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(54) Drainable panel with synthetic grass

(57) A drainable panel with synthetic grass comprising a grass-laden element (1) presenting an upper surface from which synthetic grass (2) projects and a lower surface opposite it, said panel comprising an elastically deformable blanket (3) presenting a face to which the lower surface of the grass-laden element (1) is non-removably joined, at least said blanket (3) presenting drainage holes (4) which traverse it transversally.

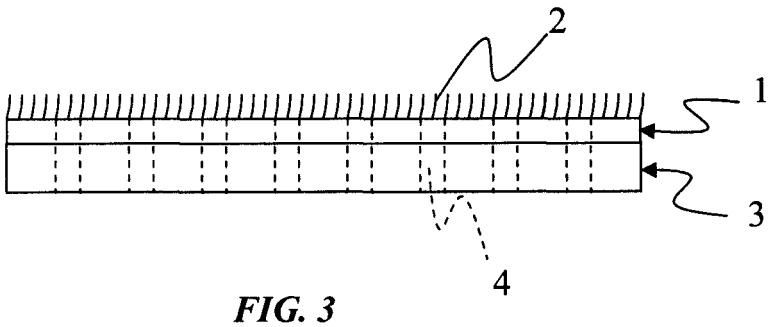

FIG. 3

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Description

[0001] The present invention relates to a drainable panel with synthetic grass in accordance with the introduction to the main claim, and a process for its production.

[0002] In the state of the art, playing fields with synthetic grass are produced using grass-laden elements comprising blades of synthetic grass sewn onto a fabric support. Said grass-laden elements present an upper surface from which the synthetic grass projects, and a lower surface on which latex is applied to permanently fix the roots of these grass blades to the fabric.

[0003] The grass-laden elements can be made drainable by a plurality of small holes provided therein.

[0004] When laid on the ground, the grass-laden elements present the problem of providing a playing surface which is too hard.

[0005] A second problem is that such grass-laden elements tend to lift from the ground when subjected to the stresses of players running along the field or suddenly stopping.

[0006] To solve these problems, sand and rubber granules or cloggings of various materials are spread between the synthetic grass blades. The purpose of the sand is to weigh down the grass-laden element and prevent it from easily lifting during use. The purpose of the rubber granules is to soften the field of play.

[0007] The solution found is not however optimal, as the rubber granules can create environmental problems.

[0008] These rubber granules can also penetrate into the players' shoes, creating annoyance.

[0009] A further problem is that with continued use of the playing field, the rubber granules are gradually lost from the field and new rubber granules have therefore to be periodically added.

[0010] An object of the present invention is therefore to provide a drainable panel with synthetic grass by which the stated drawbacks are overcome, a particular object being to provide a drainable panel with synthetic grass which is sufficiently soft to be usable for play and for the sport which is to be practised on it, without adding rubber granules or cloggings of various materials.

[0011] A further object is to provide a drainable panel with synthetic grass which does not lift easily during use.

[0012] Said objects are attained by a drainable panel with synthetic grass and by a process for its production, the inventive characteristics of which are defined in the claims.

[0013] The invention will be more apparent from the ensuing detailed description of one embodiment thereof which is provided by way of non-limiting example and is illustrated in the accompanying drawings, in which:

Figure 1 is a perspective view of the upper surface of the drainable panel with synthetic grass;
Figure 2 is a perspective view of the lower surface of the drainable panel with synthetic grass;
Figure 3 is a side elevation of the drainable panel with synthetic grass;
Figure 4 shows a stage in the production process for the drainable panel with synthetic grass.

[0014] With reference to Figures from 1 to 3, it can be seen that the drainable panel with synthetic grass comprises a grass-laden element 1 superposed on and joined to one of the two faces of an elastically deformable blanket 3. The grass-laden element 1 comprises a typically fabric support onto which blades of synthetic grass are sewn. This has an upper surface from which synthetic grass 2 projects, and a lower surface opposite it. The blanket 3, typically of plastic or rubber material, presents a face to which the lower surface of the grass-laden element 1 is non-removably fixed.

[0015] At least the blanket 3 presents drainage holes 4 which traverse it transversally. If not provided with latex, the grass-laden element 1 is water-permeable by nature and does therefore not require drainage holes. The support on which the synthetic grass blades are fixed is perforated to enable these grass blades to pass through. This is sufficient to make the grass-laden element water-permeable. Its permeability may however also be determined by the fact that this support is made of a permeable fabric onto which the synthetic grass blades are sewn. The absence of latex is preferable as the latex is suspected of being carcinogenic. If however the lower surface of the grass-laden element is covered with latex or another material which makes the grass-laden element 1 impermeable to water, the grass-laden element 1 superposed on the blanket 3 must also comprise drainage holes 4.

[0016] The drainable panel with synthetic grass can advantageously comprise a reinforcement sheet (not shown for simplicity) joined to at least one of the two faces of the blanket 3. This reinforcement sheet can therefore be interposed between the grass-laden element 1 and the blanket 3 or be glued to the blanket 3 alone, on its lower face shown in Figure 2. This reinforcement sheet can preferably comprise glass or carbon fibres, or a particular non-woven fabric material formed from fibres which are interlaced but not woven, or rock wool, cotton, polyester or hemp. If the reinforcement sheet is impermeable to water, it must also comprise drainage holes corresponding to those present in the blanket 3 and possibly in the grass-laden element 1. If the reinforcement sheet is water-permeable, it does not require the presence of drainage holes. The purpose of this reinforcement sheet is to oppose thermal expansion which can cause the panel to deform and some parts of it to lift.

[0017] The blanket 3 of the drainable panel with synthetic grass can be made of different materials, including for example polystyrene, polyurethane, an expanded rubber known as EPDM, a closed-cell expanded polyethylene known commercially as EVA, polypropylene, high density polyethylene, hard or soft plastic, recycled

or non-recycled rubber, cork, extruded polystyrene, rock wool, or compacted polystyrene beads. A closed-cell expanded crosslinked polyethylene material in accordance with EP 1 247 632 can also be used, in which pieces of thermoplastic material are heated and pressed with cooled plates to obtain partial fusion with joining of the various pieces.

[0018] The thickness and the elasticity and deformability characteristics of the blanket 3 depend on the characteristics required for the overall panel.

[0019] The dimensions and the distances between the drainage holes 4 must be such as to allow good drainage of the rain water. At the same time the drainage holes must not be so dense or so large as to excessively weaken the panel or compromise the support action of the blanket towards the grass-laden element or to excessively thin out the synthetic grass surface. For this reason the drainage holes have a diameter or transverse dimension between 1 mm and 25 mm. Preferably the drainage holes have a transverse dimension between 2 mm and 4 mm. They are spaced apart such that a panel surface of 4 dm^2 (a square of 20 cm side) has a number of drainage holes between 1 and 10000, preferably between 10 and 600.

[0020] Besides draining rain water, the presence of a plurality of through drainage holes 4 enables air to pass, to considerably reduce the deformation and lifting of parts of the panel, when its surface is subjected to even intense solar radiation.

[0021] The present patent also protects a production process for the drainable panel with synthetic grass (Figure 4).

[0022] This process comprises the following steps:

a) preparing an elastically deformable blanket 3 with two substantially parallel faces;
b) forming drainage holes transversely through the blanket 3;
c) preparing a grass-laden element 1 presenting an upper surface from which synthetic grass 2 projects and a lower surface opposite the upper surface;
d) permanently joining the lower surface of the grass-laden element 1 to a face of the blanket 3.

[0023] The described process is also protected by patent even if the steps are not carried out in the described order. For example the drainage holes 4 which traverse the blanket 3 may be formed after joining the blanket 3 to the grass-laden element 1.

[0024] If the grass-laden element 1 is impermeable to water, drainage holes are also formed in the grass-laden element 1.

[0025] The process for permanently joining the grass-laden element to the blanket can comprise gluing preferably with thermo-adhesive glue, or hot joining the plastic material to the interface by partial fusion. The heating action exerted on the thermo-adhesive glue or provided for hot joining is indicated by the arrow 6 in Figure 4. The surfaces to be glued together are superposed and pressed together by passing the grass-laden element 1 and the blanket 3 between a pair of counter-rotating parallel rollers with a suitable distance between axes.

[0026] The drainage holes 4 can be formed in various ways, for example with a known quilting machine or another machine.

[0027] The drainable panel with synthetic grass hence enables rain water to drain away and presents a softness determined by the type of blanket 3. Because of this, the presence of rubber granules on the panel grass surface can be reduced or eliminated.

[0028] The drainage holes, which also enable air to pass, prevent panel deformation and lifting due to solar heating.

[0029] Deformation due to solar heating is further limited if the drainable panel with synthetic grass comprises a reinforcement sheet with glass or carbon fibres joined to one of the faces of the blanket.

Claims

1. A drainable panel with synthetic grass comprising a grass-laden element (1) presenting an upper surface from which synthetic grass (2) projects and a lower surface opposite it, **characterised by** comprising an elastically deformable blanket (3) presenting a face to which the lower surface of the grass-laden element (1) is non-removably joined, at least the blanket 3 presenting drainage holes (4) which traverse it transversally.

2. A drainable panel with synthetic grass as claimed in claim 1, **characterised in that** the glass-laden element (1) presents drainage holes (4).

3. A drainable panel with synthetic grass as claimed in claim 1, **characterised in that** said blanket (3) is of plastic or rubber material.

4. A drainable panel with synthetic grass as claimed in claim 1, **characterised by** comprising a reinforcement sheet adhering at least to one of the two faces of the blanket (3).

5. A drainable panel with synthetic grass as claimed in the preceding claim, **characterised in that** said reinforcement sheet comprises glass or carbon fibres.

6. A drainable panel with synthetic grass as claimed in claim 1, **characterised in that** the drainage holes (4) have a transverse dimension between 1 mm and 25 mm.

7. A drainable panel with synthetic grass as claimed in the preceding claim, **characterised in that** the drainage holes (4) have a transverse dimension be-

tween 2 mm and 4 mm.

8. A drainable panel with synthetic grass as claimed in claim 6, **characterised in that** the drainage holes (4) are spaced apart such that a panel surface of 4 dm^2 presents a number of drainage holes between 1 and 10000.

9. A drainable panel with synthetic grass as claimed in the preceding claim, **characterised in that** the drainage holes (4) are spaced apart such that a panel surface of 4 dm^2 presents a number of drainage holes between 10 and 600.

10. A process for producing a drainable panel with synthetic grass, comprising the following steps:

a) preparing an elastically deformable blanket (3) with two substantially parallel faces;
b) forming drainage holes (4) transversely through the blanket (3);
c) preparing a grass-laden element (1) presenting an upper surface from which synthetic grass (2) projects and a lower surface opposite the upper surface;
d) permanently joining the lower surface of the grass-laden element (1) to a face of the blanket (3).

11. A process as claimed in the preceding claim, **characterised in that** the drainage holes (4) traversing the blanket (3) are formed after the blanket (3) has been joined to the grass-laden element (1).

12. A process as claimed in claim 10, **characterised in that** drainage holes are formed in the grass-laden element (1).

13. A process as claimed in claim 10, **characterised in that** the permanent joint between the grass-laden element and the blanket is made by gluing.

14. A process as claimed in the preceding claim, **characterised in that** a glue of thermo-adhesive type is used.

15. A process as claimed in claim 10, **characterised in that** the permanent joint between the grass-laden element (1) and the blanket (3) is made by hot joining.

16. A process as claimed in claim 10, **characterised in that** a reinforcement sheet is joined to one of the two faces of the blanket (3).

17. A process as claimed in claim 10, **characterised in that** said reinforcement sheet comprises glass or carbon fibres.

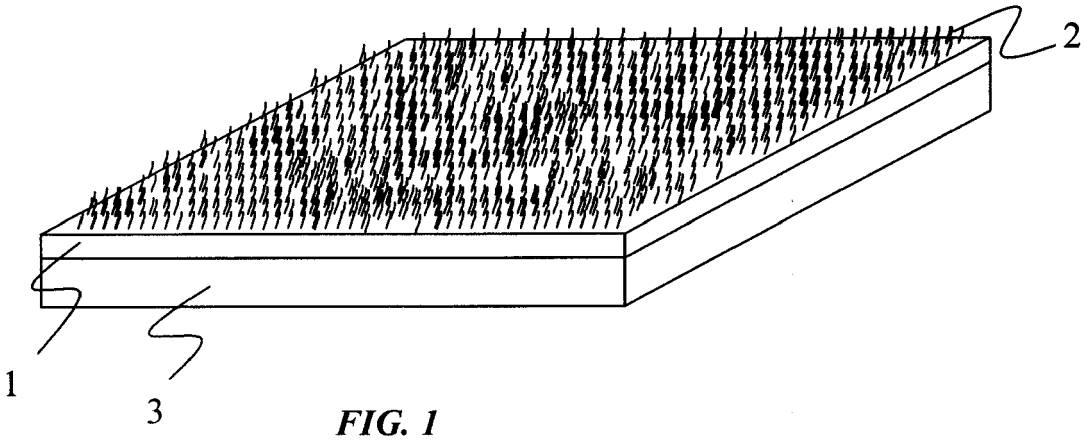

FIG. 1

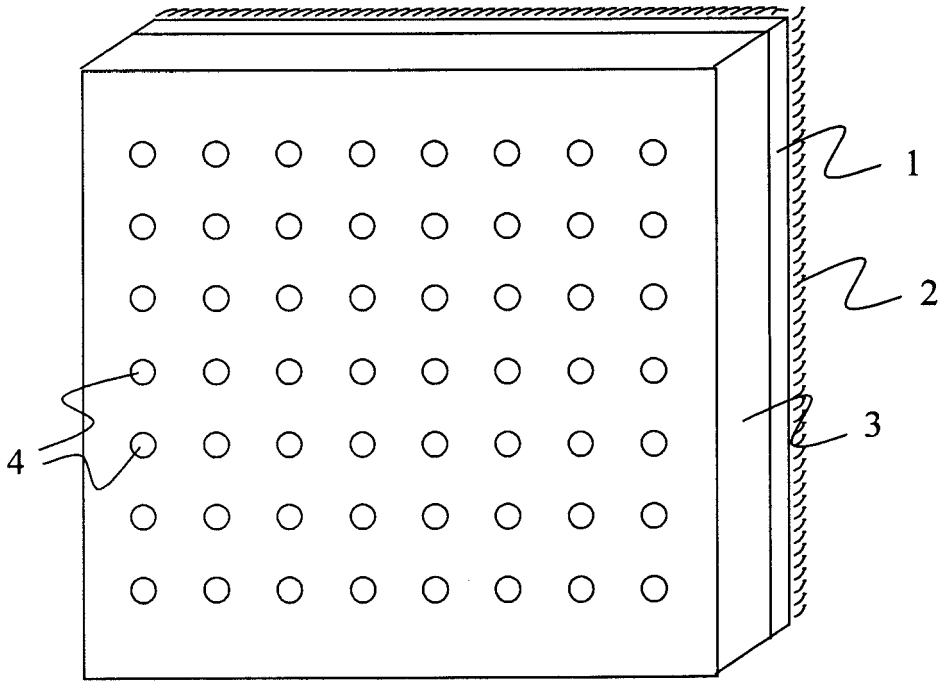

FIG. 2

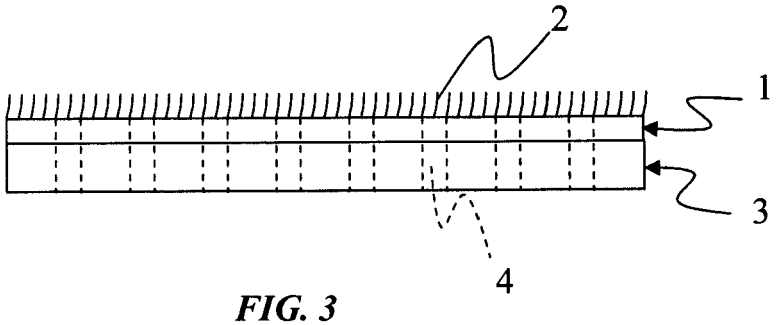

FIG. 3

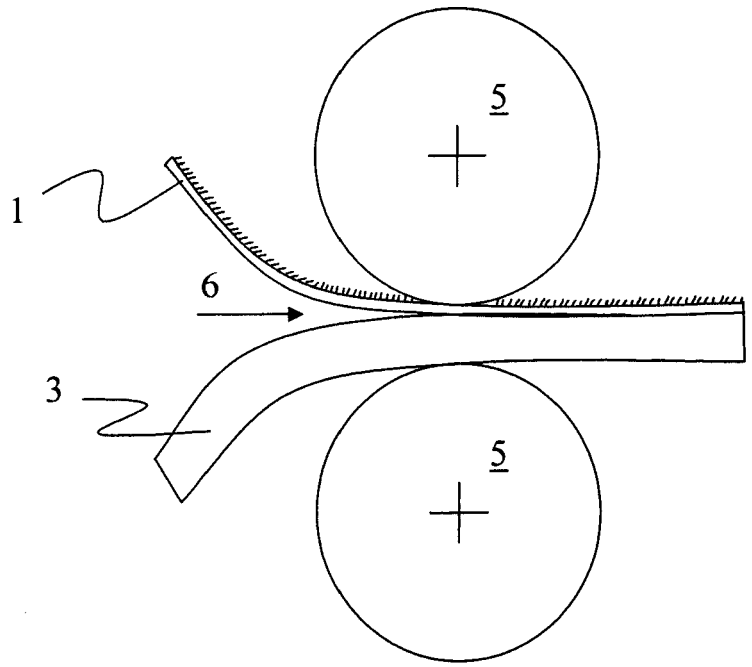

FIG. 4

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1247632 A **[0017]**