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(54) Base for a playing field

(57) The present invention concerns a base for a playing field, in particular for a tennis court and the method for preparing it.

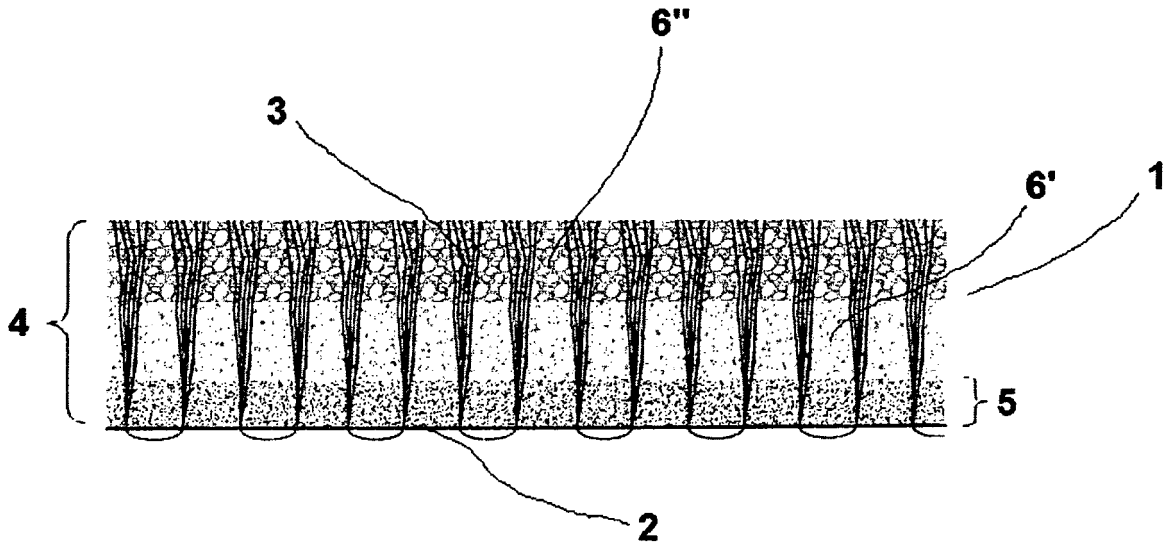

FIG. 3

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Description

[0001] The present invention concerns a base for a playing field, the method for preparing it and a playing field made with such a base. The described playing field is particularly suitable for playing tennis.

DESCRIPTION OF THE PRIOR ART

[0002] There are known traditional tennis courts commonly called "clay". They are prepared by digging to about half a metre deep, on the base of which a bed of about 35 cm of selected quarry scree is formed, the granule size of which is about 40-70 mm, which has a layer of fine gravel having average dimensions of about 3-15 mm laid over it. The layer closest to the surface comprises about 3 cm of tile granules, with low clay content having a drainage function, on which a sub-layer sits consisting of a granulate (0-2 mm) of tiles and raw clay and which is finally covered with a final layer of very fine ground brick (<1 mm in diameter), which gives the tennis court its characteristic colour.

[0003] In making the court substantial amounts of water are used, in order to allow the layers of the base to bed in. Moreover, the normal maintenance of such a base requires frequent and constant irrigation whilst also avoiding the formation of puddles: up to 15' even 4 times per day with a flow rate of 80/100 litres per minute. Therefore, it is clear that substantial amounts of water are needed.

[0004] A base prepared in this way has optimal characteristics in terms of the bounce of the ball and the possibility of sliding, these being properties that make such a surface highly esteemed.

[0005] Unfortunately, clay courts require continuous and careful, as well as expensive, upkeep. During the course of normal playing activity mounds and holes can form that must be quickly filled or flattened by using special levelling mats so that the surface goes back to being as flat and smooth as possible. When it rains, moreover, the court must be immediately covered with special covers so as to prevent it from being soaked. When located in open air they can only be used for a few months of the year and before the start of the sports season special upkeep must be carried out, with which the surface of the court is firstly cleaned of possible vegetable material through the use of an iron rasp and then the stiff top layer that forms over time due to the clay nature of the subsurface must be tilled. Then the sub-surface itself needs to be restored and new red earth, i.e. ground brick, needs to be added. Then the court lines are marked out.

[0006] The fact that the court may be located indoors like in a fixed or inflatable structure does not avoid such drawbacks that, on the contrary, can be accelerated by the stagnation of air and humidity, which can also cause the formation of an unpleasant mouldy smell. Moreover, heating causes faster hardening of the surface of the base.

[0007] The optimal properties of conventional clay bases, therefore, can easily alter over time and cause it to lose its elasticity, softness and slowness of play. Therefore, it becomes necessary to restore the ideal characteristics of the base.

[0008] It should also not be underestimated that all of the aforementioned maintenance activities require the intervention of specialised workers and involve substantial costs to keep the playing field operational. The cost of these activities is not therefore negligible.

[0009] The purpose of the present invention is therefore to provide a base for a playing field, which reproduces the advantageous properties of a conventional clay base, but that does not involve the aforementioned drawbacks relative to the costs and maintenance times.

[0010] Such purposes are accomplished by the base for a playing field in accordance with claims 1-14 attached to the present patent application and obtained according to the method of claims 15-18.

[0011] Figures 1 to 4 show bases for a playing field made according to the present invention and called Solution 1, Solution 2, Solution 3 and Solution 4 as will be shown hereafter.

[0012] More specifically, the base 1 for a playing field comprises a support 2 with wire-like formations or fibres 3 that is completely filled with filling material 4.

[0013] The wire-like formations or fibres 3 joined to the support 2 constitute the so-called "synthetic grass", obtained with methods known in the field and that as far as possible simulates a natural grass surface.

[0014] In particular, they can be obtained by weaving onto a support material made from polypropylene or felt and then proceeding to cut the weaves themselves.

[0015] The material of which the fibres 3 consist is usually a polymeric material chosen, for example, from polyethylene, polypropylene, polyamide and polyester. In particular, polypropylene is the preferred material, whereas polyethylene, being softer, is less preferred since the fibres thus obtained tend to bend too easily.

[0016] The same fibres 3 can also be of the single type, if made up of a single whole filament or else fibrillated, in the case in which the filament, from a certain height, has longitudinal cuts of different length, creating a sort of tuft of finer filaments. Fibrillated fibres have the advantage of forming a denser mesh, thus capable of holding the filling material 4 more effectively, preventing it from moving and increasing its stability.

[0017] The height of the fibres can also be about 10-30 mm according to requirements and, to make a tennis court, preferably it is about 20 mm.

[0018] By filling material, on the other hand, we mean a solid material, generally in granular form, which is made to infiltrate between the wire-like formations or fibres 3 thus filling the void that separates each wire-like formation 3 from the other and keeping them uniformly spaced and in a substantially vertical position and perpendicular to the support 2.

[0019] The filling material, 4 in turn consists of a bottom

filling layer 5 in contact with the support 2 and a top filling layer 6.

[0020] For the purposes of the present invention, the bottom layer 5 is a layer of sand of the quartziferous type, having a quartz percentage of at least 99%.

[0021] In the case in which it is necessary to fill fibres about 20 cm high, the bottom layer of sand is made using about 1.8-2.2 Kg/m^2 of support and, preferably, about 2 kg/m^2.

[0022] The amount of sand used for filling will be proportionally higher or lower according to the height of the filament-shaped formations or fibres 3.

[0023] The composition of the top filling layer 6, on the other hand, can be made differently according to the type of Solution.

[0024] Figure 1 represents a cross section of a structure for a base of a playing field in accordance with Solution 1 of the present invention. In detail, such a structure 1 comprises the primary support 2 from which the wire-like formations or fibres 3 project, which are at least partially, preferably completely, i.e. for their entire height, filled with the filling material 4.

[0025] In particular, the filling comprises the bottom layer of sand 5 and a top filling layer 6 made with highly-baked brick material in granular form, for example ground brick, the granules of which have a diameter of approximately 0.05-2 mm.

[0026] In particular, such a brick material is clay-free.

[0027] The amount of granulated brick used for filling is about 20 kg/m^2 of support.

[0028] In accordance with a second aspect, represented in Figure 2, the base for a tennis court according to the invention comprises the support 2 with the fibres 3 on which a first filling layer 5 of quartziferous sand is made as described above and a second filling layer 6 represented by a composition consisting of a highly baked granulated brick and a thermoplastic material in granular form. In particular, in the filling layer 6 the granulated brick has the characteristics described above and does not contain clay.

[0029] With regard to the thermoplastic material in granular form in the layer 6, it is polyurethane-based, characterised by a hardness defined in Sh.A (15 sec; ASTM D2240) comprised between 50 and 80, preferably 67.

[0030] According to a preferred aspect, to make the top filling layer 6 the thermoplastic material in granular form is mixed with the brick granulate in a percentage comprised between 5 and 20%, preferably 10%.

[0031] The filling material thus obtained is arranged in a quantity such as to completely cover the fibres, which, therefore, will not project from the filling remaining invisible and unnoticeable.

[0032] In accordance with a further aspect of the present invention, a base for a tennis court can be as represented in Figure 3 (Solution 3).

[0033] In particular, on the support 2 a first filling layer 5 is made consisting of quartziferous sand as indicated earlier. Above this layer 5 the top filling layer 6 is arranged, which, in turn, comprises a bottom layer 6' of thermoplastic material and a top filling layer 6" consisting of highly-baked brick material.

[0034] The thermoplastic material of the filling layer 6" and the brick granulate of the filling layer 6' have the characteristics described for Solutions 1 and 2. In particular, the brick granulate is clay-free.

[0035] Therefore, with respect to Solution 2 described above, in Solution 3 the thermoplastic polymer and the brick granulate are not mixed together, but each represent a different layer.

[0036] Thanks to the particular filling of the fibres according to the present invention, the base of the playing field has surprisingly proven to reproduce the characteristics of clay bases. In particular, it is advantageously soft, allowing players to play their sport at any level.

[0037] Moreover, such characteristics of softness allow the base itself to absorb the banging of the limbs during play optimally and better than other bases known in the field. In this way, the stresses to the joints, muscles and tendons are lower, advantageously reducing the possibility of dangerous injuries. Players can manage to play for longer, even for many hours.

[0038] According to a further aspect of the present invention, a base for a tennis court according to what has been described (Solution 1, Solution 2 and Solution 3), can be made on a shock-pad 7, as shown in Figure 4 according to the Solution 4 described hereafter.

[0039] For example, said pad can consist of the drainage geocomposite Enkadrain®5006H (SEIC), comprising a three-dimensional core of monofilaments of polypropylene inside two geotextiles of unwoven filtering polypropylene welded together and fixedly connected with the core.

[0040] When it is being made, the shock-absorbing and drainage pad 7 is rested on a surface and the support 2 carrying the fibres 3 is placed on it, without it being necessary to use glues; thereafter, the fibres can be filled according to Solution 1, 2 or 3.

[0041] The purpose of the pad is to make it easier for water to drain, in particular horizontally. In this way, a base for a playing field according to the present invention can be advantageously made even on top of surfaces that do not ensure vertical drainage, like for example cement or asphalt.

[0042] Moreover, the pad 7 gives even greater softness to the base of the playing field, increasing its tolerability.

[0043] The present invention concerns as well a playing field, in particular a tennis court, the base of which is made according to what is described in the present invention.

[0044] The preparation of such a playing field comprises the steps of:

laying out a support 2 on a flat surface characterised in that it comprises a plurality of fibres 3 attached to

it and substantially vertical and perpendicular with respect to the support 2 itself;
partially filling said fibres 3 with a bottom layer of sand 5, preferably quartziferous;
completing the filling of the fibres 3 with a top filling layer 6 comprising a brick granulate or a mixture of brick granulate and a thermoplastic material or else with a filling layer 6' consisting of a thermoplastic material on which a filling layer 6" of brick granulate is then made.

[0045] In particular, in step a), the support 2 with the fibres 3 attached to it is represented by so-called "synthetic grass".

[0046] The step of filling with sand of step b), on the other hand, is obtained with an amount of sand comprised between 1.5 and 2.5 kg/m^2 of support, preferably 2 Kg/m^2 of sand.

[0047] In step c), on the other hand, preferably the top filling layer 6 comprising a mixture of brick granulate and of a thermoplastic material comprises about 5-15% by weight of thermoplastic material.

[0048] According to the present invention, said thermoplastic material is a polyurethane in granular form and, according to a preferred aspect, it is characterised by a hardness defined in Sh.A (15 sec; ASTM D2240) comprised between 50 and 80, preferably 67.

[0049] Moreover, in the top filling layer 6, the brick granules and the granules of polymeric material have a diameter of about 0.05-2 mm.

[0050] With respect to playing fields built according to the methods already known in the field, the field obtained in accordance with the present invention requires less upkeep, in terms of hours and particularly in terms of costs. Indeed, the restoration of the base at the start of the season does not, for example, comprise the operations that were described in reference to bases for traditional tennis courts, like the removal of the hardened surface layer that forms due to heat and humidity. Moreover, the formation of holes and depressions is less common and, therefore, the surface has to be levelled less frequently. Furthermore, the field thus prepared requires less frequent and abundant watering, advantageously helping to save up to 60% water. If the field is inside a closed structure, then the unpleasant smell of mould and wet does not develop.

[0051] Whilst it is structurally different from clay courts, it still surprisingly offers the same optimal playing characteristics.

[0052] Furthermore, as described above, the base for a playing field of the present invention can be tolerated for longer by players, who suffer from less stress to the joints and muscles.

[0053] Modifications to the structure of the base for a playing field as described above within the capabilities of the man skilled in the art should also be considered to be covered by the present invention.

Claims

1. A base for a playing field (1), comprising a support (2) to which a plurality of fibres (3) are attached in a substantially vertical position and perpendicular to said support (2) and a filling material (4) comprising a bottom layer of sand (5) in contact with the support (2) and a top filling layer (6), **characterised in that** such a filling layer (6) consists of a mixture of clay-free highly-baked brick granulate and a granulated thermoplastic material, or else a layer (6') of granulated thermoplastic material and a layer of clay-free highly-baked brick granulate (6").

2. The base for a playing field (1) according to claim 1, wherein said clay-free highly-baked brick granulate is used in a quantity of about 20 kg/m^2 of support (2).

3. The base for a playing field (1) according to claim 1 or 2, wherein said granulated thermoplastic material is polyurethane.

4. The base for a playing field (1) according to any one of claims 1 to 3, wherein said polyurethane is **characterised by** a hardness defined in Sh.A comprised between 50 and 80, preferably 67.

5. The base for a playing field (1) according to any one of claims 1 to 4, wherein the clay-free highly-baked brick granulate and the granulated thermoplastic material are **characterised by** a granule size of about 0.05-2 mm.

6. The base for a playing field (1) according to any one of claims 1 to 5, wherein in said mixture of brick granulate and thermoplastic material, the thermoplastic material is comprised in a quantity of between 5-20%, preferably 10% by weight of said layer (6).

7. The base for a playing field (1) according to claim 1, wherein said fibres have a height of between 10 and 30 mm, preferably 20 mm.

8. The base for a playing field (1) according to any one of the preceding claims, wherein the filling material covers the entire height of the fibres.

9. The base for a playing field according to any one of the preceding claims, wherein the amount of sand of the bottom filling layer (5) is proportional to the height of the fibres and it is comprised between 1.8 and 2.2 Kg/m^2 of support, preferably 2 Kg/m^2 if the fibres have a height of about 20 mm.

10. The base of a playing field according to any one of the previous claims further comprising a drainage and shock-absorbing structure (7) placed under the support (2).

11. A method for making a base for a playing field, comprising the steps of:

a) laying out a support (2) on a flat surface, said support (2) being **characterised in that** it comprises a plurality of fibres (3) attached thereto, substantially vertical and perpendicular with respect to the support (2) itself;
b) partially filling said fibres (3) with a bottom layer of sand (5), preferably quartziferous;
c) filling the fibres (3) until they are completely covered with a top filling layer (6) consisting of:

i) a mixture of a thermoplastic material in granular form and of a brick granulate; or else of
ii) a layer (6') of thermoplastic material in granular form and a layer (6") of a clay-free highly-baked brick granulate.

12. The method for making a base for a playing field according to claim 11, wherein said fibres have a height comprised between 10-30, preferably 20 mm.

13. The method for making a base for a playing field according to claim 12, wherein the filling with the layer of sand (5) of step b) is obtained with a quantity of sand comprised between 1.5 and 2.5 kg/m^2 of support, preferably 2 kg/m^2 of sand for fibres having a height of about 20 mm or proportionally more or less according to the greater or lesser height of the fibres (3).

14. The method for making a base for a playing field according to any one of claims 11 to 13, wherein in step c) the mixture i) of granulated thermoplastic material and of brick granulate of the top filling layer (6) comprises about 5-15% by weight, preferably about 10% by weight of granular thermoplastic material.

15. The method for making a base for a playing field according to any one of claims 11 to 14, wherein said thermoplastic material is polyurethane in granular form.

16. The method for making a base for a playing field according to any one of claims 11 to 15, wherein said thermoplastic material is **characterised by** a hardness defined in Sh.A comprised between 50 and 80, preferably 67.

17. The method for making a base for a playing field according to any one of claims 11 to 16, wherein in the top filling layer (6), the brick granules and the granules of thermoplastic material have a diameter of about 0.05-2 mm.

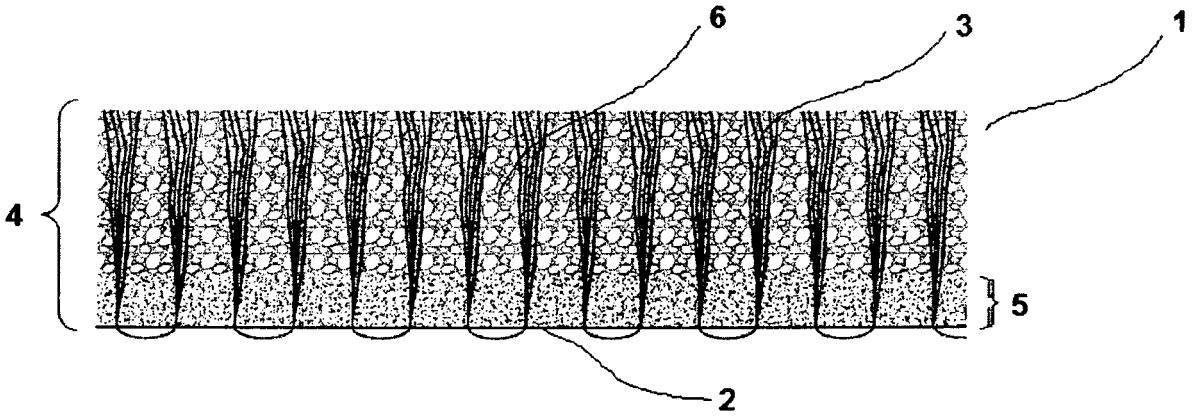

FIG. 1

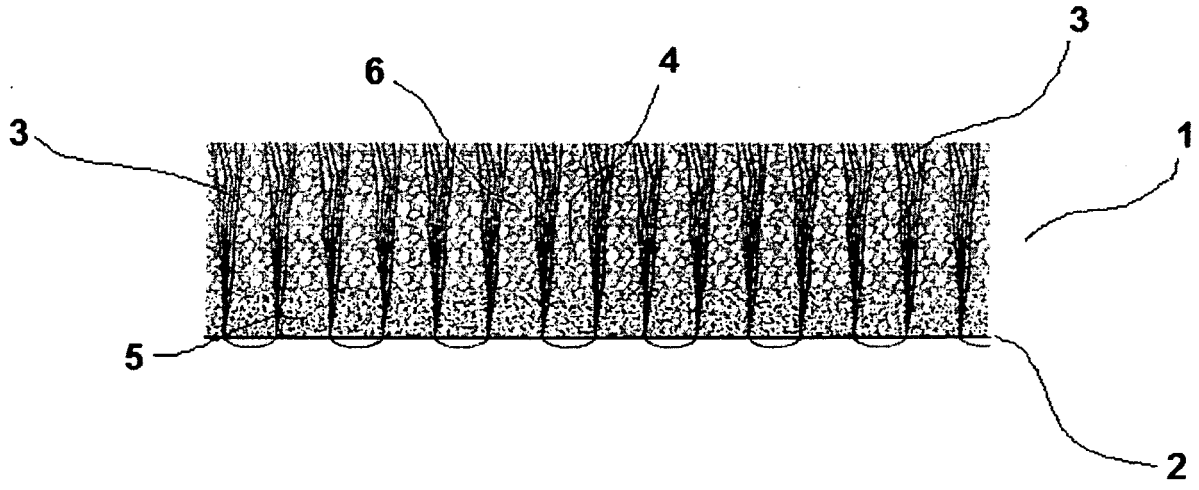

FIG. 2

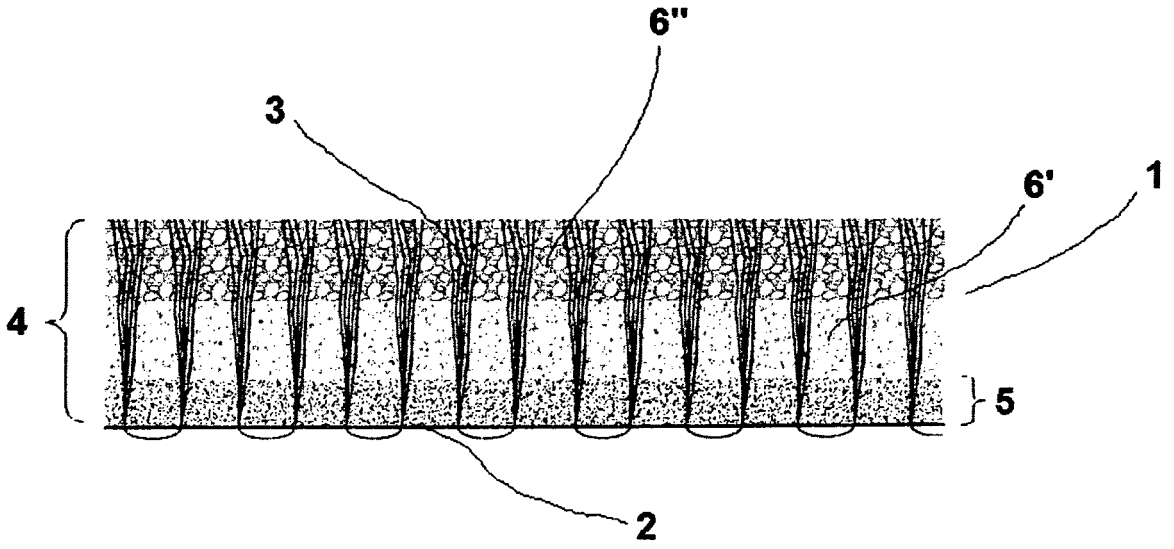

FIG. 3

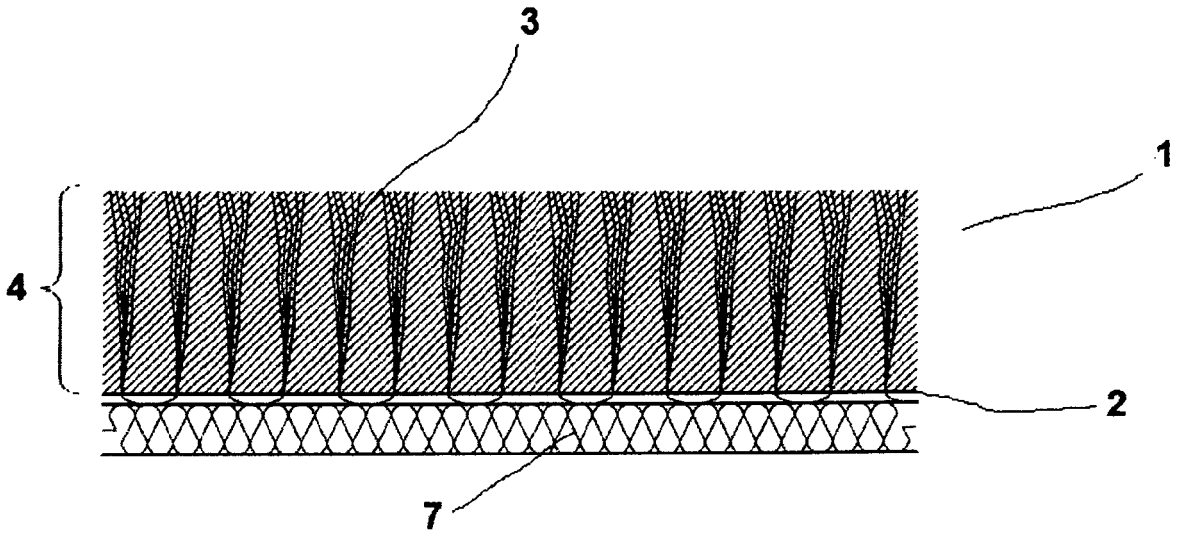

FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 11 42 5083

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 5 678 951 A (LEVASSEUR FRANCOIS [FR]) 21 October 1997 (1997-10-21) * column 2, line 38 - column 3, line 22; figure 1 *	1,11	INV. A63C19/02 E01C13/08
A	EP 2 039 831 A1 (DOMO ZELE NV [BE]) 25 March 2009 (2009-03-25) * paragraphs [0007], [0009] - [0011], [0015], [0034], [0069] - [0071], [0077], [0078], [0097], [0099], [0102]; figures 2, 12 *	1,11	
A	WO 2009/118388 A1 (DSM IP ASSETS BV [NL]; DOZEMAN ALBERTUS OTTO [NL]; JOLY GERT JOHAN [BE]) 1 October 2009 (2009-10-01) * page 7, line 33 - page 10, line 19 *	1,11	

TECHNICAL FIELDS SEARCHED (IPC)
A63C
E01C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 September 2011	Brunie, Franck

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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16-09-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5678951 A	21-10-1997	AT 143432 T	15-10-1996
		AU 700362 B2	07-01-1999
		AU 5972094 A	29-08-1994
		CA 2155749 A1	18-08-1994
		DE 69400615 D1	31-10-1996
		DE 69400615 T2	30-04-1997
		DK 683836 T3	17-03-1997
		WO 9418393 A1	18-08-1994
		EP 0612885 A1	31-08-1994
		EP 0683836 A1	29-11-1995
		ES 2092896 T3	01-12-1996
		GR 3022140 T3	31-03-1997
		JP 3305323 B2	22-07-2002
		JP 8510521 T	05-11-1996
EP 2039831 A1	25-03-2009	NONE	
WO 2009118388 A1	01-10-2009	AU 2009228949 A1	01-10-2009
		CA 2719808 A1	01-10-2009
		EP 2265764 A1	29-12-2010
		US 2011135851 A1	09-06-2011

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