



US 20060230701A1

(19) **United States**

(12) **Patent Application Publication**

**Pepa**

(10) **Pub. No.: US 2006/0230701 A1**

(43) **Pub. Date: Oct. 19, 2006**

(54) **TILE TO BE USED IN A LAYING SYSTEM ESPECIALLY FOR PRODUCING A FLOOR COVERING AND METHOD FOR PRODUCING THE SAME**

**Related U.S. Application Data**

(63) Continuation of application No. PCT/EP04/53107, filed on Nov. 25, 2004.

**Foreign Application Priority Data**

Nov. 26, 2003 (DE)..... 103 55 788.1

(76) Inventor: **Tomas Della Pepa**, Limburger Hof (DE)

**Publication Classification**

(51) **Int. Cl.**  
*E04B 2/00* (2006.01)  
(52) **U.S. Cl.** ..... 52/592.1

Correspondence Address:  
**DYKEMA GOSSETT PLLC**  
**FRANKLIN SQUARE, THIRD FLOOR WEST**  
**1300 I STREET, NW**  
**WASHINGTON, DC 20005 (US)**

(57) **ABSTRACT**

The invention relates to a tile (1) for use in a laying system, especially for producing a floor covering. Said tile comprises a support (2) located on the face on which the tile is laid. Said support (2) has contact surfaces (3) for contact with the laying face of the tile (1) and subareas (6) that are spaced apart from the laying face of the tile (1).

(21) Appl. No.: **11/441,045**

(22) Filed: **May 26, 2006**

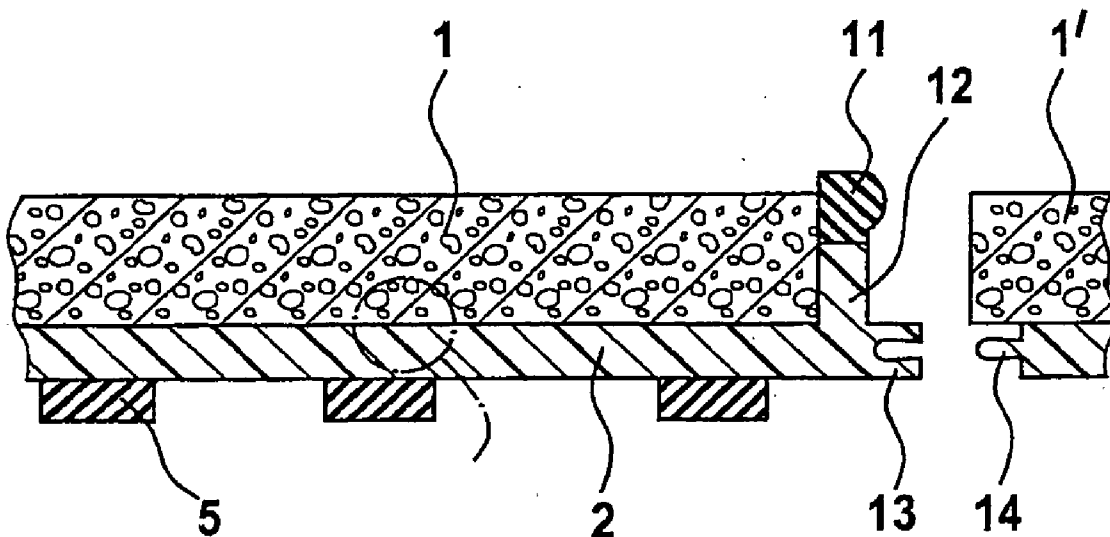


Fig. 1

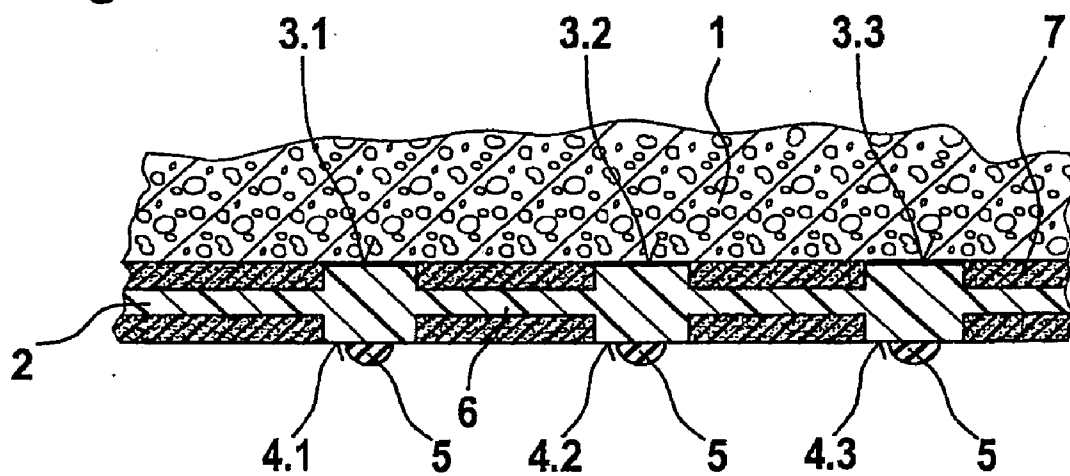
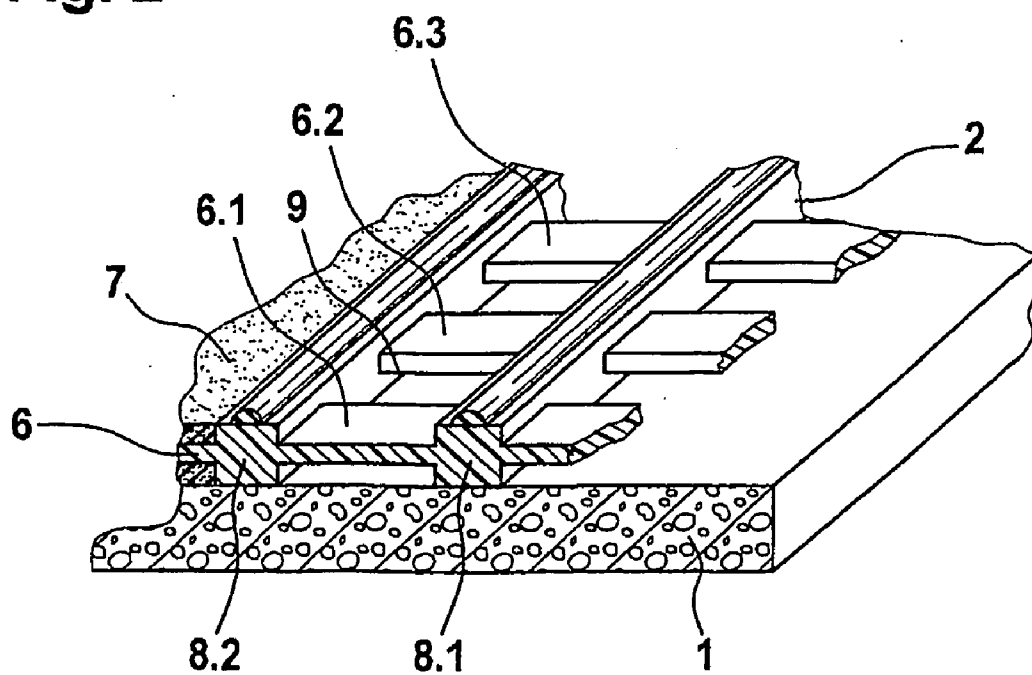
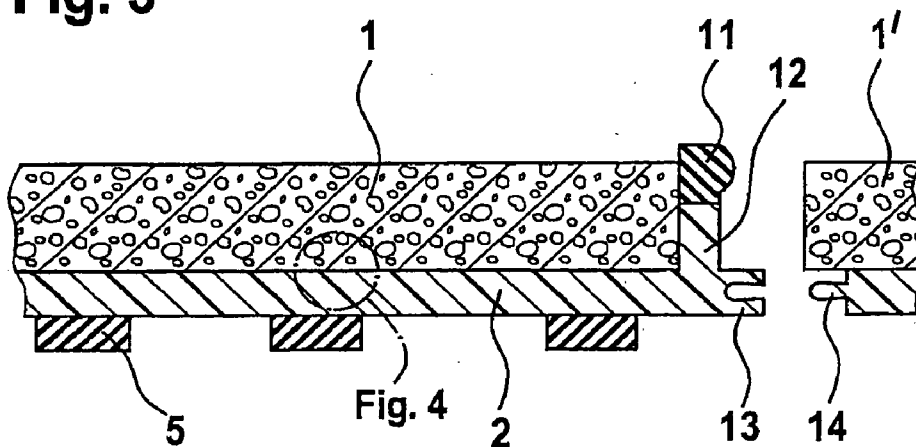


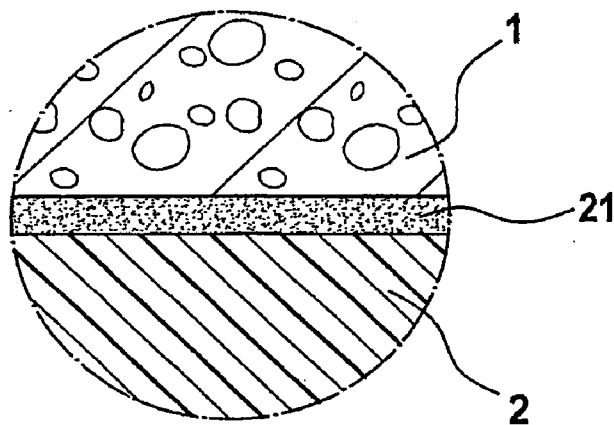
Fig. 2



**Fig. 3**



**Fig. 4**



**Fig. 5**

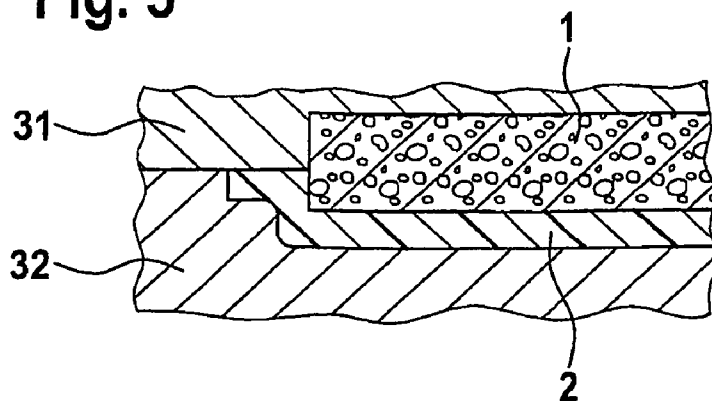


Fig. 6

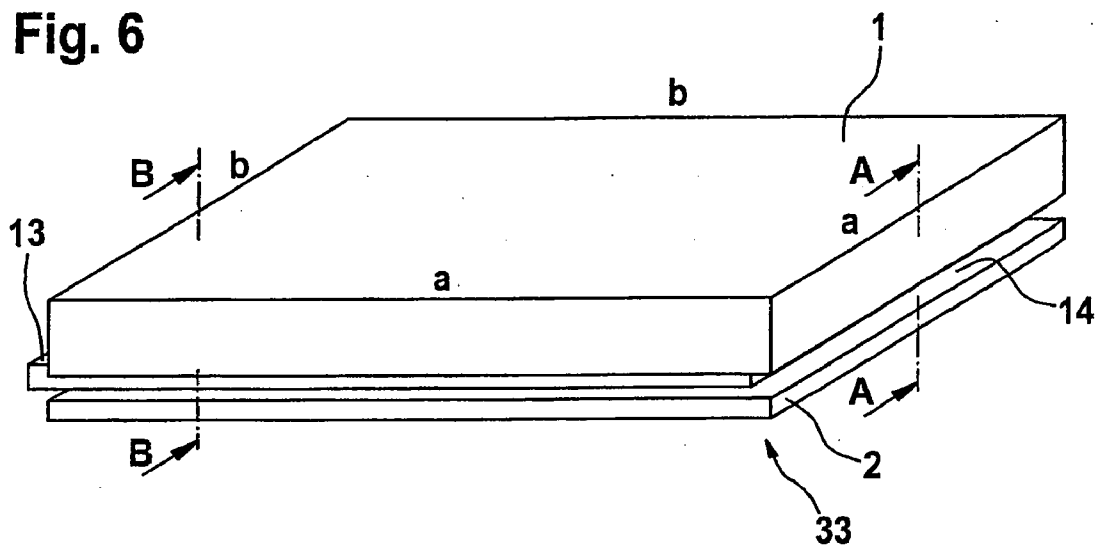


Fig. 6b

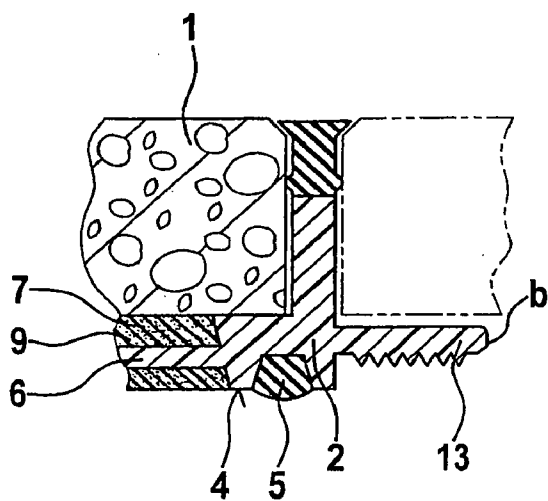
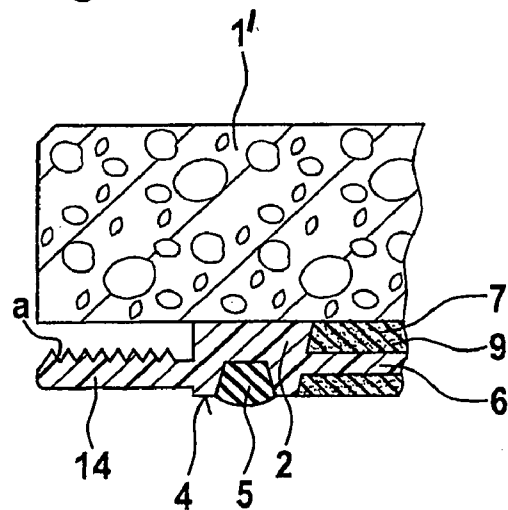


Fig. 6a



**TILE TO BE USED IN A LAYING SYSTEM  
ESPECIALLY FOR PRODUCING A FLOOR  
COVERING AND METHOD FOR PRODUCING  
THE SAME**

**TECHNICAL FIELD**

[0001] The invention relates to a tile to be used in a paving system, particularly for the production of a floor covering and to a method for the production of said tile, to a paving system, to a floor covering, and to a building comprising said floor covering.

[0002] It is possible to produce a floor covering with the aid of such tiles by placing a plurality of tiles one against the other.

**DESCRIPTION OF THE RELATED ART**

[0003] WO 03 040491 discloses a paving system for tiles in which the tiles are provided with a paving frame on which the tiles rest over at least part of their area. The frames are attached to the underside of the tiles by gluing and have a locking joint and a gasket at their edges.

[0004] WO 02 077389 A1 discloses a floor made from individual elements, wherein the flat elements are multi-layer tiles, which comprise, for example, a natural stone and a pressure-resistant layer of light material attached thereto by an adhesive joint. Grooves, in which connecting strips can be inserted, are disposed in the vertical peripheral surfaces of the layer of light material such that a tile can be joined therewith to adjoining tiles.

[0005] The joining strip can be provided with an edge strip, which improves the seal between the tiles. In addition, a two-dimensional reinforcing element of small thickness can be provided for increasing the strength of the tile.

[0006] The problem posed by this prior art is, firstly, to create a joint between the tile and the support and, secondly, to do so in a reliable and economical manner.

**SUMMARY AND OBJECTS OF THE  
INVENTION**

[0007] According to the invention, a tile to be used in a paving system, particularly for the production of a floor covering, is provided, which tile has a support disposed on its paving side, wherein the support comprises contact surfaces adapted to bear against the paving side of the tile and additionally has sub-regions which are disposed at a distance from the paving side of the tile.

[0008] These sub-regions can be projections, joining fins, reinforcing elements or grids, which are molded to the support or are inserted therein or fixed to the support in some other way.

[0009] Due to said distance it is possible to insert an adhesive into said regions.

[0010] In doing so, an adhesive joint with the tile can be created on the paving surface, for example, to hold the support in position relative to the tile. The actual attachment is then effected via the sub-regions.

[0011] The support advantageously has bearing faces which project beyond said regions. The sub-regions are thus disposed, on one side, at a distance from the paving side of

the tile and, on the other side, at a distance from the surface to be paved by the tile combined with the support.

[0012] According to a development of the invention, the intermediate space between the sub-regions and the paving side of the tile is filled with filling material. The filling material is such as to create a joint between the sub-region and the paving side of the tile. The joint relative to the paving side of the tile is advantageously created by bonding, in particular by adhesion (gluing).

[0013] The sub-regions are advantageously surrounded by the filling material. This is effected in such a way that the contact surfaces will still project above the region or will be at least flush therewith, but not covered thereby.

[0014] Strength values capable of resisting high loads are achieved firstly due to the fact that the sub-regions are embedded and secondly to the fact that the support has regions which carry both the contact surfaces and the bearing faces. The production of the joint takes place substantially without the application of pressure by inserting the filling material from the paving side into the support after it has been placed in position and allowing the filling material to become distributed therein.

[0015] The bearing faces are advantageously provided with a damping layer for footstep noise attenuation. It may be sufficient to provide only sub-regions thereof with an appropriate damping layer.

[0016] In certain circumstances it may be necessary to provide an adhesion promoter between the filling material and the paving side of the tile to increase the strength of the joint in an appropriate manner.

[0017] According to an advantageous development, the support is designed as a grid, the contact surfaces and the bearing faces being formed at the points of intersection and the grid lines representing the sub-regions.

[0018] A particularly suitable filling material is a polymer such as a synthetic resin or a PU-foam.

[0019] Another invention relates to a tile for a paving system particularly for the production of a floor covering, said tile comprising a support made of a polymer and disposed on its paving side, the support itself being attached to the tile via the process employed for molding the support.

[0020] Any subsequent method for attaching the support to the tile is thus no longer necessary. This joint is created directly during the manufacture of the support.

[0021] An adhesion promoter is advantageously provided between the support and the tile so as to still create a sufficiently strong joint in cases where the adhesion of the support material to the material of the tile presents problems.

[0022] Here again, the support can be provided with a damping layer for footstep noise attenuation.

[0023] According to a development of the two inventions, the support can comprise joining elements projecting at least partially beyond the tile, on the one hand, and joining elements disposed at least partially beneath the tile, on the other hand. Owing to these joining elements, it is possible to join two adjoining tiles to one another by causing the projection of one tile to engage in the recess of the other tile. Such joints are known in the prior art.

[0024] According to a development, the support projects beyond at least one edge of the tile, this projection being provided with a gasket. By this means it is possible to seal the interstice between two adjoining tiles.

[0025] The gasket is advantageously joined to the support via a molding process.

[0026] The invention further relates to a method for the production of a tile, wherein the tile is provided with a support which is joined to the tile concurrently with a molding process employed for the production of the support.

[0027] This is accomplished, for example, by inserting the tile into an injection-molding machine and by molding the support directly onto this tile.

[0028] Another method for the production of a tile consists in aligning a support relative to the tile via contact surfaces and by inserting filling material between the contact surfaces of the support and the tile, wherein the filling material is joined to the tile on one side and to the sub-regions of the support on the other.

[0029] One advantage of this is that the filling material is inserted substantially without the use of pressure and becomes distributed in the desired manner due to its innate flowability.

[0030] The filling material is advantageously inserted in such a way that the support is embedded in the filling material with the exception of the bearing faces. Particularly the sub-regions are thus completely surrounded by the filling material.

[0031] The methods described can also involve the application of an adhesion promoter prior to the production of the joint or the support.

[0032] The invention further relates to a paving system for the production of a floor covering using the tiles described above and to a building comprising such a floor covering.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0033] Exemplary embodiments of the invention are illustrated in the drawings, in which:

[0034] **FIG. 1** is a cross-section through a tile joined to a support according to the first invention,

[0035] **FIG. 2** is a perspective view of a part of the tile shown in **FIG. 1**,

[0036] **FIG. 3** illustrates a tile provided with a support according to the second invention,

[0037] **FIG. 4** shows a detail illustrating the use of an adhesion promoter,

[0038] **FIG. 5** illustrates part of a device for the manufacture of a support joined to a tile in a molding process,

[0039] **FIG. 6** illustrates an individual finished composite tile,

[0040] **FIG. 6a** is a cross-section of the edge region taken along the line AA of **FIG. 6**, and

[0041] **FIG. 6b** is a cross-section of an edge region taken along the line BB of **FIG. 6**.

#### DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS OF THE INVENTION

[0042] The tile **1** illustrated in **FIG. 1** consists of a material used for the production of a floor covering, ie, in particular, of natural stone or a ceramics material in the form of a tile. Such materials have only minimal resilience and are therefore mounted on a support **2** for the purpose of joining them to other tiles.

[0043] For this purpose, the support **2** comprises a plurality of contact surfaces **3** (**3.1** to **3.3**) on which the paving side of the tile **1** rests.

[0044] On its side remote from the contact surfaces **3**, the support **2** comprises bearing faces **4** (**4.1** to **4.3**), which are to be placed on the surface to be paved. In addition, a damping layer **5** is provided.

[0045] The support further comprises sub-regions **6** which are disposed in spaced relationship to the paving side of the tile **1** and are in this case embodied as joining fins between the regions **8** carrying the contact surfaces **3** and the bearing faces **4**. The sub-regions **6** are in spaced relationship to the bearing faces **4**.

[0046] The joint between the tile **1** and the support **2** is created by means of a filling material **7**, which is inserted into the intermediate space between the sub-regions **6** and the paving side of the tile **1** and which is joined to the paving side of the tile **1**. If appropriate, an adhesion promoter is used here for enabling, for example, adhesive attachment.

[0047] The filling material **7** surrounds the sub-region **6** completely, that is to say, it fills both the intermediate space relative to the paving side and the open space relative to the surface to be subsequently paved. The filling material **7** is applied in such a way that the bearing faces **4** always project above the filling material or are at least flush therewith.

[0048] This construction will now be explained in more detail with reference to **FIG. 2**. The support **2** is placed in position on the tile **1**, the support **2** comprising ribs **8** (**8.1**, **8.2**), which are joined together by joining fins **6** (**6.1** to **6.3**) in the form of sub-regions. Between these sub-regions **6.1** to **6.3**, intermediate spaces **9** are provided, through which filling material **7** filled in from the top side can reach the tile **1**. In the left-hand part of **FIG. 2**, the support **2** is already covered with filling material **7** in such a way that the bearing faces of the ribs **8.2** still project beyond it, while the joining fin **6** is completely surrounded by the filling material **7**.

[0049] Another exemplary embodiment of the invention is illustrated in **FIG. 3**. Here again, the tile **1** can be discerned, on which a support **2** has been applied in a molding process employed for the production of the support itself. To attenuate footprint sound, the support is provided with a damping layer **5**, which can be produced in a second stage of said molding process, as may also a gasket **11**, which is located on a projection **12** on an end face of the tile **1**.

[0050] The support **2** is additionally provided with a projecting joining element **13**, which interacts with a recessed joining element **14** disposed beneath an adjoining tile **1f**.

[0051] **FIG. 4** shows a detail of **FIG. 3** for illustrating the use of an adhesion promoter **21** between the tile **1** and the support **2**. Naturally, this adhesion promoter can also be

provided between the filling material 7 and the tile 1 in the exemplary embodiment shown in FIG. 1 and FIG. 2.

[0052] FIG. 5 illustrates diagrammatically how the tile 1 is held in a two-piece mold 31, 32 for joining the support 2 to the tile 1 in a molding process.

[0053] In FIG. 6 a composite tile is illustrated in a perspective view as is also illustrated in partial views in FIGS. 1, 2, and 3. The support 2 is disposed beneath the tile 1 and joining elements 13, 14 for the adjoining composite tile are provided in the marginal region of the support 2. These joining means are described, for example, in WO 03 040491 A1, which is included herein by reference. The marginal region of the support 2 is divided into two similarly designed parts a, b adjoining one another, and designed in such a way that part a interacts with part b of the adjoining tile.

[0054] The design of the support 2 in the marginal region a, b will now be described with reference to FIGS. 6a and 6b. The tile 1,1' rests on the support 2 or is joined thereto. The support 2 comprises sub-regions 6, which are embodied as fins and delimit an intermediate space 9 also delimited by the tile. This intermediate space 9 is filled with filling material 7, which surrounds the fins 6. In addition, the bearing face 4 is provided with a damping layer 5. The joining element 14 of the marginal region a is disposed beneath the tile 1, while the joining element 13 of the marginal region b will overlap it.

1. A tile for use in a paving system, particularly for the production of a floor covering, having a support disposed on a paving side, wherein said support has contact surfaces and sub-regions which are set at a distance from the paving side of said tile.

2. A tile as defined in claim 1 wherein said support has bearing faces which project beyond said sub-regions.

3. A tile as defined in claim 1, including a filling material filling the space between said sub-regions and the paving side of said tile.

4. A tile as defined in claim 3, wherein said filling material surrounds said sub-regions.

5. A tile as defined in claim 3, wherein said filling material is attached to the paving side of said tile by glue.

6. A tile as defined in claim 5, wherein said filling material extends no further than to said bearing faces.

7. A tile as defined in claim 6, wherein said bearing faces are provided with a damping layer for attenuating footstep sound.

8. A tile as defined in claim 1, including an adhesion promoter is between said filling material and the paving side of said tile.

9. A tile as defined in, claim 1, wherein said support is a grid.

10. A tile as defined in claim 3, wherein said filling material is a polymer such as a synthetic resin or a PU foam.

11. A tile for a paving system, particularly for the production of a floor covering, comprising a support made of a polymer and disposed on a paving side, wherein said support is attached to said tile via the molding process used for the production of said support.

12. A tile as defined in claim 11, including an adhesion promoter between said support and said tile.

13. A tile as defined in claim 11, wherein said support includes a damping layer for attenuating footstep sound.

14. A tile as defined in claim 13, wherein said support has, on one side thereof, a connecting element projecting at least partially beyond said tile and, on the other side thereof, a connecting element disposed at least partially beneath said tile.

15. A tile as defined in claim 14, wherein said support protrudes at at least one edge of said tile toward the top side of said tile, this projection being provided with a gasket.

16. A tile as defined in claim 15, wherein said gasket is attached to said support by a molding process.

17. A method for the production of a tile as defined in claim 1, wherein said tile is provided with a support, wherein said support is concurrently joined to said tile via a molding process employed for the production of said support.

18. A method for the production of a tile as defined in claim 1, wherein said support is positioned relatively to said tile via contact surfaces and that filling material is introduced between said contact surfaces of said support and said tile, wherein said filling material is attached on one side to said tile and on the other side to said sub-regions of said support.

19. A method as defined in claim 17, wherein said filling material is introduced in such a manner that said support is surrounded by said filling material with the exception of said bearing faces.

20. A paving system for the production of a floor covering of tiles, comprising at least one tile as defined in claim 1.

21. A floor covering comprising at least one tile as defined in claim 1.

22. A building comprising a floor covering composed of at least one tile as defined in claim 1.

\* \* \* \* \*