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

(11) Publication number: **0 164 264**
A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **85303969.1**

(22) Date of filing: **05.06.85**

(51) Int. Cl.⁴: **E 01 C 5/00**

(30) Priority: **07.06.84 GB 8414595**

(43) Date of publication of application: **11.12.85**
Bulletin 85/50

(84) Designated Contracting States: **DE GB NL**

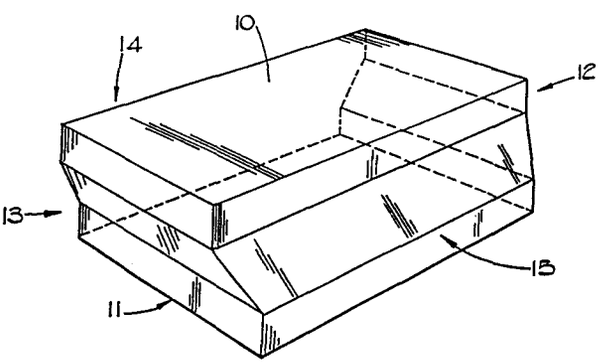
(71) Applicant: **HAINES HOLDING COMPANY N.V.,**
130 Schottegatweg P.O. Box 305, Curaçao Netherlands Antilles (NL)

(72) Inventor: **Haines, Donald John, 22 Lloyd Avenue, Torquay TQ2 7DH (GB)**

(74) Representative: **Thompson, George Michael et al, Marks & Clerk Alpha Tower Suffolk Street Queensway, Birmingham B1 1TT (GB)**

(54) Paving blocks.

(57) A paving block of the so called interlocking type has upper and lower surfaces 10, 11 and sides 12, 13, 14, 15. One side 14 is flat and the opposite side 15 has an outwardly extending portion while the other two sides have inwardly extending portions. The block by virtue of the flat side 14 can be manufactured in a conventional block forming machine. Each block when constructing paving has a similar block associated with it the two blocks being mounted in back to back relationship. The sides 14, 15 are at least twice as long as the sides 12, 13 so that vertical load applied to one block in a paving will be distributed to two adjacent blocks.



EP 0 164 264 A2

This invention relates to paving blocks for use as paving instead of the traditional concrete or reconstituted stone slab or tarmacadam surface.

Paving blocks are known which when in use have vertical sides. The blocks may be rectangular in shape or provided with a sideways interlocking shape. Such blocks are generally laid on a sand base below which is a further more solid base and it is usual to pack the small gaps between adjacent blocks with sand. The blocks so laid are located against lateral movement but individual blocks derive no support from adjacent blocks in resisting vertical loads. The foundation for the blocks must therefore be of sufficient strength to resist the vertical loading.

It has been proposed to provide what is known as vertical interlocking. In this case an individual block has lateral projections which engage with surfaces of adjacent blocks so that a vertical load applied to one block will be shared with two other adjacent blocks. In this way the loading of the foundation is reduced and it can therefore be cheaper.

Various shapes have been proposed for the blocks. In one case on opposite sides of each block recesses are provided which extend upwardly from the base of the block while the other sides of the block have recesses extending downwardly from the top of the block. The blocks can therefore be interlocked and loading applied to one block will be shared as described. Another form of block has a pair of opposite sides sloping downwardly and outwardly while the remaining sides slope downwardly and inwardly. Again the blocks form a vertically interlocked structure.

The problem with the aforesaid forms of block is that they are difficult to manufacture. A mould for producing such a block needs to have sidewalls which can be retracted from the compacted block to enable the block to be ejected from the mould. Such a mould is expensive to produce and also has limited block making capacity in the sense that only a comparatively small number of blocks can be made at the same time.

The block now to be described can be manufactured using conventional block forming techniques which means it can be manufactured cheaply and yet it can still provide vertical interlocking.

According to the invention a paving block comprises a body defining a pair of opposed rectangular surfaces one of which in use will be the upper surface and the other of which will be the base surface, said surfaces being substantially parallel to each other, one of the sides of the block extending at right angles between the surfaces, the side opposite said one side being recessed below one of the surfaces and the two other opposite sides being recessed below the other of said surface.

In the accompanying drawings:-

Figure 1 is a perspective view of one example of the block,

Figure 2 is a plan view showing eight of the blocks of Figure 1 assembled together,

Figure 3 shows another arrangement of blocks of the type shown in Figure 1 but with a different length/width ratio,

Figure 4 is a view similar to Figure 1 showing another example of the block,

Figure 5 is a section showing two of the blocks of Figure 4 assembled together, and

Figure 6 is a cut-away perspective view of the mould for the blocks shown in Figure 1.

With reference to Figures 1 and 2 of the drawings, the block has an upper surface 10 and a spaced base surface 11 substantially parallel to the upper surface, and also sides 12, 13, 14 and 15. The upper surface 10 is of rectangular form and the side 14 is vertical and extends to the base surface 11. The sides 12 and 13 extend vertically downwardly from the upper surface for a short distance and then they extend downwardly and inwardly and finally before reaching the base surface, they extend vertically downwardly. The side 15 on the other hand extends downwardly from the upper surface and then downwardly and outwardly. As with the sides 12 and 13 the side 15 extends vertically downwardly before reaching the base surface As a result the sides 12 and 13 are recessed immediately below the base surface 11 and the side 15 is recessed immediately below the upper surface 10.

In the example shown in Figures 1 and 2 the sides 14 and 15 at the surface 10 are twice as long as the sides 12 and 13. As a result eight blocks can be assembled together as shown in Figure 2 and for convenience the blocks have been numbered 16-23. It will of course be remembered that the complete structure may comprise many thousands of such blocks. Considering the block configuration shown in Figure 2, if a vertical load is applied to the block 19 the load will in part be transferred to the block 17 and to the block (not shown) on the opposite side. In like manner vertical load applied to the block 22 will in part be applied to the block 19 and to the opposite

block (not shown). It should be noted that vertical load applied to the block 19 will not be transferred to the block 18 and vice versa.

In Figure 3 the blocks have a different length/width ratios and in fact are four times longer than they are wide. They can be assembled together as shown to leave gaps 24 which can be filled with soil or other plant growing compound, to allow plants or grass to be grown. As with the previous arrangement, vertical load applied to one block will be in part distributed to two other blocks. It will be understood that other length/width ratios can be employed. In the use of a block as described to construct a paved area, it is always associated with a similar block the two blocks being located in back to back relationship that is with their sides 14 in facial contact.

The block shown in Figures 4 and 5 is similar to the block shown in Figure I except that the sides 12A, 13A and 15A are curved instead of having plane portions, the curvature of the sides 12A and 13A being opposite to that of the curvature of the side 15A. Again the side 14A of the block is vertical. Figure 5 shows how the sides of two of the blocks of Figure 4 fit together although in practice there will be a small gap which as stated will be filled with sand.

Figure 6 shows part of a mould for producing the block shown in Figure 1. As mentioned, an important feature of the block is the fact that the side 14 is vertical i.e. it extends at right angles to the surfaces 10 and 11. The mould box 25 defines a series of compartments in side-by-side and in end-to-end relationship and in each compartment a block of the

type shown in Figure 1 can be formed. The box includes a plurality of lateral plates 26 which extend in spaced parallel relationship and which form the top and bottom surfaces of the blocks. The plates 26 are interconnected by cross plates 27 which form the shaped opposite sides 12 and 13 of the blocks. The cross plates have a shape corresponding to the shape of the sides of the blocks. The block produced in one compartment between one pair of plates 26 is the opposite way round to the blocks produced in the adjacent compartments defined between the same two plates. If desired however the blocks can be produced in the mould in the same way round.

The mould box in use stands on a base board 28 and a tamper head assembly is provided which can be lowered into the mould box to achieve compaction of the semi-dry mix of material from which the blocks are formed. Each compartment in the mould box has its own tamper plate 29 which forms part of the tamper head assembly. The under surface of the tamper plate is shaped to produce the side 15 of the block.

In use, the mould box is lowered onto the base board and with the tamper head assembly lifted clear, moulding material is placed in the compartments formed by the mould box and base board. The loading of the material can be achieved in any desired manner for example, a feed box can be moved laterally over the mould box. With the compartments filled with the material, the tamper head assembly is lowered and the individual tamper plates enter their respective compartments. Compaction may be achieved with the assistance of vibration and when it is deemed that the compaction is sufficient, the vibration is stopped and the mould box is lifted vertically away from the base

board while the tamper head assembly is held against movement. The practical effect of this is that the compacted blocks are ejected from the mould box and remain upon the base board. Finally the tamper assembly is raised leaving the completed blocks on the board which can then be removed from the machine with the blocks to allow the material forming the blocks to cure. A fresh base board is placed in position, the mould box lowered and the process repeated. It should be noted that the sides 14 of the completed blocks are formed by the base board and are fully supported thereby during the curing process.

CLAIMS

1. A paving block comprising a body defining a pair of opposed rectangular surfaces one of which in use will be the upper surface and the other of which will be the base surface, said surfaces being substantially parallel to each other, one of the sides of the block extending at right angles between the surfaces, the side opposite said one side being recessed below one of the surfaces and the two other opposite sides being recessed below the other of said surfaces.

2. A paving block according to Claim 1 in which each side other than said one side extends initially at right angles to said surfaces and has an intermediate portion inclined to said surfaces.

3. A paving block comprising a body defining a pair of opposed rectangular surfaces one of which in use will be the upper surface and the other of which will be the lower surface of the block, said surfaces being substantially parallel to each other, one of the sides of the block extending at right angles to said surfaces, the side of the block opposite said one side extending initially at right angles to the one surface and inclining outwardly and downwardly towards the other surface and finally at right angles to the other surface, the other two opposite sides of the block extending initially at right angles to the one surface and inclining inwardly and downwardly towards the other surface and finally at right angles thereto.

4. A paving block according to Claim 3 in which said one side and the opposite side are at least twice as long as said two other opposite sides whereby in use the inclined portion of the side opposite said one side can be engaged by the inclined portions of at least a pair of adjacent blocks.

5. A paving block according to any one of the preceding claims in which said body is moulded in a mould box, the mould box having a pair of spaced substantially parallel plates which define said surfaces respectively, a pair of spaced cross plates configured to define said two other opposite sides of the block respectively, a base board on which the mould box rests defining said one side and a tamper head which can be lowered into the mould cavity defined by the plates and the base board, said tamper head being configured to define the side of the block opposite said one side.

6. A machine for moulding a paving block of the kind claimed in Claim 1 comprising a mould box including a pair of spaced cross plates, a base board on which the mould box can rest during the moulding operation, said plates and base board defining a mould cavity the machine further including a tamper head which can be lowered into the mould cavity, said parallel plates in use defining said surfaces of the block, said cross plates being configured to define said opposite sides respectively and said tamper head being configured to define the side of the block opposite said one side and the surface of said base board defining said one side.

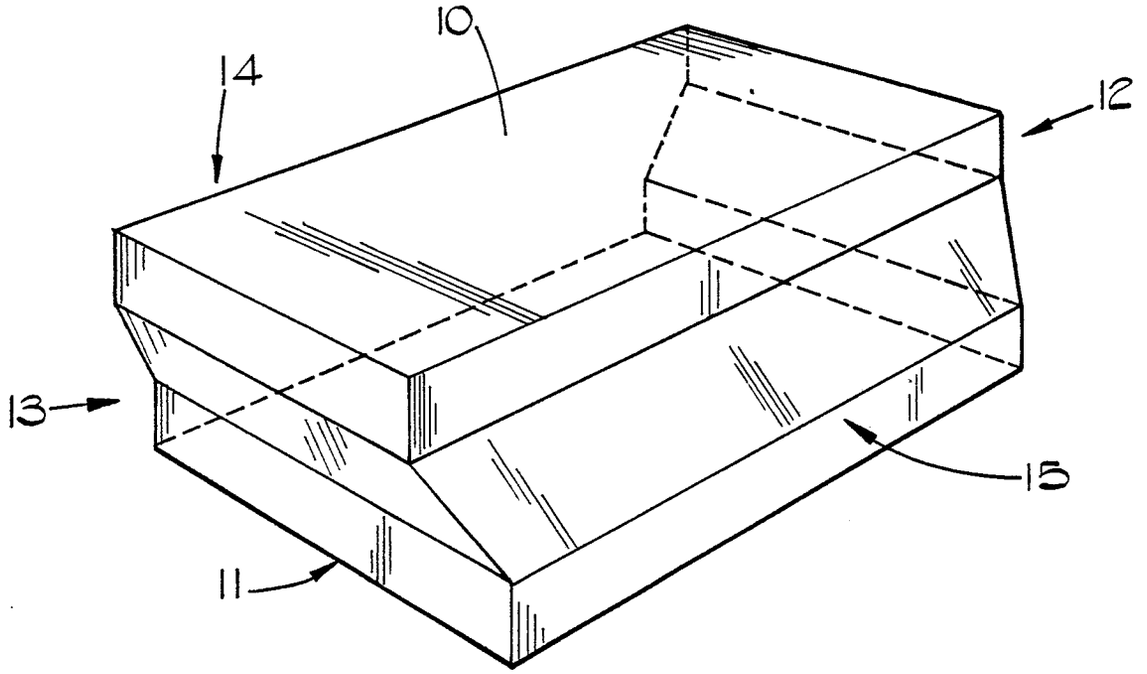


FIG.1.

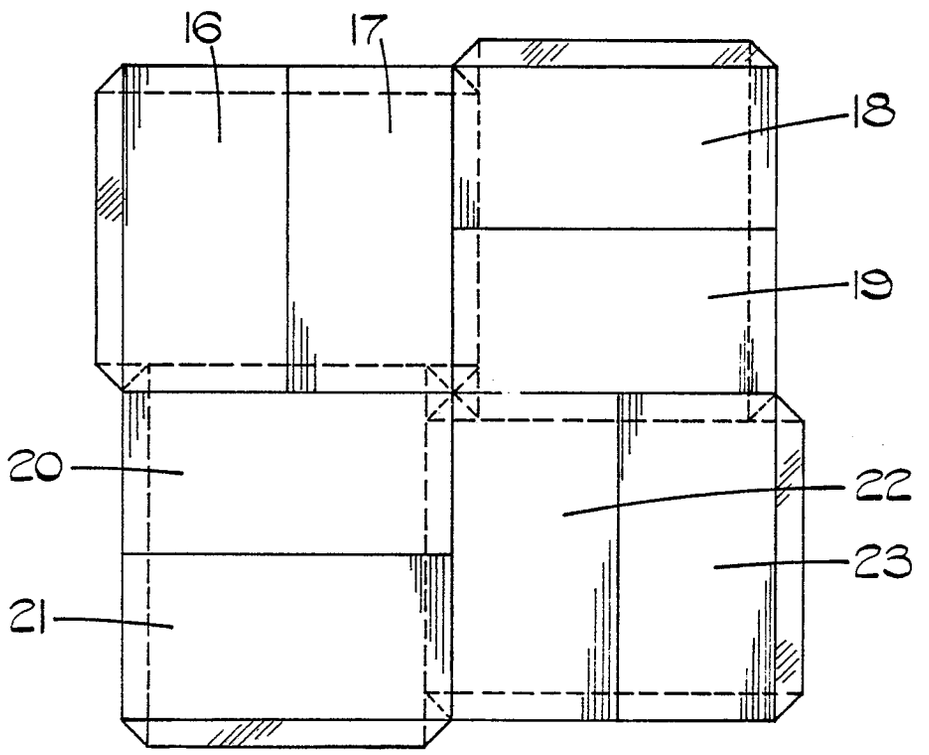


FIG.2.

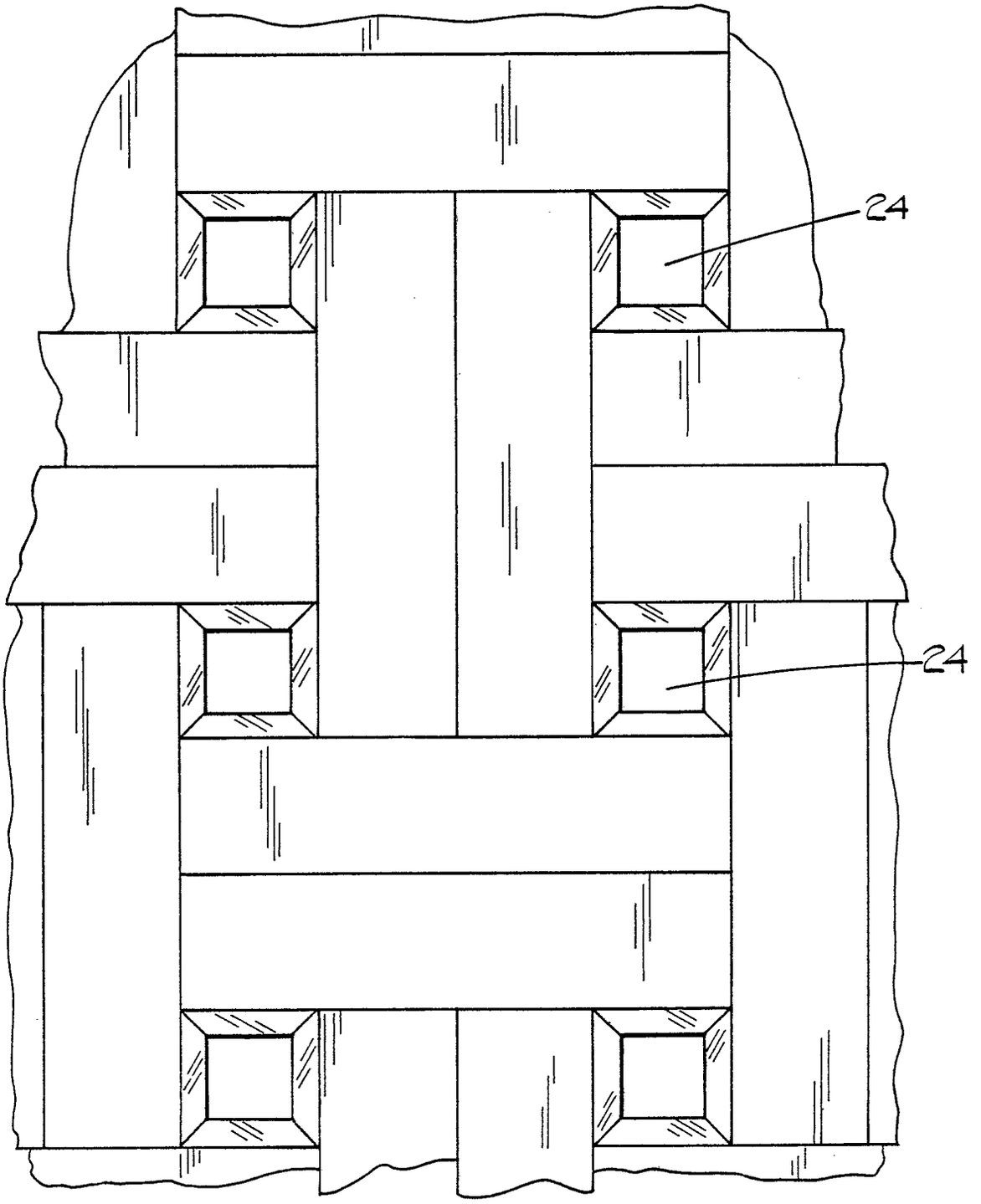


FIG.3.

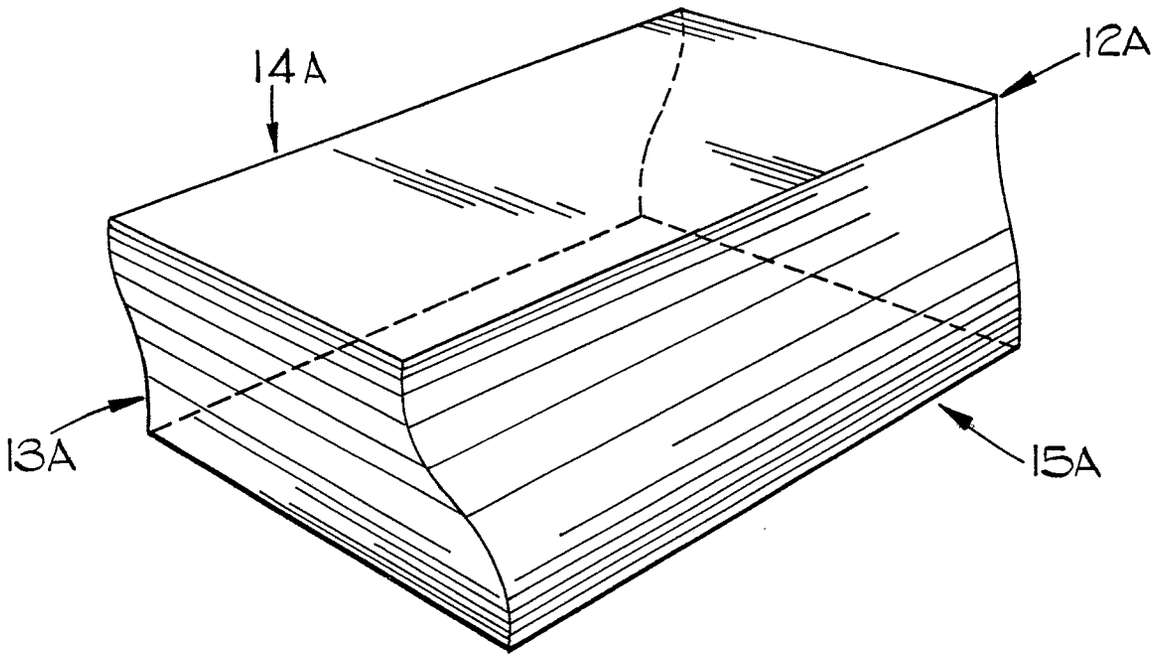


FIG. 4.

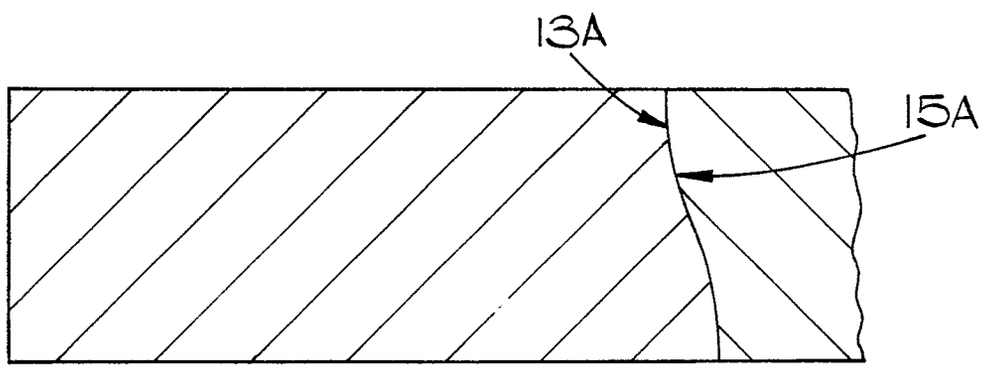


FIG. 5.

0164264

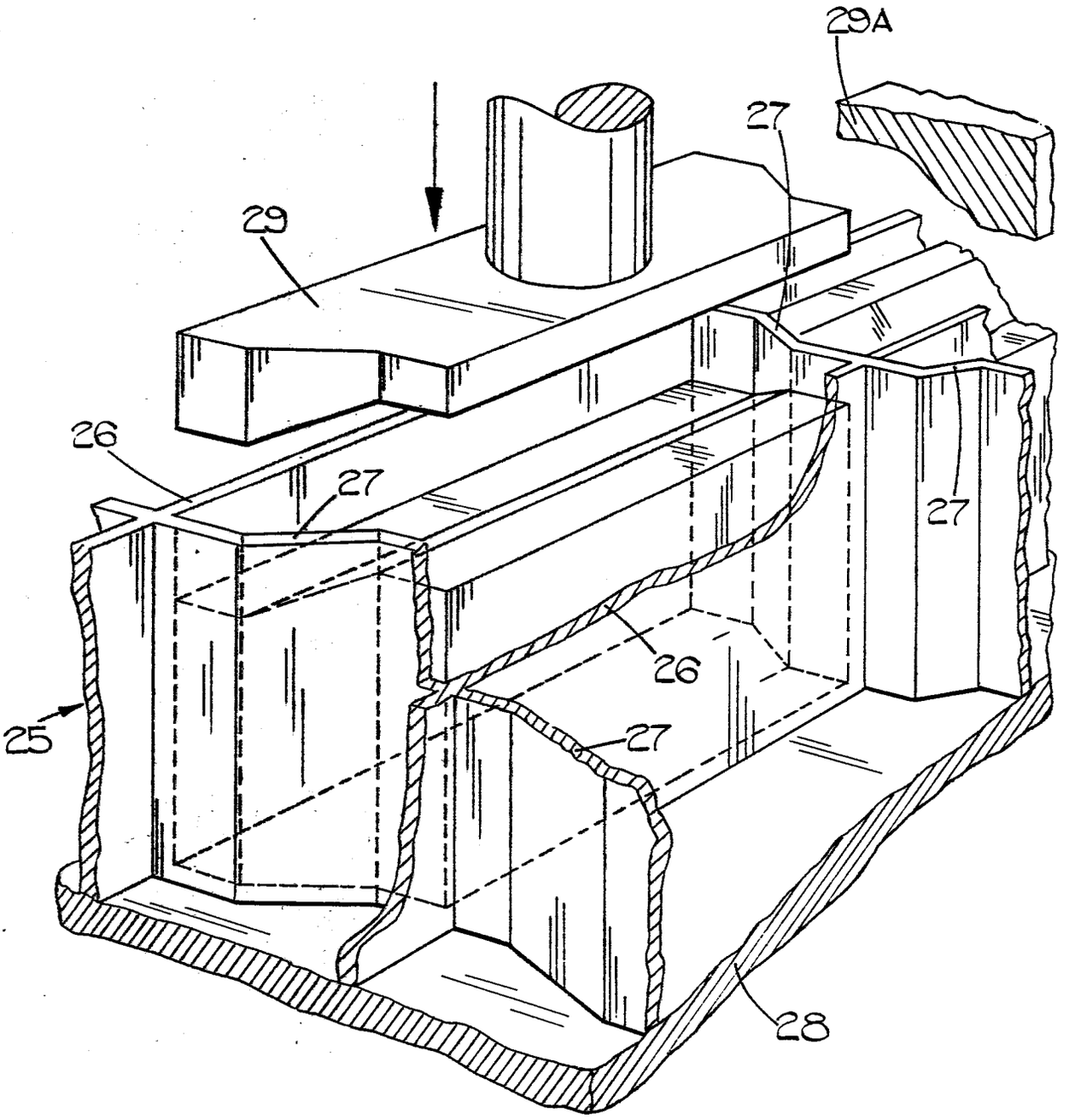


FIG.6.