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(54) **FOOTWEAR PIECE**

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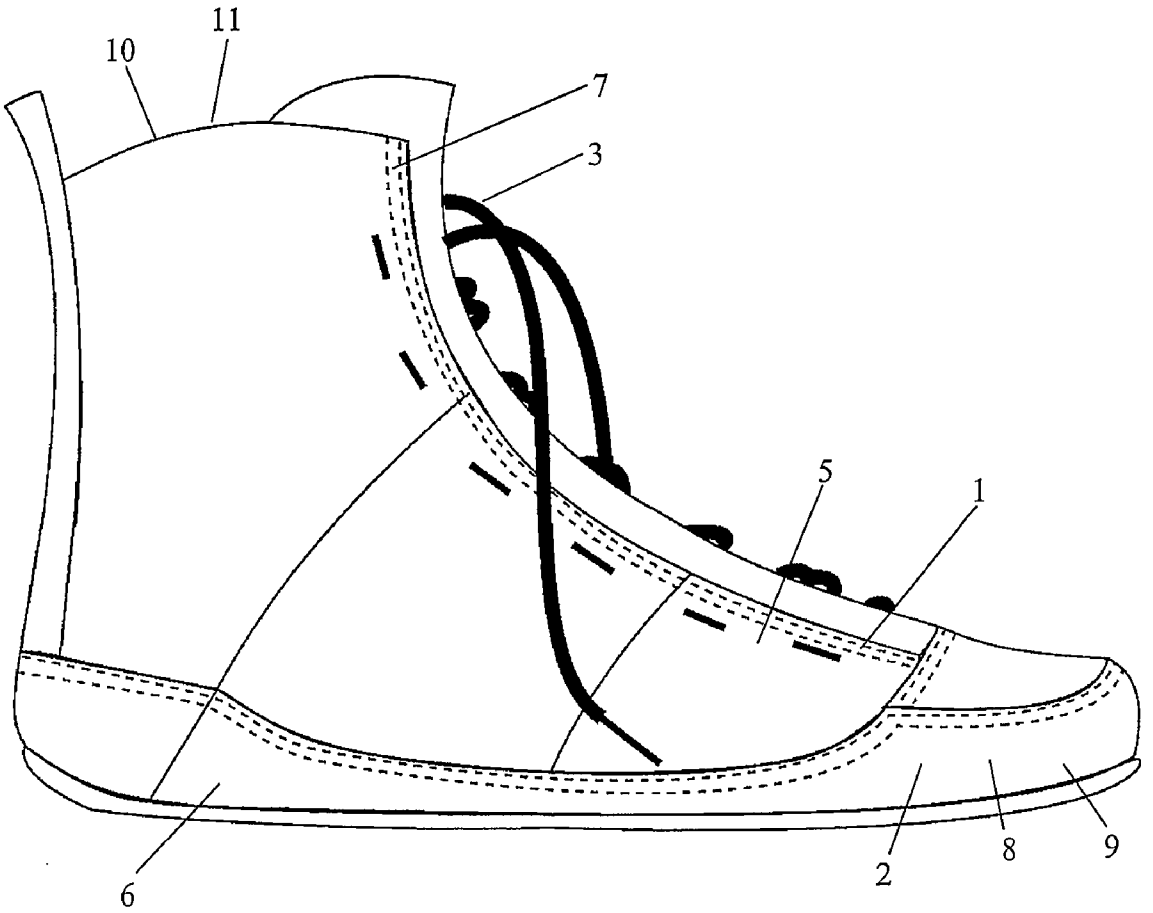
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(57) **ABSTRACT**

The invention relates to a footwear piece having an upper made of a first fabric material as well as a sole, which is made of a second fabric material, and further the footwear piece has the tightening means and a tightening flap. The footwear piece is primarily intended for outdoor use, but, if needed, it is also suitable for indoor use. The footwear piece is on the foot soft and light to use and with it a "barefoot feeling" is achieved for its user. The footwear piece moulds completely to the shapes of its user's foot and when using the footwear piece a separate sock is not necessarily needed at all. This is a light and machine-washable as well as breathable footwear piece sewn of textile, a sort of "outdoor sock" with a soft sole.



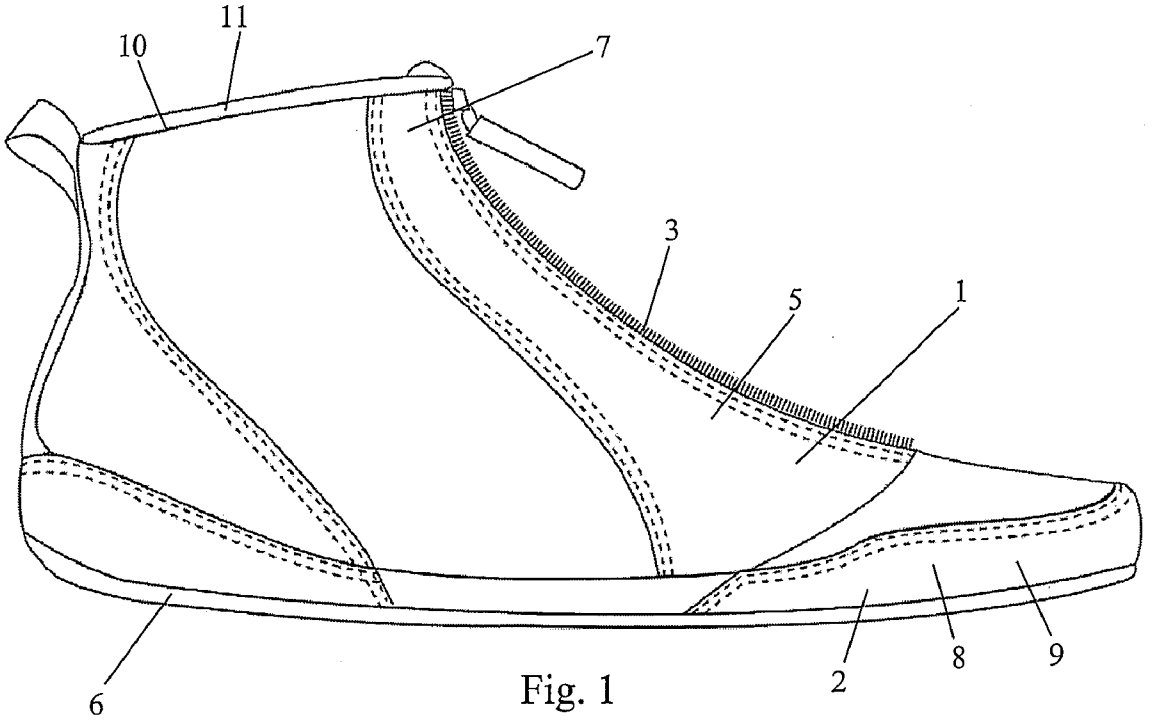


Fig. 1

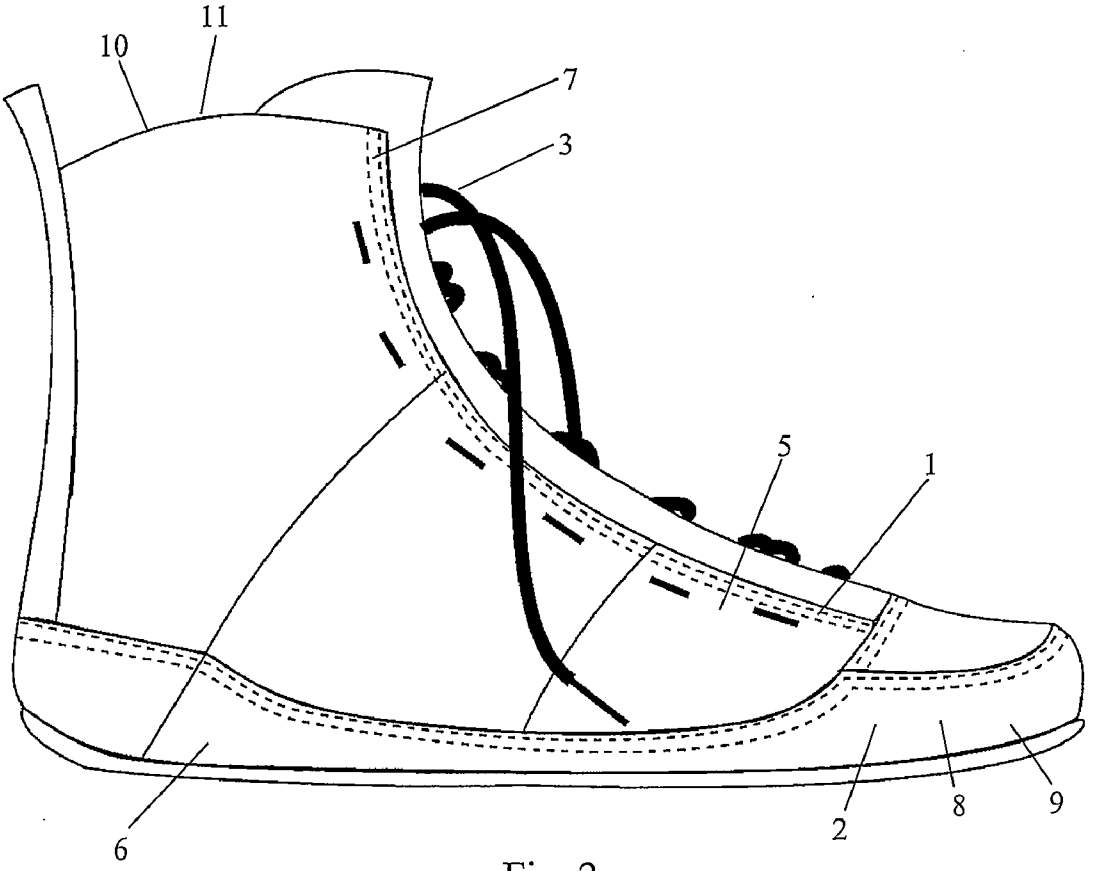


Fig. 2

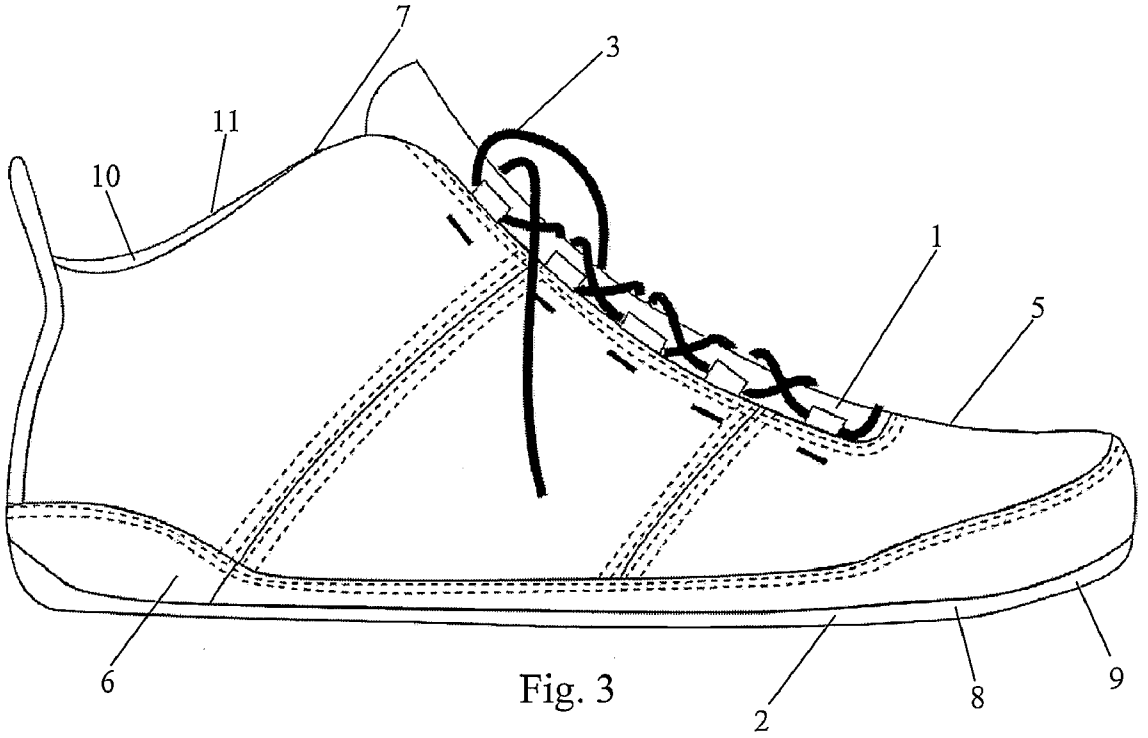


Fig. 3

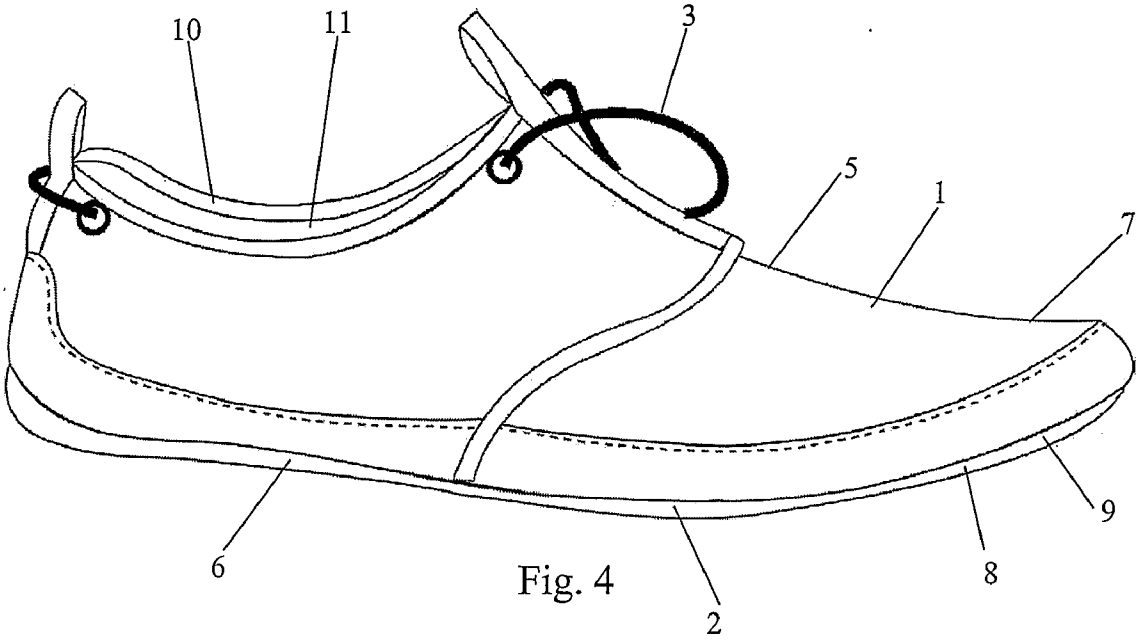


Fig. 4

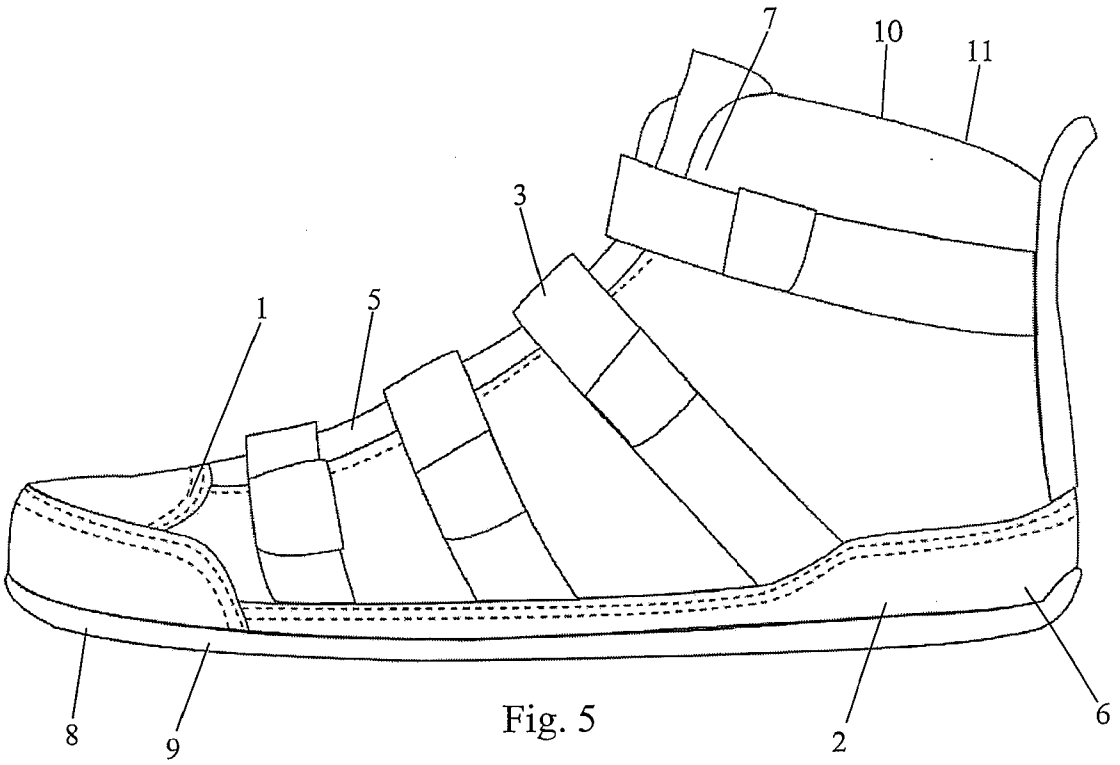


Fig. 5

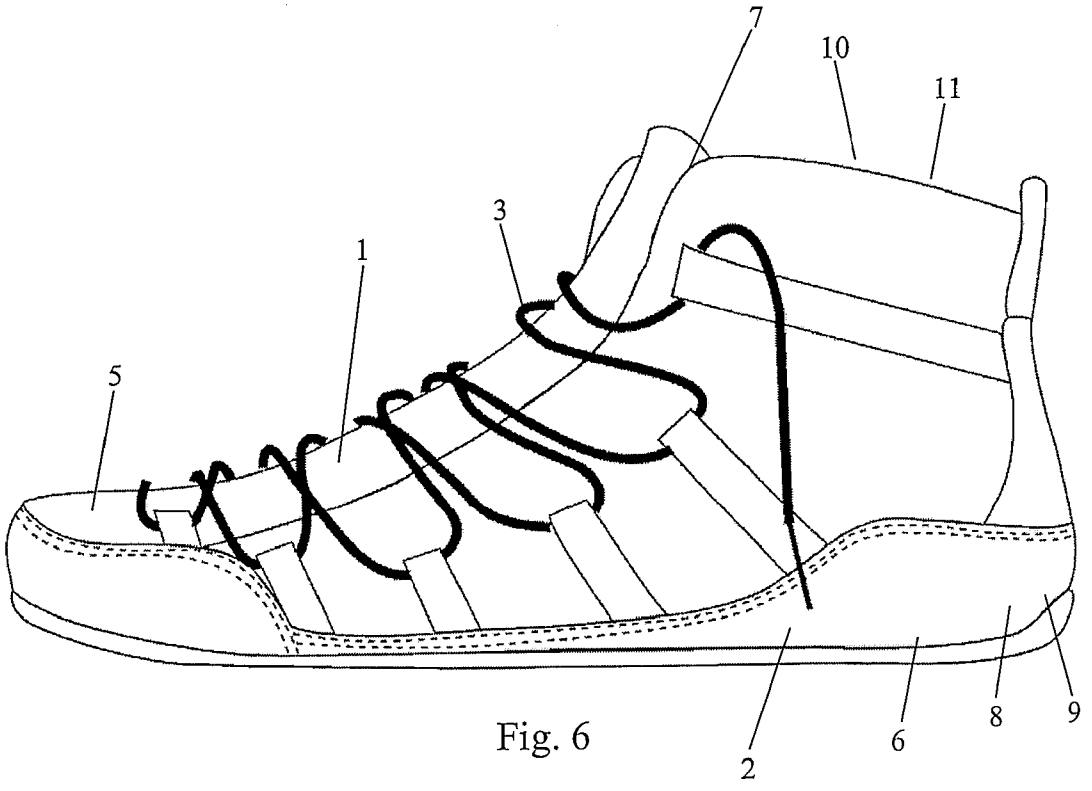


Fig. 6

FOOTWEAR PIECE

FIELD OF THE INVENTION

[0001] This invention relates to a footwear piece according to the preamble of claim **1**. More specifically, it relates to a light and soft fabric footwear piece intended and designed primarily for the outdoors, but, if needed, also for indoors, which is also elastic and which is comfortable to use also without a separate sock.

BACKGROUND OF THE INVENTION

[0002] There are generally available different types of footwear pieces for both outdoor and indoor use on the market.

[0003] Of footwear pieces for outdoor use, different types of footwear pieces for walking are known, which are generally made of relatively hard surface and sole materials. These footwear pieces are intended for use on the feet with socks, wherein sores, calluses or other consequences caused by the footwear are possibly avoided, but not nearly always. These types of footwear pieces for walking often require a long period of use, before they become comfortable for the user and mould to fit the user. These types of footwear pieces may additionally cause the user different types of muscle pain, etc.

[0004] Also found on the market are different types of footwear pieces for indoor use, which are generally made of softer surface and sole materials. These footwear pieces are not intended for outdoor use, as they do not withstand harsh outdoor wear or harsh outdoor conditions, such as dirt and moisture etc.

[0005] Further, different types of socks to be placed on the foot are known, which are mainly intended only for indoor use as well as use outdoors along with some type of outdoor footwear, but under no conditions alone outdoors.

[0006] General prior art is represented by reference publication U.S. Pat. No. 5,553,399, in which is presented a lightweight footwear piece, which is intended for providing the user with additional comfort as well as grip in relation to the ground.

[0007] Further known is i.a. "coverboot" type footwear protection solution, in which a light fabric protection is pulled over the footwear piece to be used. Also known are i.a. down slippers, which are used indoors to provide the user with additional comfort and warmth for the feet when the indoor area or floor is cold or the feet are otherwise cold.

SUMMARY OF THE INVENTION

[0008] The object of the invention is to obviate the disadvantages described above and to provide a footwear piece, which is like a combination of a footwear piece and socks and which can be used outdoors as well as indoors.

[0009] The footwear piece is soft and light to use on the foot and with it a "barefoot feeling" is achieved for its user. The footwear piece essentially moulds completely to the shapes of its user's foot and when using the footwear separate socks are not necessarily needed at all. This is a light and machine-washable as well as breathable footwear piece essentially sewn entirely of textile/fabric, sort of an "outdoor socks" or "gloves for the feet" with soft soles.

[0010] Ordinary hard-soled footwear pieces limit the movements of their user's foot and movement while walking. Ordinary footwear pieces prevent growth in the width of the foot at the ball of the foot when taking a step and they support the muscles of the sole of the foot and the toes too much, causing weakening of said muscles.

[0011] A soft-soled, light fabric footwear piece according to the invention enables moving and walking outdoors with a completely "barefooted feeling", but nevertheless provides protection to the skin of the sole of the foot.

[0012] Walking using this type of a soft-soled footwear piece according to the invention strengthens the soles of the feet and muscles of the foot sole and also essentially improves its user's balance, walking contact and also the health of the feet. These matters and advantages are particularly important to i.a. athletes and those interested in such activities, in which the foot is of particularly great significance. These types of sport activities are i.a. board sports, running sports, physical exercise in general and accuracy sports such as i.a. shooting etc.

[0013] One important user group for the footwear piece is diabetics, who often have weakened blood circulation as well as weakened sensation in their legs. For this reason, they cannot walk with entirely bare feet, because that would be dangerous due to the fact that they do not sense it if they step, for example, on some sharp object, such as a rock, glass etc. A footwear piece according to the invention provides an excellent aid to this type of problems and removes this problem.

[0014] For such a special user group, a footwear piece can comprise, but not necessarily, the elements for supporting the ankle of the user. A footwear piece of this type can comprise a supported shaft.

[0015] The purpose of a footwear piece according to this invention is to provide the user with such a "barefoot feeling" that it is as if the user had on no footwear piece at all, but rather something like a soft sock. For this reason, the footwear piece does not attempt to completely protect the sole of the foot by being completely or at least partially impenetrable, but would just slightly spread the pricks of unevenness produced by i.a. rocks, cones and other things on the ground over a larger area such that said pricking that is felt does not seem as great to the user as it would, for example, if walking barefoot.

[0016] More particularly, a footwear piece according to the invention is characterized in that which is presented in the characterizing part of the independent claim.

[0017] The dependent claims present additional features of the embodiments of a footwear piece according to the invention.

[0018] The invention is described in more detail in the accompanying claims. A footwear piece according to the invention has a sole, which is made of a second fabric material, which footwear piece is characterized in that the second fabric material comprises strong fibres.

[0019] At least a portion of said strong fibres of the second fabric material of the sole are preferably, but not necessarily, aramid fibres, para-aramid fibres, glass fibres, carbon fibres, polyethylene fibres, boron fibres, silicon carbide fibres, ceramic fibres or polyethylene fibres, or combinations of above-mentioned fibres.

[0020] At least a portion of said strong fibres of the second fabric material of the sole are preferably, but not necessarily, woven into the second fabric material.

[0021] The value according to standard DIN 53863 of the second fabric material of the sole of the footwear piece is preferably, but not necessarily, at least 5000.

[0022] A footwear piece according to the invention comprises preferably, but not necessarily, an upper, which is pref-

erably, but not necessarily, made at least partially from the first fabric material. The first fabric material of the footwear piece upper comprises preferably, but not necessarily, a water-repellent and breathable layer. The first fabric material of the footwear piece upper comprises preferably, but not necessarily, a water-repellent and breathable membrane. The water-repellent membrane is preferably, but not necessarily, a semi-permeable perforated membrane or semi-permeable porous membrane, which allows vaporized water to pass through the membrane but prevents water drops from passing through the membrane.

[0023] The footwear piece comprises preferably, but not necessarily, tightening means for tightening the footwear piece onto the foot. The tightening means can comprise a lace, button, zipper, tape and/or magnet. The tightening means can further comprise a tightening flap. The tightening flap is preferably, but not necessarily, made at least partially of a third fabric material, which comprises a synthetic polyurethane-based elastic textile.

[0024] The footwear piece further comprises preferably, but not necessarily, elements for supporting the ankle.

[0025] The first fabric material of the footwear piece's upper can comprise, for example, Heathcoat® mesh, Goretex®, Reimatec® fabric or some other comparable material. The first fabric material comprises preferably, but not necessarily, several material layers.

[0026] The second fabric material of the footwear piece's sole can comprise, for example, Kevlar®, polyurethane, Keprotec®, polyester, Twaron®, Technora®, Spectra®, Dyneema® or Cordura®, or some combination of these or a comparable type of hard and durable, but softly flexible fabric material. The second fabric material comprises preferably, but not necessarily, several material layers.

[0027] The third fabric material of a possible tightening flap of the footwear piece can for its part comprise, for example, Lycra® or some comparable material. The third fabric material comprises preferably, but not necessarily, several material layers.

[0028] Of the above-mentioned materials, the manufacturer of Goretex® is W.L. Gore & Associates, the manufacturer of Reimatec® is Reima Oy, the manufacturer of Kevlar® is DuPont Company, the manufacturer of Keprotec® is Schoeller, the manufacturer of Twaron® is Akzo, the manufacturer of Technora® is Teijin, the manufacturer of Spectra® is Allied-Signal Corporation, the manufacturer of Dyneema® is DSM and the manufacturer of Cordura® as well as Lycra® is INVISTA.

BRIEF DESCRIPTION OF THE DRAWING

[0029] In the following, the invention and its preferred embodiments are described in detail with reference, in a way of an example, to the accompanying figures, in which

[0030] FIG. **1** shows a side profile of a first preferred embodiment of a footwear piece according to the invention,

[0031] FIG. **2** shows a side profile of a second preferred embodiment of a footwear piece according to the invention,

[0032] FIG. **3** shows a side profile of a third preferred embodiment of a footwear piece according to the invention,

[0033] FIG. **4** shows a side profile of a fourth preferred embodiment of a footwear piece according to the invention,

[0034] FIG. **5** shows a side profile of a fifth preferred embodiment of a footwear piece according to the invention, and

[0035] FIG. **6** shows a side profile of a sixth preferred embodiment of a footwear piece according to the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0036] The footwear piece shown in the figures comprises an upper **1** made of a first fabric material **5**, a sole **2**, which is made of a second fabric material **6**, tightening means **3** as well as a tightening flap **4**.

[0037] The sole **2** of the footwear piece is preferably, but not necessarily, sized and moulded such that the sole **2** of the footwear piece is connected to the upper **1** of the footwear piece essentially at the ground contact level of the footwear piece or at the height of the ground contact area of the footwear piece.

[0038] The sole **2** of the footwear piece is preferably, but not necessarily, joined by sewing to the upper **1** of the footwear piece. The sewing seam between the sole **2** and the upper **1** comprises preferably, but not necessarily, a taping of the seam.

[0039] The footwear piece comprises preferably, but not necessarily, an edge-strengthening portion **8** between the upper **1** and the sole **2**.

[0040] If the footwear piece comprises an edge-strengthening portion **8** between the upper **1** and the sole **2**, the sole **2** of the footwear piece is preferably, but not necessarily, sized and moulded such that the sole **2** of the footwear piece is connected to the edge-strengthening portion **8** essentially at the ground contact level of the footwear piece or at the height of the ground contact area of the footwear piece.

[0041] If the footwear piece comprises an edge-strengthening portion **8** between the upper **1** and the sole **2**, the sole of the footwear piece **2** is preferably, but not necessarily, joined by sewing to the edge-strengthening portion **8** of the footwear piece. The sewing seam between the sole **2** and the edge-strengthening portion **8** comprises preferably, but not necessarily, a taping of the seam.

[0042] If the footwear piece comprises an edge-strengthening portion **8** between the upper **1** and the sole **2**, the upper **1** of the footwear piece is preferably, but not necessarily, joined by sewing to the edge-strengthening portion **8** of the footwear piece. The sewing seam between the upper **1** and the edge-strengthening portion **8** comprises preferably, but not necessarily, a taping of the seam.

[0043] The edge-strengthening portion **8** of the footwear piece is preferably, but not necessarily, made of a fourth fabric material **9**.

[0044] The figures show a footwear piece having an upper **1** made of a first fabric material **5**, a sole **2**, which is made of a second fabric material **6**, which second fabric material **6** comprises strong fibres (not shown).

[0045] The stiffness of the second fabric material **6** is preferably such that the sole **2** is fitted to at least partially follow the movements and shape of the sole of the foot in different positions of the sole of the foot.

[0046] At least a portion of said strong fibres are preferably, but not necessarily, aramid fibres, para-aramid fibres, glass fibres, carbon fibres, polyethylene fibres, boron fibres, silicon carbide fibres, ceramic fibres or polyethylene fibres, or different combinations of above-mentioned fibres.

[0047] At least a portion of said strong fibres of the second fabric material **6** is preferably, but not necessarily, woven into the second fabric material **6**.

[0048] In the footwear piece, the value according to standard DIN 53863 of the second fabric material **6** is preferably,

but not necessarily, at least 5000, more preferably at least 6000 and most preferably at least 10000.

[0049] In the footwear piece, the first fabric material **5** comprises preferably, but not necessarily, a water-repellent and breathable layer.

[0050] In the footwear piece, the first fabric material **5** comprises preferably, but not necessarily, a water-repellent and breathable membrane. The water-repellent membrane is preferably, but not necessarily, a semi-permeable perforated membrane or semi-permeable porous membrane, which allows vaporized water to pass through the membrane but prevents water drops from passing through the membrane.

[0051] The footwear piece shown in the figures comprises the tightening means **3** for tightening the footwear piece onto the foot.

[0052] The purpose of the tightening means **3** can additionally or alternatively be to increase or decrease the size of the opening (**11**) leading to the interior area (**10**) of the footwear piece. By the interior area of the footwear piece is meant, in this connection, the area formed by the footwear piece, in which the foot of the user is at least partially located when the user has placed the footwear piece on the foot. By the opening is meant, in this connection, the opening, which leads from outside the footwear piece into said interior area of the footwear piece and through which the user of the footwear piece puts his foot when placing the footwear piece on his/her foot.

[0053] The purpose of the tightening means **3** can additionally or alternatively be to increase or decrease the size of the interior area of the footwear piece at least partially in an inflexible manner and/or to change the shape of the interior area of the footwear piece at least partially in an inflexible manner. The tightening means **3** then allow that the user can himself, using the tightening means, mould the shape of the interior area of the footwear piece to suit his/her foot.

[0054] In the footwear piece shown in the figure, the tightening means **3** comprise a lace, button, zipper, tape and/or magnet.

[0055] In the footwear piece shown in the figure, the tightening means **3** comprise a tightening flap **4**.

[0056] In the footwear piece, the tightening flap **4** comprises preferably, but not necessarily, a third fabric material **7**, which comprises a synthetic polyurethane-based elastic textile.

[0057] The footwear piece further comprises, but not necessarily, the elements for supporting the ankle.

[0058] The first fabric material **5** of the footwear piece can comprise, for example, Heathcoat® mesh, Goretex®, Reimatec® fabric or some comparable material.

[0059] The sole of the footwear piece, i.e. the second fabric material **6**, can comprise, for example, Kevlar®, polyurethane, Keprotec®, polyester, Twaron®, Technora®, Spectra®, Dyneema® or Cordura®, or some combination of these or a comparable type of hard and durable, but softly flexible fabric material.

[0060] The above-mentioned second fabric material can comprise, for example, Keprotec® article no 13627, produced by Schoeller, which material comprises approximately 14% PU, approximately 22% AR (Kevlar®) and approximately 64% PA and the standard DIN 53863 value of which is approximately 24000.

[0061] Further, the second fabric material can be, for example, Keprotec® article no 1308, produced by Schoeller, which material comprises approximately 18% AR (Kevlar®), approximately 26% PU and approximately 56% PA and the standard DIN 53863 value of which is approximately 10000.

[0062] Further, the second fabric material can comprise, for example, Keprotec® article no 6500, produced by Schoeller, which material comprises approximately 8% EL, approximately 18% PU, approximately 33% AR (Kevlar®) and 41% PA and the standard DIN 53863 value of which is approximately 15000.

[0063] The second fabric material can alternatively be Keprotec® article no 1318, produced by Schoeller, which material comprises 30% PA, 25% AR (Kevlar®), 40% PU and 5% Lycra®.

[0064] The third fabric material **7** of the footwear piece can for its part comprise, for example, Lycra® or some comparable material. As the third material **7**, for example, neoprene can also be used, which can have different fabrics. Further, as the fabric material can be, for example, spacer, canvas and leather, or a combination of all of the above. As the fabric material can additionally be, for example, Keprotec, plastic, PVC, PU, PU-coated leather, leather and TPU.

[0065] It is also possible that the second fabric material **6** is formed of several layers, and that one layer is made, for example, such that it is woven out of strong fibres.

[0066] It is also possible that the second fabric material **6** is formed of several layers, and that one layer has a material, which has strong fibres, for example, woven into the material.

[0067] The footwear piece can, if needed, be equipped with different types of symbols, i.e. logos and/or embroideries.

[0068] To a person skilled in the art, it is clear that the above-mentioned embodiments can be adapted and/or modified without departing from the solution according to the invention, which is defined in the accompanying claims.

[0069] The invention and its embodiments are not limited to only the examples and materials presented above, rather many variations are possible within the scope of the claims.

1.-17. (canceled)

18. A footwear piece comprising a sole made of a second fabric material, wherein the second fabric material comprises strong fibers.

19. The footwear piece of claim **18**, wherein at least a portion of the strong fibers includes aramid fibers, para-aramid fibers, glass fibers, carbon fibers, polyethylene fibers, boron fibers, silicon carbide fibers, ceramic fibers, polyamide fibers, or polyethylene fibers.

20. The footwear piece of claim **18**, wherein at least a portion of the strong fibers are woven into the second fabric material.

21. The footwear piece of claim **18**, wherein a value according to standard DIN 53863 of the second fabric material is at least 5000.

22. The footwear piece of claim **18**, wherein the second fabric material comprises plural material layers.

23. The footwear piece of claim **18**, further comprising an upper, which is at least partially made of a first fabric material.

24. The footwear piece of claim **23**, wherein the first fabric material comprises plural material layers.

25. The footwear piece of claim **23**, wherein the first fabric material comprises a water-repellent and breathable layer or membrane.

26. The footwear piece of claim **26**, further comprising an edge-strengthening portion between the sole and the upper.

27. The footwear piece of claim **26**, wherein the edge-strengthening portion is made of a fourth fabric material.

28. The footwear piece of claim **27**, wherein the fourth fabric material comprises plural material layers.

29. The footwear piece of claim **18**, further comprising a tightening means for tightening the footwear piece onto a user's foot and for adjusting a shape of an interior area of the footwear piece to suit the user's foot.

30. The footwear piece of claim **29**, wherein the tightening means comprises at least one of a lace, button, zipper, tape, and magnet.

31. The footwear piece of claim **29**, wherein the tightening means comprises a tightening flap.

32. The footwear piece of claim **31**, wherein the tightening flap is at least partially made of a third fabric material, which comprises a synthetic polyurethane-based elastic textile.

33. The footwear piece of claim **32**, wherein the third fabric material comprises plural fabric layers.

34. The footwear piece of claim **18**, further comprising elements for supporting a user's ankle.

* * * * *