(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
5 November 2015 (05.11.2015)

WIPO | PCT

(10) International Publication Number
WO 2015/166137 A1

(51) International Patent Classification:
*A43B 5/00* (2006.01) *A43C 15/02* (2006.01)
*A43B 13/26* (2006.01) *A43C 15/16* (2006.01)
*A43B 13/36* (2006.01)

(21) International Application Number:
PCT/FI2015/050276

(22) International Filing Date:
22 April 2015 (22.04.2015)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
20145403 2 May 2014 (02.05.2014) FI

(72) Inventor; and
(71) Applicant : **TOLVANEN, Antti** [FI/FI]; Mäntyniementie 20 B, FI-40520 Jyväskylä (FI).

(74) Agent: **TAMPEREEN PATENTTITOIMISTO OY**; Visiokatu 1, 33720 Tampere (FI).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

**Published**:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(54) **Title**: A SPORT SHOE AND A DETACHABLY ATTACHABLE CLEAT PART FOR A SPORT SHOE

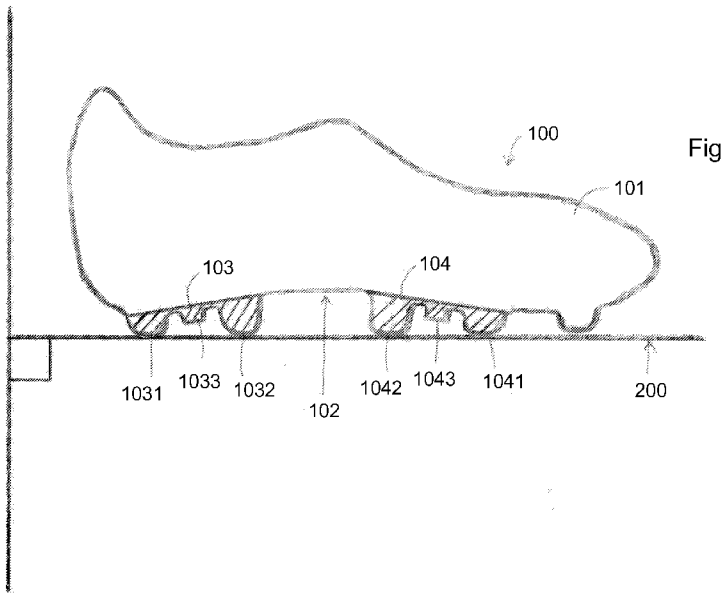



Fig.1

(57) **Abstract**: The application relates to a sport shoe (100) comprising a detachably attached cleat part (103), a sport shoe (100) for receiving a detachably attachable cleat part (103, 104) and a cleat part (103, 104) comprising cleats (1031, 1032, 1033, 1041, 1042, 1043). According to an embodiment a sport shoe (100) comprises a sole (102) and cleats (1031, 1032, 1033, 1041, 1042, 1043). The cleats (1031, 1032, 1033, 1041, 1042, 1043) are integral part of a cleat part (103, 104), which is detachably attached to the sole (102). The cleat part (103, 104) comprises at least two cleats (1031, 1032, 1033, 1041, 1042, 1043) having different height from the sole (102).

WO 2015/166137 A1

# A sport shoe and a detachably attachable cleat part for a sport shoe

## Technical Field

The application relates to a sport shoe comprising a detachably attached cleat part, a sport shoe for receiving a detachably attachable cleat part and a cleat part comprising cleats.

## Background

Cleats in an outer sole of a sport shoe are used to provide traction. Area of cleats is small compared to the area of the outer sole of the shoe. In use the cleats induce pressure against the sports ground and may penetrate to it. The caused traction is helpful for example on soft or slippery sports ground.

Amount and size of cleats may be chosen according to sports ground and/or position of the play. Longer cleats give more traction on a soft ground, but pose stress to legs and joints if used for example on hard sports ground. Shorter cleats enable better touch to hard sports ground and better shock absorbing effect, but less traction on soft ground. Non-appropriate cleats may pose inefficiency, hazard or injuries to the user.

## Summary

An object of the embodiments is to provide a sport shoe with appropriate functioning. The object is achieved by a sport shoe comprising changeable cleats. This enables appropriate cleats to be utilized in accordance to the current situation.

The sport shoe according to embodiments comprises cleats. The sport shoe may be a football shoe, a golf shoe, a rugby shoe, a baseball shoe, or a alike. Any sport shoe with cleats on its external sole may utilize the embodiments. In an embodiment the sport shoe is a football shoe.

An embodiment of the invention a sport shoe comprises a sole and cleats. The cleats are integral part of a cleat part, which is detachably attached to the sole. The cleat part comprises at least two cleats having different height from the sole.

According to an embodiment a cleat part for a sport shoe, comprises integral base portion and at least two cleats. The at least two cleats have different height from the base. The cleat part is detachably attachable to a sole of a sport shoe.

According to an embodiment a sport shoe comprises in its external sole at least one joint part. A cleat part is detachably attachable to the sole. The cleat part has two opposing surfaces and comprising at least two cleats on one surface and on the opposing surface at least one joint part. The joint part of the cleat part is attachable as a counterpart to the joint portion of the sole.

A cleat part according to embodiments comprises at least one joint part for detachably attaching it to a sole of a sport shoe. The joint parts of a cleat part are attachable to a corresponding joint counterparts of the sole.

Description of the Drawings

The following description refers to the accompanied figures of which

Figure 1 illustrates a sport shoe according to an embodiment of the invention.

Figure 2 illustrates a sport shoe according to an embodiment of the invention.

Figure 3a illustrates a side view of a cleat part according to an embodiment of the invention.

Figure 3b illustrates a side view of a cleat part according to an embodiment of the invention.

Figure 3c illustrates a side view of a cleat part according to an embodiment of the invention.

Figure 4 illustrates a sole of a sport shoe according to an embodiment of the invention.

Figure 5a illustrates a cleat part according to an embodiment of the invention.

Figure 5b illustrates a cleat part according to an embodiment of the invention.

Figure 5c illustrates a cleat part according to an embodiment of the invention.

Detailed Description of Embodiments

The figure 1 illustrates a sport shoe 100 according to an embodiment of the invention. The sport shoe 100 comprises a vamp 101 and a sole 102. The vamp 101 may comprise of leather, synthetic, textile or other suitable material. The sole 102 may comprise rubber, synthetic plastic, plastic like material, composite, hard plastic, metal, or any suitable material and/or combination of those. The sole 102 may be made of hard, rigid, generally non-deflectable material, such as thermoplastic polyurethane, composite, carbon fiber material, nylon, other polymeric material and/or metal. Cleat parts 103, 104 comprising cleats are detachably attached to the sole 102. The cleat parts 103, 104 may comprise the same or similar material as the sole. Each detachable cleat part 103, 104 comprising cleats is a one-piece structure. The cleat parts 103, 104 may be injection moulded or extruded, for example.

The cleat part 103 is attached to a heel portion of the sport shoe 100. The cleat part 103 comprises a base portion and cleats 1031, 1032, 1033. The base portion of the cleat part 103 may comprise uniform thickness, as illustrated in the side view of the Figure 1. The cleats 1031, 1032, 1033 protrude from the base of the cleat part 103. Outer cleat 1031, which is

arranged to be the outmost cleat of the heel part in the longitudinal dimension of the sport shoe sole 102, comprises shorter height from the base compared to the cleat 1032, which is arranged closer to the arch part of the sole 102. The shorter cleat 1031 and the longer cleat 1032 are arranged on opposing edge zones of the base. The cleat part 103 is arranged to be detached and attached to the sole 102 so that placement of the shorter cleat 1031 and the longer cleat 1032 are changeable in relation to the longitudinal dimension of the sole 102. The part 103 is arranged to be horizontally turnable around the cleat 1033. The cleat 1033 is the shortest cleat of the part 103 in the Figure 1. The cleat 1033 may be longer or shorter or of similar height compared to the other cleats of the cleat part. The cleat 1033 is arranged in the middle portion or in the middle of the cleat part 103. The outer cleats 1031, 1032 are arranged in the outer portions or edge zones of the part 103. The cleats and the base portion of the cleat part 103 are made of the same material. Cleats may be made of partly or completely different material than a base portion, even the two form an integral cleat part. The cleats and the base portion are integral parts of the cleat part 103.

The cleat part 104 is attached to a ball of the foot portion of the sport shoe 100. The cleat part 104 comprises a base portion and cleats 1041, 1042, 1043. The cleats 1041, 1042, 1043 protrude from the base of the portion of the cleat part 104. The base portion of the cleat part 104 may comprise a plate having uniform thickness, as illustrated in the side view of the Figure 1. The cleat 1041, which is arranged closer to the toe portion of the sole 102, is shorter from the base compared to the cleat 1042, which is arranged closer to the arch part of the sole 102. The cleat part 104 is arranged to be detached and attached to the sole 102 so that placement of the cleats 1041, 1042 is changeable in relation to the longitudinal dimension of the sole 102. The part 104 is arranged to be turnable horizontally around the cleat 1043. The cleat 1043 is the shortest cleat of the part 104 in the Figure 1. The cleat 1043 may be longer, shorter or of same or similar height compared to the other cleats of the cleat part and /or the sole. The cleat 1043 is arranged in the middle portion or in the middle of the cleat part 104. The outer cleats 1041, 1042 of the cleat part 104 are arranged in the outer, edge portions of the part 104. The cleats and the base portion of the cleat part 104 are made

of the same material. The cleats and the base portion are integral parts of the cleat part 104.

The cleat part 104 may be similar or the same with the cleat part 103. A sport shoe 100 may comprise only one cleat part 103, 104 according to an embodiment. A sport shoe 100 may comprise cleat parts 103, 104 and/ or additional cleat parts according to embodiments. The cleat part comprises at least two cleats having different heights. The cleat part comprises at least two cleats having changeable position in relation to a sole to which it has been attached. The cleat part may be symmetric. The cleat part may be turned around horizontally in order to change position of the at least two cleats in relation to a sole.

The sole 102 of the sport shoe 100 is bent. The sole 102 comprises an arch portion between its heel portion and fore foot portion. The fore foot portion may be called ball of the foot portion. The arch portion is in middle part of the sole 102 in the longitudinal dimension of the sole 102. When the heel portion and/or the fore foot portion of the sole 102 are arranged next to the straight ground level 200, the arch portion of the sole is not in touch with the ground level 200. The arch portion of the sole 102 does not meet the ground level 200 of a hard ground. If the arch portion of the sole 102 meets or is in touch with the ground level 200, at least some cleats of the cleat parts 103, 104 are arranged to penetrate the ground level 200. In an alternative sole structure sole is bent upwards, opposite as illustrated in the previous. In this case the arched portion longitudinally in the middle portion of the sole bents outward from the heel portion and/or from the fore foot portion of the sole. In other embodiment, differently shaped sport shoe sole may be employed. A sole may be relatively straight along its longitudinal dimension.

In the figure 1 shoe sole 102 is shaped to be in a different level in relation to the ground level 200 on its middle arch part, when compared to its heel part and fore foot part. The end portions of the sole 102, being the heel part and the fore foot part, are substantially at the same horizontal level along longitudinal axis of the shoe sole 102. The bent middle portion of the shoe sole 102 has a distance to the ground level 200, when the heel part and the fore foot part are arranged at the ground level 200.

The cleat part 103 is arranged to compensate the shape of the shoe sole 102 in the Figure 1. The cleat 1031 of the cleat part 103 arranged on an outmost heel portion of the sole 102 is shorter than the cleat 1032 of the cleat part 103 arranged closer to the arched portion of the sole 102. External surface of the longer cleat 1032, which is arranged on the arched portion of the sole 102, is arranged to be next to the straight ground level 200 at the same time with external surface of the shorter cleat 1031, which is arranged on the outmost cleat of the heel portion of the sole 102. The external bottom portion of the sport shoe 100, which is arranged to touch the ground, and being formed of the external end surfaces of the cleats 1031, 1032, which are of different height from the sole 102 and/or from the base of the cleat part 103, are arranged to form a straight horizontal level. The Figure 1 illustrates that the cleat ends are next to the straight ground level 200, touching the straight ground level 200 at the same time. The cleats 1031, 1032 of different heights are arranged to form even external sole level for the sport shoe 100 compensating the bent arch part of the sole 102.

Similarly the cleat part 104 is arranged to compensate the shape of the shoe sole 102 in the Figure 1. The cleat 1041, which is arranged further from an arch portion of the sole 102, is shorter than the cleat 1042, which is arranged closer to an arch portion of the sole 102. The longer cleat 1042 arranged on the arched portion of the sole 102 is arranged to be next to the straight ground level 200 at the same time with the shorter cleat 1041. The external bottom portion of the sport shoe 100, formed of the external end surfaces of the cleats 1041, 1042, which are of different height, are arranged to form at least substantially straight horizontal level, parallel with longitudinal axis of the sole 102. Figure 1 illustrates that external ends of the cleat 1041, 1042 are next to the straight ground level 200, touching the straight ground level 200 at the same time. The cleats 1041, 1042 are arranged to form even level compensating the bent arch part of the sole 102.

In the embodiment of the Figure 1, the cleats 1031, 1032, 1041, 1042 of the detachable cleat parts 103, 104, which cleats 1031, 1032, 1041, 1042 are arranged to have changeable position in the sole 102, are arranged to be in touch with the ground level 200 at the same time, as described in the

previous. In embodiments, the cleats that comprise changeable position may be arranged to form at least substantially straight horizontal level parallel with the straight ground level. In practice it is possible to have small variations, wherein all cleats of the sole may not touch the ground exactly the same time, and/or wherein only part(s) of some cleat ends touch the ground level. Variations between cleat end surfaces from a ground level may be approximately in amount of half of a cleat height. Thus some of the cleats having a changeable position may not touch the ground level at the same time with the other such cleats, but are at a distance from the ground level. The distance may correspond to approximately from one to ten millimetres.

Cleats of a sport shoe may comprise height of 0.1-40 mm, preferably 2-30 mm, more preferably 2.5-21 mm. For example the shorter cleat of a cleat part according to an embodiment may comprise height of 15 mm and the longer cleat of the cleat part may comprise height of 21 mm. Difference between the cleat heights of a cleat part may be 2-15 mm. The cleats may have form of cylindrical, square, rectangular, rhombus, oval, round, rounded square, rounded rectangular or rounded rhombus, for example. The form may be symmetric and either thinner or wider in its middle part compared to two opposing edge parts. The form may comprise thinner middle part compared to four or more even number of symmetrical edge parts. The cleats may have thicker ends closer to a sole and thinner external ends. A sport shoe may comprise cleats having different form, dimensions and/or material.

It is typical, that some of the cleats suffer most from wear. This may dependent on the user, foot properties, use and/or external conditions. Especially outmost cleats at the heel portion of a shoe may wear out or wear away part of their original height. On the other hand, there are situations, when more traction is needed, for example due to wet or soft sports ground. Previously these situations have necessitated new sport shoes. There are sport shoes with interchangeable cleats. In this case, new cleats need to be bought, carried, found and changed one by one. Fixing of a single changeable cleat of a sport shoe requires many fixing mechanisms in the sole of the shoe. Fixing mechanisms and intersections of the sole and single separate cleats may be vulnerable and form weak points of the shoe.

According to the embodiments of the present invention, when a sport shoe having different properties is desired, an existing cleat part may be utilized. According to embodiments a cleat part 103, 104 may be detached from the sole 102, turned 180 degrees horizontally, and attached back to the sole 102. The position of the cleat part 103, 104 in relation to the sole 102 is changeable, for example turnable horizontally 180°. This changed position of the sole parts 103, 104 is illustrated in the Figure 2.

The figure 2 illustrates a sport shoe 100 according to an embodiment of the invention. The cleat parts 103, 104 are turned around horizontally as compared to the Figure 1. In the figure 2 the longer cleats 1032, 1042 are arranged further from the arch portion of the sole 102 and the shorter cleats 1031, 1041 are arranged closer to the arch portion of the sole 102. In the Figure 2 external end surfaces of the longest cleats 1032, 1042 are arranged next to the ground level 200. The other cleat ends 1031, 1033, 1041, 1043 are at a distance from the straight ground level 200. In the Figure 2, the cleat parts 103 (104) of the Figure 1 are detached from the sole 102, turned horizontally 180° around the shortest mid cleats 1033 (1043) and attached to the sole 102 in a turned position. The shorter cleats 1031, 1041 are arranged closer to the arch portion of the sole 102 and the longer cleats 1032, 1042 are arranged further form the arch portion of the sole.

The cleat part may change its position so that it is detached from the sole part, turned horizontally and placed and attached back to the sole part. Turnability is implemented so that the cleats of the cleat part elongate towards the same direction before and after the replacement or turning. Places of at least two cleats of the cleat part are changeable on external surface of a sole. The places may be mutually exchangeable. A symmetric cleat part may be turnable around its point of symmetry or around its mid-point horizontally. Before and after turning, as well as during turning, the cleat part is at least substantially in the same parallel alignment in relation to the sole to which it is, or is to be, attached. The cleat part and the sole part receiving the cleat part have parallel surfaces next to each other. The cleat parts extend away from the sole part and/or from the base of the cleat part. The same mutual orientation remains during detachment, horizontal turning of the cleat part in relation to the sole and re-attachment.

The longer cleat 1032 arranged in the end heel portion provides better traction compared to a shorter cleat at this place of the sole 102. Similarly, the longer cleat 1042 closer to the middle portion of the fore foot portion provides better traction compared to shorter cleat at this place of the sole 102. Weight is put on these parts of the sole 102, which are further from the arch portion of the sole 102 during use. Also, worn cleats may be simply, easily and fast replaced by replacing an existing cleat part with a new cleat part, or where applicable, by just turning a cleat part according to embodiments.

Existing longer cleats may be replaced in a sole of a shoe. Placement of a cleat may be changed in relation to a longitudinal dimension of a sole. Placement of two cleats of a cleat part may be exchanged. Placement of shorter and longer cleat of a cleat part may be changed in relation to a shoe sole so that place of the shorter cleat becomes place of the longer cleat and vice versa. The cleat part may be symmetric. Middle point or portion of the cleat forms a turning point, around which the cleat part is turnable horizontally. Middle point or portion of the cleat part comprises a cleat, which is used for gripping in order to detach the cleat part from the sole and/or for fixing the cleat part to the sole. Non-symmetric cleat part comprises a turning point arranged to turn the cleats of the cleat part to a desired changed position.

The Figures 1 and 2 show side view of the sport shoe 100. Two cleats in a cleat part are shown. The cleat part may comprise four cleats. For example two cleats may be in the same longitudinal place and in a different horizontal place along the sole area. In the Figures 1 and 2, there may be cleats behind the shown cleats having changeable position. It is possible to have different amount of cleats in a cleat part according to embodiments.

The Figure 3a illustrates a side view of a cleat part according to an embodiment of the invention. The cleat part 301 comprises a short cleat 3011 having changeable position in relation to a sole of a sport shoe. The cleat part 301 comprises a long cleat 3012 having changeable position in relation to a sole part. The positions of the short cleat 3011 and the long cleat 3012

may be mutually exchangeable. The positions of the short cleat 3011 and the long cleat 3012 may be changed along longitudinal direction of a sole of a sport shoe. The cleat part 301 comprises joint parts 3013, 3014 on its integral base 310 surface opposing the cleats 3011, 3012. The joint parts 3013, 3014 are protrusions or recesses in the Figure 3a. The joint parts 3013, 3014 are placed at a cleat part base surface opposing the cleats. The protrusions (recesses) may be placed differently, so they are not necessarily at similar placement with the cleats of the opposing surface.

The Figure 3a further illustrates a mount part 300, which is arranged to be fixedly attached to a sole of a shoe, or arranged to form an integral part of a sole of a shoe. The mount part 300 comprises joint parts 3003, 3004. The joint parts 3003, 3004 are recesses in the Figure 3a. The joint parts 3003, 3004 are arranged to receive the joint parts 3013, 3014 of the cleat part, correspondingly. The recesses 3003, 3004 of the sole or a mount are arranged to form counterparts of the corresponding protrusions 3013, 3014 of the cleat part 301. Alternatively, the cleat part 301 may comprise recesses and the mount part 300 may comprise corresponding protrusions. The recesses may be through holes or comprise a hollow with a bottom part.

The cleat part may be attachable to a joint counterparts of a sole. Alternatively, a sole may comprise a separate mount part for receiving the cleat part. Similarly the mount part then comprises joint parts for receiving and connecting with the corresponding joint counterparts of the cleat part.

The mount part 300 may be arranged on a sole of a sport shoe. It may be fixedly attached to the sole. The mount part 300 may be an integral part of a sport shoe sole. The mount part 300 is arranged to receive a detachable cleat part 301. The cleat part 301 is detachably attachable to the mount part 300. The cleat part 301 has at least two positions to which it may be detachably attached in relation to the mount part 300. The cleat part 301 may be temporarily fixedly attached to the mount part 300 via a fixing cleat 320. The fixing cleat 320 forms a horizontal turning point for the cleat part 301. The fixing cleat 320 of the Figure 3a comprises threads for enabling screwing the cleat part 301 on and off in relation to the mount part 300. Screwing off the fixing cleat 320 enables detaching the cleat part 301 from the mount part

300, as illustrated in the Figure 3a. In the position of the Figure 3a the cleat part 301 may be turned horizontally to a desired (allowed) position in relation to the mount 300. The fixing cleat 320 is arranged to hold the cleat part 301 and the mount 300 loosely together for allowing the horizontal turning in relation to each other. The cleat part 301 may not be separated, but just detached, from the mount 300 during turning, as shown in the Figures 3a and 3c. After placement, the cleat part 301 is attached and fixed next to the mount part 300 via screwing the fixing cleat 320. The fixing cleat 320 tightens the cleat part 301 and the mount 300 in attachment and fixes those to each other. The cleat part 301 and the mount part 300 may be detached by unscrewing the fixing cleat 320.

The cleat part 301 is arranged to be attached so that the joint part recesses 3003, 3003 of the mount part 300 (or a sole) unite with the corresponding protrusions 3013, 3014 of the cleat part 301. Recesses and protrusions form counterparts, which enable correct placement of a cleat part in relation to a mount. The counterparts of the mount and the cleat part hold the parts in correct places in relation to each other. For example the counterparts enable maintaining the placement and orientation of the mount and cleat part during use of a shoe. The counterparts avoid displacement of the parts in view of each other, or incorrect placement or orientation of the cleat part in view of the mount. The cleat part is connected to the mount during turning of the cleat part. Temporary fixing is implemented via fixing part. The cleat part is turnable horizontally around the fixing part. The fixing part is situated at a mid-point of a symmetrical cleat part and at the corresponding mid-point of a similarly symmetrical mount, or at a turning point of a non-symmetric cleat part. The cleat part may be totally separated from the sole, for example for cleaning or changing a different cleat part. The symmetry of the parts refers to their peripheral dimensions, and/or areal shape and size, and/or size and shape of the cleat part and mount surfaces arranged to be merged next to each other.

Figure 3b illustrates a side view of a cleat part according to an embodiment of the invention. The cleat part 301 is fixed next to a mount part 300. Recesses of the mount part 300 include the protrusions of the cleat part 301. The cleat part has an edge portion 30, which is surrounding the periphery or

edge of the mount 300 in the fixed position. In an alternative embodiment of the Figures 3c and 3d the mount part comprises an edge portion surrounding periphery of the cleat part in the fixed portion. The edge portions 30 are possible, but not necessary. A cleat part detachably attachable to a sole may comprise no edge parts different from the base, or the edge parts may be slightly angled or thinned in order to conform the sole surface, when attached next to it. The cleat part 301 and the mount 300 are detachably attached to each other via fixing cleat 320. In the embodiment of the Figure 3b the fixing cleat is arranged to enter to a sole part of a shoe, beyond a possible mount 300. The fixing cleat 320 may comprise threads or extensions, which are arranged to elongate under the mount 300, in an angled way, and attach the cleat part 301 to the mount 300. The latter kind of fixing cleat is kind of a rivet. The extensions may extend substantially rectangular from the direction of the fixing cleat. The fixing cleat 320 is arranged to go through the cleat part 301 perpendicular to its base surface, to a mount surface 300 in the Figure 3d, and through the mount 300 surface, perpendicular to it, in the Figure 3b. Thus the sole surface (or its mount surface) and the cleat part surface are arranged parallel next to each other, in touch. The extensions of fixing part are flexible so that the cleat part 301 is detachable from the mount 300. The cleat part 301 may be detached from the mount 300 by drawing the fixing cleat away from the base of the cleat part 301, or by screwing. In another embodiment a fixing means may comprise, in addition or alternatively, a spring. The spring comprising a spring force is arranged to pull the mount 300 and the cleat part 301 towards and next to each other. Thus the fixing and attaching the parts is arranged via the spring. The cleat part 301 may be detached from the mount 300. When force pulling the parts away from each other exceeds the spring force, the cleat part 301 is drawn away from the mount 300. When drawn away, while still connected to the mount 300 via the spring, the cleat part 301 may be turned in a desired position among possible positions. Then the spring force is enabled to draw the cleat part 301 next to and in touch with the mount 300. An embodiment having a spring may comprise a cleat for gripping on the cleat surface of the cleat part. The cleat for gripping may oppose the spring in the cleat part 301. The cleat for gripping may be used for gripping, when detaching the cleat part 301 from the mount 300. Fixing cleat may comprise small protrusions or lips via which the parts may be detachably snap-fitted to each other. Fixing cleat may

comprise means having intersection of attach/detach positions. Fixing cleat may comprise means with threads, like a screw(s). Fixing cleat may comprise spring for detachably attaching a cleat part from a sole.

Figure 3c illustrates a side view of a cleat part according to an embodiment of the invention. Figure 3d illustrates the same in attached position. The cleat part 301 and the mount part 300 are detachably attached to each other via fixing means 320. The mount 300 comprises edge portion 30 arranged to surround the cleat part 301 in the attached position. The fixing means comprises screw 320. The screw 320 passes on the level of the mount, but does not penetrate beneath it, to a sole part of a shoe. Possible positions and orientation of the cleat part 301 in relation to the sole are determined via joint parts of the sole and the corresponding joint counterparts of the cleat part. It is possible that cleat part and a mount comprise corresponding shapes and sizes of their areas arranged next to each other. Possible positions and orientations of the cleat part 301 in relation to the sole are determined by recesses or hollows in one of those and the corresponding protrusions in the other, which from counterparts when placing and attaching the parts to each other.

Figure 4 illustrates a sole of a sport shoe according to an embodiment of the invention. The sole 400 comprises three cleat parts 401, 402, 403. The cleat part 401 on the heel portion of the sole 402 comprises four cleats 4011, 4012, 4013, 4014 and a fixing cleat 4015. The fixing cleat 4015 is in the middle portion of the cleat part 401. The cleat 401 is arranged to be turnable horizontally around the fixing part 4015. The cleat part 401 is turnable so that height direction of the cleats remains the same, being elongating from the sole. The cleat part 401 has form of a rounded square. Thus the form is symmetric. Depending on the protrusions or recesses of the cleat part 401 and the corresponding counterparts of the corresponding sole 400, below the cleat part 401, the symmetric cleat part 401 may be turnable 90° or 180° at a time. The cleats 4011, 4012, 4013, 4014 have from of a rectangle extending from the base of the cleat part 401, and as attached, from the sole 400. The cleats 4011, 4012 at the approximately same level or placement along the longitudinal dimension of the sole 402 have the same height from the base of the cleat part 401. The cleats 4013, 4014 in the same level or placement

along the longitudinal dimension of the sole 402 have the same height from the base of the cleat part 401 or from the sole 3402. The height of the cleats 4013, 4014 is different form the height of the cleats 4011, 4012.

In the embodiments, the difference between the cleat heights maybe 2-10 mm, preferably 4-7 mm, for example 5 mm.

The cleats of the cleat part 401 are arranged in two pairs. A pair of the cleats is approximately at the same longitudinal level of the sole, but at a different horizontal level of the sole, when the cleat part 401 is arranged to the sole 400 of a shoe. A pair of the cleats comprises same height, or distance from the base of the cleat part 401. The pair of the cleats comprises distance from the base of the cleat part 401, which is different than the corresponding distance of the other pair of the cleats of the same cleat part 401. The cleat part 401 is attachable to the sole of a sport shoe so that pair of cleats of the same height are arranged at a substantially same place in the longitudinal direction of a sole. Substantially same line refers to closely or approximately same line, or same line in the context and dimensions of cleats, not necessarily exactly the same line. For example, some difference in millimetre scale may occur.

In addition or alternatively the sole may comprise another cleat part 402 as illustrated in the figure 4. The cleat part 403 is arranged on the fore foot portion of the sole 400. The cleat part 402 comprises two cleats 4021, 4022, and a fixing cleat 4023. The fixing cleat 4023 is in the middle portion of the cleat part 402. The fixing cleat 4023 is typically shortest of the cleats of the cleat part 402. The fixing cleat 4023 has form of V, which elongates from the cleat part 402 and/or from the sole 400. The cleat 4023 may be handy to use and easy to grip and turn in order to attach and detach the cleat part 402. The cleat 402 is arranged to be turnable horizontally around the fixing part 4023. The cleat part 402 has form of a rounded rectangle. Thus the form is symmetric. Depending on the protrusions or recesses of the cleat part 402 and the corresponding counterparts of the sole 400 below the cleat part 402, the symmetric cleat part 402 may be turnable 180° at a time. The cleats 4021, 4022 have from of a rectangle extending from the base of the cleat part 402 and/or from the mount and/or from the sole 400 accordingly. The cleats

4021, 4022 at a different level or placement along the longitudinal dimension of the sole 400. The height of the cleat 4023 is different form the height of the cleas 4021, 4022. The cleat part 402 is attachable to the sole of a sport shoe so that the cleats 4021, 4022 are at the places shown in the Figure 4, or so that the cleats change places so the cleat 4021 replaces the placement of the cleat 4022 and vice versa. Alternatively the placement of the cleats may differ in the cross dimension of the sole so that turning a detachable cleat 180° around its mid-point leads to cleats changing orientation in the longitudinal direction of the sole, and correspondingly different placement of the cleats in a cross direction. For example, the cleats may not be in the same longitudinal line of a cleat part, which is parallel with the longitudinal dimension of the sole.

In addition or alternatively the sole 400 may comprise another cleat part 403 as illustrated in the figure 4. The cleat part 403 on the fore foot portion of the sole 400 comprises four cleats 4041, 4042, 4043, 4044 and a fixing cleat 4045. The fixing cleat 4045 is in the middle portion of the cleat part 403. The cleat 403 is arranged to be turnable around the fixing part 4045. The fixing part 4045 has form of three sides extending from a common mid-point at the same distance and at the same angle from each other. The fixing part 4045 may form a cleat of the sole 400. The fixing part 4045 may be easy to grip, turn and use. The cleat part 403 has form of a rounded square. The cleat part 403 is arranged in slanted manner in relation to the sole 400. The cleat part 403 may have its two opposing corners along or approximately along a longitudinal line of the sole 400. The form of the cleat part 403 is symmetric. Depending on the protrusions or recesses or alike joint parts of the cleat part 403 and the corresponding counterparts of the corresponding mount in the sole 400 below the cleat part 403, the symmetric cleat part 403 may be turnable 90° or 180° at a time. The cleats 4041, 4042 have form of a V extending from the base of the cleat part 403. The cleats 4043, 4044 have from of a curved rectangle extending from the base of the cleat part 403. The cleats 4044, 4012 are approximately at the same level or placement along the longitudinal dimension of the sole 400. The cleats 4041 and 4043 are in different level or placement along the longitudinal dimension of the sole 400 compared to each other or to the other cleats 4044, 4042. The cleats 4044, 4042 have the same height from the base of the cleat part 403 or from the

mount or from the sole 400. The height of the cleats 4043, 4044 is different form the height of the cleats 4041, 4042..

The cleats of the cleat part 403 may be arranged in two pairs. A pair of the cleats is approximately at the same longitudinal level of the sole, when the cleat part 403 is arranged to the sole 400 of a shoe. The placement of the other two cleats comprising at least approximately similar form and height is different from each other and from the placement of the other two cleats in along the longitudinal dimension of the sole 400. The cleat part 403 is attachable to the sole according to recess and protrusion counter parts of the cleat part 403 and the mount part in the sole 400 below it. The cleat parts have changeable position so that the cleat part comprising cleats is detachable, turnable around fixing cleat 4045 and attachable to the mount part in a position or orientation different from its previous position for example 180˚.

Detaching a cleat part is enabled via a fixing means or a fixing cleat. The fixing cleat may comprise means for detaching cleat part from a sole, or from a mount so that the parts are not completely, but loosely detached, still in connection via the fixing part loosely. This kind of loose connection enables turning for changing placement of the cleats and remaining detached in the turned orientation without totally separating the parts from each other. This makes the change rapid and avoids losing a cleat part. Where for example a screw-like fixing means is utilized it is possible to totally separate the cleat part from the sole. This enables changing the cleat part to another, new one and/or cleaning the parts, their surfaces and counterparts, for example.

Figure 5a illustrates a cleat part according to an embodiment of the invention. The cleat part of the Figure 5a has oval shape, which is symmetrical around the fixing cleat 501. The cleat 503 has height from the base of the cleat part different from the height of the cleat 502. The cleat part may be turned horizontally around the fixing cleat 501 so that position of the cleats 502, 503 may be exchanged with each other, when detachably attached to a sole of a sport shoe. Shape of the cleats 502, 503 is similar, being rectangular, in the Figure 5a. The shapes of the cleats 502, 503 may be different.

Figure 5b illustrates a cleat part according to an embodiment of the invention. The cleat part of the Figure 5b has square shape with rounded corners, which corners are arranged to extend outward, while the middle portion of each side of the square is bent inwardly. Corner parts of the square shaped extensions form roundish protrusions. The cleat part of the Figure 5b is symmetrical around the fixing cleat 501. The cleat part is attachable to a similar shaped mount part. The cleats 504, 505, 506, 507 are arranged to corner zones of the cleat part of the Figure 5b. The cleats 504, 505 may form a pair having the same or closely similar height from the base of the cleat part. The cleats 506, 507 may form another pair having the same or closely similar height from the base of the cleat part, which height is different from the height of the other cleat pair 504, 505. The cleat part may be turned around the fixing cleat 501 so that position of the cleats pairs 504-505 and 506-507 may be exchanged with each other, when detachably attached to a sole of a sport shoe. Shape of the cleats 504, 505, 506, 507 may be similar, being triangle extending outward from the base of the cleat part in the Figure 5a. The shapes of the cleats 504, 505, 506, 507 or pairs of the cleats may be different from what is shown in the Figure 5a.

Figure 5c illustrates a cleat part according to an embodiment of the invention. The cleat part of the Figure 5c has rectangular shape with rounded corners and it comprises a thinner portion in the middle of its longer sides. The cleat part of the Figure 5c is symmetrical around the fixing cleat 501. The fixing cleat 501 has oval shape. The cleat 508 has a height from the base of the cleat part different from the height of the cleat 509. The cleat part may be turned around the fixing cleat 501 so that position of the cleats 508, 509 may be exchanged with each other, when detachably attached to a sole of a sport shoe. Shape of the cleats 508, 509 is similar, being rectangular in the Figure 5c. The shapes of the cleats 508, 509 may be different.

The cleats having changeable positions in the cleat parts of the Figures 5abc may be arranged symmetrically in relation to each other in view of the turning point. Alternatively the cleats having changeable positions may be in any position of the cleat parts, or in the cleat part surface area. The position of a cleat is changeable by changing orientation of the whole cleat part around its turning point horizontally, in relation to a sole of a shoe. Thus the changed

position of cleats may lead to cleats placed in a different places, for example in the cross direction of a sole, compared to the other position. In some embodiments the cleat part is turnable horizontally by less than 180° and attachable to the sole of the shoe. A round cleat part may be arranged in any allowed position in relation to a sole. The allowed position in this case are determined by unitable counterparts of the round cleat part and the receiving sole or mount.

In some embodiments the fixing cleat comprises round or cylindrical shape, extending from a sole. According to at least some embodiments the fixing cleat is different from a round or cylindrical shape. The fixing cleat may have form of rectangular, V, X or similar extending from the sole of the sport shoe or cleat part. This kind of fixing cleat part takes less space compare to a round fixing cleat. Further it provides good gripping for a user enabling changing use mode of the shoe or adapting to external conditions on the fly, for example during a game or play. The screwing fixing cleat provides a simple solution which enables separating the parts from each other for proper cleaning and keeping the parts connected while detaching those for changing the orientation. A fixing cleat according to embodiments may comprise gripping area or areas on its side surface, along its height. The gripping area may comprise surface structure or indentation, for example, which provides good traction and avoids slipping from fingers and/or gloves. A separate tension means, for example wrench or alike for setting fixing cleat, like a screw, may be used.

The joint parts and their counterparts may be formed of protrusion and recess pairs arranged to fit with each other. The joint parts and their counterparts have shapes and sized for compact fitting. The cleat part may comprise protrusions, which are arranged to attach to corresponding recesses of a sole. Further the sole part may comprise a groove with deeper recesses such that the counterpart protrusions of the cleat part may be moved around along the groove and be attached to a deeper recesses. A similar setting corresponding to groove and deeper recess(es) structure may be employed with alternate structures within the same scope.

The cleat part may be attached to a sole of a sport shoe. According to other embodiment a sole comprises mount(s) having joint parts for receiving corresponding joint parts, or counterparts, of a cleat part. A mount may be made of same or similar materials than the cleat part and/or the sole. The mount may be fixedly attached to the sole of the sport shoe. The mount may be integral part of the sport shoe, for example manufactured at the same phase with the sole, using the same or similar materials. The mount may comprise a size from 2x2 cm to 12x12 cm. The size need not be square, but for example dimensions 5.5x7.8 are possible. Height of the mount may differ between 0.1-10 mm, for example. The mount may comprise edges extending slightly outward, for example 0.5-5 mm, for receiving the cleat part of corresponding size and form inside the outwardly extending edges. Alternatively the mount may be arranged inside the outwardly extending edges of the cleat part of the corresponding size and form.

The mount or sole arranged to receive a cleat part comprises joint part, for example holes, for receiving corresponding joint parts, for example protrusions, of the cleat part. When the cleat part is placed to the sole, protrusions of the cleat part are placed on the corresponding holes of the sole. Sizes of the joint parts are similar to enable tight fitting of the cleat part to the sole. The holes or recesses have similar or the same shape with the protrusions. The protrusions are configured to fit to the holes. Edges of the holes are arranged to conform external shape and size of the protrusions. Alternatively, a cleat part may comprise holes and the counterpart forms, like protrusions, may be comprised in a sole. Other forms of joint parts are possible without departing from the scope.

A cleat part and possible mount may comprise different external shapes, like rectangular, oval, round, or any suitable form. The cleat part is symmetrically turnable 180° around its turning point, which may correspond to situation of the fixing means. According to an embodiment, the forms of the cleat part and the corresponding mount are similar, conforming with each other. In the embodiments, joint parts of the cleat part and the corresponding counterparts are arranged to have corresponding shapes, conforming with each other and to be fittable with each other. This enables tight joint between the detachably attachable parts. Edge parts and other conforming parts, like holes and

corresponding protrusions, may have different forms. Instead of a thru hole, a recess may be employed. The conforming parts and/or portions, like grooves between the joint parts, may enhance placing the cleat part to its counterpart mount correctly. On the other hand, the conforming parts and/or portions may prevent wrong placement of a cleat part to the mount. The joint parts may be used to maintain the attached cleat part and mount together. For example, elastic parts may be fitted to join tightly to each other via counterparts and/or portions.

The cleat part according to embodiments may be arranged on the heel portion of a sole of a sport shoe. According to other embodiment cleat part may be arranged on fore foot part of the sole. In this embodiment, the longer cleats may be arranged on the end part (toe part) of the shoe in order to provide better traction. Alternatively, the longer cleats may be arranged closer to middle part of the fore foot. A single sole may comprise one, two or more cleat part(s) comprising cleats. In an embodiment two cleat parts are attachable to the sport shoe sole. In this embodiment, one cleat part is attachable to a mount in the heel part of the sole, and the other cleat part is attachable to a mount in the fore foot part of the sole. It is possible that additional fixed cleats are arranged on the sole. At least in one embodiment the at least two cleat parts form the cleats of the sport shoe. No other cleats exist.

According to embodiments the cleat part is attached in an inverted part of the sole such that in a first position of the cleat part external end surfaces of the cleats of different height form substantially even external surface for the sport shoe; and in a second position of the cleat part end surfaces of the longest cleats form an external surface for the sport shoe. The cleat part may be in inverted part of the sole. The height difference of the cleats of the cleat part is arranged to change height of the sole from the ground, when the cleat part is rotated horizontally to a different position. In the first position the cleats of the cleat part are at least close to same level from the even ground level. When the cleat part is rotated 180 degrees horizontally in view of the inverted sole part, only the highest cleat(s) touch the ground level. The shortest cleat(s) are arranged further form the ground level in the second position. The sole of

the shoe is higher from the ground level in the second position compared to the first position.

At least some/all embodiments provide easy and fast way to change a sport shoe appropriate for external circumstances and different use. Lifetime of a sport shoe is extended, since worn cleats are replaceable with less worn ones. Usability of a sport shoe is enhanced with the embodiments. Properties of a sport shoe may be changed. This reduces need of extra shoes, their supplies or essentials. Integral mount comprising cleats provides sustainable sole part without separate small parts and consideration of cooperation and fixing of those. Cleats of different height and changeable placement provide additional properties with a single part.

A shoe according to embodiments may be any sport shoe comprising cleats on its external sole. The cleat may provide traction. The embodiments maybe utilized in different sports, for example golf, rugby, baseball, American football, or alike. Advantageously a sport shoe is a football shoe.

The invention is not limited to the previously illustrated embodiments or examples. Obvious modifications may be made and different design options are possible within the scope of the following claims.

Claims:

1. A sport shoe comprising a sole and cleats,
   - wherein the cleats are integral part of a cleat part, which is detachably attached to the sole, **characterized** in that
   - the cleat part comprises at least two cleats having different height from the sole, and
   - the cleat part is attached in an inverted part of the sole such that in a first position of the cleat part external end surfaces of the cleats of different height form substantially even external surface for the sport shoe; and in a second position of the cleat part end surfaces of the longest cleats form an external surface for the sport shoe.

2. A sport shoe according to the claim 1, wherein the cleat part comprises at least one joint part for detachably attaching the cleat part to the sole, and optionally a joint part comprises a fixing cleat.

3. A sport shoe according to any of the preceding claims, wherein the sole comprises at least one joint part arranged to receive corresponding at least one joint counterpart of the cleat part for detachably attaching the cleat part.

4. A sport shoe according to any of the preceding claims, wherein the cleat part comprises two pairs of cleats, of which one pair have height from the sole different from the height of the other pair from the sole.

5. A sport shoe according to any of the preceding claims, wherein the sole comprises a mount comprising at least one joint part for detachably attaching the cleat part in at least one of a heel portion and a fore foot portion.

6. A sport shoe according to any of the preceding claims, wherein the cleats having different height from the sole are arranged in different places along the longitudinal dimension of the sole.

7. A sport shoe according to any of the preceding claims, wherein the cleat part is detachably attachable to the sole in at least two different positions.

8. A sport shoe according to any of the preceding claims, wherein the cleat part is detachably attachable to the sole in different positions, wherein the positions having horizontally turned shift of 90° or 180° between them around a turning point of the cleat part.

9. A cleat part for a sport shoe, comprising integral base portion and at least two cleats, **characterized** in that the at least two cleats have different height from the base, and the cleat part is detachably attachable to an inverted part of a sole of a sport shoe, such that in a first position of the cleat part external end surfaces of the cleats of different height form substantially even external surface for the sport shoe; and in a second position of the cleat part end surfaces of the longest cleats form an external surface for the sport shoe.

10. A cleat part for a sport shoe according to the claim 9, wherein the cleat part comprises two pairs of cleats, of which one pair has height from the base portion of the cleat part different from the height of other pair from the base portion of the cleat part.

11. A cleat part for a sport shoe according to any of the claims 9-10, wherein the cleat part further comprises at least one joint part for detachably attaching and detaching the cleat part to/from a sole of the sport shoe.

12. A cleat part for a sport shoe according to any of the claims 9-11, wherein the cleats are made integrally with the cleat part, and/or wherein the cleat part and the cleats are made of the same material.

13. A sport shoe according to any of the claims 1-8, comprising in its external sole at least one joint part, to which sole the cleat part is detachably attachable, the cleat part having two opposing surfaces, the cleat part comprising at least two cleats on one surface and on the opposing surface at least one joint part to be detachably attachable as a counterpart to the joint portion of the sole.

14. A sport shoe according to claim 13, wherein the cleat part is arranged to have at least two changeable positions in which it is detachably attachable to the sole or to the mount of the sole.

15. A sport shoe according to any of the claims 13-14, wherein the sole or a mount comprises a counterpart for fixing means arranged to receive fixing means for detachably attaching the cleat part to the sole or to the mount, correspondingly.

Fig.1

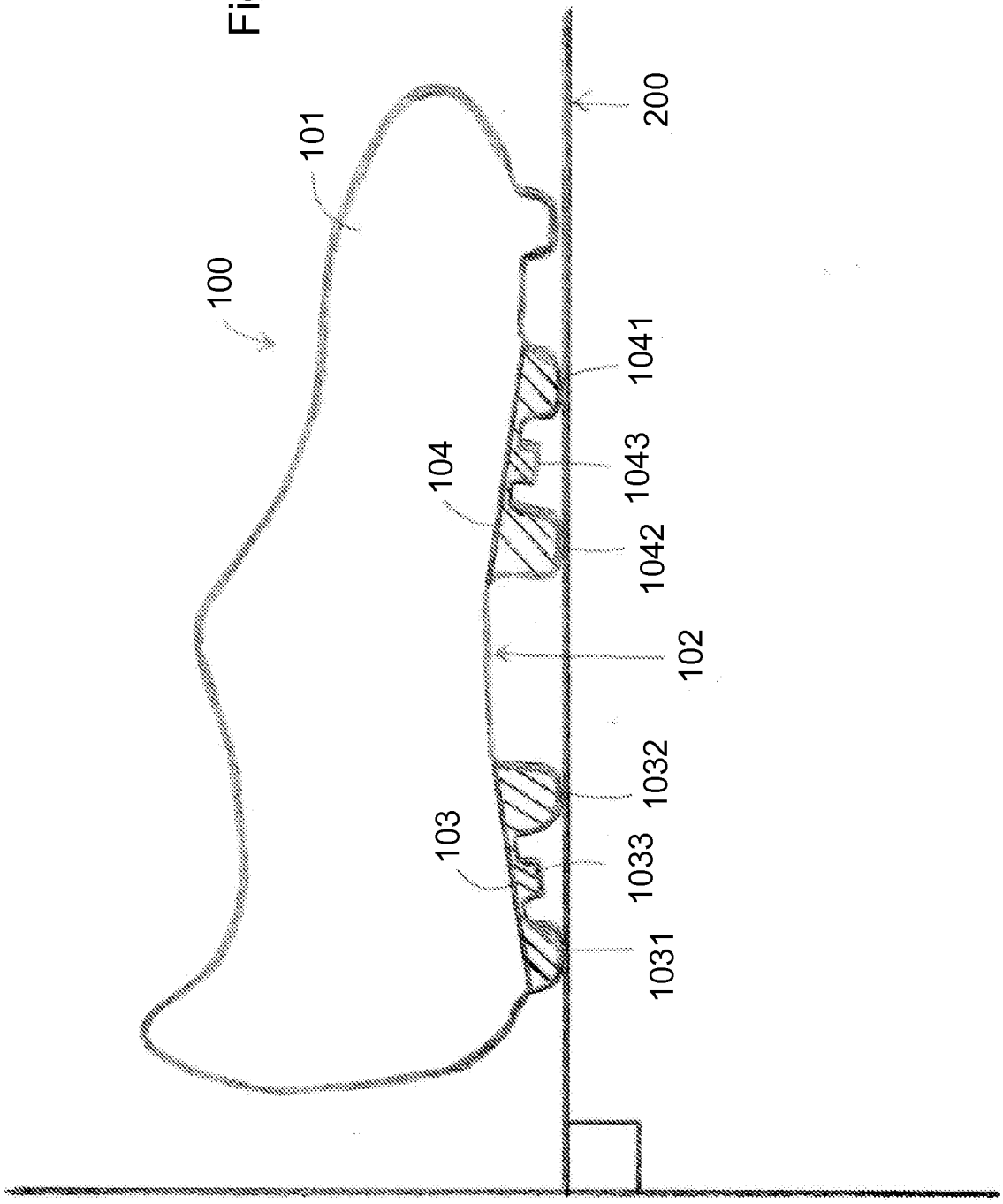
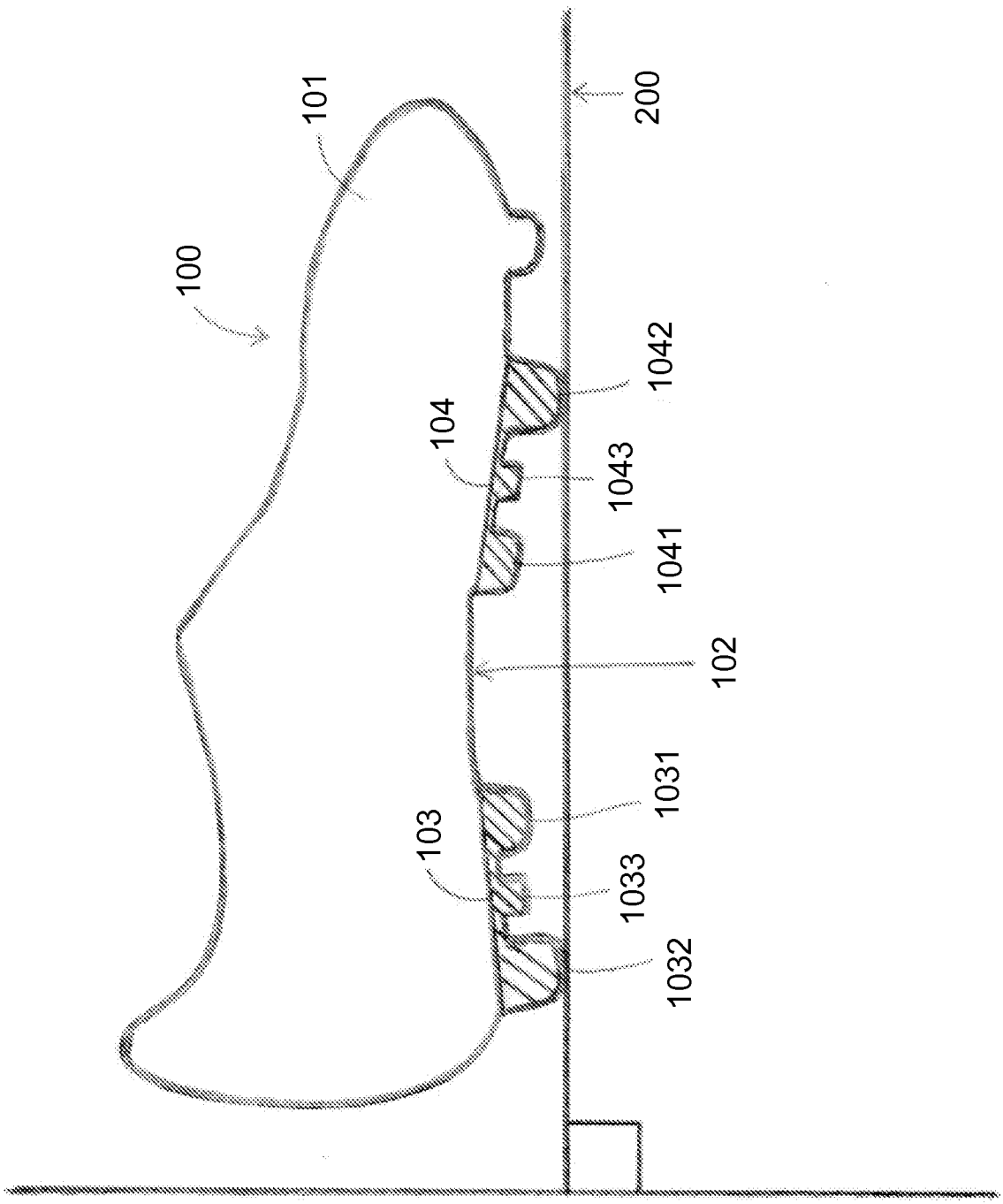


Fig. 2



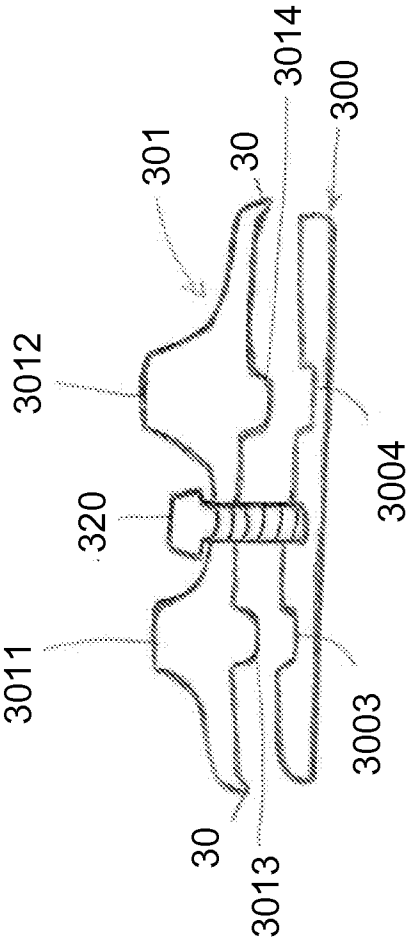



Fig. 3a

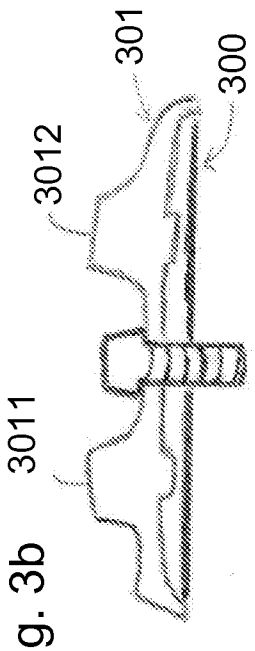



Fig. 3b

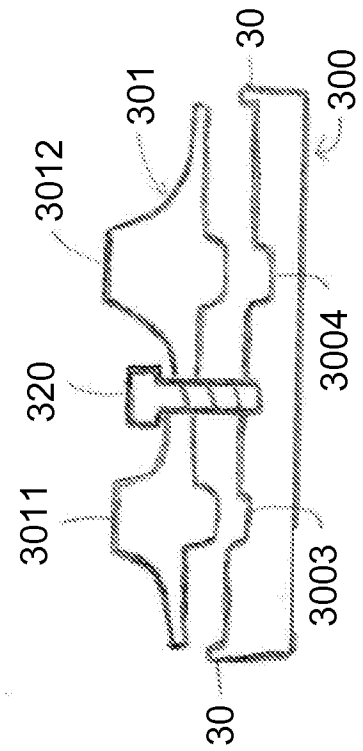



Fig. 3c

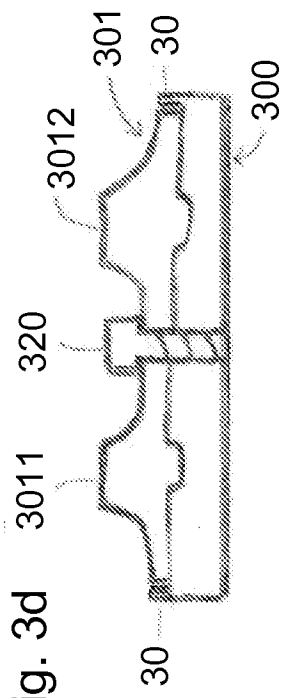
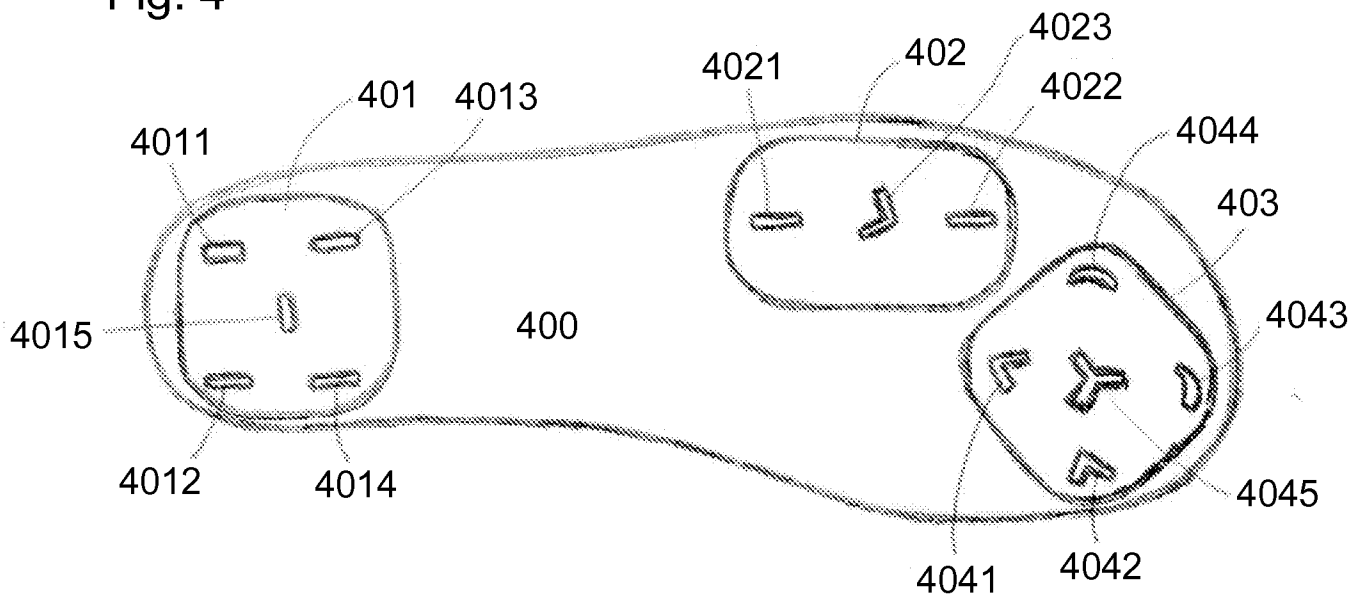



Fig. 3d

Fig. 4



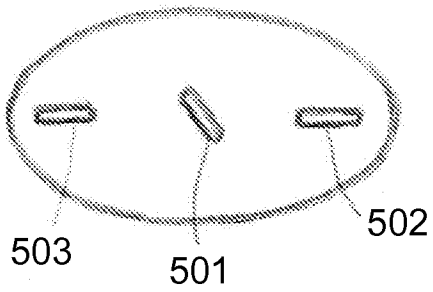




Fig. 5a

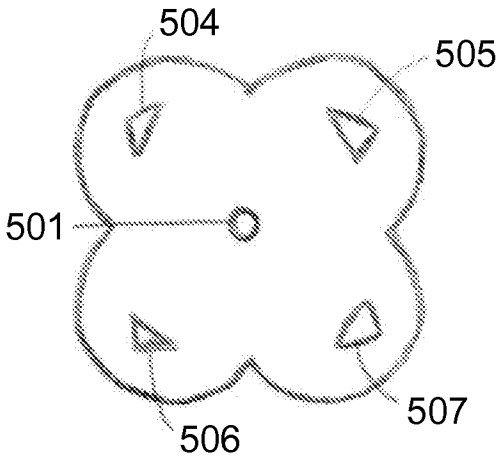



Fig. 5b

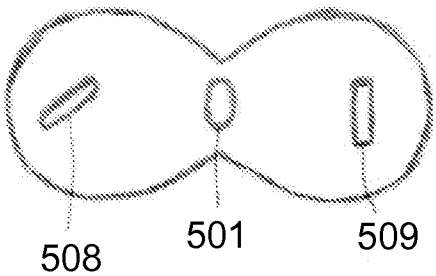



Fig. 5c

**INTERNATIONAL SEARCH REPORT**

International application No.
PCT/FI2015/050276

A. **CLASSIFICATION OF SUBJECT MATTER**

See extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A43B, A43C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

FI, SE, NO, DK

Electronic data base consulted during the international search (name of data base, and, where practicable, search terms used)

EPO-Internal, WPI, COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| A | EP 1505889 B1 (SOFTSPIKES LLC [US])<br>22 November 2006 (22.11.2006)<br>paragraphs [0001], [0010]-[0012], [0014]-[0017], [0023]-[0025], [0030]-[0033]; claims 1-4, 6-9, 11; figures 1-6 | 1-15 |
| A | WO 2006017200 A2 (CLEATS LLC [US]) 16 February 2006 (16.02.2006)<br>page 1, line 22 – page 2, line 25; page 4, line 23 – page 6, line 10; figures 2A-2C, 3A, 3B | 1-15 |
| A | US 6338208 B1 (WATERBURY MARK C [US])<br>15 January 2002 (15.01.2002)<br>figures 1-4; claims 1-3, 13 | 1-15 |
| A | US 2011047834 A1 (BAKER BRIAN D [US] et al.)<br>03 March 2011 (03.03.2011)<br>paragraphs [0009]-[0012], [0022]-[0025], [0041]; figures 1-4 | 1-15 |

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

| | | | |
|---|---|---|---|
| * | Special categories of cited documents: | "T" | later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention |
| "A" | document defining the general state of the art which is not considered to be of particular relevance | "X" | document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone |
| "E" | earlier application or patent but published on or after the international filing date | "Y" | document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art |
| "L" | document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) | "&" | document member of the same patent family |
| "O" | document referring to an oral disclosure, use, exhibition or other means | | |
| "P" | document published prior to the international filing date but later than the priority date claimed | | |

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 26 August 2015 (26.08.2015) | 28 August 2015 (28.08.2015) |

| Name and mailing address of the ISA/FI | Authorized officer |
|---|---|
| Finnish Patent and Registration Office<br>P.O. Box 1160, FI-00101 HELSINKI, Finland | Auli Rainio |
| Facsimile No. +358 9 6939 5328 | Telephone No. +358 9 6939 500 |

**INTERNATIONAL SEARCH REPORT**

International application No.
PCT/FI2015/050276

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| A | US 3442033 A (HILBURN GLENN E JR) 06 May 1969 (06.05.1969) | 1-15 |
| A | US 2012260534 A1 (GUER JEAN LUC [FR]) 18 October 2012 (18.10.2012) | 1-15 |
| P, X | Sport Fountain, Inverted Sole YouTube video [online]. Published 15.06.2014 [Retrieved 20.08.2014], <URL https://www.youtube.com/watch?v=skjzQfBGI04> | 1, 2, 4, 6-12 |

**INTERNATIONAL SEARCH REPORT**
**Information on Patent Family Members**

International application No.
PCT/FI2015/050276

| Patent document cited in search report | Publication date | Patent family members(s) | Publication date |
|---|---|---|---|
| EP 1505889 B1 | 22/11/2006 | EP 1505889 B1 | 22/11/2006 |
| | | AT 345710 T | 15/12/2006 |
| | | AU 2003259231 A1 | 19/03/2004 |
| | | CA 2495994 A1 | 11/03/2004 |
| | | CA 2495994 C | 07/07/2009 |
| | | DE 60309861 D1 | 04/01/2007 |
| | | JP 2005532142 A | 27/10/2005 |
| | | JP 4116621 B2 | 09/07/2008 |
| | | US 2004040182 A1 | 04/03/2004 |
| | | US 6834446 B2 | 28/12/2004 |
| | | US 2005108902 A1 | 26/05/2005 |
| | | WO 2004019718 A1 | 11/03/2004 |
| WO 2006017200 A2 | 16/02/2006 | AU 2005271918 A1 | 16/02/2006 |
| | | AU 2005271918 B2 | 12/08/2010 |
| | | CA 2572749 A1 | 16/02/2006 |
| | | CN 101048086 A | 03/10/2007 |
| | | CN 100525666 C | 12/08/2009 |
| | | EP 1778041 A2 | 02/05/2007 |
| | | JP 2008505727 A | 28/02/2008 |
| | | US 2006090373 A1 | 04/05/2006 |
| | | US 7654013 B2 | 02/02/2010 |
| | | US 2010064553 A1 | 18/03/2010 |
| | | US 8510974 B2 | 20/08/2013 |
| | | US 2013298424 A1 | 14/11/2013 |
| | | US 9049903 B2 | 09/06/2015 |
| US 6338208 B1 | 15/01/2002 | None | |
| US 2011047834 A1 | 03/03/2011 | US 8286371 B2 | 16/10/2012 |
| | | WO 2011028566 A1 | 10/03/2011 |
| US 3442033 A | 06/05/1969 | None | |
| US 2012260534 A1 | 18/10/2012 | EP 2434918 A1 | 04/04/2012 |
| | | FR 2945917 A1 | 03/12/2010 |
| | | FR 2945917 B1 | 15/07/2011 |
| | | WO 2010136607 A1 | 02/12/2010 |

**INTERNATIONAL SEARCH REPORT**

International application No.
PCT/FI2015/050276

CLASSIFICATION OF SUBJECT MATTER

IPC
***A43B 5/00*** (2006.01)
***A43B 13/26*** (2006.01)
***A43B 13/36*** (2006.01)
***A43C 15/02*** (2006.01)
***A43C 15/16*** (2006.01)