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(54) **Method and means for constructing masonry walls**

(57) A spacer/centering element comprising, preferably on its periphery and/or close thereto, feet (5) as zonal resting intermediaries for blocks (1) pertaining to two superposed rows and, on one side thereof, first

centering means (6a) for engaging a hole (2, 3) in a block (1) and, on the opposite side thereof, second centering means (7a) offset from the first and arranged to engage a hole in an overlying block (Figure 1).

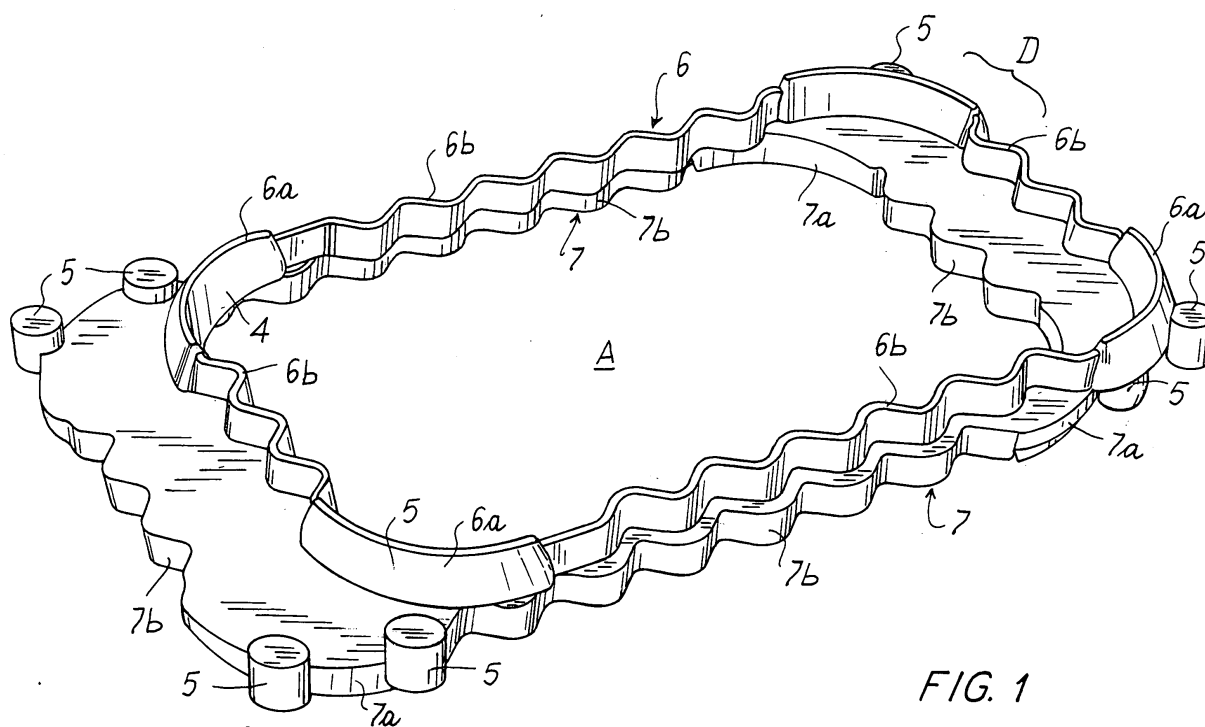


FIG. 1

Description

[0001] The present invention relates to a method and means for constructing masonry walls of prefabricated cementitious blocks.

[0002] The method currently used to construct masonry walls of cementitious blocks is based essentially on exhausting slow manual work. In this respect, on examining this method in detail it will be noted that the (qualified) bricklayer applies to the upper face of a horizontal succession of blocks relatively thick runs of mortar along two sides of the blocks, which have already received a layer of mortar applied to one of their lateral faces to obtain a lateral bond between one block and the next. The bricklayer places on the resultant row of blocks a row of blocks offset from the underlying row, this operation involving:

- I. careful horizontal and vertical positioning of the individual blocks, and
- II. falling of the excess mortar, which not only soils the wall under erection but also constitutes an irrecoverable wastage, which is disposed of.

[0003] The main object of the present invention is to provide a method and means which represent an innovation compared with the aforescribed method and enable:

- A. a definite acceleration in the construction of the masonry wall;
- B. a simplification of this construction such that it can be carried out by unqualified personnel;
- C. a considerable saving in mortar consequent on the practical reduction in wastage;
- D. complete verticality of the masonry wall obtained.

[0004] These and further objects of the present invention are attained by the method and means in accordance with the accompanying claims.

[0005] The invention will be more apparent from the ensuing detailed description of preferred embodiments thereof provided by way of non-limiting example with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a spacer/centering element representative of the essence of the invention, the view showing one side of said spacer/centering element;

Figure 2 is a perspective view of the spacer/centering element taken on the opposite side;

Figure 3 is a schematic side view of three cementitious blocks partially shown by dashed lines, with an interposed spacer/centering element prior to injection of the consolidating mortar;

Figure 4 is a perspective view of a number of blocks arranged with the spacer/centering elements locat-

ed on the holes of these blocks;

Figure 5 is a perspective view from above of a partially reproduced block, the view showing the position of the underlying spacer/centering element in situ;

Figure 6 is a schematic view showing the finishing operation by injecting mortar into the interspaces between blocks using an injection machine schematically reproduced.

[0006] With reference to the figures, the cementitious blocks 1 with which a wall is to be erected are widely known and standardized; they are similar in shape to a right (rectangular) parallelepiped having two parallel through holes 2, 3 for lightening purposes separated by an intermediate internal wall 4. The holes are conical or tapered.

[0007] A row of blocks 1 with their minor faces side by side is laid on a predisposed cementitious bed or similar cementitious surface. This row of blocks forms the base from which the wall is erected by superposing rows of mutually offset blocks.

[0008] A spacer/centering element D (described in detail hereinafter) is positioned on the base blocks, i.e. the blocks of the lower row, in correspondence with the openings of each of their holes 2, 3. This spacer/centering element D, of annular shape (moulded in plastic material, for example filled polypropylene made fireproof) comprises, preferably peripherally and/or in proximity to the periphery, support feet 5 for example of cylindrical or pin shape, which rest along the contour of these openings, these latter having rectilinear sides connected together by arcuate corners (see Figure 5). The spacer/centering element D also presents (in this example) on one side (Figure 1) a first peripheral skirt 6 which follows the contour of the hole in the block and enters the hole itself (via said opening). In this manner the spacer/centering element D rests on and is centered about the underlying block.

[0009] On the row of base blocks arranged with the spacer/centering elements, without applying mortar the operator lays in an offset arrangement a second row of blocks, into the lower hole openings of which there is inserted a second skirt similar to the first but having a smaller contour substantially offset from said first skirt 6 by about the same amount as the blocks of the second row are offset from the underlying blocks.

[0010] This achieves verticalized centering of said second row of blocks. The blocks of this second row rest on the top of said peripheral feet 5 of the spacer/centering elements D. It is apparent that each of these feet acts as a support and spacer between one row and another of the blocks, to hence obtain the horizontal interspaces A between one row of blocks and the next.

[0011] When this second row of blocks has been superposed dry, i.e. without mortar, the spacer/centering elements D are placed in position (as already stated) in the upper openings of the holes 2, 3 of the second row

of blocks, a third row of blocks then being located in the aforesaid manner, then proceeding from row to row in the stated manner until a certain wall height is achieved, this height being related to or limited by the strength of those support feet 7 most loaded by the overlying weight. After this, mortar is injected into both the horizontal and vertical interspaces.

[0012] For the injection, a nozzle 8 is provided having a wide and narrow exit mouth 9 (similar to the interspaces) and fed with mortar from a vessel 10 by means of a screw feeder 13; the feed can be controlled by a valve (not shown). To the side of the nozzle 8 there is provided a profiled smoother bar 11 with which the external face of the injected mortar layer is finished.

[0013] As can be seen from the figures showing the spacer/centering element D, the skirts 6, 7 of the spacer/centering element D comprise rounded corner portions 6a, 7a with a tapered lead-in end to provide effective centering, and intermediate parts 6b, 7b of undulated shape. With their depressions and the facing surrounding surface of the hole in the block, the undulations form channels 13 (Figure 6) through which the mortar also reaches the sides of these holes, to give rise to the formation of inward projections when the mortar has set.

[0014] The injected mortar solidifies to replace the support feet 5 for the static support of the wall.

[0015] When one wall height has been finished, the wall erection can be continued until completion by proceeding in the aforesaid manner.

[0016] Finally it should be noted that in order to enable the blocks to be removed from their production moulds, their holes 2, 3 narrow from one end to the other. To take account of this the skirts 6 and 7 are of different perimeters but of substantially equal design (as can be seen especially from Figures 1, 2).

[0017] In a variant of the invention the undulations can be dispensed with, the centering function being entrusted to only the corner portions 6a, 6b.

[0018] The spacer/centering element D defines an aperture A to enable possible passage of reinforcing rods for constructing pillars obtainable, as in the known art, by casting cementitious mortar into the holes 2, 3 of the blocks, which are virtually superposed in the erected wall.

Claims

1. A method for constructing a wall with prefabricated cementitious blocks in the form substantially of a right prism and provided with through lightening holes, which extend vertically in the constructed wall, in which the blocks are arranged offset from row to row, **characterised by** zonally resting, on the contour of the openings in the through holes of the blocks of one row, spacer/centering elements provided with first parts engaging in said holes for the purpose of centering said elements, on said one

row there being superposed a second row of blocks to zonally rest on said spacer/centering elements, which are provided with second parts engaging in the holes of said second row for the purpose of centering the blocks of the second row, said operations involving said spacer/centering elements being repeated until at least a part of the wall has been erected, in the wall or its thus erected part there appearing interspaces (F) between the rows of blocks, which are sealed by injecting mortar thereinto.

2. A spacer/centering element for implementing the method claimed in the preceding claim, **characterised by** comprising, preferably on its periphery and/or close thereto, feet (5) as zonal resting intermediaries for blocks (1) pertaining to two superposed rows and, on one side thereof, first centering means (6a), for engaging a hole (2, 3) in a block (1) and, on the opposite side thereof, second centering means (7a) offset from the first and arranged to engage a hole in an overlying block.
3. A spacer/centering element as claimed in claim 2, wherein the first and second centering means (6a, 6b) are skirts (6, 7) or parts thereof shaped in accordance with at least part of the profile of the hole (2, 3) of the block (1) in which they are to engage.
4. A spacer/centering element as claimed in claims 2 and 3, wherein the feet (5) are pin shaped and are at least partly disposed along the outer contour of said element.
5. A spacer/centering element as claimed in the preceding claims, wherein the skirts (6, 7) comprise undulating intermediate parts or portions (6b, 7b) to enable injected mortar to also pass into the interior of the holes (2, 3) in the blocks when the spacer/centering element has been mounted.
6. A spacer/centering element as claimed in the preceding claims, **characterised by** bounding a central aperture.
7. A spacer/centering element as claimed in the preceding claims, **characterised by** being moulded of fireproof plastic material.

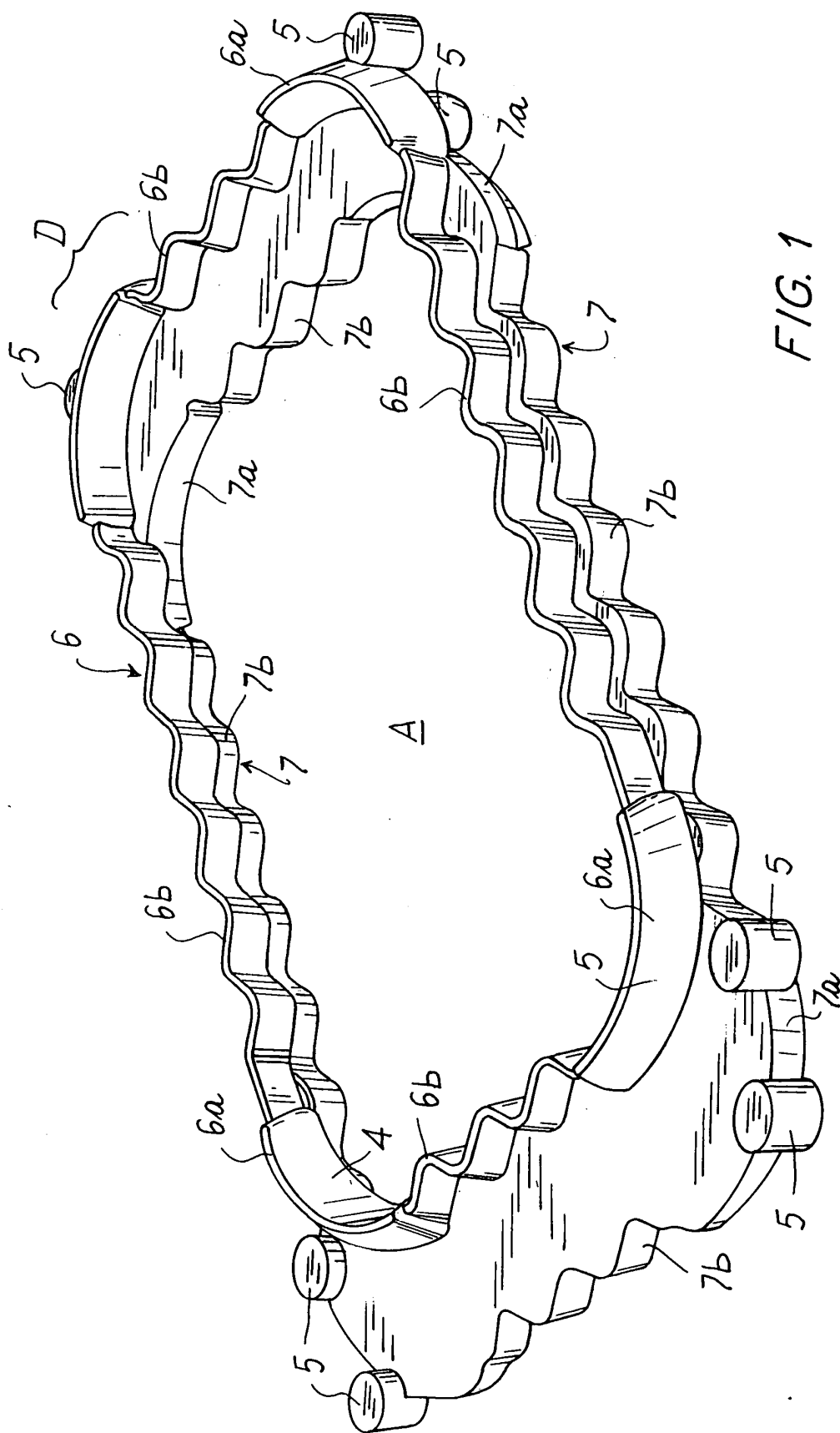


FIG. 1

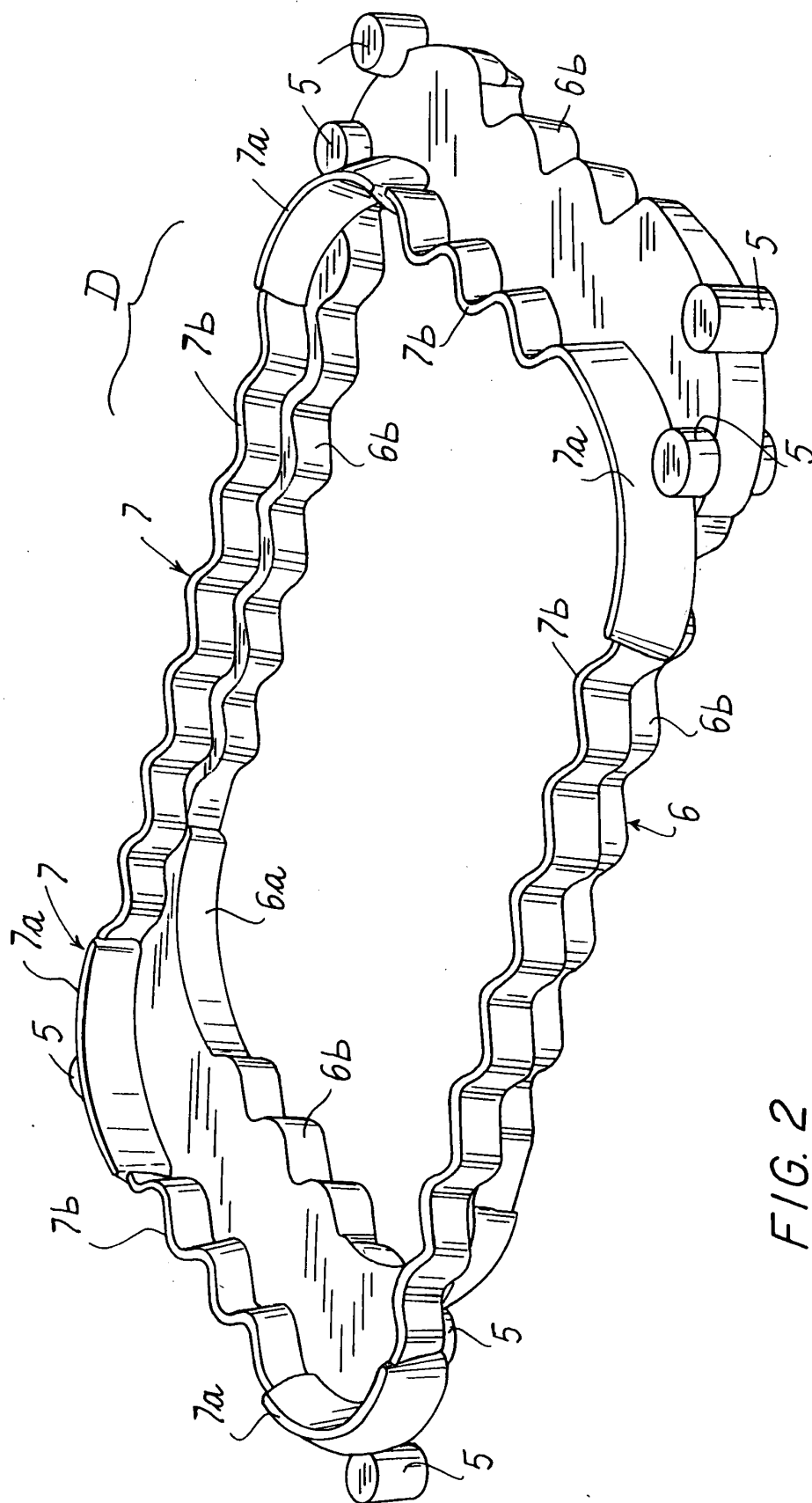


FIG. 2

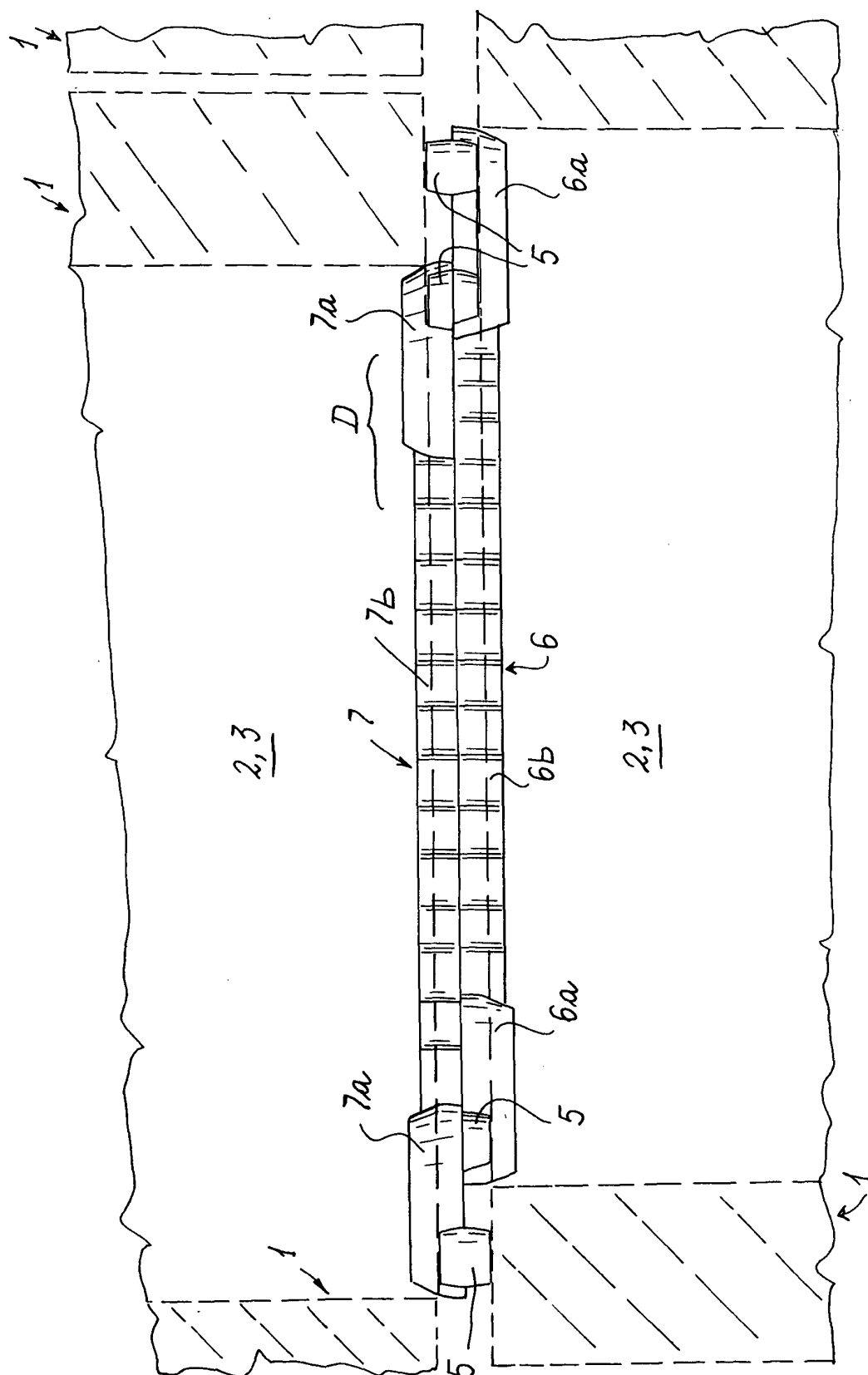


FIG. 3

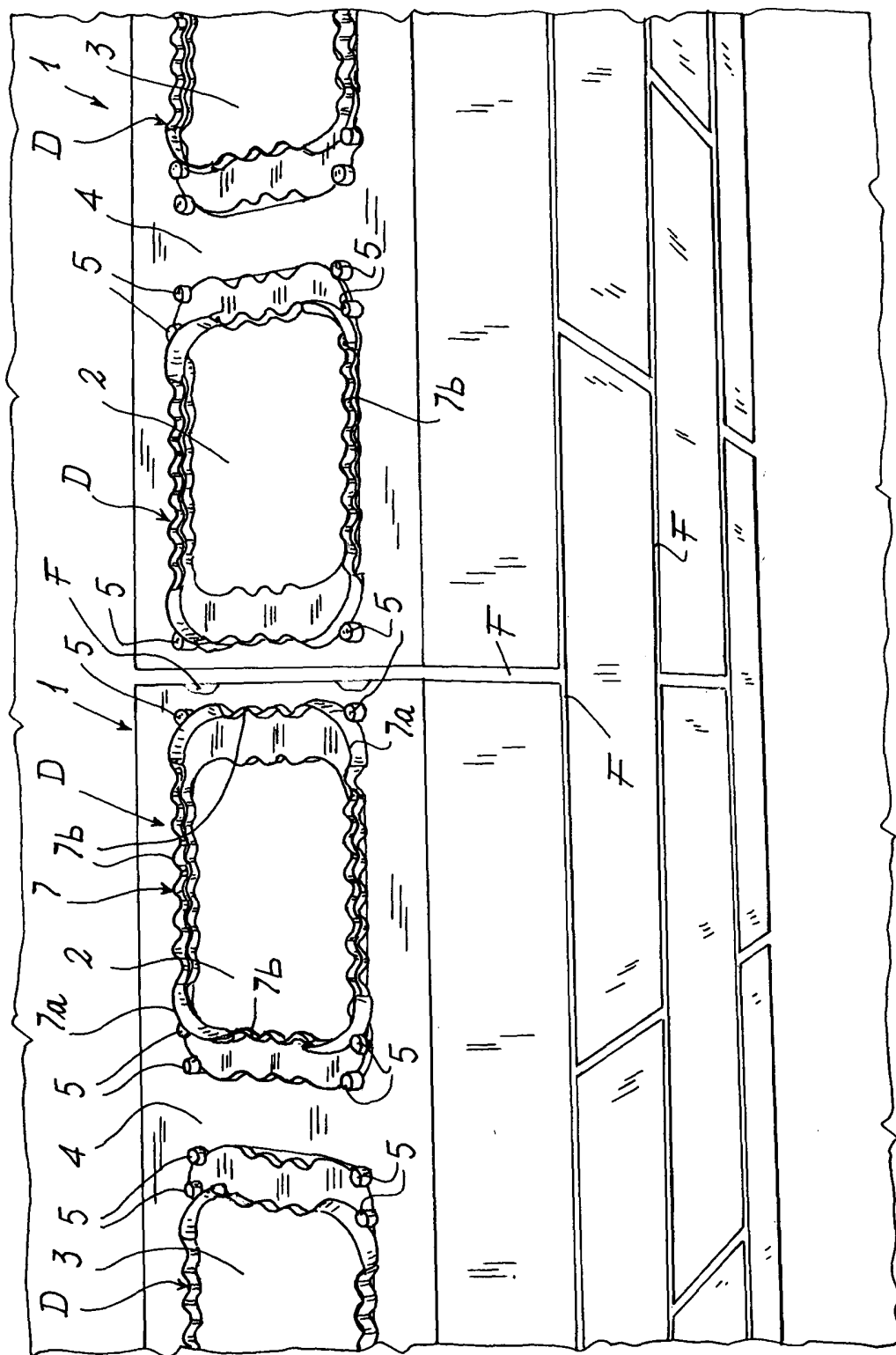
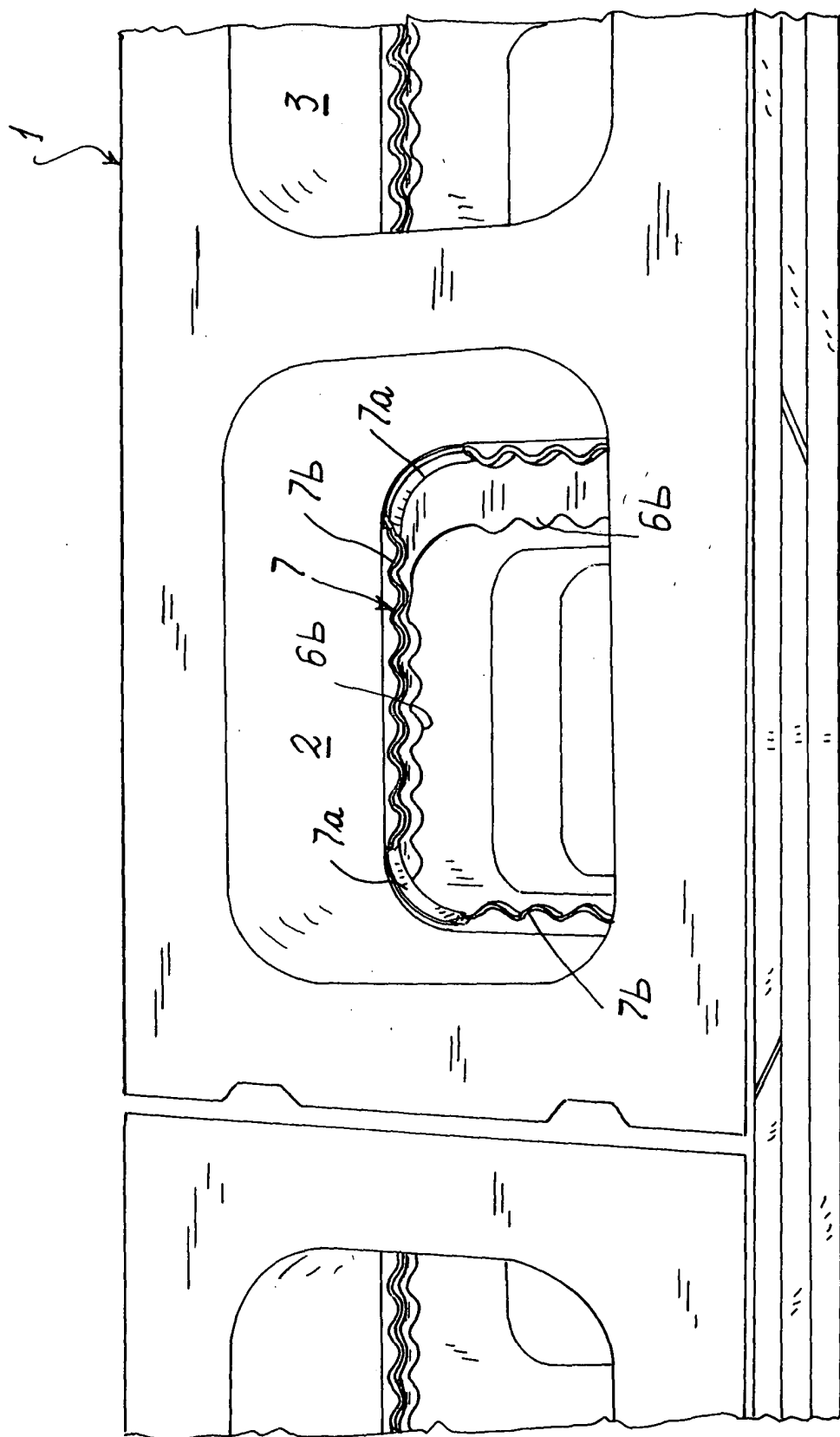


FIG. 4



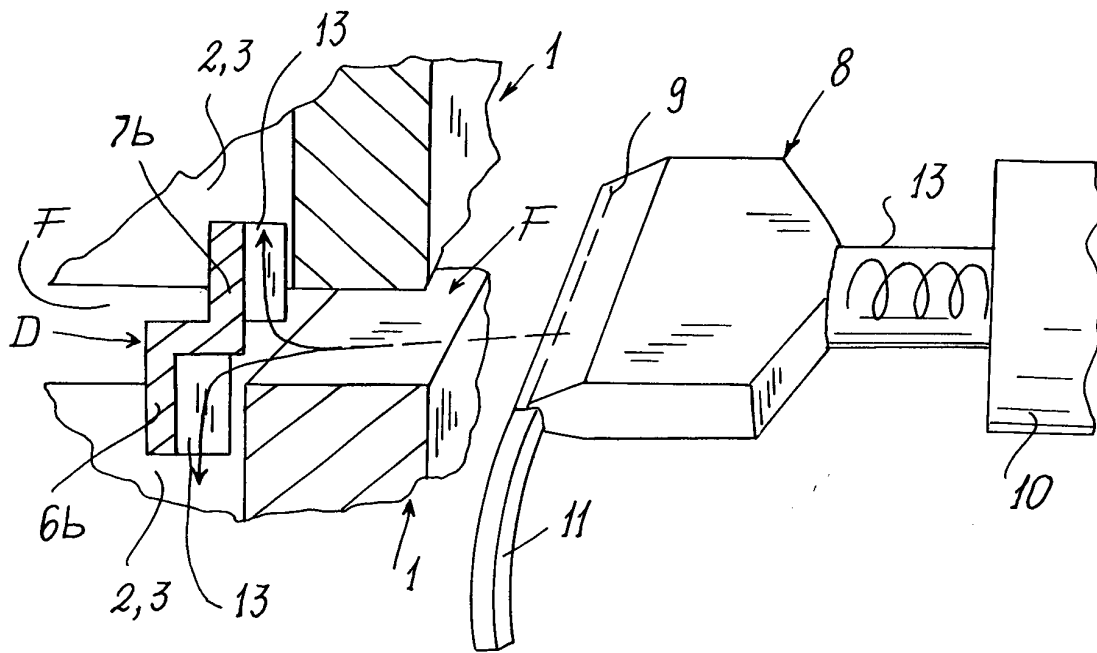


FIG. 6



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 03 02 3026

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y	US 4 091 587 A (DEPKA) 30 May 1978 (1978-05-30)	1	E04B2/14
A	* column 2, line 51 - column 5, line 15; figures 1,9-11 *	2,5-7	
Y	DE 35 07 531 A (KASAMENTBAU GMBH) 4 September 1986 (1986-09-04) * claim 2; figures 1,3 *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			E04B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		21 January 2004	Mysliwetz, W
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 03 02 3026

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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21-01-2004

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4091587	A	30-05-1978	NONE	
DE 3507531	A	04-09-1986	DE 3507531 A1	04-09-1986

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82