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Amended claims in accordance with Rule 137(2) EPC.

(54) **ARTIFICIAL TURF FOR SIMULATING NATURAL GRASS**

(57) The present invention relates to an artificial turf simulating natural grass, comprising: a base fabric (1), artificial grass yarns tufting on the base fabric (1) and an latex backing on the back of the base fabric (1). The artificial grass yarns having at least two different forms including an straight form and a curly form, and the straight artificial grass yarns (2) having at least two different colors. According to the present invention, the artificial grass yarns having at least an straight form and a curly form tuft on a base fabric, the straight artificial grass yarns are provided with at least two different colors, such that the appearance of the formed artificial turf has better natural grass simulation effect, and combination can be made according to specific functional requirements of the application of the artificial turf, thus improving applicability of the artificial turf.

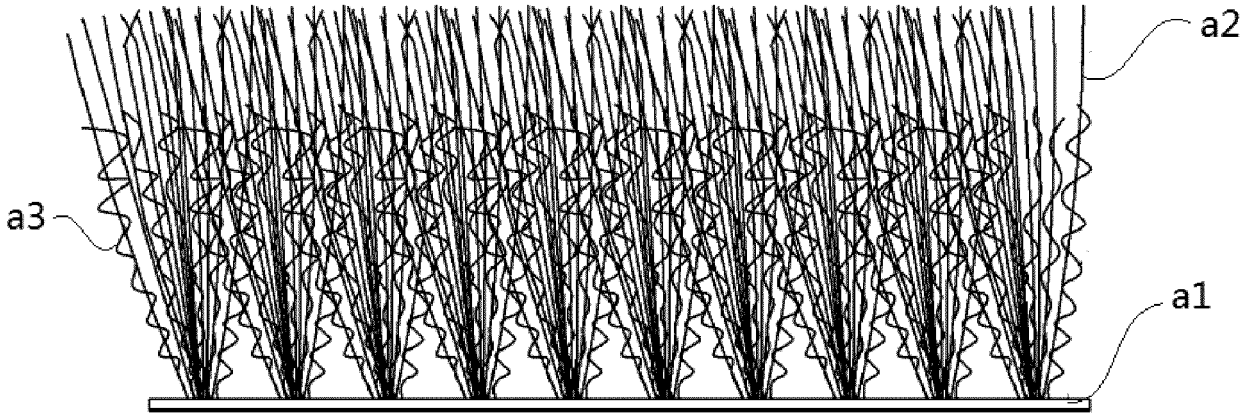

Fig. 1

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to the field of artificial turf, and more specifically relates to an artificial turf for simulating natural grass.

BACKGROUND OF THE INVENTION

[0002] An artificial turf is an industrial product made by professional production facility with plastic, chemical fiber as raw materials. The artificial turf can meet the requirements of long-time sports, it is relatively smooth and can be easily maintained , which makes it widely used in football, tennis, hockey, baseball and other fields.

[0003] The artificial turf has many tufts of artificial grass yarns simulating grass blades. Those artificial grass yarns generally have a single color, a single yarn sectional shape and a single form, for example, most of them have a single color of green, a flat sectional shape and an straight form, which lack good functionality. The artificial turf is obviously different from natural grass. With the improvement of people's living standard and holding of large-scale international and domestic events, the market scale of artificial turf is rapidly expanding, demand and quality requirements for artificial turfs are getting higher and higher, especially the demand for artificial turf highly simulating natural grass continues to increase. At the same time, higher requirements are put forward for the functionality of the artificial turf.

[0004] FIG. 1 shows a schematic view of the structure of an existing artificial turf. In this embodiment, the artificial turf comprises a base fabric a1, straight artificial grass yarns a2 and curly artificial grass yarns a3 tufting on the base fabric a1. Wherein, the color of the straight artificial grass yarns a2 is green, while that of the curly artificial grass yarns a3 is thatch color. Although such an artificial turf is somewhat similar to natural grass in appearance, there is still obvious difference compared with the actual appearance and form of natural grass, and the functionality is limited with a narrow range of application.

SUMMARY OF THE INVENTION

[0005] An object of the present invention is to provide an artificial turf for simulating natural grass, so as to enable the artificial turf to have better natural grass simulation effect.

[0006] In order to achieve the above-mentioned object, the present invention provides an artificial turf for simulating natural grass, comprising: a base fabric, artificial grass yarns tufting on a side of the base fabric and an latex backing on an opposite side of the base fabric. The artificial grass yarns having at least two different forms including an straight form and a curly form, and the straight artificial grass yarns having at least two different colors.

[0007] Further, the straight artificial grass yarns and/or the curly artificial grass yarns having matte light and/or bright light surfaces.

[0008] Further, the straight artificial grass yarns having at least two of the following colors: green, yellow and brown; depth of the colors of the straight artificial grass yarns (2) based on the application field, season and/or use thereof.

[0009] Further, the straight artificial grass yarns having at least two of the following colors: emerald green, dark green, light green, yellow green, beige, light brown and thatch color; combination of the colors of the straight artificial grass yams (2) based on the application field, season and/or use thereof.

[0010] Further, the straight artificial grass yarns having the following colors: light green, dark green, yellow green and thatch color.

[0011] Further, the cross sections of the straight artificial grass yarns having a plurality of different shapes, and the cross sections of the curly artificial grass yarns having at least one shape.

[0012] Further, the cross sections of the straight artificial grass yarns having at least two of the following shapes: a rectangular shape, a triangular shape, a diamond shape), a dual-diamond shape, an olivary shape, a wavy shape, a ribbed shape, a tri-ribbed shape, a trefoil shape, a hollow shape, a C shape, a D shape, an X shape, an S shape, a W shape, a V shape, a U shape and an M shape, the cross sections of the curly artificial grass yarns having at least one of the following shapes: a rectangular shape, a diamond shape and a ribbed shape.

[0013] Further, the cross sections of the straight artificial grass yarns having at least two of the following shapes: a rectangular shape, a triangular shape, a diamond shape, a dual-diamond shape, a wavy shape, a D shape, an S shape and a W shape.

[0014] Further, the cross sections of the straight artificial grass yarns having at least two of the following shapes: a ribbed shape, an olivary shape, a tri-ribbed shape, a trefoil shape, a hollow shape, a C shape, an X shape, a V shape, a U shape and an M shape.

[0015] Further, the thicknesses of the straight artificial grass yarns are same or different, and a filament dtex thereof ranging from 200 dtex to 3000 dtex,and the thicknesses of the curly artificial grass yarns are same or different, and a filament dtex thereof ranging from 200 dtex to 2000 dtex.

[0016] Further, the straight artificial grass yarns and the curly artificial grass yarns separately tufting and arranged in every other row or tuft together on the base fabric, or the straight artificial grass yarns and the curly artificial grass yarns tufting together and arranged in every other row with the separately tufting straight artificial grass yarns and/or curly artificial grass yarns.

[0017] Further, the pile height of the straight artificial grass yarns ranging from 8 mm to 80 mm.

[0018] Based on the above-mentioned technical solution, according to the present invention, the artificial grass

yarns having at least an straight form and a curly form tuft on a base fabric, the straight artificial grass yarns having at least two different colors, such that the appearance of the formed artificial turf has better natural grass simulation effect, and combinations can be made according to specific functional requirements of the application of the artificial turf, thus improving applicability of the artificial turf.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

[0019] The drawings illustrated here are for providing further understanding of the present invention and thus constitute part of the present application. the exemplary embodiments of the present invention and depictions thereof are for interpreting the present invention, not constituting improper limitations of the present invention. In the drawings:

FIG. 1 shows a schematic view of the structure of an existing artificial turf.

FIG. 2A is a schematic view of the structure of an embodiment of the artificial turf simulating natural grass according to the present invention.

FIG. 2B is a schematic view of the embodiment of FIG. 2A from a bottom view.

FIG. 3A is a schematic view of the structure of another embodiment of the artificial turf simulating natural grass according to the present invention.

FIG. 3B is a schematic view of the embodiment of FIG. 3A from a bottom view.

FIG. 4A is a schematic view of the structure of another embodiment of the artificial turf simulating natural grass according to the present invention.

FIG. 4B is a schematic view of the embodiment of FIG. 4A from a bottom view.

In FIG. 5, (a)-(n) are schematic views of various sectional shapes of the artificial grass yarns in the embodiments of the artificial turf simulating natural grass according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0020] Thereinafter, the technical solutions of the present invention will be further described in details through drawings and embodiments.

[0021] FIG. 2A is a schematic view of the structure of an embodiment of the artificial turf for simulating natural grass according to the present invention. In this embodiment, the artificial turf for simulating natural grass comprises: a base fabric 1, artificial grass yarns tufting on a side of the base fabric 1 and an adhesive (not shown) coated on an opposite side of the base fabric 1. The artificial grass yarns having at least two different forms including an straight form and a curly form, and the straight artificial grass yarns 2 having at least two different colors.

[0022] In the present embodiment, manufacturing of artificial grass yarns in different forms are different. Taking the straight artificial grass yarns as an example, firstly mixed material is extruded by an extruder at a proper temperature, then it is subjected to processes of cooling, heat drawing, heat setting, etc., and then get rolled. For the curly artificial grass yarns, a process of compressive deformation at a high temperature may be added after the process of heat setting, such that the artificial grass yarns are formed to be curly. Referring to FIG. 2A, the artificial grass yarns in different forms can be ply-twisted by means of a ring twisting and winding machine. Next, the twisted artificial grass yarns tuft on the base fabric according to a predetermined grass pile height and gauge into a semi-finished artificial turf by means of a tufting machine, then the semi-finished artificial turf is placed on an adhesive on the back of the base fabric and then baked by an oven and made into a finished artificial turf. On the upper layer of the artificial turf are straight artificial grass yarns, while on the lower layer are curly artificial grass yarns. It should be noted that, the above manufacturing process is merely for embodying the realizability of the artificial turf of the present embodiment instead of being specific limitation on the manufacturing process.

[0023] According to the present embodiment, the artificial grass yarns having at least an straight form and a curly form tuft on a base fabric, the straight artificial grass yarns having at least two different colors, such that the appearance of the artificial turf has better natural grass simulation effect, and combination of the colors of the straight artificial grass yarns 2 can be based on specific functional requirements of the application of the artificial turf, thus improving the applicability of the artificial turf.

[0024] In the process of ply-twisting, at least three extruders can be used simultaneously to produce straight artificial grass yarns 2, and after the processes of drawing and setting, the straight artificial grass yarns 2 are ply-twisted together with the curly artificial grass yarns 3 by a ring twisting and winding machine. In this way, the straight artificial grass yarns 2 can be directly ply-twisted with the manufactured curly artificial grass yarns 3 without being rolled, thus simplifying the process and making the overall process more smooth and more efficient. Besides, invest in manpower and winding device can be reduced. On the other hand, the use of at least three extruders to manufacture straight artificial grass yarns has at least two advantages: first, straight artificial grass yarns having different colors and/or different thicknesses and/or different sectional shapes are manufactured simultaneously; second, the production efficiency of straight artificial grass yarns is improved.

[0025] Apart from the form of ply-twisting the straight artificial grass yarns 2 and curly artificial grass yarns 3 by a ring twisting and winding machine, the artificial grass yarns in these two forms may also be twisted separately, i.e., the straight artificial grass yarns 2 and curly artificial grass yarns 3 are respectively rolled and then twisted.

For the embodiment shown in FIG. 2A, both ply-twist or separate twist can realize the form shown in FIG. 2B, i.e., the straight artificial grass yarns 2 and curly artificial grass yarns 3 tuft on the base fabric 1 together. FIGS. 3A and 3B show the forms of the straight artificial grass yarns 2 and the curly artificial grass yarns 3 separately tufting and arranged in every other row. In other embodiments, the straight artificial grass yarns 2 and the curly artificial grass yarns 3 may also tuft together and arranged in every other row with the separately tufting straight artificial grass yarns 2 (referring to FIGS 4A, 4B), or arranged in every other row with the curly artificial grass yarns 3, or arranged in every other row with both the straight artificial grass yarns 2 and the curly artificial grass yarns 3 at the same time.

[0026] The straight artificial grass yarns having with at least two of the following colors: green, yellow and brown. Depth the colors of the straight artificial grass yarns 2 can be based on the application field, season and/or use thereof. Specifically, according to the depth of color, green may include emerald green, dark green, light green, yellow green, etc., yellow may include beige, thatch color, etc., and brown may include light brown and dark brown. Correspondingly, the straight artificial grass yarns specifically having at least two of the following colors: emerald green, dark green, light green, yellow green, beige, light brown and thatch color, and combination and choice of the colors of the straight artificial grass yarns 2 can be based on the application field, season and/or use thereof. Combination of those colors can realize natural grass simulation effect for different fields, seasons and uses. For instance, when it is needed to embody the natural growth cycle of natural grass from sprouting to withering, the straight artificial grass yarns having the following colors: light green, dark green, yellow green and thatch color, thereby creating a more realistic appearance for the users.

[0027] Apart from combination of different colors, in the embodiments of the present invention, the artificial grass yarns may have a bright surface or a matte surface in light effect, wherein a bright surface has better effect of light refraction and light reflection, while a matte surface can perform diffuse reflection of light. In other embodiments of the present invention, the tufting artificial grass yarns may also have mixed bright and matte surfaces to obtain a more authentic feeling of the appearance of natural grass. These light effect surfaces may be provided on the straight artificial grass yarns or on the curly artificial grass yarns. A matte surface may comprise chemical matte surface or physical matte surface according to its way of formation. Wherein, physical matte surface may be formed during the process of extruding artificial grass yarns by an extruder die. Correspondingly, a small pattern can be provided on the extruder die, such that physical matte surface can be formed during the extrusion process. For instance, a plurality of thin vertical stripes are provided on the inner surface of the extruder die, such that correspondingly a plurality of thin vertical stripes are formed on the surface of the artificial grass yarns. Such physical matte surface with a plurality of thin vertical stripes can simulate the vein of natural grass in a more realistic way. Moreover, physical matte surface can reduce use of chemical matte agent compared with chemical matte surface only, thus protecting the environment and the users' health.

[0028] Apart from the combination of different colors, different light effect surfaces and different forms, the cross sections of the artificial grass yarns of the artificial turf of the present invention may also have different shapes in another embodiment. Referring to FIGS. 2A, 3A and 4A, the cross sections of the straight artificial grass yarns 2 having a plurality of different shapes (such as an S shape, a diamond shape, a rectangular shape and a W shape shown in FIGS. 2A, 3A and 4A), and the cross sections of the curly artificial grass yarns 3 having at least one shape (for example, a rectangular shape as shown in FIGS. 2A, 3A and 4A).

[0029] The cross sections of the straight artificial grass yarns 2 having at least two shapes. Referring to the sectional shapes shown in FIG. 5, the cross sections of the straight artificial grass yarns 2 having at least two of the following shapes: a rectangular shape, a triangular shape, a diamond shape, a dual-diamond shape (1), an olivary shape (j), a wavy shape (h), a ribbed shape (i), a tri-ribbed shape (k), a trefoil shape (m), a hollow shape (n), a C shape (a), a D shape (b), an X shape, an S shape (d), a W shape (g), a V shape (f), a U shape (e) and an M shape (c). The cross sections of the curly artificial grass yarns 3 having at least one of the following shapes: a rectangular shape, a diamond shape and a ribbed shape (i).

[0030] In FIG. 5, the C shape (a) shows a sectional shape which has a C-shaped outer contour and which can be provided with a vertical rib outside, the D shape (b) shows a sectional shape which has a D-shaped outer contour and a relatively rounded and smooth outside, the M shape (c) shows a sectional shape which has an M-shaped outer contour and relatively sharp edges, the S shape (d) shows a sectional shape which has an S-shaped outer contour and which is relatively thin and smooth on the whole, the U shape (e) shows a sectional shape which has a U-shaped outer contour and which can be provided with a vertical rib inside, the V shape (f) shows a sectional shape which has a V-shaped outer contour and which can be provided with a vertical rib outside, the W shape (g) and the wavy shape (h) respectively show a sectional shape which has an outer contour having multiple curves and which is relatively thin and smooth on the whole, the ribbed shape (i) shows a sectional shape whose outer contour is relatively thin at two ends and provided with a relatively thick vertical rib in the middle, the olivary shape (j) shows a sectional shape which has an olive-shaped outer contour and which is relatively smooth on the whole, the tri-ribbed shape (k) shows a sectional shape whose outer contour is provided with two vertical ribs on one side and one vertical rib on

the other side, the dual-diamond shape (1) shows a sectional shape whose outer contour is formed by two diamond portions overlapping each other, the trefoil shape (m) shows a sectional shape whose outer contour is formed by three arcs connected together in succession, the hollow shape (n) shows a sectional shape whose outer contour is relatively thin at two ends and provided with a relatively thick vertical rib in the middle and it is hollow at the vertical rib.

[0031] Artificial grass yarns with different sectional shapes can realize different functions on the whole (such as softness, supporting performance, abrasion resistance, etc.), thus meeting different functional requirements. Straight artificial grass yarns having a sectional shape whose outer contour is relatively rounded and thin or whose outer contour has no rib (such as, a rectangular shape, a triangular shape, a diamond shape, a wavy shape, a D shape, an S shape, a W shape, etc.) are generally softer with good handfeel and correspondingly have unremarkable supporting capacity and abrasion resistance in the overall performance. Straight artificial grass yarns having a sectional shape whose outer contour is relatively sharp or thick or whose outer contour has a rib (such as, a ribbed shape, an olivary shape, a tri-ribbed shape, a trefoil shape, a hollow shape, a C shape, an X shape, a V shape, a U shape and an M shape, etc.) are relatively tough and correspondingly have better supporting capacity and abrasion resistance in the overall performance, which are suitable for regular or more frequent tread.

[0032] In the above-mentioned embodiments of the artificial turf, the thicknesses of the straight artificial grass yarns 2 may be same or different, and a filament dtex thereof ranging from 200 dtex to 3000 dtex. The thicknesses of the curly artificial grass yarns 3 may be same or different, and a filament dtex thereof ranging from 200 dtex to 2000 dtex. It should be noted that, the same thickness herein refers to that tufting straight artificial grass yarns 2 (or curly artificial grass yarns 3) are in the same filament dtex, and different thicknesses mean that at least partial artificial grass yarns of the tufting straight artificial grass yarns 2 (or curly artificial grass yarns 3) are in different filament dtexs.

[0033] Use of artificial grass yarns with same thickness can save production cost and improve production efficiency, while use of artificial grass yarns with different thicknesses can meet the users' requirements for different supporting performance and abrasion resistance. Besides, the range of the pile height of the straight artificial grass yarns (2) may be chosen as 8-80 mm. Explanation is made below with several examples of different combinations of artificial grass yarns adopted in the artificial turf.

Example One:

[0034] A combination of a diamond shape (bright surface), a wide rectangular shape (bright surface) and a triangular shape (bright surface) is adopted for the straight artificial grass yarns, and the filament dtex ranges from 500 dtex to 2000 dtex. A rectangular shape (bright surface) and a rectangular shape (bright surface) are adopted for the curly artificial grass yarns, and the filament dtex ranges from 400 dtex to 600 dtex. For the artificial turf, the tufting density range is chosen to be 10000-150000 stitches, the grass pile height range is 20-30mm. Emerald green, dark green, yellow green and thatch color are combined together. Such combination enables the overall color to be close to natural grass. Moreover, the filament dtex is within a wide range, thick ones are combined with thin ones with a proper density, thus, the finished artificial turf feels soft and is suitable to be used in kindergartens and landscape areas.

Example Two:

[0035] A relatively long wavy shape (matte surface), a relatively short wavy shape (matte surface), and a D shape (matte surface) are adopted for the straight artificial grass yarns, and the filament dtex ranges from 800 dtex to 2000 dtex. A rectangular shape (matte surface) is adopted for the curly artificial grass yarns, and the filament dtex ranges from 400 dtex to 800 dtex. For the artificial turf, the tufting density range is chosen to be 16000-20000 stitches, the grass pile height range is 30-40mm. Emerald green, light green, dark green, beige and light brown are combined together. Such combination enables the artificial turf to have better supporting performance, thus it is suitable to be used in a courtyard area which is regularly treaded.

Example Three:

[0036] A ribbed shape (bright surface), an S shape (bright surface), a diamond shape (matte surface) and an olivary shape (bright surface) are adopted for the straight artificial grass yarns, and the filament dtex ranges from 1000 dtex to 2000 dtex. A ribbed shape (bright surface) is adopted for the curly artificial grass yarns, and the filament dtex ranges from 400 dtex to 800 dtex. For the artificial turf, the tufting density range is chosen to be 17000-25000 stitches, the grass pile height range is 30-50mm. Emerald green, dark green, yellow green, thatch color and beige are combined together. Such combination enables the finished artificial turf to have good supporting performance and good abrasion-resistant effect, thus it is suitable to be used in entertainment places and frequently treaded areas.

Example Four:

[0037] A C shape (matte surface), a dual-diamond shape (bright surface), a diamond shape (matte surface) and an olivary shape (bright surface) are adopted for the straight artificial grass yarns, and the filament dtex ranges from 500 dtex to 2000 dtex. A rectangular shape (mat-

te surface) is adopted for the curly artificial grass yarns, and the filament dtex ranges from 400 dtex to 600 dtex. For the artificial turf, the tufting density range is chosen to be 10000-15000 stitches, the grass pile height range is 50-60mm. Light green, dark green, yellow green, thatch color and beige are combined together. Such combination enables the finished artificial turf to reflect the natural growth cycle of natural grass from sprouting to withering.

[0038] Finally, it should be noted that: the abovementioned embodiments are only used for explaining the technical solutions of the present invention instead of limiting the same; while the present invention has been described in detail with reference to the preferred embodiments, those skilled in the art should understand that: modifications can still be made to the embodiments of the present invention, or equivalent replacement can be made to part of the technical features thereof; and these modifications or replacement, not departing from the spirit of the technical solutions of the present invention, should all be contained in the scope of the technical solutions defined in the present invention.

Claims

1. An artificial turf for simulating natural grass, comprising: a base fabric (1), artificial grass yarns tufting on a side of the base fabric (1) and an latex backing on an opposite side of the base fabric (1), the artificial grass yarns having at least two different forms including an straight form and a curly form, and the straight artificial grass yarns (2) having at least two different colors.

2. The artificial turf according to claim 1, wherein the straight artificial grass yarns (2) and/or the curly artificial grass yarns (3) having matte light and/or bright light surfaces.

3. The artificial turf according to claim 1, wherein the straight artificial grass yarns (2) having at least two of the following colors: green, yellow and brown; depth of the colors of the straight artificial grass yarns (2) based on the application field, season and/or use thereof.

4. The artificial turf according to claim 3, wherein the straight artificial grass yarns (2) having at least two of the following colors: emerald green, dark green, light green, yellow green, beige, light brown and thatch color; combination of the colors of the straight artificial grass yarns (2) based on the application field, season and/or use thereof.

5. The artificial turf according to claim 4, wherein the straight artificial grass yarns (2) having the following colors: light green, dark green, yellow green and thatch color.

6. The artificial turf according to claim 1, wherein the cross sections of the straight artificial grass yarns (2) having a plurality of different shapes, and the cross sections of the curly artificial grass yarns (3) having at least one shape.

7. The artificial turf according to claim 6, wherein the cross sections of the straight artificial grass yarns (2) having at least two of the following shapes: a rectangular shape, a triangular shape, a diamond shape, a dual-diamond shape, an olivary shape, a wavy shape, a ribbed shape, a tri-ribbed shape, a trefoil shape, a hollow shape, a C shape, a D shape, an X shape, an S shape, a W shape, a V shape, a U shape and an M shape, the cross sections of the curly artificial grass yarns (3) having at least one of the following shapes: a rectangular shape, a diamond shape and a ribbed shape.

8. The artificial turf according to claim 7, wherein the cross sections of the straight artificial grass yarns (2) having at least two of the following shapes: a rectangular shape, a triangular shape, a diamond shape, a dual-diamond shape, a wavy shape, a D shape, an S shape and a W shape.

9. The artificial turf according to claim 7, wherein the cross sections of the straight artificial grass yarns (2) having at least two of the following shapes: a ribbed shape, an olivary shape, a tri-ribbed shape, a trefoil shape, a hollow shape, a C shape, an X shape, a V shape, a U shape and an M shape.

10. The artificial turf according to claim 1, wherein the thicknesses of the straight artificial grass yarns (2) are same or different, and a filament dtex thereof ranging from 200 dtex to 3000 dtex, and the thicknesses of the curly artificial grass yarns (3) are same or different, and a filament dtex thereof ranging from 200 dtex to 2000 dtex.

11. The artificial turf according to claim 1, wherein the straight artificial grass yarns (2) and the curly artificial grass yarns (3) separately tufting and arranged in every other row or tuft together on the base fabric (1), or the straight artificial grass yarns (2) and the curly artificial grass yarns (3) tufting together and arranged in every other row with the separately tufting straight artificial grass yarns (2) and/or curly artificial grass yarns (3).

12. The artificial turf according to claim 1, wherein the pile height of the straight artificial grass yarns (2) ranging from 8mm to 80mm.

Amended claims in accordance with Rule 137(2) EPC.

1. An artificial turf for simulating natural grass, comprising: a base fabric (1), artificial grass yarns tufting on a side of the base fabric (1) and an latex backing on an opposite side of the base fabric (1), **characterized in that** the artificial grass yarns having at least two different forms including an straight form and a curly form, the straight artificial grass yarns (2) having at least two different colors, the cross sections of the straight artificial grass yarns (2) having a plurality of different shapes, and the cross sections of the curly artificial grass yarns (3) having at least one shape.

2. The artificial turf according to claim 1, wherein the straight artificial grass yarns (2) and/or the curly artificial grass yarns (3) having matte light and/or bright light surfaces.

3. The artificial turf according to claim 1, wherein the straight artificial grass yarns (2) having at least two of the following colors: green, yellow and brown; depth of the colors of the straight artificial grass yarns (2) based on the application field, season and/or use thereof.

4. The artificial turf according to claim 3, wherein the straight artificial grass yarns (2) having at least two of the following colors: emerald green, dark green, light green, yellow green, beige, light brown and thatch color; combination of the colors of the straight artificial grass yarns (2) based on the application field, season and/or use thereof.

5. The artificial turf according to claim 4, wherein the straight artificial grass yarns (2) having the following colors: light green, dark green, yellow green and thatch color.

6. The artificial turf according to claim 1, wherein the cross sections of the straight artificial grass yarns (2) having at least two of the following shapes: a rectangular shape, a triangular shape, a diamond shape, a dual-diamond shape, an olivary shape, a wavy shape, a ribbed shape, a tri-ribbed shape, a trefoil shape, a hollow shape, a C shape, a D shape, an X shape, an S shape, a W shape, a V shape, a U shape and an M shape, the cross sections of the curly artificial grass yarns (3) having at least one of the following shapes: a rectangular shape, a diamond shape and a ribbed shape.

7. The artificial turf according to claim 6, wherein the cross sections of the straight artificial grass yarns (2) having at least two of the following shapes: a rectangular shape, a triangular shape, a diamond shape, a dual-diamond shape, a wavy shape, a D shape, an S shape and a W shape.

8. The artificial turf according to claim 6, wherein the cross sections of the straight artificial grass yarns (2) having at least two of the following shapes: a ribbed shape, an olivary shape, a tri-ribbed shape, a trefoil shape, a hollow shape, a C shape, an X shape, a V shape, a U shape and an M shape.

9. The artificial turf according to claim 1, wherein the thicknesses of the straight artificial grass yarns (2) are same or different, and a filament dtex thereof ranging from 200 dtex to 3000 dtex, and the thicknesses of the curly artificial grass yarns (3) are same or different, and a filament dtex thereof ranging from 200 dtex to 2000 dtex.

10. The artificial turf according to claim 1, wherein the straight artificial grass yarns (2) and the curly artificial grass yarns (3) separately tufting and arranged in every other row or tuft together on the base fabric (1), or the straight artificial grass yarns (2) and the curly artificial grass yarns (3) tufting together and arranged in every other row with the separately tufting straight artificial grass yarns (2) and/or curly artificial grass yarns (3).

11. The artificial turf according to claim 1, wherein the pile height of the straight artificial grass yarns (2) ranging from 8mm to 80mm.

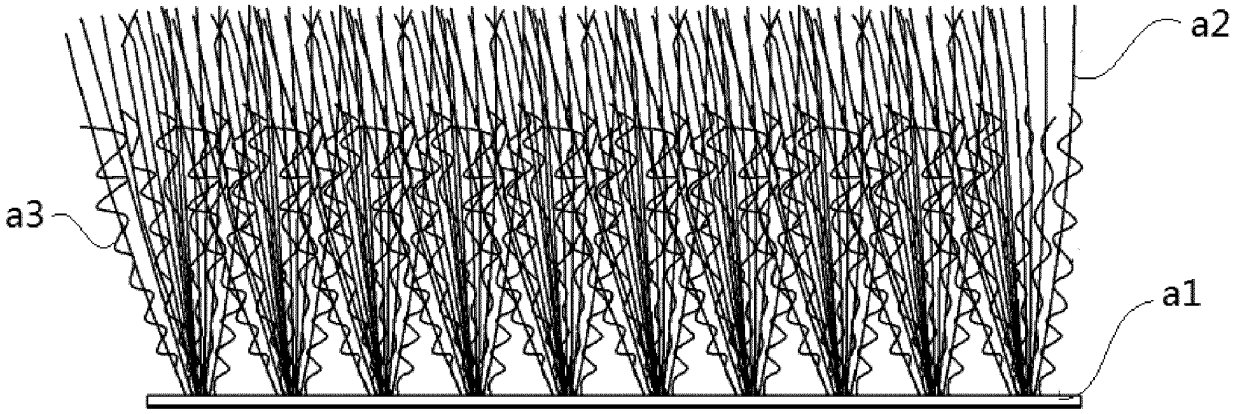

Fig. 1

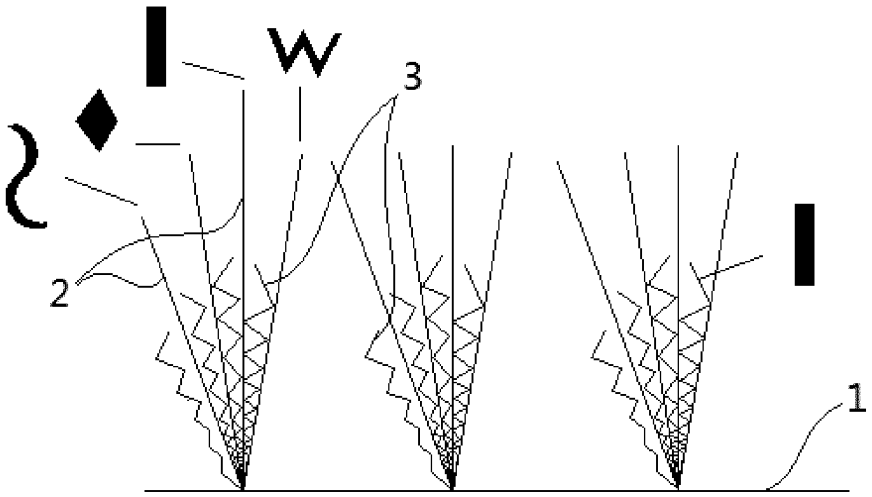

Fig. 2A

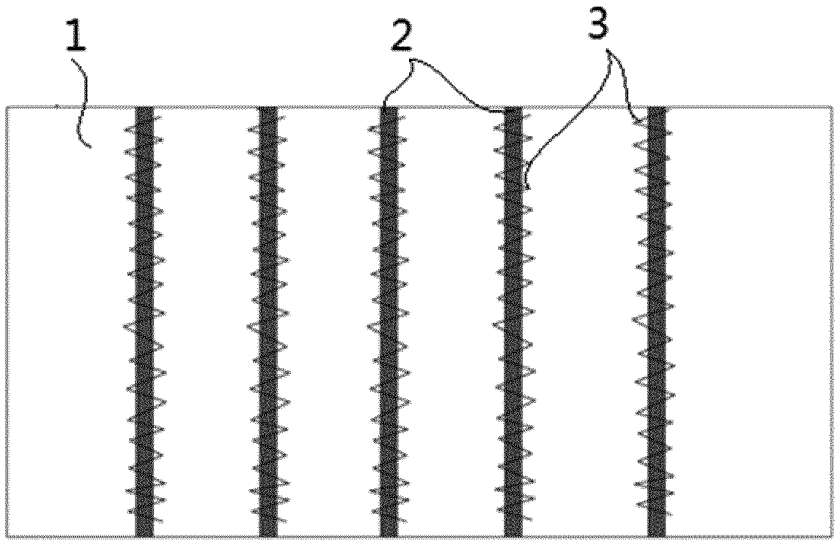

Fig. 2B

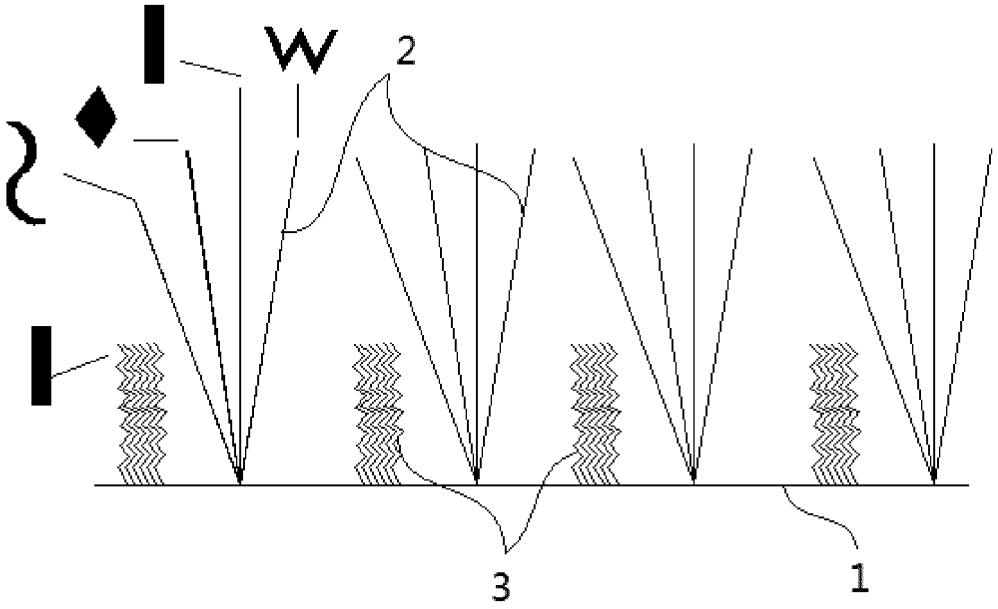

Fig. 3A

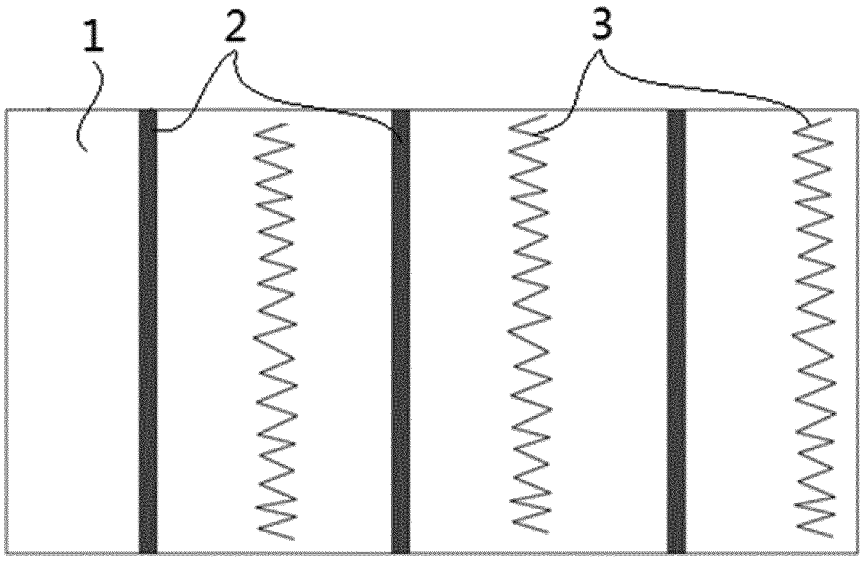

Fig. 3B

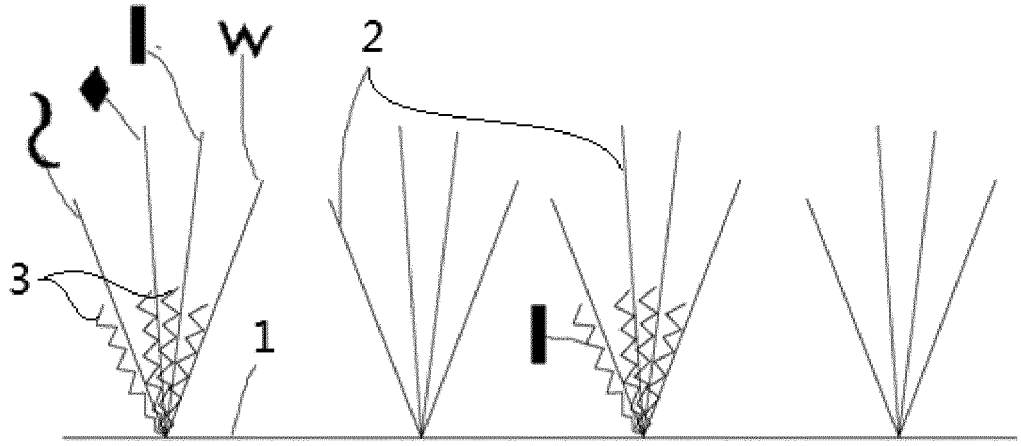

Fig. 4A

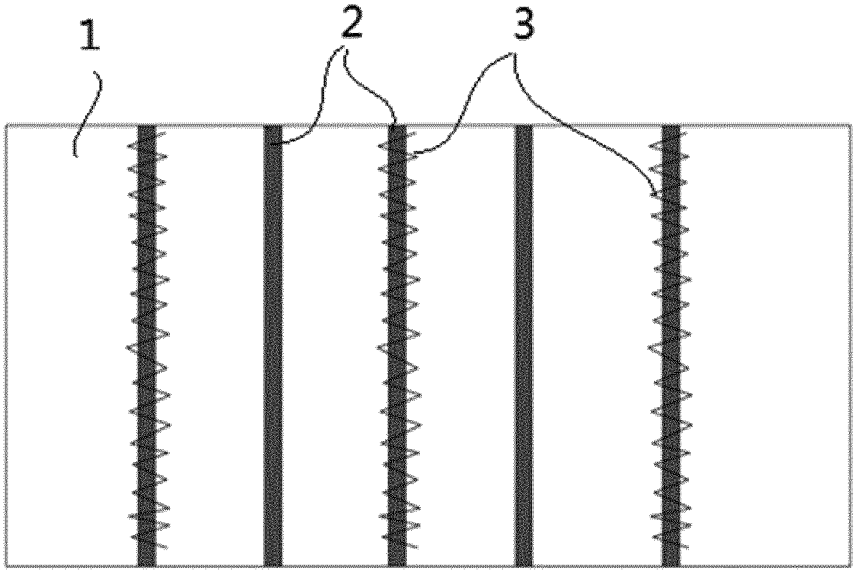

Fig. 4B

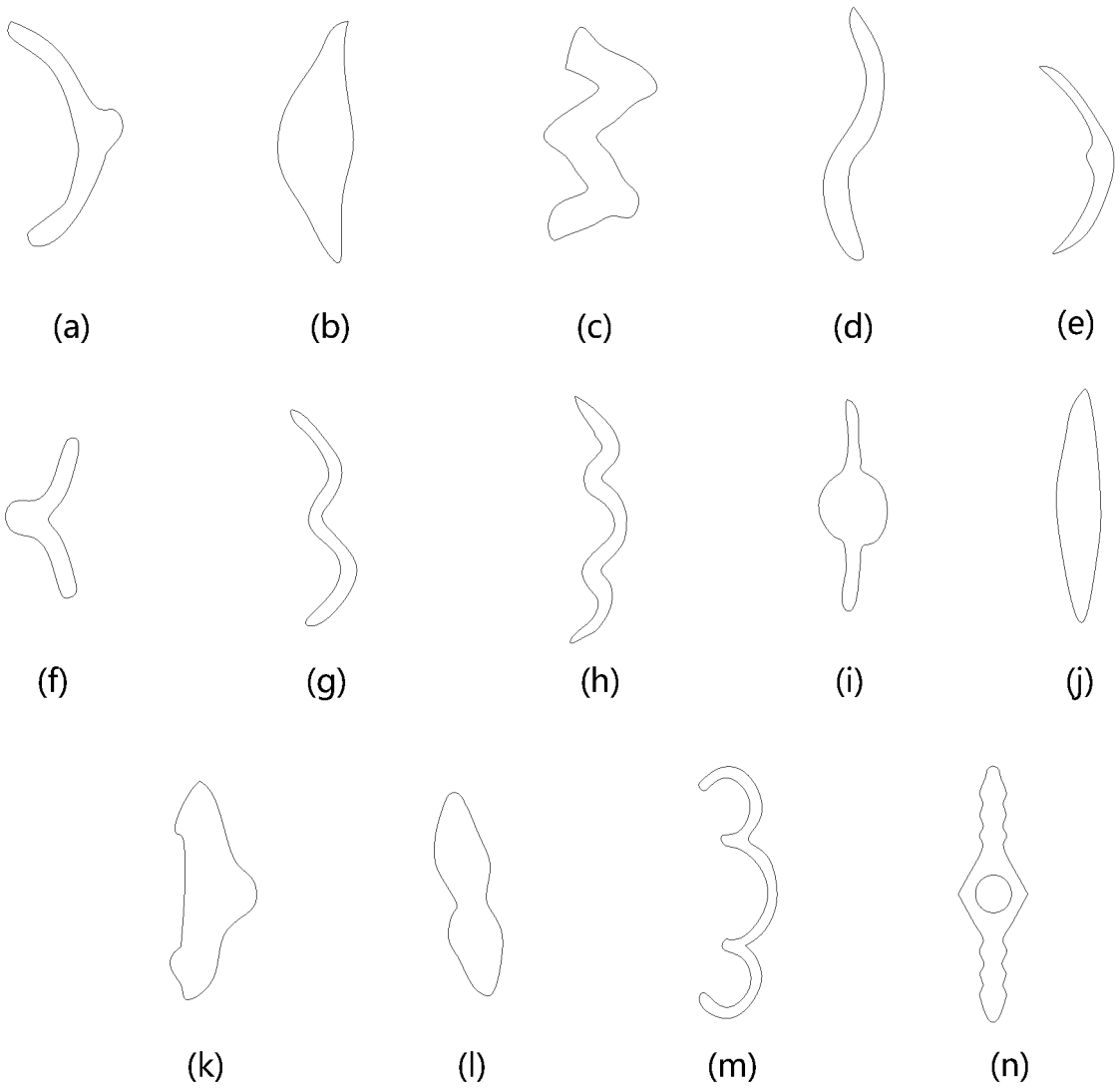

Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 17 19 3385

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X Y	JP 2014 047596 A (SEKISUI JUSHI KK) 17 March 2014 (2014-03-17) * the whole document *	1-6, 10-12 7-9	
Y	RUDOLF HUFENUS ET AL: "Design and Characterization of a Bicomponent Melt-Spun Fiber Optimized for Artificial Turf Applications", MACROMOLECULAR MATERIALS AND ENGINEERING, 24 August 2012 (2012-08-24), pages n/a-n/a, XP055037082, ISSN: 1438-7492, DOI: 10.1002/mame.201200088 * figure 6 *	7-9	TECHNICAL FIELDS SEARCHED (IPC) E01C
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The present search report has been drawn up for all claims

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Munich	28 March 2018	Beucher, Stefan

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