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

(11) **EP 1 975 334 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
01.10.2008 Bulletin 2008/40

(51) Int Cl.:
E04C 2/04 *(2006.01)*

(21) Application number: **07380130.0**

(22) Date of filing: **09.05.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK RS

(30) Priority: **28.03.2007 ES 200700834**

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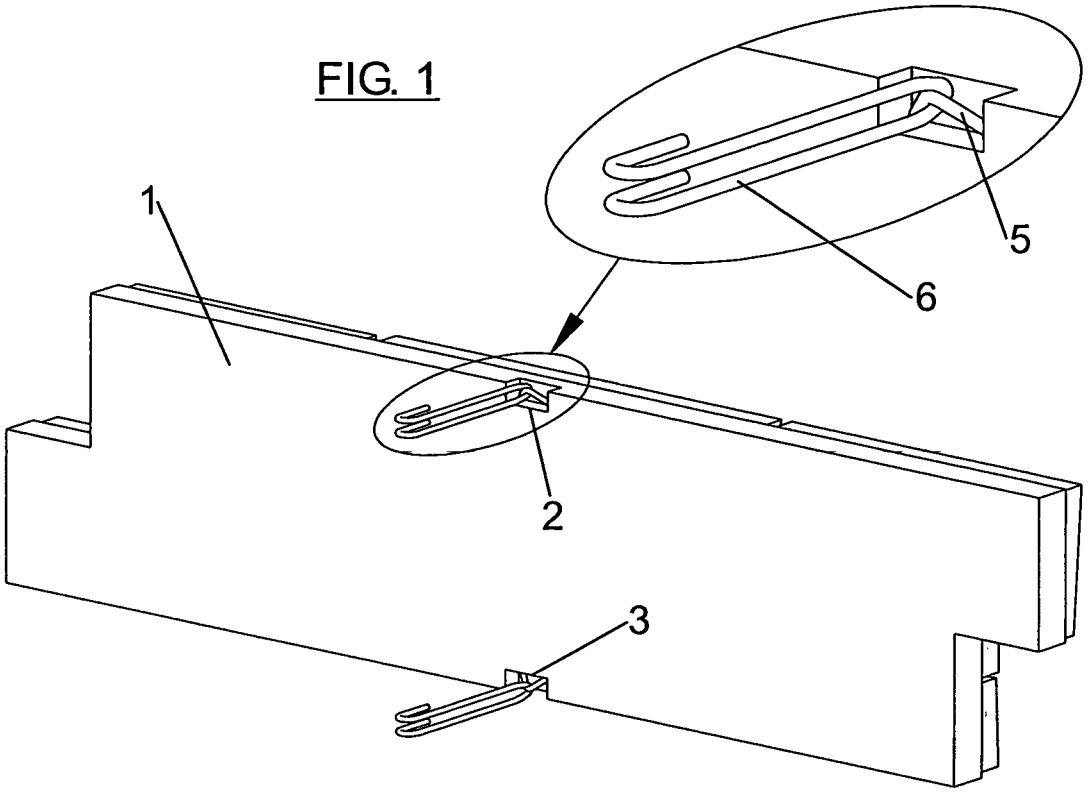
(54) **Prefabricated panel for wall construction**

(57) The invention relates to a prefabricated panel for wall construction, of the type formed by a base layer and another stone layer or the like, defining the visible face (104), in which the layer forming the visible face [104] of the panel [1] has a plurality of blocks or slabs (3) on the base layer (102), attached to one another and occupying virtually the entire contour of the mold, with the desired format for the panels and the inside being tightly filled with said blocks or slabs (103).

FIG. 1



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Description

Object of the Invention

[0001] The object of the present invention is to provide a new prefabricated panel for wall construction, offering a base layer and another natural stone layer defining the visible face. A mechanical anchor intended to support the external actions on each prefabricated element in the event of mortar failure has been incorporated in the manufacturing process.

[0002] The present invention can be applied in the field of construction, and more specifically in the construction of buildings based on prefabricated elements.

Background of the Invention

[0003] Prefabricated reinforced concrete panels with a natural stone visible face or the like, which were especially applicable in pavements, have been known up until now. The base is made of reinforced concrete and before it sets, the natural stone parts were placed, being correctly distributed in the surface of the mold prepared for that purpose, and the parts having a uniform distribution and the same geometric shape were placed with the aid of a metal template which was later removed.

[0004] Prefabricated panels are fixed solely and exclusively with mortar, i.e. the panels are fixed by mortar to the face, there being no additional securing means. In the event of mortar detachment, the panels would literally fall and this is unacceptable. The issue becomes worse when said prefabricated panel is placed at moderate heights.

[0005] For the last few years, construction quality standards have forced the use of metal wires by way of an anchoring hook in addition to the use of mortar in facades based on granite facing. Nevertheless, this solution is not suitable for prefabricated panels used as walls due to the heterogeneity of both the composition and the geometry of the prefabricated panel, which results in the intersection of weak areas where the anchoring is not possible.

[0006] Therefore, the inventors, who are persons skilled in the art, are not aware of any system or element including the features described below.

Description of the Invention

[0007] The prefabricated panel with a built-in anchor object of the present invention is provided to palliate the aforementioned problems.

[0008] The panel object of the present invention can be simply resinated, without mesh or cement, the slabs or blocks of natural stone being joined simply with resins.

[0009] The visible face is formed with a plurality of natural stone blocks or slabs, preassembled on the base layer and occupying virtually the entire contour of the mold which advantageously has a rectangular shape with the smaller sides being stepped. To that end, the stones are suitably cut and distributed, all the parts being attached and perfectly joined with the resins of the bottom layers.

[0010] The panels are finished after the demolding and drying time. It has also been foreseen that the contour of the panels has another geometric shape including a rectangular or square shape, and that the base layer can be made of reinforced cement with a metal mesh. The stones used are preferably slate, quartzite, limestone, sandstone, gneiss or granite.

[0011] The panel thus described comprises at least:

- one prefabricated panel for siding facades, such as that described;
- internal anchoring means;
- external anchoring means;

in which said internal and external anchoring means are intended to support the external actions on each prefabricated element in the event of mortar failure. In a first practical embodiment, the internal anchors are formed by a geometry manufactured of wire and embedded in the mortar layer of the prefabricated panel except in the end areas of the geometry. Two fixing points are obtained with the same part: one in the upper edge and the other in the lower edge. The fixing symmetry with respect to the length of the prefabricated part makes the reversibility in the assembly possible, thus conferring greater flexibility to the product.

[0012] The wire comprises a first vertex centered in an imaginary axis of symmetry. At the sides there are second vertices inclined with respect to the horizontal which will act as an anchoring point.

[0013] The design of the built-in wire leads to the existence of two areas resistant to the formation of the conical fracture of the mortar for each anchoring point corresponding to the second inclined vertices. Each fixing is thus joined to the mortar at two points. The described geometry minimizes the movement of the prefabricated panel with high loads due to the plastic deformation of the wire. The inclination of the ends with respect to the plane of the body of the wire allows ensuring the thickness of the mortar in the area thereof, acting as spacers in the process for manufacturing the assembly. This geometry allows maximizing the area of contact with the mortar, increasing the load necessary for the complete detachment of the prefabricated panel.

[0014] The external anchoring means comprise at least a double body hook fixed to the wall through a hole made therein.

[0015] The process for manufacturing the panel includes at last the following steps:

- placing a plurality of wires on blocks for supporting the wire at the bottom of the mold and on a first mortar layer; the wire and the blocks enter and exerting pressure against the walls of the mold, preventing

their movement;
- filling the mold, in which the mortar layer with a mesh preventing the retraction thereof in its curing is first poured and in which this layer is poured up to the height marked by the wire acting as a spacer, subsequently adding the finishing elements consisting of natural stone slabs;
- demolding the panel;
- setting;
- withdrawing the covering blocks for covering the ends of the anchors, removing the concrete and providing a space in which the ends of the anchors are accessible;

[0016] The advantages offered by the panel object of the invention comprise at least the following:

- Safety of use and anchoring of the prefabricated panel.
- Its presence does not alter the external dimensions of the prefabricated panel.
- it does not require joints between prefabricated panels such that the natural appearance of the final finishing is ensured.
- The fixing is strong and stable.
- The support of the assembly is carried out through the mortar and not through finishing elements of the visible face which may peel off, be brittle, discontinuous, etc.
- It maintains and ensures the thickness of the mortar in the anchor area and only in said area, allowing the remaining substrate of the prefabricated panel to absorb excess thicknesses in the finishing element.
- It does not require modifying the molds.
- It does not require carrying out any type of machining or alterations after the manufacturing process.

Brief Description of the Drawings

[0017] A series of drawings is very briefly described below which aid in better understanding the invention and which are expressly related to an embodiment of said invention which is set forth as a non-limiting example thereof.

- Figure 1 shows a schematic perspective view of the prefabricated panel object of the present invention, with the built-in anchor.
- Figure 2 shows a view of the external anchoring means.
- Figure 3 shows a plan profile view of the wire comprised in the internal anchoring means.
- Figure 4 is a schematic view of the mold for manufacturing the panel, in a first phase, with the built-in internal anchor.
- Figure 5 is a perspective view of an already finished prefabricated panel for wall construction.
- Figure 6 is longitudinal elevational view of the same panel of Figure 5.
- Figure 7 is a partial elevational view of a wall built with the panels object of the present invention.

Preferred Embodiment of the Invention

[0018] As can be seen in Figure 1, the prefabricated panel with a built-in anchor comprises at least:

- one prefabricated panel (1);
- internal anchoring means (5);
- external anchoring means (6);

in which said internal anchoring means (5) are embedded in the panel (1), said internal anchoring means (5) comprising at least two vertices (4) visible at the upper (2) and lower (3) edges of the panel (1), and in which said vertices (4) of the internal anchoring means (5) are the anchoring point with the external anchoring means (6) enabling the joining between the assembly formed by the panel (1) with the internal anchoring means (5) and the wall.

[0019] As can be seen in Figure 2, the external anchoring means (6) comprise at least one hook with a first joining area (61) for the joining to the internal means (5) and a second joining area (62) for the joining to the wall, both areas being opposite to one another.

[0020] In a preferred embodiment, said hook is a double hook, in which the vertex of the first joining area (61) for the joining to the internal means (5) defines the axis of symmetry of the hook.

[0021] The internal anchoring means (5) in its practical embodiment as an open polygonal-shaped wire can be seen in Figure 3. Said wire comprises two vertices (4) inclined an angle (α) with respect to the horizontal plane. There is a joining and reinforcing vertex (7) centered in the axis (8) of symmetry.

[0022] The design of the built-in wire leads to the existence of two areas resistant to the formation of the conical fracture of the mortar and for each anchoring point, defined by the vertices (4) of the internal anchoring means (5). Each fixing is thus joined to the mortar forming the panel (1) at two points.

[0023] The process for manufacturing the panel (1) includes at least the following steps:

- placing at least one internal anchoring means (5) on support blocks (10) at the bottom of the mold (9) and on a first mortar layer; and in which the internal anchoring means (5) and the blocks (10) enter and exert pressure against the walls of the mold (9);
- filling the mold (9), in which the mortar layer with a mesh preventing the retraction thereof in its curing is first poured and in which this layer is poured up to the height marked by the internal anchoring means (5) acting as a spacer, subsequently adding the finishing elements;

- demolding the panel (1);
- setting the panel (1);
- withdrawing the covering blocks (10) for covering the ends of the internal anchoring means (5), removing the concrete and providing a space in which the vertices (4) of the internal anchoring means (5) are accessible at the upper and lower edges of the panel;

[0024] The number of internal anchoring means (5) to be used is proportional to the load that the panel (1) must support.

[0025] Figures 5 and 6 show the prefabricated panel (1) for wall construction according to the invention, in which a base layer [102] for gripping the natural stone slabs [103] forming the visible face (104) and fixed to the base layer [102] is observed.

[0026] The rectangular shape with the smaller sides being stepped for determining encasing and locking means with the adjacent panels can be seen in Figure 7. The natural stone finishing is arranged by the operators in a very tight manner inside the mold, cutting the slabs [103] as needed.

Claims

1. A prefabricated panel for wall construction, of the type formed by a base layer and another stone layer or the like, defining the visible face (104), **characterized in that** the layer forming the visible face [104] of the panel [1] has a plurality of blocks or slabs (3) on the base layer (102) attached to one another and occupying virtually the entire contour of the mold, with the desired format for the panels and the inside being tightly filled with said blocks or slabs (103).

2. A prefabricated panel for wall construction according to claim 1, **characterized in that** it comprises at least:

- internal anchoring means (5);
- external anchoring means (6);

in which said internal anchoring means (5) are embedded in the panel (1), said internal anchoring means (5) comprising at least two vertices (4) visible at the upper (2) and lower (3) edges of the panel (1), and in which said vertices (4) of the internal anchoring means (5) are the anchoring point with the external anchoring means (6) enabling the joining between the assembly formed by the panel (1) with the internal anchoring means (5) and the wall.

3. A prefabricated panel according to claim 2, **characterized in that** the external anchoring means (6) comprise at least one element with a first joining area (61) for the joining to the internal means (5) and a second joining area (62) for the joining to the wall.

4. A prefabricated panel according to claim 2, **characterized in that** the element comprised in the external anchoring means (6) is a double hook, and in which the vertex of the first joining area (61) for the joining to the internal means (5) defines the axis of symmetry of the hook.

5. A prefabricated panel according to claim 2, **characterized in that** the internal anchoring means (5) comprise an open polygonal-shaped wire which in turn comprises two vertices (4) inclined an angle (α) with respect to the horizontal plane and a vertex (7) centered in the axis (8) of symmetry.

6. A prefabricated panel according to claim 6, **characterized in that** the vertices (4) define the anchoring points of the internal anchoring means (5), providing two areas resistant to the formation of the conical fracture of the mortar.

7. A prefabricated panel according to claim 1, **characterized in that** it has a rectangular contour with the smaller sides being stepped for determining encasing means between adjacent panels (1).

8. A prefabricated panel according to claim 1, **characterized in that** the natural stone slabs (103) are selected from:

- quartzite;
- limestone;
- sandstone;
- slate;
- gneiss;
- granite;

9. A prefabricated panel according to claim 1, **characterized in that** the base layer (102) for joining natural stone slabs (103) is selected from:

- resin;
- reinforced cement.

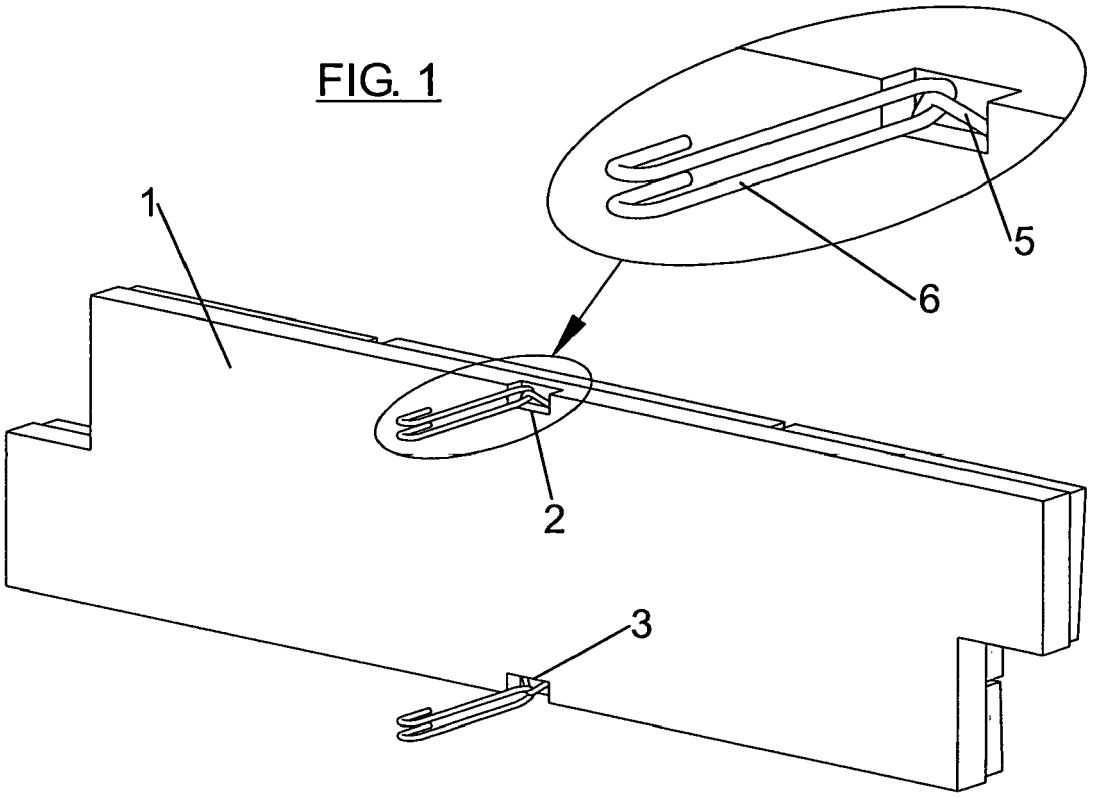
10. A process for manufacturing the prefabricated panel described in claims 1 and 2, **characterized in that** it comprises at least the following steps:

- placing at least one internal anchoring means (5) on support blocks (10) at the bottom of the mold (9) and on a first mortar layer; and in which the internal anchoring means (5) and the blocks (10) enter and exert pressure against the walls of the mold (9);
- filling the mold (9), in which the mortar layer with a mesh preventing the retraction thereof in its curing is first poured and in which this layer is poured up to the height marked by the internal anchoring means (5) acting as a spacer, subse-

quently adding the finishing elements;
- demolding the panel (1);
- setting the panel (1);
- withdrawing the covering blocks (10) for covering the ends of the internal anchoring means (5), removing the concrete and providing a space in which the vertices (4) of the internal anchoring means (5) are accessible at the upper and lower edges of the panel.

11. A process for manufacturing the prefabricated panel described in claim 10, **characterized in that** the number of internal anchoring means (5) to be used is proportional to the load that the panel (1) must support.

FIG. 1



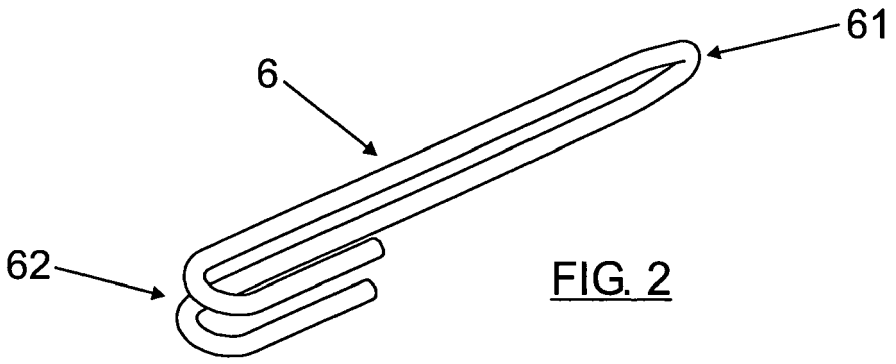


FIG. 2

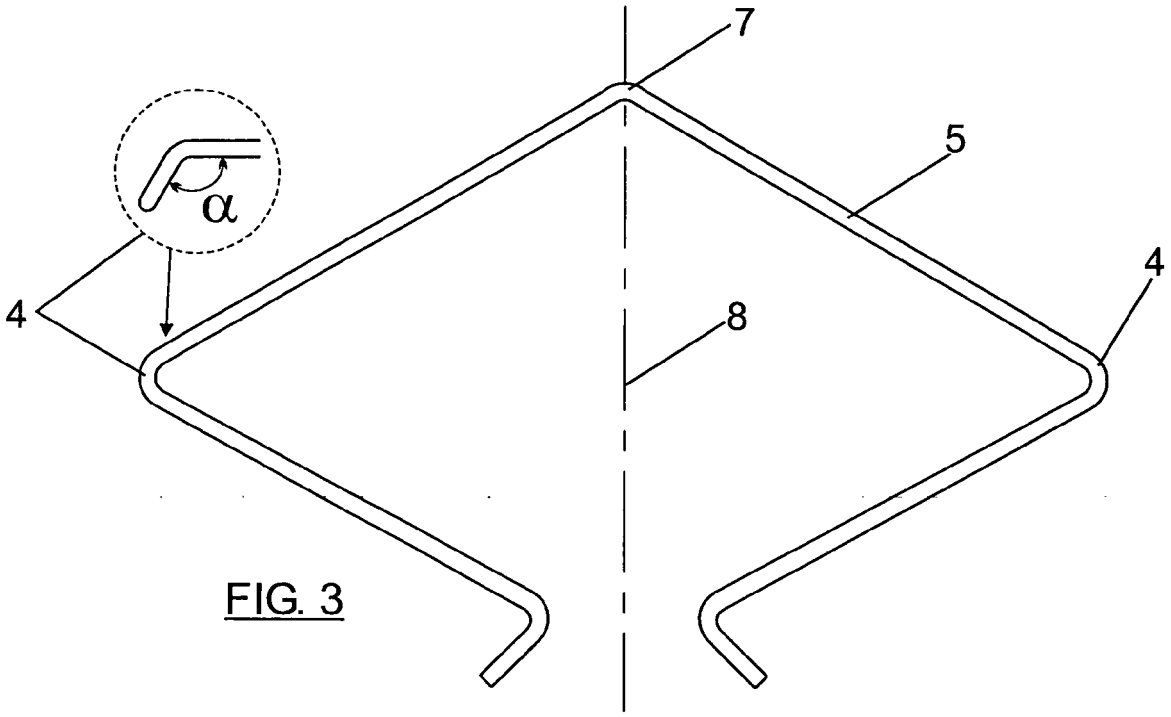


FIG. 3

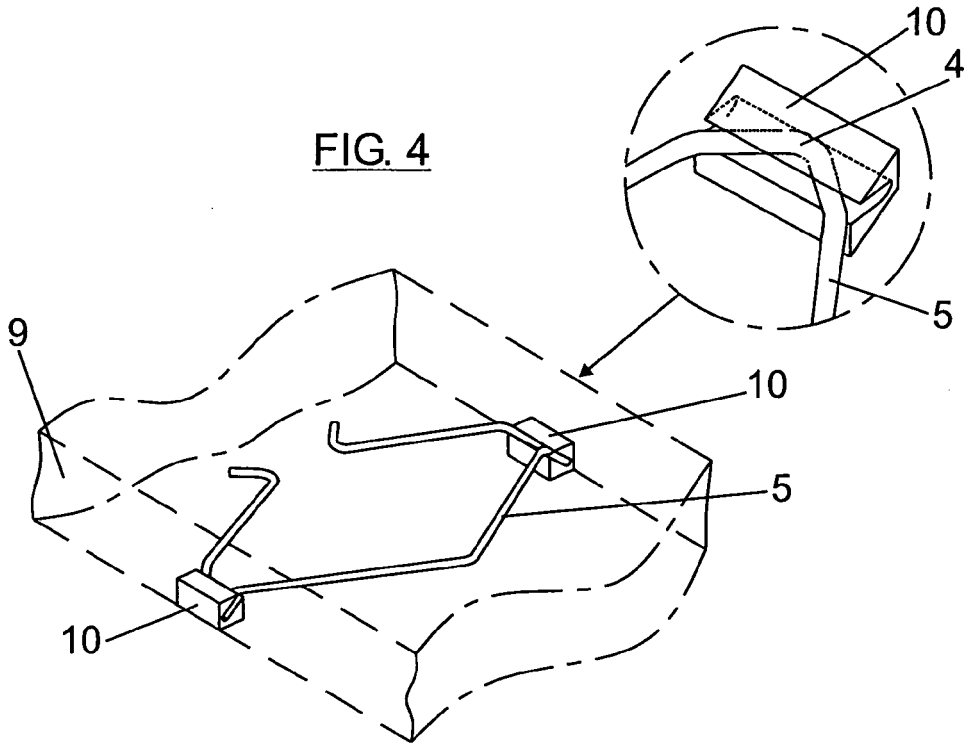


FIG. 4

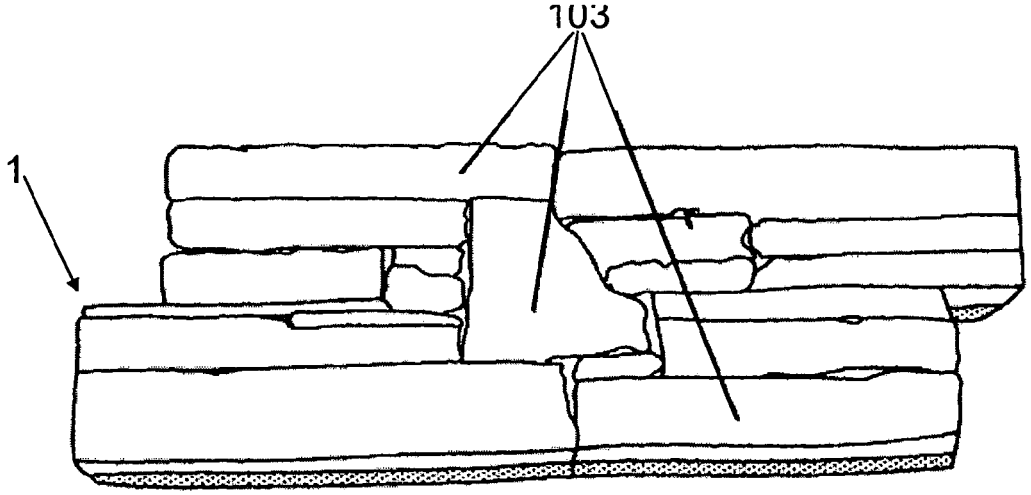


FIG. 5

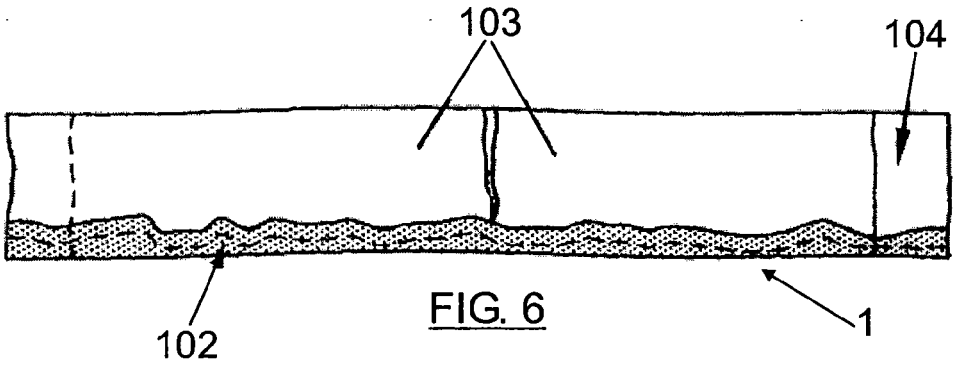


FIG. 6

FIG. 7