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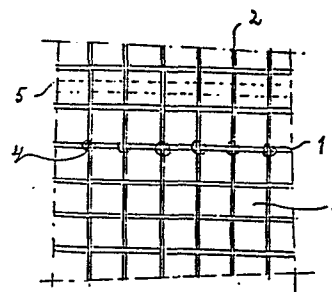
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54 A floor covering.

57 A floor covering, comprising a fabric substrate and an upper layer of a wear-proof material with an elastomeric behaviour adhered thereon, the fabric threads (1) directed in the transversal direction of the web having a large elasticity module, and the fabric threads (2) in the longitudinal direction of the web having a sufficient tensile strength for withstanding the longitudinal forces occurring during manufacturing, and having, in particular, a smaller elasticity module than the transversal threads. The transversal threads (1) consist, in particular, of glass fibres, and the longitudinal ones (2) of a polyester. In the cross-points the threads can be interconnected by means of an adhesive (4) which can also cover the rest of the threads. Such a material is, in particular, suitable for being cut into tiles which appear to be dimensionally stable.



A floor covering.

With several floor covering materials, comprising a substrate and an upper layer, consisting, respectively, of a fabric and a more or less wear-resistant material, often difficulties in respect of their dimensional stability are met with. For instance
5 so-called linoleum is manufactured from a substrate consisting of jute fabric, on which a hot plastic mass of oxidised and gelated linseed oil, fillers and dyes and, as the case may be, further additives, is calendered. The web thus obtained is introduced into a drying chamber in which it is suspended in loops, and the upper
10 layer is allowed to set therein. After leaving the drying chamber, the web is cut to the required size, and is wound on rolls.

The threads of the substrate should withstand the forces exerted thereon in the longitudinal direction of the web during calendering and also during setting. These forces may give rise
15 to more or less elastic deformations in the fabric and in the upper layer fixed thereon, which will partly be restored after setting of the upper layer. The linoleum then shows a more or less elastomeric behaviour, which means that on deformation the total volume will not or not substantially change, so that a reduction of the length
20 in one direction will lead to an increase of the length in a different direction and vice versa. The restoration of a deformation after disappearance of the forces causing said deformation can occur with a certain delay, and is not necessarily complete. Moreover the jute fabric and also the upper layer material are sensitive
25 for moisture which may also lead to changes of dimension which cannot be controlled. A consequence of all this is that linoleum is not dimensionally stable, which also holds for other materials with a comparable behaviour.

This lack of dimensional stability is not very objectionable in the case of webs wound on a roll which are to be
30 glued on a floor, but will be inconvenient in the case of loosely applied webs. This will be very objectionable, however, if the material is cut into tiles, as during storage, i.e. by moisture, considerable dimensional variations can occur, which will substantially reduce the usefulness, and in particular the mutual
35 fitting of the tiles. However there is a large demand for tile-

shaped material, i.e. because of the effects obtainable thereby, the ease of laying and the like, but this demand has not been satisfied until now because of the above-mentioned objections.

A substrate which is less sensitive for moisture than
5 jute and which can better resist to increases of length might, probably, improve the insufficient dimensional stability of linoleum and similar floor coverings. Glass fibre fabrics will, as such, satisfy this requirement, but the longitudinal threads thereof can often not withstand the longitudinal forces occurring during
10 calendering, so that rupture can occur then.

The invention is based on the insight that use can be made of the elastomeric behaviour of the upper layer material for improving the dimensional stability. The floor covering according to the invention in the form of a web having a length which is
15 considerably larger than its width, comprising a substrate of a fabric of, respectively, longitudinally and transversally directed threads or the like, and an upper layer of a more or less elastic and wear-resistant material fixed on said substrate and showing, in at least a substantial degree, an elastomeric behaviour, is, to
20 that end, characterised in that the threads extending in the transversal direction of the web have a large elasticity modulus, whereas the threads in the longitudinal direction of the web have a sufficient tensile strength for withstanding the longitudinal forces occurring during manufacturing. In particular the longitudinal
25 threads have a smaller elasticity modulus than the transversal threads.

The fabric threads extending in the longitudinal direction ensure the integrity of the formed material during calendering and setting, and can undergo a certain stretch, which, after dis-
30 appearance of the generating forces, has a tendency of recovering. The upper layer material will, after setting and after disappearance of the longitudinal forces, try to shrink somewhat. Shrinkage in the longitudinal direction would lead to an increase of the transversal dimension which will be opposed by the transversal threads
35 which had not been loaded during calendering and setting, so that shrinkage in the longitudinal direction is, therefore, counteracted. In this manner a very good dimensional stability can be obtained.

The transversal threads of such a substrate fabric consist, in particular, of glass fibres, and the longitudinal threads

can consist of a polyester.

It is, then, favourable to interconnect the fabric threads in the crossing points by means of an adhesive, which cross-linking can counteract deformation of the substrate by the forces occurring during calendering, and also the remaining parts of the substrate can be covered so as to reduce its moisture sensitivity and to improve the adhesion of the upper layer material and/or of a glue used for fixing.

Such a web is in particular suitable for being cut into tiles, as the tiles have now become sufficiently dimensionally stable, so that during storage no substantial dimensional deviations will occur which would reduce the usefulness of the tiles.

The invention will be elucidated below in more detail by reference to a drawing, in which, by way of example, a top view of a part of a substrate for a floor covering according to the invention is schematically shown.

The substrate shown consists of an open fabric with threads or bands 1 of glass fibres directed in the transversal direction of the web, and having a large elasticity modulus which means that, on stretching said threads, very considerable tensions will occur, so that a high resistance against stretching will be obtained. Such fibres have a relatively low stretch at rupture.

In the longitudinal direction of the web threads or bands 2 consisting of a polyester are provided. These threads have a lower elasticity modulus so that less resistance against stretching will be provided. The tensile strength of these threads should, however, be sufficient for withstanding the forces occurring during manufacturing.

During calendering, i.e. providing the upper layer material on the substrate between rollers, very substantial tensile forces may be exerted, so that threads with a high tensile strength are required. For completing the setting of the cover layer material provided on the substrate, the formed web is suspended in a drying chamber in loops, and also then substantial longitudinal forces can occur. The fabric used according to the invention has a high longitudinal tensile strength, and can, moreover, sufficiently yield in said direction; the longitudinal threads have a large stretch at rupture. These longitudinal threads will yield, and

keep the whole assembly together.

The cover layer material calendered on the fabric intrudes into the interspaces 3 between the fabric threads 1 and 2, and adheres to said threads. After completion of setting of the material 5 and disappearance of the longitudinal loads, however, a tendency to shrink will occur, but the cover layer material shows, in linoleum or similar floor coverings, to a substantial degree an elastomeric character, which means that on deformation the total volume will remain substantially unchanged. This means, furthermore, 10 that when longitudinal shrinkage will occur, this should be accompanied by a lateral expansion. This expansion, however, is opposed by the glass fibre threads 1, so that a substantial longitudinal shrinkage cannot take place either. The polyester threads 2 remain, therefore, subjected to a certain tension, and also in the 15 upper layer tensions will remain.

The current linoleum with a jute substrate is sensitive for moisture. For the filler substances present in the upper layer, such as sawdust or the like, can absorb moisture, and also the jute fibres are moisture sensitive. All this will be expressed in a 20 rather substantial increase in width, but also a certain longitudinal shrinkage appears to occur. The total volume may slightly increase when absorbing moisture.

When using a substrate according to the invention, the upper layer is equal to that of the known linoleum, and is, therefore, 25 fore, moisture sensitive. The increase in width, however, is prevented for the greater part by the glass fibres. The expansion should, therefore, take place primarily in the longitudinal direction, and then the tendency to shrink in that direction is to be overcome first, but also the prestressing to which the polyester 30 threads are submitted. It has appeared to be possible to obtain substantially equal expansions in both directions. A part of the expansion can, moreover, express itself as an increase in thickness. If square tiles are cut from such a floor covering, said tiles will remain substantially square even when absorbing moisture, so that 35 laying such tiles in specific patterns, in particular with alternating directions, remains possible.

Therefore, in the manner described above, a substantial improvement of the dimensional stability can be obtained, which can be improved still further by providing in the crossing points of the

threads 1 and 2 a cross-linking by means of a suitable plastic, as schematically indicated at 4. Thereby it can be prevented that, as a consequence of the substantial forces occurring during calendering, the threads will be mutually displaced. Moreover it is avoided
5 thereby that the threads, after completion of the setting of the upper layer, will be displaced under the influence of tensions already present or occurring later.

If the threads 1 and 2 are completely covered with said plastic, the adhesion of the upper layer material and/or of a glue
10 used for fixing the floor covering to an underlying floor can be improved, and, as the case may be, also the moisture sensitivity can be reduced thereby.

It will be clear that the invention is not restricted to a fabric of glass fibre and polyester threads, and that also other
15 kinds of threads can be used, provided that the latter will be able to provide a sufficient transversal resistance against stretching and are longitudinally sufficiently strong and yieldable for being able to withstand the occurring forces. The invention is, moreover, not restricted to linoleum, but can also be applied with other floor
20 coverings showing a certain elastomeric behaviour.

Claims

1. A floor covering having the shape of a web with a length which is substantially larger than the width, comprising a substrate made of a fabric of threads or the like in the longitudinal and transversal direction respectively of the web, and an upper layer
5 adhered to said substrate of a more or less elastic and wear-proof material showing in an at least substantial degree an elastomeric behaviour, characterised in that the threads in the transversal direction of the web have a large elasticity modulus, and the threads in the longitudinal direction of the web have a
10 sufficient tensile strength for withstanding the longitudinal forces occurring during manufacturing.

2. The floor covering of claim 1, characterised in that the longitudinal threads have a smaller elasticity modulus than the transversal threads.

15 3. The floor covering of claim 1 or 2, characterised in that the transversal threads consist of glass fibres.

4. The floor covering of claim 2 or 3, characterised in that the longitudinal threads consist of a polyester.

5. The floor covering of any one of claims 1..4,
20 characterised in that the longitudinal and transversal threads are interconnected by means of a suitable adhesive.

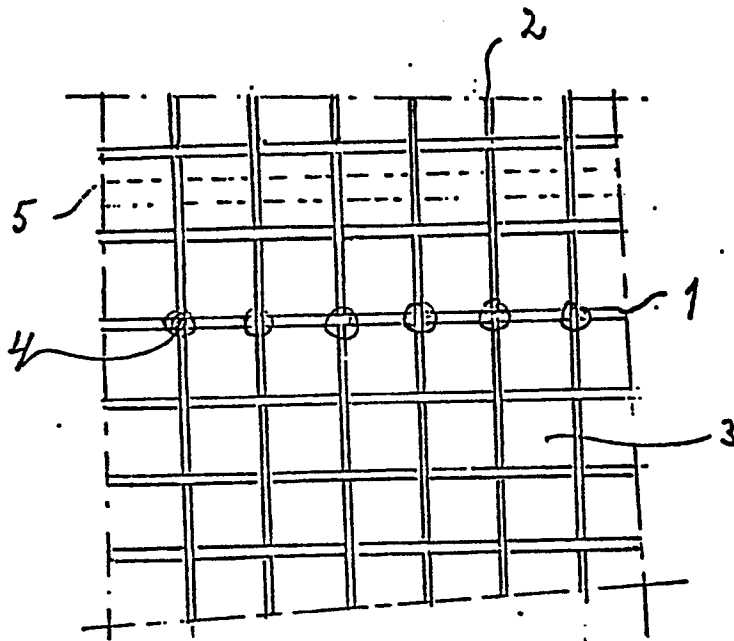
6. The floor covering of claim 5, characterised in that also the remaining parts of the threads are covered with a similar substance.

25 7. A tile, cut from a web according to any one of claims 1..6.

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European Patent
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EUROPEAN SEARCH REPORT

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Application number

EP 82 20 1096

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. 3)
A	--- US-A-4 015 038 (ROMANSKI) *The whole document*		D 06 N 7/00 B 32 B 27/12 D 06 N 1/00 D 03 D 15/00
A	--- US-A-3 871 946 (ROMANSKI) *The whole document*		
A	--- FR-A-2 300 191 (VILLEROY & BOCH) *The whole document* -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl. 3)
			D 06 N B 32 B D 03 D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 01-12-1982	Examiner HELLEMANS W.J.R.
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