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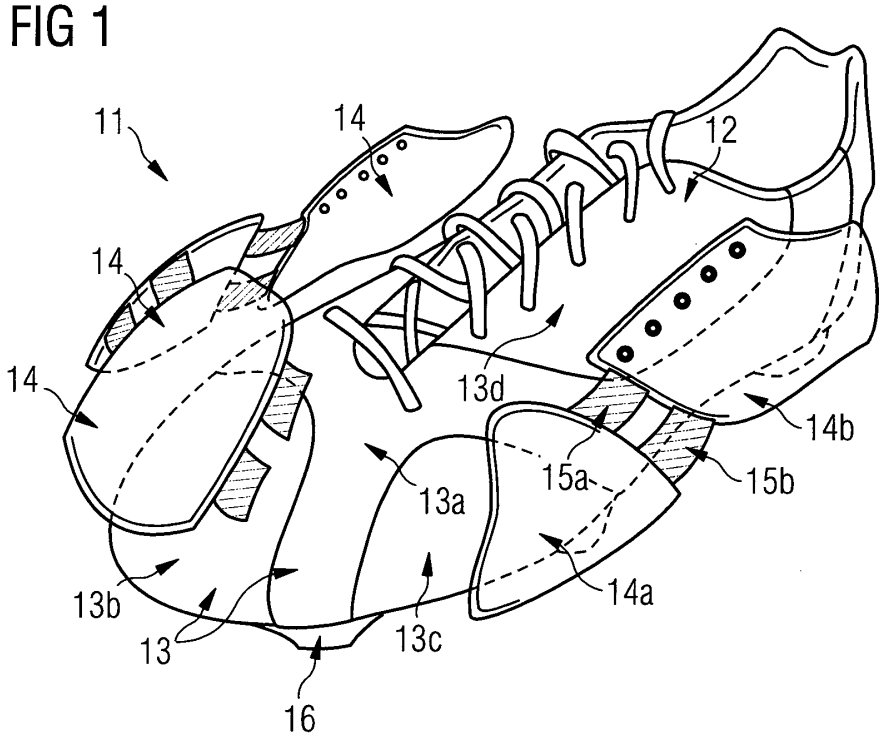
(54) ADAPTABLE SHOE UPPER AND ADAPTABLE SOLE

(57) The present invention relates to a shoe upper (12) for a shoe (11), in particular a sports shoe, comprising (a.) a first layer (13); (b.) a second layer (14) connected to the first layer in a fixed way, wherein (c.) the second layer comprises at least two regions (14a, 14b) separated from each other, and wherein (d.) the first layer comprises a higher elasticity in a region not covered by the at least two regions of the second layer than the second layer. A further aspect of the present invention relates to a sole (42), in particular a sole for a sports shoe, comprising (a.) a first layer (43); (b.) a second layer (44) connected to the first layer in a fixed way, wherein (c.) the second layer comprises at least two regions (45, 46a, 46b) separated from each other, and wherein (d.) the first layer comprises a higher elasticity at least in a region not covered by the at least two regions of the second layer than the second layer.

FIG 1



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Description

I. Technical field

[0001] The present invention relates to an adaptable shoe upper and an adaptable sole, as well as a shoe, which comprises such a shoe upper and/or such a sole.

II. Prior art

[0002] Normally shoes comprise a shoe upper and a sole attached thereto. After the purchase of a shoe neither the width nor the length of the shoe upper and/or the sole are adaptable. However, it is often the case that not until after the purchase, after a longer period of wearing a shoe the wearer notices a not perfectly correct fit of the shoe. Besides, shoes are made on lasts, whose dimensions (e.g. the width) have been determined according to average values out of a population group. Persons, whose feet do not correspond to these average values, thus do always get not perfectly optimal fitting shoes. Also the shape and/or the size of the feet can change over the time. This is especially true for children, whose shoe size rapidly changes in the first years of life.

[0003] A further example are sportspersons, which wear bandages for the support of the foot and/or the ankle joint, e.g. for medical reasons. In this case the shoe does not fit optimally due to the bandage and it may lead to chafe marks. Still a further example are persons with differently formed feet, e.g. slightly different size. Because the left and the right shoe of a pair are normally made on mirror-symmetrical lasts, at least in this case one of both shoes is not optimally fitting.

[0004] The DE 20 2010 017 958 U1 relates to a sports shoe, in particular a football boot, wherein the whole shoe comprises two components - an inner section and an outer section.

[0005] According to the US 2014/0 325 871 A1 a sole for a shoe is provided, which comprises a midsole and an outer sole. The midsole comprises thereby a base body and a plurality of deformation elements. The outer sole comprises a first outer sole region and a plurality of first outer sole elements, wherein pressure load onto a first outer sole element leads to a deformation of at least one of the deformation elements that are assigned to the first outer sole element.

[0006] US 7,546,698 B2 and US 7,770,307 B2 describe a footwear article, which comprises a shoe upper, which is at least partially formed of a base layer and thread sections, which lie adjacent to a surface of the base layer. The thread sections are arranged such that they provide structural elements, which, for example, delimit the rotation in directions, which correspond to longitudinal axes of the thread sections.

[0007] US 8,561,322 B2 refers to a sole with adaptable size. The sole comprises a solid region and an adaptable region. The adaptable region is deformable, if the sole is heated up to a melting temperature, which is assigned to the adaptable region. The shape and the size of the sole can be adapted by deforming the adaptable region.

[0008] The present invention relates to the underlying problem to provide a shoe upper and/or a sole for a shoe, in particular a sports shoe, which adapts in an easy manner to the shape of the foot.

[0009] Further prior art is disclosed in DE 10 2012 206 062 A1, in DE 10 2011 086 742 A1, and in DE 602 03 716 T2

III. Summary of the invention

[0010] According to a first aspect of the present invention this problem is solved by a shoe upper for a shoe, in particular a sports shoe, which comprises: (a.) a first layer; (b.) a second layer connected to the first layer in a fixed way, wherein (c.) the second layer comprises at least two regions separated from each other, and wherein (d.) the first layer comprises a higher elasticity in a region not covered by the at least two regions of the second layer than the second layer.

[0011] According to the invention the shoe upper comprises a first layer and a second layer connected therewith. The elasticity of the first layer is higher than the elasticity of the second layer. Through this the shoe upper may adapt in an optimal way to the shape of the foot of a wearer, due to the fact that the first layer yields. In order to enable a stretching of the first layer, the second, less elastic, layer does not form a closed surface, but forms at least two regions that are separated from each other. At least in a region not covered by these regions the first layer is more elastic than the second layer. The at least two regions of the second layer thus form a gap for the subjacent or overlying first layer. Depending on the shape of the foot this gap expands more or less so that the shoe upper can adapt to the shape of the foot.

[0012] Since the second layer is less elastic than the first layer, the second layer may, despite the flexibility and adaptability of the shoe upper, provide the necessary support for the foot. In particular, the second layer may provide stability to the shoe upper at especially stressed places, for example in the heel and toe region.

[0013] By the arrangement according to the invention and relative elasticity of first and second layer an adaptable and flexible shoe upper is then obtained, which is, at the same time, in a position to provide the necessary support and stability to the foot.

[0014] The elasticity of materials may, for example, be described by its modulus of elasticity (also referred to as modulus of tension, elasticity coefficient, modulus of elasticity, E-modulus or Young's modulus). The absolute value of the modulus of elasticity is the larger, the larger the tensile stress is, which is required in order to evoke a certain stretching.

[0015] The second layer may be at least partially arranged on the first layer. Thereby the second layer may delimit the elasticity of the first layer at systematical selected places. The second layer may thus delimit the elas-

ticity of the subjacent first layer in the regions in which the first layer and the second layer overlap.

[0016] The first layer may substantially define the shape of the shoe upper. The shape of the shoe upper is then provided by the first layer. This simplifies the manufacturing process of the shoe upper, since no further materials are required -besides the second layer. For example, the first layer may be manufactured as knitted fabric made in one piece on a weft knitting machine or warp knitting machine.

[0017] The at least two regions of the second layer may be patches, which are arranged on the first layer in a distance to each other. Patches simply may be cut-out or blanked-out from a suitable material and may be fixed on the first layer.

[0018] The at least two regions of the second layer may be made from leather or plastic. These materials are relatively easy to process and provide a high degree of stability and support to the foot at the places at which the regions are arranged at the shoe upper.

[0019] The at least two regions of the second layer may be stitched, glued or welded onto the first layer. In this way, a simple but nonetheless durable connection between the first layer and the second layer can be established.

[0020] The first layer may be made of an elastic polyurethane material, an elastic polyurethane coated substrate or an elastic, rubber-coated plastic. These materials comprise an ideal elasticity for the present invention and are durable and enduring.

[0021] The first layer may be substantially formed as a two-ply layer. For example, an inner ply may be made of a lining material, for example a foamed material. As second ply, the elastic material may be applied to the first ply. The second ply may, for example, be glued or welded to the first ply. The first ply and the second ply may at least partially overlap.

[0022] The at least two regions of the second ply may be connected by means of at least one first connecting element. The connecting element may delimit the relative arrangement of the two regions to each other and thereby define a maximum stretching of the shoe upper. That way it can be prevented that the shoe upper stretches too much and does not provide sufficient support and stability to the foot. For example, the connecting element can ensure a maximum distance between the at least two regions of the second ply. The connecting element prevents then that the gap between the two regions becomes too large and the first ply is stretched too much. The connecting element thereby constitutes a delimitation for the elasticity of the shoe upper.

[0023] The connecting element may comprise a smaller elasticity than the first ply. Thus, the elasticity of the shoe upper may be effectively delimited.

[0024] The at least one connecting element can be made in such a way that it can be severed. If the foot needs more space (e.g. as with shoes for children, bandaged feet, or feet that are asymmetrically formed) the elasticity of the shoe upper in the region of the severed connecting element may be increased by means of a systematic severing of the connecting element. Consequently the shoe upper may be adapted quite systematically to the shape of the foot and/or size. Such an adaption can be done by the owner of the respective shoe even after the purchase. For that purpose no special tool is needed.

[0025] The at least one connecting element may be removable connected with the at least two regions of the second ply. For example, the connecting element may be attached to the at least two regions of the second ply by means of a hook-and-loop fastener or snap fasteners. Also in this way an elasticity of the shoe upper may be adapted. Because the connecting element may be attached again to the shoe upper, this action is reversible. In case the wearer may set the bandages aside, for example due to a medical recovery, the elasticity of the shoe upper may be adapted according to the smaller required space of the foot by means of reattaching the connecting element.

[0026] The maximum distance between the at least two regions of the second layer may increase, if the at least one connecting element is severed or removed. In this way, as already explained, the elasticity of the shoe upper may be increased systematically.

[0027] The at least one connecting element may be replaced by another connecting element of a different length. That way the maximum elasticity of the shoe upper may be adapted in an easy manner. As with shoes of children, for example, the connecting element may be replaced by a longer connecting element, if the foot of the child reaches a certain shoe size.

[0028] The at least two regions of the second layer may be connected to each other by means of at least one second connecting element. Thereby, the second connecting element may comprise a different length than the first connecting element. That way the elasticity of the shoe upper may be increased, if the shorter connecting element (e.g. the first connecting element) is severed or removed.

[0029] The second connecting element may be arranged above the first connecting element. For example, a shorter first connecting element may be arranged above a longer second connecting element. A severing or removing of the first connecting element increases the maximum elasticity of the shoe upper.

[0030] The second connecting element may be arranged besides the first connecting element. It may be a connecting element of the same length as the first connecting element. Alternatively the second connecting element may have another length, in order to make the maximum elasticity of the shoe upper adaptable, as already described.

[0031] The first connecting element and/or the second connecting element may be made of a non-elastic, or only slightly elastic, material. The elasticity of the first and/or second connecting element is in any case smaller

than the elasticity of the first layer. The first and/or second connecting element may be made, for example, from a textile material. The textile material may be, for example, a knitted, braided and/or woven material and/or a non-woven fabric.

[0032] A further aspect of the present invention relates to a shoe, in particular a sports shoe, comprising (a.) a shoe upper as described before; and (b.) a sole attached to the shoe upper.

[0033] Still a further aspect of the present invention relates to a sole, in particular a sole for a sports shoe, comprising (a.) a first layer; (b.) a second layer connected to the first layer in a fixed way, wherein (c.) the second layer comprises at least two regions separated from each other, and wherein (d.) the first layer comprises a higher elasticity in at least one region not covered by the at least two regions of the second layer than the second layer.

[0034] Also this aspect of the invention provides for obtaining a shoe which adapts in an optimal way to the foot. According to the invention the sole comprises namely a first layer and a second layer connected therewith. The elasticity of the first layer is higher than the elasticity of the second layer. Through this the sole can adapt in an optimal way to the sole of foot of the wearer, because the first layer yields. In order to enable a stretching of the first layer, the second, less elastic layer does not form a closed surface, but forms at least two regions separated from each other. At least in a region not covered by these regions the first layer is more elastic than the second layer. The at least two regions of the second layer form a gap then for the subjacent or overlying first layer. Depending on the shape of the sole of foot and the load the gap extends more or less, so that it may adapt to the sole.

[0035] Due to the fact that the second layer is less elastic than the first layer, the second layer may provide the necessary support for the foot, despite the flexibility and adaptability of the sole. In particular the second layer may give stability to the sole and the especially stressed places, for example in the heel and toe region. Additionally the second layer may be profiled and abrasion-resistant for the ground contact.

[0036] Because of the arrangement according to the invention and the relative elasticity of the first and second layer an adaptable and flexible sole is then obtained, which is, at the same time, in the position to provide the necessary support and stability to the sole of foot as well as traction and abrasion resistance.

[0037] The inner sole may comprise at least one first region, which comprises a higher elasticity than a second region of the inner sole. In this manner the inner sole also adapts to the shape of the foot and the load accordingly. The arrangement of the at least first region with a higher elasticity of the inner sole may be adapted to the arrangement of the second layer on the first layer. In regions in which the second layer does not overlap the first layer the inner sole may preferably comprise regions with a higher elasticity.

[0038] The second layer may at least partially be arranged on the first layer. Thus, the second layer may delimit the elasticity of the first layer in systematically selected places. That way the second layer may delimit the elasticity of the subjacent first layer in the regions, in which the first layer and the second layer overlap.

[0039] The first layer may substantially define the shape of the sole. The shape of the sole is then defined by the first layer. This simplifies the manufacturing process of the sole, since no further materials are necessary, besides the second layer. For example the first layer could be manufactured in a casting process in one piece.

[0040] The second layer may be injection-molded to the first layer. In this way a fixed and permanent connection between both layers may be provided.

[0041] The first layer may be made of TPU with a Shore hardness of 60-100, 70-90 or 78-82 A. The second layer may be made off polyamide, for example PA6, PA11 or PA12, and/or TPU with a Shore hardness of 90-100 or 94-96 A.

[0042] The sole may further comprise an inner sole. The inner sole may serve as an insole (Brandsohle). An inner sole provides for a feeling that the shoe is comfortable to wear and may be additionally provided with further functions, e.g. air permeability and/or moisture absorption.

[0043] The regions with a higher elasticity of the inner sole may overlap at least partially regions with a higher elasticity of the first layer of the sole. In selected regions (e.g. in the heel and/or toe region) thus the whole sole can adapt to the shape of the sole of the wearer in an optimal way and/or stretch according to the loads.

[0044] Still a further aspect of the present invention relates to a shoe, in particular a sports shoe, comprising (a.) a sole as described before; and (b.) a shoe upper attached to the sole.

[0045] The shoe upper may be a shoe upper as described before.

IV. Short description of the drawings

[0046] In the following aspects of the present invention are illustrated in more detail with reference to the accompanying figures. These figures show:

Fig. 1: a schematic illustration of a shoe with a shoe upper according to the invention;

Fig. 2A: an exemplary embodiment of a shoe with a shoe upper according to the invention in a lateral view;

Fig. 2B: an exemplary embodiment of a shoe with a shoe upper according to the invention in a plan view;

Fig. 2C: an exemplary embodiment of a shoe with a shoe upper according to the invention in a medial view;

Fig. 3A: a further exemplary embodiment of a shoe with a shoe upper according to the invention in a lateral view;

Fig. 3B: a further exemplary embodiment of a shoe with a shoe upper according to the invention in a plan view;

Fig. 3C: a further exemplary embodiment of a shoe with a shoe upper according to the invention in a medial view; and

Fig. 4: an exemplary embodiment of a shoe with a sole according to a further aspect of the present invention.

V. Detailed description of preferred exemplary embodiments

[0047] In the following exemplary embodiments and modifications of the present invention will be described in more detail.

[0048] The Fig. 1 shows a schematic illustration of a shoe 11, which comprises a shoe upper 12 according to the invention. The shoe 11 shown in Fig. 1 is a sports shoe, as for example a football boot. The present invention is applicable to any sport shoes, as for example rugby, football, basketball, tennis, golf, running shoes, etc. The invention is not limited to sports shoes, but may also be applied in casual shoes and shoes, which are worn on formal occasions.

[0049] The shoe upper 12 comprises a first layer 13. In the exemplary embodiment of Fig. 1 the first layer 13 substantially defines the shape of the shoe upper 12, i.e. the shoe 11 may be worn also without the second layer 14 that is to be explained. The shoe upper 12 would, in this case, however, yield way too much at certain places should the situation arise. In general it is sufficient, if the first layer 13 is arranged in certain regions of the shoe upper 12, i.e. the first layer does not have to extend across the whole shoe upper 12. For example the first layer 13 could be arranged only in a toe region, a heel region, an instep region, or combinations thereof. In general the first layer 13 is arranged at that position, where the shoe upper 12 shall be elastic, so that it can adapt to the shape of the foot.

[0050] In the exemplary embodiment of Fig. 1 the first layer 13 also comprises two different kinds of regions. A first region is denoted by reference sign 13a and extents across the front foot region crosswise and along a lower region of the side of the shoe upper 12 into the rear region of the shoe upper 12. Furthermore the first layer 13 comprises a further region 13b in the toe region, a region 13c in the front side region and a region 13d at the instep region of the shoe upper 12. The material used for the region 13a may be different from the one used for the regions 13b, 13c and 13d. In particular the elasticity of these materials may be different.

[0051] It is also possible, that the first layer is substantially formed two-plyed. For example an inner ply could be made of a lining material, for example a foamed material. As a second ply the elastic material can be applied to the first ply. The second ply may for example be glued or welded onto the first ply. The first ply and the second ply may at least partially overlap. For example, as an alternative to the exemplary embodiment shown in Fig. 1, the inner ply may substantially extends across the whole shoe upper and may be visible in the crosswise region denoted by the reference sign 13a. Onto the inner ply in the regions of the second ply denoted by the reference signs 13a, 13b, 13c and 13d may be glued or welded. The elasticity of the first ply may differ from the elasticity of the second ply.

[0052] The arrangement and the shape of the regions 13a, 13b, 13c and 13d in Fig. 1 is only to understand exemplary and may vary according to the application (e.g. the sport) of the shoe 11. Also the first layer 13 may not comprise such regions, but may be made throughout from one material.

[0053] The first layer 13 is an elastic material. Potential materials are for example polyurethan or rubber-coated plastic.

[0054] The shoe upper 12 also comprises as second layer 14 connected to the first layer 13 in a fixed way, which comprises at least two regions separated from each other. In Fig. 1 two such regions are denoted exemplarily with the reference signs 14a and 14b. The regions 14a and 14b are patches, which are arranged onto the first layer 13 with a distance to each other. Furthermore Fig. 1 is an explosive view, i.e. the second layer 14 is illustrated spaced apart from the first layer 13 due to illustration reasons. In general, the second layer 14 is however connected in a fixed way of the first layer 13, for example by stitching, gluing or welding.

[0055] The at least two regions of the second layer 14 (in Fig. 1 exemplarily denoted by the reference signs 14a and 14b) are spaced apart, i.e. the regions 14a and 14b are arranged onto the first layer 13 spaced apart from each other. The at least two regions 14a and 14b may be made from leather or plastic.

[0056] The first layer 13 comprises according to the invention a higher elasticity in at least one region not covered by the at least two regions of the second layer than the second layer 14. In the exemplary embodiment of Fig. 1 the region 13a of the first layer 13 is not covered by the second layer 14. The elasticity of the region 13a is higher than the elasticity of the second layer 14, in particular as in the at least two regions 14a and 14b.

[0057] The elasticity of materials may be described for example by its modulus of elasticity (also referred to as modulus of tension, elasticity coefficient, modulus of elasticity, E-modulus or Young's modulus). The absolute value of the modulus of elasticity is the larger, the larger the tension is, which is required to in order to evoke a certain stretching.

[0058] Due to the fact that the second layer 14 com-

prises a lower elasticity than the first layer 13 and is connected to it in a fixed way, the second layer 14 delimits the elasticity of the subjacent first layer 13 in the regions, in which the first layer 13 and the second layer 14 overlap.

[0059] In the exemplary embodiment of Fig .1 the second layer 14 overlaps the subjacent first layer 13 completely, i.e. there is no region, in which both of the layers do not overlap. It is also possible in the scope of the present invention, that the first layer 13 and the second layer 14 overlap only partially. Also in the exemplary embodiment of Fig. 1 the second layer 14 is arranged above the first layer 13. A reverse arrangement is also possible, i.e. the second layer 14 may be arranged below the first layer 13.

[0060] In the exemplary embodiment of Fig. 1 the at least two regions 14a and 14b of the second layer 14 are connected with each other by means of an optional first connecting element. Such a first connecting element is exemplarily denoted by the reference sign 15a in Fig. 1. The connecting element 15a ensures a maximum distance between the at least two regions 14a and 14b of the second layer 14. Hereby the connecting element 15a may comprise a lower elasticity than the first layer 13, i.e. the connecting element 15a delimits the relative movement of both regions 14a and 14b with respect to each other, which is possible due to the higher elasticity of the subjacent first layer 13.

[0061] The first connecting element 15a may be made for example from a non-woven material. Alternatively, the first connecting element 15a may also be a knitted, braided and/or woven material. While in the first example of Fig. 1 the first connecting element 15a has a tape-like shape, it is also possible, that the first connecting element 15a comprises a round cross section and is e.g. a thread or yarn.

[0062] The first connecting element 15a may be made in such a way that it may be severed. In the first example of Fig. 1 the first connecting element 15a may be severed for example by means of a scissor. It is also possible, that the first connecting element 15a is removable connected to the at least two regions 14a and 14b. For example the first connecting element 15a and at least one of the two regions 14a and 14b may comprise a snap fastener or a hook-and-loop fastener, so that the connecting element may be removed from this region. It is also possible, that also the other region comprises a snap fastener or a hook-and-loop fastener, so that the connecting element 15a may be removed completely from the shoe upper 12.

[0063] When the first connecting element 15a is severed or removed, in general, the maximum distance between the at least two regions 14a and 14b of the second layer increases, since the connecting element does not delimit the relative movement of the two regions 14a and 14b with respect to each other anymore, which is possible due to the lower elasticity of the subjacent first layer 13. So, if the connecting element 15a in the exemplary embodiment of Fig. 1 is severed or removed, the elasticity of the shoe upper 12 increases in this lateral region, in which the connecting element 15a was arranged. The shoe upper 12 could then receive a foot with a larger width.

[0064] It is as also possible that the first connecting element 15a may be replaced by another connecting element of another length. So, the maximum elasticity of the shoe upper may be adapted in the region of the connecting element 15a. A shorter connecting element delimits the elasticity of the shoe upper accordingly, while a longer connecting element allows for a broader distance between the regions 14a and 14b of the second layer.

[0065] As shown in the exemplary embodiment of Fig. 1, the regions 14a and 14b of the second layer 14 are connected with each other by means of an optional second connecting element 15b. The second connecting element 15b is arranged besides the first element 15a. However, it is also possible that the second connecting element 15b is arranged above the first connecting element. The second connecting element 15b may comprise another length than the first connecting element. For example, the length of the second connecting element 15b may be greater than that of the first connecting element 15a. In case, as already described, the first element 15a is removed or severed, the elasticity of the shoe upper will increase in the region of the connecting element 15a, since the maximum distance between the two regions 14a and 14b of the second layer 14 is now delimited by the longer second connecting element 15b.

[0066] The shoe 11, illustrated in Fig. 1, also comprises, besides the already described shoe upper 12, a sole 16. It is connected to the shoe upper 12 e.g. by stitching, gluing or welding. Alternatively, the sole 16 may be injection-molded directly onto the shoe upper 12. The sole 16 may be an ordinary sole, for example made from ethylene vinyl acetate (EVA), thermoplastic polyurethane (TPU), cured rubber or expanded polyurethane (eTPU). Alternatively, it may be a sole according to another aspect of the present invention, which will be explained in more detail with reference to Fig. 4.

[0067] The Figures 2A, 2B and 2C show a further exemplary embodiment of a shoe 11 with a shoe upper 12 according to the invention. This is a football boot, which comprises, besides a shoe upper 12 already described with reference to Fig. 1, a sole 16 with studs, three of which are exemplarily denoted by reference sign 21. With reference to the shoe upper 12 what has been said with reference to Fig. 1 is valid. In contrast to the shoe upper 12 according to Fig. 1 the shoe upper according to Fig. 2A, 2B and 2C comprises additional connecting elements in the rear foot region and heel region, respectively, two of which are exemplarily denoted by the reference signs 15c and 15d. Moreover the shoe upper 12 according to Fig. 2A, 2B and 2C comprises overall a higher number of connecting elements 15a, 15b, 15c, 15d, whereby the adaptability of the shoe upper 12 is further increased.

[0068] The figures 3A, 3B and 3C show an exemplary

embodiment of the invention that is an alternative to the example of figures 2A, 2B and 2C. The shoe 11 shown in figures 3A, 3B and 3C also comprises a shoe upper 12 according to the invention with the same features as the shoe 11 shown in the figures 2A, 2B and 2C. In contrast to the exemplary embodiment of the figures 2A, 2B and 2C the shoe 11 shown in the figures 3A, 3B and 3C comprises, however, no connecting elements between regions of the second layer 14. For example, in contrast to the exemplary embodiment of the figures 3A, 3B and 3C, no connecting element between the regions 14a and 14b is arranged. Due to the fact that the shoe 11 shown in the figures 3A, 3B and 3C does not comprise any connecting elements, the elasticity of the first layer 13 is basically lower than in the exemplary embodiment of the figures 2A, 2B and 2C, in order to count for the absence of connecting elements.

[0069] The Fig. 4 shows an exemplary embodiment of a shoe 11 with a sole 42 according to a further aspect of the present invention. The shoe 41 shown in Fig.4 is a football boot. The sole 42 shown in Fig. 4 may, however, be applied to any arbitrary sports shoes, as for example rugby, football, basketball, tennis, golf, running shoes, etc. The invention is not limited to sports shoes, but may also be applied to casual shoes and shoes, which are worn at formal occasions.

[0070] The sole 42 comprises a first layer 43. The layer 43 may be made from TPU 80A for example. The sole 42 further comprises a second layer 44 connected to the first layer 43 in a fixed way. The second layer 44 comprises a first section 45 in the mid foot region, which is made from PA12. Furthermore the first layer comprises a front foot section 46a and a heel section 46b, which is made from TPU 95A. This arrangement of the sections 45, 46a and 46b of the second layer 44 allows for a flexible and stretchable outer sole. The arrangement of the sections 45, 46a and 46b may, however, vary fundamental. Likewise, other materials may be used. The two layers 43 and 44 may be connected to each other by gluing or welding. Alternatively the first layer 43 may be injection-molded to the second layer 44, or vice versa.

[0071] The second layer 44 comprises at least two regions separated from each other, from which two are exemplarily denoted in Fig. 4 by the reference signs 47a and 47b. The two regions 47a and 47b are spaced apart from each other, so that the first layer 43 is visible between the regions 47a and 47b of the second layer 44.

[0072] According to the invention the first layer 43 comprises a higher elasticity in at least one region not covered by the at least two regions 47a and 47b of the second layer 44 than the second layer 44. In the exemplary embodiment of Fig. 4 a crosswise region of the first layer 43 is not covered by the second layer 44. The elasticity of the first layer 43 is higher in this region than the elasticity of the second layer 44, in particular as in the at least two regions 47a and 47b.

[0073] In the embodiment example of Fig. 4 the second layer 44 and the subjacent first layer 43 do not cover completely. For example, the second layer 44 extends up to the edge of the sole 42, however, the first layer 43 does not. In the scope of the present invention it is, however, also possible, that the first layer 43 and second layer 44 cover completely, i.e. there is no region in which the two layers do not cover each other. Also in the embodiment example of Fig. 4, the second layer 44 is arranged above the first layer 43. A reverse arrangement is also possible, i.e. the second layer 44 may be arranged below the first layer 43.

[0074] Due to the fact that the second layer 44 comprises a lower elasticity than the first layer 43 and is connected to it in a fixed way, the second layer 44 delimits the elasticity of the subjacent first layer 43 in the regions, in which the first layer 43 and the second layer 44 overlap.

[0075] In the exemplary embodiment of Fig. 4 the first layer 43 substantially defines the shape of the sole 42, i.e. the shoe 41 could be worn without the second layer 44. In this case, however, the sole would yield too much at certain places. In general, it is sufficient, if the first layer 43 is arranged in certain regions of the sole 42, i.e. the first layer 43 does not have to extend across the whole sole 42. For example, the first layer 43 could be arranged only in a toe region, a heel region, a mid foot region, or combinations thereof. In general, the first layer 43 is arranged at positions, where the sole 42 shall be elastic, so that it can adapt to the foot sole shape and the loads while wearing the shoe 41.

[0076] Optionally the sole 42 may also comprise an inner sole (not shown in Fig. 4). This sole may comprise regions with a higher elasticity than other regions. The regions of higher elasticity of the inner sole may at least partially overlap regions with a higher elasticity of the first layer 43 of the sole 42. In selected regions (e.g. in the heel and/or toe region) hence the complete sole 42 may adapt to the sole shape of the wearer and/or may stretch according to the loads.

[0077] The shoe 41 shown in Fig. 4 also comprises a shoe upper 48, which may be connected to the sole 42 e.g. by stitching, gluing or welding. The sole 42 may also be injection-molded onto the shoe upper 48. The shoe upper 48 may be a shoe upper, as it is used with ordinary football boots. Alternatively, it may be a shoe upper 12 according to the invention, as it was already described with reference to the figures 1, 2A, 2B, 2C, 3A, 3B and 3C.

[0078] Within the scope of the present invention exemplary embodiments may be combined with each other, in order to obtain a further exemplary embodiment, which was not explicitly described herein. For example, certain features of an exemplary embodiment may be combined with certain features of another exemplary embodiment, in order to obtain a new exemplary embodiment according to the present invention, which was not explicitly described herein.

[0079] In the following, further embodiments are described to facilitate the understanding of the invention:

1. Shoe upper for a shoe, in particular a sports shoe,

comprising:

a. a first layer;
b. a second layer connected to the first layer in a fixed way, wherein
c. the second layer comprises at least two regions separated from each other, and wherein
d. the first layer comprises a higher elasticity in a region not covered by the at least two regions of the second layer than the second layer.

2. Shoe upper according to embodiment 1, wherein the second layer is at least partially arranged on the first layer.
3. Shoe upper according to the preceding embodiment, wherein the second layer delimits the elasticity of the subjacent first layer in the regions in which the first layer and the second layer overlap.
4. Shoe upper according to one of the preceding embodiments, wherein the first layer substantially defines the shape of the shoe upper.
5. Shoe upper according to one of the preceding embodiments, wherein the at least two regions of the second layer are patches, which are arranged on the first layer in a distance to each other.
6. Shoe upper according to one of the preceding embodiments, wherein the at least two regions of the second layer are made of leather or plastic.
7. Shoe upper according to one of the preceding embodiments, wherein the at least two regions of the second layer are stitched, glued or welded onto the first layer.
8. Shoe upper according to one of the preceding embodiments, wherein the first layer is made of an elastic polyurethane material, an elastic polyurethane coated substrate or an elastic, rubber coated plastic.
9. Shoe upper according to one of the preceding embodiments, wherein the at least two regions of the second layer are connected to each other by means of at least one first connecting element.
10. Shoe upper according to one of the preceding embodiments, wherein the connecting element ensures a maximum distance between the at least two regions of the second layer.
11. Shoe upper according to one of the embodiments 9 to 10, wherein the connecting element comprises a lower elasticity than the first layer.
12. Shoe upper according to one of the embodiments 9 to 11, wherein the at least one connecting element is made in such a way that it can be severed.
13. Shoe upper according to one of the embodiments 9 to 11, wherein the at least one connecting element is removable connected to the at least two regions of the second layer.
14. Shoe upper according to one of the embodiments 12 or 13, wherein the maximum distance between the at least two regions of the second layer increases when the at least one connecting element is severed or removed.
15. Shoe upper according to one of the embodiments 9 to 14, wherein the at least one connecting element can be replaced by another connecting element of a different length.
16. Shoe upper according to one of the embodiments 9 to 15, wherein the at least two regions of the second layer are connected to each other by means of at least one second connecting element.
17. Shoe upper according to the preceding embodiment, wherein the second connecting element comprises a different length than the first connecting element.
18. Shoe upper according to one of the embodiments 16 or 17, wherein the second connecting element is arranged above the first connecting element.
19. Shoe upper according to one of the embodiments 16 or 17, wherein the second connecting element is arranged besides the first connecting element.
20. Shoe upper according to one of the embodiments 9 to 19, wherein the first connecting element is made of a non-woven fabric.
21. Shoe upper according to one of the embodiments 16 to 20, wherein the second connecting element is made of a non-woven fabric.
22. Shoe, in particular a sports shoe, comprising:

a. a shoe upper according to one of the preceding embodiments; and
b. a sole attached to the shoe upper.

23. Sole, in particular a sole for a sports shoe, comprising:

a. a first layer;
b. a second layer connected to the first layer in a fixed way, wherein
c. the second layer comprises at least two regions separated from each other, and
d. the first layer comprises a higher elasticity at least in a region not covered by the at least two regions of the second layer than the second layer, wherein
e. the sole further comprises an inner sole, wherein
f. the inner sole comprises at least a first region which comprises a higher elasticity than a second region of the inner sole.

24. Sole according to the preceding embodiment, wherein the second layer is at least partially arranged on the first layer.
25. Sole according to one of the embodiments 23 to 24, wherein the second layer delimits the elasticity of the subjacent first layer in the regions in which the first layer and the second layer overlap.
26. Sole according to one of the embodiments 23 to 25, wherein the first layer substantially defines the

shape of the sole.

27. Sole according to one of the embodiments 23 to 26, wherein the second layer is injection-molded to the first layer.

28. Sole according to one of the embodiments 23 to 27, wherein the first layer is made of TPU with a Shore hardness of 60-100, 70-90 or 78-82 A and the second layer is made of PA6, PA11, PA12 and/or TPU with a Shore hardness of 90-100 or 94-96 A.

29. Sole according to one of the embodiments 23 to 28, wherein the regions of higher elasticity of the inner sole at least partially overlap regions of higher elasticity of the first layer of the sole.

30. Shoe, in particular a sports shoe, comprising:

a. a sole according to one of the embodiments 23 to 29; and
b. a shoe upper attached to the sole.

31. Shoe according to embodiment 30, wherein the sole is a sole according to one of the embodiments 1 to 21.

Claims

1. Shoe upper for a shoe, in particular a sports shoe, comprising:

a. a first layer;
b. a second layer connected to the first layer in a fixed way, wherein
c. the second layer comprises at least two regions separated from each other, and wherein
d. the first layer comprises a higher elasticity in a region not covered by the at least two regions of the second layer than the second layer.

2. Shoe upper according to claim 1, wherein the second layer is at least partially arranged on the first layer.

3. Shoe upper according to the preceding claim, wherein the second layer delimits the elasticity of the subjacent first layer in the regions in which the first layer and the second layer overlap.

4. Shoe upper according to one of the preceding claims, wherein the first layer substantially defines the shape of the shoe upper.

5. Shoe upper according to one of the preceding claims, wherein the at least two regions of the second layer are patches made of leather or plastic, which are arranged on the first layer in a distance to each other.

6. Shoe upper according to one of the preceding claims, wherein the at least two regions of the second layer are connected to each other by means of at least one first connecting element.

7. Shoe upper according to one of the preceding claims, wherein the connecting element ensures a maximum distance between the at least two regions of the second layer.

8. Shoe upper according to one of the claims 6 or 7, wherein the at least two regions of the second layer are connected to each other by means of at least one second connecting element.

9. Shoe upper according to the preceding claim, wherein the second connecting element comprises a different length than the first connecting element.

10. Shoe upper according to one of the claims 6 to 9, wherein the first connecting element and/or the second connecting element is made of a non-woven fabric.

11. Shoe, in particular a sports shoe, comprising:

a. a shoe upper according to one of the preceding claims; and
b. a sole attached to the shoe upper.

12. Sole, in particular a sole for a sports shoe, comprising:

a. a first layer;
b. a second layer connected to the first layer in a fixed way, wherein
c. the second layer comprises at least two regions separated from each other, and
d. the first layer comprises a higher elasticity at least in a region not covered by the at least two regions of the second layer than the second layer, wherein
e. the sole further comprises an inner sole, wherein
f. the inner sole comprises at least a first region which comprises a higher elasticity than a second region of the inner sole.

13. Sole according to the preceding claim, wherein the second layer is at least partially arranged on the first layer.

14. Sole according to one of the claims 12 to 13, wherein the second layer delimits the elasticity of the subjacent first layer in the regions in which the first layer and the second layer overlap.

15. Shoe, in particular a sports shoe, comprising:

a. a sole according to one of the claims 12 to

14; and
b. a shoe upper attached to the sole.

FIG 1

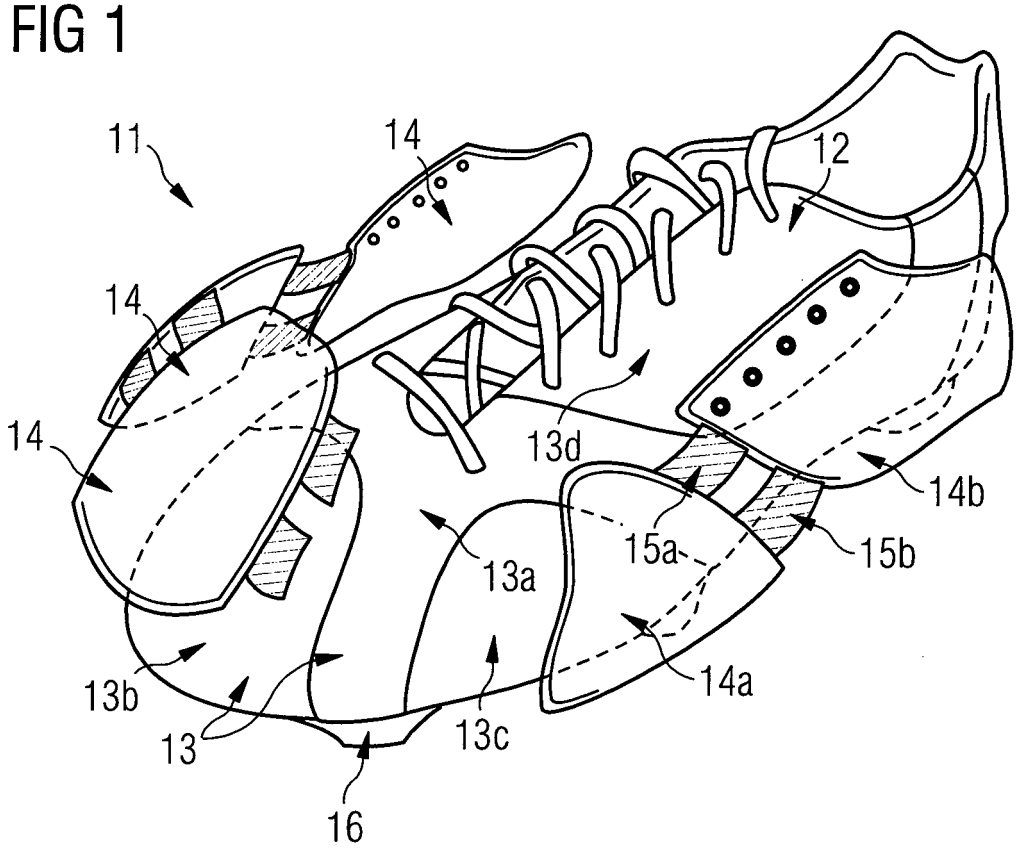
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FIG 2A

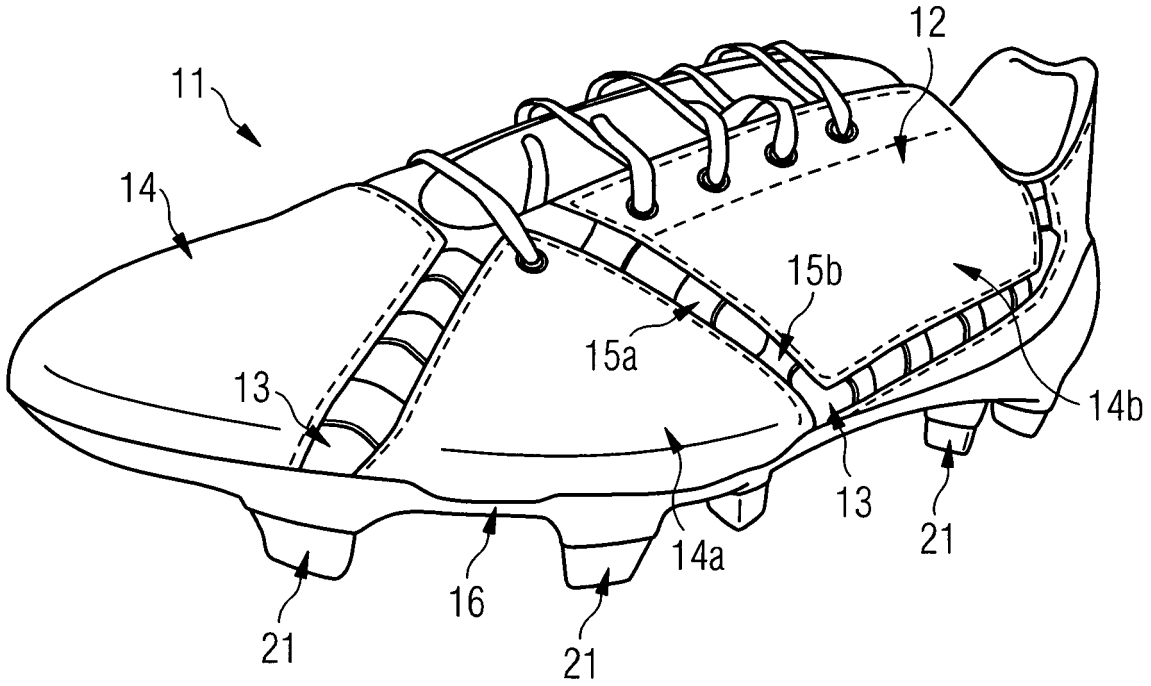
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FIG 2B

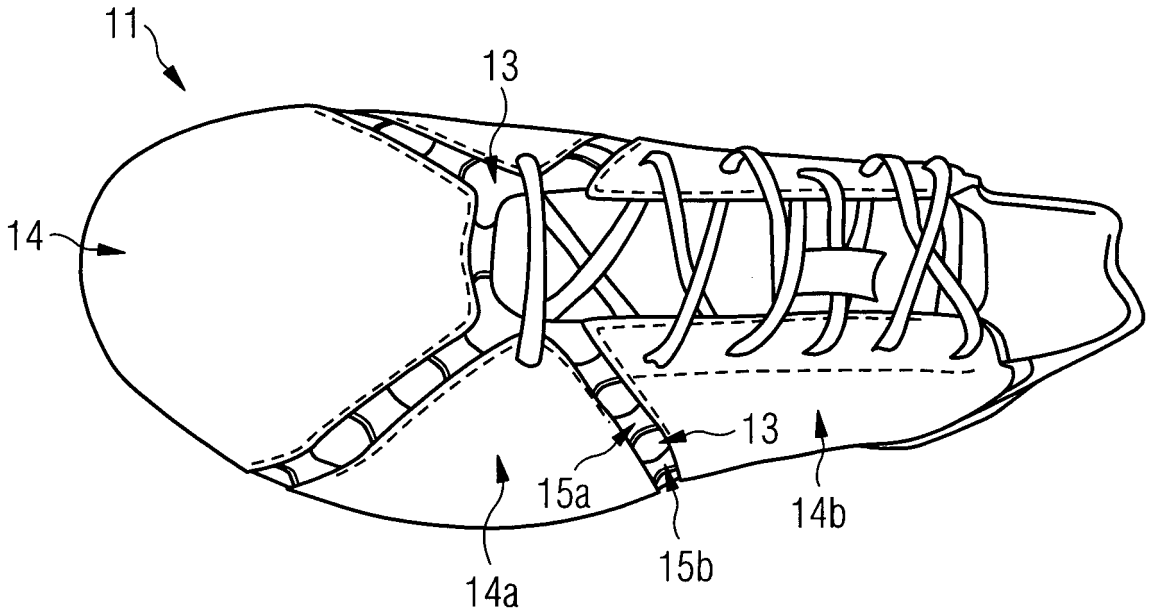


FIG 2C

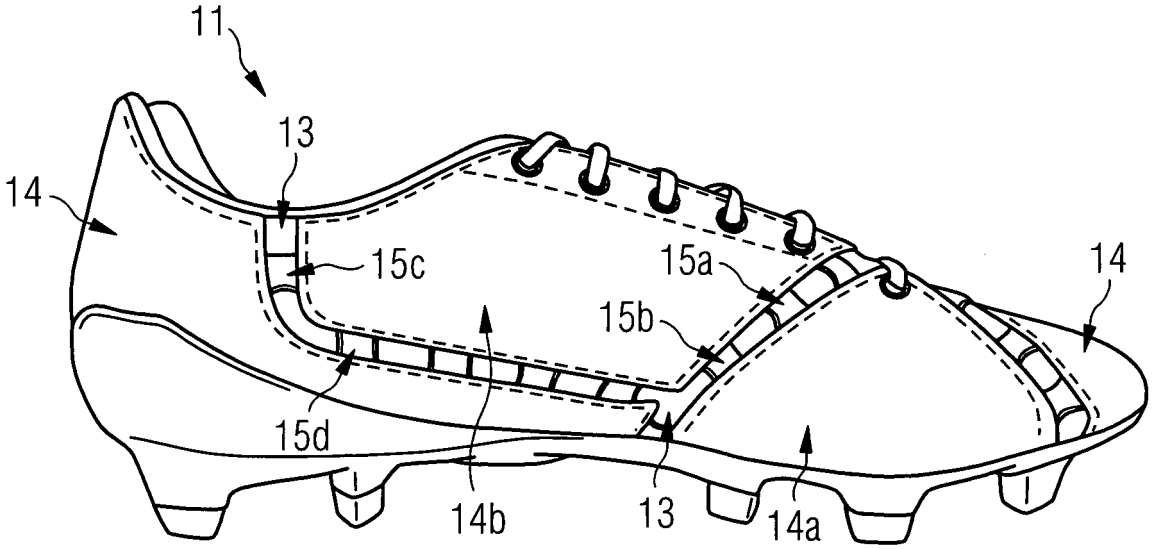


FIG 3A

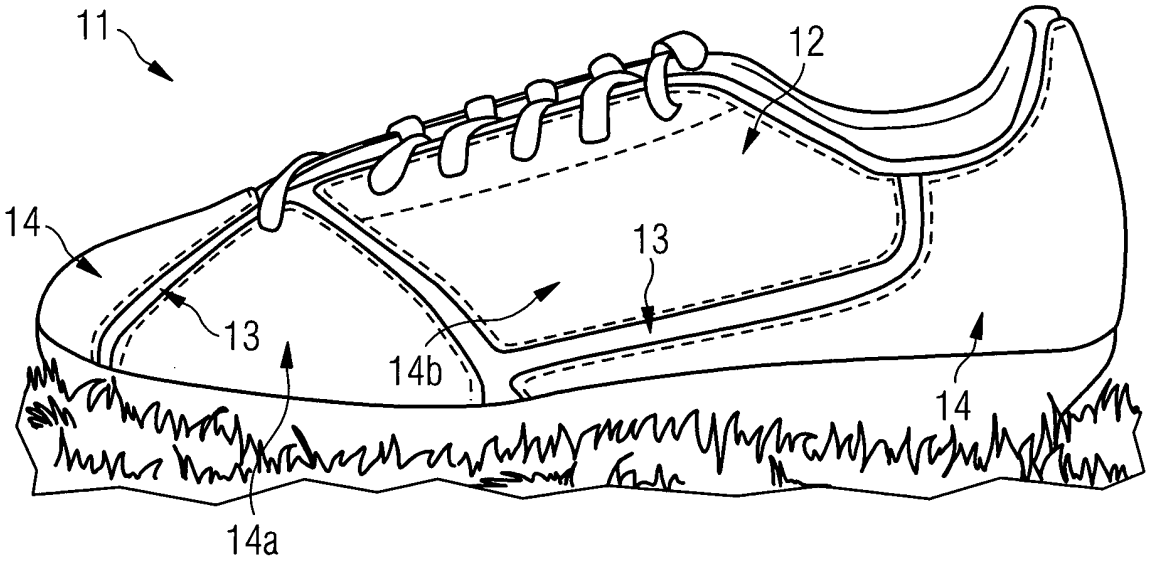


FIG 3B

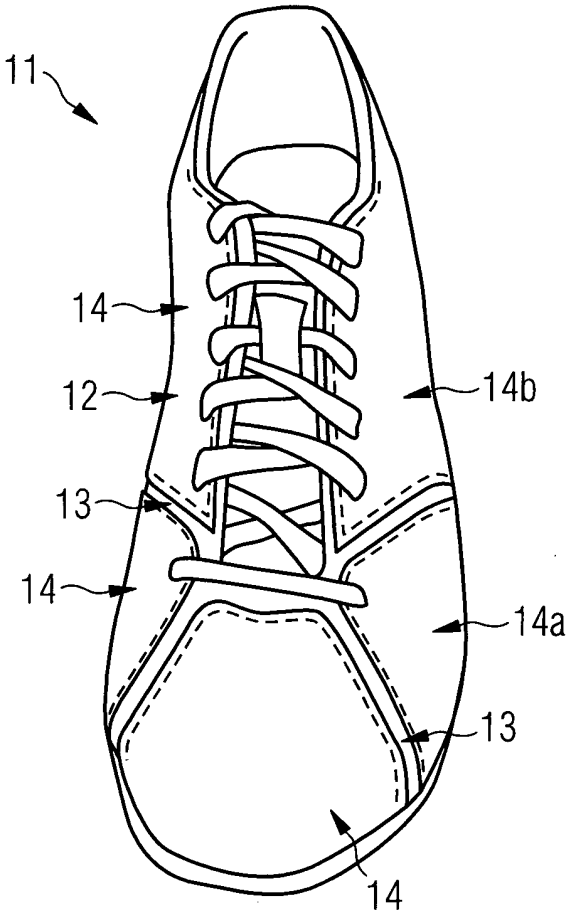


FIG 3C

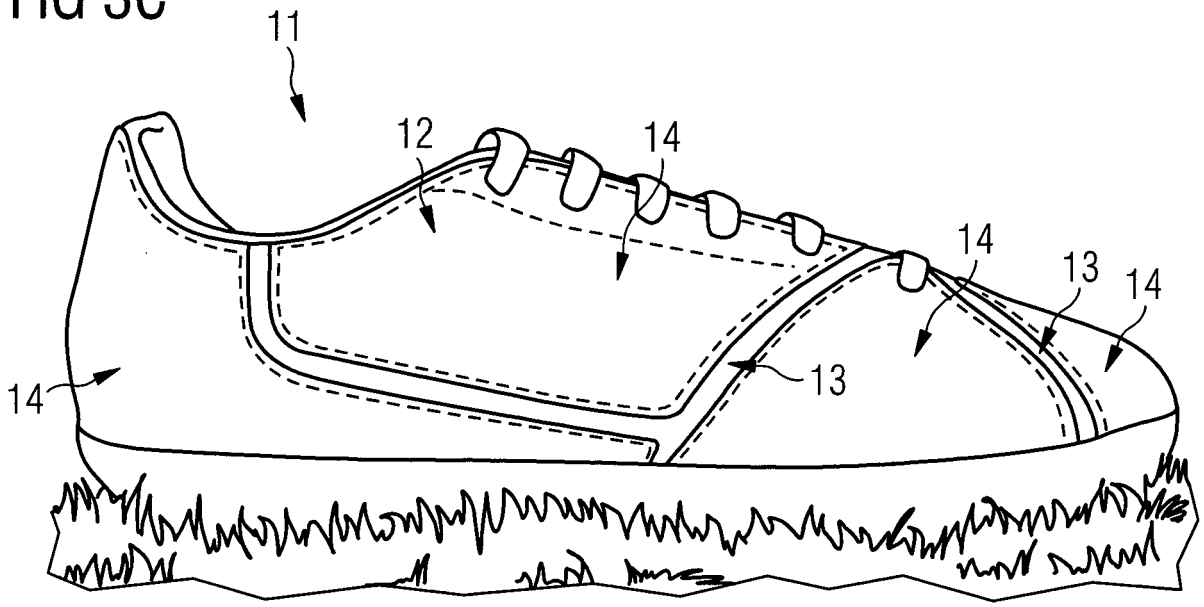
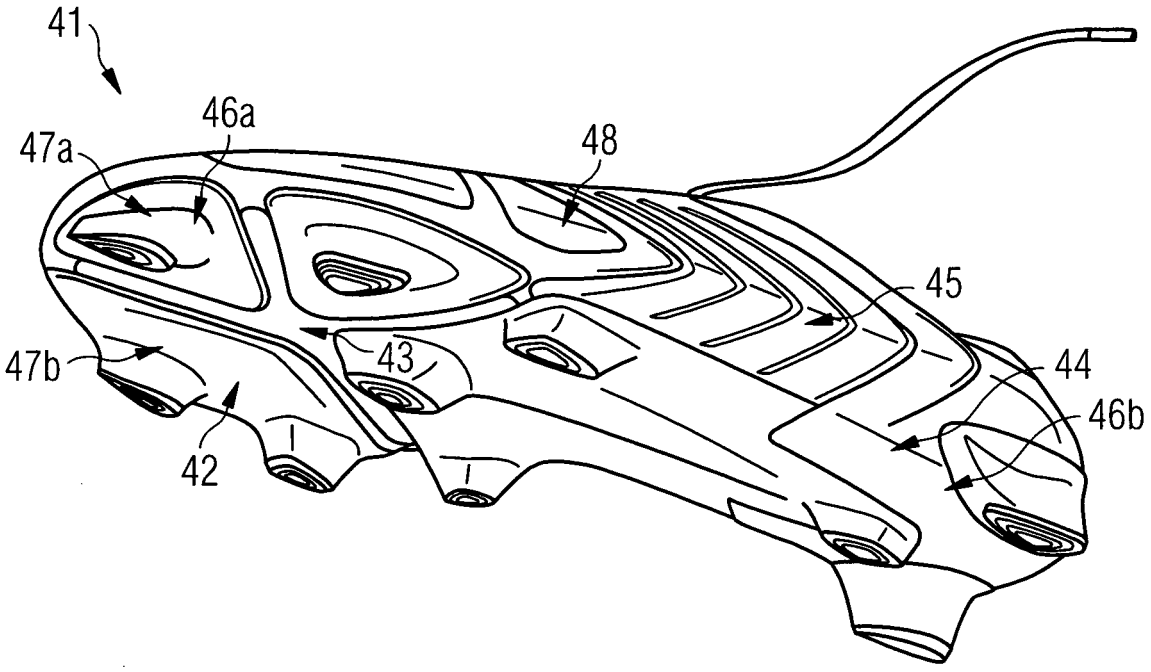


FIG 4



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