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

(11) EP 0 717 161 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
19.06.1996 Bulletin 1996/25

(51) Int Cl.6: **E04F 15/08**, E04F 15/18

(21) Application number: **95850227.0**

(22) Date of filing: **14.12.1995**

(84) Designated Contracting States:
AT CH DE FR LI NL SE

(30) Priority: **14.12.1994 SE 9404361**

(71) Applicant: **Akzo Nobel Decorative Coatings AB**
S-100 61 Stockholm (SE)

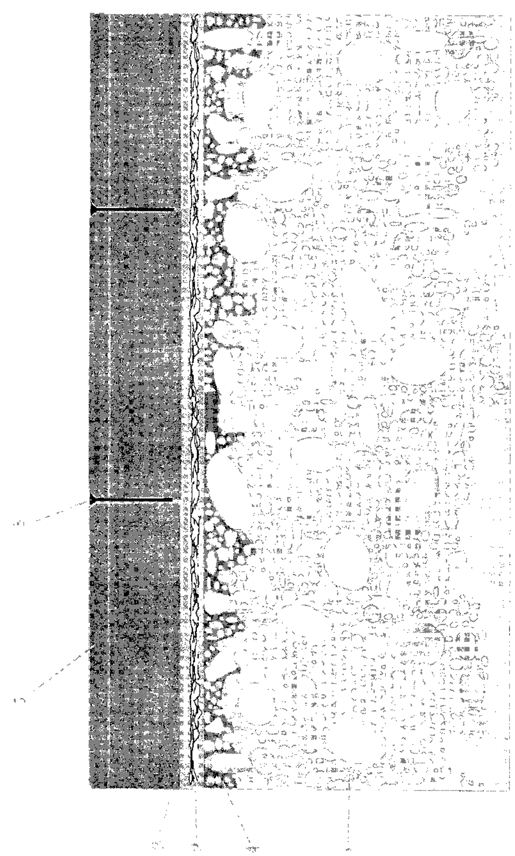
(72) Inventors:
- **Hilgenbrink, Bernhard**
48565 Steinfurt-Borghorst (DE)
- **Hermann, Günther**
48720 Rosendahl-Darfeld (DE)

(74) Representative: **Wibom, Hans Sven Erik et al**
Dr. Ludwig Brann Patentbyra AB
P.O. Box 17192
S-104 62 Stockholm (SE)

(54) A tile floor and a process for production thereof

(57) This invention is related to a tile floor which is resistant to chemicals and impervious to liquids, said floor comprising a top layer of floor tiles (5), a substrate for said floor tile layer comprising a supporting structural member, and a bonding material layer (3) comprising bonding material which binds the floor tile layer to the substrate, said substrate also comprising a mainly fibre based intermediate material layer (2), on to which the floor tile layer is bonded with the bonding material, said bonding material penetrating through the intermediate material layer within at least a part of the areal extension of the intermediate material layer into contact with and bonding to an underlying part of the substrate, thereby at least contributing to the bonding of the floor tile layer and the intermediate material layer to the underlaying substrate.

This invention is also related to a method for producing such tile floors.



EP 0 717 161 A2

Printed by Jouve, 75001 PARIS (FR)

Description

This invention is related to a tile floor and a process for production thereof, especially a tile floor which is resistant to chemicals, such as acids, and is impervious to liquids, especially acids.

Tile floors are per se well-known for indoor as well as outdoor use, such as in industry buildings, and are often required to be resistant to chemicals and impervious to liquids, and are also often subjected to repeatedly applied high mechanical loads. For said purpose it is known to apply e.g. ceramic tiles on a base of mortar, optionally with a layer of a binding material, such as a cement slurry, and also to seal the layer of tiles with a sealing material applied in the gaps between adjacent tiles. The top layer of tiles is sometimes subjected to a vibration treatment with vibrating tools for consolidating or compacting the underlying layer and improving the contact with the tile layer.

As examples of such prior art processes reference can be made to DE 23 48 301, DE 25 45 925, DE 27 54 800, DE 41 11 152 Al and EP 0 340 598 A2, which disclose tile floors in which the gaps between the tiles are filled with acid resistant materials These and other processes and the products thereof have, however, until now exhibited several disadvantages. Among these disadvantages is that such previously known tile floors are difficult, time consuming and expensive to produce and/or are vulnerable to the formation of cracks caused by high stresses and impact loads which are not uncommon for tile floors, especially for tile floors in e.g. industry buildings. Such cracks are particularly objectionable when the floor should also be resistant and impervious to chemicals, especially liquids.

The present invention makes it possible to achieve one or more of the following advantages in relation to the prior art: improved resistance against chemicals, improved imperviousness and/or crack resistance of the tile floor, also when subjected to high stresses and high impact loads, reduction of the time required for laying the floor, reduction of the time required until the floor can support loads, simplified laying of the floor, reduced risk of undesired intermixing of floor layers, improved bonding of the floor layers, reduced consumption of floor materials, such as bonding materials, especially organic binders, etc. and/or reduced material and labour costs.

The floor tiles used for the tile floor according to this invention can be of various types which have also previously been used as an upper or top layer of floors, such as tiles made from metallic materials, natural or artificial stone, wood products, concrete, plastics and especially ceramics, e.g. glazed or unglazed ceramics, such as dry-pressed and sintered ceramic floor tiles.

The tile floor according to this invention comprises a floor tile layer on a substrate for said layer, which substrate comprises a supporting structural member and a bonding layer comprising a bonding material which binds the tiles in the tile layer to the substrate. The substrate comprises as an upper part thereof an intermediate layer which within at least a part of its areal extension is permeable to and penetrated by the bonding material of the bonding layer. The substrate may also comprise a base layer underneath the intermediate layer and on the structural member, optionally forming a part of said member. The structural member will normally support the static and dynamic loads applied onto the floor tiles, through other layers present on the structural member, such as the bonding layer, the intermediate layer and the base layer, if used.

The upper surface of the structural member and/or the base layer should suitably have a shape, e.g. a slope, which fairly closely coincides with the desired shape of the tile layer forming the top of the floor, e.g. a distance in the vertical direction between the base layer and the upper surface of the tile layer which within the main part of the surface area of the floor deviates less than 20 cm and preferably approximately 5 cm from the average value of said distance within said surface area, and/or an average deviation of angle of slope within said area of less than 10 and preferably less than 3 degrees. Usually the angle of slope of the tile layer is more than zero degrees from the horizontal. A suitable degree of flatness is defined in DIN 18 202.

A suitable material for said base layer is concrete or mortar, especially cement mortar, and the base layer may comprise reinforcements, such as embedded reinforcements, e.g. steel rods and steel mesh reinforcements. The material, from which the base layer is made, comprises usually a mixture of a binder phase, especially an inorganic hydraulic binder, such as cement, e.g. Portland cement or aluminous cement, and particulate fillers or aggregates, especially sand, gravel and similar materials. An example of a suitable filler is sand, preferably washed sand, with a grain size (grading curve) within the range 0 to 8 mm. As is well-known in the art also coarser aggregate fractions may be present in the mix, such as crushed aggregates for concrete, gravel, cobbles, puddingstones, expanded clay, etc. The mixing ratio of binder, especially cement, e.g. Portland cement, to filler, especially sand, is often suitably at least 1:2 or at least 1:4, and optionally up to 1:10 or up to 1:8, e.g. about 1:6. A suitable water/cement ratio is e.g. about 0.5, but also higher or lower values can be used, e.g. up to 0,8 and down to 0,3.

The cured strength of the base layer mortar could suitably at least correspond to ZE 12 according to DIN 18 560. This corresponds usually to a cement content of at least 240 kg of cement per cubic metre of fresh cement mortar.

An intermediate layer is suitably applied on the base layer, or on the structural member in case no base layer is used. The purpose of the intermediate layer is especially to prevent, completely or at least partially, mixing of the base layer material into the bonding layer used for bonding the tiles, and especially to reduce penetration of the bonding material into the base material layer to a comparatively narrow zone at the interface of the bonding material/base layers, and/or to permit convenient application of the bonding layer material on to the base layer, or optionally on to the structural member in case a separate base layer is not used. The intermediate layer is important especially in case the bonding layer material is applied on to an incompletely cured (set) or substantially uncured base material, and/or a base material still showing plasticity or consistency, such as earth-moist, fluid, harsh, plastic or semi-fluid consistency, e.g. as measured with various well-known measuring devices, such as Mo, flow table, slump cone, Thaulow, vebe and other measuring devices, and/or on an incompletely compacted or uncompacted base layer, in which case it may be difficult to apply the bonding material as a layer, such as an even layer or as a layer of strings, e.g. with a trowel (teeth-trowel), and/or the bonding material and the base layer material may, or have a tendency to, intermix excessively, in which case a substantial part of the bonding material may become lost in the base layer and unable to bind to the tiles.

Preferably the bonding material forms an interface with the base material layer at or below the lower surface of the intermediate material layer, preferably over at least 40%, at least 60% or at least 80% or substantially 100% of the areal extension of the base material surface below the intermediate/bonding material layers. A certain degree of penetration of the bonding material into the base material can help to improve the bonding to the base material layer, e. g. penetration to an average depth of at least 1 mm, at least 3 mm or at least 5 mm, and optionally up to at most 20 mm, at most 10 mm or at most 6 mm into the base material layer.

The intermediate layer should preferably be at least partially permeable to the bonding material used in the bonding layer, e.g. comprise perforations, open pores or openings, e.g. between fibres or fibre yarns, which permit penetration thereof by the bonding material. This porosity includes the porosity present in a fibre material, especially textile fibre material. Such fibrous materials may have an average fibre diameter of e.g. at least 0,01, at least 0,05 mm or at least 0,1 mm and optionally up to at most 2 mm, at most 1mm or at most 0,1 mm. The porosity may comprise an average pore size of from at least 0,01 mm, at least 0,1 mm or at least 1 mm and optionally up to at most 5 mm or at most 1 mm, depending upon the type of porous material. The porous intermediate material is preferably flexible, so that it by its own weight, and optionally when loaded with the bonding material, tightly follows the shape of the base material layer on which it is laid, e.g. with a distance between the intermediate material layer and the substrate, such as the base layer, calculated as an average over the areal extension of the intermediate layer, of at most 10 mm or at most 1 mm. The flexibility may be such that the intermediate material without difficulty can be winded up on a roll (e.g. a roll with a diameter of at most 25 times the thickness of the intermediate material). The intermediate layer material may consist e.g. of such fibrous materials as woven or non-woven or other textile materials. Suitable materials for the intermediate layer are thus e.g. fleece materials, this expression being taken in a broad meaning, e.g. non-woven materials, felted materials, woven materials, fabrics, stitched, knitted or hoistery products, of organic and/or inorganic materials, such as glass, stone, organic polymers, such as polyamides, polyesters, polyolefines, e.g. polyethylene, polypropylene, acrylic polymers, vinylic polymers, etc., preferably mainly in the shape of fibres or products made from fibres, e.g. glass fibre materials, polyamide fibre materials, polyester fiber materials, other textiles, or porous products. Suitable are e.g. materials of the lightweight non-woven type, e.g. based on one or more of the materials mentioned above, e.g. polyester, polyamide, polypropylene, polyethylene, glass fibres and natural fibres. Suitable are usually materials of the geotextile type and other materials which are commonly used as intermediate layers, e.g. between different materials, such as materials of different grain size ranges, e.g. in road construction, building industry etc.

The intermediate layer should preferably have characteristics which make it possible to lay down a layer of the material on the base layer or other substrate, especially before partial or complete curing or setting of such a base layer or substrate, and/or make it possible to subject the intermediate material layer to a certain amount of mechanical interaction, e.g. by applying a layer of liquid or flowable bonding material thereon, preferably as a layer of even thickness, optionally with or in the form of strings, e.g. with trowels, such as trowels with or without teeth, or other means, without the formation of wrinkles or other irregularities in the intermediate material layer or without removal of said layer from the underlying surface. The intermediate material may be supplied as a web material, which can be laid down as pieces of suitable length and width, e.g. as overlapping pieces, on the base layer or supporting member. Preferably the pieces are laid down in parallel and/or crossing directions. One or more such layers of intermediate material, especially web, may be applied on the substrate. The weight per square metre of the intermediate layer may amount to e.g. at least 10, at least 20 or at least 50 grams, and a suitable upper limit of the weight may be up to 500 or up to 300 grams, e.g. a fleece (non-woven) with a weight of 30 to 240 grams per square metre, and suitably a tensile strength according to DIN 53857-2 of at least 1 or at least 3 KN and up to e.g. 15 or up to 8 KN. The thickness of a web or sheet material used in the intermediate material layer may be e.g. at least 0,1 mm, at least 0,5 mm or at least 1 mm, and optionally e.g. at most 10 mm, at most 5 mm, at most 2 mm or at most 1 mm. the intermediate material layer may be formed from one such web or sheet part or from 2 or more such parts arranged in a stack on each other. The porosity of the intermediate layer material, prior to impregnation with the bonding material, may amount to e.g. at least 60 %, and optionally e.g. at most 80 % or at most 60 %, preferably mainly as open, communicating porosity, depending e.g. upon the type of material. Examples of suitable materials are those produced and sold by Du Point Company under the trade mark "Typar", e.g. Typar 3207, 3267, 3337, 3407-2, 3707 and especially 3407, 3607-3 and 3857. These materials are disclosed e.g. in an information sheet from the producer with the title "Technische Daten

Typar" (copy enclosed as Table 1) and the disclosure of said information sheet is enclosed by reference. Similar products from other producers can also be used, preferably products with characteristics within. or essentially within, the ranges defined by the above mentioned "Typar" products, especially the upper and lower values for the various characteristics given for said products, particularly the especially mentioned three products.

The intermediate layer material should thus preferably be permeable to the bonding layer material so that a layer of the bonding material applied on the intermediate material will or can be brought to penetrate through the intermediate material layer to the surface, on which the intermediate material layer rests, i.e. usually the surface of the base layer or the structural member, and to form a bond to said surface. Furthermore, the material of the intermediate layer should preferably also permit impregnation of the intermediate layer with the bonding material, preferably so that open empty spaces or voids in the intermediate layer are filled, e.g. to at least 20 %, at least 50 %, at least 75 % or essentially completely filled with the bonding material in the finished tile floor. Optionally the intermediate material may also be impregnated with bonding material, e.g. to a percentage within the limits mentioned above, prior to applying the intermediate material on the substrate, especially the base material.

As indicated above, the bonding layer suitably comprises a bonding material which can bind to the floor tiles as well as to the intermediate layer and the base layer or the structural member in case no base layer is used. The bonding material may be of inorganic as well as organic origin, such as hydraulic binders, e.g. cement, such as Portland cement and aluminate cement, especially acid resistant cement, water glass, but preferably organic and especially polymeric binders (adhesives, glues etc.) are used, either alone or in combination, optionally with hydraulic binders; such as epoxy resins, polyurethanes, polyesters etc., e.g. as dispersions, such as aqueous dispersions and emulsions, especially of the two-component type. Examples of such two-component binders or two-component reactive resins are combinations of a resin component and a hardener component, in which the resin component may consist of a Bisphenol resin, such as Bisphenol A resin, Bisphenol F resin or Bisphenol A/F resin, e.g. with reactive diluents, such as a Glycidyl ether. The hardener may preferably consist of a "cold hardener", especially amine hardener, such as aliphatic polyamine, cycloaliphatic amine, aliphatic amine or aromatic amine hardener, e.g. modified amine hardener. The hardener, such as amine hardener, may suitably be of the type which can be emulsified in water. Also combinations of two or more such binders may be used. The bonding material is preferably combined with fillers, such as particulate or fibrous fillers, especially inert fillers, such as silica, e.g. silica flour, fire-clay, organic resin flour, organic resin granules etc. The particle size distribution of the fillers should preferably be selected so that the bonding material can penetrate through the intermediate material layer and also rise in the gaps between the tiles, e.g. when subjecting the tiles to a vibration treatment for compacting and consolidating the tile layer and optionally other parts of the floor below the tile layer.

When applying the bonding and/or intermediate layers on a fresh or non-cured base layer of mortar (e.g. cement mortar) which is damp, moist or still wet, the bonding material should preferably be resistant against wet and/or alkaline conditions and may preferably consist of water dispersible epoxy resin, acid resistant cements, dispersions, water glass or combinations of two or more such materials.

The bonding material should be resistant against and/or impervious to the materials against which the tile floor should be resistant and/or impervious. A number of such chemicals are mentioned in a pamphlet from Applicant with the title: "Schönox Fliesentechnik, Beständigkeitsliste, SCHÖNOPOX CON, SCHÖNOPOX CF", the disclosure of which is included herein by reference. The bonding material is preferably resistant and impervious to one or more of the chemicals enumerated in the list in said pamphlet, especially to those marked with "+" or "(+)" in said list. Among such chemicals, in various concentrations, can be mentioned: organic acids, e.g. formic, acetic, lactic, oxalic, tartaric and citric acids, inorganic acids, e.g. boric, chromic, chloric, phophoric, nitric, hydrochloric and sulphuric acids, bases, e.g. ammonium, potassium and sodium hydroxides and carbonates, alkoholes, e.g. ethanol, isopropanol, butanol and phenols, hydrocarbons, e.g. petroleum, gasoline, kerosene, motor oil, turpentine, etc.

The tiles are suitably laid down with small gap widths between adjacent tiles, such as in average up to 15 mm, up to 10 mm, up to 5 mm, up to 2 mm or up to 1 mm, and usually at least 0,1 mm gap width. The gaps are preferably filled partly or completely with bonding material rising from the bonding layer, especially as a result of a compacting and consolidating treatment, especially mechanical, preferably vibration treatment, but can also be filled partly or completely with a bonding and/or sealing material, e.g. the material used in the bonding layer, supplied from the upper side of the tile layer. The tiles are preferably cleaned from any excess of bonding and/or sealing material at the gaps or on the upper surface of the tiles as soon as possible.

Devices and methods for consolidating or compacting tile floors are well-known. Vibrating devices can according to this invention be used with advantage for laying tile floors, and such devices and methods which are previously known to those skilled in the art can generally be used also for laying tile floors according to this invention. Examples of such devices are those produced by Firma Karl Dahm, Germany, such as those devices which are commercially availalble under the trade names "Doberman", "Alano", "Rüttelgerät KD I", "Rüttelgerät KD II" and "Handrüttelgerät KD II", and devices of similar types from other producers.

An embodiment of this invention is explained in the following example with reference to the enlosed drawing. This example is intended to illustrate the invention without in any way restricting the scope of the invention.

Example

The enclosed drawing is a vertical cross section through a part of a tile floor according to this invention. The tile floor rests on a structural member for the tile floor consisting of a construction (not shown on the drawing) of concrete made from Portland cement and conventional aggregate. A base layer 1 of Portland cement mortar based on a mixture of 1 part of Portland cement and 6 parts of washed sand with a grading curve of 0 to 8 mm, and a quantity of coarser aggregate stones and with a water/cement ratio of 0.5, was applied on a welded steel rod reinforcement (not shown) to a layer thickness of about 10 cm, and screeded to make the surface smooth. The fresh, unhardened base layer was coated with an intermediate layer 2 of soft, synthetic polymer non-woven (fleece) of the geo-textile type with a surface weight of about 100 grams per square metre, a thickness of below 0,9 mm and a pore size range of mainly 0,1 to 1,5 mm, Said non-woven was delivered as web on rolls, which were available with a web width of 1 to 4 metres and a web length of 50 to 200 metres. Epoxy mortar based on epoxy resin of the water emulsifiable type (SCHÖNOPOX CON, SCHÖNOPOX CF, registered trade marks) containing silica flour as an inert filler was used as bonding material. The binding compound was a two-component water emulsifiable epoxy resin mortar, and the bonding material was applied on the intermediate layer with a trowels (with and without teeth) in a quantity which was sufficient for completely filling the voids in the intermediate layer, and for penetrating down through the intermediate layer into contact with the base layer and forming a continuous layer 3 on top of the intermediate layer. The epoxy mortar, which in the finished tile floor was penetrated through the intermediate layer 2, formed a penetration layer 4 at the interface of the intermediate layer 2 with the cement mortar base layer 1 with excellent bonding to the base layer. On the bonding epoxy mortar layer 3 dry-pressed ceramic floor tiles 5 according to DIN EN 176 and DIN 18 158 were laid tightly abutting with a gap width of in average below 1 millimetre as a top layer. The tile floor layer was subjected to a vibration treatment with a vibrator of the type commonly used for vibrating tile floors. The vibration treatment was performed until it was decided that the base layer and the bonding and intermediate layers were consolidated and compacted with removal of voids from said layers and from the interfaces between the bonding layer and the bottom surfaces of the tiles, and penetration of the bonding material to the surface of the base layer was sufficient. By said vibration treatment the bonding material was brought to rise in the gaps 6 between the tiles, optionally essentially to the level of their upper surface, or to a lower level, in which case the gaps were filled from above with a grout consisting essentially of the same material as the epoxy mortar used for the bonding layer 3. The surface of the tile layer was then cleaned from any bonding material which had been spread onto the tile surfaces. The finished floor was resistant to acids and impervious to liquids and exhibited high mechanical strength, with the intermediate non-woven layer 2 acting as a reinforcement of the bonding epoxy mortar layer 3, and also as a barrier against penetration of the concrete material of the base layer up into the epoxy mortar layer 3.

Alternative embodiments of the invention are obvious to those skilled in the art from the disclosure above.

Typar[x]

Table 1

Properties	Test method	Unit	3207	3267	3337	3407	3407-2	3607-3	3707	3857
Mechanical properties			070	0,75						
Punch push - through force (x)	DIN 54307	N	500	690	830	1270	1500	1850	2450	3030
Class value (x-s)			-	-	609	1152	1350	1784	2250	2904
Fleeche class			1	1	1	2	2	3	3	4
Tear strength from stripe tensile test	DIN 53857-2	kN/m	3,1	4,1	5,0	7,6	8,8	10,3	14,2	17,4
		N/10 cm	310	410	500	760	880	1030	1420	1740
		N/ 5 cm	155	205	250	380	440	515	710	870
Elongation at break from stripe tensile test	DIN 53857-2	%	35	40	40	40	40	40	40	40
Grab tensile test	DIN 53858	N	270	360	440	565	710	890	1070	1300
Elongation at break from grab tensile test		%	> 60 %	> 60 %	> 60 %	> 60 %	> 60 %	> 60 %	> 60 %	> 60 %
Area weight	DIN 53854	g/m²	68	90	110	136	150	190	240	290
Thickness	DIN 53855/3	mm								
at 2 kN/m² load			0,36	0,41	0,45	0,46	0,48	0,56	0,68	0,78
at 20 kN/m² load			0,33	0,36	0,40	0,43	0,44	0,52	0,65	0,75
at 200 kN/m² load			0,29	0,34	0,35	0,39	0,40	0,48	0,63	0,72
Hydraulic properties										
Flow rate Q at 10 cm water head	DE VOORST	l/m² x s	250	210	160	100	75	60	40	30
"Water permeability" k under 2 kN/m² load	EMPA/ITF/ Franzius	*m/s (x 10⁻⁴)	25	13	10	7	5	6,5	4,0	3,5
		m/s	0,0025	0,0013	0,001	0,0007	0,0005	0,00065	0,0004	0,00035
		cm/s	0,25	0,13	0,1	0,07	0,05	0,065	0,04	0,035
"Water permeability" k under 200 kN/m² load	EMPA/ITF/ Franzius	*m/s (x 10⁻⁴)	9	7	6	5	3,5	5	2,8	2,1
		m/s	0,0009	0,0007	0,0006	0,0005	0,00035	0,0005	0,00028	0,00021
		cm/s	0,09	0,07	0,06	0,05	0,035	0,05	0,028	0,021
Effective opening diameter $D_{W(90)}$	Franzius/ EMPA	mm	0,27	0,25	0,19	0,14	0,13	0,1	0,09	0,07
		micron	270	250	190	140	130	100	90	70

*also m/s E-4

The stated values are within the testing accuracy of the laboratory test in question. Changes may occur.

[x]Du Pont's registered Trade Mark

Claims

1. A tile floor which is resistant to chemicals and impervious to liquids, said floor comprising a top layer of floor tiles (5), a substrate for said floor tile layer comprising a supporting structural member, and a bonding material layer (3) comprising bonding material which binds the floor tile layer to the substrate, said substrate also comprising a mainly fibre based intermediate material layer (2), on to which the floor tile layer is bonded with the bonding material, said bonding material penetrating through the intermediate material layer within at least a part of the areal extension of the intermediate material layer into contact with and bonding to an underlying part of the substrate, thereby at least contributing to the bonding of the floor tile layer and the intermediate material layer to the underlaying sub-

strate.

2. A tile floor according to claim 1, wherein said substrate comprises a base material layer (1), especially a cement mortar layer, and wherein the bonding material penetrating through the intermediate material layer is bonded to said base material layer.

3. A tile floor according to any of the preceding claims, wherein the bonding material is resistant to acids and impervious to liquids and comprises a binder selected from the group consisting of organic resins and hydraulic binders, especially epoxy resins, such as epoxy mortars.

4. A tile floor according to any of the preceding claims, which comprises as a base material layer (1), under the intermediate material layer (2), a mortar layer consisting of a combination of aggregates and mortar binder selected from the group consisting of hydraulic cements, gypsum and organic resins.

5. A tile floor according to any of the preceding claims, which is substantially free from penetration of materials from the base material layer, upon which the intermediate material layer rests, into the bonding material layer (3) above the intermediate material layer (2), or at most exhibits penetration of material from the base material layer into the intermediate material layer up to at most a part of the thickness of the intermediate material layer.

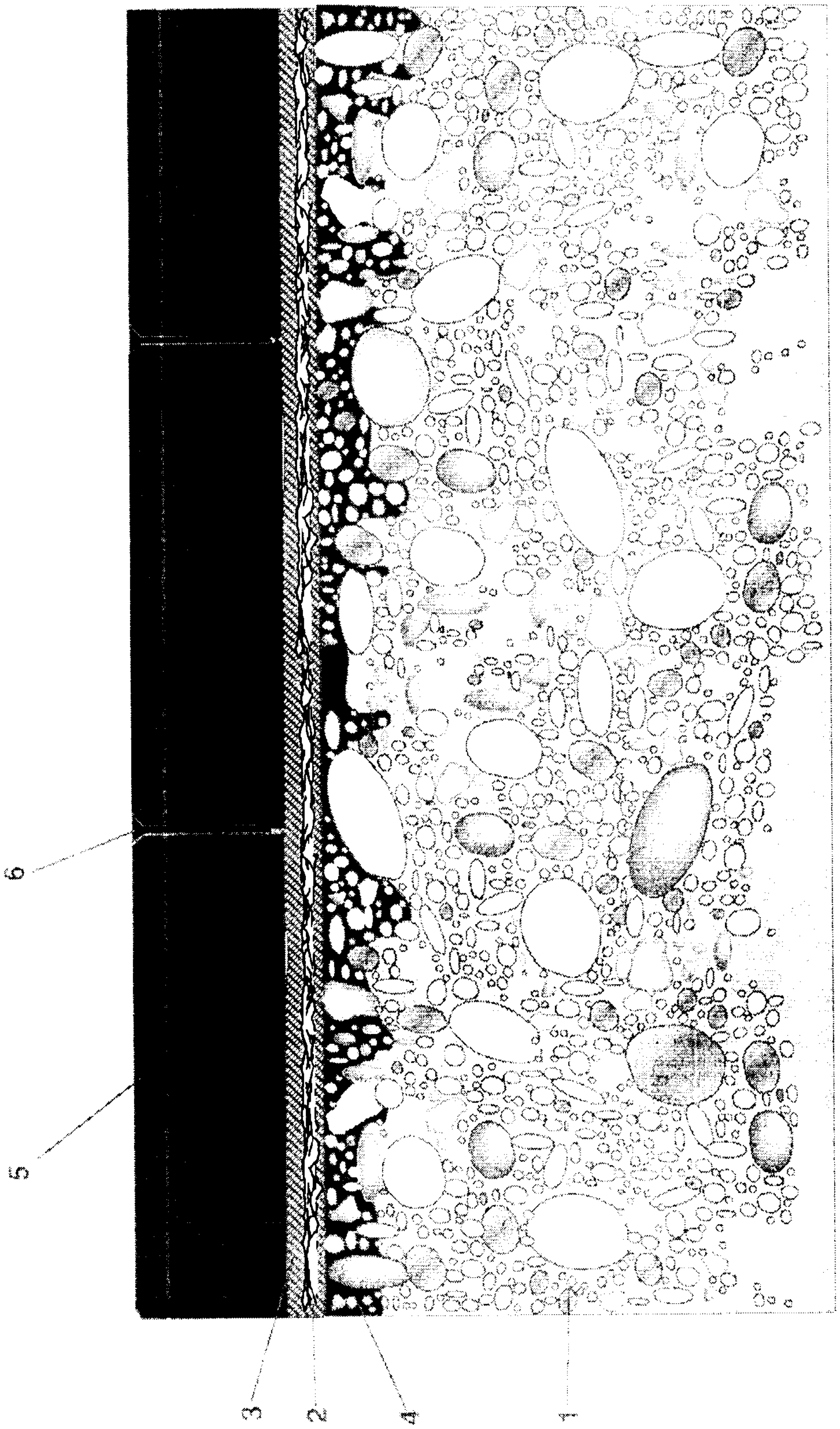
6. A tile floor according to any of the preceding claims, wherein the intermediate material layer (2) consists mainly of fibre based material, especially textile material, such as geotextile materials, comprising communicating voids extending through the thickness of the intermediate material layer from the bonding material layer (3) to the part of the substrate, especially base material layer, on which the intermediate material layer rests, said voids being at least partially filled with bonding material penetrating from the bonding material layer into contact with the part of the substrate (1) on which the intermediate material layer rests.

7. A tile floor according to claim 6 wherein the textile material comprises non-woven or woven fibrous inorganic or organic materials, especially of the geo-textile type.

8. A process for producing a tile floor according to any of the preceding claims, which comprises applying as an upper part of a substrate for a floor tile (5) layer at least one layer comprising a mainly fibre based intermediate material (2) and a bonding material (3), said applied bonding material being suitable for forming below said floor tile layer a continuous layer (3) of chemical resistant and liquid impermeable bonding material for bonding said floor tile layer, said intermediate material layer (2) being permeable to the bonding material, placing a layer of floor tiles (6) on said at least one layer of bonding material and intermediate material, and consolidating and compacting the floor by subjecting the floor tile layer to a mechanical compacting treatment, thereby forming a tight bonding contact between the floor tiles and an underlying continuous bonding material layer, said bonding material being within at least a substantial part of the areal extension of the intermediate material layer penetrated through said intermediate material layer into contact with and binding to the underlaying part of the substrate, especially a base material layer (1) of cement mortar.

9. A process according to claim 8 wherein the compacting treatment comprises a vibrating treatment.

10. A process according to claim 8 or 9, wherein the intermediate material is applied as at least one layer (2) on to an at most incompletely set and especially fresh, unhardened base material layer (1) of the substrate, said at least one intermediate material layer being at most incompletely permeable to said incompletely set base layer material and permeable to the bonding material to an extent, which permits contact of the bonding material with the base material layer through open voids in the intermediate material layer communicating with the upper and lower sides of said layer, the open voids in the intermediate material layer being at least partially filled with the bonding material prior to or after the application of the mechanical compacting treatment.


6
5
3
2
4
1