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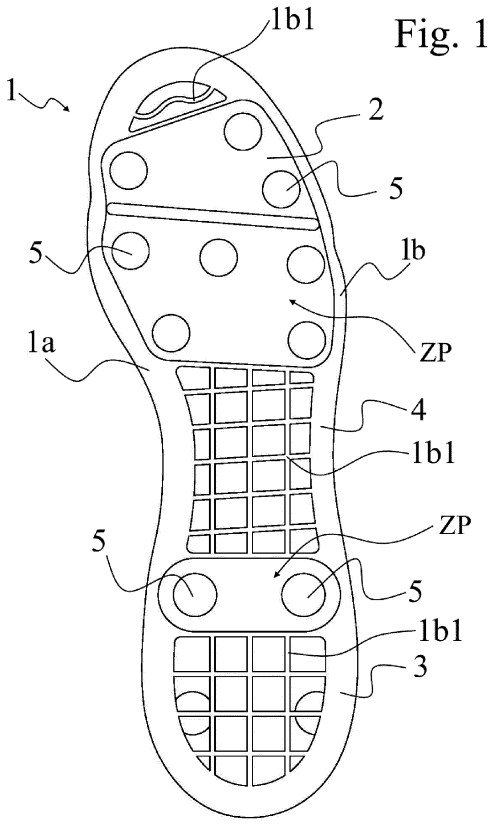
(54) **SOLE FOR SPORTS FOOTWEAR**

(57) A sole for footwear, in particular a sole for a sports footwear, as well as a footwear comprising such a sole and a method of obtaining the same.

Fig. 1



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Description

TECHNICAL FIELD OF THE INVENTION

[0001] The present invention relates to a sole for footwear, as well as a footwear comprising such a sole and a method of obtaining the same.

[0002] More particularly, the present invention relates to a sole suitable to be used for the realization of a sports footwear.

STATE OF THE ART

[0003] In the sector of footwear production or, more particularly, in the sector of soles for sports footwear, soles made of various materials are known.

[0004] For example, in the case of football sports, soles with cleats made entirely of thermoplastic polyurethane (TPU) are known. As is known, this material has a high stiffness, which in the course of sporting activity results in high stresses on the legs or joints of the user.

[0005] Furthermore, a sole used for the sporting activity of football is not necessarily suitable for use in another sport, for example for the sporting activity of cycling or running in natural outdoor environments ("trail running"). Each discipline, in fact, determines stresses in different portions of the user's legs or joints and also requires footwear with different characteristics for the different performances to be performed.

[0006] Furthermore, the realization of these soles entirely by means of a single material, or even with different materials, but through molding methods that permanently connect the possible layers or elements of the sole, considerably limits the range of possible use also in the scope of the same sport, and therefore versatility. For example, a shoe for football activity on wet and muddy ground requires a sole with cleats having a different stiffness and grip compared to a shoe for football activity on hard synthetic terrain.

[0007] Another parameter to consider is the shape of the cleats, which must also vary based on the type of terrain on which the sole is used.

[0008] Obviously these parameters vary even more considerably when the same shoe can be used for different sports activities or in variable environmental conditions.

[0009] Very often, referring to a sole for footwear suitable, for example, for football activities, a sole made of rigid material with cleats made of soft material is required, to best alleviate the stresses that are transmitted to the leg or joints of the user. However, when trying to join, for example by means of co-molding techniques, a sole made of a certain rigid material with cleats made of a soft material, the two parts struggle to stay firmly connected to each other, especially if subjected to stresses and friction with the ground.

[0010] Furthermore, even if the hard and soft material are of the same nature, for example hard TPU and soft TPU, despite their co-molding is possible, it is not possible to obtain the same grip and the same durability given by different materials, such as rubber. In addition, the aesthetic appearance of a sole, and more generally of a shoe, is nowadays more and more a key factor for the purchase by a possible buyer.

[0011] Often, one of the main reasons that alienate the buyer from buying a particular shoe, even though it has the desired technical characteristics, is precisely the aesthetic value that does not meet the user's taste and the low level of customization allowed.

[0012] For these reasons, it is increasingly necessary to produce a sole and consequently a footwear comprising such a sole, which allows to overcome the disadvantages described above.

OBJECTS OF THE INVENTION

[0013] The main object of the present invention is therefore to provide a sole for footwear, in particular a sole for sports footwear, which is capable of improving the state of the prior art.

[0014] Another object of the present invention is to provide a sole for footwear that has a high degree of versatility and which can therefore be used for multiple sports activities or in different or variable conditions within the same sporting discipline.

[0015] Another object of the present invention is to provide a sole for footwear suitable for alleviating as much as possible the stresses transmitted to the leg or joints of the user.

[0016] Yet another object of the present invention is to provide a sole for footwear which is easy to manufacture and at competitive costs.

[0017] Still another object of the present invention is to provide a sole for footwear which has a high level of customization.

[0018] Not least object of the present invention is to provide a footwear provided with a sole according to the present invention.

[0019] Yet another object of the present invention is to provide a method for manufacturing a sole for footwear which is simple and of low cost.

[0020] This and other objects are achieved by a sole for footwear according to the attached claim 1, by a footwear according to the attached claim 16 and by a method for obtaining such a sole according to the attached claim 18.

[0021] Further advantageous features of the present invention are described in the dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] Further characteristics and advantages of the present invention will become more evident from the detailed description of some preferred embodiments of a sole according to the present invention, given by way of non-limiting example in the accompanying drawings, in

which:

- figure 1 is a top view of a sole for footwear according to an embodiment of the present invention;
- figure 2 is a top view of a pair of elements of the sole for footwear according to an embodiment of the present invention;
- figure 3 is another top view of a sole for footwear according to the present invention comprising the sole of figure 1 and the elements of figure 2 in an assembled version;
- figure 4 is a bottom view of the sole for footwear of figure 1;
- figure 5 is a bottom view of the elements of the sole for footwear of figure 2;
- figure 6 is a bottom view of a sole for footwear comprising the sole of figure 4 with the elements of figure 5 in an assembled version;
- figures 7a and 7b are respectively a perspective view and a side view of the elements of the sole for footwear according to an embodiment of the present invention;
- figure 8 is a perspective view of a footwear comprising a sole according to an embodiment of the present invention.

[0023] In the accompanying drawings, identical or similar parts or components are indicated with the same reference number.

EMBODIMENTS OF THE INVENTION

[0024] With reference to the attached figures, it will be noted that a sole for footwear according to the present invention is generally indicated with the reference number 1.

[0025] As it will be possible to ascertain, the sole for footwear 1 according to the present invention is particularly suitable for sports use, for example for outdoor soccer activities, or in open environments, but also for indoor ones, or in closed environments, as well as for cycling, for running, for example for trail running, or running in natural outdoor environments, but also for running on the track or running in general, for skiing, for tennis, or for sports in general.

[0026] Therefore, the sole 1 is a sole for a sports footwear.

[0027] The sole for footwear 1 according to the present invention comprises at least one body 1a and at least one insertable element 10.

[0028] The at least one element 10 can be constrain, in a removable way or not, to the at least one body 1a.

[0029] As regards the at least one body 1a, it has an upper surface 1b intended, in use, to come into contact with the user's foot and/or with a midsole or insole, and a lower surface 1c intended, in use, to come into contact at least partially with the external environment or with the ground. The sole 1 and/or said surfaces 1b, 1c each comprise at least a front portion or area of the forefoot 2, at least a rear portion or area of the rearfoot 3 and at least an intermediate portion or area of the midfoot 4, which connects the front portion 2 with the rear portion 3.

[0030] The direction determined by the front portion or the area of the forefoot 2 and the rear portion or the area of the rearfoot 3 is a substantially longitudinal direction of the sole 1.

[0031] A transverse direction of the sole 1 is substantially perpendicular to the longitudinal direction and/or extends from the internal side in use to the external side in use of the sole 1 and/or of the footwear equipped with the sole 1 according to the present invention.

[0032] The body 1a determines the frame of the sole 1 and/or its structural part, in the sense that it is the part of the sole 1 that supports the user's weight and gives it rigidity and structure.

[0033] The sole 1 and/or the body 1a, at least at the front portion or area of the forefoot 2 and/or the rear portion or area of the rearfoot 3, comprises at least one through opening 5 or a plurality of through openings 5.

[0034] The body 1a has a certain thickness S. The thickness determines for example the distance between the upper surface 1b and the lower surface 1c.

[0035] The at least one through opening 5 crosses the thickness of the sole 1, extending in fact from the upper surface 1b to the lower surface 1c.

[0036] The at least one element 10 can be inserted in at least one through opening 5.

[0037] In the embodiment of the present invention shown in figure 1, the sole 1 in the front portion or area of the forefoot 2 has eight through openings 5 while in the rear portion or area of the rearfoot 3 has two through openings 5.

[0038] According to further variants of the sole according to the present invention (not shown in the figures), further combinations can be provided having more or less through openings 5 in the front portion or area of the forefoot 2 and more or less through openings 5 in the rear portion or area of the rearfoot 3, depending on your needs.

[0039] In the same way, further through openings can also be provided at the intermediate portion or area of the midfoot 4, if it is useful for the type of footwear on which the sole 1 is applied, for example for attaching a pedal to the sole 1 of a shoe suitable for cycling.

[0040] In the embodiment shown in figure 4, the through openings 5 of said portions or areas 2, 3 have a substantially circular shape, having a diameter between about 5 mm and about 15 mm. In particular, the through openings 5 present in the rear portion or area of the rearfoot 3 may have a slightly larger diameter than the through openings present in the front portion or area of the forefoot 2, for example greater than about 0.2 mm.

[0041] Clearly, according to the needs and the type of use of the sole for footwear 1, the opposite could also be provided, i.e. a front portion or area of the forefoot 2 having through openings 5 with a slightly larger diameter

than the through openings 5 present in the rear portion or area of the rearfoot 3, or also through openings 5 of equal size in both portions 2, 3.

[0042] Of course, in other embodiments of the present invention through openings of different shapes can be provided, for example rectangular, square, triangular, arched or C-shaped, L-shaped, irregularly shaped, etc.

[0043] The at least one opening 5 is positioned, according to a version of the invention, at at least part of the perimeter of the sole 1 and/or of the body 1a. In particular, the at least one opening 5 is positioned at the inner side and/or the outer side of the sole 1 in the front portion or area of the forefoot 2 and/or in the rear portion or area of the rearfoot 3.

[0044] According to a version of the invention, the through openings 5 are arranged according to an arch for example extending along at least part of the perimeter of the sole 1 and/or of the body 1a. In particular, when the openings 5 are arranged according to an arch placed at the external side of the sole, this arch has a concavity facing the internal side of said sole 1, and/or vice versa.

[0045] The at least one through opening 5 or the plurality of through openings 5 can also be provided in the middle or in a central position with respect to the perimeter through openings 5 positioned at the internal side and those positioned at the external side of the sole 1 in the front portion or area of the forefoot 2 and/or in the rear portion or area of the rearfoot 3.

[0046] As regards the at least one insertable element 10, it comprises a body having a substantially sheet-like conformation equipped with an upper surface 10a, a lower surface 10b and a thickness 10c.

[0047] The upper surface 10a is in use facing the user's foot and/or the midsole or insole of the shoe while the lower surface 10b is in use facing the body 1a of the sole 1.

[0048] In at least one version of the invention, the lower sole 10b of the at least one insertable element 10 is in contact, in use, with the upper surface 1b of the body 1a.

[0049] The insertable element 10 also comprises at least one cleat 11 or a plurality of cleats 11.

[0050] The at least one cleat 11 is associated with the lower surface 10b or better departs from the latter.

[0051] In one version of the invention, the substantially sheet-like body of the at least one insertable element 10 and the at least one cleat 11 are made in one piece, and/or constitute a single body.

[0052] In one version of the invention, the upper surface 10a can comprise hardening ribs 10a1 mainly used to give greater rigidity to said insertable element 10 or better to its body having a substantially sheet-like conformation.

[0053] The number of cleats 11 of the at least one insertable element 10 varies according to the number of through openings 5, since each cleat 11 is inserted in use in a respective through opening 5 of the sole 1.

[0054] For example, in the non-limiting embodiment of the present invention shown in the figures, in which in the front portion or area of the forefoot 2 there are eight through openings 5, the insertable element 10 - to be positioned in that specific front portion or area of the forefoot 2 - comprises eight cleats 11 which depart from its lower surface 10b, positioned according to the same arrangement as the through openings 5 present on said front portion or area of the forefoot 2. In fact, each cleat 11 is inserted in use in a respective through opening 5.

[0055] Typically, in at least one version of the invention, the at least one insertable element 10 is not used in the intermediate portion or area of the midfoot 4 of the sole 1 because, during ordinary walking of the foot or during the practice of common sports disciplines which include the run of the user, said intermediate portion or area of the midfoot 4 does not come into contact with the ground and therefore does not need to cushion any stresses.

[0056] Similarly, in the non-limiting embodiment of the present invention shown in the figures, in which in the rear portion or area of the rearfoot 3 there are two through openings 5, the respective insertable element 10 - to be positioned in that specific rear portion or area of the rearfoot 3 - comprises two cleats 11 which depart from its lower surface 10b, positioned according to the same arrangement as the through openings 5 present on said rear portion or area of the rearfoot 3.

[0057] As well as for the number and arrangement, the shape of said cleats 11 also varies according to the shape of the through openings 5.

[0058] For example, when the at least one through opening 5 has a substantially circular shape, the respective cleat 11 will have a shape in plan or section which is also substantially circular or in any case having a size such as to be able to be inserted in the respective through opening 5 and from do not come out accidentally.

[0059] According to a version of the invention, the cleats 11 have at least a first end 11c constrained to the body of the insertable element 10 having a substantially sheet-like conformation, or better to its lower surface 10b, as well as at least a second distal end 11d from the body of the element insertable 10 able to come into contact with the ground. The second distal end 11d is opposite to the first end 11c of the body having a substantially sheet-like conformation of the insertable element 10.

[0060] In practice, the second distal end 11d is a free end while the first end 11c is a constrained end of the insertable element 10.

[0061] In one version of the invention, the second distal end 11d has a section which, preferably, is smaller than the section of the first end 11c so as to facilitate the entry of each cleat 11 into the respective through opening 5. By way of non-limiting example, the section of the at least one second end 11d can be smaller than the section of the first end 11c by an interval comprised between about 0.5 mm and about 2 mm, for example 1 mm.

[0062] Again, by way of non-limiting example, the cleats 11 can have a height between about 3 mm and about 25 mm, for example 13 mm.

[0063] In the case illustrated in figures 7a and 7b, the

cleats have a truncated cone shape, therefore having a circular section. Of course, other sections of the cleats 11 can also be provided, for example square, rectangular, triangular, polygonal, pentagonal, hexagonal, octagonal, trapezoidal, irregular, etc.

[0064] Similarly, the cleats 11 can also have other three-dimensional conformations, namely cylindrical, truncated pyramid, cube, parallelepiped, pentagonal or hexagonal or octagonal based prism, irregular, tubular, etc.

[0065] Advantageously, said cleats 11 can be, according to requirements, full and/or partially full and/or internally empty or hollow.

[0066] In the case in which the cleats are internally empty or hollow, they have a first surface or side wall and a second surface or base wall as well as an internal cavity which can have a respective opening at the upper surface 10a of the body having a substantially sheet-like configuration of the at least one insertable element 10 or it can be closed by this body and therefore have no opening on the body itself.

[0067] This therefore allows the flexibility of the cleats 11 to be varied, thus allowing a high level of customization of the sole 1 which can be adapted for use in various sports activities.

[0068] By way of non-limiting example, using internally empty or hollow cleats 11 will result in a more flexible cleat 11 and therefore a sole 1 particularly suitable for sports such as for example running; using instead full and/or partially full cleats 11, a less flexible cleat 11 will be obtained and therefore a sole 1 particularly suitable for sports activities such as football.

[0069] As regards the composition of the at least one insertable element 10, it is preferably made of rubber, however other materials can also be provided having a greater softness and/or flexibility with respect to the material with which the body 1a of the sole 1 is made, for example soft TPU, a foam material, polyurethane foam, ethylene vinyl acetate (EVA), various rubber compounds or the like.

[0070] Furthermore, said at least one insertable element 10 can be made in any color as desired, the same or different with respect to the color of the body 1a of the sole 1.

[0071] For example, in the event that two insertable elements 10 were provided, it would be possible to create one with a color and the other of a different color, being able to create various different combinations also depending on the color chosen for the realization of the body 1a of the sole 1.

[0072] In addition, it is also possible to customize the brilliance of at least one insertable element 10 by creating a glossy or opaque insertable element 10 on the basis of the material used for its realization or by means of specific manufacturing processes. For example, in the case in which the lower surface 1c of the body 1a is glossy, the realization of one or more opaque insertable elements 10 could create a particular visual effect.

[0073] All this clearly allows, in addition to an aesthetic improvement of the sole 1, also a high degree of customization of the same by the user.

[0074] Advantageously, one or more stiffening ribs 1b1 used to give greater strength and rigidity to the body 1a of the sole 1 can be provided at the rear portion or area of the rearfoot 3 and/or at the intermediate portion or area of the midfoot 4 and/or at the front portion or area of the forefoot 2 of said upper surface 1b.

[0075] According to the non-limiting embodiment of the invention shown in figure 1, several stiffening ribs 1b1 are provided in the rear portion or area of the rearfoot 3 and in the intermediate portion or area of the midfoot 4 positioned so as to substantially form a lattice, therefore with each rib 1b1 mutually perpendicular to the others.

[0076] In at least one version of the invention, a single stiffening rib 1b1 is provided in the front portion or area of the forefoot 2.

[0077] Conveniently, the sole 1 and/or the body 1a may present, in one version of the invention, at least one area ZP at at least one through opening 5 or at the plurality of through openings 5.

[0078] Such at least one area ZP can be provided at the front portion or area of the forefoot 2 (for example first area ZP) and/or in the rear portion or area of the rearfoot 3 (for example second area ZP) and/or in the intermediate portion or area of the midfoot 4 (for example third area ZP).

[0079] This area ZP is a positioning area, if desired recessed, for the at least one insertable element 10.

[0080] Advantageously, the shape of said positioning area ZP, when recessed, is substantially complementary to the shape of the insertable element 10 which is suitable for housing.

[0081] In particular, in the version illustrated in the attached figures, the area ZP present in the front portion or area of the forefoot 2 has an approximately trapezoidal conformation with a shaping that substantially follows the internal and external sides of the sole 1 in the front portion or area of the forefoot 2. The area ZP present in the rear portion or area of the rearfoot 3, on the other hand, has a substantially elliptical conformation.

[0082] The sole 1 and/or the body 1a has a thickness which can be comprised between about 1 mm and about 15 mm, for example about 2.5 mm.

[0083] Said thickness can vary along the profile of said body 1a, for this reason it is possible to have a greater thickness of the body 1a in the rear portion or area of the rearfoot 3, for example in an interval between 0.5 mm and 2.5 mm, with respect to the intermediate portion or area of the midfoot 4 and/or to the front portion or area of the forefoot 2 of said body 1a.

[0084] As regards the composition of the body 1a of the sole 1, it is preferably made of thermoplastic polyurethane (TPU) but could also be made of any other material suitable for the purpose, for example in fiberglass, carbon, rubber, other types of polyurethane or ethylene vinyl acetate (EVA).

[0085] Conveniently, in other versions of the invention, embodiments of the body 1a can also be provided in other rigid materials, for example rubber, rigid rubber, or a composite material with carbon fibers or the like.

[0086] In any case, the main requirement for the realization of the body 1a is the rigidity that it confers on the sole 1, therefore any material suitable for obtaining a good level of rigidity can be used for the realization of said body 1a.

[0087] In one version of the invention, the sole 1 and/or the body 1a can have, at the lower surface 1c of the body 1a, for example at the rear portion or area of the rearfoot 3, at least one secondary cleat 6 or secondary cleats 6 made integrally with the body 1a of the sole 1, and therefore fixed thereto in an immovable way. This version of the invention is particularly suitable for football as the rear portion or area of the rearfoot 3 is particularly stressed in football.

[0088] Clearly, other variants of the invention can be envisaged, for example at least one secondary cleat 6 or secondary cleats 6 made integrally with the body 1a of the sole 1 in the front portion or area of the forefoot 2. This version of the invention is particularly suitable in case of the sporting activity of running in natural environments.

[0089] The at least one secondary cleat 6 extends away from the lower surface 1c, i.e. protrudes from it in a direction substantially perpendicular to the latter.

[0090] These secondary cleats 6 can be made of the same material used to make the body 1a of the sole 1 and can be full and/or partially full and/or internally empty or hollow, according to the needs and the desired degree of rigidity.

[0091] In the non-limiting embodiment of the present invention shown in the figures, the secondary cleats 6 have a substantially frusto-conical shape, however other shapes can also be provided, for example with a triangular, rectangular, polygonal section, having a cylindrical, arched, frusto-conical or frusto-pyramidal, prismatic shape, having an irregular shape, etc.

[0092] As regards the lower surface 1c of the body 1a of said sole 1, it can be of any color as desired and, moreover, it can be treated, by means of a suitable manufacturing process, so that it has a certain aesthetic effect, for example a surface lower 1c glossy, satin or matte.

[0093] In addition, said lower surface 1c may have shapes and/or grooves and/or elevations suitable to improve the aesthetic appearance of the sole 1 and/or to stiffen its structure.

[0094] The sole 1 in its final and complete version provides that the at least one insertable element 10 is positioned in the positioning area ZP of the respective portion or area of the body 1a, with the cleats 11 inserted in the respective openings 5 and the body having a substantially sheet-like conformation of the at least one insertable element 10 in contact with the upper surface of the sole 1.

[0095] Depending on whether the positioning area ZP is recessed or not, the at least one insertable element 10 can be respectively flush or not flush with the upper surface 1b of the sole 1.

[0096] In particular, in one version of the invention, when the positioning area ZP is recessed, the depth of recess of this zone may or may not correspond to the thickness of the body having a substantially sheet-like conformation of the insertable element 10. When the thickness of this body corresponds to the recess depth of the area ZP, the insertable element 10 is flush with the sole 1 and/or with the body 1a and/or with the upper surface 1b.

[0097] If the area ZP is not recessed or if its depth of recess is different with respect to the thickness of the body having a substantially sheet-like conformation of the insertable element 10, the latter will not be flush with the sole 1 and/or with the body 1a and/or with the upper surface 1b.

[0098] As already mentioned, being the arrangement of the cleats 11 of the at least one insertable element 10 substantially comparable to the arrangement of the through openings 5 present in the positioning area ZP of the respective portion or area 2, 3, 4 of the body 1a, the at least one element insertable 10 is mechanically constrained to said body 1a.

[0099] In particular, in at least one version of the invention, each cleat 11 of the at least one insertable element 10 can have at least one groove 11b, if desired an annular groove, at the end of the cleat 11 constrained to the body having a substantially sheet-like conformation of the at least one insertable element 10.

[0100] By way of non-limiting example, the groove 11b can have a height between about 1 mm and about 5 mm, for example 2 mm and a depth between about 0.1 mm and about 10 mm, for example about 2.5 mm.

[0101] This at least one groove 11b is mainly used to facilitate the mechanical constraint by interlocking between the cleat 11 and opening 5 respectively. In this case, the height of the groove 11b corresponds to the thickness S of the body 1a in that determined position, in fact, the perimeter of the through opening 5, determined in the body 1a, fits into the respective groove 11b of the cleat 11 of the insertable element 10, determining a (removable) constraint between the insertable element 10 - or better between its cleat 11 - and the body 1a.

[0102] In fact, the through opening 5 has a cross section substantially corresponding to (or only slightly greater than) that of the cleat 11 at the groove 11b, while the portion 11a of the cleat 11, adjacent and placed on the opposite band with respect to the groove 11b, has a cross section greater or slightly greater than that of the opening 5 so as to determine the aforementioned interlocking.

[0103] The portion 11a of the cleat 11 can have various shapes which can vary on the basis of the geometric shape chosen for the construction of the cleat 11, for example in the variant of the present invention shown in figure 7, the portion 11a of the cleat 11 has a substantially frusto-conical shape, however, in other variants of the invention, for example in the case in which the cleat 11

is made substantially in the shape of a prism with a trapezoidal base, the portion 11a of the cleat 11 will also have the shape of a prism with a trapezoidal base.

[0104] In one version of the invention, the groove 11b is positioned substantially at the first end 11c of the cleat 11. In this way most of the cleat 11 protrudes with respect to the lower surface 1c of the body 1a, being able to perform their shock-absorbing function of the sole 1.

[0105] In a further version of the invention, the at least one cleat 11 or some cleats 11 when there is a plurality of them, does/do not have the groove 11b. In this case, the constraint between the at least one insertable element 10 and the respective portion or area of the body 1a occurs for example by means of engagement, if desired, forced, respectively between cleat 11 and through opening 5.

[0106] This version can facilitate the replacement of at least one insertable element 10, provided that the joint between the cleat 11 and the through opening 5 is not re-formed by the groove 11b. In this way, the user could replace the at least one insertable element 10 quickly, simply by extracting the cleats 11 from the respective openings and then removing the insertable element 10 to be replaced in order to replace it with a new element 10 or of a different color or again having flexibility characteristics different from those of the removed element.

[0107] In practice, with reference by way of example but not of limitation to a cleat 11 having a frusto-conical shape, as shown in the embodiment shown in figure 5, it will present, reasoning in two dimensions, a larger base, of circular shape at the first end 11c of the body having a substantially sheet-like conformation of the at least one insertable element 10, having a larger diameter, for example greater than about 2 mm, with respect to the diameter of the corresponding through opening 5, and a smaller base, of circular shape at the second distal end 11d, having a smaller diameter, for example less than about 2 mm, with respect to the diameter of the corresponding through opening 5.

[0108] The forced engagement of the insertable element 10 in the body 1a, or rather of its cleats 11 in the through openings 5 of the body 1a, at the positioning area ZP of the respective portion or area of the body 1a, will therefore determine an elastic deformation of each cleat thus allowing its insertion inside the through opening 5 and the constraint of the insertable element 10 with the body 1a.

[0109] The constraint obtained through the forced engagement is reversible, i.e. it is possible to disengage the insertable element 10 from the body 1a of the sole 1 simply by applying a mechanical traction force having a greater modulus, even if desired the same, and the opposite or substantially opposite direction to the direction used. for the constraint and/or the insertion of said insertable element 10.

[0110] The removability of the insertable element 10 therefore allows to replace, for example in the case of wear or in the case in which it is desired to change the color and/or stiffness of the plurality of cleats 11, said at least one insertable element 10.

[0111] In other variants of the present invention, it would be possible to obtain a constraint between the at least one insertable element 10 and the body 1a of the sole 1 also by means of other types of engagement, in addition to the engagement just described, for example by means of a suitable C-shaped or hemisphere element present at the perimeter of the through opening 5, to be inserted at a special shape having a corresponding but complementary or annular conformation or at the groove 11b of each cleat 11.

[0112] From a manufacturing point of view, the body 1a and the at least one insertable element 10 can be obtained through molding techniques known in the state of the art, such as, for example, injection molding or compression molding.

[0113] In one version of the invention, for example, the body 1a can be obtained by injection molding while the insertable element 10 by compression molding.

[0114] Clearly, the choice of the materials used for the construction of the body 1a of the sole 1 and of the at least one insertable element 10 also determine the molding method used to obtain them, for example if it is chosen to produce the at least one insertable element 10 in EVA, it would be possible to obtain this element also by means of an injection molding technique.

[0115] In one version of the invention, the body 1a of the sole 1 is made of TPU while the at least one insertable element 10 is made of rubber, for example soft rubber. In this way, all the difficulties that are usually encountered in making a product in the aforementioned two materials but by means of the co-molding technique are eliminated and at the same time a product is obtained that is able to withstand the stresses generated during sports activity. and which confers the desired grip or adherence on the sole 1 itself.

[0116] The subject of the present invention is also a footwear 20 comprising such a sole 1.

[0117] In particular, said footwear can comprise an upper 21 which can be made of different materials and/or fabrics, for example leather or eco-leather, or of synthetic material such as polyurethane (PU), or of polyester or microfiber fabric, etc.

[0118] The upper 21 can be connected to the sole 1 through various methods, for example by stitching or gluing through suitable adhesive means.

[0119] The footwear 20 may also include one or more midsoles and/or insoles to give greater cushioning and greater comfort to the user's foot.

[0120] The present invention also refers to a method of obtaining such a sole 1.

[0121] The method of obtaining a sole 1 according to the present invention provides as a first step, the step of molding, by means of suitable molding techniques, at least one body 1a and at least one insertable element 10 of the sole 1.

[0122] The step of working the body 1a and/or the at

least one insertable element 10 thanks to suitable working techniques can then be provided, in order to obtain a certain brightness of the lower surface 1c of the body 1a and/or of the lower surface 10b of the at least one insertable element 10.

[0123] Furthermore, a step of finishing could be envisaged, using techniques known in the field, in order to eliminate any molding burrs from at least one body 1a and/or from at least one insertable element 10.

[0124] Subsequently, the step of mechanically constraining the at least one insertable element 10 to the body 1a of the sole 1 is envisaged.

[0125] Said step of mechanically constraining the at least one insertable element 10 to the body 1a can comprise forcibly engaging at least one cleat 11 or a plurality of cleats 11 in at least one through opening 5 or in a plurality of through openings 5 present in the body 1a of the sole 1.

[0126] Subsequently, the sole 1 thus formed will be connected, by means of gluing or sewing or other techniques, to an upper 21 of a footwear 20.

[0127] The present invention makes it possible to obtain a sole for footwear, in particular for sports footwear, which is highly versatile and customizable.

[0128] In fact, the sole according to the present invention makes it possible to quickly replace the at least one insertable element that is removably constrained to said sole, and therefore to obtain, by replacing and/or changing the latter, a sole more suitable for sports activity in question, for example football, for example having a plurality of cleats 11 of the insertable element 10 positioned mainly in the front portion or area of the forefoot 2 or a sole more suitable for running in natural outdoor environments or trail running, for example having the at least one plurality of secondary cleats 11 of the insertable element 10 positioned mainly in the rear portion or area of the rearfoot 3.

[0129] Furthermore, the present invention allows the rigidity of the plurality of cleats 11 of the insertable element 10 to be changed at will, simply by removing said insertable element 10 and replacing it with another insertable element 10 having a plurality of more rigid cleats 11, for example each having or a part of said cleats 11 full and/or partially full inside them.

[0130] For this it will be possible, for a possible user, to choose the best configuration, both functional and aesthetic, of the sole 1 on the basis of the particular sporting activity that will be carried out.

[0131] In addition, the insertable element 10 could be used, in the context of a shoe suitable for cycling, also as an attachment for the bicycle pedal.

[0132] It has thus been seen that the present invention fully achieves the proposed aims.

[0133] The present invention has been described according to preferred embodiments but equivalent variants can be conceived without departing from the scope of protection offered by the following claims.

[0134] Furthermore, the invention thus conceived is susceptible of numerous modifications and variations, all of which fall within the scope of the inventive concept as defined in the claims.

[0135] In addition, all the details can be replaced by other technically equivalent elements. In practice, the materials used, as well as the contingent shapes and dimensions, may be any according to requirements without thereby departing from the scope of the protection of the following claims. In the event that the technical characteristics mentioned in the claims are followed by reference numbers, these reference numbers are introduced with the sole purpose of increasing the clarity of the claims and consequently the aforementioned reference numbers do not have a limiting effect on the interpretation of each element identified as an example by such reference numbers.

Claims

1. Sole (1) for footwear, comprising at least one body (1a) and at least one insertable element (10), in which said at least one body (1a) comprises an upper surface (1b) intended, in use, to come into contact with the user's foot or with a midsole or insole of a shoe and a lower surface (1c) intended, in use, to come into contact at least partially with the external environment or with the ground, in which said sole (1) and/or said surfaces (1b, 1c) comprise at least a front portion or area of the forefoot (2), at least a rear portion or area of the rearfoot (3) and at least an intermediate portion or area of the midfoot (4) which connects said front portion (2) with said rear portion (3), said sole (1) and/or said at least one body (1a) comprising, at at least said at least one front portion or area of the forefoot (2) and/or said at least one rear portion or area of the rearfoot (3), at least one through opening (5), wherein said at least one insertable element (10) comprising an upper surface (10a), intended, in use, to come into contact with the user's foot or with a midsole or insole of a shoe, a lower surface (10b), suitable in use to come into contact with said upper surface (1b) of said body (1a), and a thickness (10c), **characterized in that** said at least one insertable element (10) can be inserted at least partially into said at least one through opening (5).

2. Sole (1) for footwear according to claim 1, wherein said insertable element (10) in use is mechanically constrained by interlocking in said respective at least one opening (5).

3. Sole (1) for footwear according to claim 1 or 2, in which at said at least one through opening (5) there is a positioning area (ZP) for said at least one insertable element (10).

4. Sole (1) for footwear according to any one of the preceding claims, wherein said insertable element (10) comprises at least one cleat (11) which departs from said lower surface (10b) of said insertable element (10) and/or of a body having a substantially sheet-like conformation of said insertable element (10).

5. Sole (1) for footwear according to any one of the preceding claims, in which said at least one cleat (11) is positioned at said at least one through opening (5), so that the latter can house and/or constrain mechanically, for example by interlocking, said at least one cleat (11).

6. Sole (1) for footwear according to any one of the preceding claims, wherein said at least one body (1a) is made of rigid material, for example of thermoplastic polyurethane or of rubber, rigid rubber or of a composite material with glass fibers or carbon fibers or similar materials, polyurethane or ethylene vinyl acetate (EVA).

7. Sole (1) for footwear according to any one of the preceding claims, in which at the rear portion or area of the rearfoot (3) and/or the intermediate portion or area of the midfoot (4) and/or the front portion or area of the forefoot (2) of said upper surface (1b) of said body (1a) of said sole (1) one or more stiffening ribs (1b1) are present and/or in which said lower surface (1c) of said body (1a) of said sole (1) has shapes and/or grooves and/or elevations and/or in which said upper surface (10a) of said at least one insertable element (10) comprises hardening ribs (10a1).

8. Sole (1) for footwear according to any one of the preceding claims, wherein said positioning area (ZP) of said front portion or area of the forefoot (2) and/or of said rear portion or area of the rearfoot (3) and/or of said intermediate portion or area of the midfoot (4) is recessed with respect to the upper surface (1b) of said at least one body (1a).

9. Sole (1) for footwear according to the preceding claim, in which said recessed positioning area (ZP) has a conformation substantially complementary to that of said at least one insertable element (10) and/or of its body having a substantially sheet-like conformation.

10. Sole (1) for footwear according to any one of the preceding claims, wherein said lower surface (1c) of said at least one body (1a) has at least one secondary cleat (6) made integrally with the body (1a) of the sole (1) and/or made of the same material of said at least one body (1a) of said sole (1).

11. Sole (1) for footwear according to the preceding claim, wherein said at least one secondary cleat (6) and/or said at least one cleat (11) is full and/or partially full and/or internally empty or hollow or in which said sole (1) comprises a plurality of secondary cleats (6) and/or said at least one insertable element (10) has a plurality of cleats (11) and at least some of said cleats (11) and/or secondary cleats (6) are full and/or partially full and/or internally empty or hollow.

12. Sole (1) for footwear according to any one of the preceding claims, wherein said lower surface (1c) of said body (1a) of said sole (1) is shiny, satin or opaque and/or in which said at least one cleat (11) of said at least one insertable element (10) is shiny, satin or opaque.

13. Sole (1) for footwear according to any one of the preceding claims, in which said at least one insertable element (10) is made of soft material, for example of rubber or foam material or of ethylene vinyl acetate or of soft thermoplastic polyurethane or materials having a greater softness and/or flexibility than the material with which said body (1a) of the sole (1) is made.

14. Sole (1) for footwear according to any one of the preceding claims, in which said at least one insertable element (10) is mechanically constrained, for example by interlocking, in said respective positioning area (ZP) through a coupling and/or insertion between said at least one cleat (11) or said plurality of cleats (11) and said at least one through opening (5) or said plurality of through openings (5) and/or in which said coupling and/or insertion between said at least one cleat (11) or said plurality of cleats (11) and said at least one through opening (5) and said plurality of through openings (5) is a reversible forced coupling and/or insertion.

15. Sole (1) for footwear according to any one of the preceding claims, wherein said at least one cleat (11) of said at least one insertable element (10) has at least one groove (11b) for securing said body (1a) of said sole (1) with said at least one insertable element (10) and/or for the constraint of said at least one opening (5) with said at least one cleat (11) of said at least one insertable element (10) and/or in which said groove (11b) has an annular conformation.

16. Footwear (20) comprising a sole (1) according to any one of the preceding claims 1 to 15 and an upper (21).

17. Footwear according to claim 16, wherein said footwear (20) comprises one or more midsoles and/or one or more insoles and/or in which said footwear is a sports shoe for example for outdoor football activ-

ities, or in open spaces, and/or indoor or in closed spacers, or for cycling, running, for example trail running or running in natural outdoor environments, or running on the track or running in general, skiing, tennis, or for sports in general.

18. Method for obtaining a sole (1) according to any one of claims 1 to 15, comprising the steps of:

mold at least one body (1a) of said sole (1) and at least one insertable element (10), in which said at least one body (1a) has at least one through opening (5) and said at least one insertable element (10) comprises at least one cleat (11),
mechanically constraining said at least one insertable element (10) to said body (1a) of said sole (1),
characterized in that said step of mechanically constraining said at least one insertable element (10) to said body (1a) involves coupling and/or inserting said at least one cleat (11) in said at least one through opening (5).

19. Method according to claim 18, comprising a step of positioning said at least one insertable element (10) at at least one positioning area (ZP) present in at least one of a front portion or area of the forefoot (2), at least a rear portion or area of the rearfoot (3) and at least an intermediate portion or area of the midfoot (4), so that said at least one cleat (11) is positioned at said at least one opening (5), before said step of coupling and/or inserting said at least one element (10) into said at least one body (1a) and/or in which said molding step comprises injection molding and/or compression molding.

20. Method according to claim 18 or 19, wherein said step of mechanically constraining said at least one insertable element (10) to said body (1a) provides for inserting and/or engaging a perimeter of said at least one through opening (5) in at least one groove (11b) provided in said at least one cleat (11), in which said groove (11b) is a housing groove, if desired with interlocking, of said body (1a) of said sole (1).

21. Method according to any one of claims 18 to 20, comprising a step of working said body (1a) and/or said at least one insertable element (10) in order to make a lower surface (1c) of said body (1a) shiny or opaque and/or a lower surface (10b) of said at least one insertable element (10) and/or a step of finishing said at least one body (1a) and/or said at least one insertable element (10), in order to example of eliminating any molding burrs of said at least one body (1a) and/or of said at least one insertable element (10).

Fig. 1

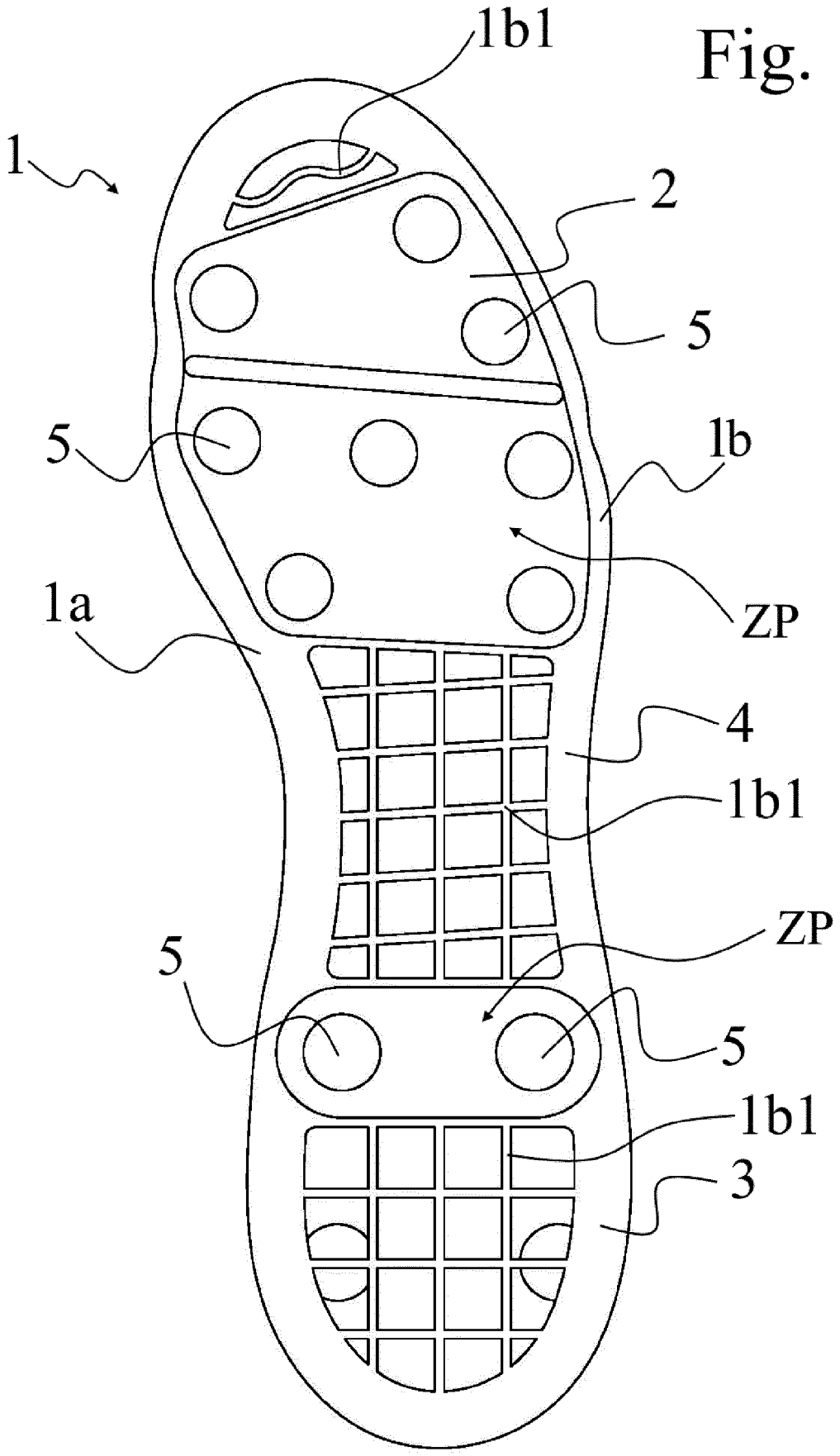
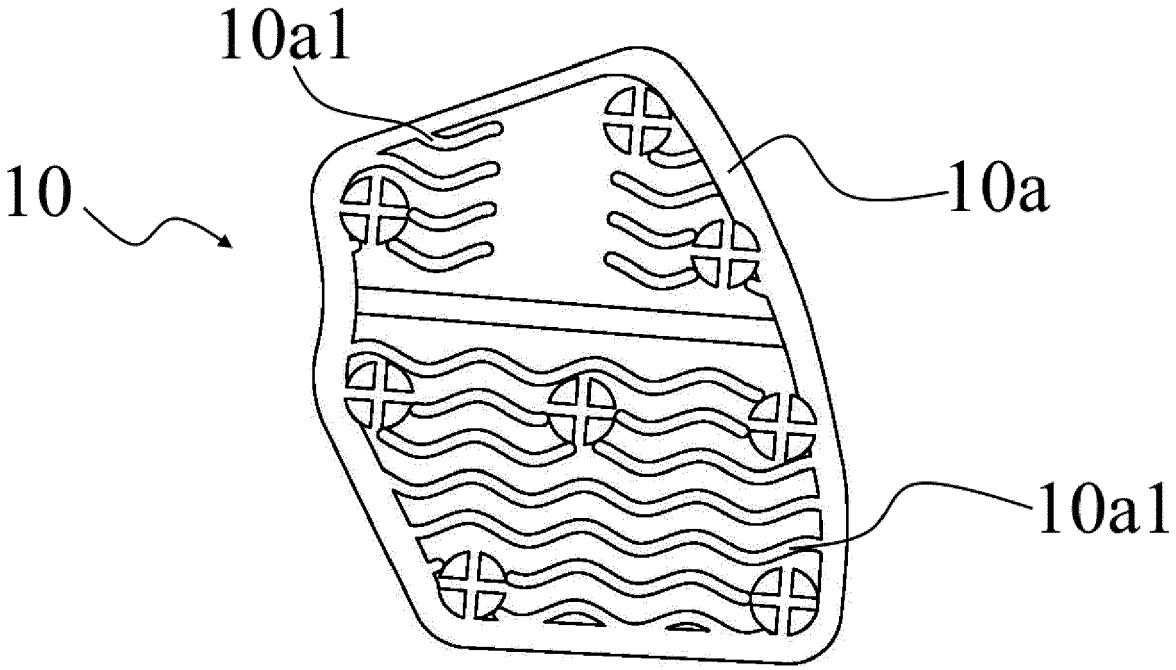


Fig. 2



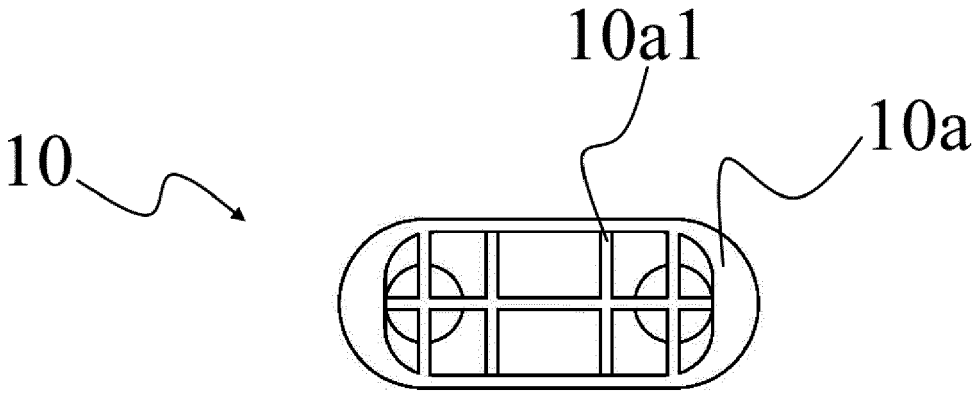


Fig. 3

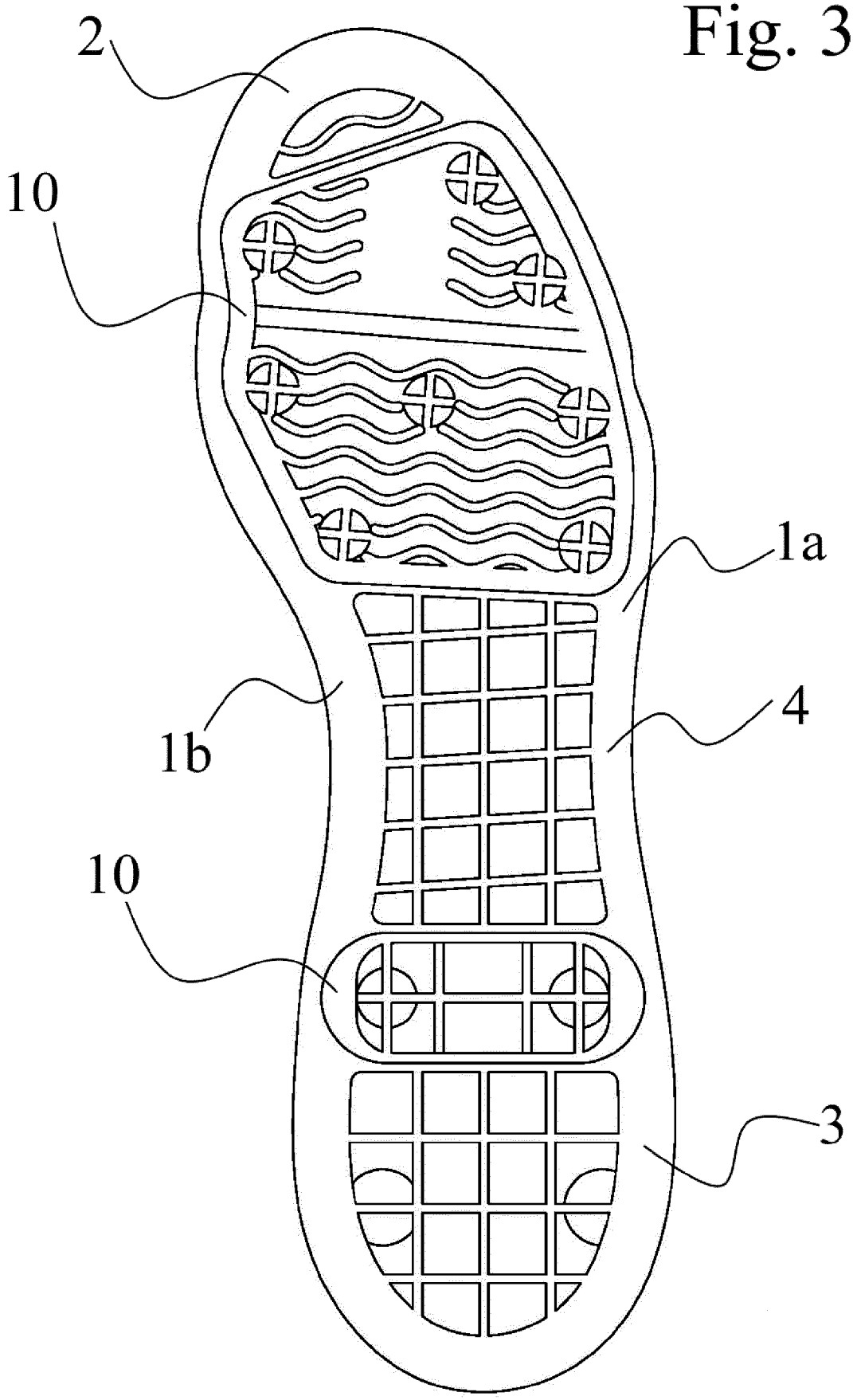


Fig. 4

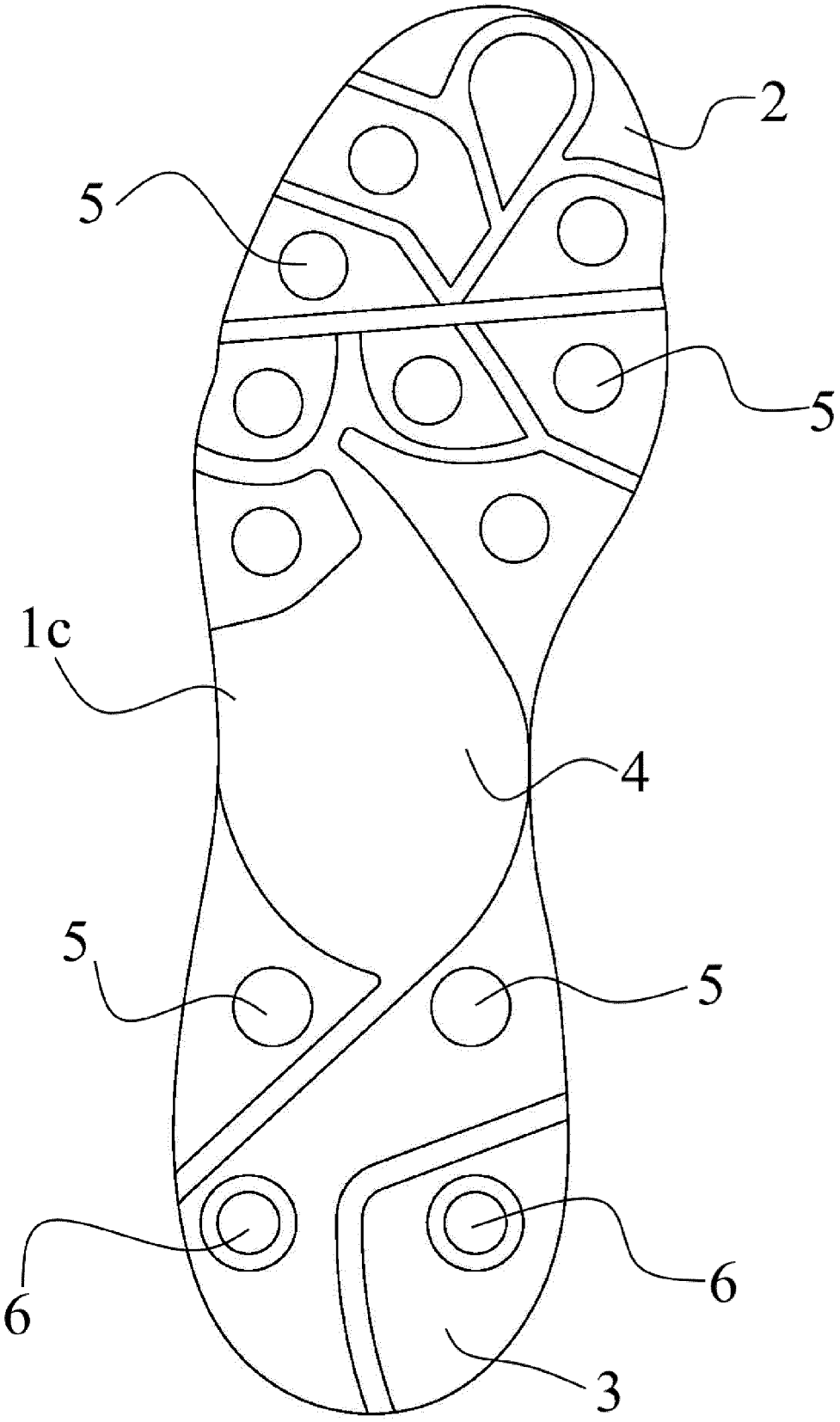
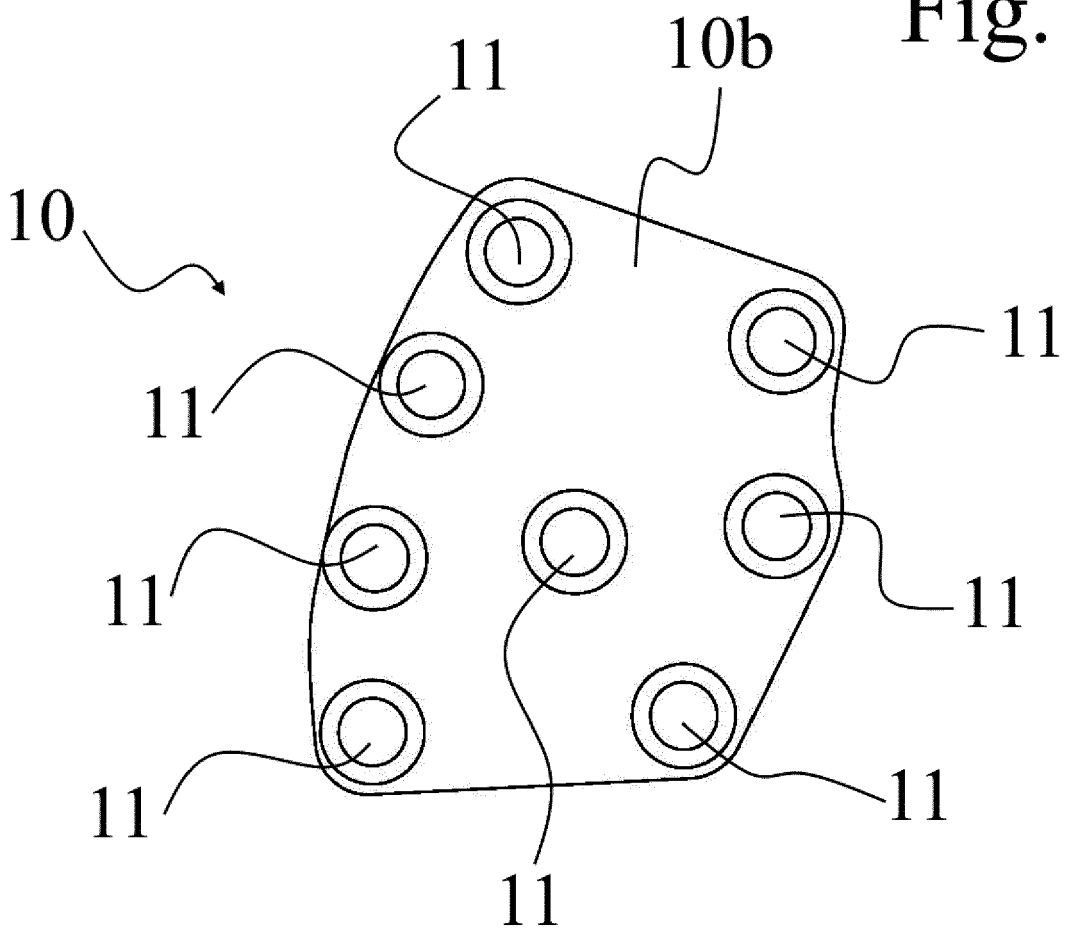


Fig. 5



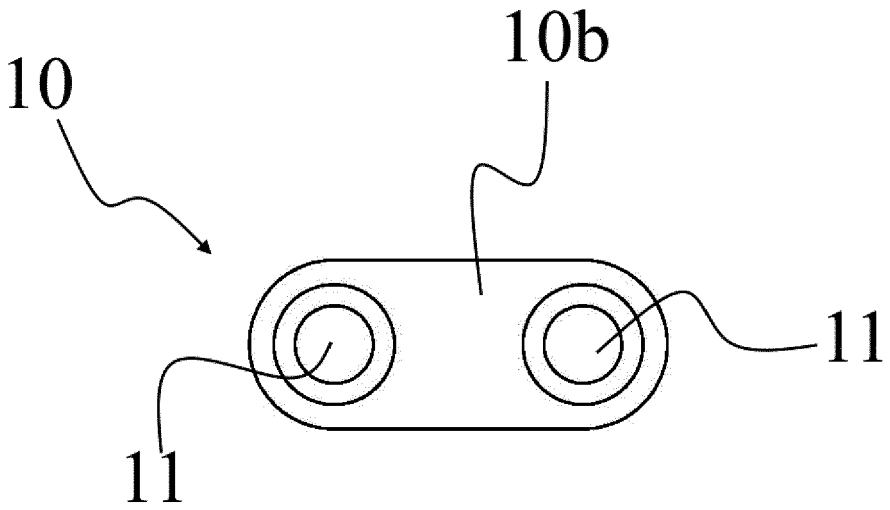


Fig. 6

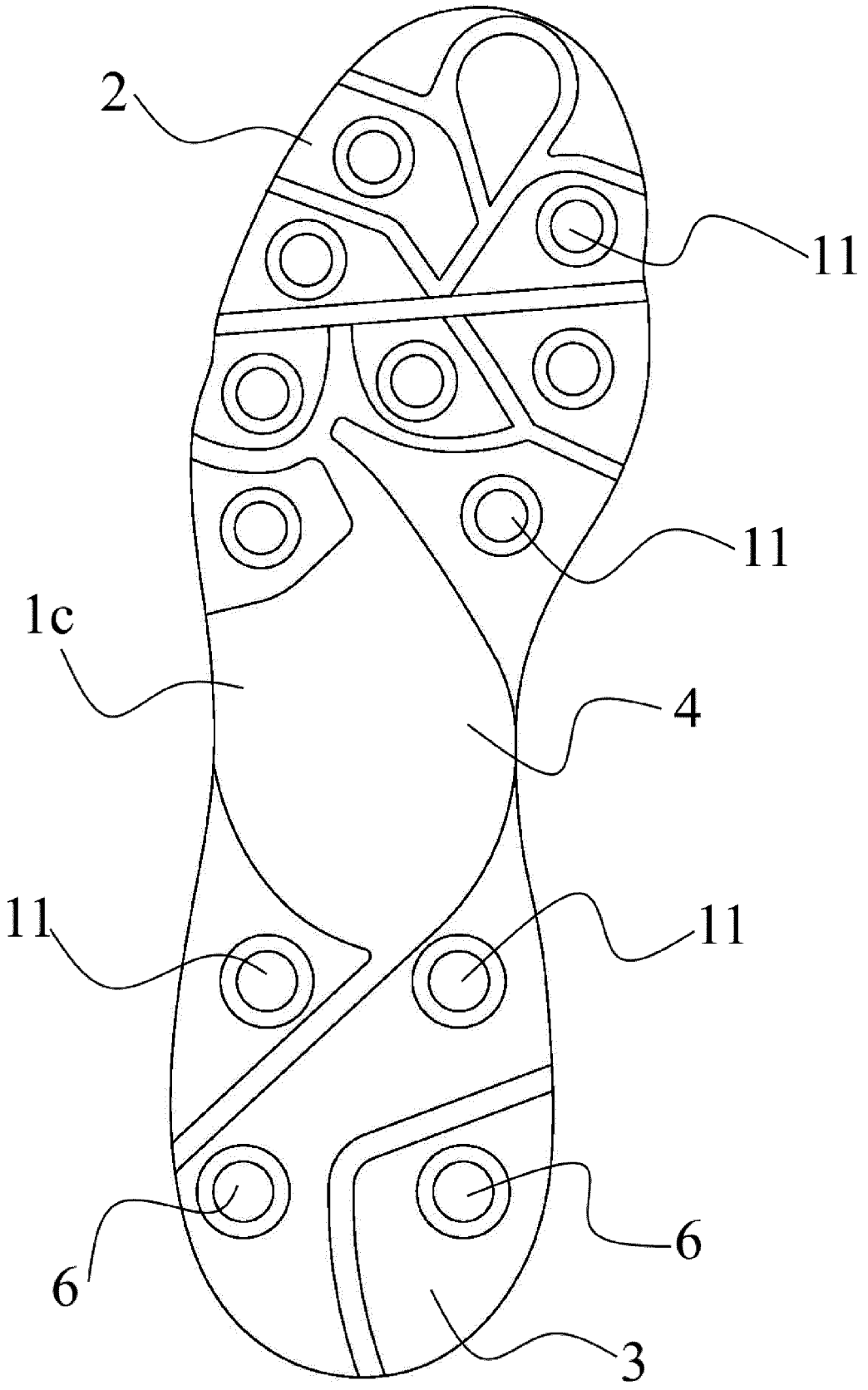


Fig.7a

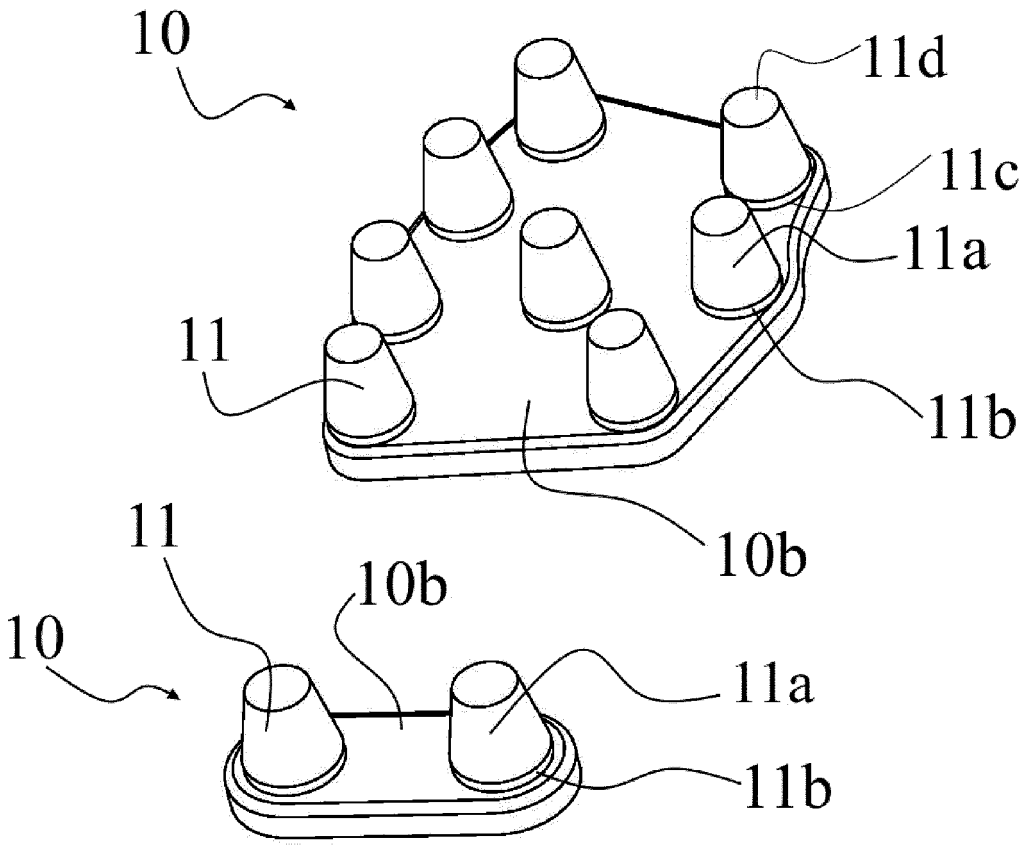
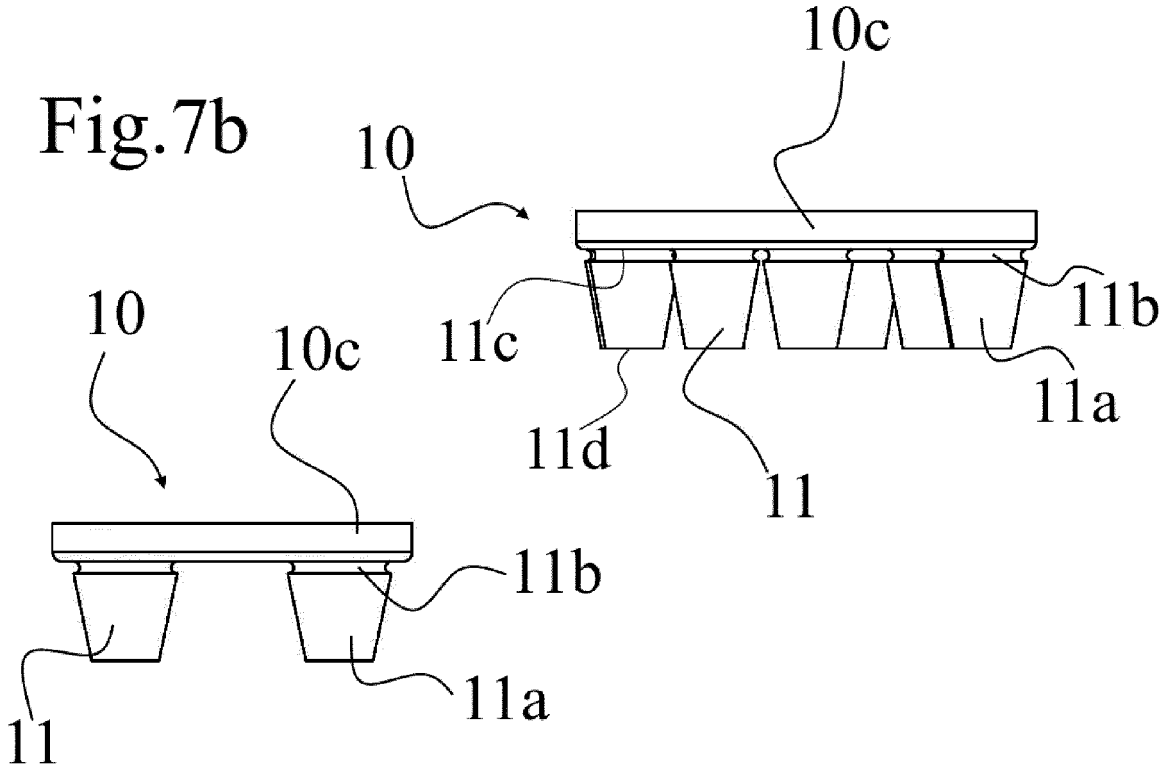

10
11d
11c
11a
11
11b
10b
11
10b
10
11a
11b

Fig.7b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10
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11b
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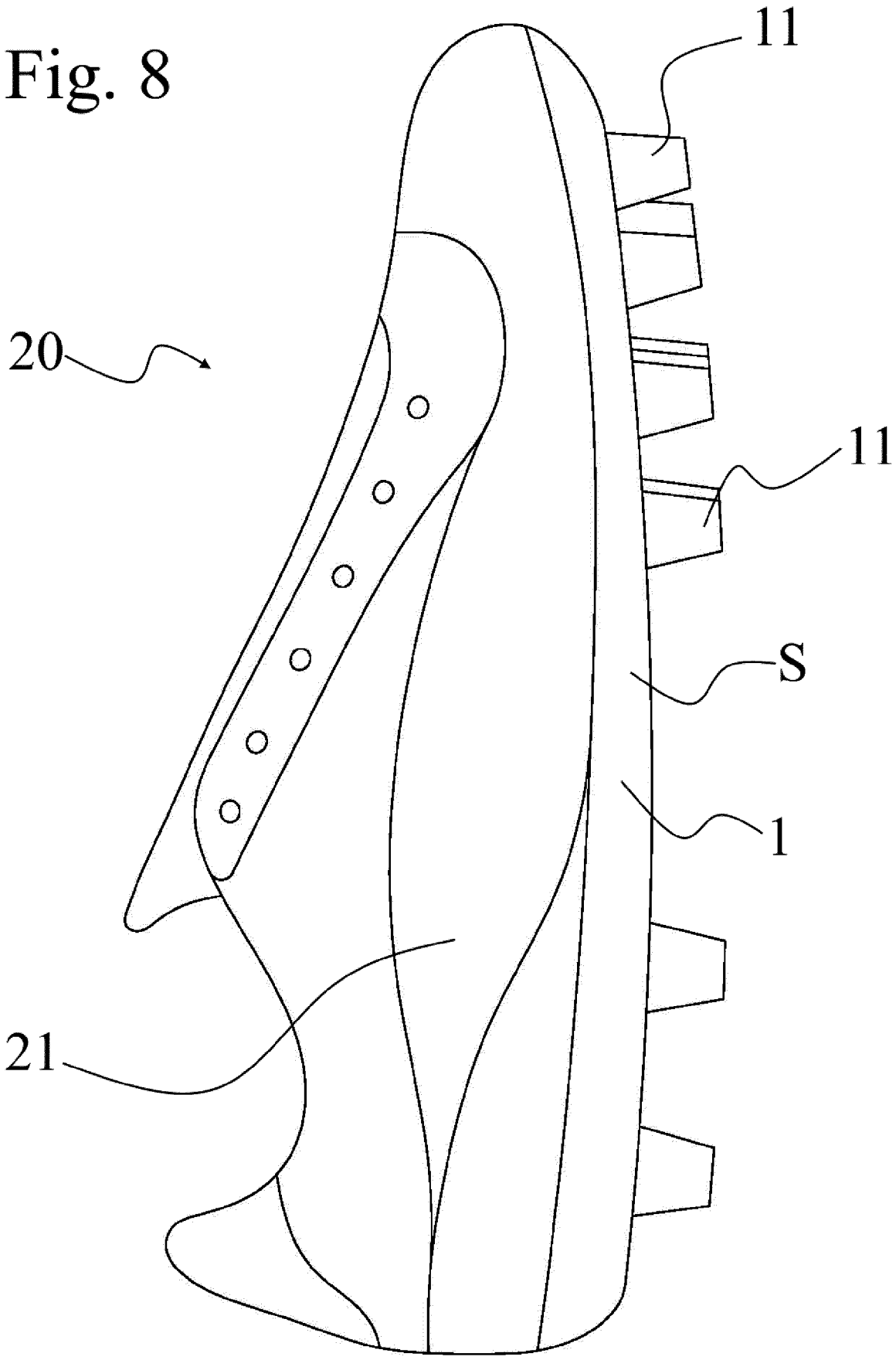
10c
11b
11a
11

Fig. 8



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EUROPEAN SEARCH REPORT

Application Number
EP 21 19 8363

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Y	* paragraphs [0061], [0073]; figures	7,20	A43B13/16
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3 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	14 January 2022	Ciubotariu, Adrian

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