend continuously for the entire width of the block, due to the presence of the cavities 20 and 22. Rather, the channel 44 is defined by separate indents 62 and 64 formed in the respective side walls 30 and 32. Likewise, the central channel 48 is defined by indents 66 and 68, with the upper surface of the web 28 also defining the lower surface of the channel 48. The channel 46 is constituted by indents 70 and 72. Similarly, the projection 50 is defined by castellations 74 and 76 and the projection 56 is constituted by castellations 78 and 80.

Turning now to Figure 3, the lower surface 26 of the block has a profile with an outer semi-channel 82 being located adjacent the side face 14 and an outer semi-projection 84 being located adjacent the side face 12. Situated between and alternating with the semi-channel 82 and the semi-projection 84 is a full projection 86 and a full channel 88. Referring now to Figure 5, it can be seen that the full channel 88 is defined by individual indents 90, 92 and 94 formed in the undersides of the respective side wall 36, the web 28 and the opposite wall 34. Likewise the projection 86 is constituted by individual castellations 96, 98 and 100.

The transverse axis of symmetry 38 divides the upper surface 24 of the block 10 into two mirrored halves 102 and 104. The one half 102 is formed from the semi-projection 40, the full channel 44, the full projection 50 and half of the full channel 48, which is effectively a semi-channel. Likewise the other half 104 of the upper face 24 is made up of the half projection 42, the full channel 46, the full projection 52 and the other half of the full channel 48.

It is clear from the drawings that the lower surface 26 of the block has a profile which is complemental with the profile of one of the halves 102 or 104 of the upper surface 24 of the block. This allows the lower surface 26 of one block to complementally engage one half of the upper surface 24 of another subjacent block, with the major axes of the blocks being perpendicular to one another, as is shown in chain outline at 106.

In Figure 6, blocks identical to those illustrated in Figures 1 to 5 are used to build two walls 110 and 112 which meet at a corner 114. The bricks are laid in a stretching bond. The lower course 116 of bricks is laid in the upright position. The superjacent course of bricks 118 is laid in the inverted position, and the following superjacent course 120 of bricks is laid once more in the upright position. In this manner, the surfaces of the bricks having transversely extending projections and channels, (referred to in the specification as the upper surfaces) are complementally interengaged with one another, as is shown at 122. The surfaces of the bricks having longitudinally extending projections and channels (referred to in the specification as the lower surface) are complementally interengaged with one another during the laying of the next course 120, as is shown at 124. The transverse interlocking shown at 122 prevents longitudinal movement of the bricks in the direction of arrows 126. Likewise, the longitudinal interlocking shown at 124 prevents transverse movement of the bricks in the direction of arrows 128. As a result, mortarless walls can be built higher than is the usual practise, as alternate courses provide interlocking in different directions and serve to strengthen the walls.

Complete interlocking of the blocks also takes place at the corner 114. The transversely extending channels and projections on the lower surface of the uppermost block 130 form a snug complemental fit with the transversely extending channels and projections on one half of the upper surface of the subjacent block 132, as well as with the longitudinally extending channels and projections on one half of the the subjacent block 134, which is perpendicular to the block 132.

In order to reinforce the corner 114, reinforcing rods 136 are located in the cavity 138 which extends through the corner, and a corner post is formed by pouring concrete 140 into the cavity 138. As the cavities 20 and 22 in the blocks are aligned when they are assembled in stretching bond, the reinforcing concrete posts may be formed at any desired interval along the wall. For instance, where a gable wall is being built, posts may be formed in every third or fourth cavity.

As all the blocks are identical in form, this speeds up the manufacturing process, and serves to simplify the ordering of blocks for building a house, for instance.

A further advantage of the building block of the invention lies in its ease of manufacture. The blocks are manufactured from an aggregate in groups of four or six. Movable pallets are located on a vibrating table and are fed from a pallet conveyor, which carries a drawsheet. The drawsheet, which has a crenellated profile complemental to the upper surface of each block, is moved into position over the pallet and four mouldboxes are lowered into position over the drawsheet. The mouldboxes are filled with aggregate which is then compacted using an overhead tamping head. The tamping head has a compaction face which is shaped to form the longitudinal channels and projections in the lower face of the block.

Once compaction has occured, the drawsheet is withdrawn. The mouldboxes are then raised with the tamping heads lowered to maintain the newly formed blocks in position. The tamping heads are thereafter raised, and the pallet is slid away to make room for a subsequent pallet.

By merely altering the shape of the tamping head and by using a suitably profiled drawsheet, and slightly modified moulboxes, the blocks of the invention can be formed using relatively basic block making equipment.

The projection and channels may take on any shape. For instance they may be castellated or scalloped.

For the purposes of this specification, the terms "side", "end", "upper" and "lower" have been used solely for the purpose of clarifying the orientation of the various faces of the block, and should not be seen as limiting the scope of the claims.

Claims

1. A building block (10) comprising a pair of opposed major side faces (12,14) a pair of opposed minor end faces (16,18) and a pair of opposed major upper and lower faces (24,26) characterised in that, the upper or the lower face has a profile, when viewed in a direction normal to the end faces, with an outer semi-channel (82) and an inner full channel (88)alternating with an inner full projection (86) and an outer semi-projection (84), the semi-channel and the semi-projection being half the width of the full channel and the full projection, and the channels and projections extending longitudinally between the opposed end faces (16,18) of the block; and the opposed lower or upper face (26,24) of the block being symmetrical about an imaginary axis (38) which extends transversely between opposed side faces (12,14) to divide the lower or upper face into two equal halves (102, 104) each half having a profile, when viewed normal to the major side faces, comprising a semi-projection (40,42) and a full projection (50,52) alternating with a full channel (44,46) and a semi-channel (48), which extend transversely between opposed side faces, and which are complemental with the channels and projections on the opposed respective upper or lower face.

2. A building block as claimed in claim 1 characterised in that at least one aperture (20,22) extends between the upper and lower faces (24,26), the aperture being defined by opposed side (30,32) and end walls (34,36) of the block.

3. A building block as claimed in claim 2 characterised in that a pair of apertures (20,22) extends between the upper and the lower faces, the apertures being divided by an inner web (28) which extends transversely between the opposed side walls of the block parallel to the end walls.

4. A building block as claimed in claim 3 characterised in that the web (28) is located exactly midway along the side walls (30,32) of the block, so as to define two identical rectangular apertures (20,22).

5. A building block as claimed in any one of the preceding claims characterised in that the one upper or lower face (24,26) of the block, when viewed normal to one of the side faces, has transversely extending outer semi-projections (40,42) adjacent the end face and three inner full channels (44,46,48) which alternate with two inner full projections (50,52) so as to provide a crenellated profile.

6. A building block as claimed in claim 5 characterised in that the uppermost portions of the projections (50,52) and the semi-projections are co-planar (58), and the lowermost portions of the channels (44,46,48) are also co-planar (60).

7. A building block as claimed in claim 6 characterised in that, on the opposed lower or upper face (22,24) having longitudinally extending projections and channels, the uppermost portion of the projection (86) and the uppermost portion of the semi-projection (84) is co-planar, and the lowermost portion of the channel (88) and the lowermost portion of the semi-channel (82) is co-planar.

8. A building block as claimed in any one of the preceding claims characterised in that all the longitudinally extending channels and projections (82,84,86,88) on the one upper or lower face (26) are defined solely by cutting lines which run normal to the end faces (16,18) of the block.

9. A building block as claimed in claim 8 characterised in that all the transversely extending channels and projections (40,42,44,46,48,50,52) on the opposed lower or upper face (24) are defined solely by cutting lines which run normal to the side faces (12,14) of the block.

10. A building block as claimed in claim 3 characterised in that the longitudinally extending projections and channels (86,88) are defined by respective castellations (96,98,100) and indents (90,92,94) formed in each of the end walls (34,36)and the inner web (28).

11. A building block as claimed in claim 3 or claim 10 characterised in that the transversely extending projections (50,52) and channels (44,48,46) are defined by respective castellations (74,76,78,80) and indents (62,64,66,68,70,72) formed in the side walls (30,32).

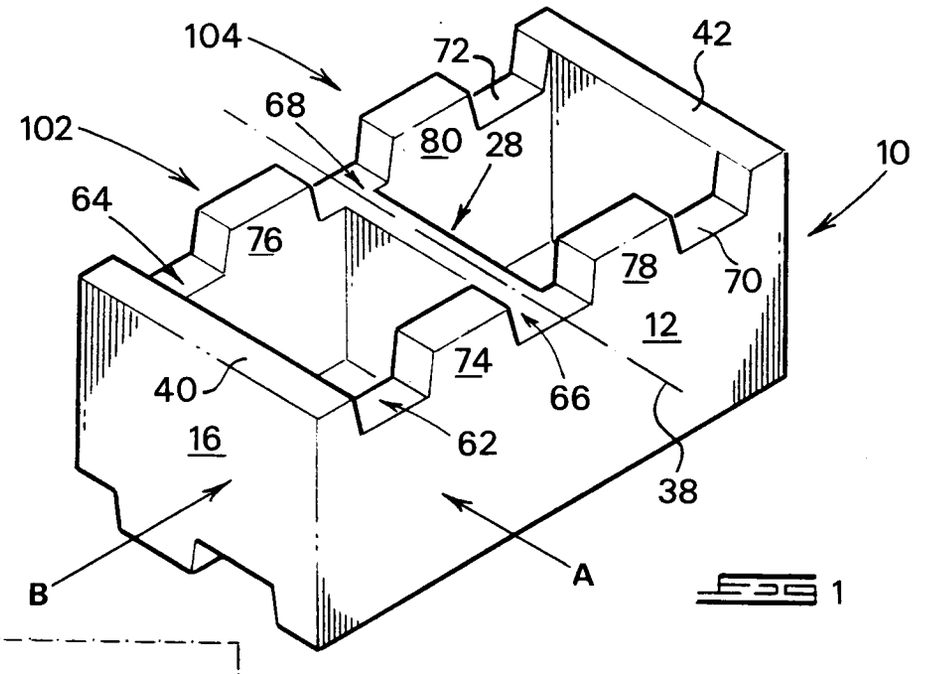

Fig 1

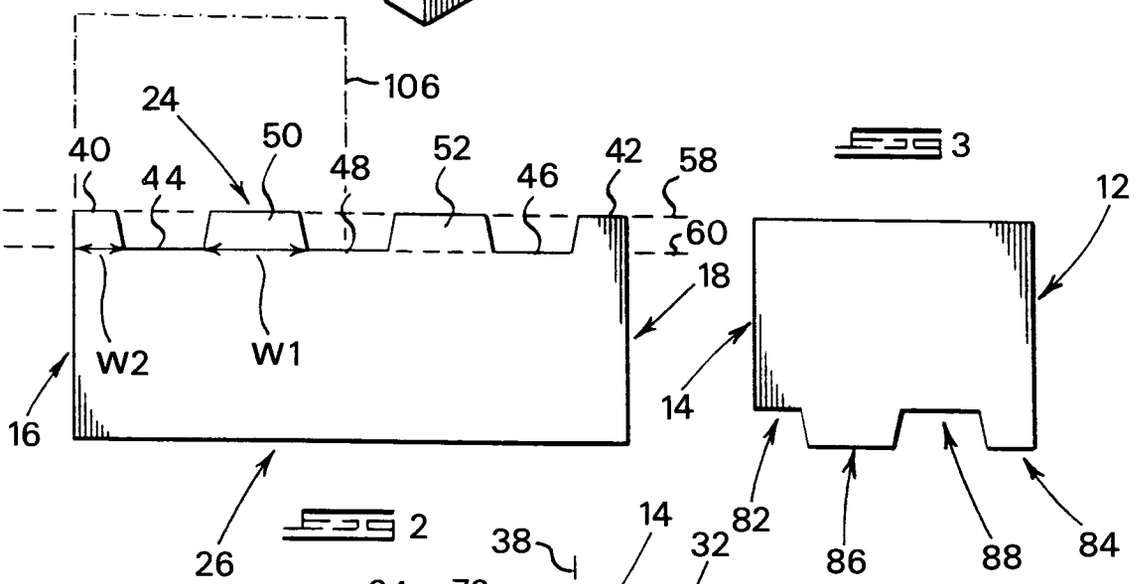

Fig 3

Fig 2

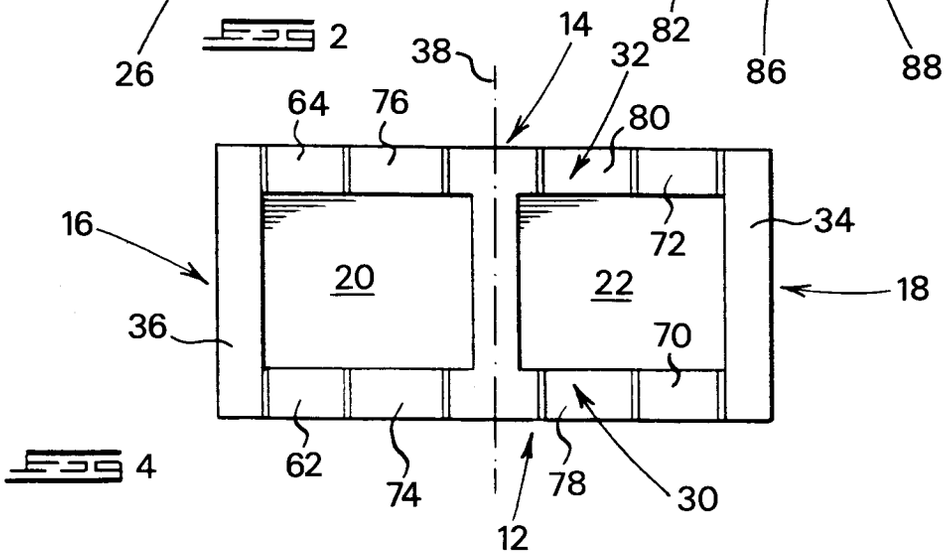

Fig 4

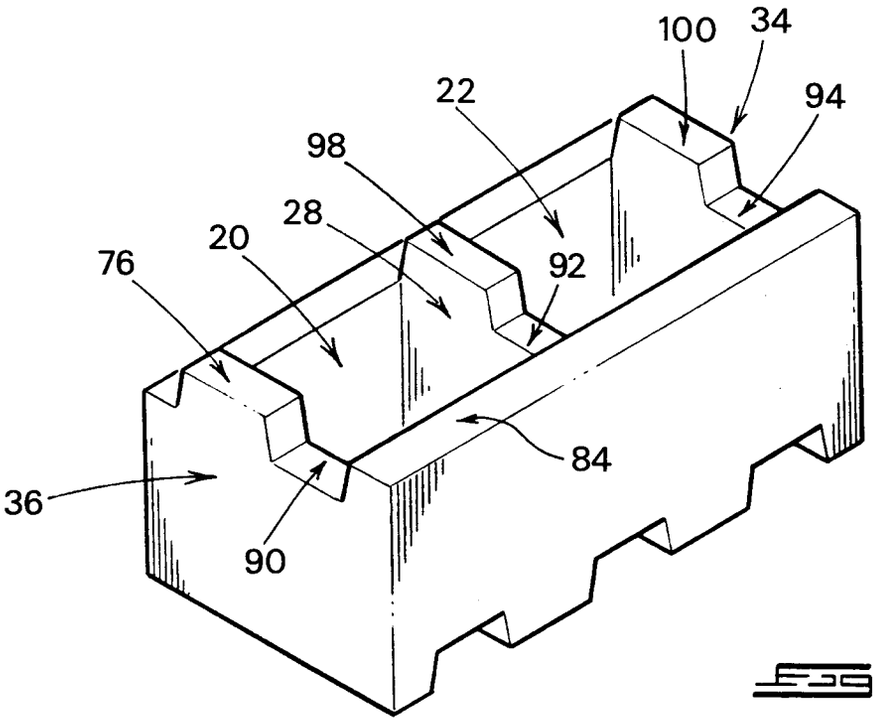
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FIG 5

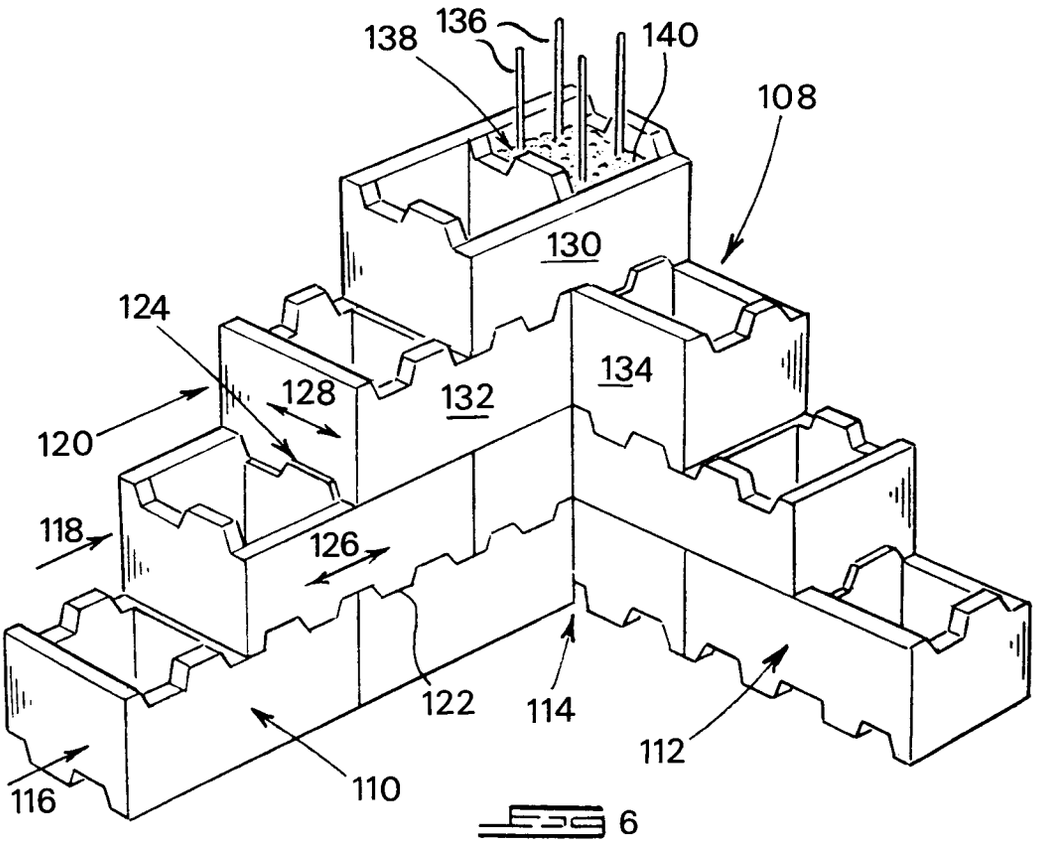
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FIG 6