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KAGAMI et al.(10) **Pub. No.: US 2022/0225736 A1**(43) **Pub. Date: Jul. 21, 2022**(54) **SHOE****Publication Classification**(71) Applicant: **ASICS CORPORATION**, Hyogo (JP)(51) **Int. Cl.***A43C 11/14* (2006.01)*A43C 1/06* (2006.01)*A43B 5/06* (2006.01)(72) Inventors: **Kana KAGAMI**, Hyogo (JP); **Ayu BESSHO**, Hyogo (JP); **Kenta MORIYASU**, Hyogo (JP)(52) **U.S. Cl.**CPC *A43C 11/14* (2013.01); *A43B 5/06* (2013.01); *A43C 1/06* (2013.01)(73) Assignee: **ASICS CORPORATION**, Hyogo (JP)(21) Appl. No.: **17/617,286**

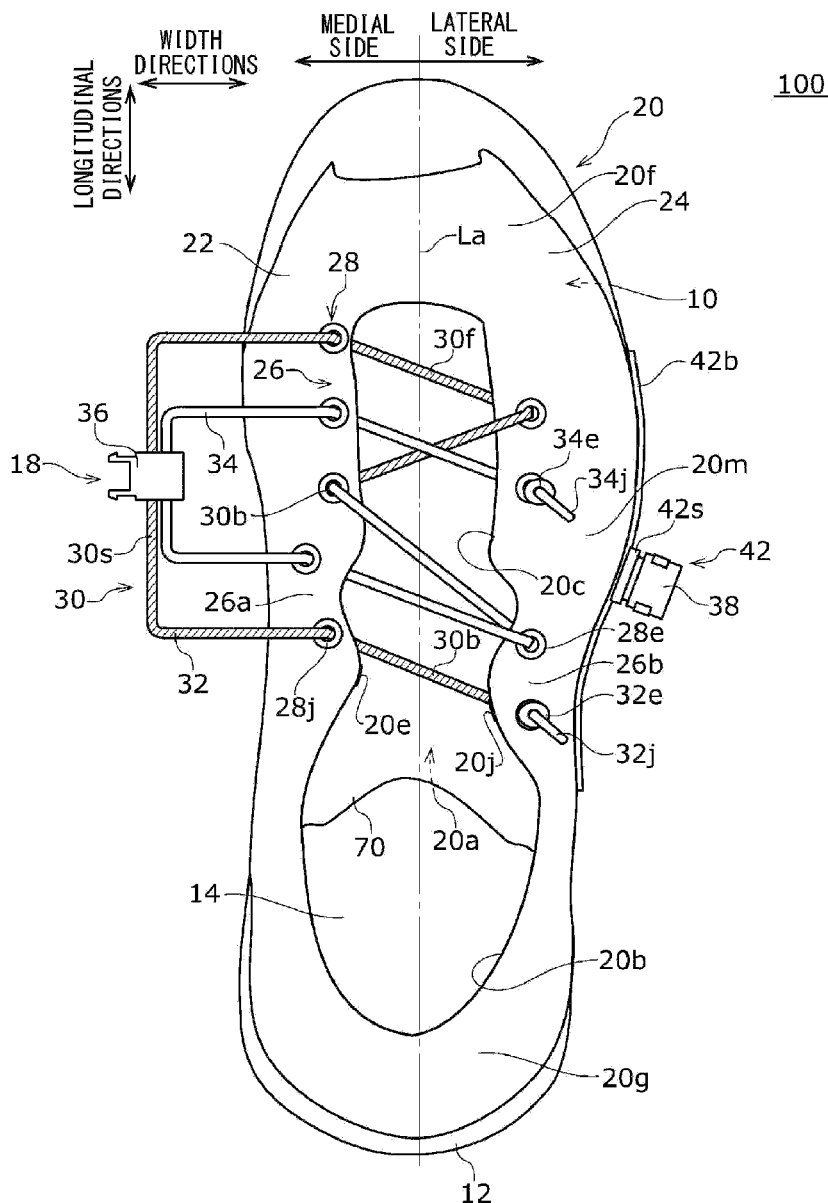
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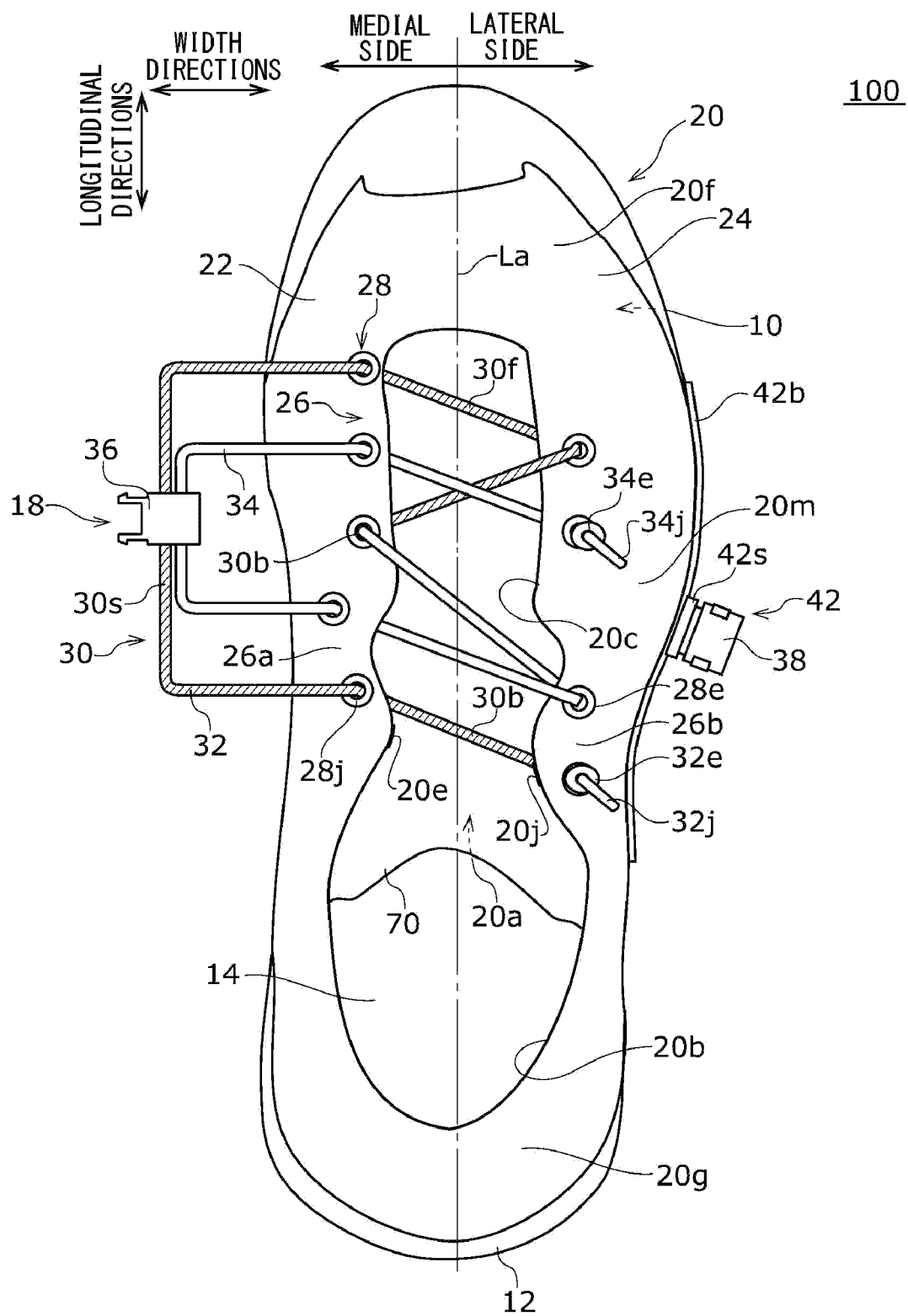
ABSTRACT(22) PCT Filed: **Jun. 13, 2019**(86) PCT No.: **PCT/JP2019/023533**

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A shoe includes a sole, an upper provided above the sole to accommodate a foot, a tightening part that applies tightening force to the upper, and a force transmitter that transmits tightening force from the tightening part to a lower part of a midfoot portion of the upper.





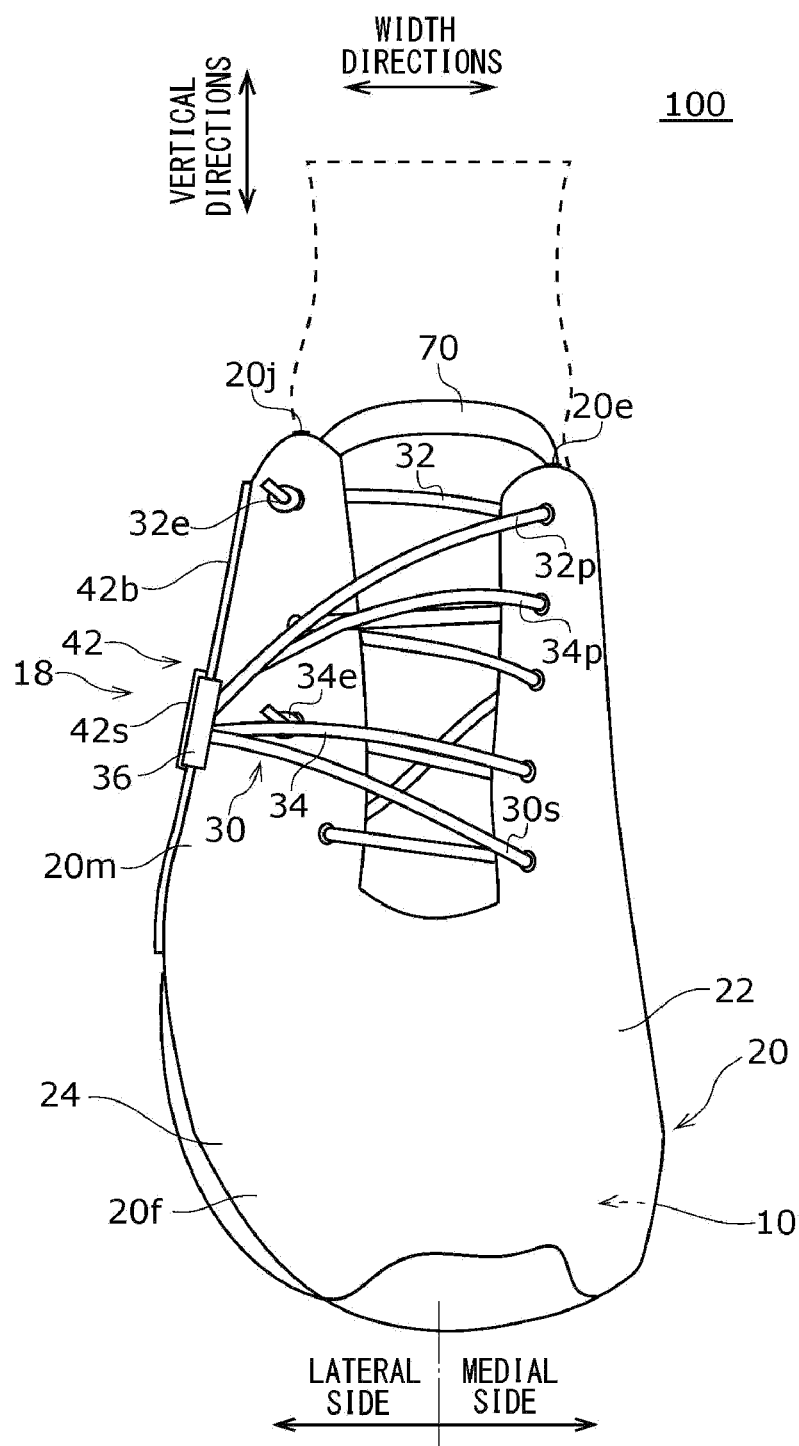
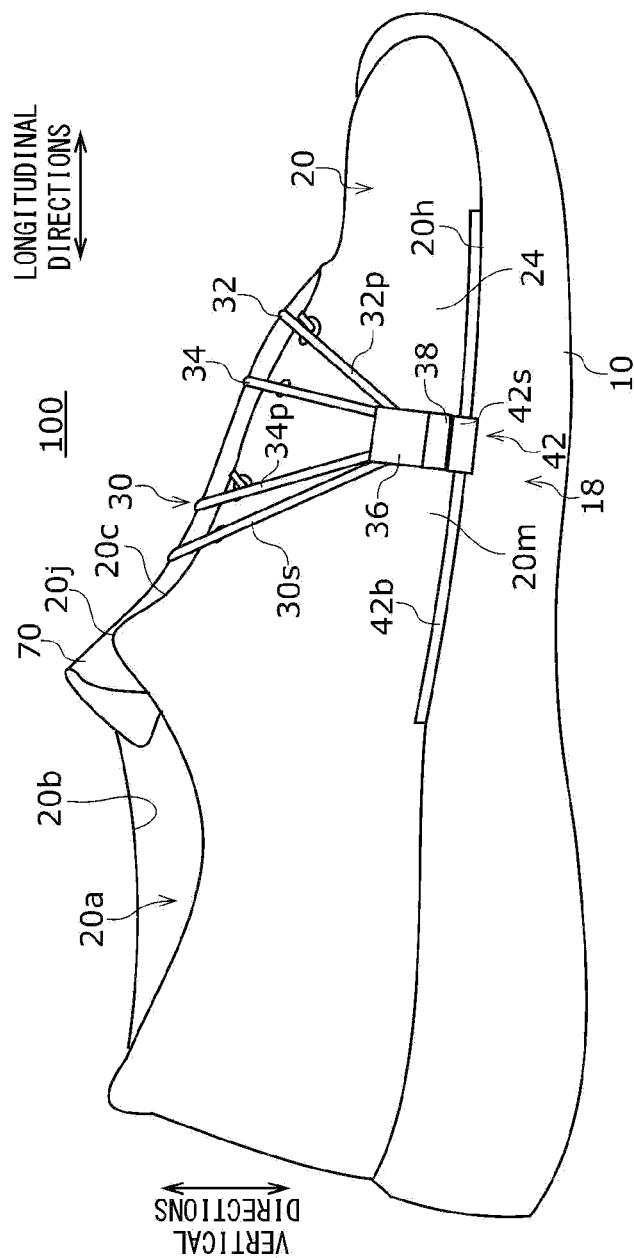


FIG. 2



3
G
F

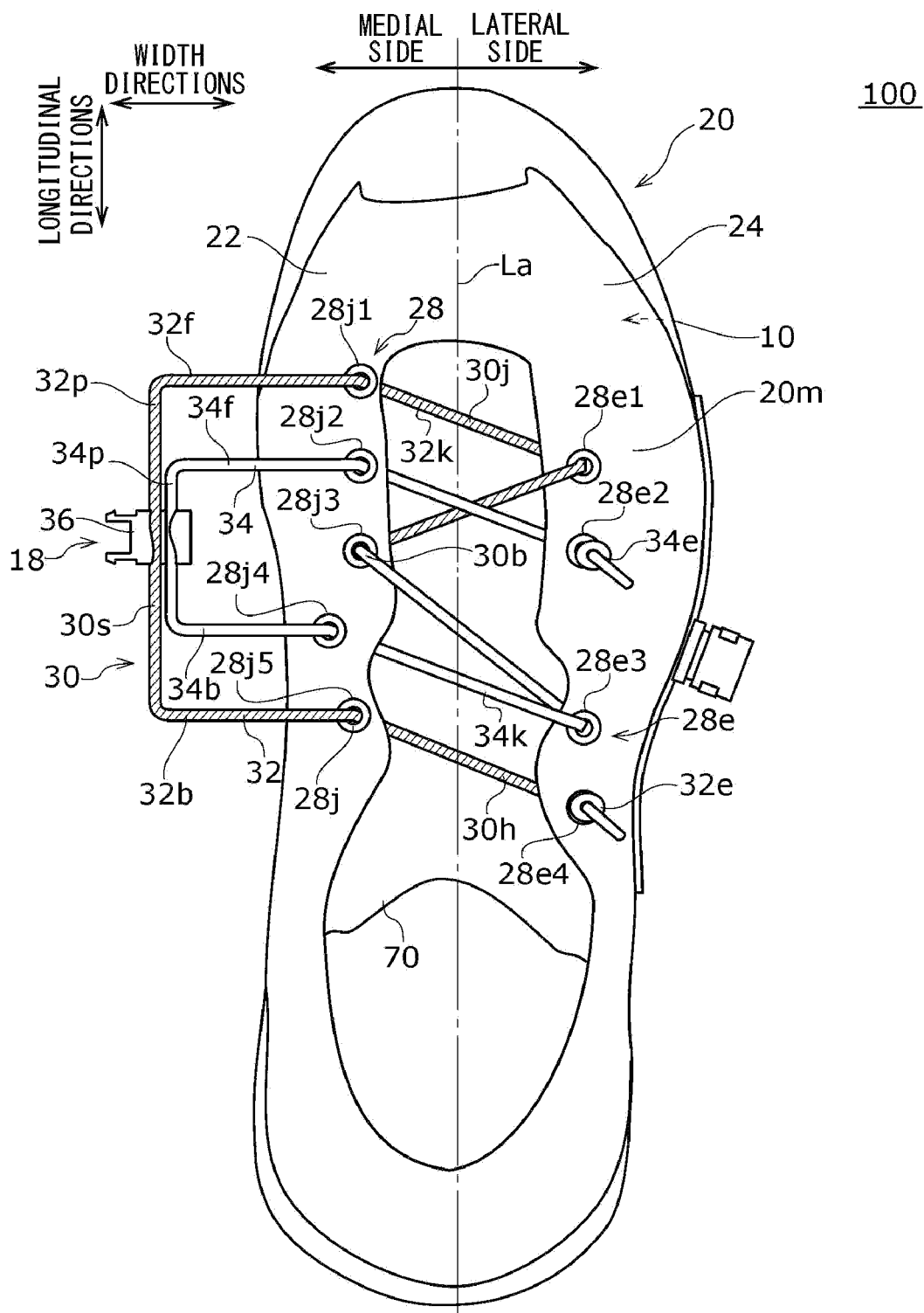
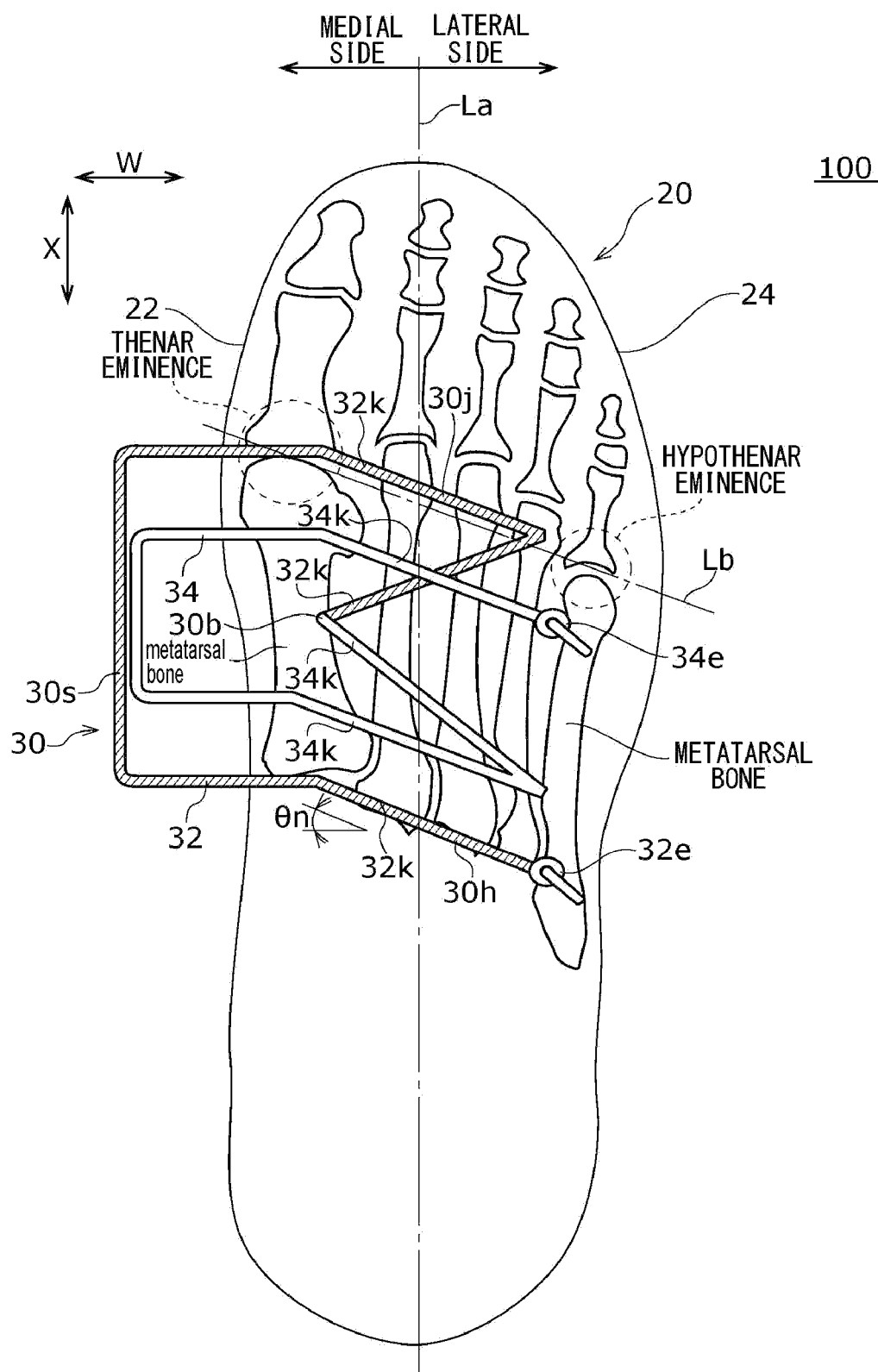


FIG. 4



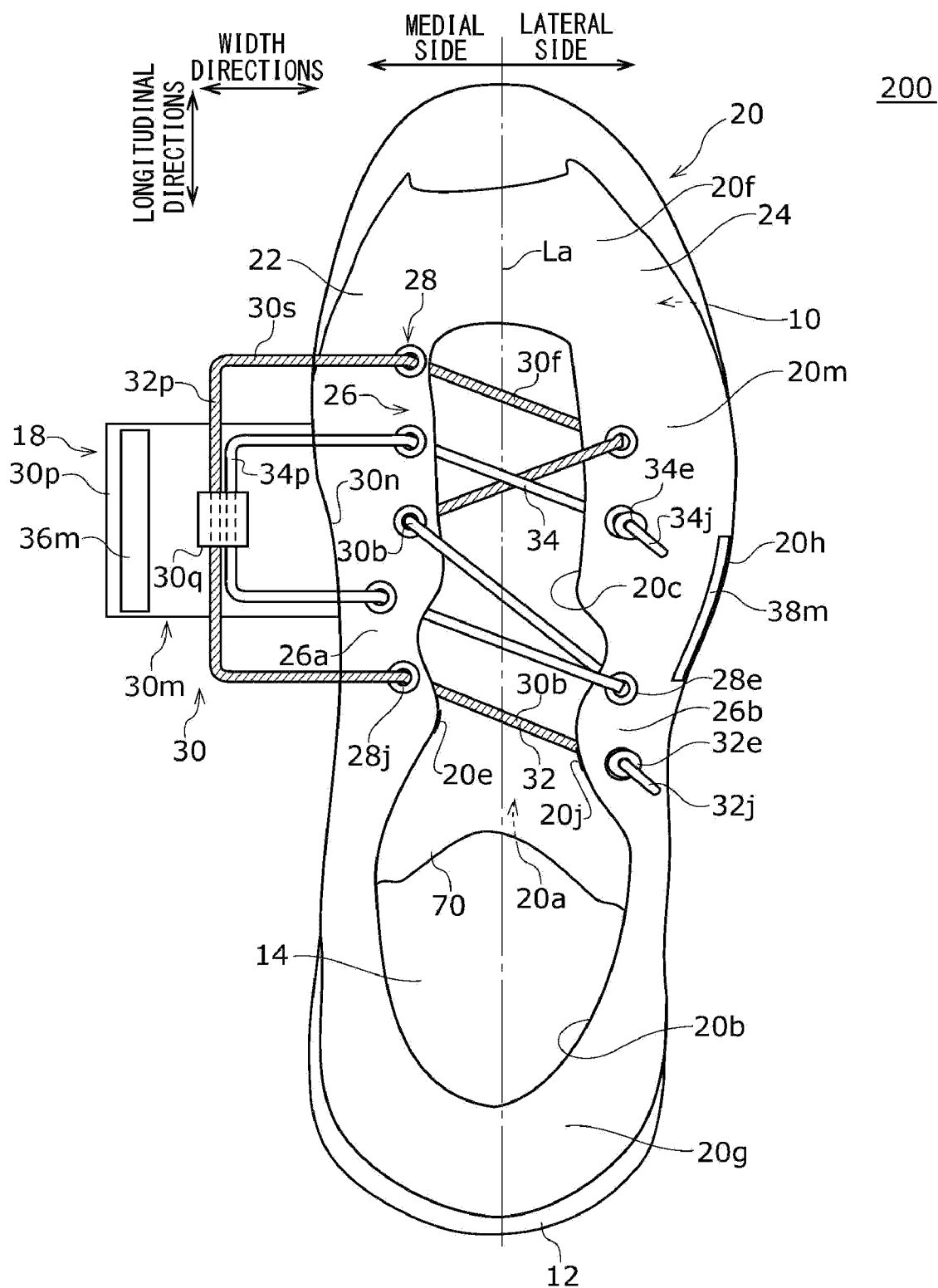


FIG. 6

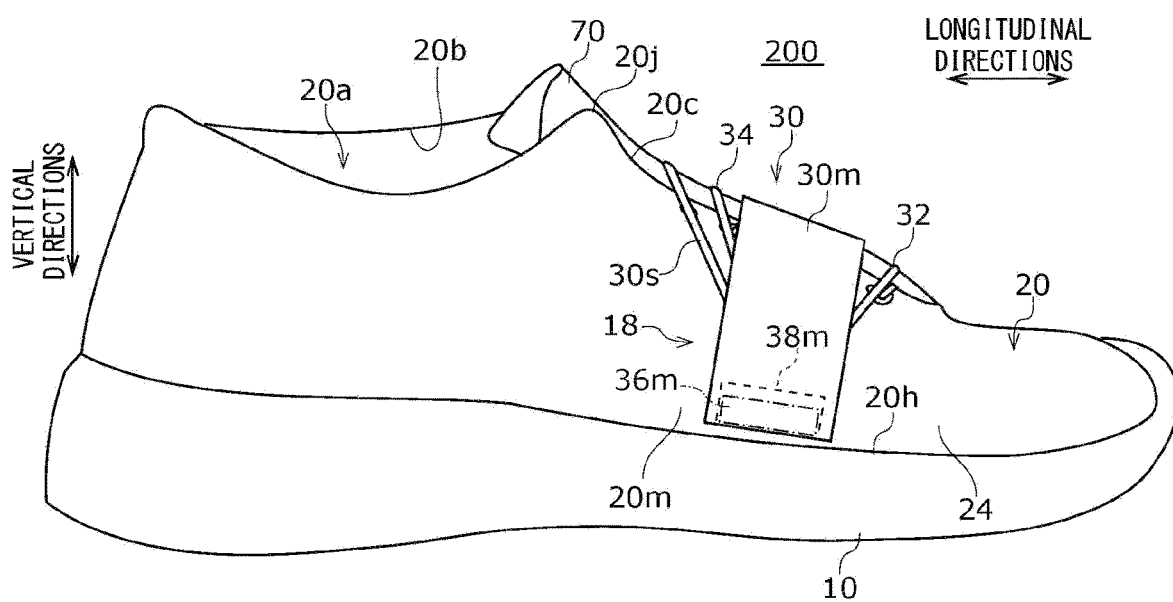


FIG. 7

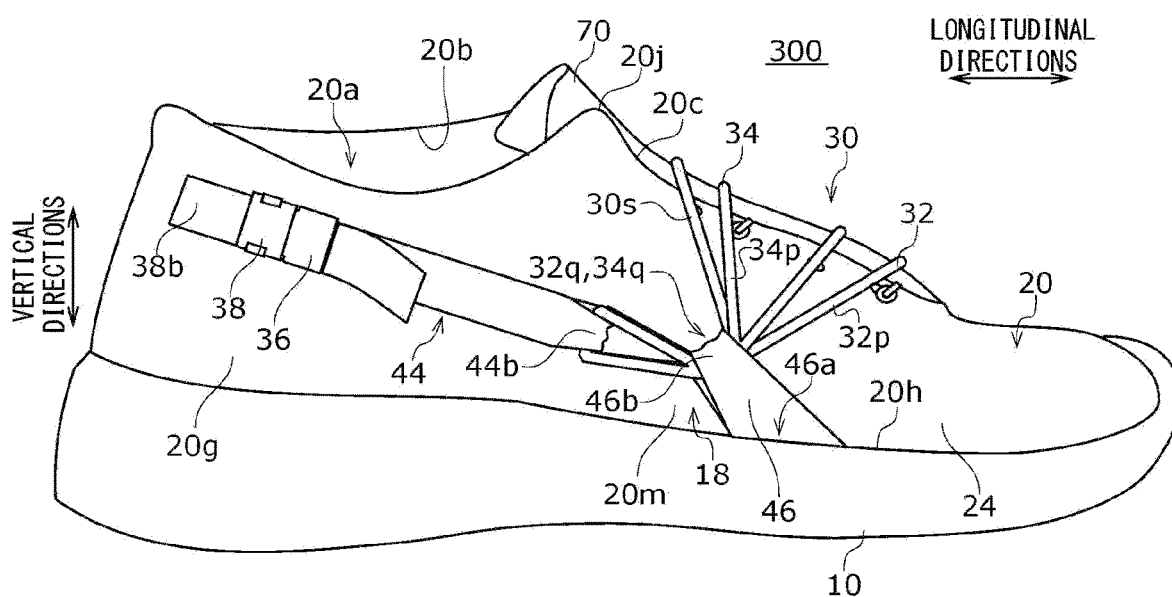


FIG. 8

SHOE

TECHNICAL FIELD

[0001] The present invention relates to a shoe.

BACKGROUND ART

[0002] Shoes with uppers that can be easily tightened are known. For example, Patent Literature 1 describes a shoe that includes a shoelace for tightening the upper, and a fastener provided midway along the shoelace. The shoelace passes, in a zigzag pattern, through eyelets formed on the both side parts of the upper between which an opening is provided, and an end of the shoelace is fixed to the upper. The fastener is fixed around the wearing opening on the top of the upper.

PRIOR ART REFERENCE

Patent Literature

- [0003] Patent Literature 1: Specification of U.S. Pat. No. 9,730,492
[0004] Patent Literature 2: Specification of U.S. Pat. No. 5,353,483
[0005] Patent Literature 3: Japanese Unexamined Patent Application Publication No. 10-179210
[0006] Patent Literature 4: Japanese Translation of PCT International Application Publication No. 2018-532554
[0007] Patent Literature 5: Japanese Patent No. 6236142
[0008] Patent Literature 6: Japanese Patent No. 6117380

SUMMARY OF INVENTION

Technical Problem

[0009] With regard to the upper tightening mechanism and the fit of the shoe, the inventors have found the following recognition.

[0010] To reduce the time for putting on and off a shoe, it is desirable that the upper can be easily tightened. However, with the shoe described in Patent Literature 1, since the fastener is fixed around the wearing opening on the top of the upper, the tightening force is concentrated around the wearing opening. Accordingly, the tightening force decreases from the wearing opening toward the toe, and the space between the upper and the instep becomes larger, which impairs the fit.

[0011] To improve the fit on the toe side, strongly tightening the entire shoelace may be considered. However, in this case, the tightening force around the wearing opening will become excessively large, which is disadvantageous in terms of the comfort. Therefore, the inventors have found that there is room for improvement in the shoe described in Patent Literature 1, in terms of enabling both the easy tightening of the upper and the maintaining of the fit.

[0012] The present invention has been made in view of such an issue, and a purpose thereof is to provide a shoe of which the upper can be easily tightened and of which the fit can be maintained.

Solution to Problem

[0013] In response to the above issue, a shoe according to an embodiment of the present invention includes a sole, an upper provided above the sole to accommodate a foot, a

tightening part that applies tightening force to the upper, and a force transmitter that transmits tightening force from the tightening part to a lower part of a midfoot portion of the upper.

[0014] Optional combinations of the above, and implementation of the present invention, including the constituting elements and expressions, in the form of methods, apparatuses, programs, transitory or non-transitory storage medium storing programs, or systems may also be practiced as additional modes of the present invention.

Advantageous Effects of Invention

[0015] The present invention provides a shoe of which the upper can be easily tightened and of which the fit can be maintained.

BRIEF DESCRIPTION OF DRAWINGS

- [0016] FIG. 1 is a plan view that schematically illustrates a shoe according to an embodiment of the present invention;
[0017] FIG. 2 is a front view of the shoe shown in FIG. 1;
[0018] FIG. 3 is a side view of the shoe shown in FIG. 1;
[0019] FIG. 4 is a plan view that illustrates the vicinity of a tightening part of the shoe shown in FIG. 1;
[0020] FIG. 5 is a plan view that illustrates positional relationships among a shoelace of the shoe shown in FIG. 1, and the thenar eminence and the hypothenar eminence of a wearer;
[0021] FIG. 6 is a plan view that schematically illustrates a shoe according to a first modification;
[0022] FIG. 7 is a side view of the shoe shown in FIG. 6; and
[0023] FIG. 8 is a side view that schematically illustrates a shoe according to a second modification.

DESCRIPTION OF EMBODIMENTS

[0024] In the following, the present invention will be described based on a preferred embodiment with reference to each drawing. In the embodiment and modifications, like reference characters denote like or corresponding constituting elements and members, and the same description will be omitted as appropriate. Also, the dimensions of a member may be appropriately enlarged or reduced in each drawing in order to facilitate understanding. Further, in each drawing, part of a member less important in describing the embodiment may be omitted.

[0025] Also, terms including ordinal numbers, such as “first” and “second”, are used to describe various constituting elements; however, such terms are used in order to distinguish one constituting element from another and do not limit the constituting elements.

[0026] [Embodiment]

[0027] In the following, a configuration of a shoe 100 according to an embodiment of the present invention will be described with reference to the drawings. FIG. 1 is a plan view that schematically illustrates the shoe 100 according to the embodiment. Each drawing mentioned below, including FIG. 1, illustrates a shoe for a right foot, unless otherwise specified. However, the description in the present specification is also applicable to a shoe for a left foot. FIG. 2 is a front view of the shoe 100. FIG. 3 is a side view of the shoe 100. FIG. 3 shows the shoe 100 viewed from the lateral side of the foot.

[0028] The shoe 100 of the present embodiment can be used for walking shoes, running shoes, safety shoes, and sports shoes for tennis or basketball, for example, and the use of the shoe 100 is not limited. The shoe 100 includes a sole 10 and an upper 20. As illustrated in FIG. 1, a portion on the medial side (the left side in FIG. 1) with respect to a center line La in a width direction of the upper 20 will be referred to as a medial portion 22, and a portion on the lateral side (the right side in FIG. 1) with respect to the center line La in a width direction of the upper 20 will be referred to as a lateral portion 24. Also, the direction from the lateral side toward the medial side of the foot will be referred to as the inner side, and the opposite direction will be referred to as the outer side. Further, a direction along the center line La will be referred to as a “longitudinal direction”.

[0029] Also, the direction toward the toe side along the center line La will be referred to as the “front side” or “front”, and the opposite direction will be referred to as the “rear side” or “rear”. Accordingly, a width direction is perpendicular to the center line La. Also, in the upper 20, a portion corresponding to the metatarsal bones (see also FIG. 5) in a longitudinal direction will be referred to as a midfoot portion 20m. When the longitudinal length of the shoe 100 is regarded as 100%, the midfoot portion 20m corresponds to a region from 25% to 85% or, more exactly, from 30% to 80%, from the tip, in a range parallel with a straight line perpendicular to the center line La. Also, in the upper 20, a portion in front of the midfoot portion 20m in a longitudinal direction will be referred to as a forefoot portion 20f, and a portion in the rear of the midfoot portion 20m in a longitudinal direction will be referred to as a rearfoot portion 20g. The forefoot portion 20f is a portion that almost corresponds to the phalanges, and the rearfoot portion 20g is a portion that almost corresponds to the tarsals.

[0030] In the state where the shoe 100 is placed on a horizontal plane (hereinafter, referred to as a “horizontal state”), the upper side will be referred to as the “upper side” or “above”, and the opposite side will be referred to as the “lower side” or “below”. Also, in a horizontal state, a direction extending vertically will be referred to as a “vertical direction”.

[0031] (Sole)

[0032] The sole 10 is a portion to be in contact with the ground. The sole 10 includes an outsole 12 and an insole 14. Above the sole 10, the upper 20 is fixed by means of bonding or the like. The sole 10 may include a midsole between the outsole 12 and the insole 14. The sole 10 may have a unisole structure and need not necessarily include the insole 14.

[0033] (Upper)

[0034] The upper 20 is provided above the sole 10 to accommodate a foot. The upper 20 surrounds an internal space 20a for accommodating a foot. On the upper 20, a central opening 20c is formed from a wearing opening 20b toward the front. The central opening 20c is not an essential configuration, and the upper 20 may have a so-called monosock structure. The upper 20 includes the medial portion 22, the lateral portion 24, an eyelet formation part 26, and eyelet parts 28. Also, on the upper 20, a tightening part 30 for applying tightening force to the upper 20 is provided, and a force transmitter 18 for transmitting the tightening force from the tightening part 30 to a lower part of the midfoot portion 20m of the upper 20 is also provided. In the present embodiment, the force transmitter 18 includes a clasp 36 for detachably fixing the tightening part 30 to the

upper 20, and a receiving part 38. Also, on the upper 20, a position adjustment mechanism 42 and a shoe tongue 70 are provided. FIG. 1 shows a state where the clasp 36 is not fixed to the upper 20, and each of FIGS. 2 and 3 shows a state where the clasp 36 is fixed to the upper 20.

[0035] (Tightening Part)

[0036] The tightening part 30 tightens the upper 20. The tightening part 30 in this example is disposed to across the central opening 20c in a width direction. The tightening part 30 applies, to the upper 20, tightening force for closing the central opening 20c in the width directions. The tightening part 30 may include a belt-shaped member, a string-shaped member, or the both. The tightening part 30 in the present embodiment is a shoelace 30s, which includes a first portion 32 and a second portion 34 formed continuously. The first portion 32 corresponds to a portion from a boundary 30b between the first portion 32 and the second portion 34 to an end 32e of the shoelace 30s. The second portion 34 corresponds to a portion from the boundary 30b between the first portion 32 and the second portion 34 to an end 34e of the shoelace 30s. The boundary 30b and the ends 32e and 34e will be described later.

[0037] Through each eyelet part 28, the first portion 32 or the second portion 34 passes, so as to transmit the tightening force from the tightening part 30 to the upper 20. The eyelet parts 28 in this example are grommets that each have a hole vertically piercing. The eyelet parts 28 are formed in the eyelet formation part 26 provided along a circumferential edge of the central opening 20c of the upper 20. The eyelet formation part 26 includes a first formation part 26a provided in the medial portion 22, and a second formation part 26b provided in the lateral portion 24. To obtain higher rigidity than the surrounding portions, the eyelet formation part 26 may be formed of a material having lower elasticity or flexibility than the surrounding portions, a material thicker than the surrounding portions, a material denser than the surrounding portions, or a material harder than the surrounding portions. Also, the eyelet formation part 26 may be formed of the same material as the surrounding portions.

[0038] The eyelet parts 28 in the present embodiment include outer eyelet parts 28e provided on the lateral side, and inner eyelet parts 28j provided on the medial side. Multiple inner eyelet parts 28j are provided in the first formation part 26a, and multiple outer eyelet parts 28e are provided in the second formation part 26b. To even the tightening force distribution in a longitudinal direction, the number of inner eyelet parts 28j (five, for example) is larger than the number of outer eyelet parts 28e (four, for example). Also, the number of inner eyelet parts 28j is odd, and the number of outer eyelet parts 28e is even, so that the sum of them becomes an odd number. Accordingly, the outer eyelet parts 28e and the inner eyelet parts 28j are arranged to be asymmetric in a width direction.

[0039] (Clasp)

[0040] The clasp 36 is a member for detachably fixing the tightening part 30 to the lower part of the midfoot portion 20m of the upper 20 and corresponds to the force transmitter. The clasp 36 is connected to the receiving part 38 provided on the upper 20 so as to be fixed to the upper 20. Accordingly, the clasp 36 is placed in a fixed state of being connected to the receiving part 38, and an unfixed state of being separated from the receiving part 38. When the clasp 36 is fixed, it is preferable that the clasp 36 is fixed around a boundary part 20h between the upper 20 and the sole 10,

on the lateral side of the midfoot portion 20m. However, the receiving part 38 has only to be fixed onto a line that constitutes the contour of the upper 20 in top view or to a position below the line. Alternatively, the receiving part 38 may be fixed to a side surface of the sole 10. The contour of the upper 20 is a line obtained by connecting outermost projecting parts in the upper 20. The clasp 36 has only to be capable of fixing the tightening part 30 and may be a hook-and-loop fastener, a hook, a magnet, or the like. In this example, the clasp 36 is a male part of a resin buckle, and the receiving part 38 is a female part of the buckle. The clasp 36 and the receiving part 38 may also be a front release buckle or a side release buckle.

[0041] (Position Adjustment Mechanism)

[0042] Since the shape of a foot is different for each wearer, the fixed position of the clasp 36 may desirably be adjustable. Accordingly, the position adjustment mechanism 42 is provided in the present embodiment with which the fixed position of the clasp 36 on the upper 20 can be shifted in the longitudinal directions. For example, the position adjustment mechanism 42 may be a slider mechanism. The position adjustment mechanism 42 in the present embodiment includes a rail member 42b provided on the lateral portion 24 of the upper 20 such as to extend in a longitudinal direction, and a slider 42s provided to be longitudinally movable along the rail member 42b. To the slider 42s, the receiving part 38 is fixed. The position adjustment mechanism is not essential, and the position of the receiving part 38 may also be fixed.

[0043] The shoe tongue 70 covers the central opening 20c from the internal space 20a side of the upper 20. As the shoe tongue 70, a so-called split tongue may be adopted in which the ends in a width direction thereof are fixed respectively at the left and right ends of the central opening 20c, and a middle portion of the shoe tongue 70 is split into left and right parts.

[0044] FIG. 4 is also referred to. FIG. 4 is a plan view that illustrates the vicinity of the tightening part 30. FIG. 4 illustrates the clasp 36 partially cut out. The multiple inner eyelet parts 28j will be respectively referred to as eyelet parts 28j1, 28j2, 28j3, 28j4, and 28j5 serially from the front toward the rear. Also, the multiple outer eyelet parts 28e will be respectively referred to as eyelet parts 28e1, 28e2, 28e3, and 28e4 serially from the front toward the rear. The eyelet parts 28j1, 28j2, 28j3, 28j4, and 28j5 may be evenly spaced or may be partially spaced unevenly. Also, the eyelet parts 28e1, 28e2, 28e3, and 28e4 may be evenly spaced or may be partially spaced unevenly.

[0045] The eyelet part 28j3, which is disposed in the middle in a longitudinal direction among the inner eyelet parts 28j, will be particularly referred to as a middle eyelet part 28j3. In the tightening part 30, a part laid through the middle eyelet part 28j3 is defined as the boundary 30b between the first portion 32 and the second portion 34. Also, in the tightening part 30, a portion extending from the middle eyelet part 28j3 toward the rear side is defined as the first portion 32. Also, in the tightening part 30, a portion extending from the middle eyelet part 28j3 toward the front side is defined as the second portion 34. Accordingly, the first portion 32 and the second portion 34 have a relationship such that, when one of them becomes longer, the other becomes shorter. Therefore, the position of the boundary 30b in the entire length of the tightening part 30 changes accordingly.

[0046] The end 32e of the first portion 32 and the end 34e of the second portion 34 are fixed to the lateral side of the upper 20. In this example, the end 32e of the first portion 32 is fixed at the eyelet part 28e2, which is the second outer eyelet part 28e from the front. Also, the end 34e of the second portion 34 is fixed at the eyelet part 28e4, which is the fourth outer eyelet part 28e from the front (or the rearmost outer eyelet part 28e). An end being fixed as used herein means that, even when the clasp 36 is pulled, the end is retained without coming out of the corresponding eyelet part. The fixing structure for the ends 32e and 34e is not particularly limited. In this example, at each of the ends 32e and 34e, a knot (node) that is large enough not to pass through the corresponding eyelet part 28e is formed. Each of the ends 32e and 34e may also be configured with a lace stopper member.

[0047] Portions of the shoelace 30s extending from the knots at the ends 32e and 34e toward the side opposite to the eyelet parts 28e will be respectively referred to as extension lace parts 32j and 34j, as illustrated in FIG. 1. The tips of the extension lace parts 32j and 34j may be free ends. Also, each of the tips of the extension lace parts 32j and 34j may be cut off at an appropriate length for each wearer.

[0048] Since the shape of a foot is different for each wearer, an appropriate length of each of the first portion 32 and the second portion 34 is also different. Accordingly, the lengths of the first portion 32 and the second portion 34 may desirably be changeable. Therefore, in the present embodiment, the lengths of the first portion 32 and the second portion 34 are made adjustable at the end 32e of the first portion 32 and the end 34e of the second portion 34.

[0049] By changing the position of the knot at the end 32e, 4j when the extension lace part 32j is made longer, the first portion 32 becomes shorter, and, when the extension lace part 32j is made shorter, the first portion 32 becomes longer. Also, by changing the position of the knot at the end 34e, when the extension lace part 34j is made longer, the second portion 34 becomes shorter, and, when the extension lace part 34j is made shorter, the second portion 34 becomes longer. As described previously, the tip side with respect to a knot may be cut to an appropriate length. Also, instead of forming a knot, a dial-type length adjustment mechanism may be provided, for example. In these cases, the lengths can be easily adjusted.

[0050] A route from the end 32e of the first portion 32 will be described. As illustrated in FIG. 4, the first portion 32 extends from the eyelet part 28e4 to the eyelet part 28j5, from the eyelet part 28j5 to the eyelet part 28j1, from the eyelet part 28j1 to the eyelet part 28e1, and from the eyelet part 28e1 to the middle eyelet part 28j3. In the first portion 32, the portion from the eyelet part 28j5 to the eyelet part 28j1 is pulled out to the inner side to constitute a lead part 32p. In the lead part 32p, the clasp 36 is provided. Each portion extending between an inner eyelet part 28j and an outer eyelet part 28e in the first portion 32 will be referred to as an inward-outward extending part 32k.

[0051] A route from the end 34e of the second portion 34 will be described. As illustrated in FIG. 4, the second portion 34 extends from the eyelet part 28e2 to the eyelet part 28j2, from the eyelet part 28j2 to the eyelet part 28j4, from the eyelet part 28j4 to the eyelet part 28e3, and from the eyelet part 28e3 to the middle eyelet part 28j3. In the second portion 34, the portion from the eyelet part 28j2 to the eyelet part 28j4 is pulled out to the inner side to constitute a lead

part 34*p*. In the lead part 34*p*, the clasp 36 is provided. Each portion extending between an inner eyelet part 28*j* and an outer eyelet part 28*e* in the second portion 34 will be referred to as an inward-outward extending part 34*k*.

[0052] The lead parts 32*p* and 34*p* in this example pass through a passage within the clasp 36. Accordingly, pulling the clasp 36 applies tension to the first portion 32 and the second portion 34, thereby applying tightening force to the upper 20.

[0053] The clasp 36 is disposed on both the first portion 32 and the second portion 34. The clasp 36 is attached such as to be relatively movable with respect to the first portion 32 and the second portion 34. Accordingly, by changing the positional relationship between the boundary 30*b* of the first portion 32 and the second portion 34 and the clasp 36, one of the first portion 32 and the second portion 34 can be made shorter to strengthen the tightening force therein, and the other can be made longer to weaken the tightening force therein.

[0054] The first portion 32 and the second portion 34 are sectioned into front portions 32*f* and 34*f* located forward of the clasp 36, and rear portions 32*b* and 34*b* located rearward of the clasp 36, respectively. In other words, the clasp 36 is disposed between the front portions 32*f*, 34*f* and the rear portions 32*b*, 34*b*. By changing the positional relationship between the clasp 36 and the shoelace 30*s*, the tightening force in either the front portions 32*f*, 34*f* or the rear portions 32*b*, 34*b* can be weakened, and the tightening force in the other can be strengthened. This can adjust the tightening force distribution in a longitudinal direction.

[0055] FIG. 5 is also referred to. FIG. 5 is a plan view that illustrates positional relationships among the shoelace 30*s*, and the thenar eminence and the hypothenar eminence of a wearer. In FIG. 5, a straight line connecting the hypothenar eminence and the thenar eminence of the wearer is denoted by a reference character L*b*. The straight line L*b* is inclined by 15 degrees in the clockwise direction with respect to a width direction in plan view.

[0056] In the present embodiment, the rearmost part of the first portion 32 constitutes a top line 30*h* of the tightening part 30, and the forefront part of the first portion 32 constitutes a bottom line 30*j* of the tightening part 30. In each of the top line 30*h* and the bottom line 30*j* in the example of

[0057] FIG. 4, the lateral side is positioned rearward of the medial side. In plan view, each of the top line 30*h* and the bottom line 30*j* is inclined by a predetermined angle On with respect to a width direction. The predetermined angle On may be an angle approximate to the positional relationship between the thenar eminence and the hypothenar eminence of a wearer in plan view, such as 15 degrees.

[0058] Also, in plan view, the positional relationship between the eyelet part 28*j*5 and the eyelet part 28*e*4, through which the top line 30*h* passes, is approximate to the positional relationship between the thenar eminence and the hypothenar eminence of a wearer. In other words, a straight line connecting the eyelet part 28*j*5 and the eyelet part 28*e*4 extends substantially in parallel with the straight line connecting the thenar eminence and the hypothenar eminence. Also, in plan view, the positional relationship between the eyelet part 28*j*1 and the eyelet part 28*e*1, through which the bottom line 30*j* passes, is approximate to the positional relationship between the thenar eminence and the hypothenar eminence of a wearer. In other words, a straight line

connecting the eyelet part 28*j*1 and the eyelet part 28*e*1 extends substantially in parallel with the straight line connecting the thenar eminence and the hypothenar eminence.

[0059] To absorb impact and reduce fatigue during walking, for example, it is desirable to maintain a transverse arch from the thenar eminence to the hypothenar eminence. Accordingly, the tightening part 30 in the present embodiment is configured such that the tightening force acts in directions in which the thenar eminence and the hypothenar eminence come closer to each other. Specifically, the tightening part 30 is configured such as to tighten the upper 20 in directions substantially parallel with the straight line connecting the hypothenar eminence and the thenar eminence.

[0060] More specifically, an average of the extending directions of the inward-outward extending parts 32*k* and 34*k* located between the inner eyelet parts 28*j* and the outer eyelet parts 28*e* is set to be substantially parallel with the straight line connecting the hypothenar eminence and the thenar eminence. The straight line connecting the thenar eminence and the hypothenar eminence is inclined by about 15 degrees with respect to a width direction such that the lateral side is positioned rearward of the medial side.

[0061] In the first portion 32, the inward-outward extending part 32*k* extending from the eyelet part 28*e*1 to the middle eyelet part 28*j*3 is inclined such that the medial side is positioned rearward of the lateral side. Also, in the second portion 34, the inward-outward extending part 34*k* extending from the eyelet part 28*e*3 to the middle eyelet part 28*j*3 is greatly inclined such that the lateral side is positioned rearward of the medial side. Including these, an average of the extending directions (i.e., directions of tension) of the inward-outward extending parts 32*k* and 34*k* is inclined by about 15 degrees with respect to a width direction.

[0062] There will now be described top lines of the wearing opening 20*b*. The top lines on the lateral side and the medial side of the wearing opening 20*b* may be provided symmetrically. However, in the present embodiment, the top lines on the lateral side and the medial side are provided asymmetrically as illustrated in FIG. 1, in terms of ease of wearing. When putting on a shoe, the wearer often inverts the foot (with the hallux side positioned higher) to insert the foot into the wearing opening 20*b*. Accordingly, the wearer can put on the shoe more easily when the hallux side of the wearing opening 20*b* is open. Therefore, a top line 20*e* on the medial side (hallux side) of the wearing opening 20*b* in the upper 20 is positioned forward of a top line 20*j* on the lateral side of the wearing opening 20*b*. The top line 20*j* is positioned near the eyelet part 28*e*4 at which the end 32*e* on the rear side of the shoelace 30*s* is fixed. As illustrated in FIG. 2, the top line 20*j* is positioned higher than the top line 20*e*.

[0063] There will now be described the features of the shoe 100 of the present embodiment configured as described above. The shoe 100 includes the sole 10, the upper 20 provided above the sole 10 to accommodate a foot, the tightening part 30 that applies tightening force to the upper 20, and the force transmitter 18 that transmits tightening force from the tightening part 30 to a lower part of the midfoot portion 20*m* of the upper 20. With this configuration, the tightening part 30 can be fixed to the lower part of the midfoot portion 20*m* of the upper 20, contributing to evening of the tightening force distribution in a longitudinal direction.

[0064] The force transmitter 18 includes the clasp 36 that detachably fixes the tightening part 30 to the upper 20. In this case, with a simple configuration, the tightening force can be transmitted to the upper 20.

[0065] The clasp 36 is fixed to the upper 20, around the boundary part 20h between the upper 20 and the sole 10. In this case, the tightening force can be certainly applied to a foot, contributing to the evening of the tightening force distribution.

[0066] The tightening part 30 includes the first portion 32 and the second portion 34 formed continuously with each other. The clasp 36 is provided on both the first portion 32 and the second portion 34. By changing the positional relationship between the boundary 30b of the first portion 32 and the second portion 34 and the clasp 36, the tightening force in one of the first portion 32 and the second portion 34 can be strengthened, and the tightening force in the other of the first portion 32 and the second portion 34 can be weakened. In this case, the amount of tightening can be adjusted near the wearing opening 20b and on the toe side.

[0067] The tightening part 30 is a shoelace. The upper 20 includes the eyelet parts 28 through which the first portion 32 or the second portion 34 passes. The end 32e of the first portion 32 and the end 34e of the second portion 34 are fixed to the lateral side of the upper 20. The clasp 36 is fixed to the lateral side. In this case, the shoelace can be easily tightened from the medial side toward the lateral side. This can contribute to the evening of the tightening force distribution.

[0068] The eyelet parts 28 include the outer eyelet parts 28e provided on the lateral side and the inner eyelet parts 28j provided on the medial side. The number of inner eyelet parts 28j is larger than the number of outer eyelet parts 28e. In this case, tightening can be performed dispersedly at multiple positions equal in number to the inner eyelet parts 28j, contributing to the evening of the tightening force distribution.

[0069] The lengths of the first portion 32 and the second portion 34 are adjustable at at least one of the clasp 36, the end 32e of the first portion 32, and the end 34e of the second portion 34. In this case, the length of the shoelace 30s can be adjusted based on the foot size.

[0070] The rearmost part of the first portion 32 constitutes the top line 30h of the tightening part 30, and the forefront part of the first portion 32 constitutes the bottom line 30j of the tightening part 30. In each of the top line 30h and the bottom line 30j, the lateral side is positioned rearward of the medial side. In this case, a line corresponding to the bases of toes and the MP joints can be appropriately tightened.

[0071] The shoe includes the position adjustment mechanism 42 with which the fixed position of the clasp 36 can be shifted in a longitudinal direction. In this case, the clasp 36 can be fixed at an appropriate position in a longitudinal direction.

[0072] The top line 20e on the medial side of the wearing opening 20b in the upper 20 is positioned forward of the top line 20j on the lateral side of the wearing opening 20b. In this case, when a wearer puts on the shoe 100, the medial side of the wearing opening 20b is opened, so that the wearing and removing of the shoe becomes easier.

[0073] The tightening part 30 tightens the upper 20 in a direction substantially parallel with a straight line connecting a hypothenar eminence and a thenar eminence. In this case, when a foot receives a load, force acts such that the

hypothenar eminence and the thenar eminence are broadened and the transverse arch is deformed; however, tightening the foot such that the hypothenar eminence and the thenar eminence come closer to each other can contribute to the maintaining of the transverse arch.

[0074] An exemplary embodiment of the present invention has been described in detail. The abovementioned embodiment merely describes a specific example for carrying out the present invention. The embodiment is not intended to limit the technical scope of the present invention, and various design modifications, including changes, addition, and deletion of constituting elements, may be made to the embodiment without departing from the scope of ideas of the invention defined in the claims. In the aforementioned embodiment, matters to which design modifications may be made are described with the expression of “of the embodiment”, “in the embodiment”, or the like. However, it is not unallowable to make a design modification to a matter without such expression. Also, the hatching provided on the cross sections in the drawings is not provided to limit the materials of the objects with the hatching.

[0075] (Modifications)

[0076] In the following, modifications will be described. In the drawings and description of the modifications, like reference characters denote like or corresponding constituting elements and members in the embodiment. Repetitive description already provided in the embodiment will be omitted as appropriate, and configurations different from those in the embodiment will be intensively described.

[0077] (First Modification)

[0078] Although the embodiment describes an example in which the tightening part 30 is constituted only by the shoelace 30s, the present invention is not limited thereto. The tightening part 30 may include a belt-shaped member. FIG. 6 is a plan view that schematically illustrates a shoe 200 according to the first modification and corresponds to FIG. 1. FIG. 7 is a side view of the shoe 200 and corresponds to FIG. 3. The present modification differs from the embodiment in that the tightening part 30 includes a belt part 30m in addition to the shoelace 30s and that first and second hook-and-loop fasteners 36m and 38m are employed as the clasp 36, instead of a buckle.

[0079] As illustrated in FIG. 6, a base end 30n of the belt part 30m is fixed to the medial portion 22 of the upper 20. The belt part 30m has a thin rectangular shape extending from the base end 30n in a width direction, and, on a leading end 30p thereof, the first hook-and-loop fastener 36m is provided. Near the leading end 30p of the belt part 30m, a lead support 30q is formed such that the lead parts 32p and 34p of the shoelace 30s pass therethrough. The lead support 30q is a passage through which the lead parts 32p and 34p pass in a longitudinal direction.

[0080] The second hook-and-loop fastener 38m is provided on the upper 20, around the boundary part 20h between the upper 20 and the sole 10. One of the first hook-and-loop fastener 36m and the second hook-and-loop fastener 38m has a hook face, and the other thereof has a loop face. Accordingly, the first hook-and-loop fastener 36m can be detachably fixed onto the second hook-and-loop fastener 38m. Fixing the first hook-and-loop fastener 36m onto the second hook-and-loop fastener 38m can tighten the upper 20. Also, detaching the first hook-and-loop fastener 36m from the second hook-and-loop fastener 38m can release the tightening of the upper 20.

[0081] The first modification describes an example in which the tightening part 30 is constituted by a single belt-shaped member. However, the present invention is not limited thereto, and the tightening part 30 may include multiple belt-shaped members. For example, the tightening part 30 may include two or more thin rectangular portions extending in a width direction. In this case, the base ends of the two or more thin rectangular portions may be connected with each other or may be separated from each other. Also, the leading ends of the two or more thin rectangular portions may be connected with each other or may be separated from each other.

[0082] (Second Modification)

[0083] With reference to FIG. 8, a shoe 300 according to the second modification will be described. FIG. 8 is a side view that schematically illustrates the shoe 300 according to the second modification and corresponds to FIG. 3. The force transmitter 18 in the present modification includes the clasp 36 for detachably fixing the shoelace 30s to the upper 20, and a member for drawing a middle part of the shoelace 30s toward the lower part of the midfoot portion 20m of the upper 20. The present modification differs from the embodiment particularly in the fixing structure for the lead parts 32p and 34p in the tightening part 30, and the other configurations are similar to those in the embodiment. Accordingly, the fixing structure for the lead parts 32p and 34p will be mainly described. The fixing structure for the lead parts 32p and 34p in the present modification includes an extension part 44 and a middle support 46. The middle support 46 exemplifies the member for drawing the middle part of the shoelace 30s and corresponds to the force transmitter.

[0084] (Extension Part)

[0085] The embodiment describes an example in which the lead parts 32p and 34p of the shoelace 30s are connected directly to the clasp 36. In the present modification, the lead parts 32p and 34p are connected to the clasp 36 via the extension part 44. The extension part 44 is a belt-shaped member formed of a flexible material, such as cloth. On the base end side of the extension part 44, a loop part 44b is provided such that the lead parts 32p and 34p pass there-through. The loop part 44b may be formed by folding back, for example. In the loop part 44b, the loop need not necessarily be closed, and part of the loop may be open. On the base end side of the extension part 44, a hook may be provided instead of the loop part 44b. On the leading end side of the extension part 44, the clasp 36 is fixed. The clasp 36 is a male part of a resin buckle.

[0086] The fixed position of the receiving part 38 is not particularly limited. In the present modification, the receiving part 38 is fixed to the lateral side of the rearfoot portion 20g in the upper 20. Specifically, the receiving part 38 is fixed onto or above a line that constitutes the contour of the upper 20 in top view. The receiving part 38 may be fixed below the line. Also, although the receiving part 38 may be fixed directly to the upper 20, the receiving part 38 in this example is fixed to the upper 20 via a belt 38b. The receiving part 38 may be fixed directly to the upper 20. The receiving part 38 is a female part of a resin buckle.

[0087] The middle support 46 supports bundled middle regions of the lead parts 32p and 34p of the shoelace 30s so as to concentrate the directions of tension (tightening force) of the lead parts 32p and 34p at the lower part of the midfoot portion 20m of the upper 20. In other words, the middle support 46 draws middle parts 32q and 34q of the lead parts

32p and 34p toward the lower part of the midfoot portion 20m to support the middle parts 32q and 34q.

[0088] The configuration of the middle support 46 is not particularly limited, as long as it can apply, to the lead parts 32p and 34p, tension toward a predetermined position. In the example of FIG. 8, the middle support 46 is a member including a loop part 46b through which the middle parts 32q and 34q of the lead parts 32p and 34p are made to pass, and the middle support 46 applies frontward and downward tension to the middle parts 32q and 34q. The middle support 46 is a belt-shaped member formed of an elastic or flexible material, such as cloth, and the loop part 46b is formed by folding back the belt-shaped member. In the loop part 46b, the loop need not necessarily be closed, and part of the loop may be open. Also, the middle support 46 may include, instead of the loop part 46b, a hook through which the middle parts 32q and 34q are made to pass, or a projection around which the middle parts 32q and 34q are hooked. The position of an upper edge of the loop part 46b may desirably be below the contour of the upper.

[0089] A base end 46a of the middle support 46 is fixed to the upper 20, around the boundary part 20h between the upper 20 and the sole 10. The loop part 46b is positioned on the upper rear side with respect to the base end 46a. When the clasp 36 and the receiving part 38 are arranged on the rear side, the abovementioned positional relationship between the base end 46a and the loop part 46b of the middle support 46 can apply, to the upper, the tension (tightening force) of the lead parts 30s and 34p among the lead parts more effectively. When the clasp 36 and the like are provided on the front side, it is preferable to dispose the loop part 46b on the upper front side with respect to the base end 46a.

[0090] The use of the fixing structure for the lead parts 32p and 34p will be described. When the extension part 44, connected with the lead parts 32p and 34p, and the clasp 36, connected with the leading end side of the extension part 44, have been made to pass through the loop part 46b of the middle support 46, by connecting the clasp 36 to the receiving part 38, the tightening part 30 can tighten the upper 20. In this state, tension toward the lower part of the midfoot portion 20m acts on the lead parts 32p and 34p, thereby reducing deviation in the tightening force distribution in a longitudinal direction of the upper 20. Also, by detaching the clasp 36 from the receiving part 38, the tightening part 30 is placed in a non-tightening state, so that the tightening of the upper 20 is released.

[0091] The middle support 46 may be configured with a position adjustment mechanism such as to be movable in the longitudinal directions.

[0092] The clasp 36 and the receiving part 38 may be configured as hook-and-loop fasteners, hooks, magnets, or the like, instead of a resin buckle.

[0093] (Other Modifications)

[0094] Although the embodiment describes an example in which the number of inner eyelet parts 28j is larger than the number of outer eyelet parts 28e, the present invention is not limited thereto. The numbers may be equal, or the number of inner eyelet parts 28j may be smaller than the number of outer eyelet parts 28e.

[0095] Although the embodiment describes an example in which a single clasp 36 is provided, the present invention is not limited thereto and multiple clasps may be provided. Also, the clasp may be configured to be fixable to multiple

positions in the upper. Also, the receiving part may be configured to be attachable and detachable, and the attachment parts therefor may be provided at multiple positions. Further, separate clasps may be provided respectively in the first portion 32 and the second portion 34.

[0096] Although the embodiment describes an example in which the clasp 36 is fixed to the upper 20, the present invention is not limited thereto. For example, the clasp 36 may be fixed to a portion extending from the sole 10.

[0097] Although the embodiment describes an example in which the eyelet parts 28 are grommets, the present invention is not limited thereto. Each eyelet part 28 has only to have a structure through which the shoelace 30s can be made to pass. Alternatively, the eyelet parts 28 may be lace hook parts, such as hooks, instead of holes. The hole edge of each eyelet part 28 may be reinforced by a reinforcement member or may be made thicker than the vicinity thereof by means of buttonhole stitches, for example.

[0098] Although the embodiment describes an example in which the tightening part 30 includes a single shoelace 30s, the present invention is not limited thereto. The tightening part may include multiple shoelaces. Also, when comfort in wearing is considered important, such as in the case of shoes for children or elderly persons, the shoelace 30s may be formed of a material with high elasticity or flexibility. Meanwhile, when the stability is considered important, such as in the case of sports shoes, the shoelace 30s may be formed of a material with low elasticity or flexibility.

[0099] Although the embodiment describes an example in which the receiving part 38 is disposed on the lateral side, the receiving part 38 may be disposed on the medial side. Also, over the clasp 36 and the receiving part 38, a protection cover may be provided to prevent entering of foreign matter, such as a small stone. Also, the clasp 36 may include a mechanism part for adjusting the lengths of the first portion 32 and the second portion 34.

[0100] Each of the abovementioned modifications provides functions and effects similar to those of the aforementioned embodiment.

[0101] Optional combinations of the aforementioned embodiment and modifications may also be practiced as additional embodiments of the present invention. Such an additional embodiment made by combination has the effect of each of the combined embodiment and modifications.

INDUSTRIAL APPLICABILITY

[0102] The present invention relates to a tightening part of a shoe and is applicable to a shoe.

REFERENCE SIGNS LIST

[0103] 10 sole
 [0104] 20 upper
 [0105] 20b wearing opening
 [0106] 20e, 20j top line
 [0107] 20h boundary part
 [0108] 20m midfoot portion
 [0109] 28 eyelet part
 [0110] 28e outer eyelet part
 [0111] 28j inner eyelet part
 [0112] 30 tightening part
 [0113] 30b boundary
 [0114] 30h top line
 [0115] 30j bottom line

[0116] 30s shoelace
 [0117] 32 first portion
 [0118] 34 second portion
 [0119] 32e, 34e end
 [0120] 36 clasp
 [0121] 42 position adjustment mechanism
 [0122] 100, 200, 300 shoe

1. A shoe, comprising:

a sole;

an upper provided above the sole to accommodate a foot;
 a tightening part that applies tightening force to the upper;
 and

a force transmitter that transmits tightening force from the tightening part to a lower part of a midfoot portion of the upper.

2. The shoe according to claim 1, wherein the force transmitter includes a clasp that detachably fixes the tightening part to the upper.

3. The shoe according to claim 2, wherein the clasp is fixed to the upper, around a boundary part between the upper and the sole.

4. The shoe according to claim 2, wherein the tightening part includes a first portion and a second portion formed continuously with each other, the clasp is provided on both the first portion and the second portion, and,

by changing the positional relationship between the boundary of the first portion and the second portion and the clasp, the tightening force in one of the first portion and the second portion can be strengthened, and the tightening force in the other of the first portion and the second portion can be weakened.

5. The shoe according to claim 4, wherein the tightening part is a shoelace, the upper includes an eyelet part through which the first portion or the second portion passes, an end of the first portion and an end of the second portion are fixed to a lateral side of the upper, and the clasp is fixed to the lateral side.

6. The shoe according to claim 5, wherein the eyelet part includes an outer eyelet part provided on the lateral side and an inner eyelet part provided on a medial side, and the number of the inner eyelet part is larger than the number of the outer eyelet part.

7. The shoe according to claim 5, wherein the lengths of the first portion and the second portion are adjustable at at least one of the clasp, the end of the first portion, and the end of the second portion.

8. The shoe according to claim 5, wherein the rearmost part of the first portion constitutes a top line of the tightening part, and the forefront part of the first portion constitutes a bottom line of the tightening part, and,

in each of the top line and the bottom line of the tightening part, the lateral side is positioned rearward of the medial side.

9. The shoe according to claim 2, further comprising: a position adjustment mechanism with which the fixed position of the clasp can be shifted in a longitudinal direction.

10. The shoe according to claim 1, wherein a top line on the medial side of a wearing opening in the upper is positioned forward of a top line on the lateral side of the wearing opening.

11. The shoe according to claim 1, wherein the tightening part tightens the upper in a direction substantially parallel with a straight line connecting a hypothenar eminence and a thenar eminence.

12. The shoe according to claim 1, wherein the tightening part includes a shoelace, and the force transmitter includes a clasp that detachably fixes the shoelace to the upper, and a member that draws a middle part of the shoelace toward the lower part of the midfoot portion of the upper.

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