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(12) # EUROPEAN PATENT SPECIFICATION

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(54) **Method of providing a substructure for an artificial grass field and artificial grass field applied to such a substructure.**

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Description

The invention relates to a method of providing a substructure of an artificial grass field by arranging a foundation on an available layer of sand or a deposited layer of sand. The invention furthermore relates to an artificial grass field applied to such a substructure.

An artificial grass field and an associated substructure are described in British Patent 1,528,264, which artificial grass field is developed for outdoor games, in particular tennis and hockey. From this British Patent it appears that the substructure is built up from a layer of stones or gravel on which a layer of sand and a layer of clay are deposited. Such an artificial grass field is also described in Dutch Patent Application 8100174 (GB—A—2087959), wherein it is, however, stated on page 3, last paragraph that the premliminary treatment of the base of the field does not form part of the Patent Application and that it is only schematically designated by reference sign 21.

In the further developments of such artificial grass fields the substructure is further improved by applying a layer of lava to the layer of sand to a height of about 15 cm, the surface of the coarse lava layer being strewn with lava sand, on which a water-pervious, pressure-distributing thin cloth is deposited. In this substructure, if desired, a draining system may be arranged. The lava is a stony material originating from Germany or France and formed by solidification of vulcanic material.

For given sports, particularly for football it has appeared to be important that on such an artificial grass field high damping should be ensured in order to discharge the sportsman as much as possible and in order to render the game on the artificial grass field as much as possible similar to that on a natural grass field. Solutions in this respect have hitherto been sought in modifications of the grass surface, for example, by bringing sand between the fibres as indicated in the aforesaid British Patent 1,528,264 (or the corresponding U.S. Patent 4,044,179) and Dutch Patent Application 8100174. It has now been found that a higher damping for such an artificial grass field can also be obtained by replacing the lava of the foundation by a different material and the method embodying the invention is characterized in that in the method mentioned in the preamble the foundation is composed of a mixture of material containing unbroken sand with at least 1% by weight of fibrous material.

The higher damping is obtained by using the unbroken sand, a kind of sand consisting of round grains, in which preferably at least 95% by weight has a granular size distribution of 0.2 to 0.6 mm. If in the foundation only this unboken sand were used, a high damping would be obtained, it is true, but the cohesion of this sand is so poor that permanent deformations would occur in the foundation layer where the foundation is loaded. In order to minimize such deformations it appeared to be necessary to mix the unbroken sand with at least 1% by weight of fibrous material. Preferably 3 to 7% by weight of fibrous material was used. An example of fibrous material is organic fibres and artificial fibres such as polypropylene fibres or Nylon fibres or inorganic fibres such as glass fibres. These fibres preferably have a length of 6 to 10 mm and a thickness of about 10 µm. By using this fibre material in the unbroken sand a foundation is obtained, which on the one hand has a high damping and on the other hand minimum deformation since the fibres have a levelling and stress-distributing effect on the sand grains.

In providing such a foundation layer there will be a tendency to minimize the content of fibre material because it is very expensive as compared with the sand to be used. The fibrous material will be about 50 times more expensive per kilogram than the sand to be used. In constructing hockey fields a less high damping will suffice than in the construction of football fields. In such a foundation layer unbroken sand may be replaced partly by broken sand in conjunction with less fibrous material. The layer of broken sand has a considerably lower damping than unbroken sand, but the deformation of the layer of broken sand is less than that of a layer of unbroken sand. The lower sensitivity of broken sand to deformation enables the use of less fibrous material. The replacement of 40% of unbroken sand by broken sand brings about a potential reduction of the use of fibres. If in pure unbroken sand for a hockey field 5% of fibres is used, the amount of fibre can be reduced to 3% by replacing 40% of unbroken sand by broken sand. The resultant damping is lower, it is true, but the sensitivity to deformation remains substantially the same.

The unbroken sand is a round, natural sand, for example, from river sand, whereas broken sand is obtained by a mechanical grinding treatment of, for example, stones; this broken sand has an angular grain surface.

By the addition of the fibres the resistance to deformation of the stability of the layer is increased. By adding the fibrous material less deep indents and bulging of the foundation are ensured at the places of load than without fibrous material in the unbroken sand.

Apart from the construction of artificial grass field for football, hockey or tennis such artificial grass fields may also be used for other sports, in particular in riding schools.

Claims

1. A method of constructing a substructure for an artificial grass field by depositing a foundation on an available layer of sand or a deposited layer of sand characterized in that the foundation is composed of a mixture of material containing unbroken sand with at least 1% by weight of fibrous material.

2. A method as claimed in Claim 1 characterized in that at least 95% by weight of the sand has a grain size distribution of 0.2 to 0.6 mm.

3. A method as claimed in Claims 1 to 2 characterized in that the foundation contains 3 to 7% by weight of fibrous material.

4. A method as claimed in Claims 1 to 3 characterized in that the fibrous material is chosen among organic fibres such as polypropylene fibres or PA 6 (Nylon®) fibres or inorganic fibres such as glass fibres.

5. A method as claimed in Claim 4 characterized in that the fibres have a length of 6 to 10 mm and a thickness of 5 to 15 µm.

6. A method as claimed in Claims 1 to 5 characterized in that apart from the fibrous material and unbroken sand an amount of broken sand is provided in the foundation.

7. An artificial grass field comprising an upper layer of artificial grass fibres arranged in a mat deposited on a substructure, in which a layer of sand may be applied between the artificial grass fibres characterized in that the substructure is composed as described in Claims 1 to 6.

Revendications

1. Procédé de construction d'une infrastructure pour une pelouse artificielle, par dépôt d'une fondation sur une couche existante de sable ou une couche déposée de sable, caractérisé en ce que la fondation est composée d'un mélange de matières contenant du sable non concassé avec au moins 1% en poids de matière fibreuse.

2. Procédé suivant la revendication 1, caractérisé en ce qu'au moins 95% en poids du sable a une répartition granulométrique de 0,2 à 0,6 mm.

3. Procédé suivant la revendication 1 ou 2, caractérisé en ce que la fondation contient 3 à 7% en poids de matière fibreuse.

4. Procédé suivant l'une des revendications 1 à 3, caractérisé en ce que la matière fibreuse est choisie parmi des fibres organiques, telles que des fibres de polypropylène ou des fibres de PA6 (Nylon®), ou des fibres non organiques telles que des fibres de verre.

5. Procédé suivant la revendication 4, caractérisé en ce que les fibres ont une longueur de 6 à 10 mm et une épaisseur de 5 à 15 µm.

6. Procédé suivant les revendications 1 à 5, caractérisé en ce que, en plus de la matière fibreuse et du sable non concassé, une certaine quantité de sable concassé ets prévue dans la fondation.

7. Pelouse artificielle comprenant une couche supérieure de fibres d'herbe artificielle disposées en un tapis déposé sur une infrastructure, dans laquelle une couche de sable peut être appliquée entre les fibres d'herbe artificelle, caractérisée en ce que l'infrastructure est composée comme décrit dans les revendications 1 à 6.

Patentansprüche

1. Verfahren zur Errichtung eines Unterbaues für einen künstlichen Rasen, indem auf eine vorhandene Sandschichte oder auf eine aufgeschüttete Sandschichte eine Gründung aufgebracht wird, dadurch gekennzeichnet, daß die Gründung aus einer Materialmischung gebildet wird, die ungebrochenen Sand (Flußsand) mit mindestens einem Gewichtsprozent Fasermaterial enthält.

2. Verfahren nach Anspruch 1, dadurch gekennzeichnet, daß mindestens 95 Gewichtsprozent des Sandes eine Korngrößenverteilung von 0,2 bis 0,6 mm aufweist.

3. Verfahren nach den Ansprüchen 1 bis 2, dadurch gekennzeichnet, daß die Gründung 3 bis 7 Gewichtsprozent Fasermaterial enthält.

4. Verfahren nach den Ansprüchen 1 bis 3, dadurch gekennzeichnet, daß das Fasermaterial aus organischen Fasern wie Polypropylenoder PA6 (Nylon®) -Fasern oder anorganischen Fasern wie Glasfasern ausgewählt ist.

5. Verfahren nach Anspruch 4, dadurch gekennzeichnet, daß die Fasern eine Länge von 6 bis 10 mm und eine Stärke von 5 bis 15 µm besitzen.

6. Verfahren nach den Ansprüchen 1 bis 5, dadurch gekennzeichnet, daß in der Gründung außer dem Fasermaterial und dem ungebrochenen Sand (Flußsand) ein Anteil aus gebrochenem Sand (Bruchsand) vorgesehen ist.

7. Künstlicher Rasen mit einer oberen Lage aus künstlichen Grashalmen in einer auf einem Unterbau aufliegenden Matte, in welcher eine Sandschichte zwischen den künstlichen Grashalmen aufgelegt sein kann, dadurch gekennzeichnet, daß der Unterbau nach den Ansprüchen 1 bis 6 zusammengesetzt ist.