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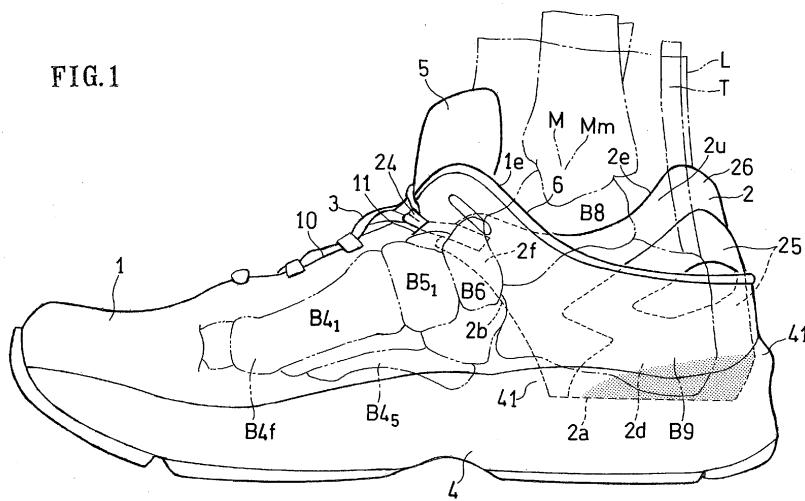
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(54) SHOE WITH IMPROVED HEEL FIT PERFORMANCE

(57) First eyelet holes are arranged in two rows along a notch and a shoelace 3 passes therethrough, and a sub-upper includes a front extension 2f. The front extension 2f includes an eyelet portion 24 forming a second eyelet hole. The eyelet portion 24 is drawn toward the center of the foot by the fastening force from a portion of the shoelace 3 near the second eyelet hole, and the eyelet portion 24 bends as it engages with a main upper 1 at a through hole, thereby changing the direction of the

fastening force to pull the upper portion 2u including the front extension 2f toward a front side, while the main upper 1 is drawn toward the center of the foot by the fastening force from a portion of the shoelace 3 near one of the first eyelet holes that is posterior to the second eyelet hole, whereby a portion of the front extension 2f that is covered by the main upper 1 is pressed against the upper side surface of the foot, thereby fitting the upper portion of the sub-upper 2 to the upper side surface of the foot.

FIG. 1



Description**TECHNICAL FIELD**

5 [0001] The present invention relates to a shoe with an improved fit property accommodating the movement of the heel during exercises including walking and running, and more particularly to a shoe with an improved fit property accommodating the movement of the heel from foot-flat to take-off.

BACKGROUND ART

10 [0002] If the heel of the foot moves significantly inside the upper during a walk or a run, it may make it difficult to stably hold the foot or it may cause a loss of power during a walk or a run. Therefore, the fit property allowing the heel to fit to the upper is an important function of a shoe.

15 There are numerous conventional techniques aiming at improving the heel fit (see the first to fourth patent documents).

[0003]

[First Patent Document] Japanese Laid-Open Patent Publication No. 2008-132227 (Abstract)

[Second Patent Document] Japanese Laid-Open Patent Publication No. 2-5903 (Abstract)

[Third Patent Document] US 4,670,998 (Abstract)

20 [Fourth Patent Document] Japanese Laid-Open Patent Publication No. 6-217806 (Abstract)

[0004] The first patent document discloses an upper structure provided with an outer upper wrapping around an upper main body. An elastic area is provided between the front portion and the heel portion of the upper main body.

This upper main body is such that the mouth (the top line) expands when putting on and the mouth shrinks when worn, and therefore a good fit at the heel may be obtained.

[0005] The second patent document discloses a hard stirrup covering the back surface and the opposite side surfaces of the calcaneal bone. The hard stirrup is formed by a hard plastic containing reinforced fiber.

Such a stirrup may be useful in suppressing the rotation of the navicular bone.

[0006] The third patent document discloses a generally V-shaped stirrup. The stirrup may support the middle foot, particularly, suppress inadvertent movements of the navicular bone.

[0007] The fourth patent document discloses a shoe including a sock inner and a strap. In the fourth patent document, the sock inner is formed by an elastic material, and the strap may fit the flexible sock inner to the heel.

SUMMARY OF THE INVENTION

35 [0008] However, these documents fail to disclose studies on the movement of the heel of the foot during exercises, particularly from foot-flat to take-off.

[0009] Before discussing the configuration of the present invention, the movement of the heel will be discussed.

40 FIG. 16 shows a medial side view of the foot in a standing position, and FIG. 17 shows a medial side view in a push-off position. In these figures, the points O1 to O12 are markers attached to the surface of the foot, and values in the figures denote dimensions between these points in millimeters.

[0010] A comparison between the standing position and the push-off position shows that the lower portion (the distance between the point O3 and the point O11, the distance between the point O3 and the point O12) and the rear portion (the distance between the point O11 and the point O12) of the heel of the foot shrink about the malleolus, or the like, as the center. The shrinking of the heel will lead to slippage between the upper and the foot.

[0011] Thus, the heel of the foot shrinks by about 3 mm toward the front side, whereas the heel portion of the upper surface of the sole will not shrink so much. Therefore, even if the upper is formed so that the heel portion of the upper stretches, whereby the rear end of the upper moves toward the rear end of the heel, the fit property of the heel portion will not improve so much because the upper is restricted by the sole.

[0012] That is, it is presumed that in order for the heel not to move in the upper, it is important that the side surface of the upper is pressed against the upper side surface of the heel to prevent slippage therebetween.

[0013] The upper main body disclosed in the first patent document has its lower portion connected integrally with the sole from the front foot to the rear foot. Therefore, in the heel portion of the upper main body, when the stretchable upper portion shrinks, the non-stretchable lower portion may expand in the foot width direction. Therefore, the heel fit will be deteriorated.

[0014] The front portion of the stirrup disclosed in the second patent document extends diagonally downward, and

the stirrup does not cover the portion right behind the malleolus. Therefore, a tensile force acts on the hard stirrup in a diagonally forward direction.

Therefore, while the stirrup may be useful in suppressing the rotation of the navicular bone, it will not be so useful in making the upper side surface of the upper fit to the upper side surface of the heel below the malleolus.

5 [0015] A portion of the stirrup is accommodated in a pocket of the upper and the stirrup is placed below the upper edge of the upper in the rear foot portion, and therefore it is not possible to press the upper edge portion of the upper forming the mouth against the side surface of the foot.

10 [0016] The uppers disclosed in the third and forth patent documents are integral with the sole from the front foot to the rear foot. Therefore, the fastening force of the shoe lace will unlikely be localized at the mouth (top line), the portion 10 of the upper near the mouth will unlikely conform to the side surface of the foot, and the heel portion of the upper will likely expand in the foot width direction.

[0017] Thus, it is an object of the present invention to provide a shoe capable of providing a good fit accommodating the movement of the heel during exercises including walking and running, particularly from foot-flat to take-off.

15 SOLUTION TO PROBLEM

[0018] In order to achieve the object set forth above, a shoe according to an embodiment of the present invention is a shoe with an improved heel fit including: a main upper being continuous from a tip of a toe to side surfaces of a heel and covering the toe and a medial side and a lateral side of a foot; a sub-upper formed by a separate member from the 20 main upper, covering the heel in the main upper and not covering a distal head of a metatarsal bone; a shoelace for fitting the main upper and the sub-upper to the foot; and a sole to which secured edge portions of the main upper and the sub-upper along lower edges thereof are secured, wherein: the main upper includes a notch covered by a tongue, and first eyelet holes which are arranged in two rows along the notch and through which the shoelace passes; the sub-upper includes portions covering a medial side surface and a lateral side surface of a talus bone, and a medial side 25 surface, a lateral side surface and a back surface of a calcaneal bone, and is in contact with a surface of the foot on the side surfaces and the back surface; the sub-upper includes a lower portion, and an upper portion above the lower portion, the lower portion being covered by the main upper; a rear portion of the tongue and the upper portion of the sub-upper together form a mouth through which a leg extends in an upward direction when worn, and fit to the foot at the mouth; the upper portion of the sub-upper includes a layered portion including a base material layered on a cushioning material 30 serving to fit to an upper portion of the foot, with the layered portion bulging toward a surface of the foot by virtue of the cushioning material; the layered portion of the upper portion extends diagonally upward in a rearward direction from directly below medial and lateral malleoli so as to cover a lower portion of an Achilles tendon at a level above a lower end of the lateral malleolus; the upper portion includes a front extension extending forward from directly below the medial and lateral malleoli past a front end of the calcaneal bone, wherein at least a portion of the front extension is covered 35 by the upper, and the upper portion including the front extension is not attached to the main upper; the front extension includes an eyelet portion forming a second eyelet hole; a through hole is formed on a medial side and on a lateral side of the main upper for allowing the eyelet portion to pass therethrough so that the second eyelet hole is exposed outside the main upper; and in a state where the shoelace has been passed through the plurality of first and second eyelet holes and is exerting a fastening force, the eyelet portion is drawn toward a center of the foot by the fastening force from a 40 portion of the shoelace near the second eyelet hole, and the eyelet portion bends as the eyelet portion engages with the main upper at the through hole, thereby changing a direction of the fastening force to pull the upper portion including the front extension toward a front side, while the main upper is drawn toward the center of the foot by the fastening force from a portion of the shoelace near one of the first eyelet holes that is posterior to the second eyelet hole, whereby a portion of the front extension that is covered by the main upper is pressed against an upper side surface of the foot, 45 thereby fitting the layered portion including the cushioning material to the upper side surface of the foot.

ADVANTAGEOUS EFFECTS OF THE INVENTION

[0019] In this embodiment, the sub-upper only covers the heel and is , not secured to the sole in the tread area, and it therefore easily follows the flexion of the foot.

50 [0020] The sub-upper is a separate member from the main upper, and wraps around the heel in the main upper. Therefore, even if the main upper expands at the mouth in the foot width direction, the main upper will not hinder the upper portion, particularly the layered portion including the cushioning material, of the sub-upper, which is not attached to the main upper, from fitting to the upper side surface of the foot by virtue of the fastening force of the shoelace.

55 [0021] Since the eyelet portion bends as it engages with the main upper at the through hole, the fastening force of the shoelace drawing toward the center of the foot is turned into a tensile force in the forward direction. Therefore, on the upper side surface of the foot, a forward tensile force acts on the upper portion, particularly the layered portion, of the sub-upper, whereby the upper portion, particularly the layered portion, of the sub-upper fits to the side surface of

the foot.

[0022] Moreover, on the side surface of the talus bone, the main upper presses the front extension of the sub-upper onto the side surfaces of the foot in an inward direction by virtue of the fastening force of the shoelace. Thus, the upper portion of the sub-upper curves in conformity with the horizontal cross section of the foot, thereby fitting the upper portion, particularly the layered portion, of the sub-upper to the upper side surface of the foot. That is, while the upper portion of the sub-upper being pulled forward via the eyelet portion has a U-shaped horizontal cross section, it takes a shape that is gradually curved toward the center of the foot as it extends from directly below the malleolus toward the front side due to the pressing force of the main upper, thereby fitting to the upper side surface of the foot.

[0023] In the present invention, the layered portion is optional.

Nevertheless, if the layered portion is provided, the layered portion including the cushioning material is likely to be pressed against the upper side surface of the foot. Therefore, if the layered portion is provided, the fit property is high. The layered portion may include a layer that is attached to and layered on one of the front surface and the reverse surface of the base material forming the sub-upper, or may include the cushioning material sandwiched and layered between the inner skin and the outer skin (the base material).

15 BRIEF DESCRIPTION OF THE DRAWINGS

[0024]

20 FIG. 1 is a schematic side view showing a shoe according to an embodiment of the present invention as viewed from the medial side of the foot.

FIG. 2 is a schematic side view showing a sub-upper in a state where it is separated from a main upper as viewed from the medial side of the foot.

FIG. 3 is a schematic side view showing the shoe as viewed from the lateral side of the foot.

FIG. 4 is a schematic side view showing the sub-upper in the separated state as viewed from the lateral side of the foot.

FIG. 5 is a schematic back view showing the sub-upper in the separated state as viewed from the rear side of the foot.

FIG. 6 is a schematic perspective view showing the shoe in a state where the tongue is opened and the insole has been removed as viewed from the medial side of the foot.

FIG. 7 is a schematic perspective view showing the shoe in a state where the tongue is opened and the insole has been removed as viewed from the lateral side of the foot.

FIG. 8 is a schematic plan view of the shoe.

FIG. 9 is a schematic back view of the shoe.

FIG. 10 is a schematic side view showing an area near a front extension and a portion of the main upper on an enlarged scale, illustrating a fastening structure by means of a shoelace, as viewed from the medial side of the foot.

FIG. 11 is a schematic side view showing the same as viewed from the lateral side.

FIGS. 12A to 12C are schematic plan views showing the sub-upper.

FIG. 13A is a cross-sectional view taken along line XIII A-XIII A of FIG. 8, and FIG. 13B is a cross-sectional view taken along line XIII B-XIII B of FIG. 8.

FIG. 14 is a schematic side view showing a foot in a push-off position with the shoe on as viewed from the medial side of the foot.

FIG. 15 is a schematic side view showing a foot in a push-off position with the shoe on as viewed from the lateral side of the foot.

FIG. 16 is a medial side view of a foot in a standing position.

FIG. 17 is a medial side view of a foot in a push-off position.

45 MODE FOR CARRYING OUT THE INVENTION

[0025] In a preferred embodiment of the present invention, the front extension extends forward past the secured edge portion of the sub-upper, and a front end of the secured edge portion of the sub-upper is placed posterior to a front end of a calcaneal bone, wherein the front extension has a non-secured edge portion along a lower edge thereof extending diagonally rearward toward the front end of the secured edge portion of the sub-upper.

[0026] In such an embodiment, the front end of the secured edge portion along the lower edge is located posterior to the front end of the front extension, and it does not hinder a tensile force from acting in the front-back direction on the layered portion when the front extension is pulled forward. Therefore, the layered portion is likely to fit to the upper side surface of the foot.

[0027] In a preferred embodiment of the present invention, the sub-upper includes an exposed portion, which is not accommodated in the main upper, extending from directly under a rear end of the medial malleolus and the lateral malleolus to a back surface of the heel; and the main upper covers a lower portion of the calcaneal bone from the back

surface.

[0028] In such an embodiment, the main upper covers the lower portion of the calcaneal bone from the back surface, and the main upper has a high stability for holding the heel. Therefore, the rigidity of the sub-upper can be reduced, and the fit of the sub-upper will therefore be enhanced.

5 The exposed portion of the sub-upper that is exposed from the main upper will not deform in response to deformation of the main upper. Therefore, the upper portion of the sub-upper will not expand in the foot width direction, but will remain fitted to the upper side surface of the foot.

[0029] In a preferred embodiment of the present invention, the main upper and the sub-upper are attached to each other on a back of the heel and are not attached to each other in the upper portion of the sub-upper directly below the malleolus and in an area in front of the upper portion of the sub-upper.

10 [0030] In such an embodiment, in the upper portion directly below the malleolus, the uppers are not attached to each other. Thus,

15 i) the main upper is likely to expand in the foot width direction in response to flexion of the foot, and there is a small resistance during flexion,
ii) even if the main upper expands at the mouth, the sub-upper is likely to fit to the side surface of the foot because the sub-upper is not restricted by the main upper, and
iii) moreover, the uppers are attached to each other on the back surface of the heel, thereby providing a high rigidity on the heel back surface. Therefore, the stability is high for holding the heel.

20 [0031] In a preferred embodiment of the present invention, the inner skin and the outer skin are formed by a flexible material so that the upper portion of the sub-upper stretches in a front-back direction when the shoelace is fastened.

[0032] In such an embodiment, the sub-upper including the flexible material layered on the cushioning material is not restricted by the main upper and is likely to conform to the side surface of the foot.

25 [0033] In a preferred embodiment of the present invention, a counter formed by a synthetic resin which is harder than the layered portion and which has a U-shaped horizontal cross section is secured to the outer skin, over an area from the back surface to medial and lateral side surfaces of the heel, in a lower portion of the sub-upper away from an upper edge of the sub-upper so that the layered portion conforms to a side surface of the foot.

30 [0034] In such an embodiment, the hard U-shaped counter will not hinder the flexible cushioning material and the inner skin from conforming to the foot, and the hard counter helps the upper portion conform to the foot.

[0035] In a preferred embodiment of the present invention, the front extension extends forward past a front end of the counter; and in medial-side and lateral-side areas anterior to the front end of the counter, the main upper presses the front extension against side surfaces of the foot by the fastening force of the shoelace.

35 [0036] In such an embodiment, the flexible front extension, rather than the hard counter, is pressed against the side surface of the foot by the main upper. Therefore, the front extension is curved in conformity with the surface of the instep of the foot. This curving greatly increases the tensile force in the front-back direction acting on the layered portion.

[0037] In a preferred embodiment of the present invention, the counter is placed along the layered portion of the sub-upper; the upper edge of the main upper extends diagonally downward in a rearward direction to a rear end of the heel; and the main upper covers a front end portion of the counter and does not cover a rear portion of the counter in the upper portion of the sub-upper.

40 [0038] In such an embodiment, the front end portion of the counter is pressed against the side surface of the foot by the main upper. Therefore, there is a great moment acting on the counter, and the counter can be pressed against the side surface of the foot even if it is a hard counter.

45 Embodiment 1

[0039] 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 the scope of the present invention shall not be relied upon to define the scope of the present invention.

50 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.

[0040] An embodiment of the present invention will now be described with reference to the drawings. In the following description, a shoe for the right foot will be illustrated.

55 General configuration:

[0041] As shown in FIGS. 1 and 3, a shoe of the present embodiment includes a main upper 1, a sub-upper 2, a shoelace 3, and a sole 4.

[0042] The main upper 1 is continuous from the tip of the toe 9 to the back surface of the heel 8 shown in FIGS. 2 and 4, and covers the toe and the medial side and the lateral side of the foot.

The sub-upper 2 shown in FIGS. 1 and 3 is formed by a separate member from the main upper 1 and is placed in the main upper 1, as will be described later.

5 The shoelace 3 is for making the main upper 1 and the sub-upper 2 fit to the foot F (FIGS. 2 and 4).

[0043] In FIGS. 6 and 7, the sock lining (sock liner) of the shoe has been removed. As shown in these figures, a secured edge portion 1a at the lower edge of the main upper 1 is sewn and secured to the insole forming a part of the sole 4, and a secured edge portion 2a at the lower edge of the sub-upper 2 is sewn and secured to the insole.

10 Main upper 1:

[0044] As shown in FIG. 8, the main upper 1 includes a notch 10 covered by a tongue 5, and first eyelet holes h1 to h3, h5 and h6 which are arranged in two rows along the notch 10 and through which the shoelace 3 passes.

15 [0045] As shown in FIGS. 1 and 3, the main upper 1 does not cover the lower end of the Achilles tendon T and covers the lower portion of the calcaneal bone B9 from the back surface.

As shown in FIG. 8, a through hole 11 is formed on the medial side and the lateral side of the main upper 1 in the middle foot area. An eyelet member (an example of an eyelet portion) 24 provided on the sub-upper 2 having the second eyelet hole h4 is inserted through each through hole 11, with the second eyelet hole h4 (FIG. 8) exposed on the outside of the main upper 1 via the through hole 11, as will be described later.

20

Sub-upper 2:

[0046] As shown in FIGS. 1 to 4, the sub-upper 2 includes a lower portion 2d and an upper portion 2u above the lower portion 2d, and the lower portion 2d is covered by the main upper 1. The rear portion of the tongue 5 and the upper portion 2u of the sub-upper 2 together form a mouth (top line) 6 through which the leg L comes out in an upward direction when the shoe is worn, and fit to the foot at the mouth 6.

[0047] As shown in FIGS. 2 and 4, the sub-upper 2 is in contact with the surface of the foot F on the side surfaces and the back surface thereof. The sub-upper 2 is formed so as to cover at least a portion of the heel 8 that is posterior to the malleolus M.

[0048] That is, as shown in FIG. 1, on the medial side of the foot F, the sub-upper 2 covers at least a portion of the medial side surface of the talus bone B8, the navicular bone B6 and the calcaneal bone B9. On the other hand, as shown in FIG. 3, on the lateral side of the foot, the sub-upper 2 covers at least a portion of the lateral side surface of the talus bone B8, the cuboid bone B7 and the calcaneal bone B9. Thus, as shown in FIGS. 1 to 4, the sub-upper 2 is designed so as to cover the heel 8 and not to cover the metatarsal bones B4.

35 B5₁ in FIG. 1 denotes the medial cuneiform bone.

[0049] As shown in FIGS. 13A and 13B, the sub-upper 2 includes layered portions 20 and 29 in the upper portion 2u and the lower portion 2d. The layered portions 20 and 29 each have a cushioning material 21 represented as a dotted area, layered with an inner skin 22 and an outer skin 23, with the cushioning material 21 sandwiched therebetween. The cushioning material 21 may be, for example, a foamed resin or a foamed rubber as well as a non-woven fabric (felt), or the like, and serves to fit to the upper portion of the foot F (FIGS. 2 and 4) in the upper portion 2u and the lower portion 2d of the sub-upper 2. The thickness of the cushioning material 21 is such that the upper layered portion 20 is thicker than the lower layered portion 29, with the upper layered portion 20 bulging toward the surface of the foot F by virtue of the cushioning material 21.

[0050] In FIGS. 2, 4 and 5, the area of the upper layered portion 20 is dotted. The upper layered portion 20 extends diagonally upward in a rearward direction from directly below the medial and lateral malleoli M so as to cover a lower portion of the Achilles tendon T at a level above the lower end of the lateral malleolus M.

[0051] The inner skin 22 and the outer skin 23 shown in FIGS. 13A and 13B are formed by a flexible material so that the upper portion 2u of the sub-upper 2 slightly stretches in the front-back direction when the shoelace 3 is fastened. The material of the inner skin 22 and the outer skin 23 of the sub-upper 2 may be a fabric, a synthetic leather, or the like, used for the tongue 5, for example. The inner skin 22 and the outer skin 23 are formed by a flexible material that is more stretchable than a portion of the main upper 1 that covers the side surface of the foot.

Counter 24:

55 [0052] As shown in FIG. 12A, a heel counter 25 formed by a non-foamed synthetic resin which has a U-shaped horizontal cross section is secured to the outer skin 23. As shown in FIGS. 2, 4 and 5, the counter 25 is secured to the surface of the outer skin 23. The counter 25 is secured to a lower portion of the sub-upper 2 away from an upper edge 2e of the sub-upper 2 so that the upper layered portion 20 conforms to the side surface of the foot F. That is, the counter

25 is placed along the layered portion 20 of the sub-upper 2.

[0053] As shown in FIGS. 1, 3 and 9, an upper edge 1e of the main upper 1 extends diagonally downward in a rearward direction to the rear end of the heel 8 (FIGS. 2 and 4).

The sub-upper 2 includes an exposed portion 26 that is not accommodated by the main upper 1, extending from directly below the rear end of the medial malleolus Mm and the lateral malleolus Mi to the back surface of the heel 8.

5 Therefore, the main upper 1 covers the front end portion of the counter 25 in the upper portion 2u of the sub-upper 2, and does not cover the rear portion of the counter 25 in the upper portion 2u of the sub-upper 2, i.e., the exposed portion 26 of the sub-upper 2.

10 Front extension 2f:

[0054] As shown in FIGS. 1 and 3, the upper portion 2u of the sub-upper 2 integrally includes front extensions 2f extending forward past the front end of the counter 25.

15 In the upper portion of the sub-upper 2, the front extensions 2f extend forward from directly below the medial and lateral malleoli Mm and Mi past the front end of the opposite side surfaces of the calcaneal bone B9.

[0055] The main upper 1 and the sub-upper 2 are bonded (attached) to each other in a lower portion of the back of the heel 8 so that they can move independently, and bonded (attached) to each other in an area of the sub-upper 2 covered by a roll-up portion 41 (a portion overlapping the upper) of the sole 4, while they are not bonded (attached) to each other in the upper portion 2u of the sub-upper directly below the malleolus M and in an area in front of the upper portion 2u. Therefore, the upper portion 2u including the front extensions 2f is not attached to the main upper 1, and will not deform in response to changes in the shape of the main upper 1. That is, even if the main upper 1 expands at the mouth, the sub-upper 2 will not expand.

[0056] The front extension 2f extends forward past the secured edge portion 2a of the sub-upper 2. On the other hand, the front end of the secured edge portion 2a of the sub-upper 2 is placed posterior to the front end of the calcaneal bone B9. Therefore, the front extension 2f has a non-secured edge portion 2b along the lower edge thereof extending diagonally downward and rearward toward the front end of the secured edge portion 2a. At least a portion of the front extension 2f is covered by the upper 1.

30 Eyelet member 24:

[0057] The medial and lateral front extensions 2f each include a band-shaped eyelet member 24, separate from the main upper 1, secured (sewn) thereto. The eyelet member 24 of FIG. 8 is formed in a loop shape, thereby forming the second eyelet hole h4 in the eyelet member 24 receiving the shoelace 3 passing through the loop.

35 Fastening structure:

[0058] As shown in FIG. 8, in a state where the shoelace 3 has been passed through the plurality of first and second eyelet holes h1 to h6 and is exerting the fastening force, the eyelet members 24 are drawn toward the center of the foot by the fastening force from portions 30 (dotted portions) of the shoelace 3 near the second eyelet holes h4. At the same time, as shown in FIGS. 10 and 11, the eyelet member 24 bends as it engages with the main upper 1 at the through hole 11, thereby changing the direction of the fastening force to pull the upper portion 2u including the front extension 2f of FIG. 12B in the forward direction X (FIG. 10).

[0059] On the other hand, the main upper 1 is drawn toward the center of the foot by the fastening force from portions 31 (dotted portions) of the shoelace near one (h5) of the first eyelet holes h1 to h3, h5 and h6 shown in FIG. 8 that is posterior to the second eyelet hole h4. Therefore, portions of the front extensions 2f that are covered by the main upper 1 shown in FIGS. 1 and 3 are pressed against the upper side surface of the foot F (FIGS. 2 and 4) in the direction of arrows 100 in FIG. 12C so as to be curved in conformity with the shape of the foot, thereby fitting the layered portion 20 including the cushioning material 21 to the upper side surface of the foot.

[0060] Thus, as shown in FIGS. 14 and 15, the cushioning material 21 fits to the upper side surface of the foot even in the push-off position, thereby obtaining a good fit despite the movement of the heel 8.

[0061] While preferred embodiments have been described above with reference to the drawings, various obvious changes and modifications will readily occur to those skilled in the art upon reading the present specification.

For example, the medial side of the sub-upper 2 may cover a portion of the medial cuneiform bone B5₁ (FIG. 1) or may cover a portion of the first metatarsal bone B4₁ (FIG. 1), as indicated by one-dot-chain lines in FIG. 2.

55 On the other hand, it is preferred that the lateral side of the sub-upper 2 does not cover the fifth metatarsal bone B4₅ in view of the wearability.

Instead of sewing the eyelet member 24 to the front extension 2f, an eyelet portion through which the shoelace 3 can be inserted may be provided by forming a through hole using a resin or metal eyelet in the front extension 2f.

A plurality of second eyelet holes h4 may be provided on the medial side and/or the lateral side of the foot.

Thus, such changes and modifications are deemed to fall within the scope of the present invention, which is defined by the appended claims.

5 INDUSTRIAL APPLICABILITY

[0062] The present invention is applicable to shoes capable of providing a good fit accommodating the movement of the heel.

10 DESCRIPTION OF THE REFERENCE NUMERALS

[0063]

1:	Main upper
15 1a:	Secured edge portion (of main upper)
10:	Notch
11:	Through hole
2:	Sub-upper
2a:	Secured edge portion (of sub-upper)
20 2d:	Lower portion (of sub-upper)
2e:	Edge portion (of sub-upper)
2f:	Front extension
2u:	Upper portion (of sub-upper)
20:	Layered portion
25 21:	Cushioning material
22:	Inner skin
23:	Outer skin
24:	Eyelet member
25:	Counter
30 3:	Shoelace
4:	Sole
5:	Tongue
6:	Mouth
8:	Heel
35 9:	Toe
At:	Achilles tendon
B4 _n :	Metatarsal bone
B4f:	(metatarsal bone) distal head
B8:	Talus bone
40 B9:	Calcaneal bone
F:	Foot F
h1 to h3, h5 and h6:	First eyelet hole
h4:	Second eyelet hole
L:	Leg
45 M:	Malleolus
MI:	Lateral malleolus
Mm:	Medial malleolus

50 **Claims**

1. A shoe with an improved heel fit comprising:

55 a main upper being continuous from a tip of a toe to side surfaces of a heel and covering the toe and a medial side and a lateral side of a foot; a sub-upper formed by a separate member from the main upper, covering the heel in the main upper without covering a distal head of a metatarsal bone; a shoelace for fitting the main upper and the sub-upper to the foot; and a sole to which secured edge portions of the main upper and the sub-upper along lower edges thereof are secured, wherein:

the main upper includes a notch covered by a tongue, and first eyelet holes which are arranged in two rows along the notch and through which the shoelace passes;

5 the sub-upper includes portions covering a medial side surface and a lateral side surface of a talus bone, and a medial side surface, a lateral side surface and a back surface of a calcaneal bone, and is in contact with a surface of the foot on the side surfaces and the back surface;

the sub-upper includes a lower portion, and an upper portion above the lower portion, the lower portion being covered by the main upper;

10 a rear portion of the tongue and the upper portion of the sub-upper together form a mouth through which a leg extends in an upward direction when worn, and fit at the mouth;

the upper portion extends diagonally upward in a rearward direction from directly below medial and lateral malleoli so as to cover a lower portion of an Achilles tendon at a level above a lower end of the lateral malleolus;

15 the upper portion includes a front extension extending forward from directly below the medial and lateral malleoli past a front end of the calcaneal bone, wherein at least a portion of the front extension is covered by the upper, and the upper portion including the front extension is unattached to the main upper;

the front extension includes an eyelet portion forming a second eyelet hole;

20 a through hole is formed on a medial side and on a lateral side of the main upper for allowing the eyelet portion to pass therethrough so that the second eyelet hole is exposed outside the main upper; and in a state where the shoelace has been passed through the plurality of first and second eyelet holes and is exerting a fastening force,

25 the eyelet portion is drawn toward a center of the foot by the fastening force from a portion of the shoelace near the second eyelet hole, and the eyelet portion bends as the eyelet portion engages with the main upper at the through hole, thereby changing a direction of the fastening force to pull the upper portion including the front extension toward a front side, while the main upper is drawn toward the center of the foot by the fastening force from a portion of the shoelace near one of the first eyelet holes that is posterior to the second eyelet hole, whereby a portion of the front extension that is covered by the main upper is pressed against an upper side surface of the foot, thereby fitting the upper portion of the sub-upper to the upper side surface of the foot.

30 **2. A shoe with an improved heel fit comprising:**

a main upper being continuous from a tip of a toe to side surfaces of a heel and covering the toe and a medial side and a lateral side of a foot; a sub-upper formed by a separate member from the main upper, covering the heel in the main upper without covering a distal head of a metatarsal bone; a shoelace for fitting the main upper and the sub-upper to the foot; and a sole to which secured edge portions of the main upper and the sub-upper along lower edges thereof are secured, wherein:

35 the main upper includes a notch covered by a tongue, and first eyelet holes which are arranged in two rows along the notch and through which the shoelace passes;

40 the sub-upper includes portions covering a medial side surface and a lateral side surface of a talus bone, and a medial side surface, a lateral side surface and a back surface of a calcaneal bone, and is in contact with a surface of the foot on the side surfaces and the back surface;

45 the sub-upper includes a lower portion, and an upper portion above the lower portion, the lower portion being covered by the main upper;

a rear portion of the tongue and the upper portion of the sub-upper together form a mouth through which extends in an upward direction when worn, and fit to the foot at the mouth;

50 the upper portion of the sub-upper includes a layered portion including a base material and a cushioning material serving to fit to an upper portion of the foot and being layered on the base material, with the layered portion bulging toward a surface of the foot by virtue of the cushioning material;

the layered portion of the upper portion extends diagonally upward in a rear direction from directly below medial and lateral malleoli so as to cover a lower portion of an Achilles tendon at a level above a lower end of the lateral malleolus;

55 the upper portion includes a front extension extending forward from directly below the medial and lateral malleoli past a front end of the calcaneal bone, wherein at least a portion of the front extension is covered by the upper, and the upper portion including the front extension is unattached to the main upper;

the front extension includes an eyelet portion forming a second eyelet hole;

a through hole is formed on a medial side and on a lateral side of the main upper for allowing the eyelet portion to pass therethrough so that the second eyelet hole is exposed outside the main upper; and

in a state where the shoelace has been passed through the plurality of first and second eyelet holes and is exerting a fastening force,

5 the eyelet portion is drawn toward a center of the foot by the fastening force from a portion of the shoelace near the second eyelet hole, and the eyelet portion bends as the eyelet portion engages with the main upper at the through hole, thereby changing a direction of the fastening force to pull the upper portion including the front extension toward a front side, while the main upper is drawn toward the center of the foot by the fastening force from a portion of the shoelace near one of the first eyelet holes that is posterior to the second eyelet hole, whereby a portion of the front extension that is covered by the main upper is pressed against an upper side surface of the foot, thereby fitting the layered portion including the cushioning material to the upper side surface of the foot.

10 3. A shoe according to claim 2, wherein the front extension extends forward past the secured edge portion of the sub-upper, and a front end of the secured edge portion of the sub-upper is placed posterior to a front end of the calcaneal bone, wherein the front extension has a non-secured edge portion along a lower edge thereof extending diagonally 15 rearward toward the front end of the secured edge portion of the sub-upper.

4. A shoe according to claim 2, wherein:

20 the upper portion of the sub-upper includes an exposed portion extending from directly under rear ends of the medial and lateral malleoli to a back surface of the heel without being accommodated in the main upper,; and the main upper covers a lower portion of the calcaneal bone from the back surface.

25 5. A shoe according to claim 4, wherein the main upper and the sub-upper are attached to each other on a back of the heel and are unattached to each other in the upper portion of the sub-upper directly below the malleolus and in an area in front of the upper portion of the sub-upper.

6. A shoe according to claim 2, wherein the base material is formed by a flexible material so that the upper portion of the sub-upper stretches in a front-back direction when the shoelace is fastened.

30 7. A shoe according to claim 6, wherein the base material is formed by an inner skin and an outer skin with the cushioning material sandwiched therebetween, and a counter formed by a synthetic resin which is harder than the layered portion and which has a U-shaped horizontal cross section is secured to the outer skin, over an area from the back surface to medial and lateral side surfaces of the heel, in a lower area of the sub-upper away from an upper edge of the sub-upper so that the layered portion conforms to a side surface of the foot.

35 8. A shoe according to claim 7, wherein:

40 the front extension extends forward past a front end of the counter; and in areas anterior to the front end of the counter in medial-side and lateral-side, the main upper presses the front extension against the side surface of the foot by the fastening force of the shoelace.

9. A shoe according to claim 8, wherein:

45 the counter is placed along the layered portion of the sub-upper; an upper edge of the main upper extends diagonally downward in the rearward direction to a rear end of the heel; and the main upper covers a front end portion of the counter without covering a rear portion of the counter in the upper portion of the sub-upper.

50 10. A shoe with an improved heel fit comprising:

55 a main upper being continuous from a tip of a toe to side surfaces of a heel; a sub-upper formed by a separate member from the main upper, conforming to the heel in the main upper; a shoelace for fitting the main upper and the sub-upper to the foot; and a sole to which secured edge portions of the main upper and the sub-upper are attached; the main upper includes first eyelet holes through which the shoelace passes; the sub-upper includes a flexible portion covering the heel, and is in contact with the side surfaces and a back surface of the heel in the main upper; the sub-upper includes a lower portion, and an upper portion above the lower portion, the lower portion being

covered by the main upper;
 a rear portion of the tongue and the upper portion of the sub-upper together form a mouth through which a leg
 5 extends in an upward direction when worn, and fit at the mouth;
 the upper portion is provided with an eyelet portion forming a second eyelet hole;
 a through hole is formed on a medial side and on a lateral side of the main upper for allowing the eyelet portion
 10 to pass therethrough so that the second eyelet hole is exposed outside the main upper; and
 in a state where the shoelace has been passed through the plurality of first and second eyelet holes and is
 exerting a fastening force,
 the eyelet portion is drawn toward a center of the foot by the fastening force from a portion of the shoelace near
 15 the second eyelet hole, thereby the upper portion being pulled toward a front side and fitting to an upper side
 surface of the foot.

11. A shoe according to claim 10, wherein:

15 the upper portion of the sub-upper includes a layered portion including a cushioning material serving to fit to an
 upper part of the foot, and an inner skin and an outer skin layered together with the cushioning material sand-
 20wiched therebetween, the layered portion bulging toward a surface of the foot by virtue of the cushioning material;
 the layered portion of the upper portion extends rearward from directly below medial and lateral malleoli; and
 the upper portion includes a front extension extending forward from directly below the medial and lateral malleoli
 25 past a front end of a calcaneal bone and extending forward past the secured edge portion of the sub-upper.

**12. A shoe according to claim 11, wherein in the state where the shoelace has been passed through the plurality of first
 and second eyelet holes and is exerting the fastening force, the layered portion is pulled forward to fit to the upper
 side surface of the foot.**

**13. A shoe according to claim 12, wherein in the state where the shoelace has been passed through the plurality of first
 and second eyelet holes and is exerting the fastening force, the main upper is drawn toward the center of the foot
 30 by the fastening force from a portion of the shoelace near one of the first eyelet holes that is posterior to the second
 eyelet hole, whereby a portion of the front extension of the upper portion that is in the main upper is pressed against
 the upper side surface of the foot, thereby fitting the layered portion including the cushioning material to the upper
 side surface of the foot.**

14. A shoe according to claim 10, wherein:

35 the sub-upper includes an exposed portion extending from directly under rear ends of the medial and lateral
 malleolus to a back surface of the heel without being accommodated in the main upper; and
 the main upper covers a lower portion of the calcaneal bone from the back surface.

**15. A shoe according to claim 14, wherein the main upper and the sub-upper are attached to each other on a back of
 40 the heel and are unattached to each other in the upper portion of the sub-upper directly below the malleolus and in
 an area in front of the upper portion of the sub-upper.**

**16. A shoe according to claim 10, wherein a counter formed by a synthetic resin which is harder than the layered portion
 and which has a U-shaped horizontal cross section is secured to the outer skin, over an area from the back surface
 45 to medial and lateral side surfaces of the heel, in a lower area of the sub-upper away from an upper edge of the
 sub-upper so that the upper portion conforms to side surfaces of the foot.**

17. A shoe according to claim 16, wherein:

50 the front extension extends forward past a front end of the counter; and
 in medial-side and lateral-side areas anterior to the front end of the counter, the main upper presses the front
 extension against the side surfaces of the foot by the fastening force of the shoelace.

18. A shoe according to claim 17, wherein:

55 the counter is placed along the layered portion of the sub-upper;
 an upper edge of the main upper extends diagonally downward in a rearward direction to a rear end of the heel;
 and

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the main upper covers a front end portion of the counter , without covering a rear portion of the counter in the upper portion of the sub-upper.

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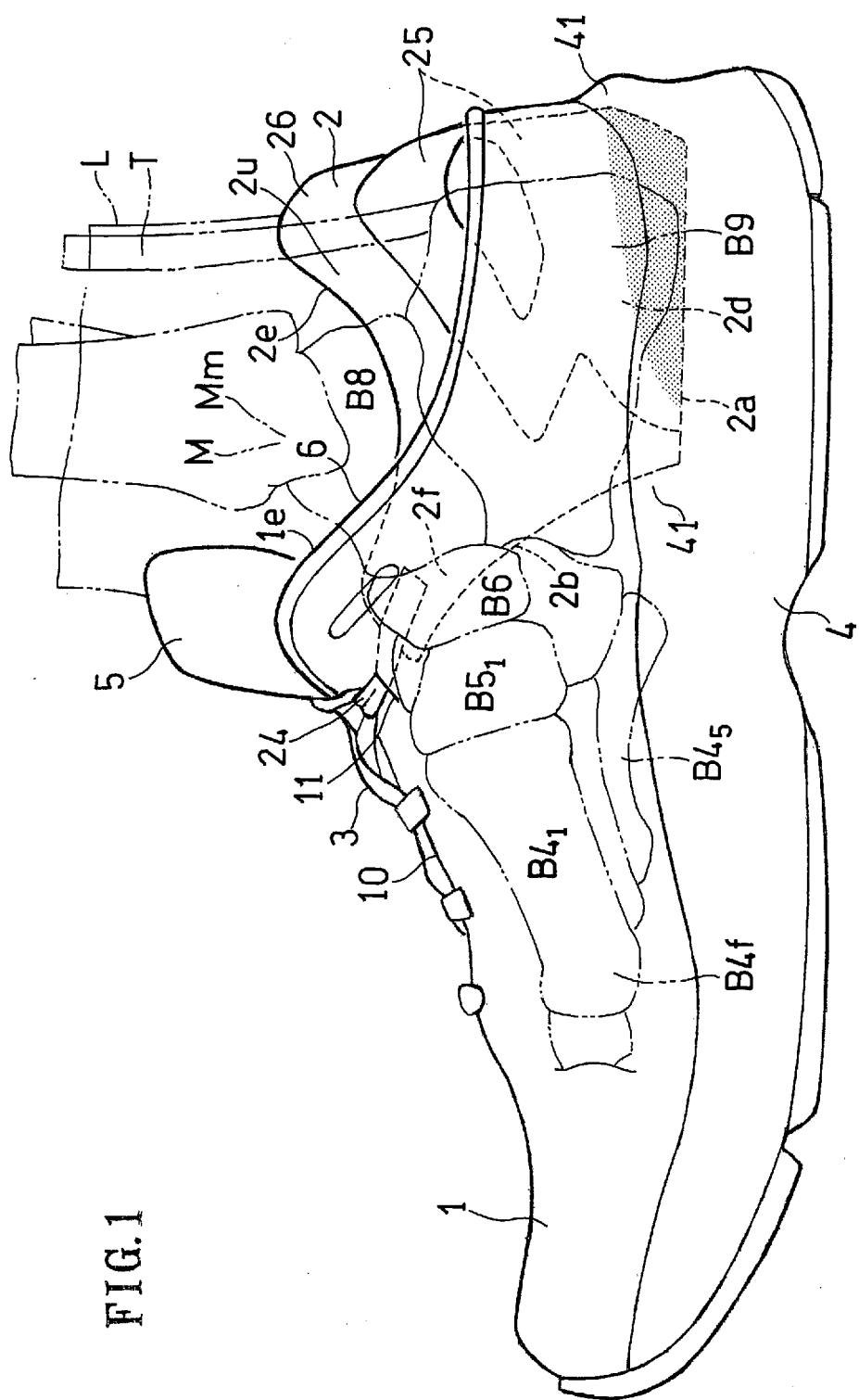
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FIG. 1



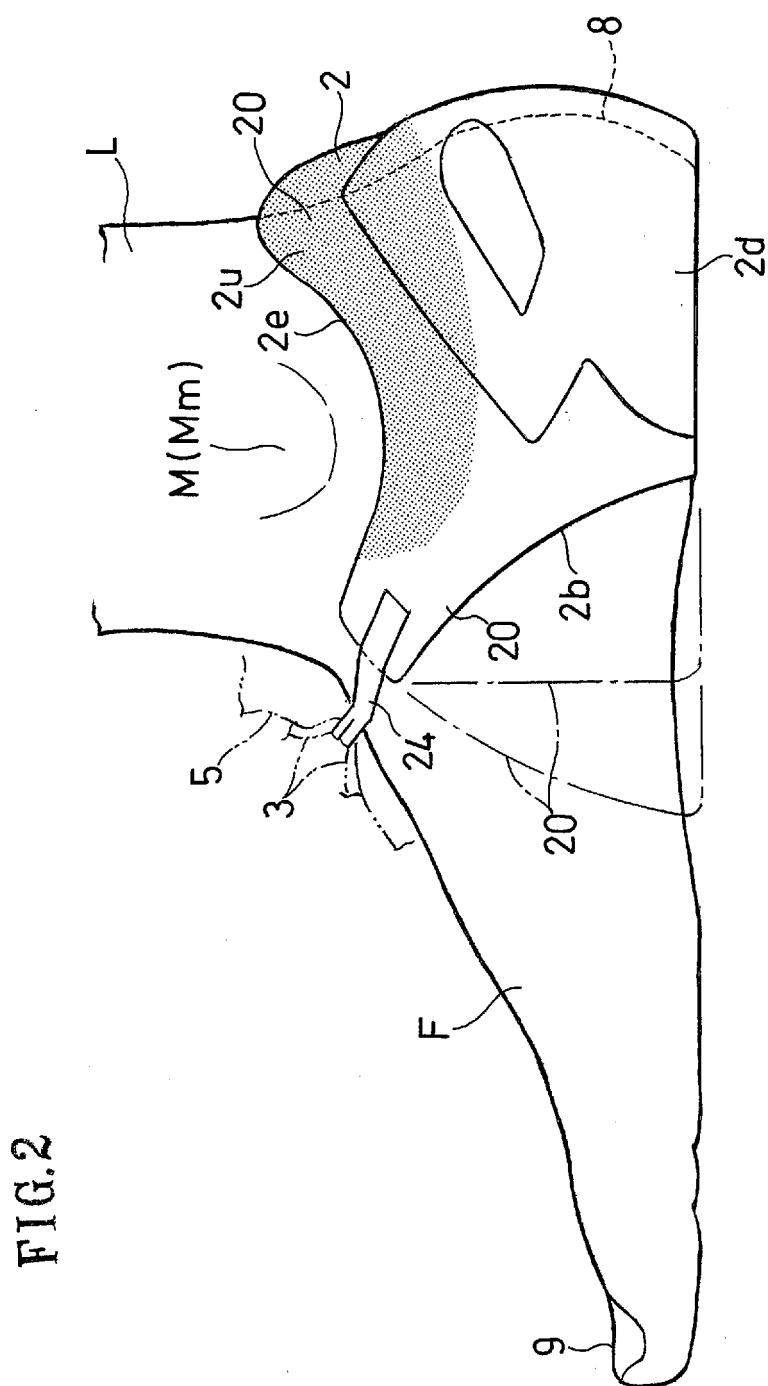


FIG. 3

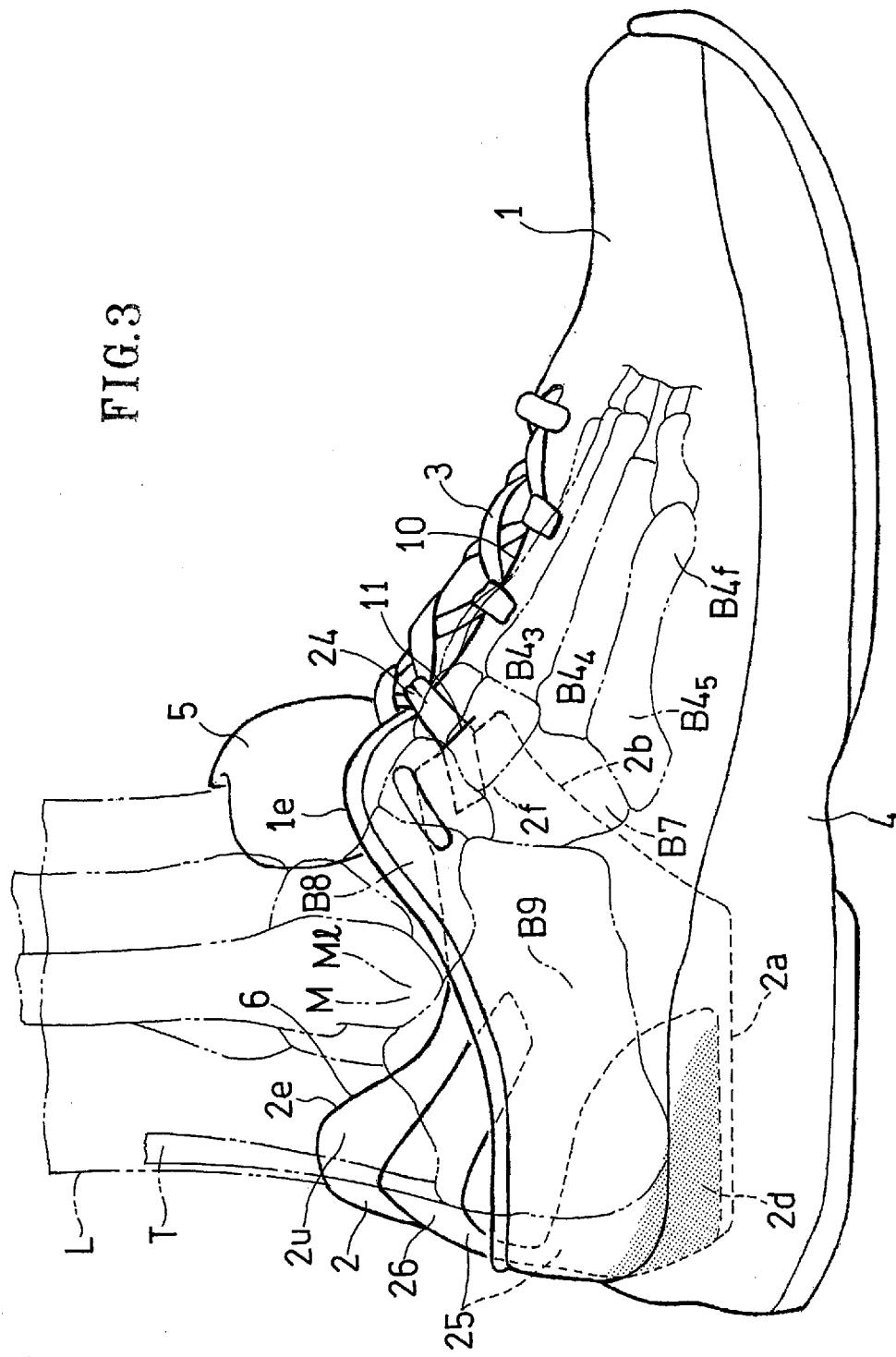


FIG. 4

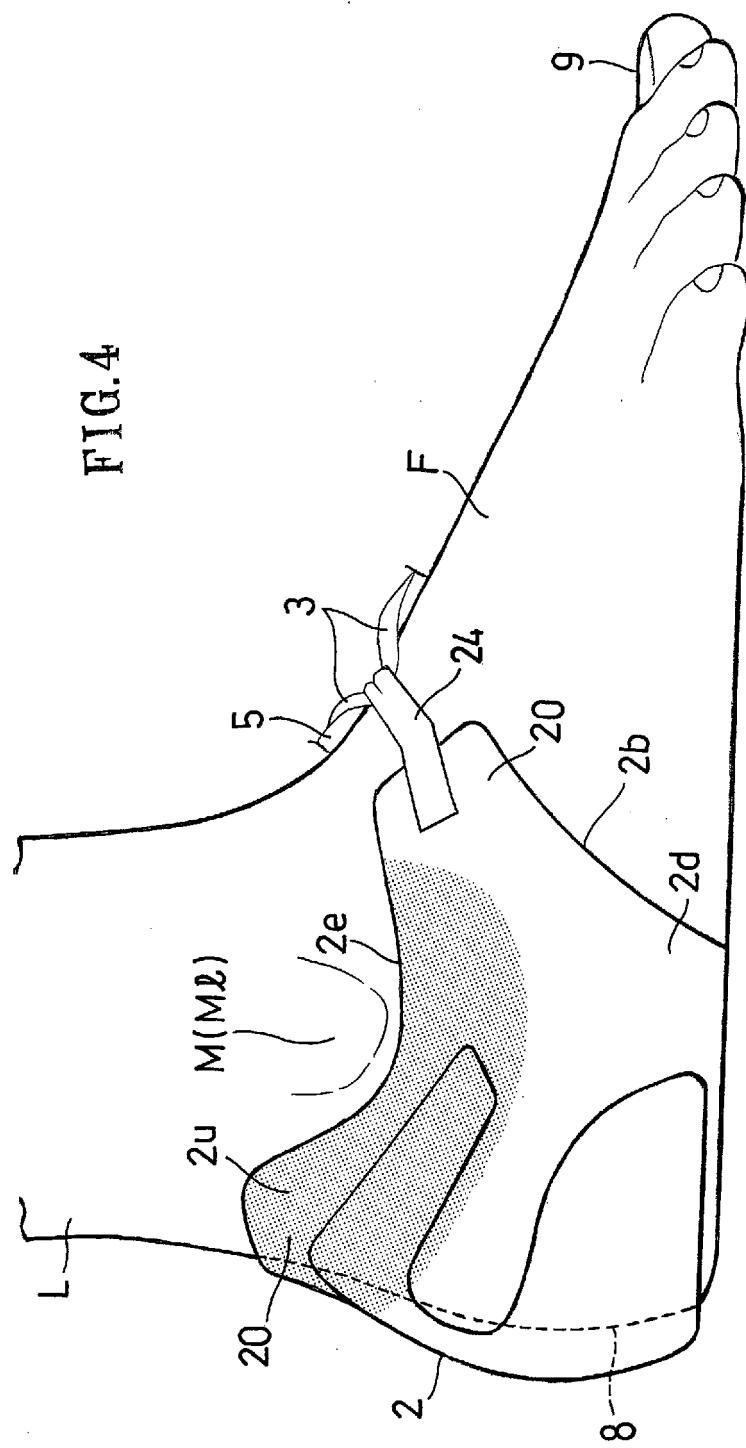


FIG.5

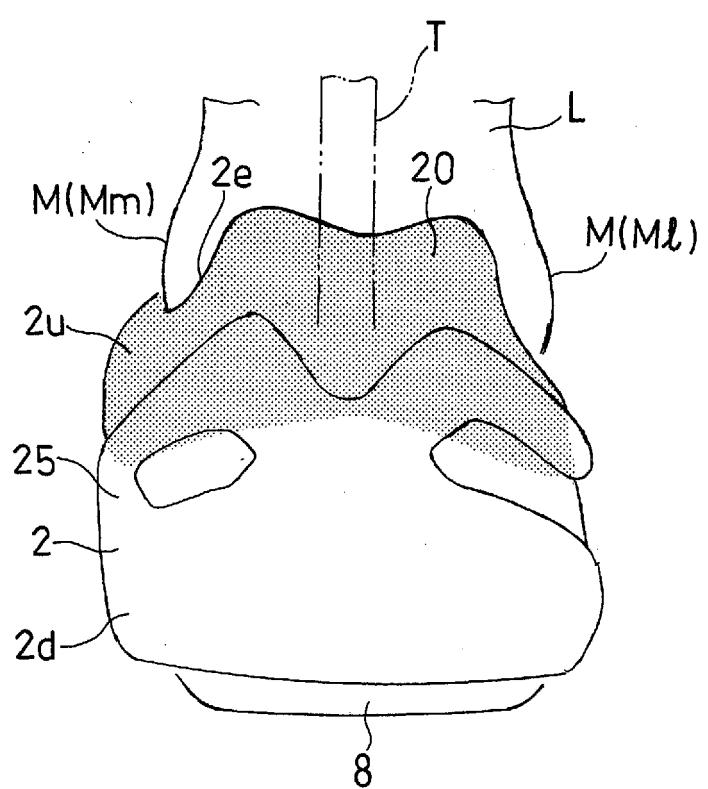


FIG. 6

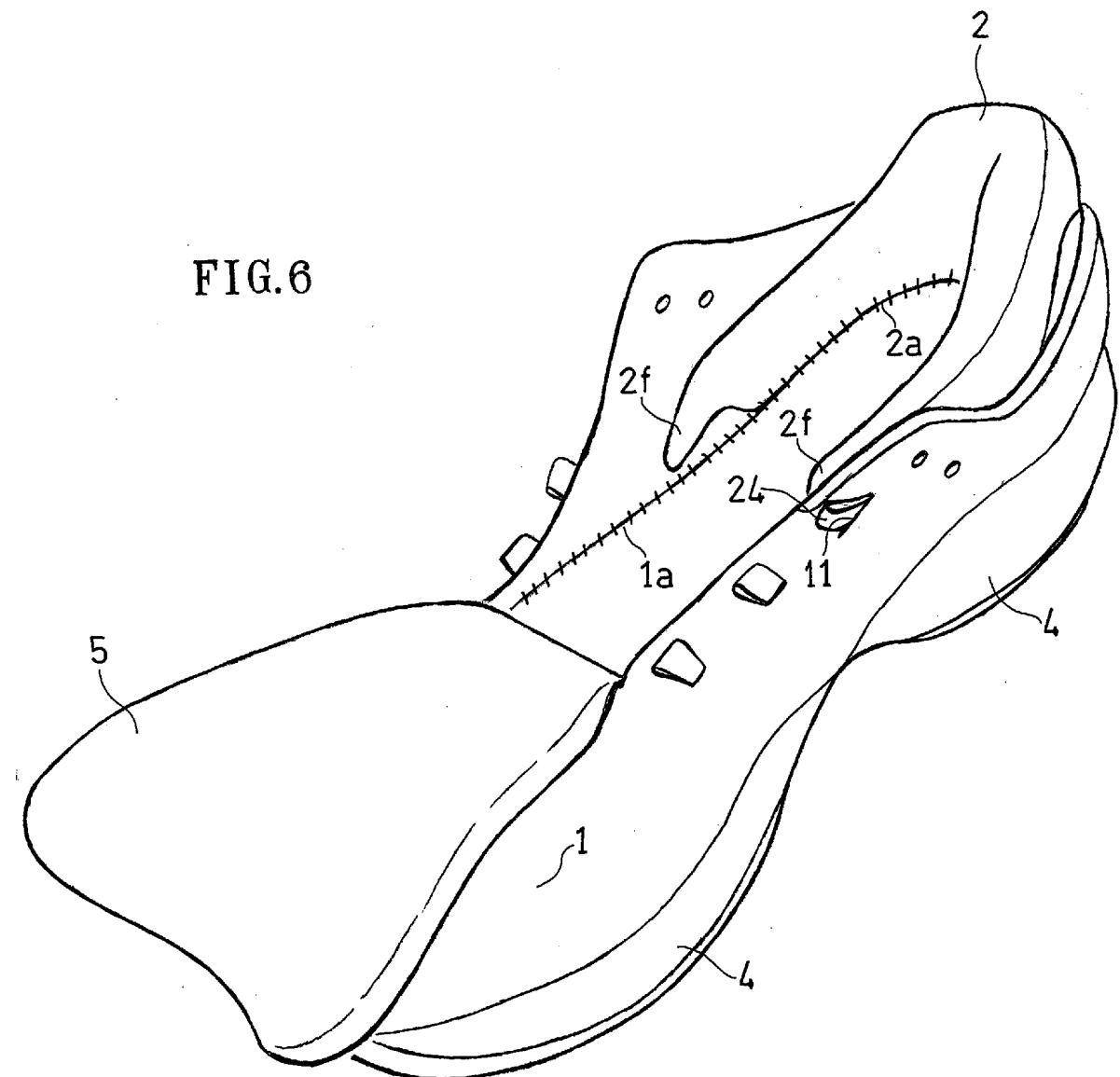


FIG. 7

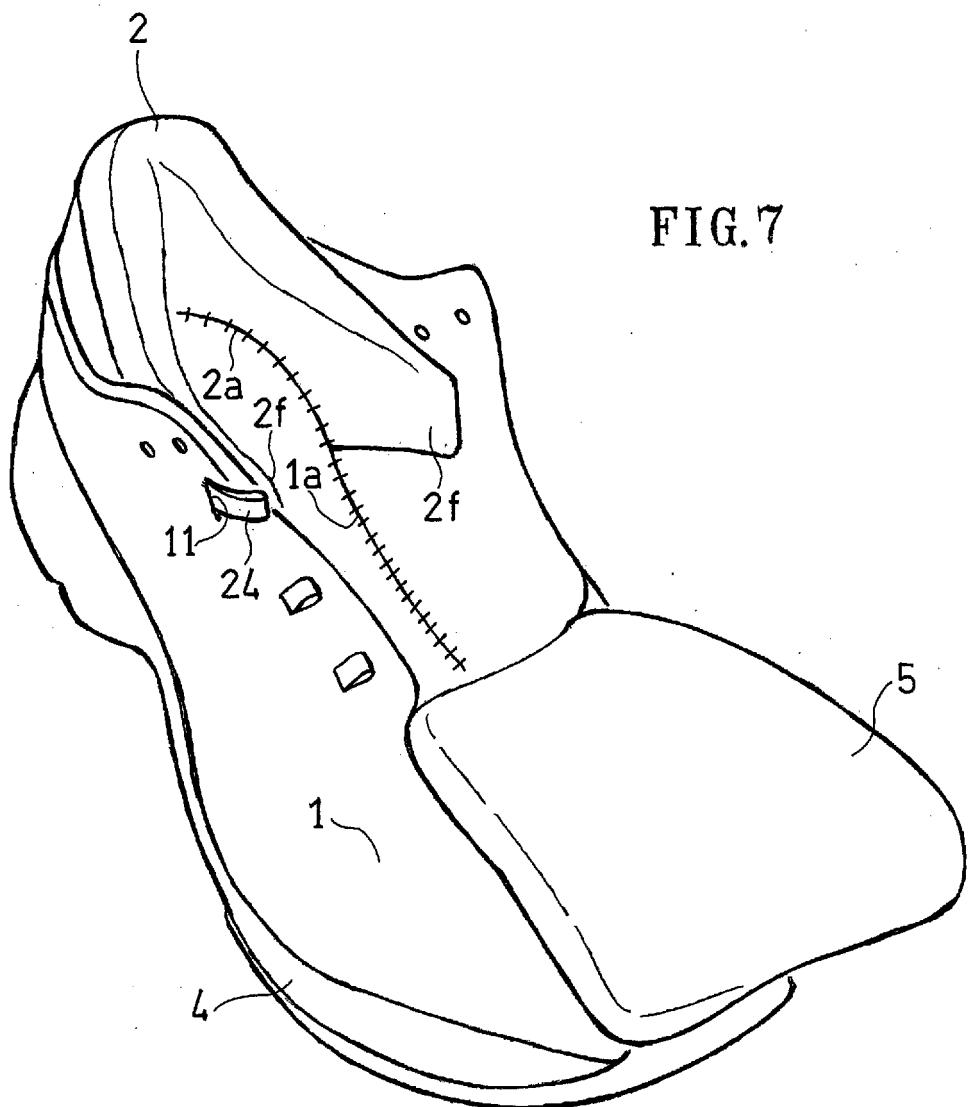


FIG.8

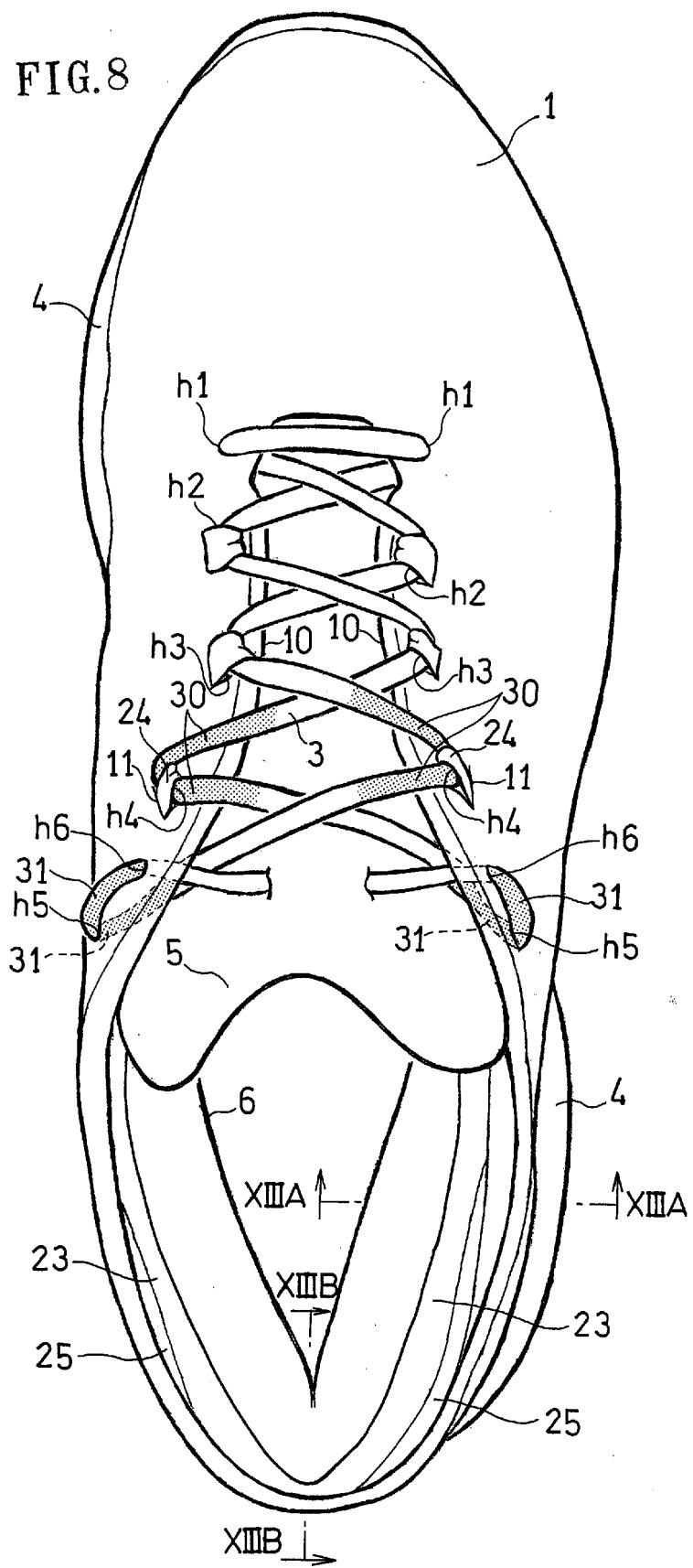
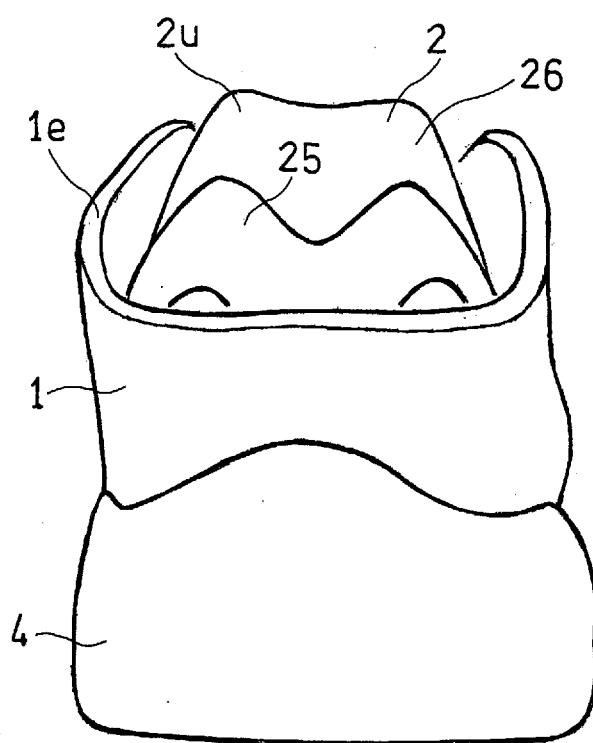


FIG.9



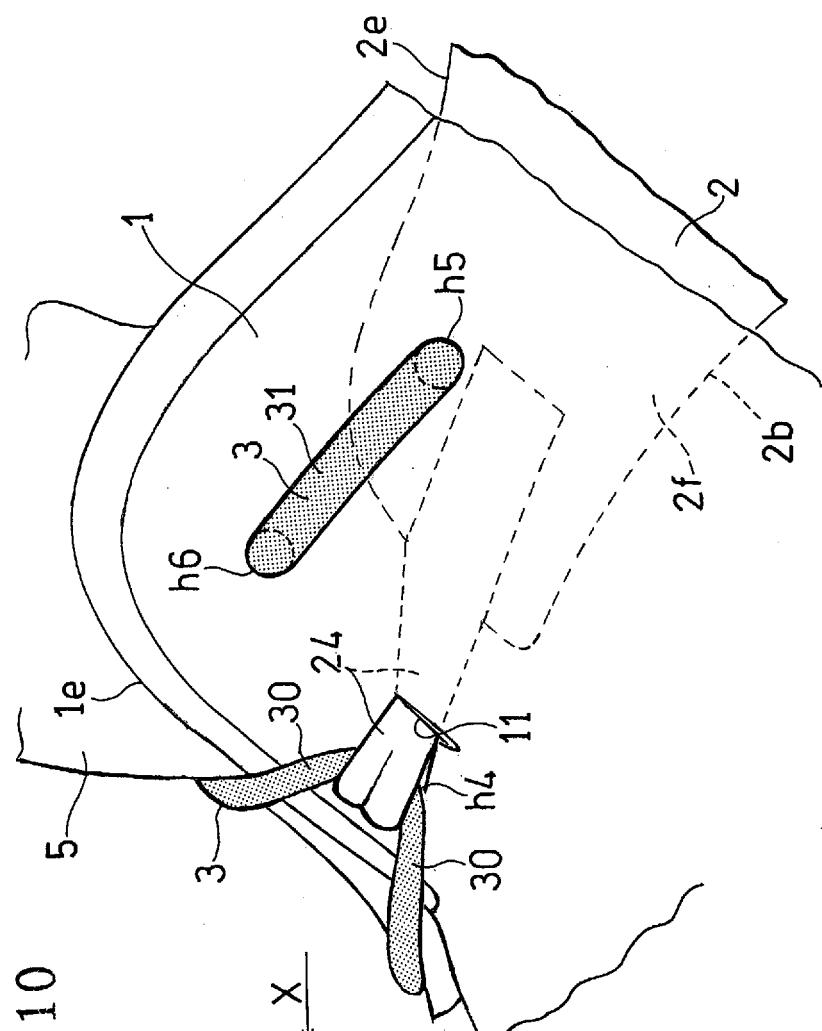


FIG. 10

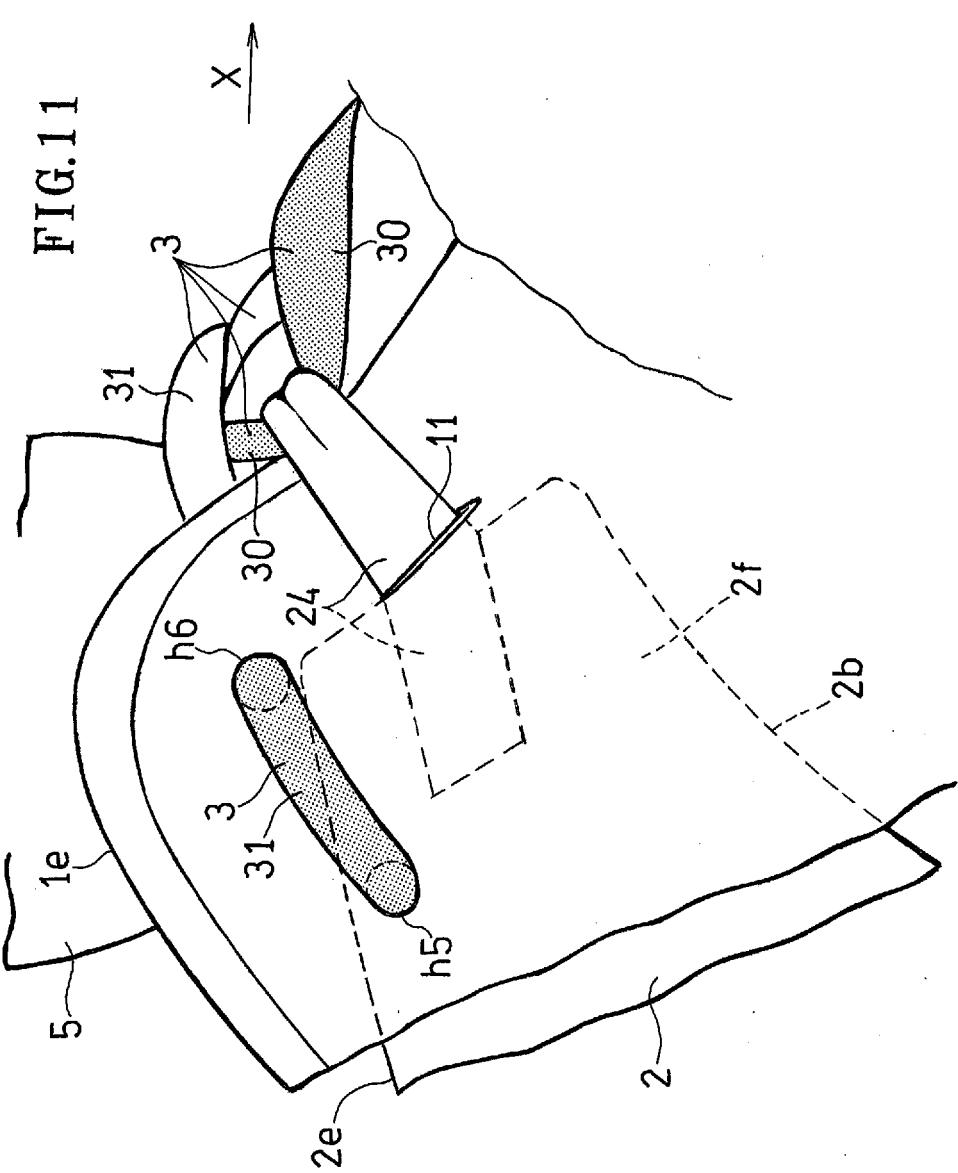


FIG. 12 A

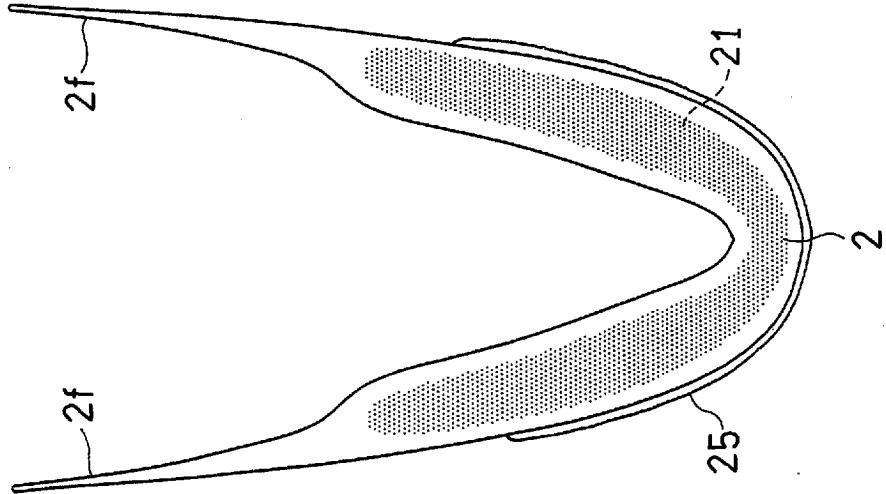


FIG. 12 B

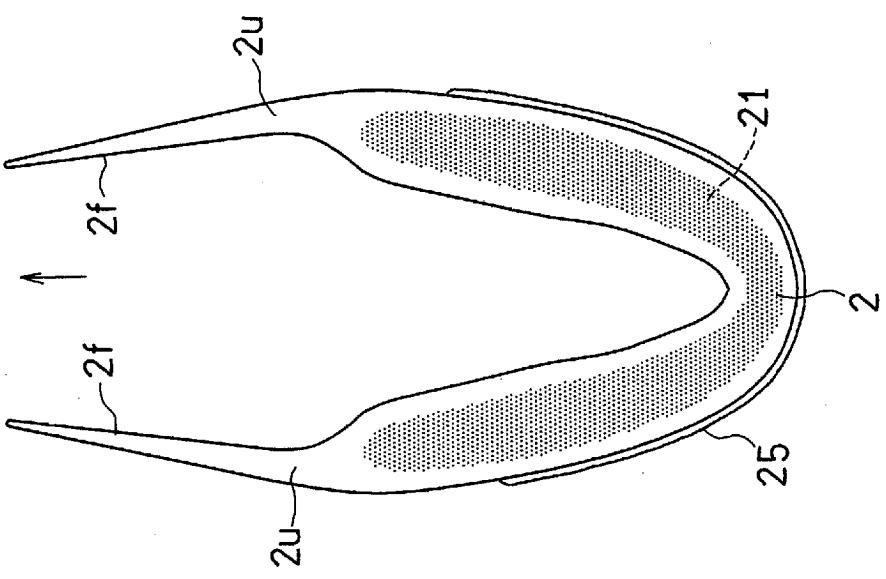


FIG. 12 C

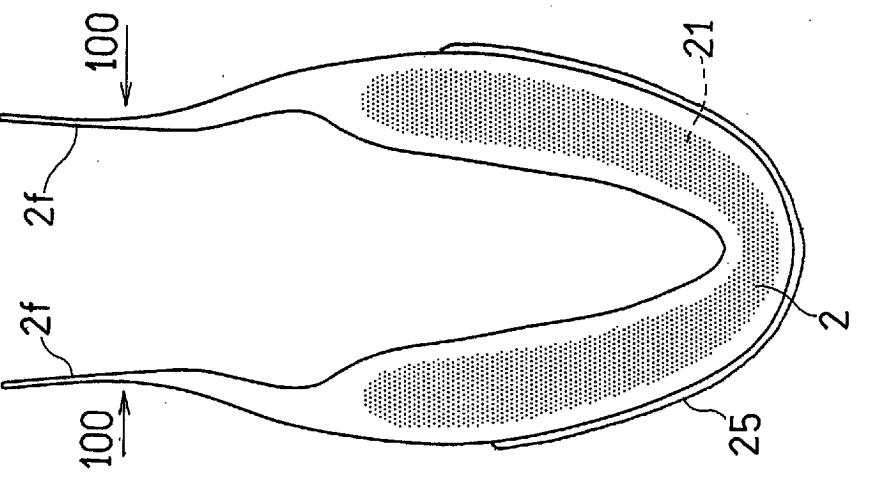


FIG. 13 B

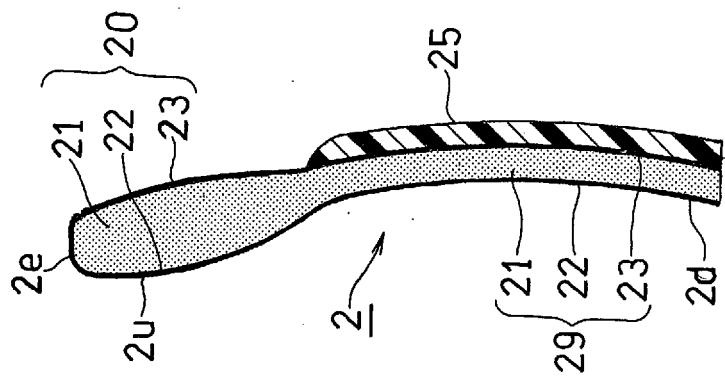
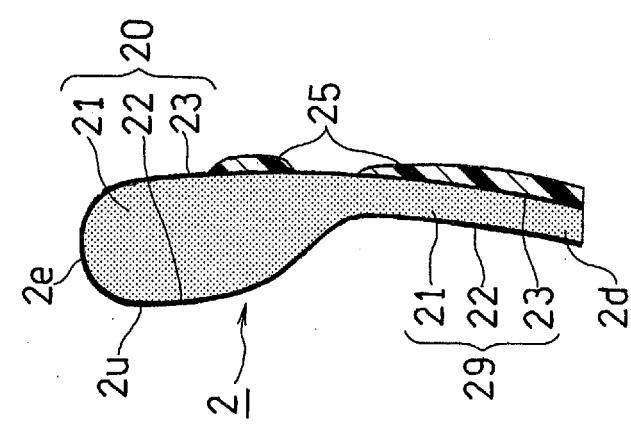


FIG. 13 A



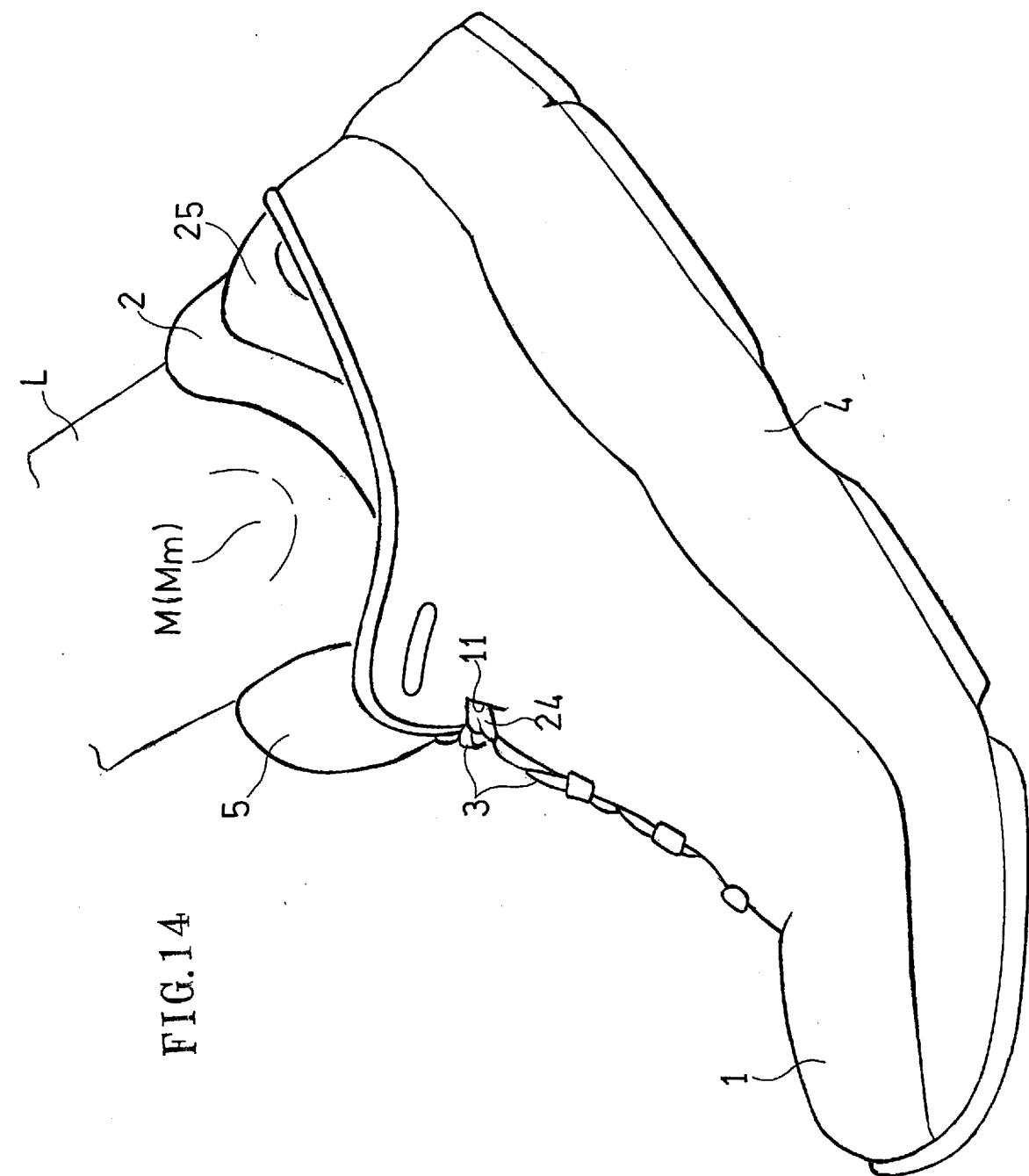
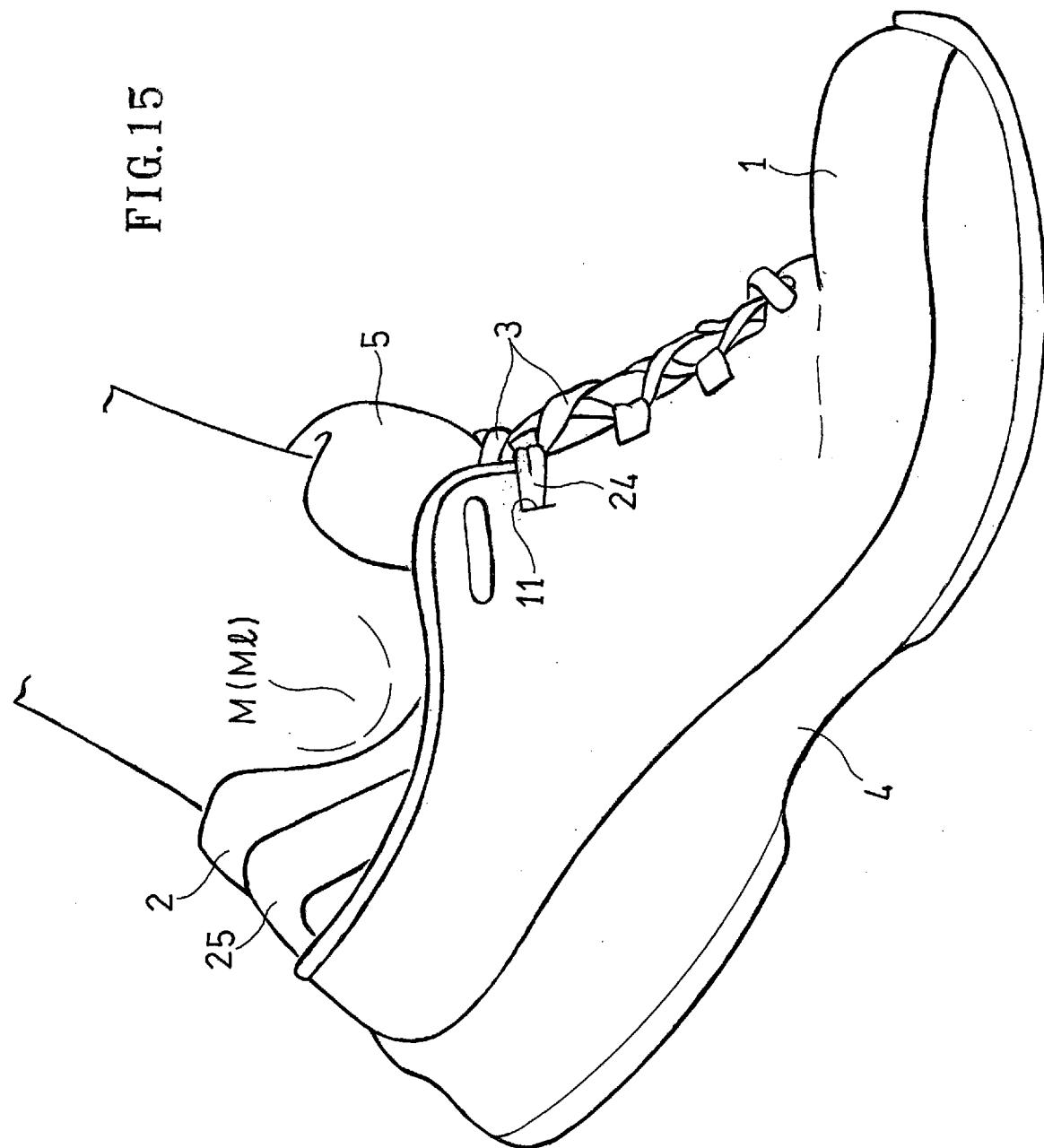


FIG. 14

FIG. 15



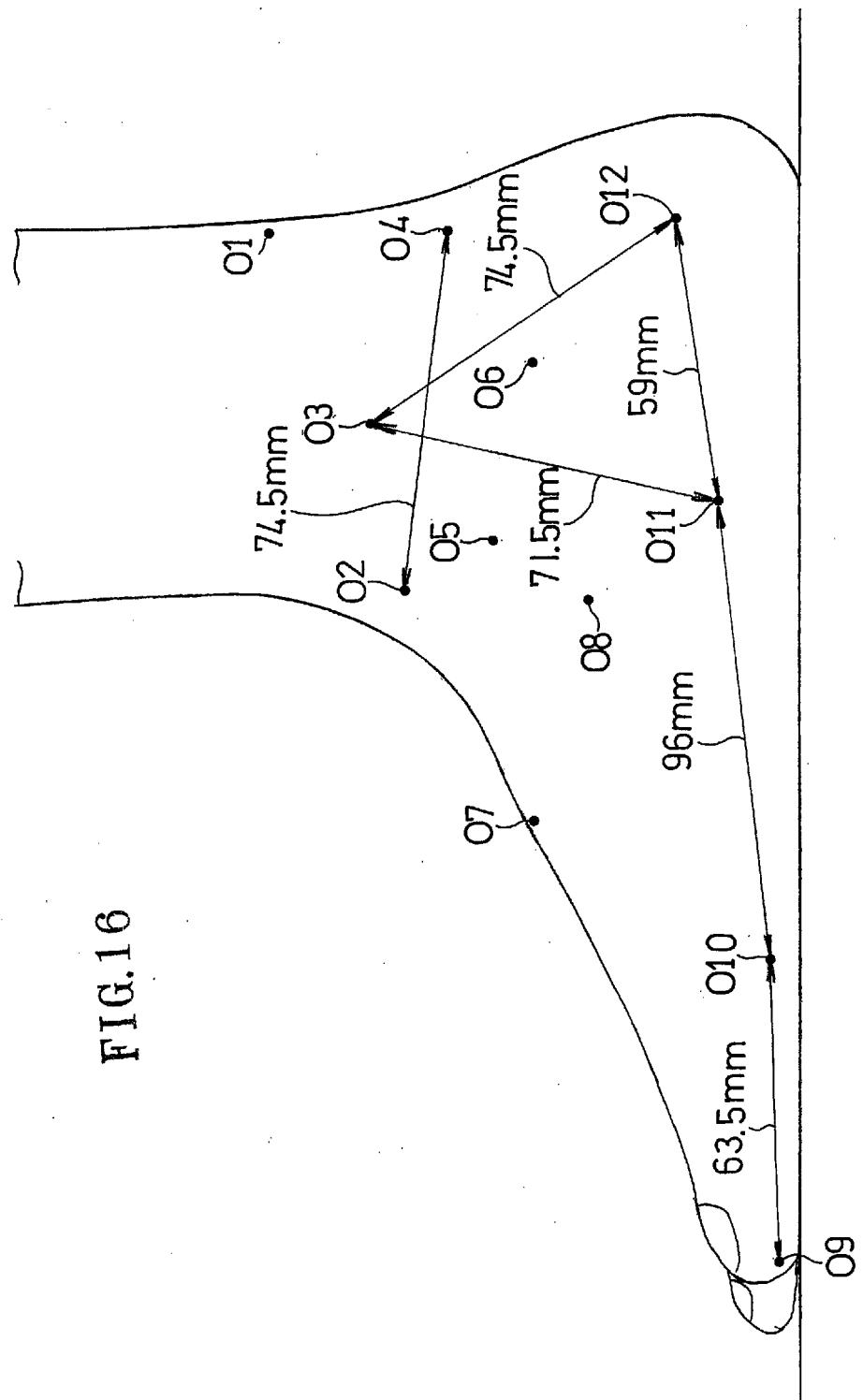


FIG. 16

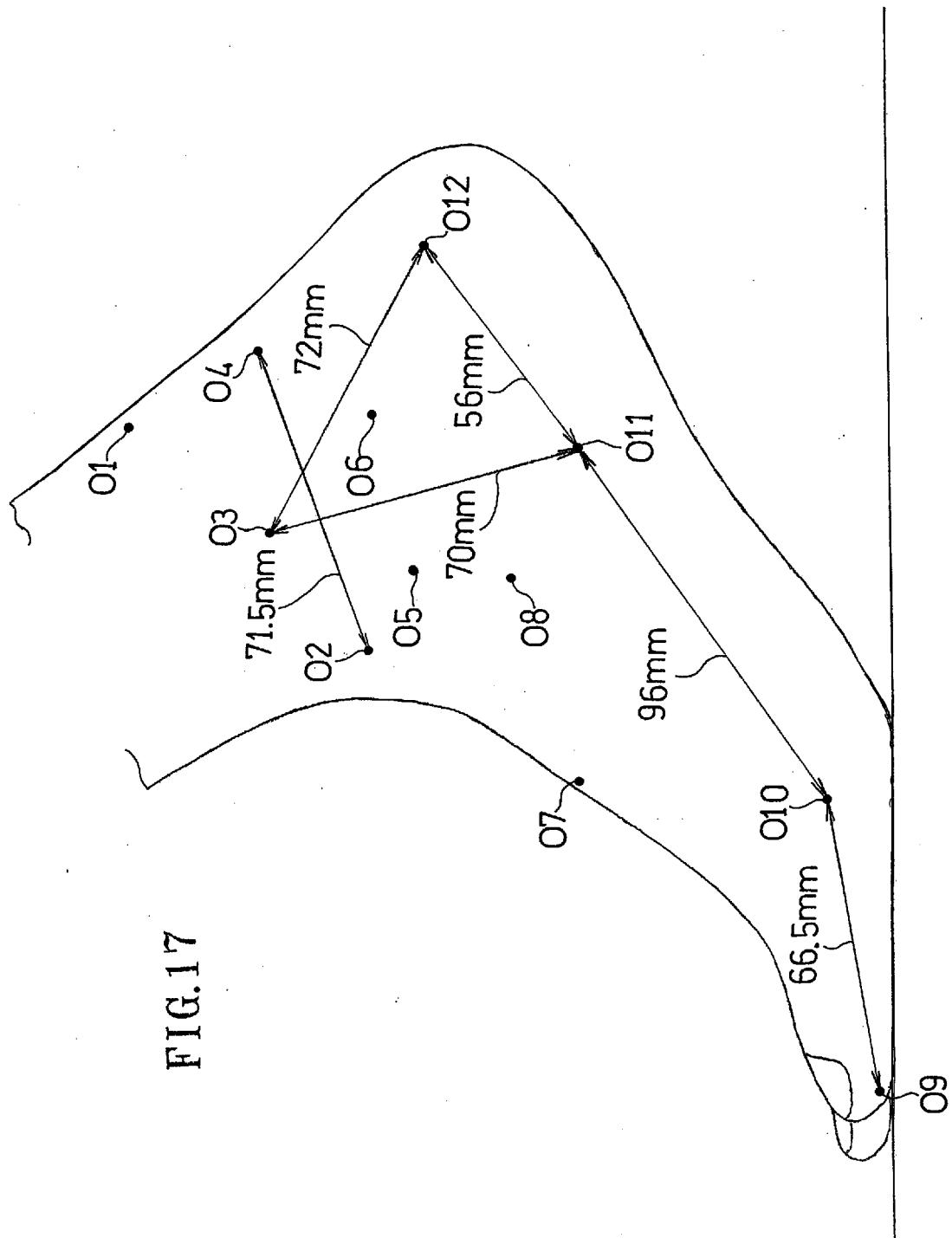


FIG. 17

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2009/006109

A. CLASSIFICATION OF SUBJECT MATTER
A43B23/02 (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)
A43B1/00-23/30Documentation 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 1996-2009
Kokai Jitsuyo Shinan Koho 1971-2009 Toroku Jitsuyo Shinan Koho 1994-2009

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.
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 151811/1986 (Laid-open No. 57902/1988) (MIZUNO INC.), 18 April 1988 (18.04.1988), entire text; all drawings (Family: none)	1-18
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 59169/1984 (Laid-open No. 170107/1985) (Nippon Gomu Kabushiki Kaisha), 11 November 1985 (11.11.1985), entire text; all drawings (Family: none)	1-18

 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	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 02 December, 2009 (02.12.09)	Date of mailing of the international search report 15 December, 2009 (15.12.09)
Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer
Faxsimile No.	Telephone No.

Form PCT/ISA/210 (second sheet) (April 2007)

INTERNATIONAL SEARCH REPORT		International application No. PCT/JP2009/006109
C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2-5903 A (Prince Manufacturing, Inc.), 10 January 1990 (10.01.1990), entire text; all drawings & EP 0329392 A2	1-18
A	JP 2008-132227 A (MIZUNO INC.), 12 June 2008 (12.06.2008), all drawings & WO 2008/065865 A1 & US 2008/0120871 A1	1-18
A	JP 62-231602 A (Chesebrough-Ponds Inc.), 12 October 1987 (12.10.1987), all drawings & US 4670998 A & EP 0231118 A2	1-18
A	JP 6-217806 A (Asics Corp.), 09 August 1994 (09.08.1994), all drawings (Family: none)	1-18

Form PCT/ISA/210 (continuation of second sheet) (April 2007)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2008132227 A [0003]
- JP 2005903 A [0003]
- US 4670998 A [0003]
- JP 6217806 A [0003]