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(54) **METHOD FOR PRODUCING A SYNTHETIC FIBRE FOR USE IN AN ARTIFICIAL GRASS SPORTS
FIELD AND SUCH A SYNTHETIC FIBRE**

VERFAHREN ZUR HERSTELLUNG EINER SYNTHESSEFASER ZUM EINSATZ IN KUNSTRASEN
UND DERARTIGE SYNTHESSEFASER

FABRICATION D'UNE FIBRE SYNTHETIQUE POUR PELOUSE ARTIFICIELLE DE TERRAIN DE
SPORTS, ET FIBRE SYNTHETIQUE

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(56) References cited:
EP-A- 0 259 940 EP-A- 1 378 592
EP-A1- 0 301 843 EP-A1- 0 417 832
EP-A2- 0 259 940 WO-A-2004/106601
WO-A1-99/04074 WO-A1-2004/106601

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Description

[0001] The invention relates to a method for producing a synthetic fibre for use in an artificial grass sports field according to claim 1.

[0002] The invention also relates to such a synthetic fibre and to an artificial lawn suitable for a sports field, consisting of a substrate to which synthetic fibres according to the invention are attached.

[0003] Currently, synthetic materials are being used for various purposes. Especially the use of various sorts of synthetic materials in artificial lawns for sports fields has markedly increased in recent years. One fibre is known from EP259940, which describes a strip-like thread that may be produced by co-extrusion of a number of films.

[0004] Research in this regard has in particular been concentrated on the development of synthetic fibres for use in artificial lawns for sports fields, in which fibres of a particular length are attached to a substrate, for example by tufting. The development of artificial grass fibres and artificial grass sports fields derived therefrom has progressed so far that it is now possible to construct artificial grass sports fields which are very difficult to distinguish from natural grass sports fields, not only as regards the way they look but also, and in particular, as regards the way they function during play.

[0005] Unlike natural grass sports fields, artificial grass sports fields can be played on longer and more intensively, irrespective of the weather conditions. Currently, the development of new artificial grass fibres is particularly focussed on obtaining a fibre which will further reduce the incidence of injuries such as grazes and burns caused by sliding or twisted joints.

[0006] Existing fibres specifically developed for artificial grass sports field are obtained from a layer of synthetic material, for example by means of a cutting operation. The layer of synthetic material may consist of a mixture of different synthetic materials, for example, with one synthetic material serving to give the fibre a certain strength (against breaking or splitting), whilst another synthetic material in the mixture provides the fibre with a certain elasticity or flexibility or better sliding properties.

[0007] A drawback of such existing synthetic fibres is the fact that, due to the homogeneous structure all (sub)properties of the fibre are homogeneously incorporated in the fibre. As a result, certain properties of the fibre may be less prominently present than is desirable, whilst other properties predominate more than is desirable. Therefore, the composition of the current fibres is usually standardized and often their production and material costs are unnecessarily high.

[0008] The object of the invention is according to the independent claims.

[0009] The co-extrusion step accomplishes a separation of the various properties of the synthetic materials that are used. By providing the synthetic fibre with a layered structure, it becomes possible to provide each layer

with a function-specific property, which property does not need to be present elsewhere in the fibre, or needs to be present only to a markedly reduced degree. This makes it possible to select the formulation for the fibre specifically for a certain use, which, in addition to a more efficient material consumption, also results in a synthetic fibre with markedly improved playing and fibre properties than in the homogeneously composed known fibres.

[0010] According to the invention, the playing properties of the synthetic fibre are significantly improved by stretching the fibre after the co-extrusion process. Apart from an increase in length, according to the invention it is precisely the selection of materials after the stretching process that provides a fibre with such strength properties in a transverse direction that it will split less easily, for example.

[0011] When used in an artificial grass sports field, such a fibre, and consequently the artificial lawn, will have a much longer life, and the artificial lawn will require much less maintenance, thus remaining playable longer. Furthermore, the risk of injury of the players is considerably reduced.

[0012] In a first functional embodiment of the process according to the invention, the layer of synthetic material is composed of a core layer of a first synthetic material, which core layer is surrounded on both sides by one or several outer layers, each consisting of a different synthetic material.

[0013] Thus a functional separation of the different properties of the different synthetic materials can be achieved, in which each layer of synthetic material has a function-specific property, which is not necessary or not functional elsewhere in the fibre.

[0014] The layers may have different thicknesses, depending on the desired function-specific properties of the synthetic fibre to be obtained.

[0015] In a first embodiment, the first synthetic material consists of a mixture of a polymer and a plastomer, in which in particular the ratio of the plastomer in the core layer is 30-80 wt.% and more in particular the ratio of the plastomer in the core layer is 30-50 wt.%. This results in a fibre having a core layer which, from a function-specific viewpoint, exhibits a very favourable non-splitting behaviour.

[0016] In another embodiment, at least one of the other synthetic materials may comprise a hydrophilic additive. The artificial grass fibre thus obtained has this function-specific characteristic that it can absorb moisture (water). This will keep the artificial grass sports field moist longer, which has a positive effect on playing behaviour (slides etc.). When the field is played on, the absorbed moisture is released, the same as with natural grass.

[0017] An example of a hydrophilic additive that can be used as the top layer or outer layer of the co-extrusion fibre is ethylene vinyl alcohol copolymer. Depending on the quantity of vinyl alcohol in the copolymer, this polymer is capable of absorbing much water.

[0018] Another embodiment of a hydrophilic additive

is the use of polyhydroxyethyl methylacrylate.

[0019] In yet another embodiment, at least one of the other synthetic materials may comprise an antistatic additive. As a result, any static electricity generated when the field is played on can discharge. Usually, the strewing material between the fibres, which is used in many artificial grass sports fields, is statically charged during play and as a result migrates upwards in the field. Thus, the granular strewing material can be spread through the air, which is less pleasant during play.

[0020] The antistatic additive furthermore ensures that no static discharges will take place via the players.

[0021] More specifically, the antistatic additive may be a polymer, especially a permanent antistatic, such as a polyamide or a polyether block amide. In another embodiment, the additive is a polyester block copolymer.

[0022] The invention will now be explained in more detail with reference to a drawing, in which:

Figs. 1A-1D show different embodiments of a synthetic fibre not according to the invention;

Figs. 2A and 2B schematically show a few embodiments of an artificial grass sports field provided with a synthetic fibre in which Fig 2A is not according to the invention and Fig 2B is according to the invention.

[0023] The fibres (10, 20, 30, 40) have been obtained from a foil of a synthetic material, which foil, obtained by co-extrusion, is composed of at least two layers of different synthetic materials (11, 12) as shown in Fig. 1A. Contrary to the currently known synthetic fibres, which are composed of a homogeneous mixture of synthetic materials, the layered structure of the synthetic fibre (10, 20, 30, 40) makes it possible to provide each layer (sub-layers 11 and 12 in this embodiment) with a function-specific property. As a result, the use of a synthetic material having a specific property in a particular part of the synthetic fibre obviates or strongly reduces the need for the presence of this synthetic material and the related function-specific property elsewhere in the fibre.

[0024] For example, it is possible to use a synthetic material for the sub-layer 11 which in principle provides the synthetic fibre with the required mechanical strength (and rigidity) and which in particular non-splitting properties such that the synthetic fibre used for the artificial grass sports field will not split as a result of being played on.

[0025] In another embodiment as shown in Fig. 1B, the synthetic fibre 20 is built up of three layers of three different synthetic materials indicated by reference numerals 21, 22, 23. The middle layer 21 is made of an inexpensive synthetic material that is to give the fibre 20 its mechanical strength, whilst the outer layers 22 and 23 may be made of different synthetic materials, each of which may exhibit a different function-specific property, which property comes out best on the outer side of the synthetic fibre rather than in the centre.

[0026] Thus, the outer layers 21 and 22 may have an

elastic property, for example, contrary to the inner layer 21, which provides the fibre with a certain rigidity (against breaking or splitting), which elastic property of the outer layer 21 or 22 has a positive effect on the playing properties of the artificial grass sports field.

[0027] Whereas in the embodiment in Fig. 1B the outer layers 22 and 23 may be made of different synthetic materials, Fig. 1C shows an embodiment in which the outer layers 32A and 32B are made of the same synthetic material.

[0028] Fig. 1D shows a further, more complex layered structure of a synthetic fibre. By means of co-extrusion of different synthetic materials, a layered synthetic fibre made up of a central core 41 and surrounded by different types of outer layers 42A-42B or 43A-43B, respectively, is obtained.

[0029] The essence of the method according to the invention and the synthetic fibres according to the invention obtained thereby lie in the fact that the synthetic fibre, contrary to the known synthetic fibres, does not have a homogeneous structure in which all different synthetic materials and the related properties are homogeneously incorporated in the fibre. As a result of the homogeneous structure or composition of the existing artificial grass sports fields, certain properties of the fibre may be present less prominently than is desirable, whereas other properties are now predominantly present than desired.

[0030] Using the method according to the invention, it is possible to obtain synthetic fibres according to a specific formulation that, contrary to the standardized fibres, exhibit a function-specific property in certain parts of the fibre that is not considered necessary or desirable elsewhere in the fibre.

[0031] This enables a more efficient use of the various (synthetic) materials, which not only serves to reduce costs but also provides a more universal synthetic fibre according to the invention having markedly improved playing and fibre properties than in the homogeneously constructed known fibres. In this specific embodiment, the inner layers 11, 21, 31 and 41 may be made of a more inexpensive synthetic material that in principle provides the fibre with a certain strength against breaking or splitting. The outer layers 12, 22, 32, 32A-32B, 42A-42B and 43A-43B may be made of a synthetic material that does not necessarily need to be present in the fibre core.

[0032] In this context, a specific embodiment may be made up of an outer layer built up of an antistatic additive. The antistatic additive prevents the fibre from being charged by means of static electricity generated as a result of the artificial grass sports field being played on. Contrarily, the antistatic additive precisely ensures that the generated static electricity can discharge from the artificial grass sports field and, for example, will not discharge via the players, which can lead to unpleasant experiences.

[0033] In addition, in most artificial grass sports fields a granular strewing material (usually made of a rubberlike

material) is used, which, due to the static electricity that is generated, migrates upward in the artificial grass sports field and which is spread through the air as a result of the field being played on. The airborne granular strewing material has a disturbing effect on the players.

[0034] The antistatic additive in particular is a permanent antistatic, possibly a polymer, such as a polyamide or polyether block amide. In another embodiment, the additive is a polyester block copolymer.

[0035] In another embodiment, one of the outer layers (or both outer layers) (12, 22-23, 32a-32b, 43a-43b) may comprise a hydrophilic additive. The artificial grass fibre thus obtained has the function-specific characteristic that it can absorb moisture (water) from the atmosphere, such as rain. This makes the artificial grass sports field remain moist longer, just like a natural-lawn sports field, which has a positive effect on the playing behaviour in particular when sliding etc. While the field is being played on, the absorbed moisture is released, the same as with natural grass.

[0036] An example of a hydrophilic additive that can be used as the top layer or outer layer (12, 22-23, 32a-32b, 43a-43b) of the co-extrusion fibre is ethylene vinyl alcohol copolymer. Depending on the quantity of vinyl alcohol in the copolymer, this copolymer can absorb much water.

[0037] The middle layer (11, 21, 31, 41) in this case gives the fibre its strength, whilst the relatively thin top layer (12, 22-23, 32a-32b, 43a-43b) absorbs water. This water can be absorbed from the air (in the form of rain, fog, etc.) or can be supplied by an active sprinkler installation. (Often, artificial grass sports fields are sprinkled just before they are played on.)

[0038] During play, the absorbed water is released again, which reduces the risk of injury, for example when sliding. Furthermore, the absorbed water keeps the temperature of the field lower, since an artificial grass sports field can be heated by the sun, under adverse conditions to temperatures as high as 70 °C.

[0039] Another embodiment of a hydrophilic additive as the outer layer (12, 22-23, 32a-32b, 43a-43b) uses polyhydroxyethyl methacrylate. In order to prevent bonding problems to the middle layer (11, 21, 31, 41), a five-layer co-extrusion configuration is required, as shown in Fig. 1D. The layers 32a-42b are bonding layers for the hydrophilic layer 43a-43b to the central layer 41 in that case.

[0040] For illustration purposes, the various layers of the artificial grass fibre (as shown in Figs. 1A-1D) are shown to have different thicknesses. The thicknesses as shown, however, do not correspond to the actual thicknesses of the produced artificial grass fibres in any way.

[0041] In the embodiment in Fig. 1D, the bonding layer 42a-42b is considerably thinner than shown, usually it is 1-5% of the total fibre thickness, whilst the other layers 41-43a-43b are considerably thicker. If polyethylene is used as the middle layer 11-21-31-41, ethylene vinyl alcohol copolymer functioning as the hydrophilic additive

will bond to the middle layer without any filling bonding layers being used.

[0042] Figs. 2A and 2B show a few embodiments of an artificial grass sports field in which Fig. 2B shows a synthetic fibre according to the invention. In both figures, the artificial grass sports field comprises a substrate 1, to which several synthetic fibres 2 as obtained by using the method according to the invention are attached at the locations indicated by reference numeral 3, for example by tufting. The synthetic fibre 2 has been obtained from a layer of synthetic material, which material has been produced from at least two different synthetic materials by means of a co-extrusion process. The synthetic fibre may be individually attached to the substrate or as a bundle of, for example intertwined fibres 2a-2c. More in particular, the fibre that is obtained by co-extrusion can be a fibrillated band fibre.

[0043] In Fig. 2B, the synthetic fibre according to the invention is a monofilament. In Fig. 2B, the substrate has an open structure and is composed of a grid of supporting yarns 1a-1b, to which the synthetic fibres 2 are attached.

Claims

1. A method for producing a synthetic fibre (10, 20, 30, 40) for use in an artificial grass sports field using a co-extrusion process, comprising the steps of:

- i. supplying a first synthetic material;
- ii. supplying at least a second synthetic material;
- iii. composing by co-extrusion a layer of synthetic material consisting of at least a layer of first synthetic material (11, 21, 31, 41) and a layer of said second synthetic material (12, 22, 32, 42), wherein the layer of synthetic material is composed of an inner layer of said first synthetic material and one or more outer layers, each layer consisting of a different synthetic material
- iv. obtaining the synthetic fibre as a monofilament, from the layer of synthetic material,

characterized in that after step iv) the layer of synthetic material in the form of a monofilament is stretched.

2. A method according to claim 1, **characterized in that** during step iii) the layers are composed having different thicknesses.

3. A method according to claim 1 or claim 2, **characterized in that** step i) comprises the step of supplying the first synthetic material as a mixture of a polymer and a plastomer.

4. A method according to claim 3, **characterized in that** the plastomer is being supplied with the ratio of the plastomer in the first synthetic material being

30-80 wt.%.

5. A method according to claim 4, **characterized in that** the plastomer is being supplied with the ratio of the plastomer in the core layer being 35-50 wt.%. 5
6. A method according to any one or more of the preceding claims, **characterized in that** step ii) consists of supplying a hydrophilic additive as at least one of the other synthetic materials. 10
7. A method according to claim 6, **characterized in that** the hydrophilic additive being supplied is an ethylene vinyl alcohol co-polymer. 15
8. A method according to claim 7, **characterized in that** the hydrophilic additive being supplied is a polyhydroxyethyl methacrylate. 20
9. A method according to any one or more of the preceding claims, **characterized in that** step ii) comprises the step of supplying an antistatic additive as at least one of the other synthetic materials. 25
10. A method according to claim 9, **characterized in that** the antistatic additive being supplied is a polymer, in particular a polyamide or a polyether block amide. 30
11. A method according to any one or more of the preceding claims, **characterized in that** the layer of synthetic material is composed of an inner layer of said first synthetic material, which inner layer is surrounded on both sides by one or more outer layers, each layer consisting of a different synthetic material. 35
12. A synthetic fibre obtained by using the method according to any one or more of the preceding claims, said synthetic fibre being composed of a layer of synthetic material, wherein said layer is composed of an inner layer of a first synthetic material and one or more outer layers, each layer consisting of a different synthetic material. 40
13. An artificial lawn suitable for sports fields, provided with synthetic fibres according to claim 12. 45
14. An artificial lawn according to claim 13, **characterized in that** the lawn comprises a substrate to which the synthetic fibres have been attached. 50
15. An artificial lawn according to claim 13 or 14, **characterized in that** a granular material has been strewn between the synthetic fibres. 55

Patentansprüche

1. Verfahren zur Herstellung einer Synthesefaser (10, 20, 30, 40) zur Verwendung in einem Kunstrasensportplatz unter Verwendung eines Co-Extrusionsverfahrens, umfassend die Schritte:
 - i. Zuführen eines ersten Synthesematerials;
 - ii. Zuführen mindestens eines zweiten Synthesematerials;
 - iii. Zusammensetzen durch Co-Extrusion einer Schicht aus Synthesematerial, bestehend aus mindestens einer Schicht aus erstem Synthesematerial (11, 21, 31, 41) und einer Schicht aus dem zweiten Synthesematerial (12, 22, 32, 42), wobei die Schicht aus Synthesematerial zusammengesetzt ist aus einer Innenschicht auf dem ersten Synthesematerial und einer oder mehreren Außenschichten, wobei jede Schicht aus einem verschiedenen Synthesematerial besteht,
 - iv. Erhalten der Synthesefaser in der Form eines Monofilaments aus der Schicht aus Synthesematerial, **dadurch gekennzeichnet, dass** nach Schritt iv) die Schicht aus Synthesematerial in der Form eines Monofilaments gereckt wird.
2. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** während Schritt iii) die Schichten mit unterschiedlichen Dicken zusammengesetzt werden.
3. Verfahren nach Anspruch 1 oder Anspruch 2, **dadurch gekennzeichnet, dass** Schritt i) den Schritt des Zuführens des ersten Synthesematerials als eine Mischung aus einem Polymer und einem Plastomer umfasst.
4. Verfahren nach Anspruch 3, **dadurch gekennzeichnet, dass** das Plastomer so zugeführt wird, dass der Anteil des Plastomers in dem ersten Synthesematerial 30-80 Gew.-% beträgt.
5. Verfahren nach Anspruch 4, **dadurch gekennzeichnet, dass** das Plastomer so zugeführt wird, dass der Anteil des Plastomers in der Kernschicht 35-50 Gew.-% beträgt.
6. Verfahren nach irgendeinem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** Schritt ii) in der Zuführung eines hydrophilen Additivs als mindestens eines des anderen Synthesematerials besteht.
7. Verfahren nach Anspruch 6, **dadurch gekennzeichnet, dass** das zugeführte hydrophile Additiv ein Ethylen-Vinylalkohol-Copolymer ist.
8. Verfahren nach Anspruch 7, **dadurch gekennzeichnet,**

zeichnet, dass das zugeführte hydrophile Additiv ein Polyhydroxyethylmethacrylat ist.

9. Verfahren nach irgendeinem oder mehreren der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** Schritt ii) den Schritt des Zuführens eines antistatischen Additivs als mindestens eines des anderen Synthesematerials umfasst. 5
10. Verfahren nach Anspruch 9, **dadurch gekennzeichnet, dass** das zugeführte antistatische Additiv ein Polymer ist, insbesondere ein Polyamid oder ein Polyether-Block-Amid. 10
11. Verfahren nach irgendeinem oder mehreren der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Schicht aus Synthesematerial zusammengesetzt wird aus einer Innenschicht aus dem ersten Synthesematerial, welche Innenschicht auf beiden Seiten umgeben wird durch eine oder mehrere Außenschichten, wobei jede Schicht aus einem verschiedenen Synthesematerial besteht. 15 20
12. Synthesefaser, erhalten durch Verwendung des Verfahrens nach irgendeinem oder mehreren der vorangehenden Ansprüche, wobei die Synthesefaser zusammengesetzt ist aus einer Schicht aus Synthesematerial, wobei die Schicht zusammengesetzt ist aus einer Innenschicht aus einem ersten Synthesematerial und einer oder mehreren Außenschichten, wobei jede Schicht aus einem verschiedenen Synthesematerial besteht. 25 30
13. Kunstrasen, der für Sportplätze geeignet ist, versehen mit Synthesefasern gemäß Anspruch 12. 35
14. Kunstrasen nach Anspruch 13, **dadurch gekennzeichnet, dass** der Rasen ein Substrat umfasst, an welchem die Synthesefasern befestigt worden sind. 40
15. Kunstrasen nach Anspruch 13 oder 14, **dadurch gekennzeichnet, dass** ein granuläres Material zwischen die Synthesefasern gestreut worden ist. 45

Revendications

1. Procédé de fabrication d'une fibre synthétique (10, 20, 30, 40) destinée à une utilisation dans une pelouse artificielle de terrain de sports utilisant un processus de co-extrusion comprenant les étapes de : 50
 - i) fournir un premier matériau synthétique
 - ii) fournir au moins un second matériau synthétique ; 55
 - iii) composer, par co-extrusion, une couche de matériau synthétique consistant en au moins une couche d'un premier matériau synthétique

(11, 21, 31, 41) et une couche dudit second matériau synthétique (12, 22, 32, 42), dans lequel la couche de matériau synthétique est composée d'une couche interne dudit premier matériau synthétique et d'une ou de plusieurs couche(s) externe(s), chaque couche consistant en un matériau synthétique différent ;
iv) obtenir la fibre synthétique sous la forme d'un monofilament à partir de la couche de matériau synthétique,

caractérisé en ce que, après l'étape iv), la couche de matériau synthétique sous la forme d'un monofilament est étirée.

2. Procédé selon la revendication 1, **caractérisé en ce que**, pendant l'étape iii) les couches sont constituées avec des épaisseurs différentes.
3. Procédé selon la revendication 1 ou la revendication 2, **caractérisé en ce que** l'étape i) comprend l'étape de fourniture du premier matériau synthétique sous la forme d'un mélange d'un polymère et d'un plastomère.
4. Procédé selon la revendication 3, **caractérisé en ce que** le plastomère est fourni avec un rapport de plastomère dans le premier matériau synthétique compris entre 30 et 80 % en poids.
5. Procédé selon la revendication 4, **caractérisé en ce que** le plastomère est fourni avec un rapport de plastomère dans la couche centrale compris entre 35 et 50 % en poids.
6. Procédé selon l'une quelconque ou plusieurs des revendications précédentes, **caractérisé en ce que** l'étape ii) consiste à fournir un additif hydrophile en tant qu'au moins l'un des autres matériaux synthétiques.
7. Procédé selon la revendication 6, **caractérisé en ce que** l'additif hydrophile fourni est un copolymère d'éthylène alcool vinylique.
8. Procédé selon la revendication 7, **caractérisé en ce que** l'additif hydrophile fourni est un polyhydroxyéthyle méthacrylate.
9. Procédé selon l'une quelconque ou plusieurs des revendications précédentes, **caractérisé en ce que** l'étape ii) comprend l'étape de fourniture d'un additif antistatique en tant qu'au moins l'un des autres matériaux synthétiques.
10. Procédé selon la revendication 9, **caractérisé en ce que** l'additif antistatique fourni est un polymère, en particulier un polyamide ou un polyéther bloc amide.

11. Procédé selon l'une quelconque ou plusieurs des revendications précédentes, **caractérisé en ce que** la couche de matériau synthétique est composée d'une couche interne dudit premier matériau synthétique, laquelle couche interne est entourée, des deux côtés, d'une ou de plusieurs couche(s) externe(s), chaque couche consistant en un matériau synthétique différent. 5
12. Fibre synthétique obtenue grâce à l'utilisation du procédé selon l'une quelconque ou plusieurs des revendications précédentes, ladite fibre synthétique étant composée d'une couche de matériau synthétique, dans laquelle ladite couche est composée d'une couche interne d'un premier matériau synthétique et une ou plusieurs couche(s) externe(s), chaque couche consistant en un matériau synthétique différent. 10 15
13. Pelouse artificielle adaptée aux terrains de sport, pourvue de fibres synthétiques selon la revendication 12. 20
14. Pelouse artificielle selon la revendication 13, **caractérisée en ce que** la pelouse comprend un substrat sur lequel ont été fixées les fibres synthétiques. 25
15. Pelouse artificielle selon les revendications 13 ou 14, **caractérisée en ce qu'**un matériau granulaire a été répandu entre les fibres synthétiques. 30

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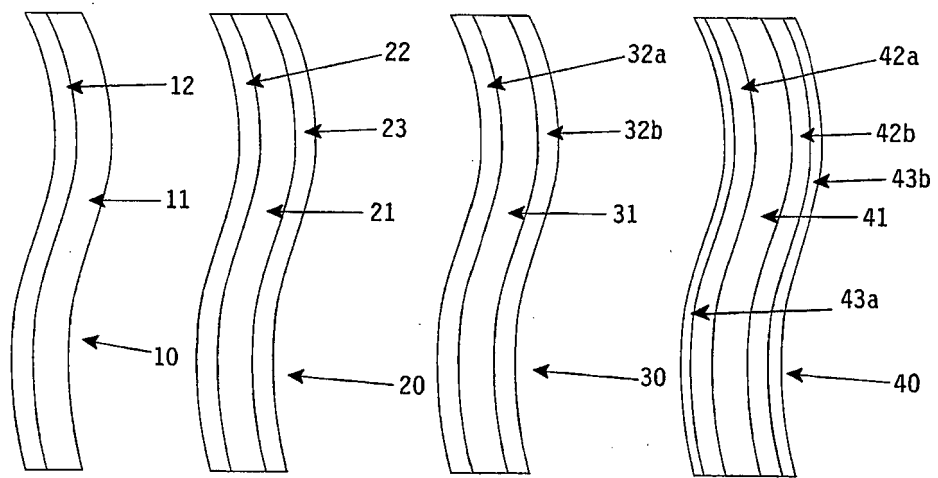


Fig. 1A Fig. 1B Fig. 1C Fig. 1D

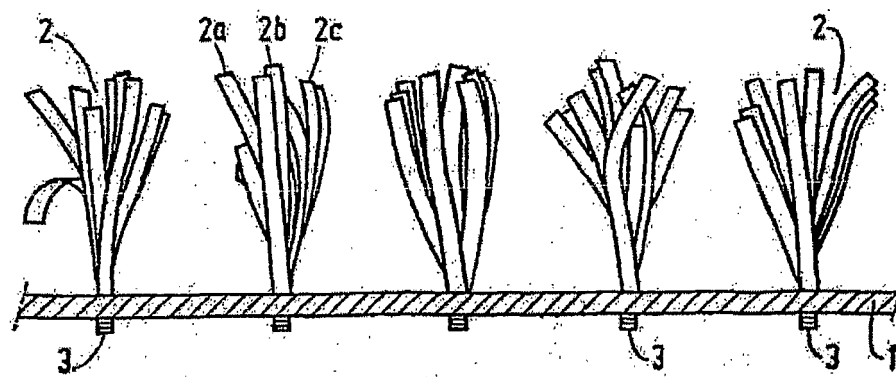


Fig. 2A

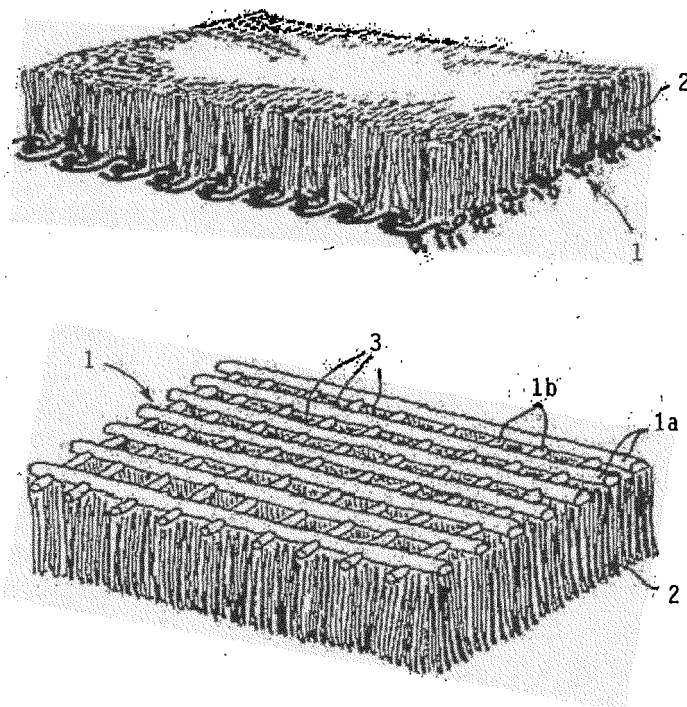


Fig. 2B

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 259940 A [0003]