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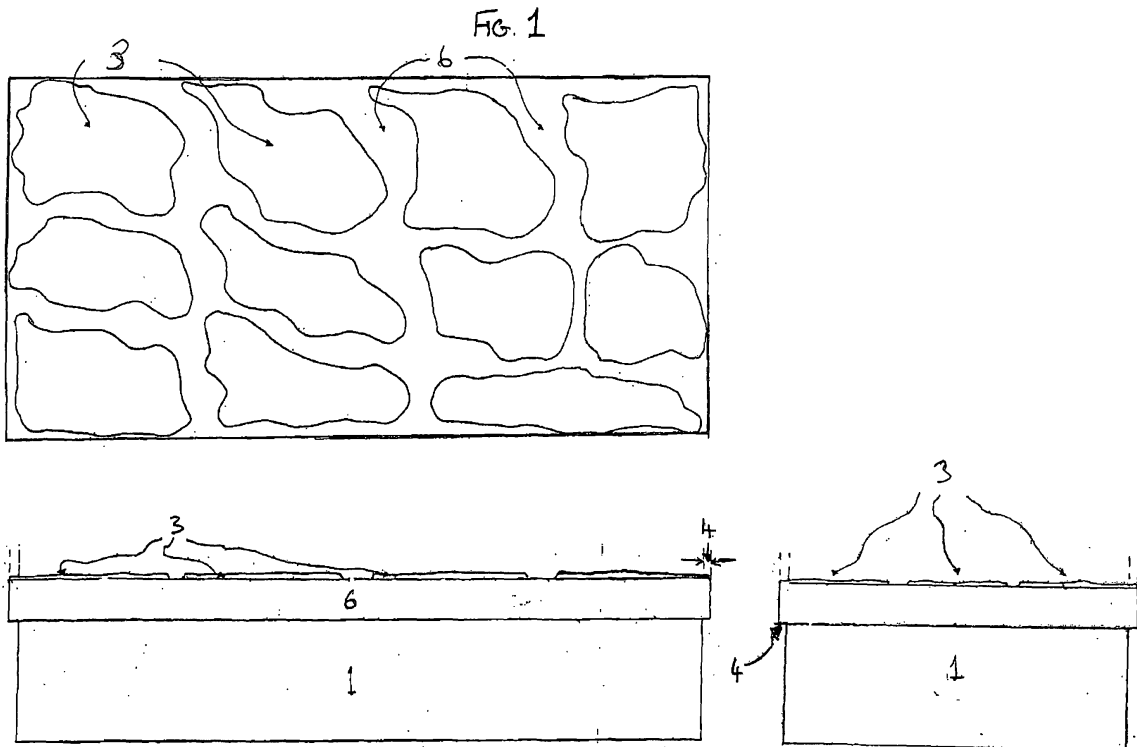
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**(54) Decorative load bearing blocks**

(57) A block according to the present invention comprises a load bearing body 1 onto the surface of which is provided a decorative facing 2 comprising a number of flint or similar mineral pieces 3 set into a pointing mixture. The mould optionally has a peripheral lip extending from the upper surface into which pieces of flint or similar

mineral pieces 3 can extend. The hand set mineral pieces provide a slightly irregular shaped periphery to the top surface of the facing block. Blocks can be then matched such that protrusions from one block can be aligned with indentations on adjacent blocks. The inclusion of a pointing mixture provides an appearance of a finished building structure, without the need for further pointing.



**EP 1 785 537 A2**

## Description

**[0001]** This invention relates to facing blocks of the type used in the construction of buildings and structures to provide natural stone effects generally on the external surfaces of the building or structure but which can also be used internally as décor finishes or feature claddings or coverings such as fireplace surrounds etc.

**[0002]** In older villages and towns it is not uncommon to find buildings and structures built with a decorative arrangement of natural stone, pebbles, flint and the like laid up with mortar. The random arrangement of differently shaped and/or coloured pieces results in an attractive ruralistic appearance and is often admired by onlookers.

**[0003]** Over the years, this natural stone and mortar method has been used less and less primarily because it is a labour intensive, time consuming building method, which is highly reliant on dry conditions for its successful completion. Consequently, it is an expensive building process. In recent years, such methods have been replaced by cheaper, faster more versatile building methods and materials such as bricks, concrete building blocks and various prefabricated structures.

**[0004]** In recent years products have become available which combine the aesthetic properties of natural stone methods with the convenience of modern methods. An example of this type of product is the Dorset Flintblock, one of a range of products manufactured by Dorset Flint and Stone Blocks Limited. These products consist of moulded blocks of concrete into one surface of which a decorative arrangement of pieces of natural stone, pebbles, flint and the like are hand-set. The blocks can then be assembled into a building structure using methods similar to those conventionally used with plain concrete blocks, the decorative surface facing externally in the wall structure to provide an appearance of a natural stone built wall. Similar products incorporate pebble, cobble and sand stone facings. Man made "look a like" materials may also be used to provide the decorative surface. Blocks such as these can be used in load bearing applications thus minimising the need for internal structural support.

**[0005]** Conventionally, simple square or rectangular shaped metal moulds are used to shape the blocks, the moulds being disassembled from the set concrete to release the block. Different shapes or patterns of stone work can be achieved by inserting shaped polystyrene pieces or similar or other types of material in strategic places about the mould to define the desired shape of the end product or different mould shapes can be used if required.

**[0006]** The set pieces of stone may be treated to improve or change the natural appearance of the stone, for example by staining, polishing or varnishing or it can be worked with tools which is generally known as dressing the stone. Alternatively the stone may be presented as it appears naturally, or undressed. Alternatively other

materials may be set as required.

**[0007]** The simple shape of these stone faced blocks render them far easier to assemble into building structures than randomly shaped stone pieces. The blocks can be assembled using all-weather techniques conventionally used for plain concrete block and brick building providing a simple and cost effective route to an attractive, traditional or modern decorative external wall surface.

**[0008]** In the Applicant's previous patent GB 2 356 875 a problem addressed is the additional weight added to a typical sized concrete block by the inclusion of stone pieces on the surface. Often the most commonly used sizes of blocks are too heavy for a single person to handle and position safely. Also, whilst the stone pieces on the surface of an individual block can be randomly spaced to provide a realistic stone built effect, the rectangular outline of the individual blocks can sometimes be seen to disrupt the random appearance on a completed surface comprising a number of the blocks. In that patent, the problem is addressed by providing a decorative building block comprising; a supportive load bearing body having set into at least one surface a decorative arrangement of mineral pieces wherein the load bearing body comprises a mixture of a cement and lightweight aggregates.

**[0009]** The present invention provides a block which enables a builder to more quickly and cost effectively construct a wall or structure with a finished appearance. The invention is applicable to regular weight blocks and the lightweight blocks described in the Applicant's earlier patent GB 2 356 875.

**[0010]** In accordance with a first aspect of the present invention, there is provided a decorative building block comprising; a supportive load bearing body, a layer of pointing mix set onto at least one external surface of the load bearing body and a decorative arrangement of mineral pieces set into the aforesaid external surface or surfaces.

**[0011]** In accordance with a second aspect of the present invention there is provided a method for the manufacture of a decorative building block, the method comprising;

- a) placing into a suitably configured mould a cementitious mixture to form the load bearing body of the building block;
- b) applying to at least one external surface of the cementitious mixture, a pointing mixture;
- c) setting into the surface or surfaces of step b) a plurality of mineral pieces, thereby to provide one or more decorative surfaces with the appearance of a finished, pointed building structure.

**[0012]** Desirably a further step d) Involves cleaning the exposed surfaces of the mineral pieces to remove any excess pointing mix. A preferred, yet optional cleaning method is brushing the decorative surface with a steel brush.

**[0013]** In a further optional step, the mineral pieces may be dressed or treated as previously described to change their cosmetic appearance.

**[0014]** Desirably, the pointing mixture is added to a surface of the cementitious mix while the load bearing body is still pliable. This has the advantage that the mineral pieces can be more deeply set into the surface, creating a more convincing three dimensional appearance of the completed block. The pointing mixture may be of any known composition including but not strictly limited to sand mortars of varying colours; sharp sand, lime and grit.

**[0015]** The composition of the cementitious mixture is immaterial it can be any mixture known to the construction industry used to produce load bearing blocks. Optionally, the mixture may comprise a lightweight composite such as that described in the Applicant's earlier patent GB 2 356 875 and protected by the Applicant's trade mark TRAD-LITE®.

**[0016]** The mould is conveniently, but not essentially comprised of a flexible, peelable material such as rubber.

**[0017]** The completed blocks may be assembled into a building structure by placing them adjacent one another with their decorative surfaces in alignment and by bonding the adjoining edges of the blocks with a bonding agent, for example but not strictly limited to mortar, or a resin.

**[0018]** As described in the Applicant's earlier patent GB 2 356 875, the mould and block may, optionally, be provided with a peripheral lip to enable the decorative pieces to overhang the main body of the block and allow overhanging mineral pieces on adjacent blocks to be interleaved and provide a more random appearance in a finished structure built from the blocks. To accommodate the pointing mixture, the lip may have slightly larger dimensions than stated in our earlier GB patent GB 2 356 875. For example, the lip may extend by anything from about 1mm to about 10mm beyond the load bearing body of the block. Optionally, the lip may comprise solely of pointing mixture and mineral pieces, the cementitious mix being confined to the main load bearing body of the block.

**[0019]** The lip on the mould allows a decorative surface which extends slightly beyond the perimeter of the load bearing body, this enables some of the set decorative mineral pieces to be positioned to overhang the edge of the load bearing block. When two or more blocks are adjoined, say in building a wall, the overhanging mineral pieces can be aligned to fit into gaps on adjacent blocks. This results in a less apparent demarcation between blocks and a more random overall pattern of pieces on the completed wall surface.

**[0020]** As discussed in GB 2 356 875, the mould for the load bearing body is provided with a peripheral lip sufficiently deep to receive pieces of mineral to be used in the decorative facing. Whilst the peripheral lip is conveniently provided about a top surface of the block, it may be provided in a plane below that surface.

**[0021]** Also as described in the Applicant's earlier pat-

ent GB 2 356 875, the block may, optionally, be provided with a frog incorporated around the periphery of the block.

**[0022]** The frog is incorporated around the periphery of the block between the outer facing decorative surface and the inner-facing surface of the block. The frog is provided in the form of a groove of any suitable cross section such as a V or rectangle or square, preferably the cross-section is arcuate, most preferably semi-circular. Whilst the frog may be incorporated at any position between the decorative surface and the inner surface, it is preferably positioned about midway between the two surfaces. The width and depth of the frog are not critical but they are preferably of the order of a few centimetres for the width and a few millimetres for the depth. The frog provides a keying surface for the mortar when the blocks are laid as the blocks have to be laid with reduced bed and perpendicular joints of ideally 5mm but between 2mm and 8mm (normally 10mm) to achieve the best results.

**[0023]** Conveniently, by using a suitably adapted mould, the lip and frog can be incorporated when the block is moulded. Most conveniently, the blocks can be moulded in a rubber or similar flexible mould, which can be peeled away from the set block without risk of damage.

**[0024]** In order to meet the requirements of British Standards and any other relevant regulations load-bearing blocks must be able to withstand any specified loads. The term "load-bearing body" as used herein should be interpreted accordingly. Varying proportions of cement and aggregates (both lighter and normal weight) may be used in the body, provided that set moulding meets the specified strength criteria. Typically, in order to be considered load bearing a block should be able to withstand a load of at least about 7N/mm<sup>2</sup>.

**[0025]** The decorative arrangement of mineral pieces may comprise pieces of flint, sandstone, limestone, pebbles, cobbles or any similar attractive naturally occurring or other artificial materials such as bottles etc., stone or mineral. The pieces may be whole, particularly in the case of cobbles and pebbles, or cut and may be dressed or undressed.

**[0026]** Optionally the decorative arrangement may be applied to two or more adjacent surfaces of the block to provide a corner, two sided, edge or end block.

**[0027]** For the purposes of clarification and exemplification, an embodiment of the invention will now be described with reference to the following Figures. Other embodiments will no doubt occur to the skilled addressee without departing from the true scope of the invention as defined by the appended claims.

Figure 1 shows a first embodiment of a block according to the present invention.

Figure 2 shows the block of Figure 1 in cross section

Figure 3 shows pairs of blocks according to the present invention before and after alignment to form a single wall surface.

Figure 4 shows a second embodiment of a block according to the present invention.

Figure 5 shows the block of Figure 5 in cross section.

**[0028]** As can be seen from Figure 1 a block according to the present invention comprises a load bearing body 1 onto a surface of which is provided a decorative facing 2 comprising a number of flint or similar mineral pieces 3.

**[0029]** The decorative pieces are set into an outermost layer of pointing mixture 6 of the block. The mould has a peripheral lip 4 extending from the upper surface into which pieces of flint or similar mineral pieces 3 can extend.

**[0030]** Figure 2 shows the block of Figure 1 in cross section. As can be seen, the decorative pieces are set deeply into the pointing mixture layer 6 and through into the top most surface of the load bearing body 1 which comprises the cementitious mixture.

**[0031]** Figure 3 shows the top face of two facing blocks according to the present invention. It can be seen that the hand set mineral pieces 3 provide a slightly irregular shaped periphery to the top surface of the facing block. Blocks can be then matched such that protrusions from one block can be aligned with indentations on adjacent blocks. As can be seen from Figure 3b this results in a far more random surface pattern when the blocks are laid together along a joint 7. The joint may be sealed by the provision of a bonding agent along the joint 7.

**[0032]** The block shown in Figures 4 and 5 is in most respects the same as that shown in Figures 1 and 2 but is distinguished by the provision of a rebate 8 or "half rabbit" which serves, when the edges of two blocks are abutted in a building structure, to create a channel to facilitate the insertion of pointing material to further improve and disguise the joints. The rebate is shown on an upper edge surface of the lip but may be provided on an outer edge surface of the lip. The cross section of the rebate shown is rectangular but may have any other suitably shaped cross section for example, but not strictly limited to; wholly or partly wedge shaped or wholly or partly curved.

**[0033]** It is to be understood that the embodiments described are provided purely by way of example and are not intended to restrict the scope of the invention as defined by the appended claims. In particular, it is made clear that the invention is applicable to any decorative building block including, but not strictly limited to, the lightweight blocks described in the Applicant's earlier patent and blocks wherein the load bearing body comprises a cementitious mixture including ordinary, heavyweight aggregates or an admix of them

## Claims

1. A decorative building block comprising; a supportive load bearing body, a layer of pointing mixture set

onto at least one external surface of the load bearing body and a decorative arrangement of mineral pieces set into the aforesaid external surface or surfaces.

2. A decorative building block as claimed in claim 1 wherein the decorative arrangement is applied to two or more surfaces to form a corner, two sided, end or edge block.

3. A decorative building block as claimed in claim 1 or claim 2 wherein the load-bearing body is able to withstand loads of at least 7 N/mm<sup>2</sup>.

4. A decorative building block as claimed in any preceding claim wherein the cementitious mixture comprises cement and lightweight aggregates.

5. A decorative building block as claimed in claim 4 wherein the cementitious mixture further includes an air entrainment admixture.

6. A decorative building block as claimed in claim 4 or claim 5 wherein the mixture of a cement and lightweight aggregates further includes a water reducing agent.

7. A decorative building block as claimed in any of claims 4 to 6 wherein the cement and aggregates are provided in proportions by weight of between about 1:7 and about 1:2.

8. A decorative building block as claimed in claim 7 wherein the cement and aggregates are provided in proportions by weight of between about 1:3 and 1:4.

9. A decorative building block as claimed in any preceding claim wherein the block is provided with a peripheral lip.

10. A decorative building block as claimed in any preceding claim wherein the block has a frog around its periphery.

11. A decorative building block as claimed in claim 10 wherein the frog is arcuate in cross-section.

12. A decorative building block as claimed in claim 10 or claim 11 wherein the frog is positioned about midway between a decorative face and an opposing face of the block.

13. A decorative building block as claimed in any preceding claim wherein the pointing mixture is selected from mixtures comprising; sand mortars of varying colours; sharp sand, lime and grit.

14. A decorative building block as claimed in any of claims 9 to 13 wherein the lip is provided with a pe-

ripheral rebate which serves, when the edges of two blocks are abutted in a building structure, to create a channel to facilitate the insertion of pointing material to further improve and disguise the joins.

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- 15.** A decorative building block as claimed in claim 14 wherein the rebate is provided on an upper edge surface of the lip.
- 16.** A decorative building block as claimed in claim 14 wherein the rebate is provided on an outer edge surface of the lip.
- 17.** A decorative building block as claimed in any of claims 14 to 16 wherein the rebate has a cross section selected from; rectangular, wholly or partly wedge shaped or wholly or partly curved.
- 18.** A method for the manufacture of a decorative building block, the method comprising;
- a) placing into a suitably configured mould a cementitious mixture to form the load bearing body of the building block;
  - b) applying to at least one external surface of the cementitious mixture, a pointing mixture;
  - c) setting into the surface or surfaces of step b) a plurality of mineral pieces, thereby to provide one or more decorative surfaces with the appearance of a finished, pointed building structure.
- 19.** A method as claimed in claim 18 further comprising the step;
- d) cleaning the exposed surfaces of the mineral pieces to remove any excess pointing mixture.
- 20.** A method as claimed in claim 19 wherein step d) involves brushing the decorative surface with a metal, optionally steel, brush.
- 21.** A method as claimed in any of claims 18 to 20 further comprising dressing or treating the mineral pieces to alter their cosmetic appearance.
- 22.** A method as claimed in any of claims 18 to 21 wherein steps b) and c) are performed while the cementitious mixture of step a) is still pliable.

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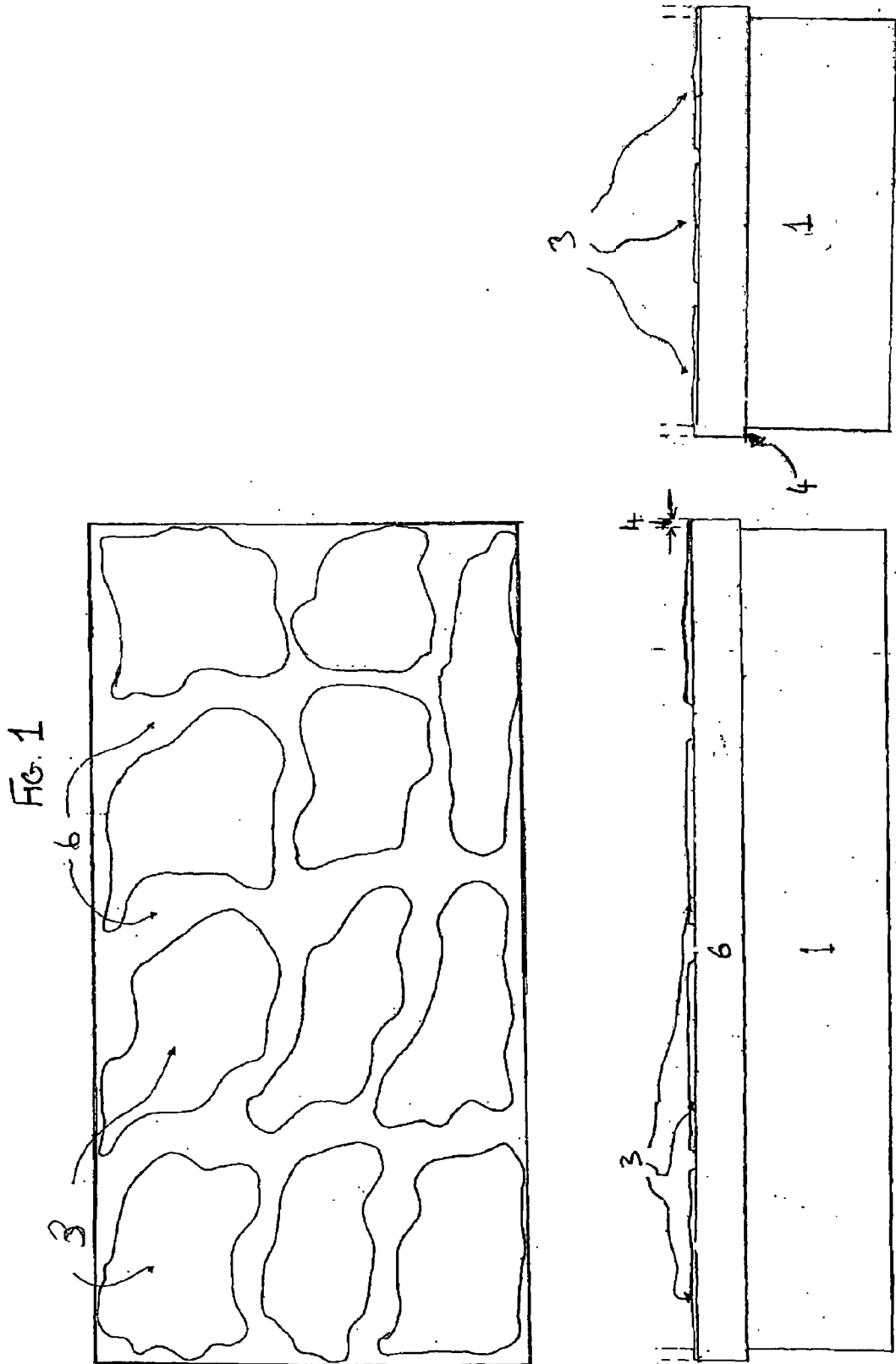
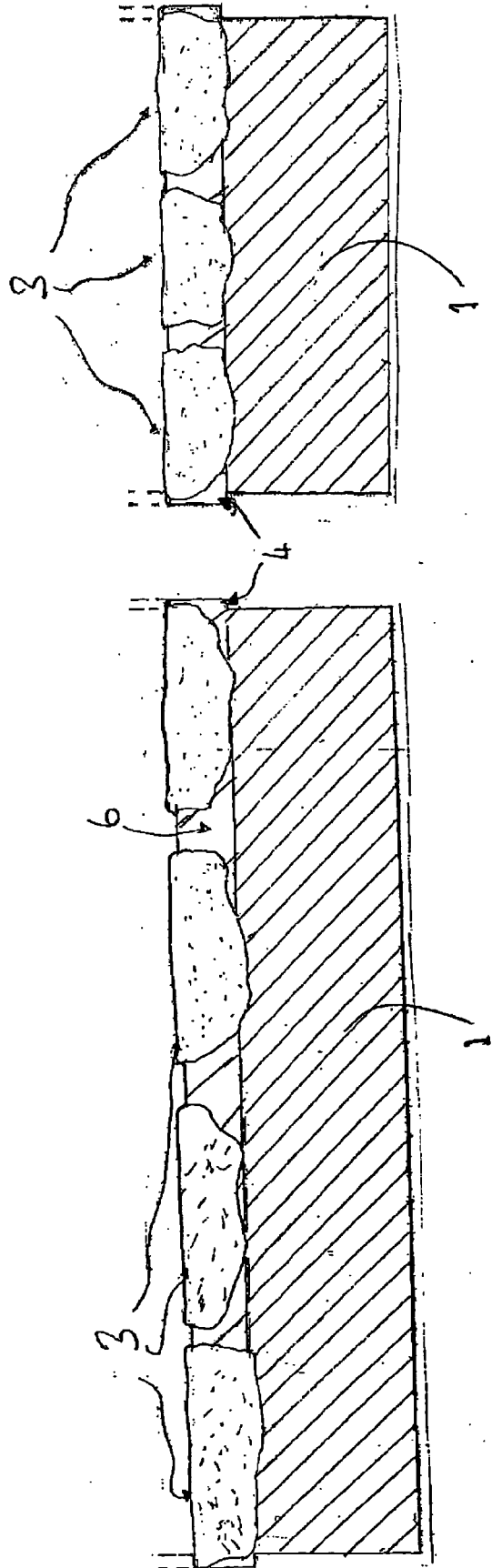


FIG. 2



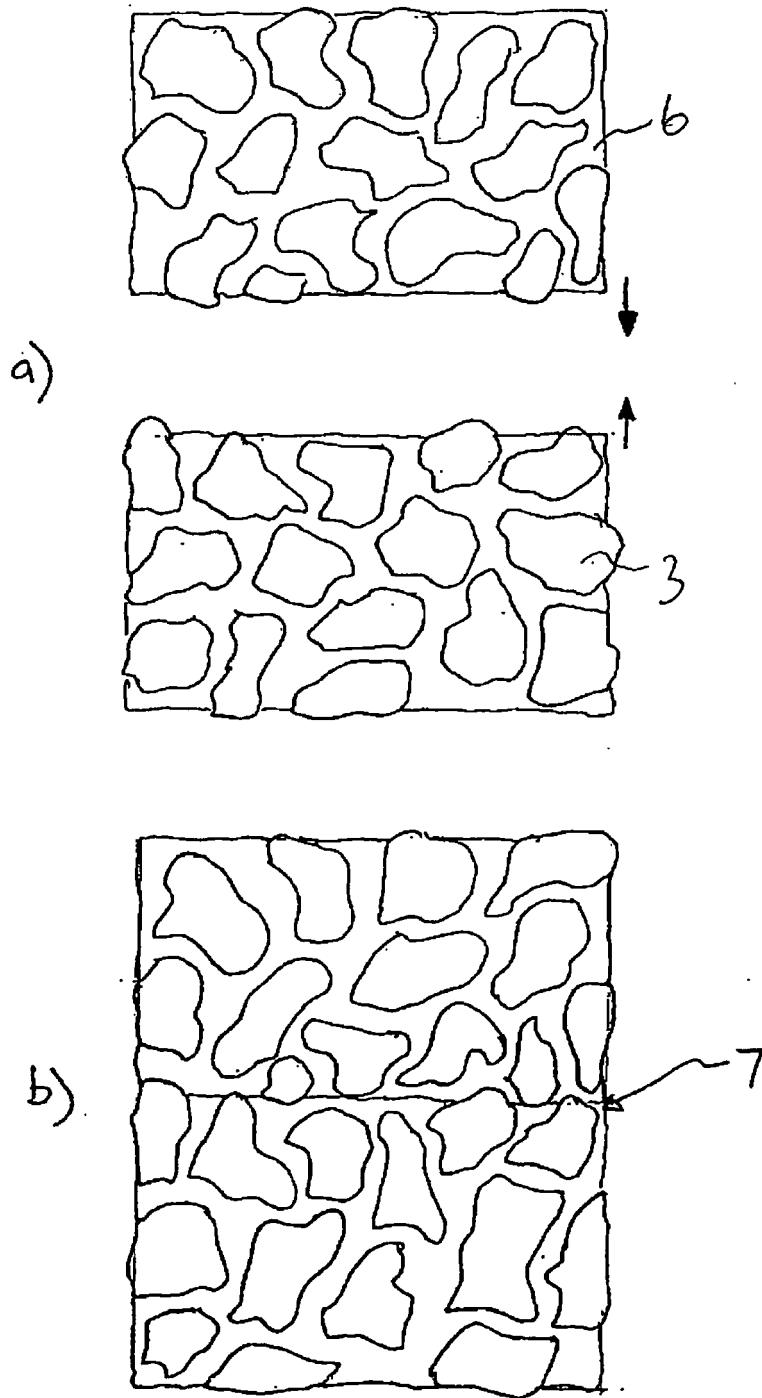
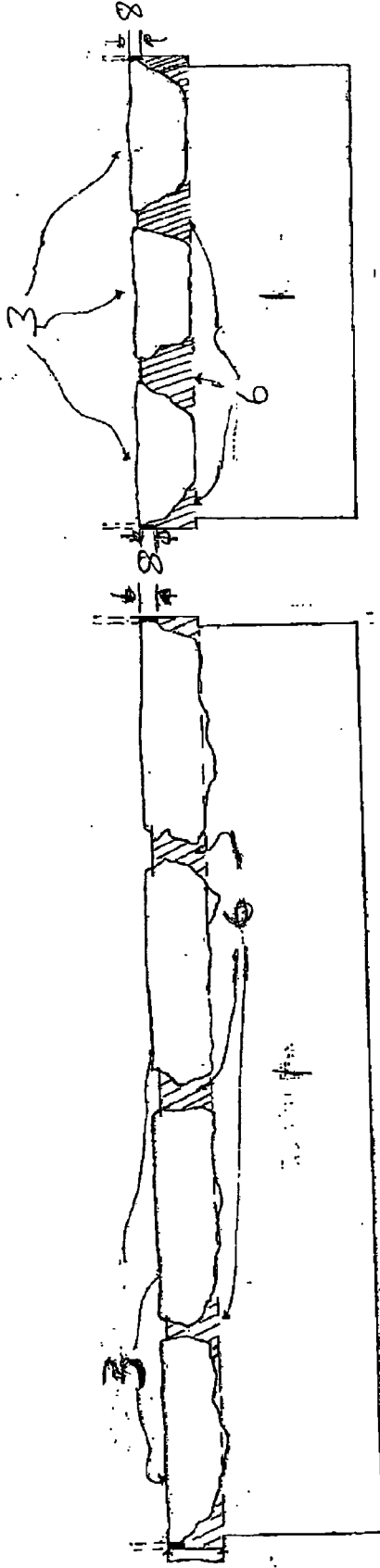


FIG. 3

FIG. 4



FIG. 5



**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- GB 2356875 A [0008] [0009] [0015] [0018] [0018]  
[0020] [0021]