(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 127 448 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
08.02.2017 Bulletin 2017/06

(21) Application number: **14888343.2**

(22) Date of filing: **31.03.2014**

(51) Int Cl.:
A43B 23/02 *(2006.01)* ***A43B 7/14*** *(2006.01)*

(86) International application number:
PCT/JP2014/059541

(87) International publication number:
WO 2015/151195 (08.10.2015 Gazette 2015/40)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

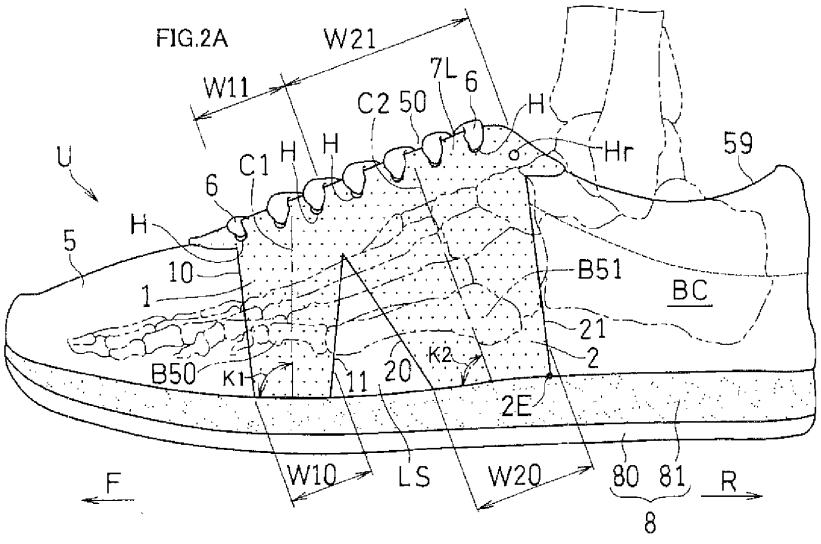
(71) Applicant: **ASICS Corporation**
Kobe-shi, Hyogo 650-8555 (JP)

(72) Inventors:
- **NONOGAWA, Mai**
  Kobe-shi
  Hyogo 650-8555 (JP)
- **ISOBE, Masashi**
  Kobe-shi
  Hyogo 650-8555 (JP)

(74) Representative: **Schwabe - Sandmair - Marx**
Patentanwälte Rechtsanwalt Partnerschaft mbB
Joseph-Wild-Straße 20
81829 München (DE)

(54) SHOE UPPER

(57) An upper including: a reinforcement member on a medial or a lateral side being provided, the reinforcement member being less stretchable than a member forming a sock and extending from a medial or lateral eyelet stay to a sole while being attached to a medial or lateral side surface of the sock, the lateral reinforcement member including a first reinforcement portion covering a fifth proximal phalanx from a side surface, and a second reinforcement portion covering a shaft or a base of a fifth metatarsal bone from a side surface, the medial reinforcement member including a third reinforcement portion covering a ball of a big toe from a side surface, and a width of at least one of the reinforcement portions being smaller at a lower end portion thereof than at an upper end portion thereof.



EP 3 127 448 A1

(Cont. next page)

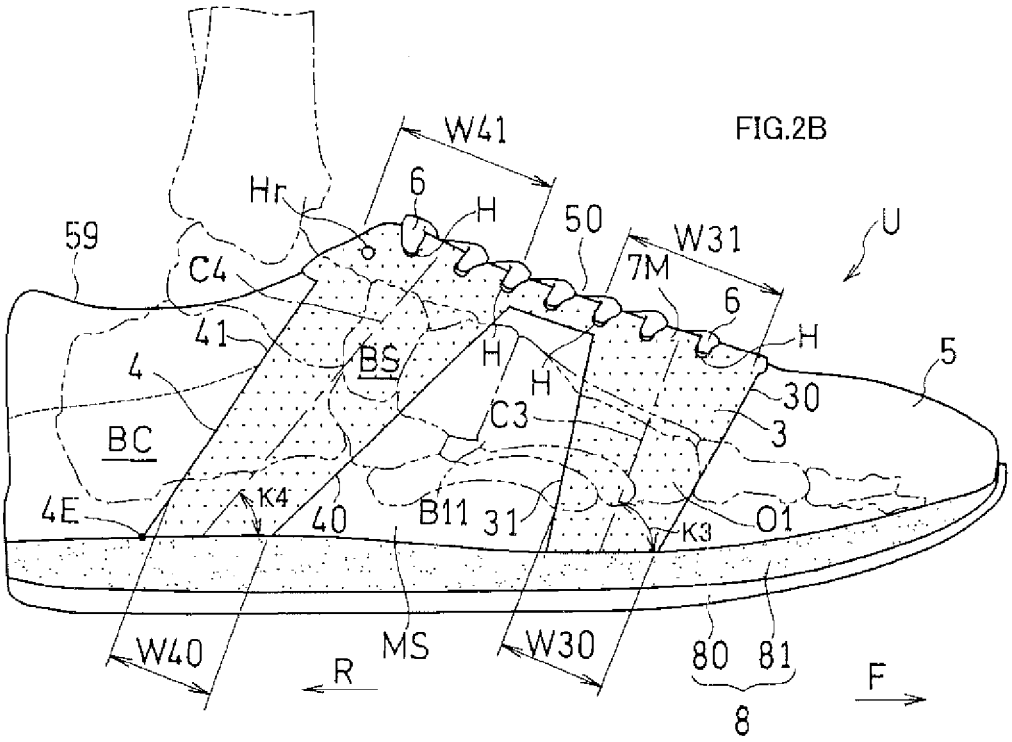

W41
Hr
6
H
50
W31
U
59
C4
7M
6
41
BS
H
H
H
5
4
30
C3
3
BC
K4
4E
40
B11
31
K3
O1
W40
MS
W30
80
81
R
F
8

FIG.2B

Description

Technical Field

[0001] The present invention relates to improvement of an upper of a shoe.

Background Art

[0002] A shoe is required to achieve various functions such as lightweight properties and comfortable touch with a foot in addition to a fit (fitting property) at the time of wearing of the shoe. In consideration of comfortable touch with a foot, many uppers are made of a soft material such as a mesh. An upper made of a soft material such as a mesh, specifically, an upper made of a low-rigidity material cannot distribute tightening force generated during fastening with a lace or a belt (belts), etc. throughout the upper, making it difficult to achieve a fit.

[0003] To enhance the fit of the low-rigidity upper, the upper should be reinforced using a material of higher rigidity to transmit tightening (securing) force to be generated throughout the upper. Some of shoes having been commercially available so far are provided with high-rigidity reinforcement members placed at uppers in consideration of transmission of tightening force. In many cases, however, lightweight properties or a fit is damaged in a manner that depends on the shape or volume of a reinforcement member.

Citation List

Patent Literature

[0004]

The first patent document: WO 2001/082735 (front page)
The second patent document: JP 2003-24108A (front page)
The third patent document: JP 02-5903A (FIG. 1)
The fourth patent document: JP 11-201 (front page)
The fifth patent document: JP 60-227701 (FIGS. 1 and 2)

Summary of Invention

[0005] To enhance a fit (fitting property) at the time of wearing of a shoe, tightening force generated during fastening of the shoe with a fastening member such as a shoelace or a belt should be distributed throughput an upper, and/or an upper should conform to a foot shape of a wearer.

[0006] A conventional shoe includes many reinforcement members for transmitting tightening force to be generated during fastening with a shoelace or a belt, etc. throughout an upper, failing (making it unlikely) to achieve lightweight properties. In addition, a reinforcement member extending in a vertical direction of the upper has a width at the lower end thereof on the sole side same as or larger than a width at the upper end thereof. This makes it difficult for the reinforcement member to deform freely when a wearer fastens the upper with a shoelace or a belt, etc., making it difficult for the upper to achieve a fit with the shape of a foot of the wearer.

[0007] It is therefore an object of the present invention to provide an upper of a shoe capable of contributing to weight reduction and enhancement of a fit.

[0008] According to one aspect, an upper of a shoe of the present invention includes:

a sock 5;
a lateral edge portion 7L and a medial edge portion 7M placed respectively on a lateral edge 5E and a medial edge 5E of an opening 50 of the sock 5, the lateral and medial edge portions 7L and 7M being less stretchable (harder to stretch) than a member forming the sock 5, and defining a plurality of holes H through which a shoelace 6 passes;
at least one reinforcement member on a lateral side L, the at least one reinforcement member being less stretchable than the member forming the sock 5 and extending from the lateral edge portion 7L to a sole 8 or a heel counter 9 while being attached to a lateral-side surface of the sock 5; and
at least one reinforcement member on a medial side M, the at least one reinforcement member on the medial side M being less stretchable than the member forming the sock 5 and extending from the medial edge portion 7M to the sole 8 or the heel counter 9 while being attached to a medial side surface of the sock 5, wherein:

the at least one reinforcement member on the lateral side L includes
a first reinforcement portion 1 covering at least a portion of a fifth proximal phalanx B50 from a side surface and
a second reinforcement portion 2 covering at least a portion of a shaft or a base of a fifth metatarsal bone B51 from the side surface;

the at least one reinforcement member on the medial side M includes a third reinforcement portion 3 covering at least a portion of a ball O1 of a big toe from a side surface; and
a width of at least one of the plurality of the reinforcement portions (the first, second, and third reinforcement portions) is smaller at a lower end portion thereof (of one reinforcement portion) than at an upper end portion thereof (of the one reinforcement portion).

[0009] According to the present invention, the recitation "the at least one reinforcement member on the lateral side L includes a first reinforcement portion 1 and a sec-

ond reinforcement portion 2" covers a case where "the at least one reinforcement member includes both the first and second reinforcement portions" and a case where "the at least one reinforcement member includes the first reinforcement portion and the other at least one reinforcement member, different from the former (aforementioned) reinforcement member, includes the second reinforcement portion," for example.

[0010] According to the present invention, the width of the at least one reinforcement portion is smaller at the lower end portion thereof than at the upper end portion thereof. The reinforcement member extending from an upper edge of the upper to a sole or a heel counter will function to distribute the force of a shoelace acting on an eyelet stay (decoration) 7L and an eyelet stay (decoration) 7M throughout the upper. The width of the reinforcement portion being smaller at the lower end portion thereof than at the upper end portion thereof means that the width of the reinforcement portion restrained by the sole or the heel counter is small. This will allow the reinforcement portion to deform relatively freely.

[0011] Thus, the upper achieves a fit with a foot shape of a wearer easily. Further, the reinforcement member is placed at a minimum required site such as at least a portion of a fifth proximal phalanx, a fifth metatarsal bone, or a ball of a big toe. As a result, the area of the reinforcement member is reduced and this will contribute to weight reduction.

[0012] The first reinforcement portion 1 covers a fifth proximal phalanx B50 and the second reinforcement portion 2 covers a shaft and/or a base of a fifth metatarsal bone B51. In this way, the upper supports the lateral side of a foot efficiently using the small reinforcement member and achieves a fit with (in) the lateral side of the foot easily. Further, the area of the reinforcement member is reduced and this will contribute to weight reduction.

[0013] Meanwhile, the third reinforcement portion 3 covers a side surface of a ball O1 of a big toe. In this way, the medial side of a foot is supported efficiently using the small reinforcement member, and a fit with (in) the medial side of the foot is achieved easily. Further, the area of the reinforcement member is reduced and this will contribute to weight reduction.

[0014] According to a different (another) aspect, the upper of a shoe of the present invention includes:

a sock 5; a lateral edge portion 7L and a medial edge portion 7M each placed on an edge 5E near a center of the sock 5 in a foot width direction (a direction of a foot breadth), the lateral and medial edge portions 7L and 7M being less stretchable than a member forming the sock 5;

at least one reinforcement member on a lateral side L, the at least one reinforcement member being less stretchable than the member forming the sock 5 and extending from the lateral edge portion 7L to a sole 8 or a heel counter 9 while being attached to a lateral-side surface of the sock 5; and

at least one reinforcement member on a medial side M, the at least one reinforcement member on the medial side M being less stretchable than the member forming the sock 5 and extending from the medial edge portion 7M to the sole 8 or the heel counter 9 while being attached to a medial-side surface of the sock 5, wherein:

the at least one reinforcement member on the lateral side L includes

a first reinforcement portion 1 covering at least a portion of a fifth proximal phalanx B50 from a side surface and

a second reinforcement portion 2 covering at least a portion of a shaft or a base of a fifth metatarsal bone B51 from the side surface;

the at least one reinforcement member on the medial side M includes a third reinforcement portion 3 covering at least a portion of a ball O1 of a big toe from a side surface; and

a width of at least one of the plurality of reinforcement portions (the first, second, and third reinforcement portions) is smaller at a lower end portion thereof (of one reinforcement portion) than at an upper end portion thereof (of the one reinforcement portion).

[0015] This aspect may achieve effect comparable to the effect achieved by the aforementioned one aspect.

[0016] According to the aforementioned "different aspect," a fastening member including a shoelace may be provided. For example, a non-stretchable or stretchable belt (belts) member may be employed as the fastening member as well as the shoelace. If the belt member is employed, one, or two or more belts may be provided.

[0017] According to the present invention, if a shoe has a shoelace, the edge portions 7L and 7M may be formed of eyelet stays (decorations) or tubular loops, for example. If the upper of the shoe is fastened with a belt (belt) and is not fastened with a shoelace, the edge portions 7L and 7M can be formed by using a material same as or similar to that used for forming the reinforcement member and can be formed by using a material less stretchable than a material forming the sock 5.

[0018] Note that a base of each bone means a slightly bulging thick site near a posterior joint of the bone. This base is also called a proximal condyle. A head (condyle) of each bone means a slightly bulging thick site near an anterior joint of the bone and is also called a distal condyle. A shaft of each bone means a site between the base and the head (condyle) of the bone and generally has a smoothly changing thickness.

[0019] According to the present invention, the upper end portion of each reinforcement portion generally means an uppermost one-third portion of the reinforcement portion defined by equally dividing each reinforcement portion into three portions vertically. The lower end portion of each reinforcement portion generally means a

lowermost one-third portion of the reinforcement portion defined by equally dividing the reinforcement portion into three portions vertically.

[0020] According to the present invention, the "width of the reinforcement portion" can be read (understood) as a width in an alignment direction of the plurality of holes H in which these holes H through which the shoelace 6 passes are aligned smoothly in a line on the medial or lateral side.

[0021] On the other hand, in every case including alignment of the plurality of holes H in a staggered pattern on the medial or lateral side, the "width of the reinforcement portion" can be read as a width in a direction perpendicular to each of center lines C1 to C4 of the respective first to fourth reinforcement portions along a direction in which a corresponding reinforcement portion extends.

[0022] If a line along a front end (edge) or a rear end (edge) of each of the reinforcement portions 1 to 4 does not extend smoothly, for example, an average of the aforementioned uppermost one-third portions can be employed as the "width of the upper end portion of the reinforcement portion" whereas an average of the aforementioned lowermost one-third portions can be employed as the "width of the lower end portion of the reinforcement portion."

Brief Description of Drawings

[0023]

FIG. 1A is a lateral side view of a shoe showing a first embodiment of the present invention, and FIG. 1B is a medial side view of this shoe.

FIG. 2A is a lateral side view of a shoe showing a second embodiment of the present invention, and FIG. 2B is a medial side view of this shoe.

FIG. 3A is a lateral side view of a shoe showing a third embodiment of the present invention, and FIG. 3B is a medial side view of this shoe.

FIG. 4A is a lateral side view of a shoe showing a fourth embodiment of the present invention, and FIG. 4B is a medial side view of this shoe.

FIG. 5A is a lateral side view of a shoe showing a fifth embodiment of the present invention, and FIG. 5B is a medial side view of this shoe.

FIG. 6A is a lateral side view of a shoe showing a sixth embodiment of the present invention, and FIG. 6B is a medial side view of this shoe.

FIG. 7A is a lateral side view of a shoe showing a seventh embodiment of the present invention, and FIG. 7B is a medial side view of this shoe.

FIG. 8A is a lateral side view of a shoe showing an eighth embodiment of the present invention, and FIG. 8B is a medial side view of this shoe.

FIG. 9A is a lateral side view of a shoe showing a ninth embodiment of the present invention, and FIG. 9B is a medial side view of this shoe.

FIG. 10A is a lateral side view of a shoe showing a tenth embodiment of the present invention, and FIG. 10B is a medial side view of this shoe.

FIG. 11 is a schematic plan view of an upper showing a direction of tightening force acting in response to fastening with a shoelace.

FIG. 12A is a lateral side view of a show showing Comparative Example, FIG. 12B is a medial side view of this shoe, and FIG. 12C is a schematic sectional view of a shoe showing an evaluation method.

FIG. 13 is a bar graph showing evaluation result.

FIG. 14A is a lateral side view of a shoe showing an eleventh embodiment of the present invention, and FIG. 14B is a medial side view of this shoe.

Description of Embodiments

[0024] According to the one or the different aspect of the present invention, one of preferable embodiments described below can be employed or the following embodiments can be employed in combination. At least recitations in the dependent claims of the appended claims are also applicable to the different aspect.

[0025] For example, preferably, the at least one reinforcement member on the medial side further includes a fourth reinforcement portion 4 covering at least a portion of a navicular bone BS from the side surface, and
the fourth reinforcement portion 4 has a width, and a width W40 at a lower end portion of the fourth reinforcement portion 4 is smaller than a width W41 at an upper end portion of the fourth reinforcement portion 4.

[0026] In this case, the fourth reinforcement portion 4 covers the navicular bone BS. This allows the upper to achieve a fit with a middle foot section easily using the small reinforcement member. Further, the area of the reinforcement member is reduced and this will contribute to weight reduction. The width of the fourth reinforcement portion 4 being smaller at the lower end portion thereof than at the upper end portion thereof means that the width of the fourth reinforcement portion 4 restrained by a sole or a heel counter is small. This will allow the fourth reinforcement portion 4 to deform relatively freely. In this way, the upper will achieve a fit with a foot shape of a wearer easily.

[0027] Preferably, the upper comprises:

a lateral-side soft region LS, in which the member forming the sock 5 is exposed, defined between two virtual lines, the two virtual lines extended downwardly, one from a most anterior F one H of the plurality of holes H and another from a most posterior R one H of the plurality of holes H in the lateral edge portion 7L along the lateral-side surface and along a vertical plane; and

a medial-side soft region MS, in which the member forming the sock 5 is exposed, defined between two virtual lines, the two virtual lines extended downwardly, one from a most anterior F one H of the plurality of holes H and another from a most posterior

R one H of the plurality of holes H in the medial edge portion 7M along the lateral-side surface and along a vertical plane,

wherein an area of the medial-side soft region MS be larger than an area of the lateral-side soft region LS.

[0028] In this case, the medial-side soft region MS larger than the lateral-side soft region LS is provided on the medial side of a foot having a shape with irregularities (a concave and convex shape) more complex than those on the lateral side of the foot. This allows the upper to achieve a fit easily on the medial side. Meanwhile, even though the area of the lateral-side soft region LS is smaller than that on the medial side and an upper includes a large area of a reinforcement member on the lateral side, the upper will still achieve a fit with a foot on the lateral side of the foot, because the lateral-side foot has a shape with irregularities simpler than those on the medial side.

[0029] Preferably, a center line C4 of the fourth reinforcement portion 4 along a direction in which the fourth reinforcement portion 4 extends extends in a diagonally rearward and downward direction toward the sole 8, and an angle K4 formed between the center line C4 of the fourth reinforcement portion 4 and a horizontal line is smaller than an angle K1 formed between a center line C1 of the first reinforcement portion 1 along a direction in which the first reinforcement portion 1 extends and the horizontal line, and

the angle K4 is smaller than an angle K2 formed between a center line C2 of the second reinforcement portion along a direction in which the second reinforcement portion 2 extends and the horizontal line.

[0030] In this case, the fourth reinforcement portion 4 leans (tilts) largely in a posture more leaning forward than the first and second reinforcement portions 1 and 2. Specifically, the fourth reinforcement portion extends in a diagonally rearward and downward direction from a navicular bone BS. Thus, on the medial side of a foot having a more complex side-surface shape than the lateral side of the foot, fastening force of a shoelace or a belt, etc. is transmitted further rearward in an extended range. Specifically, the upper also achieves a fit easily in the extended rearward range on the medial side.

[0031] Preferably, a center line C3 of the third reinforcement portion 3 along a direction in which the third reinforcement portion 3 extends extends in a diagonally rearward and downward direction toward the sole 8.

[0032] In this case, the third reinforcement portion 3 is placed in a forward leaning (inclination) posture. This will allow the third reinforcement portion 3 to cover a base of a first proximal phalanx from above on the medial side of a forefoot section.

[0033] Preferably, the angle K4 formed between the center line C4 of the fourth reinforcement portion 4 and the horizontal line is smaller than an angle K3 formed between a center line C3 of the third reinforcement portion 3 along a direction in which the third reinforcement portion 3 extends and the horizontal line.

[0034] In this case, on the medial side of a foot, the fourth reinforcement portion 4 leans forward more largely than the third reinforcement portion 3. This places the lower end portion of the fourth reinforcement portion 4 in a posterior position to form the large soft region MS between the third and fourth reinforcement portions 3 and 4, with the large soft region MS covered with the sock. In this way, fastening force of a shoelace or a belt, etc. acts on the medial side of the foot having a complex shape.

[0035] Preferably, a line 41 along a rear end (edge) of the fourth reinforcement portion 4 is more tilting (leaning, inclining) forward than a line 21 along a rear end (edge) of the second reinforcement portion 2, and

a lower end 4E of the line 41 along the rear end of the fourth reinforcement portion 4 is placed posterior to a lower end 2E of the line 21 along the rear end of the second reinforcement portion 2, with the fourth reinforcement portion 4 covering a front portion of a lower portion of a calcaneal bone BC from a side surface.

[0036] Generally, a part (site) directly below a malleolus on the medial side M of a foot is necked (narrowed, constricted) subtly, compared to a counterpart on the lateral side L of the foot. A gap with the upper is likely to occur at this part. In the present case, the fourth reinforcement portion 4 largely leaning forward covers a front portion of a lower portion of a calcaneal bone BC. This will allow the upper to achieve a fit with the foot at the aforementioned part easily.

[0037] Preferably, an area of a medial-side soft region MS, in which the member forming the sock 5 is exposed, between the third reinforcement portion 3 and the fourth reinforcement portion 4 on the medial side surface is larger than an area of a lateral-side soft region LS, in which the member forming the sock 5 is exposed, between the first reinforcement portion 1 and the second reinforcement portion 2 on the lateral-side surface.

[0038] In this case, the medial-side soft region MS larger than the lateral-side soft region LS is provided on the medial side of a foot having a shape with irregularities more complex than those on the lateral side of the foot. This allows the upper to achieve a fit easily on the medial side. Meanwhile, even though the area of the lateral-side soft region LS is smaller than that on the medial side and an upper includes a large area of a reinforcement member on the lateral side, the upper will still achieve a fit with a foot on the lateral side of the foot, because the lateral-side foot has a shape with irregularities simpler than those on the medial side.

[0039] According to the present invention, the reinforcement member includes one or more reinforcement portions having lower end portions smaller than upper end portions thereof.

[0040] For example, the third reinforcement portion 3 has the width, and a width W30 of a lower end portion of the third reinforcement portion 3 is smaller than a width W31 of an upper end portion of the third reinforcement portion 3.

[0041] Alternatively, the second reinforcement portion 2 has the width, and a width W20 of a lower end portion of the second reinforcement portion 2 is smaller than a width W21 of an upper end portion of the second reinforcement portion 2.

[0042] Alternatively, the first reinforcement portion 1 has the width, and a width W10 of a lower end portion of the first reinforcement portion 1 is smaller than a width W11 of an upper end portion of the first reinforcement portion 1.

[0043] Two or more of these reinforcement portions may have widths of lower end portions thereof smaller than widths of upper end portions thereof.

[0044] Still preferably, the width of the third reinforcement portion 3 is smaller at a lower end portion of the third reinforcement portion than at an upper end portion of the third reinforcement portion,
the width of the second reinforcement portion 2 is smaller at a lower end portion of the second reinforcement portion than at an upper end portion of the second reinforcement portion, and
the width of the first reinforcement portion 1 is smaller at a lower end portion of the first reinforcement portion than at an upper end portion of the first reinforcement portion.

[0045] This will contribute to further enhancement of a fit of the upper and further weight reduction of the upper.

[0046] Still preferably, an area of a medial-side soft region MS, in which the member forming the sock 5 is exposed, between the third reinforcement portion 3 and the fourth reinforcement portion 4 on the medial-side surface is larger than an area of a lateral-side soft region LS, in which the member forming the sock 5 is exposed, between the first reinforcement portion 1 and the second reinforcement portion 2 on the lateral-side surface.

[0047] This will contribute to achieving the aforementioned effect optimally.

[0048] Preferably, a center line C4 of the fourth reinforcement portion 4 along a direction in which the fourth reinforcement portion 4 extends extends in a diagonally rearward and downward direction toward the sole 8,
an angle K4 formed between the center line C4 of the fourth reinforcement portion 4 and a horizontal line is smaller than an angle K1 formed between a center line C1 of the first reinforcement portion 1 along a direction in which the first reinforcement portion 1 extends and the horizontal line, and
the angle K4 is smaller than an angle K2 formed between a center line C2 of the second reinforcement portion 2 along a direction in which the second reinforcement portion 2 extends and the horizontal line;
a line 41 along a rear end (edge) of the fourth reinforcement portion 4 is more tilting (leaning, inclining) forward than a line 21 along a rear end (edge) of the second reinforcement portion 2;
a lower end 4E of the line along the rear end of the fourth reinforcement portion 4 is placed posterior to a lower end 2E of the line 21 along the rear end of the second reinforcement portion 2; and
the fourth reinforcement portion 4 covers a front portion of a lower portion of a calcaneal bone BC.

[0049] Preferably, the plurality of holes H in the upper includes four or more holes provided on each of a lateral side and a medial side of a foot, and
a width of each of the reinforcement portions 1 to 4 at the upper end portion thereof is set in such a manner that the upper end portion faces (confronts, is opposed to, is adjacent to) the plurality of holes H of (belonging to) the four or more holes H on the lateral or medial side.

[0050] In this case, each of the reinforcement portions 1 to 4 receives tension applied by using the shoelace 6 passed through the plurality of holes H and transmitted through the eyelet stays 7L and 7M. This will facilitate stabilization of a direction in which the tension acts on the reinforcement portion having an upper end portion facing the plurality of holes H.

[0051] In this case, the fourth reinforcement portion 4 largely leaning forward covers a front portion of a lower portion of a calcaneal bone BC. This will enhance a fit with the front portion of the lower portion of the calcaneal bone BC where good conformity with a foot is generally not achieved.

[0052] The upper includes: a lateral-side soft region LS in which the member forming the sock 5 is exposed, defined between two virtual lines extended downwardly, one from a part of the lateral edge portion 7L corresponding to a front end of a ball of a little toe and the other from a part of the lateral edge portion 7L corresponding to a rear end of a lateral malleolus, along the lateral-side surface and along a vertical plane; and
a medial-side soft region MS in which the member forming the sock 5 is exposed, defined between two virtual lines extended downwardly, one from a part of the medial edge portion 7M corresponding to a front end of a ball of a big toe and the other from a part of the medial edge portion 7M corresponding to a rear end of a medial malleolus, along the medial-side surface and along a vertical plane,
wherein an area of the medial-side soft region MS is larger than an area of the lateral-side soft region LS.

[0053] In this case, the medial-side soft region MS larger than the lateral-side soft region LS is provided on the medial side of a foot having a shape with irregularities (concave and convex) more complex than those on the lateral side of the foot. This allows the upper to achieve a fit easily on the medial side. Meanwhile, the area of the lateral-side soft region LS is smaller than that on the medial side. However, even an upper including a reinforcement member of a large area on the lateral side will achieve a fit with a foot on the lateral side of the foot, because the lateral-side foot has a shape with irregularities simpler than those on the medial side.

[0054] The present invention will be understood more clearly from the following description of preferred embodiments taken in conjunction with the accompanying drawings. Note however that the embodiments and the drawings are merely illustrative and should not be taken to

define the scope of the present invention. The scope of the present invention shall be defined only by the appended claims. In the accompanying drawings, like reference numerals denote like components throughout the plurality of figures.

Embodiments

[0055] Embodiments of the present invention will be described below by referring to the drawings. FIGS. 1A and 1B, FIGS. 2A and 2B, FIGS. 3A and 3B, FIGS. 4A and 4B, FIGS. 5A and 5B, FIGS. 6A and 6B, FIGS. 7A and 7B, FIGS. 8A and 8B, FIGS. 9A and 9B, and FIGS. 10A and 10B show a first embodiment, a second embodiment, a third embodiment, a fourth embodiment, a fifth embodiment, a sixth embodiment, a seventh embodiment, an eighth embodiment, a ninth embodiment, and a tenth embodiment respectively.

[0056] The second embodiment as a most representative embodiment will be described first.

[0057] As shown in FIGS. 2A and 2B, an upper U is placed on a sole 8.

[0058] The sole 8 may include an outsole 80 having a ground contact surface, and a midsole 81 placed on the outsole 80 and made of a foamed body (foam body). In FIGS. 1A to 10B, 12, and 14, the midsole 81 is given irregular small dots.

[0059] Referring to FIGS. 2A and 2B, the upper U includes a sock 5, an eyelet stay 7M, an eyelet stay 7L, a reinforcement member (portion) 1, a reinforcement member 2, a reinforcement member 3, and a reinforcement member 4. The eyelet stays 7M and 7L and the reinforcement member may be attached to an outer side (exterior) surface or to an inner surface (interior surface) of the upper U. In FIGS. 1A to 10B and 12, the eyelet stays 7M and 7L and the reinforcement member are given regular dots.

[0060] The sock 5 shown in FIGS. 2A and 2B is formed of one or two or more members made of woven fabric, knit fabric, or knit-like fabric. The sock 5 covers the instep and the heel of a foot softly. The sock 5 may include a tongue not shown in the drawings.

[0061] The lateral eyelet stay 7L and a medial eyelet stay 7M are placed respectively on a lateral edge 5E and a medial edge 5E of an opening 50 of the sock 5 shown in FIG. 11. The eyelet stays 7L and 7M are less stretchable than the member forming the sock 5 and define a plurality of holes H through which a shoelace 6 passes. The passed shoelace 6 is to exhibit fastening force at the time of wearing. The lateral and medial eyelet stays 7L and 7M may be continuous with each other at a front end or may be separated (spaced apart) from each other.

[0062] As shown in FIGS. 4 to 6, each of the eyelet stays 7L and 7M may have one or a plurality of notches (cuts) 7N. As shown in FIGS. 14A and 14B, the eyelet stay 7L may include eyelet stays 7L separated from each other and each of the eyelet stays 7L may have a single hole H or a plurality of holes H. Further, the eyelet stay 7M may include eyelet stays 7M separated from each other and each of the eyelet stays 7M may have a single hole H or a plurality of holes H.

[0063] A material forming the eyelet stays 7L and 7M shown in FIGS. 2A and 2B may be a tape material, artificial leather, or two or more of such materials. The plurality of holes H through which the shoelace 6 passes may be small round holes formed in the material such as artificial leather or be loop-shaped members (materials) sewed on the material such as artificial leather.

[0064] If the sock 5 is made of suede-like artificial leather, for example, the edge portions 7L and 7M and the reinforcement member (portion) 1 may be formed by using a material less stretchable than such suede-like artificial leather.

[0065] Referring to FIG. 2A, a lateral reinforcement member includes a first reinforcement portion 1 and a second reinforcement portion 2. On the other hand, a medial reinforcement member of FIG. 2B includes a third reinforcement portion 3 and a fourth reinforcement portion 4.

[0066] Referring to FIG. 2A, each of the first and second reinforcement portions 1 and 2 is less stretchable than the member forming the sock 5, attached to a lateral-side surface of the sock 5, and extends from the lateral eyelet stay 7L to the upper end of the midsole 81. On the other hand, each of the third and fourth reinforcement portions 3 and 4 of FIG. 2B is less stretchable than the member forming the sock 5, attached to a medial-side surface of the sock 5, and extends from the medial eyelet stay 7M to the upper end of the midsole 81.

[0067] The first reinforcement portion 1 of FIG. 2A covers at least a portion of a fifth proximal phalanx B50 from a side surface. The second reinforcement portion 2 covers at least a portion of a shaft or a base of a fifth metatarsal bone B51 from a side surface.

[0068] The third reinforcement portion 3 of FIG. 2B covers at least a portion of a ball O1 of a big toe from a side surface. The fourth reinforcement portion 4 covers at least a portion of a navicular bone BS from a side surface.

[0069] Each of the reinforcement portions 1 to 4 has a width in an alignment direction of the plurality of holes H. The width of each of the reinforcement portions is smaller at a lower end portion thereof than at an upper end portion thereof. The alignment direction of the plurality of holes H mentioned herein corresponds to an alignment direction of holes H through which the shoelace 6 passes that is to exhibit the aforementioned fastening force and thus means an alignment direction of the holes H closer to an anterior side F than a top line (a foot insertion opening) 59. According to this embodiment, the plurality of holes H does not include a most posterior hole Hr. The foot insertion opening 59 is a part from which a leg extends during wearing and is continuous with opening 50 on the anterior side F.

[0070] A width W10 of a lower end portion of the first reinforcement portion 1 is smaller than a width W11 of an upper end portion of the first reinforcement portion 1

of FIG. 2A. A width W20 of a lower end portion of the second reinforcement portion 2 is smaller than a width W21 of an upper end portion of the second reinforcement portion 2. A width W30 of a lower end portion of the third reinforcement portion 3 is smaller than a width W31 of an upper end portion of the third reinforcement portion 3. A width W40 of a lower end portion of the fourth reinforcement portion 4 is smaller than a width W41 of an upper end portion of the fourth reinforcement portion 4.

[0071] According to embodiment, the plurality of holes H faces the upper end portion of each of the first to fourth reinforcement portions 1 to 4. The lateral and medial eyelet stays 7L and 7M are each provided with four or more of the holes H.

[0072] At each of the reinforcement portions 1 to 4, the width of the lower end portion is preferably from about 30 to about 97%, more preferably, from about 35 to about 95%, most preferably, from about 50 to about 85% of the width of the upper end portion.

[0073] Each of the reinforcement portions 1 to 4 of FIGS. 2A and 2B preferably extends in a direction substantially parallel to a direction in which tightening force acts to be applied by using the shoelace 6 passed through the holes H. Specifically, the direction in which each of the reinforcement portions 1 to 4 extends may preferably be set so as to be substantially parallel to a pulling direction in which force Fo resulting from the shoelace 6 indicated by alternate long and two short dashed lines of FIG. 11 acts on the holes H. The position and shape of a reinforcement member to work effectively for enhancing a fit should be determined based on a way in which tightening force acts.

[0074] Referring to FIGS. 2A and 2B, the reinforcement portions 1 to 4 have a virtual center line C1, a virtual center line C2, a virtual center line C3, and a virtual center line C4 extending in respective directions agreeing with directions in which corresponding ones of the reinforcement portions 1 to 4 extend. If each of the aforementioned width is hard to measure in the alignment direction of the plurality of holes H, each of the width can be measured in a direction perpendicular to a corresponding one of the center lines C1 to C4.

[0075] The center lines C1 to C4 along the directions in which the reinforcement portions 1 to 4 extend respectively extend in a diagonally rearward and downward direction toward the sole 8. An angle K4 of FIG. 2B formed between the center line C4 of the fourth reinforcement portion 4 and the sole 8 is smaller than an angle K1 and an angle K2 of FIG. 2A formed between the center lines C1 and C2 along the directions in which the first and second reinforcement portions 1 and 2 extend, respectively, and the sole 8. The angle K4 formed between the center line C4 of the fourth reinforcement portion 4 and the sole 8 is smaller than an angle K3 formed between the center line C3 of the third reinforcement portion 3 and the sole 8.

[0076] If a surface of the sole 8 is a horizontal surface or nearly a horizontal surface, the angles K1 to K4 can be angles formed between each of the center lines C1 to C4 and the surface of the sole 8. If the surface of the sole 8 is curved largely or has irregularities, the angles K1 to K4 are measured between each of the center lines C1 to C4 and the horizontal line.

[0077] Referring to FIGS. 2A and 2B, a line 10, a line 20, a line 30, and a line 40 along front edges of the reinforcement portions 1 to 4 respectively are placed in forward leaning postures. Further, a line 21, a line 31, and a line 41 along rear edges of the second to fourth reinforcement portions 2 to 4 respectively are placed in forward leaning postures.

[0078] The line 41 along the rear edge of the fourth reinforcement portion 4 is more leaning forward than the line 21 along the rear edge of the second reinforcement portion 2. A lower end 4E of the line 41 along the rear edge of the fourth reinforcement portion 4 is placed posterior to a lower end 2E of the line 21 along the rear edge of the second reinforcement portion 2.

[0079] Thus, the fourth reinforcement portion 4 covers a front portion of a lower portion of a calcaneal bone BC from a side surface and an area of the calcaneal bone BC covered by the fourth reinforcement portion 4 is larger than an area of the calcaneal bone BC covered by the second reinforcement portion 2. In some cases, no portion of the calcaneal bone BC is covered by the second reinforcement portion 2.

[0080] The upper U of FIG. 2A includes a lateral-side soft region LS in which the member forming the sock 5 is exposed. The lateral-side soft region LS is defined between the first and second reinforcement portions 1 and 2 on the lateral-side surface. Likewise, the upper U of FIG. 2B includes a medial-side soft region MS in which the member forming the sock 5 is exposed. The medial-side soft region MS is defined between the third and fourth reinforcement portions 3 and 4 on the medial-side surface.

[0081] The area of the medial-side soft region MS is larger than the area of the lateral-side soft region LS of FIG. 2A.

[0082] Other embodiments will be described next.

[0083] The following description of the embodiments is mainly intended for differences from the second embodiment.

[0084] According to a first embodiment shown in FIGS. 1A and 1B, the fourth reinforcement portion 4 is not provided.

[0085] According to the first embodiment, the lateral-side soft region LS of FIG. 1A means a region in which the member forming the sock 5 is exposed. This region is defined between two virtual lines VL extended downwardly, one from a most anterior F one H of the plurality of holes H through which the shoelace 6 passes and the other from a most posterior R one H of the plurality of holes H in the lateral eyelet stay 7L along the lateral-side surface and along a vertical plane. On the other hand, the medial-side soft region MS of FIG. 1B means a region in which the member forming the sock 5 is exposed. This

region is defined between two virtual lines extended downwardly, one from a most anterior F one H of the plurality of holes H through which the shoelace 6 passes and the other from a most posterior R one H of the plurality of holes H in the medial eyelet stay 7M along the lateral-side surface and along a vertical plane. According to this embodiment, the area of the medial-side soft region MS is also larger than the area of the lateral-side soft region LS.

[0086] According to a third embodiment shown in FIGS. 3A and 3B, the widths of the reinforcement portions 1 to 4 on the lateral side and medial side are larger than the corresponding widths of the reinforcement portions of the aforementioned second embodiment.

[0087] According to a fourth embodiment of FIGS. 4A and 4B, as shown in FIG. 4B, the medial eyelet stay 7M is provided with a cut off (notch) 7N to interrupt (intercept) the continuity of the medial eyelet stay 7M.

[0088] FIGS. 4A and 4B show a different standard for the aforementioned "width of a reinforcement portion." Specifically, as illustrated in FIGS. 4A and 4B, each of the widths of the reinforcement portions 1 to 4 including W10, W11, ..., W40, and W41 means a width in a direction perpendicular to a corresponding one of the center lines C1 to C4.

[0089] For example, the width W41 of the upper end portion of the fourth reinforcement portion 4 means a distance W41 between two leader lines parallel to the center line C4. On the other hand, the width W40 of the lower end portion of the fourth reinforcement portion 4 means a distance W40 between two leader lines parallel to said center line C4.

[0090] The upper includes the lateral-side soft region LS in which the member forming the sock 5 is exposed. The lateral-side soft region LS is defined between two virtual lines extended downwardly, one from a part corresponding to a front end of a ball 05 of the little toe and the other from a part corresponding to a rear end of a lateral malleolus AL in the lateral edge portion 7L, along the lateral-side surface and along a vertical plane.

[0091] The upper includes the medial-side soft region MS in which the member forming the sock 5 is exposed. The medial-side soft region MS is defined between two virtual lines extended downwardly, one from a part corresponding to a front end of a ball O1 of a big toe and the other from a part corresponding to a rear end of a medial malleolus AM in the medial edge portion 7M, along the medial-side surface and along a vertical plane.

[0092] The area of the medial-side soft region MS is larger than the area of the lateral-side soft region LS.

[0093] According to a fifth embodiment of FIGS. 5A and 5B, as shown in FIG. 5B, the medial eyelet stay 7M is provided with a cut off 7N formed between the third and fourth reinforcement portions 3 and 4 to interrupt the continuity of the medial eyelet stay 7M and continuity between the third and fourth reinforcement portions 3 and 4.

[0094] According to a sixth embodiment of FIGS. 6A and 6B, as shown in FIG. 6B, the medial eyelet stay 7M is provided with a plurality of cuts off 7N to interrupt the continuity of the medial eyelet stay 7M and continuity between the third and fourth reinforcement portions 3 and 4.

[0095] A test conducted to verify the effect of the present invention will be described next.

[0096] Before the test, a shoe according to Comparative Example shown in FIGS. 12A and 12B not including a reinforcement member on both of a medial side and a lateral side of the shoe was prepared. A reinforcement member was attached to an upper of this Comparative Example to prepare a shoe according to Test Example 1 of FIGS. 1A and 1B, a shoe according to Test Example 2 of FIGS. 2A and 2B, and a shoe according to Test Example 3 of FIGS. 3A and 3B. Further, the medial eyelet stay 7M according to each of Test Examples 2 and 3 was partially cut off to prepare a shoe according to Test Example 4 of FIGS. 4A and 4B, a shoe according to Test Example 5 of FIGS. 5A and 5B, and a shoe according to Test Example 6 of FIGS. 6A and 6B.

[0097] Then, a plurality of test subjects worn each of the shoes according to each of the aforementioned Examples and formed a state of tightening with a lace like in the general case of wearing a shoe by each test subject, specifically, a state indicated by virtual lines of FIG. 12C. Immediately thereafter, each test subject formed a state indicated by solid lines of FIG. 12C by applying tightening force using a shoelace larger than that applied in the general case. The amount of displacement of the upper in a direction normal to the surface of the upper U of each of Examples was measured in these states and the measured amounts were expressed in terms of numerical values. The bar graph of FIG. 13 shows the result of the measurement.

[0098] A smaller amount of the aforementioned measured displacement can be considered to show a better fit for a wearer achieved in the general state of tightening with a lace. In the bar graph of FIG. 13, a better fit is expressed by a larger value.

[0099] As understood from Comparative Example and Examples 1 to 3 of FIG. 13, regarding a lateral side L of a foot, a larger area of a reinforcement member achieves a better fit. This is considered to be for the reason that, as the lateral side L of the foot is formed of a relatively gentle slope surface of mild irregularities, a high-rigidity reinforcement member tightly conforms to the surface of the lateral side L of the foot.

[0100] On the other hand, as understood from Comparative Example and Examples 1 and 2, regarding a medial side M of a foot, a better fit is achieved with increase in the area of a reinforcement member to some extent. However, as understood from a comparison between Example 2 of FIG. 2B and Example 3 of FIG. 3B, a fit shown in FIG. 13 exhibits substantially no change even if the area of a reinforcement member is large. This is considered to be for the reason that, as a bone protrudes inwardly in a range from a base of a first metatarsal

bone B11 to a navicular bone BS of FIG. 2 on the medial side M of the foot, it becomes difficult to achieve a fit with the surface of the medial side M of the foot if a high-rigidity reinforcement member has an excessively large area.

[0101] As understood from comparisons of Examples 2 and 3 to Examples 4 to 6 of FIG. 13, a better fit is achieved on the medial side M with the medial eyelet stay 7M cut into an anterior portion and a posterior portion.

[0102] Other embodiments will be described next on the basis of the aforementioned test result.

[0103] According to embodiments shown in FIGS. 7B to 9B, a through hole is formed at a portion of one of the reinforcement portions 1 to 4 in a medial and/or lateral side of the foot to form a small soft region SS in which the sock 5 is exposed. In these cases, it may be possible to reduce a weight further. Meanwhile, slight change may be caused in terms of a fit.

[0104] The following describes how the aforementioned widths including W10, W11, ..., W40, and W41 should be understood in the presence of the soft region SS resulting from a through hole formed at a portion of one of the reinforcement portions 1 to 4.

[0105] As shown in FIG. 7B, if the soft region SS is provided at a lower end portion, a substantial width at the lower end portion becomes smaller than the width W30 or W40. In this case, the widths W30 and W40 at the lower end portions should be determined based on the lines 30 and 40 along the front edges and the lines 31 and 41 along the rear edges.

[0106] As shown in FIG. 8B, if the soft region SS is provided at an upper end portion and the soft region SS has a relatively small area, a substantial width at the upper end portion may become smaller than the width W31 or W41. However, in the presence of the small soft region SS, tightening force applied by using the shoelace 6 may act locally on the sole 8 through the medial and lateral eyelet stays 7M and 7L and the reinforcement portions 3 and 4.

[0107] In this case, the widths W31 and W41 at corresponding upper end portions should be determined based on the line 30 along the front edge and the line 31 along the rear edge, and the line 40 along the front edge and the line 41 along the rear edge.

[0108] In the embodiment shown in FIG. 9B, each of the reinforcement portions 3 and 4 has such a shape as is formed by arranging a pair of an anterior tape material and a posterior tape material each having a given (constant) width in a substantially V-pattern. In each of the reinforcement portions 3 and 4, the soft region SS is formed to extend from an upper end portion to a lower end portion.

[0109] In this case, determination should also be made as to how tightening force applied by using the shoelace 6 acts. Specifically, referring to FIG. 9B, the reinforcement portions 3 and 4 have a site 32 and a site 42 respectively at the corresponding top (uppermost) ends where the reinforcement portions 3 and 4 are narrowed downwardly, compared to the medial eyelet stay 7M. In this way, tightening force applied by using the shoelace 6 will be transmitted from the eyelet stay 7M through the sites 32 and 42 and then act on the reinforcement portions 3 and 4 each having the given width.

[0110] Thus, in this case, the widths W30 and W40 at the lower end portions and the widths W31 and W41 at the upper end portions should also be determined based on the lines 30 and 40 along the front edges and the lines 31 and 41 along the rear edges.

[0111] According to the embodiment shown in FIG. 9A, a cut off is provided at each of the lower end portions of the lateral first and second reinforcement portions 1 and 2 to form a small soft region SS. The first and second reinforcement portions 1 and 2 are placed in an anterior position and a posterior position and continuous with each other at their upper end portions and their central portions viewed in a vertical direction.

[0112] In this case, tightening force will be transmitted from the shoelace 6 engaged with the lateral eyelet stay 7L at a front portion to the upper U through the first reinforcement portion 1. Meanwhile, tightening force will be transmitted from the shoelace 6 engaged with the lateral eyelet stay 7L at a rear portion to the upper U through the second reinforcement portion 2.

[0113] Specifically, the first and second reinforcement portions 1 and 2 are required only to be separated from each other at least at their lower end portions as an anterior portion and a posterior portion, and can be continuous with each other at their upper end portions.

[0114] In this case, the widths W10, W11, W20, and W21 should be determined by setting a virtual line VL2 at which the first and second reinforcement portions 1 and 2 are separated and by employing the same way as the aforementioned way described by referring to FIG. 9B.

[0115] Referring to FIG. 8A, the first and second reinforcement portions 1 and 2 are completely continuous with each other in an anterior-posterior direction. In this case, as understood from the aforementioned result of FIG. 13, a fit may also be enhanced on the lateral side L of a foot. According to this embodiment, while the first and second reinforcement portions 1 and 2 are continuous with each other, the third reinforcement portion 3 of FIG. 8B has the width W30 at the lower end portion thereof smaller than the width W31 at the upper end portion thereof. Thus, this embodiment is also included in the present invention.

[0116] The aforementioned description of the embodiments is intended for regions where the medial and lateral eyelet stays 7M and 7L are provided. Meanwhile, in many cases, a toe portion and a heel portion of the upper U are provided with a reinforcement member 51, a reinforcement member 52, a reinforcement member 53, and a reinforcement member 54 as shown in FIGS. 10A or 10B, or a heel counter. In such a case, as shown by virtual lines VL3, the front edge lines and the rear edge lines of

the reinforcement portions 1 to 4 should be set by extending some of lines.

[0117] An embodiment shown in FIGS. 14A and 14B includes a heel counter 9. In the illustrations of these drawings, the reinforcement portions 1 to 4 are given regular dots and the heel counter 9 is hatched. According to this embodiment, the anterior first and third reinforcement portions 1 and 3 extend to the midsole 81. The second reinforcement portion 2 of FIG. 14A extends to the midsole 81 or the heel counter 9. The fourth reinforcement portion 4 of FIG.14B does not reach the midsole 81 but it extends to the heel counter 9.

[0118] The second reinforcement portion 2 and/or the fourth reinforcement portion 4 may extend to the midsole (sole) 81 while being caught (sandwiched) between the heel counter 9 and the sock 5.

[0119] According to this embodiment, the first and second reinforcement portions 1 and 2 of FIG. 14A are formed into a loop pattern. Further, the third and fourth reinforcement portions 3 and 4 of FIG. 14B are formed into a loop pattern.

[0120] Like in this embodiment, if a reinforcement portion(s) is (are) formed into a loop pattern, the width of each reinforcement portion at an upper end portion thereof and that of each reinforcement portion at a lower end portion thereof should be determined by leaving out an upper edge extending in an anterior-posterior direction along the eyelet stays 7L and 7M and a lower edge extending in the anterior-posterior direction along the sole or the heel counter 9.

[0121] According to this embodiment, a tape material T to exhibit substantially no stretching properties in response to the external force generated during wearing may be stacked on the hard-to-stretch reinforcement portions 1 to 4 having (forming) a loop pattern.

[0122] The heel counter 9 may include: a base 9B made of low-rigidity artificial leather; and a resin layer 9P having higher rigidity than the base 9B and adhesively stacked on the base 9B. Like in this embodiment, the midsole 81 may have a plurality of layers.

[0123] The preferred embodiments have been described above by referring to the drawings. A person with ordinary skill in the art who has read this specification will easily think of various changes and modifications within an obvious range.

[0124] For example, a sole placed under an upper may include only an outsole. The upper may be a high-top upper, not a low-top upper.

[0125] Each reinforcement member may be attached fixedly to a sock by means of paste, adhesion, sewing, or adhesion and sewing.

[0126] Thus, such changes and modifications are deeded to fall within the scope of the present invention defined by the appended claims.

Industrial Applicability

[0127] The present invention is applicable to a shoe having a lace-tightening structure using a shoelace and additionally, to a shoe having a fastening structure achieved by a fastening member such as a shoelace or a belt (belts).

Reference Signs List

[0128]

1: First reinforcement portion
2: Second reinforcement portion 2E: Lower end 20: Line along front edge 21: Line along rear edge
3: Third reinforcement portion 30: Line along front edge 31: Line along rear edge
4: Fourth reinforcement portion 4E: Lower end 40: Line along front edge 41: Line along rear edge
T: Tape material
5: Sock 5E: Edge 50: Opening
6: Shoelace
7L: Lateral eyelet stay 7M: Medial eyelet stay 7N: Cut off
8: Sole 80: Outsole 81: Midsole
9: Heel counter
LS, MS, SS: Soft region
BC: Calcaneal bone BS: Navicular bone B50: Fifth proximal phalanx B51: Fifth metatarsal bone
O1: Ball of a big toe C1 to C4: Center line
F: Anterior R: Posterior K1 to K4: Angle U: Upper
VL: Virtual line
W10, S11, W20, W21, W30, W31, W40, W41: Width

Claims

1. An upper of a shoe comprising:

a sock 5;
lateral and medial edge portions 7L and 7M placed respectively on lateral and medial edges 5E of an opening 50 of the sock 5, the lateral and medial edge portions 7L and 7M being less stretchable than a member forming the sock 5, and defining a plurality of holes H through which a shoelace 6 passes;
at least one reinforcement member on a lateral side L, the at least one reinforcement member being less stretchable than the member forming the sock 5 and extending from the lateral edge portion 7L to a sole 8 or a heel counter 9 while being attached to a lateral-side surface of the sock 5; and
at least one reinforcement member on a medial side M, the at least one reinforcement member on the medial side M being less stretchable than the member forming the sock 5 and extending from the medial edge portion 7M to the sole 8 or the heel counter 9 while being attached to a medial side surface of the sock 5, wherein:

the at least one reinforcement member on the lateral side L includes
a first reinforcement portion 1 covering at least a portion of a fifth proximal phalanx B50 from a side surface and
a second reinforcement portion 2 covering at least a portion of a shaft or a base of a fifth metatarsal bone B51 from the side surface;
the at least one reinforcement member on the medial side M includes a third reinforcement portion 3 covering at least a portion of a ball O1 of a big toe from a side surface; and
a width of at least one of the reinforcement portions is smaller at a lower end portion thereof than at an upper end portion thereof.

2. The upper according to claim 1, wherein:

the at least one reinforcement member on the medial side further comprises a fourth reinforcement portion 4 covering at least a portion of a navicular bone BS from the side surface; and
the fourth reinforcement portion 4 has a width, and a width W40 of the fourth reinforcement portion 4 at a lower end portion thereof is smaller than a width W41 of the fourth reinforcement portion 4 at an upper end portion thereof.

3. The upper according to claim 1, comprising:

a lateral-side soft region LS, in which the member forming the sock 5 is exposed, defined between two virtual lines, the two virtual lines extended downwardly, one from a most anterior F one H of the plurality of holes H and another from a most posterior R one H of the plurality of holes H in the lateral edge portion 7L along the lateral-side surface and along a vertical plane; and
a medial-side soft region MS, in which the member forming the sock 5 is exposed, defined between two virtual lines, the two virtual lines extended downwardly, one from a most anterior F one H of the plurality of holes H and another from a most posterior R one H of the plurality of holes H in the medial edge portion 7M along the lateral-side surface and along a vertical plane,

wherein an area of the medial-side soft region MS is larger than an area of the lateral-side soft region LS.

4. The upper according to claim 2, wherein a center line C4 of the fourth reinforcement portion 4 along a direction in which the fourth reinforcement portion 4 extends extends in a diagonally rearward and downward direction toward the sole 8, and

an angle K4 formed between the center line C4 of the fourth reinforcement portion 4 and a horizontal line is smaller than an angle K1 formed between a center line C1 of the first reinforcement portion 1 along a direction in which the first reinforcement portion 1 extends and the horizontal line, and
the angle K4 is smaller than an angle K2 formed between a center line C2 of the second reinforcement portion along a direction in which the second reinforcement portion 2 extends and the horizontal line.

5. The upper according to claim 4, wherein a center line C3 of the third reinforcement portion 3 along a direction in which the third reinforcement portion 3 extends extends in a diagonally rearward and downward direction toward the sole 8.

6. The upper according to claim 4 or 5, wherein the angle K4 formed between the center line C4 of the fourth reinforcement portion 4 and the horizontal line is smaller than an angle K3 formed between a center line C3 of the third reinforcement portion 3 along a direction in which the third reinforcement portion 3 extends and the horizontal line.

7. The upper according to claim 2, 4, 5 or 6, wherein:

a line 41 along a rear end of the fourth reinforcement portion 4 is more tilting forward than a line 21 along a rear end of the second reinforcement portion 2; and
a lower end 4E of the line 41 along the rear end of the fourth reinforcement portion 4 is placed posterior to a lower end 2E of the line 21 along the rear end of the second reinforcement portion 2, with the fourth reinforcement portion 4 covering a front portion of a lower portion of a calcaneal bone BC from a side surface.

8. The upper according to claim 2, 4, 5, 6 or 7, wherein an area of a medial-side soft region MS, in which the member forming the sock 5 is exposed, between the third reinforcement portion 3 and the fourth reinforcement portion 4 on the medial side surface is larger than an area of a lateral-side soft region LS, in which the member forming the sock 5 is exposed, between the first reinforcement portion 1 and the second reinforcement portion 2 on the lateral-side surface.

9. The upper according to any one of claims 2 and 4 to 8, wherein the third reinforcement portion 3 has a width, and a width W30 of a lower end portion of the third reinforcement portion 3 is smaller than a width W31 of an upper end portion of the third reinforcement portion 3.

10. The upper according to any one of claims 2 and 4 to

9, wherein the second reinforcement portion 2 has a width, and a width W20 of a lower end portion of the second reinforcement portion 2 is smaller than a width W21 of an upper end portion of the second reinforcement portion 2.

11. The upper according to any one of claims 2 and 4 to 10, wherein the first reinforcement portion 1 has a width, and a width W10 of a lower end portion of the first reinforcement portion 1 is smaller than a width W11 of an upper end portion of the first reinforcement portion 1.

12. The upper according to claim 2, wherein:

the width of the third reinforcement portion 3 is smaller at a lower end portion thereof than at an upper end portion thereof;
the width of the second reinforcement portion 2 is smaller at a lower end portion thereof than at an upper end portion thereof; and
the width of the first reinforcement portion 1 is smaller at a lower end portion thereof than at an upper end portion thereof.

13. The upper according to claim 12, wherein an area of a medial-side soft region MS, in which the member forming the sock 5 is exposed, between the third reinforcement portion 3 and the fourth reinforcement portion 4 on the medial-side surface is larger than an area of a lateral-side soft region LS, in which the member forming the sock 5 is exposed, between the first reinforcement portion 1 and the second reinforcement portion 2 on the lateral-side surface.

14. The upper according to claim 2, wherein:

a center line C4 of the fourth reinforcement portion 4 along a direction in which the fourth reinforcement portion 4 extends extends in a diagonally rearward and downward direction toward the sole 8,
an angle K4 formed between the center line C4 of the fourth reinforcement portion 4 and a horizontal line is smaller than an angle K1 formed between a center line C1 of the first reinforcement portion 1 along a direction in which the first reinforcement portion 1 extends and the horizontal line, and
the angle K4 is smaller than an angle K2 formed between a center line C2 of the second reinforcement portion 2 along a direction in which the second reinforcement portion 2 extends and the horizontal line;

a line 41 along a rear end of the fourth reinforcement portion 4 is more tilting forward than a line 21 along a rear end of the second reinforcement portion 2;
a lower end 4E of the line along the rear end of the fourth reinforcement portion 4 is placed posterior to a lower end 2E of the line 21 along the rear end of the second reinforcement portion 2; and
the fourth reinforcement portion 4 covers a front portion of a lower portion of a calcaneal bone BC.

15. The upper according to any one of claims 1 to 14, wherein:

the plurality of holes H includes four or more holes provided on each of a lateral side and a medial side of a foot; and
a width of each of the reinforcement portions 1 to 4 at the upper end portion thereof is set in such a manner that the upper end portion faces a plurality of holes H of the four or more holes H on the lateral or medial side.

16. An upper of a shoe comprising:

a sock 5;
a lateral edge portion 7L and a medial edge portion 7M each placed on an edge 5E near a center of the sock 5 in a foot width direction, the lateral and medial edge portions 7L and 7M being less stretchable than a member forming the sock 5;
at least one reinforcement member on a lateral side L, the at least one reinforcement member being less stretchable than the member forming the sock 5 and extending from the lateral edge portion 7L to a sole 8 or a heel counter 9 while being attached to a lateral-side surface of the sock 5; and
at least one reinforcement member on a medial side M, the at least one reinforcement member on the medial side M being less stretchable than the member forming the sock 5 and extending from the medial edge portion 7M to the sole 8 or the heel counter 9 while being attached to a medial-side surface of the sock 5, wherein:

the at least one reinforcement member on the lateral side L includes
a first reinforcement portion 1 covering at least a portion of a fifth proximal phalanx B50 from a side surface and
a second reinforcement portion 2 covering at least a portion of a shaft or a base of a fifth metatarsal bone B51 from the side surface;

the at least one reinforcement member on the medial side M includes a third reinforcement portion 3 covering at least a portion of a ball O1 of a big toe from a side surface; and
a width of at least one of the plurality of reinforcement portions is smaller at a lower end portion thereof than

at an upper end portion thereof.

17. The upper according to claim 1, 2, or 16, comprising:

a lateral-side soft region LS in which the member forming the sock 5 is exposed, defined between two virtual lines extended downwardly, one from a part of the lateral edge portion 7L corresponding to a front end of a ball of a little toe and another from a part of the lateral edge portion 7L corresponding to a rear end of a lateral malleolus, along the lateral-side surface and along a vertical plane; and

a medial-side soft region MS in which the member forming the sock 5 is exposed, defined between two virtual lines extended downwardly, one from a part of the medial edge portion 7M corresponding to a front end of a ball of a big toe and another from a part of the medial edge portion 7M corresponding to a rear end of a medial malleolus, along the medial-side surface and along a vertical plane, wherein

an area of the medial-side soft region MS is larger than an area of the lateral-side soft region LS.

FIG.1A

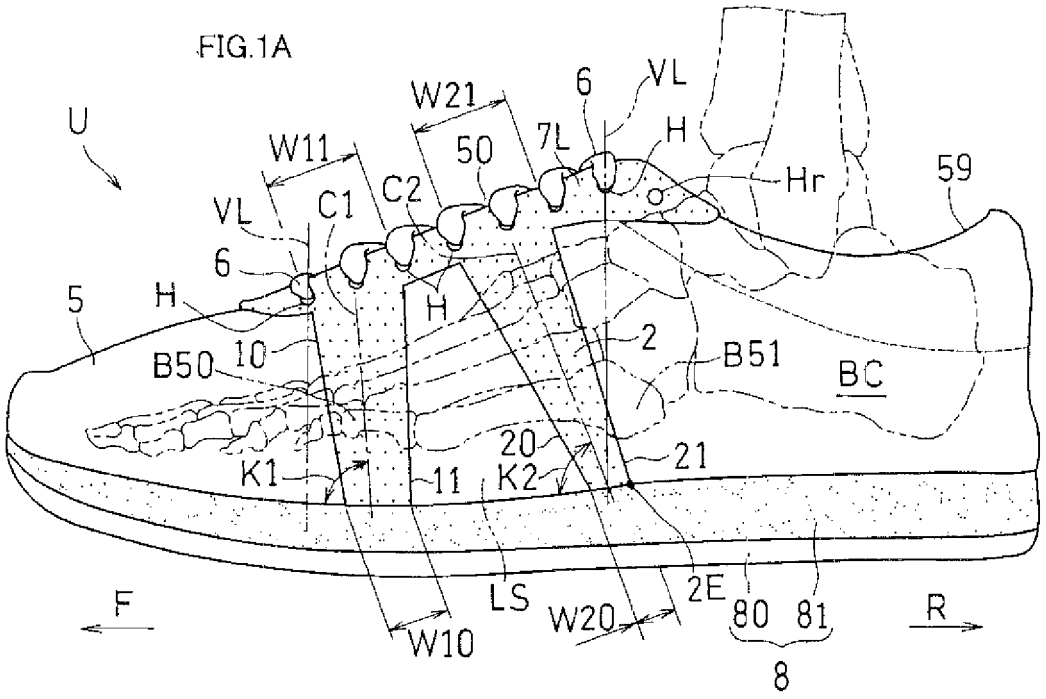

U
W21
W11
50
7L
6
VL
H
Hr
59
VL
C1
C2
6
5
H
H
B50
10
2
B51
BC
20
21
K1
11
K2
F
LS
W10
W20
2E
80
81
R
8

FIG.1B

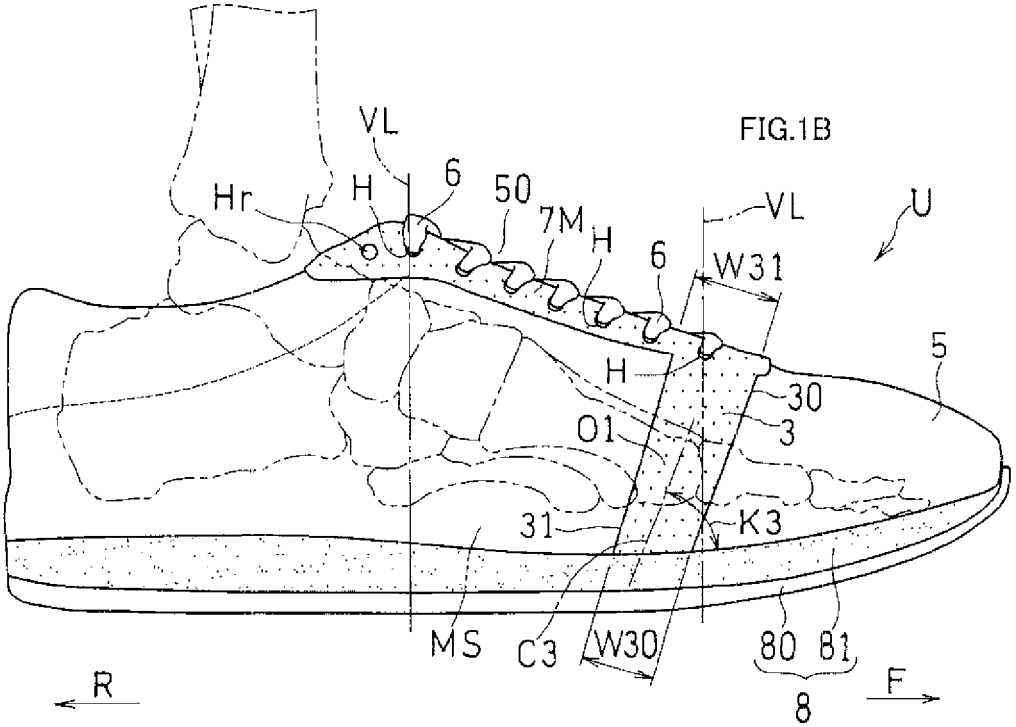

VL
Hr
H
6
50
7M
H
6
VL
U
W31
5
H
30
O1
3
31
K3
MS
C3
W30
80
81
R
F
8

FIG.2A

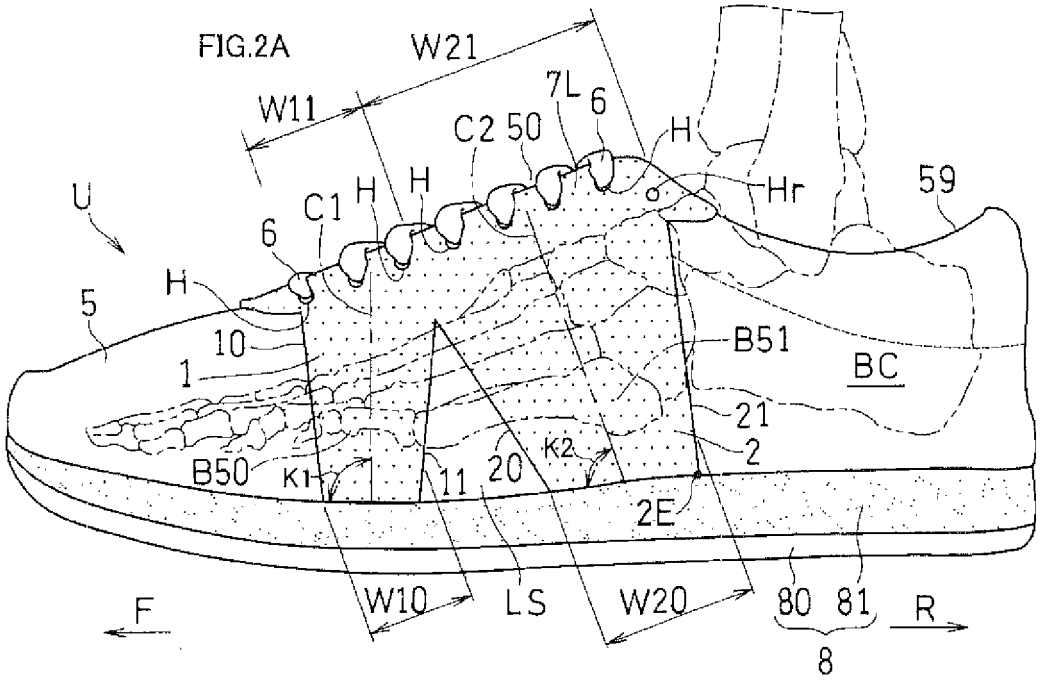

W21
W11
7L
6
C2
50
H
U
C1
H
H
Hr
59
6
H
5
10
B51
1
BC
21
B50
K1
11
20
K2
2
2E
W10
LS
W20
80
81
R
F
8

FIG.2B

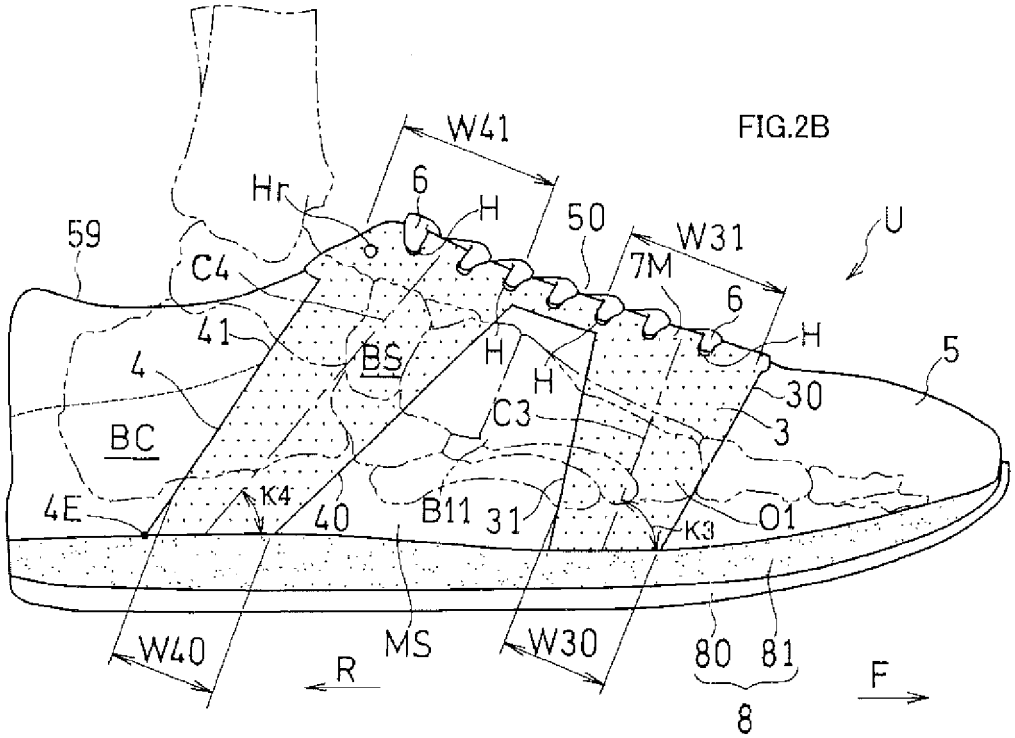

W41
Hr
6
H
50
W31
U
59
C4
7M
6
41
H
H
5
4
BS
H
30
C3
BC
3
K4
4E
40
B11
31
K3
O1
W40
MS
W30
80
81
R
F
8

FIG.3A

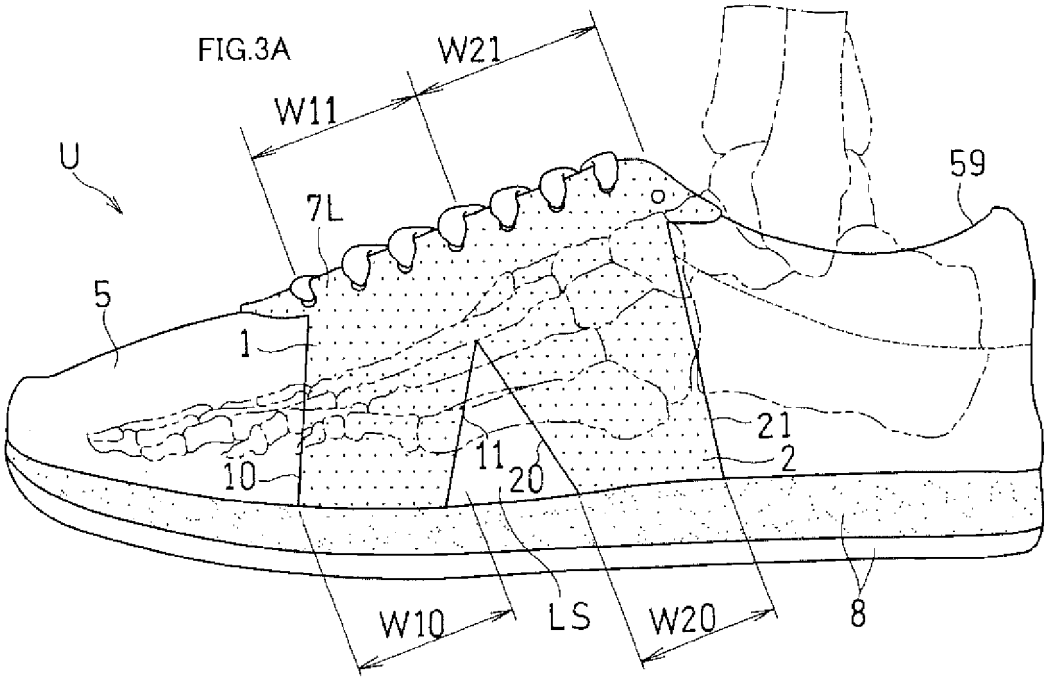

W21
W11
U
59
7L
5
1
21
2
11
20
10
W10
LS
W20
8

FIG.3B

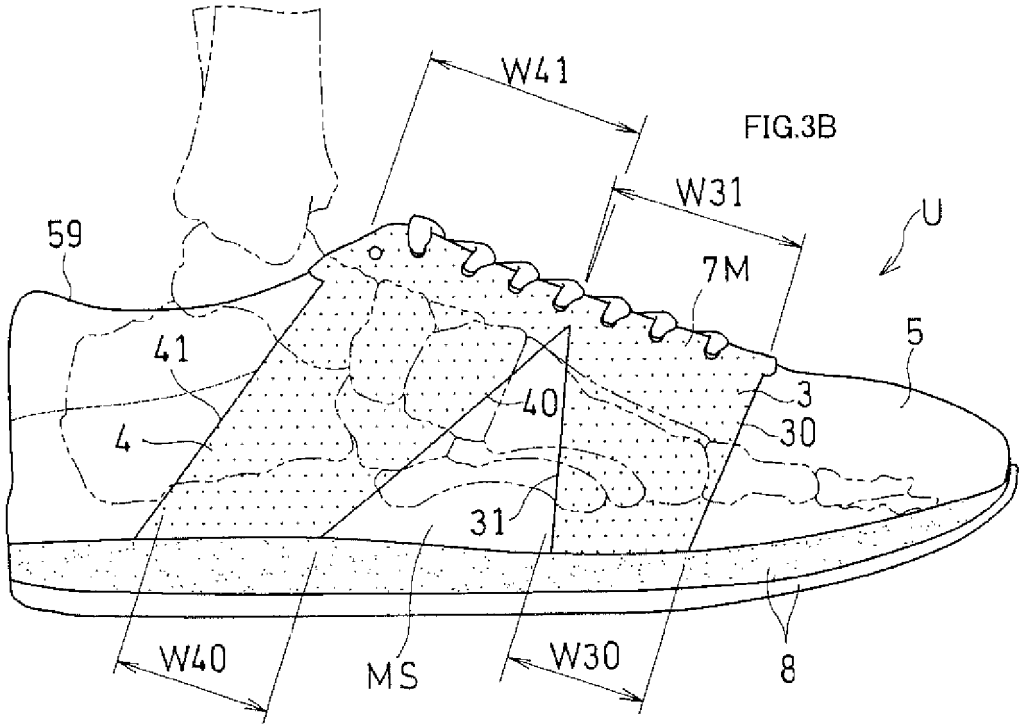

W41
W31
U
59
7M
5
41
40
3
30
4
31
W40
MS
W30
8

FIG.4A

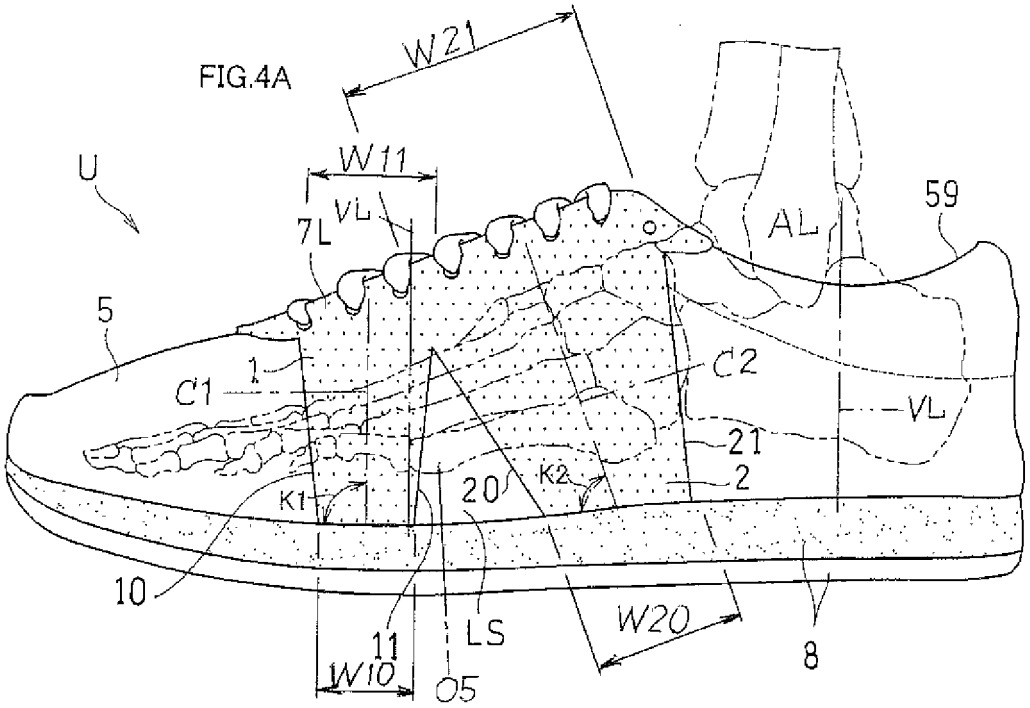

W21
W11
U
7L
VL
AL
59
5
C1
1
C2
VL
21
2
K1
20
K2
10
11
W10
LS
O5
W20
8

FIG.4B

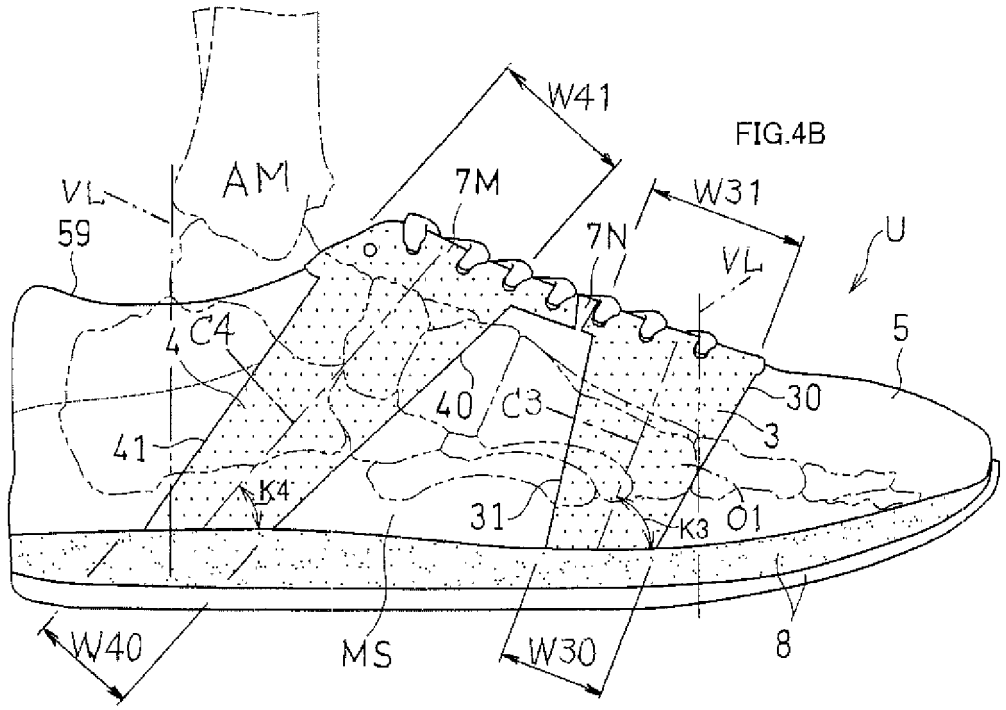

W41
AM
VL
59
7M
7N
W31
VL
U
4
C4
5
40
C3
30
41
3
K4
31
K3
O1
W40
MS
W30
8

FIG.5A

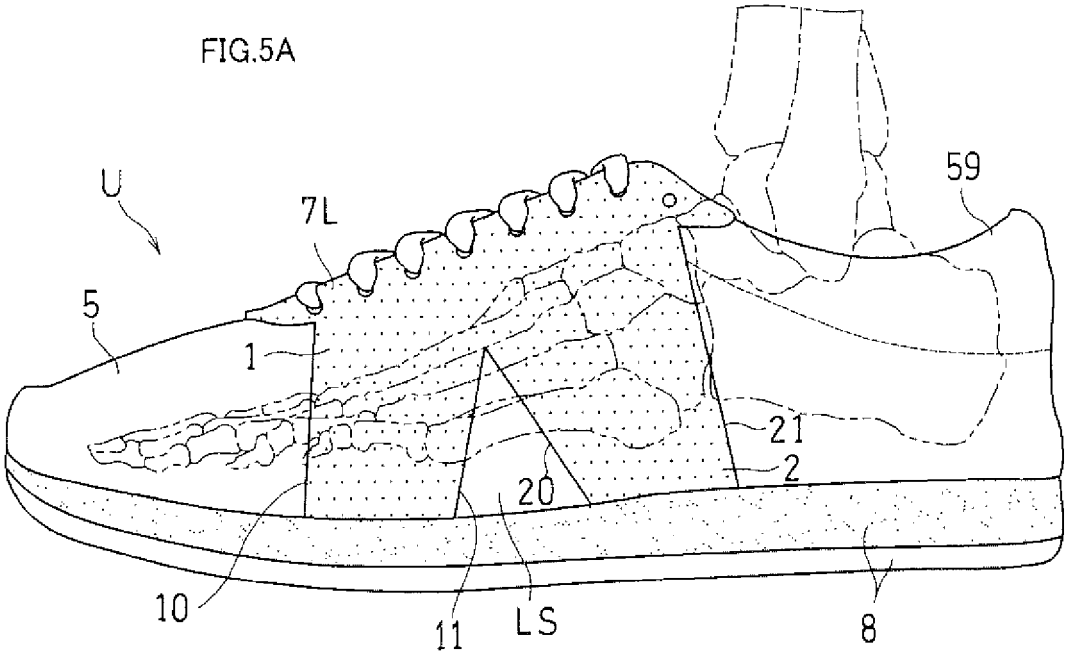


FIG.5B

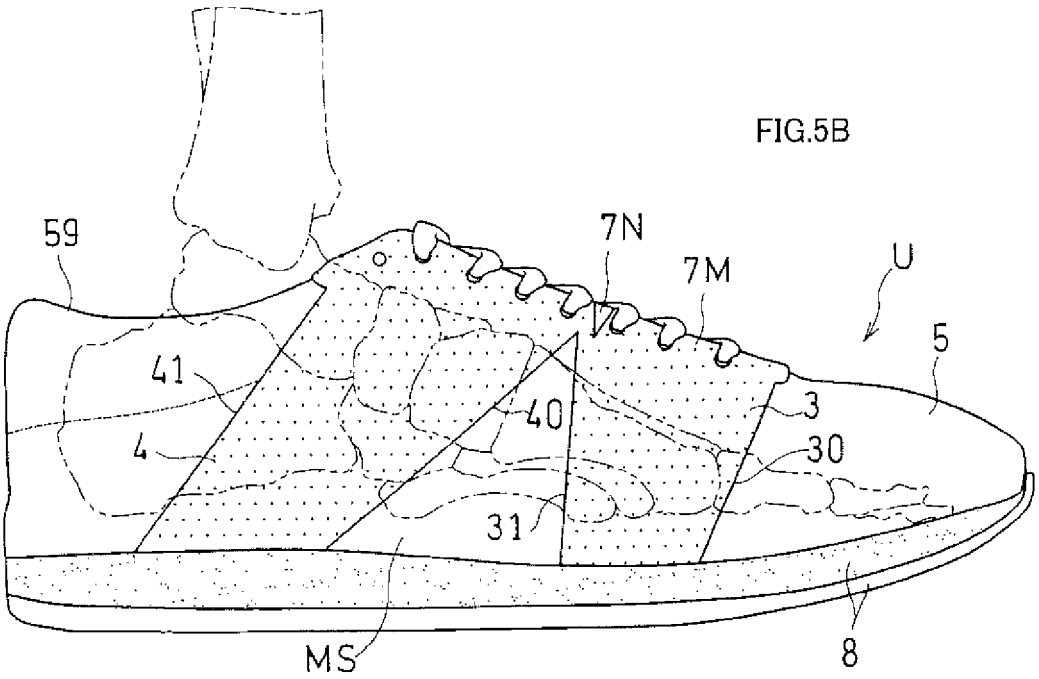


FIG.6A

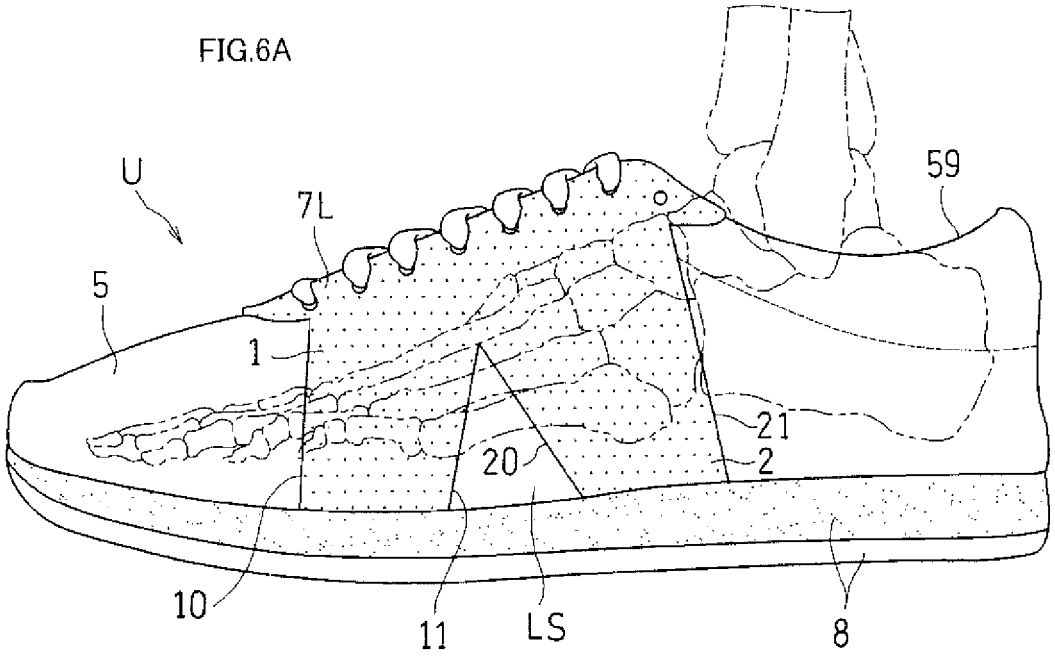


FIG.6B

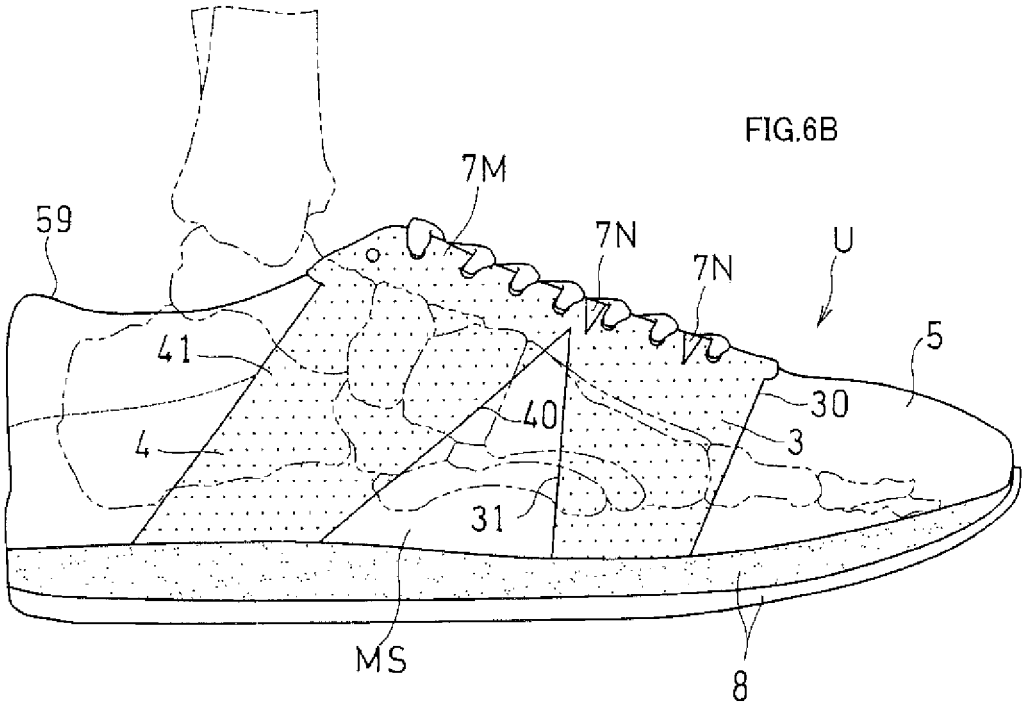


FIG.7A

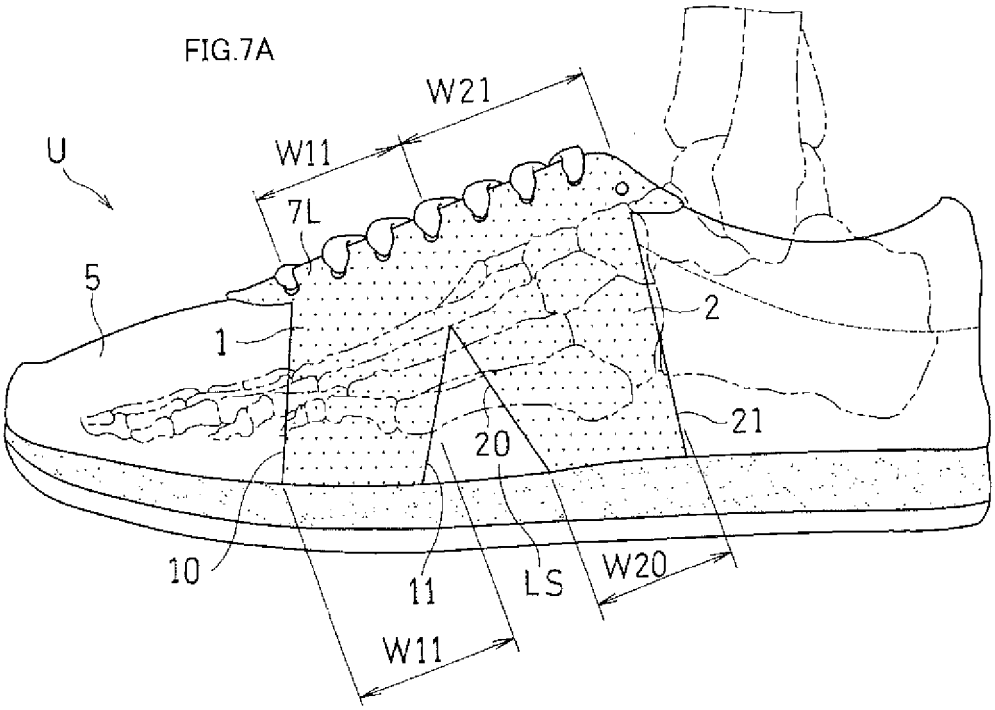

W21
W11
U
7L
5
1
2
21
20
10
11
LS
W20
W11

FIG.7B

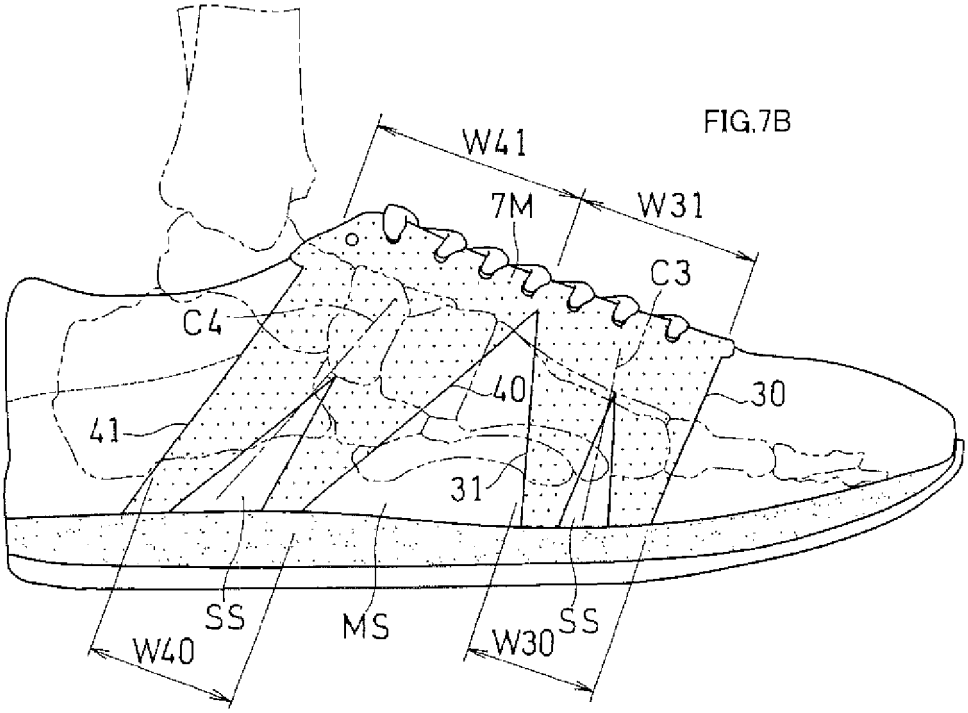

W41
7M
W31
C3
C4
40
30
41
31
SS
MS
SS
W40
W30

FIG.8A

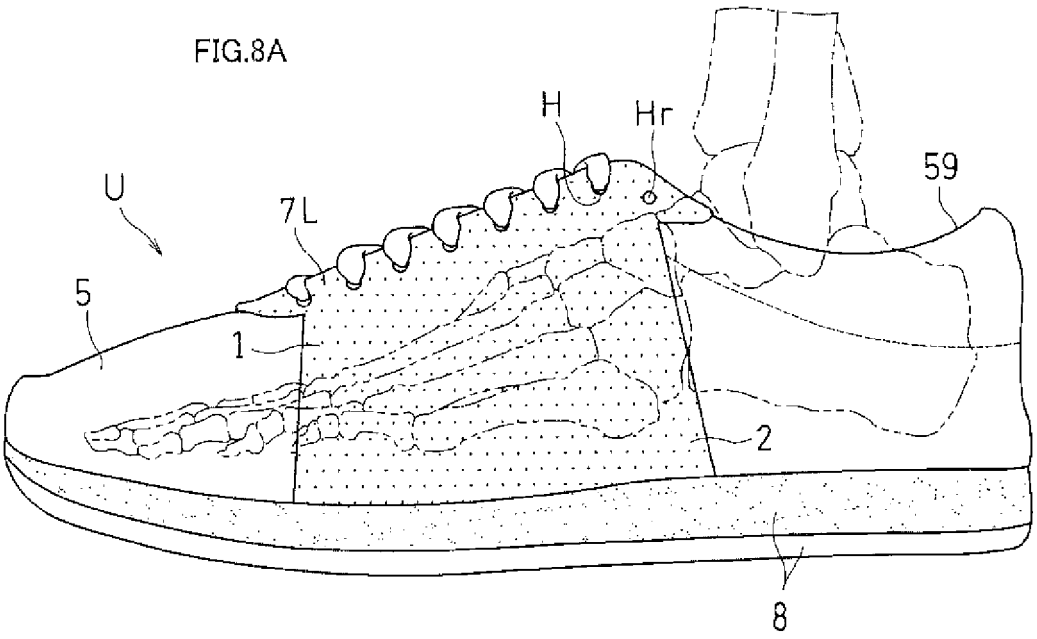

H
Hr
59
U
7L
5
1
2
8

FIG.8B

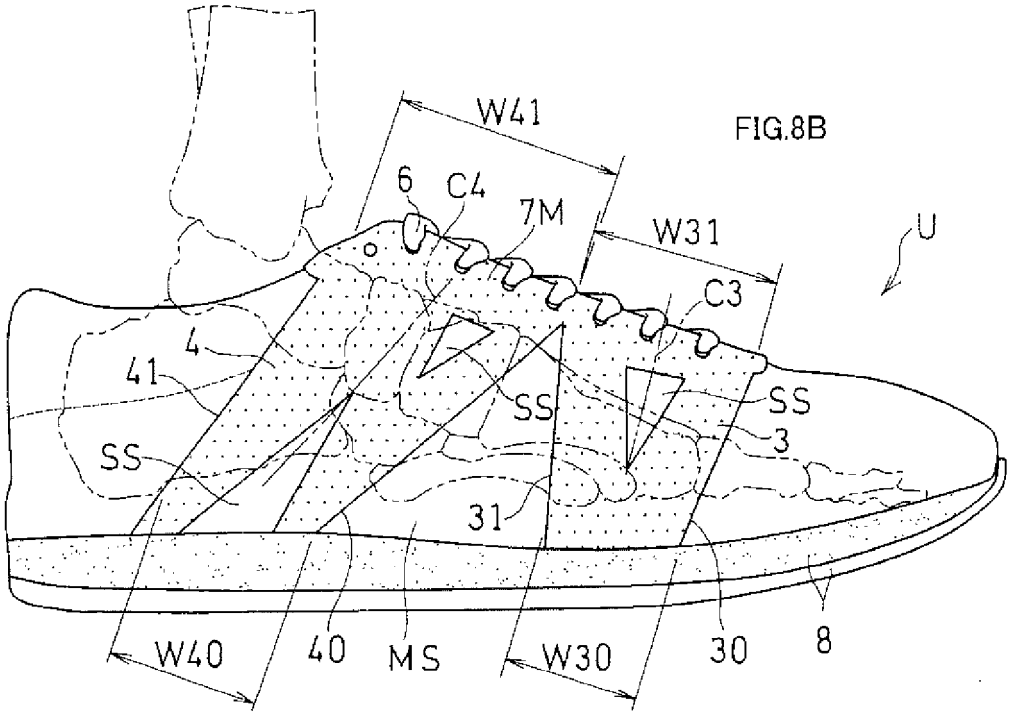

W41
6
C4
7M
W31
U
C3
4
41
SS
SS
SS
3
31
W40
40
MS
W30
30
8

FIG.9A

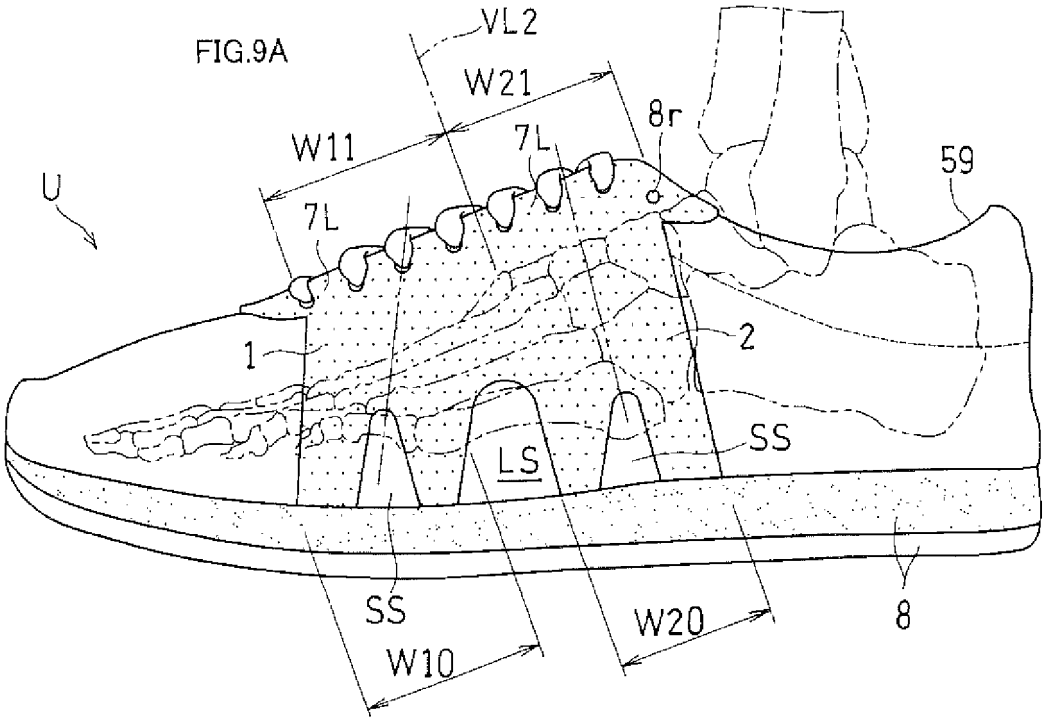

VL2
W21
W11
7L
8r
59
U
7L
1
2
SS
LS
SS
W10
W20
8

FIG.9B

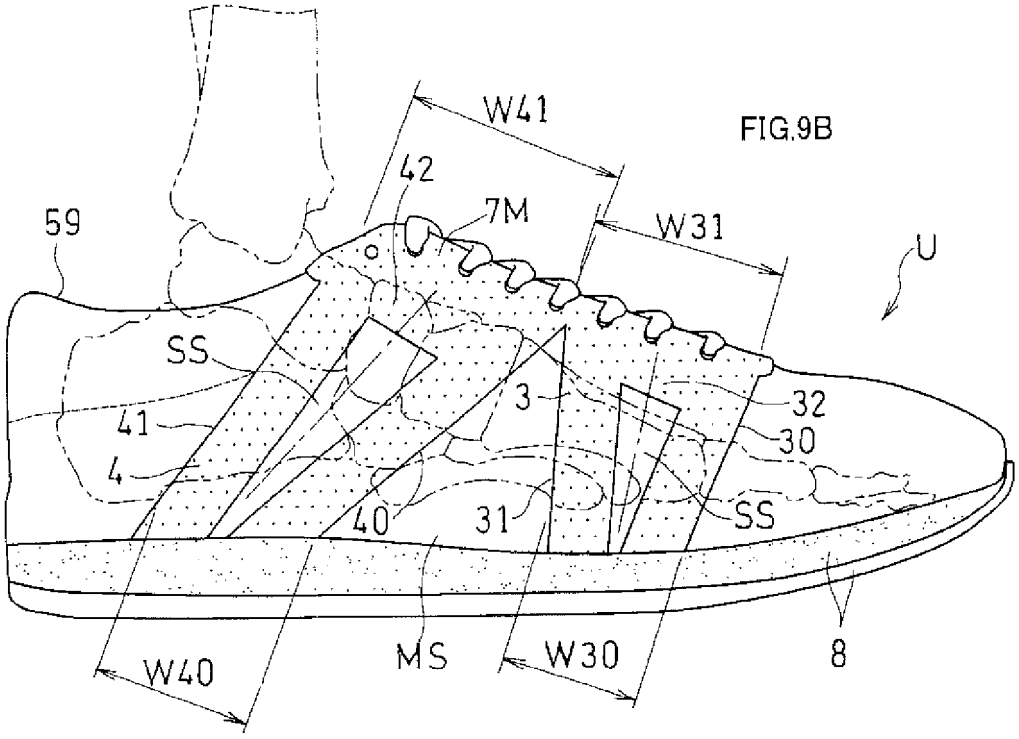

W41
42
7M
W31
59
U
SS
41
4
3
32
30
40
31
SS
W40
MS
W30
8

FIG.10A

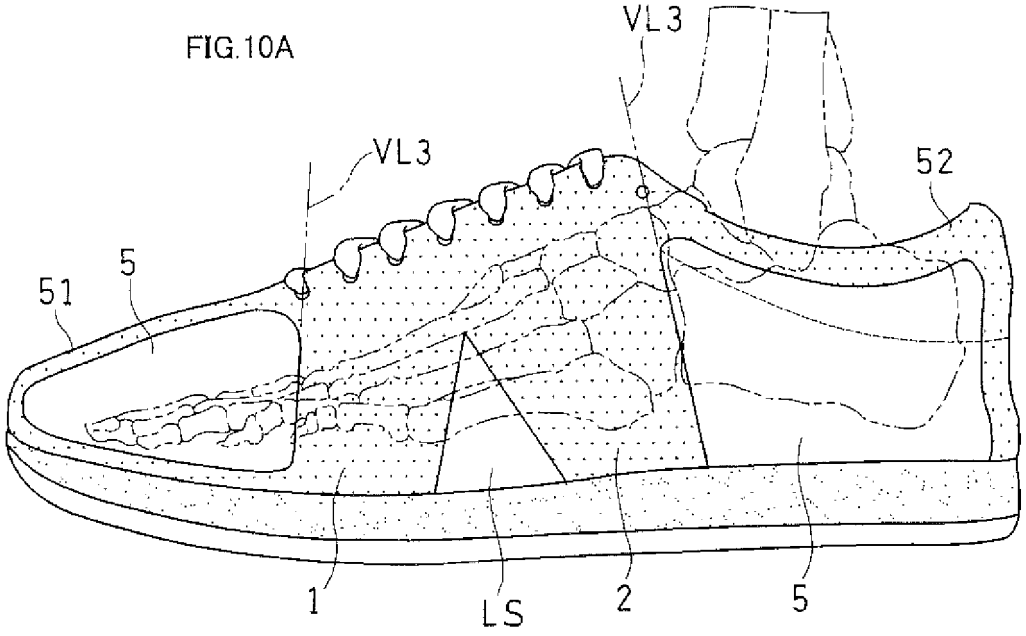


FIG.10B

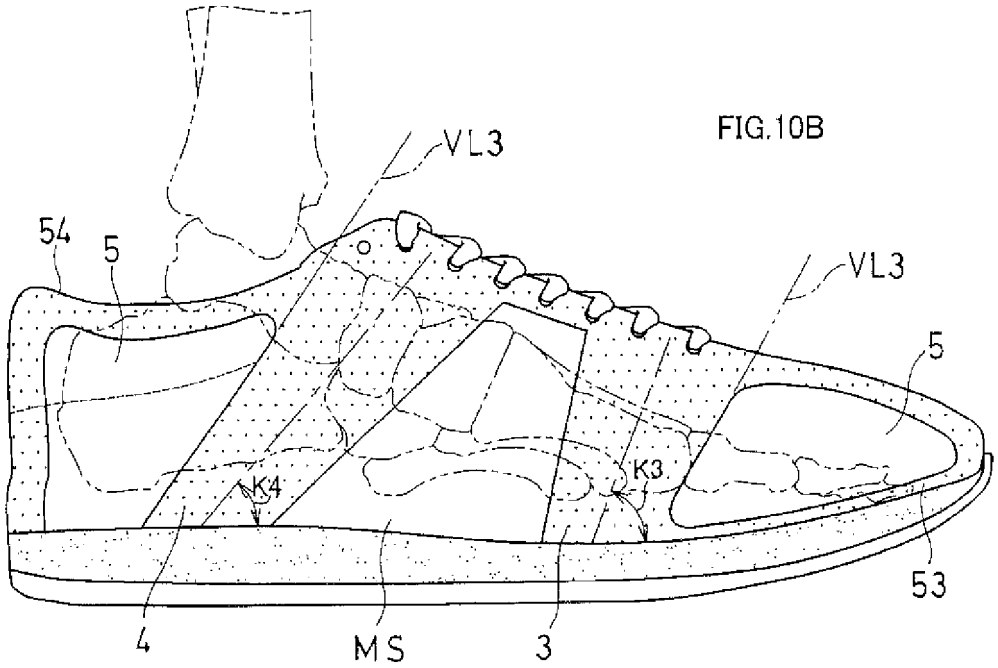


FIG.11

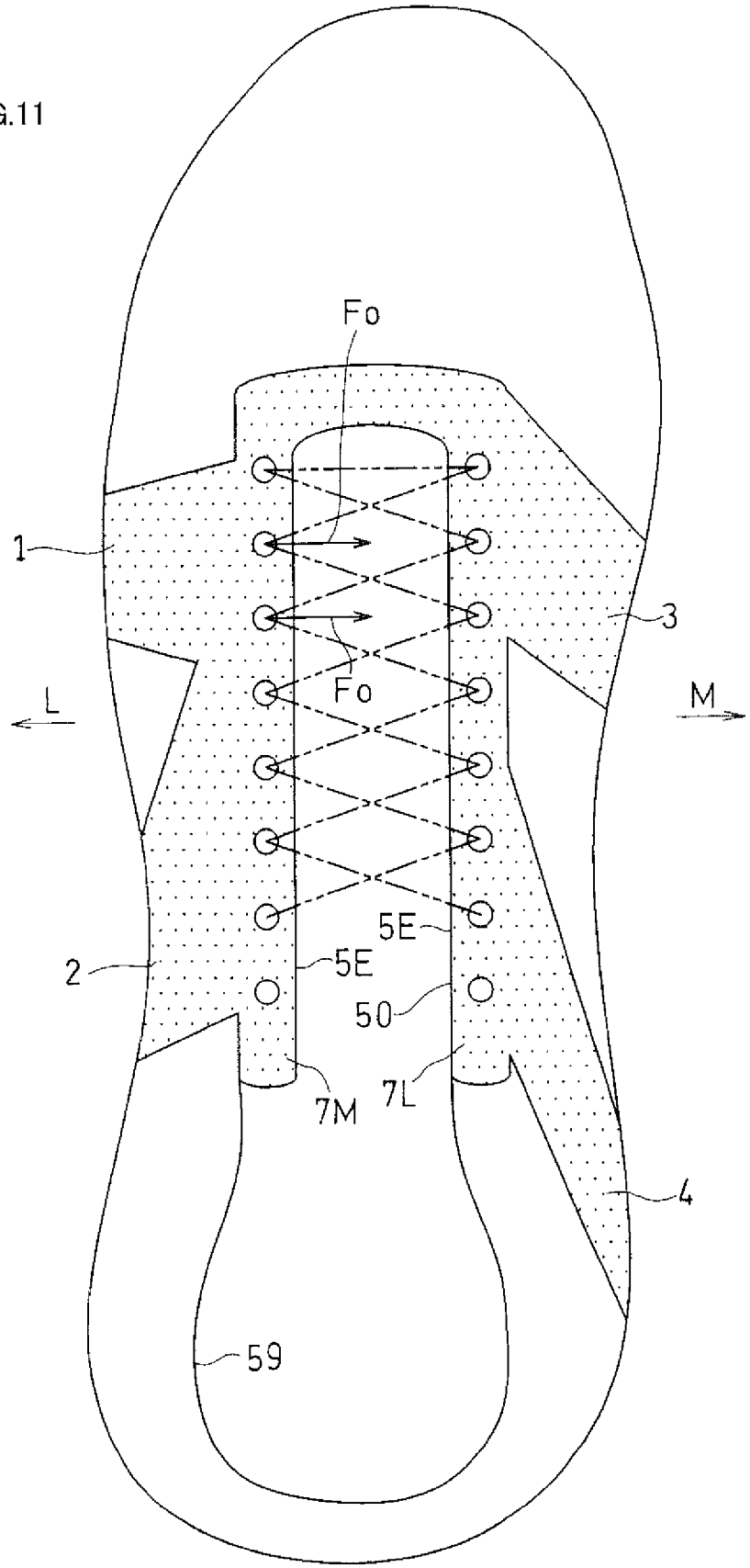


FIG.12A

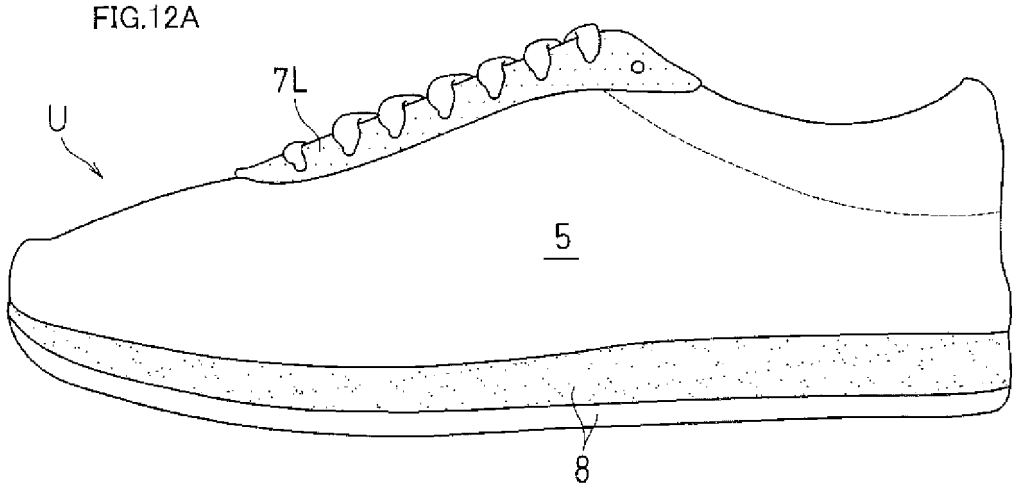


FIG.12B

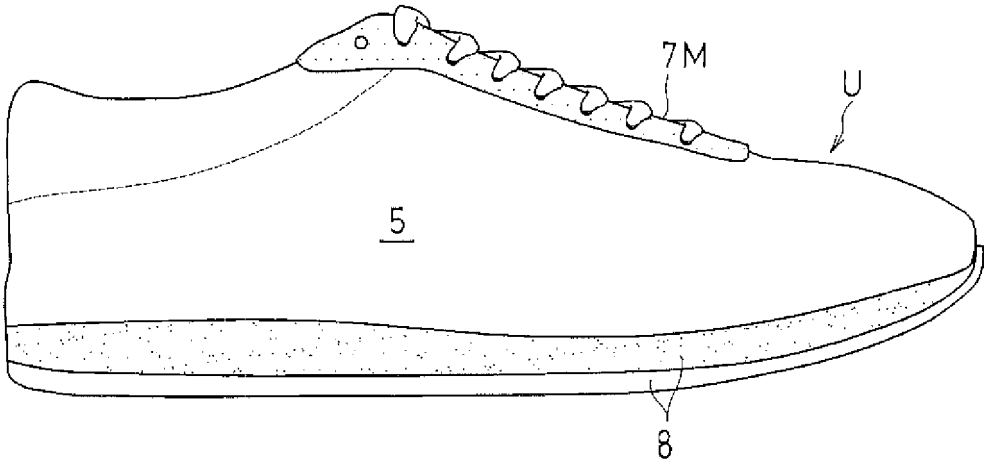


FIG.12C

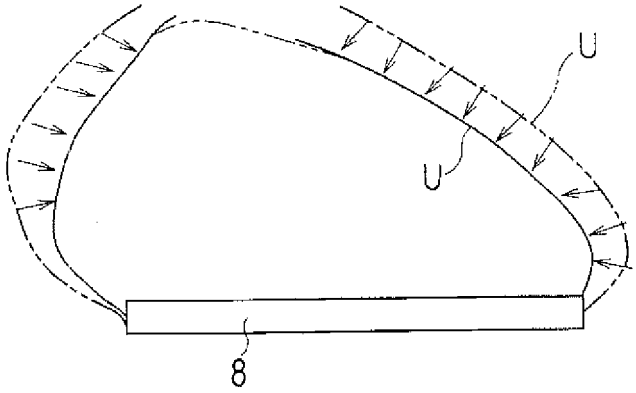


FIG.13

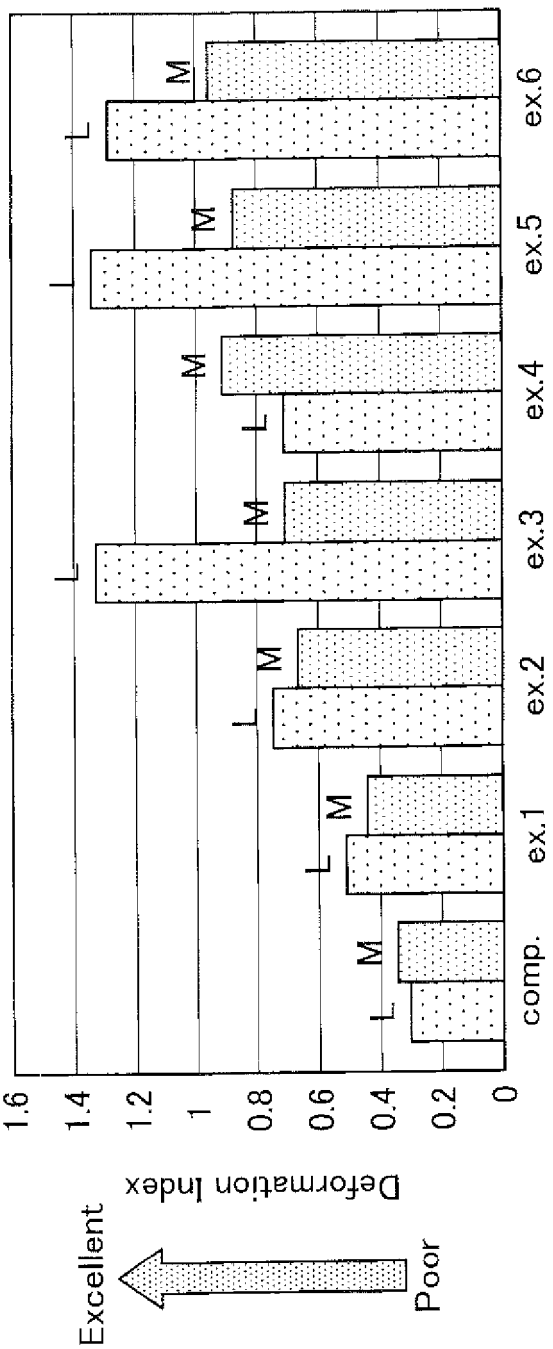

Deformation Index
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Excellent
Poor
comp.
ex.1
ex.2
ex.3
ex.4
ex.5
ex.6
L
M

FIG14A

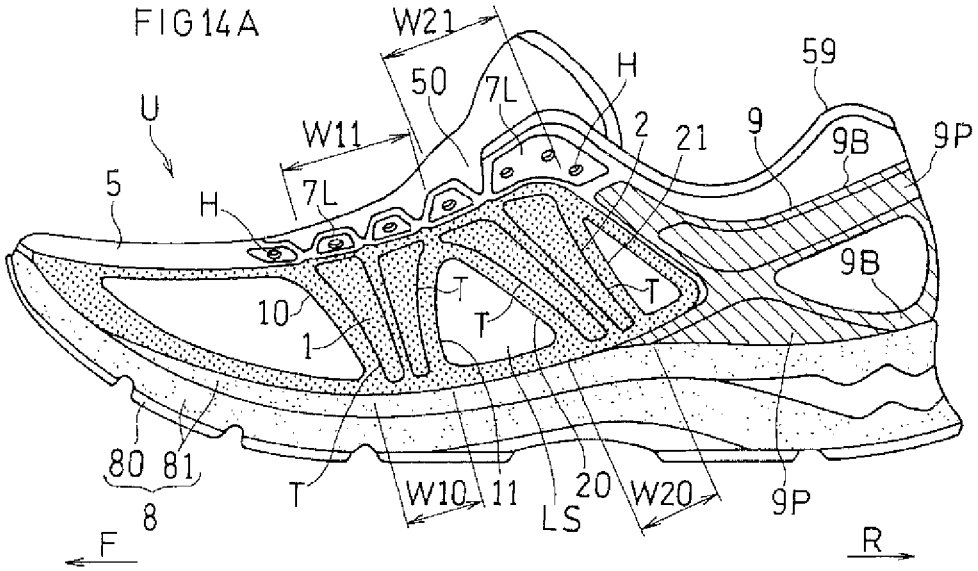
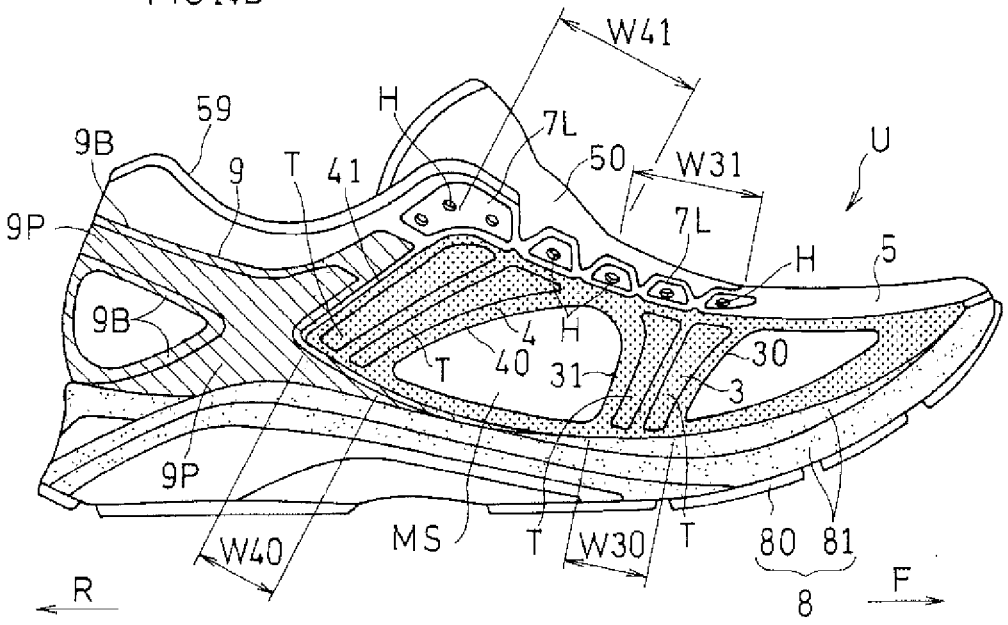


FIG14B



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2014/059541

A. CLASSIFICATION OF SUBJECT MATTER
A43B23/02(2006.01)i, *A43B7/14*(2006.01)i

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)
A43B1/00-23/30

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2014
Kokai Jitsuyo Shinan Koho 1971-2014 Toroku Jitsuyo Shinan Koho 1994-2014

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 141779/1980(Laid-open No. 62901/1982) (Yasuo WAKAI), 14 April 1982 (14.04.1982), specification, page 2, line 8 to page 3, line 3; fig. 1 (Family: none)	1-2,9-12, 15-16 3-8,13-14,17
Y A	JP 49-48435 A (Alfred Powers), 10 May 1974 (10.05.1974), page 2, upper right column, line 17 to lower right column, line 11; fig. 2 & US 3768182 A & GB 1422219 A & DE 2318834 A	1-2,9-12, 15-16 3-8,13-14,17

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

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"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)
"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
"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
"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
"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
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
09 June, 2014 (09.06.14)	24 June, 2014 (24.06.14)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2014/059541

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	JP 62-231602 A (Chesebrough-Ponds Inc.), 12 October 1987 (12.10.1987), page 4, upper right column, lines 1 to 10; fig. 1 & US 4670998 A & EP 0231118 A2	1-2,9-12, 15-16 3-8,13-14,17
A	US 2096160 A (CHAMBERS, F.S.), 19 October 1937 (19.10.1937), all drawings (Family: none)	3-8,13-14,17

Form PCT/ISA/210 (continuation of second sheet) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 2001082735 A **[0004]**
- JP 2003024108 A **[0004]**
- JP 2005903 A **[0004]**
- JP 11000201 A **[0004]**
- JP 60227701 A **[0004]**