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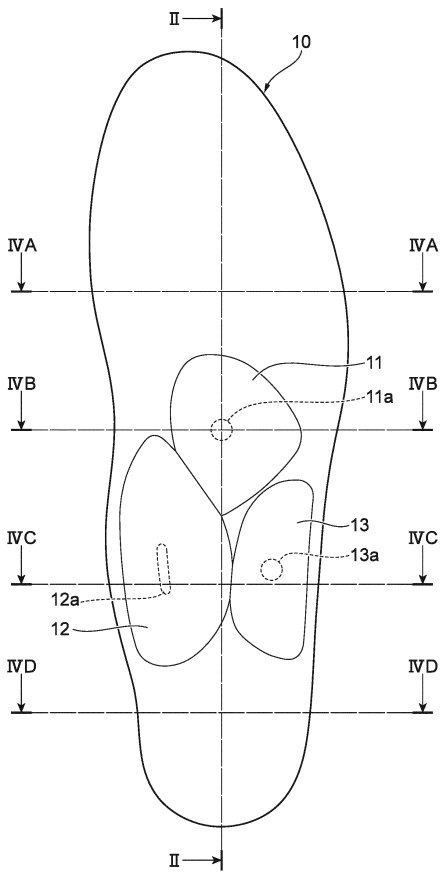
(54) SOCK LINING FOR FOOTWEAR, ETC

(57) An insole for an article of footwear has a shape corresponding to an inner bottom of the footwear and includes, on its upper side, a protrusion having three apexes. With respect to total length from a toe-side end to a heel-side end, the protrusion extends from a position at about 2/5 to a position at about 4/5 of the total length from the toe-side end. The three apexes include a first apex located substantially at the center of the total length and substantially at the center in a width direction of the insole, and second and third apexes arranged in the width direction at positions at about 2/3 of the total length from the toe-side end. The second apex is located at a medial-side edge of the insole. The third apex is located at about 1/4 of a length in the width direction of the insole from its lateral-side edge.

FIG.1



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Description

Technical Field

[0001] The present invention relates to an insole for an article of footwear and a covering for a foot.

Background Art

[0002] Insoles for footwear have been devised to date from various perspectives including mitigating impact on feet and reducing load, improving movements, and improving stability in standing postures. Patent Document 1 discloses an insole for shoes that supports three points of the first metatarsal sesamoid, the tuberosity of the fifth metatarsal bone, and the calcaneal tuberosity from the foot sole to stabilize the center of gravity with the three-point balancing and provides a stimulus to adjust body movements from the foot sole and help a body to return to a normal posture.

[0003] Also, Patent Document 2 discloses an insole that can correct or prevent collapse of three arches of the foot and prevent plantar fasciitis. The insole disclosed in Patent Document 2 is provided with, on its side contacting the foot, a protrusion for the transverse arch, a protrusion for the medial longitudinal arch, and a protrusion for the lateral longitudinal arch for supporting these three arches. The insole is further provided with, on its top side in a hindfoot region corresponding to a hindfoot portion of the foot, a plantar fascia protection recess of a concave shape for protecting the fascia origin of the plantar fascia extending radially from near the calcaneal tuberosity of the calcaneus.

Citation List

Patent Literature

[0004]

Patent Document 1: Japanese Patent Application Laid-Open Publication No. 2013-150797
Patent Document 2: Japanese Patent Application Laid-Open Publication No. 2017-023706

Summary of Invention

Technical Problem

[0005] The insole disclosed in Patent Document 1 lacks sufficient stability in standing postures. Improvements are still desirable in the shape of the insole in order to provide more stability in standing postures.

[0006] An object of the present invention is to provide an insole for an article of footwear and a covering for a foot that include elevations having three apexes arranged in a predetermined positional relationship and thus improve stability in standing postures.

Solution to Problem

[0007] A first aspect of the present invention to achieve the above object is an insole for an article of footwear. The insole has a shape corresponding to an inner bottom surface of the article of footwear. The insole includes, on a side thereof facing upward when attached to the article of footwear, a protrusion having three apexes. With respect to a total length from a toe-side end to a heel-side end, the protrusion extends from a position at about 2/5 of the total length from the toe-side end to a position at about 4/5 of the total length from the toe-side end. The three apexes of the protrusion include a first apex located substantially at a center of the total length of the insole and substantially at a center in a width direction of the insole, and a second apex and a third apex arranged in the width direction at positions at about 2/3 of the total length from the toe-side end. The second apex is located at a medial-side edge of the insole. The third apex is located at a position at about 1/4 of a length in the width direction of the insole from a lateral-side edge thereof.

[0008] More preferably, the second apex may be higher than the first apex and the third apex, and the first apex and the third apex may be at the same height.

[0009] A second aspect of the present invention to achieve the above object is an insole for an article of footwear. The insole includes: three protrusions on a side of the insole facing upward when attached to the article of footwear. the three protrusions include: a first protrusion having an apex located substantially at a center of a total length from a toe-side end to a heel-side end of an inner bottom of the article of footwear, to which the insole is attached, and substantially at a center in a width direction of the inner bottom; a second protrusion having an apex located at a position at about 2/3 of the total length of the inner bottom from the toe-side end and corresponding to a medial-side edge of the inner bottom; and a third protrusion having an apex located at a position at about 2/3 of the total length of the inner bottom from the toe-side end and at about 1/4 of a length in the width direction of the inner bottom from a lateral-side edge thereof.

[0010] A third aspect of the present invention to achieve the above object is a covering for a foot. The covering includes: a first protrusion having an apex located substantially at a center of a total length from a toe-side end to a heel-side end of an inner bottom and substantially at a center in a width direction of the inner bottom; a second protrusion having an apex located at a position at about 2/3 of the total length of the inner bottom from the toe-side end and corresponding to a medial-side edge of the inner bottom; and a third protrusion having an apex located at a position at about 2/3 of the total length of the inner bottom from the toe-side end and at about 1/4 of a length in the width direction of the inner bottom from a lateral-side edge thereof.

Advantageous Effects of Invention

[0011] The present invention provides an insole for an article of footwear and a covering for a foot that include elevations having three apexes arranged in a predetermined positional relationship and thus improve stability in standing postures.

Brief Description of Drawings

[0012]

FIG. 1 is a top view of an insole in accordance with an exemplary embodiment.
FIG. 2 is a sectional view of the insole of FIG. 1 taken along a line II-II.
FIG. 3 is a side view of the insole of FIG. 1 as viewed from the medial side.
FIGS. 4A to 4D are sectional views of the insole of FIG. 1; FIG. 4A is a sectional view taken along a line IVA-IVA, FIG. 4B is a sectional view taken along a line IVB-IVB, FIG. 4C is a sectional view taken along a line IVC-IVC, and FIG. 4D is a sectional view taken along a line IVD-IVD.
FIG. 5 illustrates the insole as being attached to an article of footwear.
FIG. 6 illustrates the shape of the insole of FIG. 1 with a heel portion removed.
FIG. 7 illustrates the shape of the insole of FIG. 1 with a toe portion removed.

Description of Embodiments

[0013] Hereinafter, a detailed description will be given of a preferred embodiment of the present invention with reference to the drawings. It should be noted that the present invention is not limited to the embodiment given below and may be modified, altered, or improved based on knowledge of those skilled in the art without departing from the scope of the present invention.

<Overall structure>

[0014] FIGS. 1 to 5 illustrate an insole in accordance with an exemplary embodiment. FIG. 1 is a top view of the insole. FIG. 2 is a sectional view of the insole of FIG. 1 taken along a line II-II. FIG. 3 is a side view of the insole of FIG. 1 as viewed from the medial side. FIG. 4A is a sectional view of the insole of FIG. 1 taken along a line IVA-IVA, FIG. 4B is a sectional view of the insole of FIG. 1 taken along a line IVB-IVB, FIG. 4C is a sectional view of the insole of FIG. 1 taken along a line IVC-IVC, and FIG. 4D is a sectional view of the insole of FIG. 1 taken along a line IVD-IVD. FIG. 5 illustrates the insole as being attached to an article of footwear.

[0015] The insole 10 has substantially the same shape as an inner bottom 21 (see FIG. 5) defining an inner bottom surface of an article of footwear 20. When the insole 10 is attached to the article of footwear 20, the insole 10 covers the inner bottom 21. While the insole 10 and the inner bottom 21 of the article of footwear 20 may not be completely of the same shape, the term "substantially the same shape" as used herein encompasses a slight shape difference that does not cause distortion of the insole 10 when it is attached to the article of footwear 20 or displacement of the insole 10 inside the article of footwear 20 during walking with the article of footwear 20 attached with the insole 10. In the case where the shape difference is so large as to cause the insole 10 to be distorted when it is attached to the article of footwear 20, an outer periphery of the insole 10 may be shaved or cut to fit the shape of the inner bottom 21 of the article of footwear 20, for example. In the case where there is a gap that causes the insole 10 to be displaced inside the article of footwear 20 during walking with the article of footwear 20 attached with the insole 10, an auxiliary member filling that gap may be affixed to the insole 10 to make it fit the shape of the inner bottom 21 of the article of footwear 20, for example.

[0016] For example, the insole 10 has a stacked structure composed a top layer, an intermediate layer, and a back layer. When the insole 10 is attached to the article of footwear, the top layer constitutes a side that contacts a foot of a user wearing the article of footwear. For example, materials for the top layer may be those with a brushed surface or a fine concave-convex surface to enhance skin feel and ensure good gripping of the foot sole. Examples of such materials include polyester knitting mesh. The intermediate layer constitutes a core layer of the insole 10. For example, materials for the intermediate layer may be those that have enough stiffness as the core material for the intermediate layer, as well as having cushioning property and being deformable to a certain extent. Examples of such materials include ethylene vinyl acetate foam. The back layer constitutes a side contacting the inner bottom 21 when the insole 10 is attached to the article of footwear 20. For example, materials for the back layer may be those that are not slippery on the inner bottom 21 of the article of footwear 20 due to friction. Examples of such materials include non-woven melted fabric with a crisscross pattern. It should be noted that the above stacked structure of the insole 10 is merely exemplary in nature. Alternatively, in order to obtain desired characteristics of cushioning property, stiffness, etc., the intermediate layer may be composed of a plurality of layers made of different materials. Materials for each layer may be chosen from the various ones that are available as the insole 10.

[0017] The shape of a foot differs from individual to individual and is not constant. Also, each person has his/her own characteristics in the position and movement of the center of gravity in standing postures or during walking, and thus these characteristics are not constant. For adjustment to cope with these matters, the thickness of the insole 10 may be partially increased or decreased by, for example, shaving it from the back layer side or

affixing an auxiliary member.

<Structure of protrusions of the insole>

[0018] The insole 10 is provided with protrusions having three apexes on its side that faces upward when attached to the article of footwear 20. These protrusions may be regarded as a single protrusion having three apexes, or may be regarded as three protrusions each having one apex. Herein, the insole 10 is described as having three protrusions. That is, the insole 10 is provided with three protrusions 11, 12, 13 as shown in FIGS. 1 to 4D.

[0019] The first protrusion 11 is a gently raised region with a generally circular contour slightly projecting toward the lateral side and the toe side. In the longitudinal direction from a toe-side end to a heel-side end of the insole 10 (in the direction of the straight line denoted by II-II in FIG. 1), the first protrusion 11 extends from a position at about 2/5 to a position at about 3/5 of the length (total length) from the toe-side end in that direction. In the width direction perpendicular to the longitudinal direction, the first protrusion 11 extends from a position at about 1/4 to a position at about 5/6 of the length from the medial side in that direction.

[0020] The first apex 11a, which is the highest portion of the first protrusion 11, is formed substantially at the center in the longitudinal direction from the toe-side end to the heel-side end of the insole 10 and substantially at the center in the width direction perpendicular to the longitudinal direction. For example, the height of the first apex 11a is about 4 to 4.5 mm from a surface of the insole 10 not provided with the protrusions 11, 12, 13. The height may be adjusted according to the foot shape, the position of the center of gravity, the gait, etc. of the user. The first apex 11a is not pointed but is a round surface. Alternatively, the first apex 11a may be a flat surface with a certain area.

[0021] The second protrusion 12 is a gently raised region with a generally egg-shaped contour located on the heel side relative to the first protrusion 11 and on the medial side. In the longitudinal direction from the toe-side end to the heel-side end of the insole 10, the second protrusion 12 extends from a position at about 1/2 to a position at about 4/5 of the length from the toe-side end in that direction. In the width direction perpendicular to the longitudinal direction, the second protrusion 12 extends from a position at about 3/5 of the length from the medial side in that direction to a medial-side edge.

[0022] The second apex 12a, which is the highest portion of the second protrusion 12, is formed at the medial-side edge of the insole 10 and at a position that is located at about 2/3 of the length from the toe-side end in the longitudinal direction from the toe-side end to the heel-side end of the insole 10. For example, the height of the second apex 12a is about 7.5 mm from the surface of the insole 10 not formed with the protrusions 11, 12, 13. The height may be adjusted according to the foot shape, the position of the center of gravity, the gait, etc. of the user. The second apex 12a is not pointed but is a round surface. Alternatively, the second apex 12a may be a flat surface with a certain area.

[0023] The third protrusion 13 is a gently raised region with a generally semicircular contour located on the heel side relative to the first protrusion 11 and on the lateral side. In the longitudinal direction from the toe-side end to the heel-side end of the insole 10, the third protrusion 13 extends from a position at slightly less than about 3/5 to a position at about 4/5 of the length from the toe-side end in that direction. In the width direction perpendicular to the longitudinal direction, the third protrusion 13 extends from a position at about 2/5 of the length from the lateral side in that direction to near a lateral-side edge.

[0024] The third apex 13a, which is the highest portion of the third protrusion 13, is formed at a position that is located at about 2/3 of the length from the toe-side end in the longitudinal direction from the toe-side end to the heel-side end of the insole 10 and at about 1/4 of the length from the lateral-side edge in the width direction perpendicular to the longitudinal direction. For example, the height of the third apex 13a is about 4 mm from the surface of the insole 10 not formed with the protrusions 11, 12, 13. The height may be adjusted according to the foot shape, the position of the center of gravity, the gait, etc. of the user. The third apex 13a is not pointed but is a round surface. Alternatively, the third apex 13a may be a flat surface with a certain area.

[0025] Comparing the apexes 11a, 12a, 13a of the respective protrusions 11, 12, 13, the first apex 11a is positioned substantially at the center of the insole 10, and the second apex 12a and the third apex 13a are arranged in the width direction at particular positions on the heel side relative to the first apex 11a. Regarding the height from the surface of the insole 10 not formed with the protrusions 11, 12, 13, the second apex 12a is the highest among the apexes 11a, 12a, 13a, and the first apex 11a and the third apex 13a are almost at the same height or the first apex 11a is slightly higher than the third apex 13a.

[0026] In the foregoing, the protrusions formed on the insole 10 have been described as the three protrusions 11, 12, 13. However, the protrusions may be regarded as a single protrusion as mentioned earlier. In this case, such a single protrusion is regarded as a region that extends from a position at about 2/5 to a position at about 4/5 of the length from the toe-side end in the longitudinal direction from the toe-side end to the heel-side end of the insole 10 and that includes the three apexes 11a, 12a, 13a and a gently curved, continuous surface between the apexes 11a, 12a, 13a.

<Modifications>

[0027] The insole 10 with the structure described with reference to FIGS. 1 to 5 has substantially the same shape as the inner bottom 21 of the article of footwear 20. However, the insole 10 of the present embodiment

may have any contour shape as long as the aforementioned positional relationship of the apexes 11a, 12a, 13a of the respective protrusions 11, 12, 13 can be established when the insole 10 is attached to the article of footwear 20. For example, depending on the kind of the article of footwear 20 or user preferences, the insole 10 without a heel portion or a toe portion may be easier to attach to the article of footwear 20. Even in such a case, the protrusions 11, 12, 13 and the apexes 11a, 12a, 13a may be arranged in the aforementioned positional relationship when the insole 10 is attached to the article of footwear 20. In this case, however, the positional relationship of the protrusions 11, 12, 13 and the apexes 11a, 12a, 13a is defined in relation to the shape of the inner bottom 21 of the article of footwear 20.

[0028] FIG. 6 illustrates the shape of the insole 10 of FIGS. 1 to 5 with the heel portion removed. FIG. 7 illustrates the shape of the insole 10 of FIG. 1 to 5 with the toe portion removed. An insole 10a shown in FIG. 6 does not include the heel portion, but its toe portion corresponds to a toe portion of the inner bottom 21 of the article of footwear 20. Accordingly, when the insole 10a is attached to the article of footwear 20, the protrusions 11, 12, 13 and the apexes 11a, 12a, 13a are arranged at similar positions to those on the insole 10 shown in FIGS. 1 to 5, with respect to the inner bottom 21. Likewise, an insole 10b shown in FIG. 7 does not include the toe portion, but its heel portion corresponds to a heel portion of the inner bottom 21 of the article of footwear 20. Accordingly, when the insole 10b is attached to the article of footwear 20, the protrusions 11, 12, 13 and the apexes 11a, 12a, 13a are arranged at similar positions to those on the insole 10 shown in FIGS. 1 to 5, with respect to the inner bottom 21.

[0029] In the modifications shown in FIGS. 6 and 7, the first apex 11a of the first protrusion 11 is positioned substantially at the center in the longitudinal direction from the toe-side end to the heel-side end of the inner bottom 21 of the article of footwear 20, to which the insole 10a or 10b is attached, and also substantially at the center in the width direction perpendicular to the longitudinal direction. The second apex 12a of the second protrusion 12 is at a position that is located at about 2/3 of the length of the inner bottom 21 from its toe-side end in the longitudinal direction from its toe-side end to its heel-side end and that corresponds to a medial-side edge of the inner bottom 21. The third apex 13a of the third protrusion 13 is at a position that is located at about 2/3 of the length of the inner bottom 21 from its toe-side end in the longitudinal direction from its toe-side end to its heel-side end and that is located at about 1/4 of the length of the inner bottom 21 from its lateral-side edge in the width direction.

[0030] While FIG. 6 illustrates the insole 10a without the heel portion and FIG. 7 illustrates the insole 10b without the toe portion, these modifications are merely exemplary in nature. As long as the positions of the protrusions 11, 12, 13 and the apexes 11a, 12a, 13a can be defined as explained with reference to FIGS. 1 to 5, an insole without both of the toe portion and the heel portion may also be possible.

[0031] When the above insole without the toe portion or the heel portion is attached to a predetermined portion inside the article of footwear 20, the insole may be fixed with a predetermined adhesive member. This advantageously restricts movement of the insole inside the article of footwear 20 during use. Examples of the adhesive member include double-sided adhesive tape and an adhesive. The adhesive member, such as double-sided adhesive tape and an adhesive, may be applied to the back side of the insole (the side facing the inner bottom 21 of the article of footwear 20) in advance, and release paper or the like may be affixed to the surface of the adhesive member.

[0032] Thus, in use, the user may temporarily place the insole with the release paper affixed thereto on a predetermined position inside the article of footwear, determine the position of the insole by confirming positions of the protrusions 11, 12, 13 and the apexes 11a, 12a, 13a, and then peel off the release paper to attach and fix the insole at the determined position, for example. This means that this modification allows the insole to be used like a sticker, enabling easy attachment operation.

[0033] In using the insole without the toe portion and/or the heel portion, the use of the above adhesive member is not essential. The above adhesive member is not needed in situations where the insole can be free from displacement during use, such as because the insole is positioned with its width and shape fitted with an inner periphery of the article of footwear 20.

[0034] While the above embodiment and modifications have described the structure of the invention as being applied to the insole, the same structure may also be applied to coverings for feet. The coverings for feet are worn on feet and may at least include a portion directly or indirectly contacting the foot sole. In other words, the inner bottom 21 itself of the article of footwear 20, which is an example of the coverings for feet, may be shaped to have the protrusions 11, 12, 13 and the apexes 11a, 12a, 13a arranged as explained with reference to FIGS. 1 to 5. Put another way, the article of footwear 20 itself may be configured to have the protrusions 11, 12, 13 and the apexes 11a, 12a, 13a arranged as explained with reference to FIGS. 1 to 5.

[0035] Examples of the articles of footwear include things worn on the feet, such as zoris (Japanese sandals), sandals, slippers, tabis (Japanese socks), getas (Japanese wooden clogs), and shoes. The articles of footwear also include outdoor shoes for outdoor use and indoor shoes for indoor use. The coverings for feet are not limited to these articles of footwear and may also include other things directly worn on feet, such as socks and stockings, supporters, medical braces and other braces. Supporters may include those having an elastic ring-shaped base member and worn on the arch of the foot by the user inserting his/her toe through the base member, those in the form of socks without toe and heel

portions, and other various different types. In cases where the structure of the invention is applied to various coverings for feet, the covering may be configured such that it includes, in its region facing the foot sole when worn on the foot, the protrusions 11, 12, 13 and the apexes 11a, 12a, 13a arranged as explained with reference to FIGS. 1 to 5.

[0036] The skeleton of a human foot has three arches sometimes called the medial longitudinal arch, the transverse arch and the lateral longitudinal arch. Some existing insoles for footwear have protrusions formed according to positions of the respective foot arches to support these arches. Since the shape of a foot differs from individual to individual and is not constant, using such an insole requires individually adjusting the positions and height of these protrusions according to the foot shape of each person using the insole. In contrast, in the present embodiment, the shape and positions of the protrusions 11, 12, 13 and the apexes 11a, 12a, 13a are defined based on the shape of the insole 10 itself or the shape of the inner bottom 21 of the article of footwear 20 into which the insole 10 is inserted and based on the relative positional relationship of the protrusions 11, 12, 13, and thus there is no need for individual adjustment according to the foot shape of each person. The same advantages hold for the coverings for feet of the embodiment.

[0037] The technical scope of the present invention is not limited to the embodiment described above. For example, while in the above embodiment, a boundary between each of the protrusions 11, 12, 13 and the region where none of the protrusions 11, 12, 13 are formed is clearly drawn to illustrate the arrangement of the protrusions 11, 12, 13 in FIGS. 1 to 4D, in reality, the protrusions 11, 12, 13 may be formed by smooth curved surfaces without clear boundaries. Also, the region where none of the protrusions 11, 12, 13 are formed does not have to be a flat surface and may have a recess(es) to hold the foot sole, like those of typical insoles, in a forefoot portion on the toe side relative to the protrusion 11 and in a hindfoot portion on the heel side relative to the protrusions 12, 13. Various other modifications and substitutions without departing from the technical concept of the present invention are also encompassed by the present invention.

[0038] Although the various aspects of the present invention have been described using the embodiment and modifications, these embodiment and modifications are not intended to limit the scope of the present invention, but are provided to contribute to the understanding of the present invention. The scope of the present invention is not limited to the structure and methods explicitly described in this specification but also includes combinations of various aspects of the present invention disclosed herein. Among the features of the present invention, those to be patented are recited in the following claims; however, other features that are not recited in the claims at present but disclosed in this specification may be used as the basis for possible future claims.

Reference Signs List

[0039]

10, 10a, 10b	Insole
11, 12, 13	Protrusion
11a, 12a, 13a	Apex
20	Article of footwear
21	Inner bottom

Claims

1. An insole for an article of footwear, wherein

the insole has a shape corresponding to an inner bottom surface of the article of footwear,
the insole comprises, on a side thereof facing upward when attached to the article of footwear, a protrusion having three apexes, wherein, with respect to a total length from a toe-side end to a heel-side end, the protrusion extends from a position at about 2/5 of the total length from the toe-side end to a position at about 4/5 of the total length from the toe-side end,
the three apexes of the protrusion comprise a first apex located substantially at a center of the total length of the insole and substantially at a center in a width direction of the insole, and a second apex and a third apex arranged in the width direction at positions at about 2/3 of the total length from the toe-side end,
the second apex is located at a medial-side edge of the insole, and
the third apex is located at a position at about 1/4 of a length in the width direction of the insole from a lateral-side edge thereof.

2. The insole for an article of footwear according to claim 1, wherein
the second apex is higher than the first apex and the third apex.

3. The insole for an article of footwear according to claim 1 or 2, wherein
the first apex and the third apex are at the same height.

4. An insole for an article of footwear, the insole comprising:

three protrusions on a side of the insole facing upward when attached to the article of footwear, wherein
the three protrusions comprise:

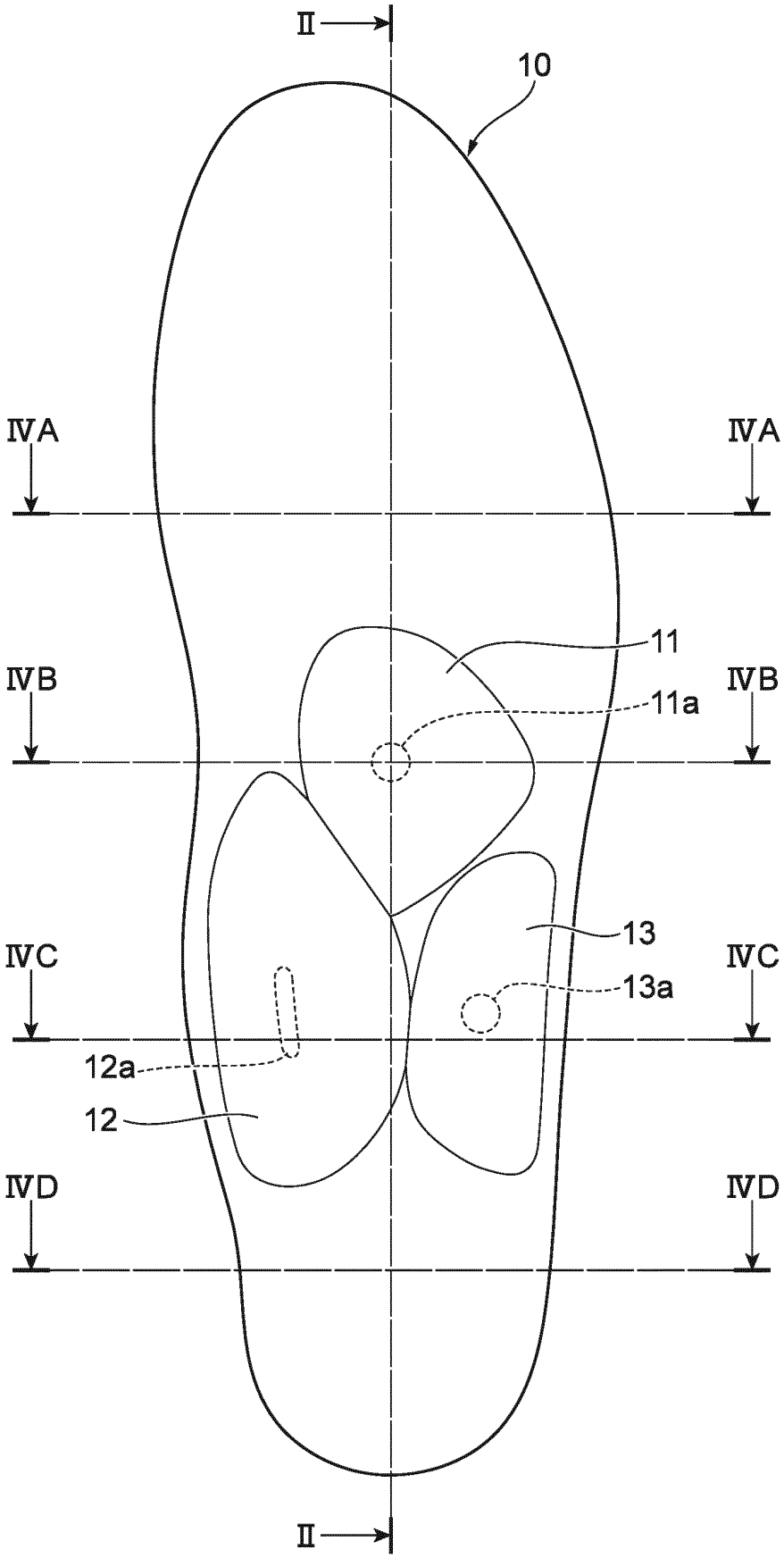
a first protrusion having an apex located substantially at a center of a total length

from a toe-side end to a heel-side end of an inner bottom of the article of footwear, to which the insole is attached, and substantially at a center in a width direction of the inner bottom;
a second protrusion having an apex located at a position at about 2/3 of the total length of the inner bottom from the toe-side end and corresponding to a medial-side edge of the inner bottom; and
a third protrusion having an apex located at a position at about 2/3 of the total length of the inner bottom from the toe-side end and at about 1/4 of a length in the width direction of the inner bottom from a lateral-side edge thereof.

5. A covering for a foot, the covering comprising:

a first protrusion having an apex located substantially at a center of a total length from a toe-side end to a heel-side end of an inner bottom and substantially at a center in a width direction of the inner bottom;
a second protrusion having an apex located at a position at about 2/3 of the total length of the inner bottom from the toe-side end and corresponding to a medial-side edge of the inner bottom; and
a third protrusion having an apex located at a position at about 2/3 of the total length of the inner bottom from the toe-side end and at about 1/4 of a length in the width direction of the inner bottom from a lateral-side edge thereof.

FIG.1



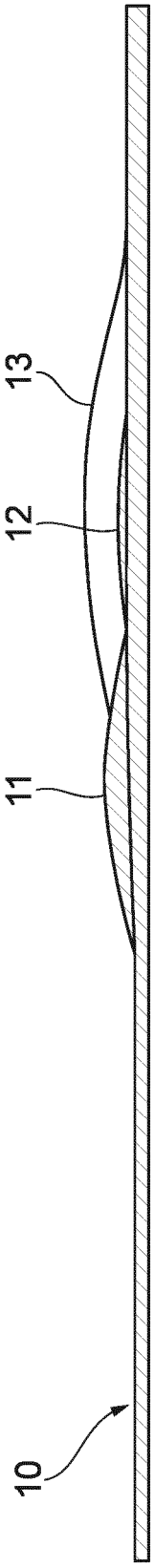


FIG.2

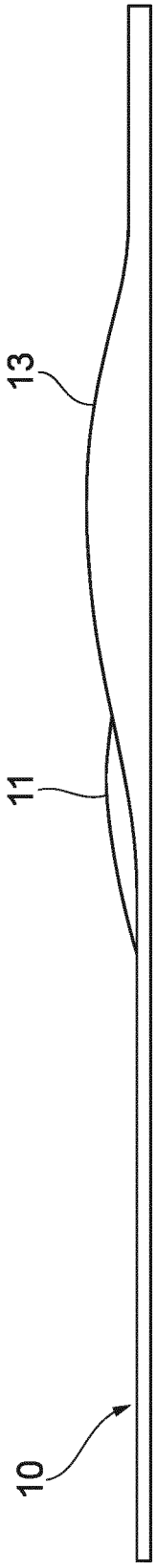


FIG.3

FIG.4A

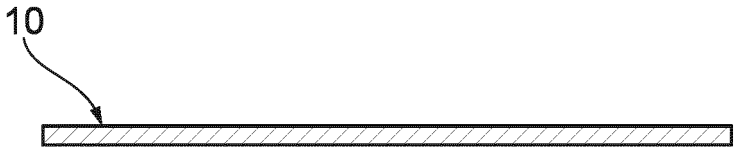


FIG.4B

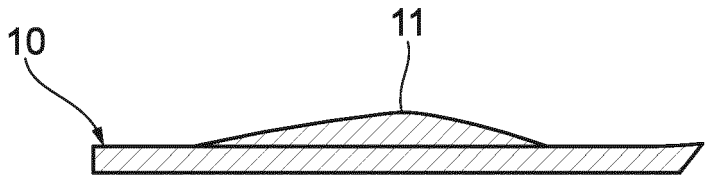


FIG.4C

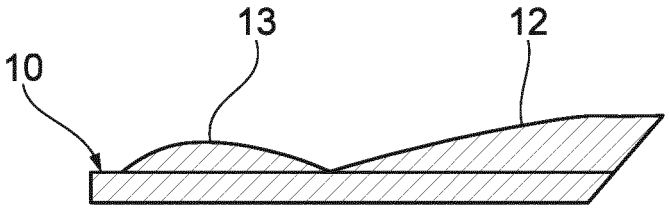
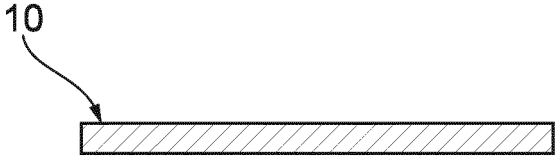


FIG.4D



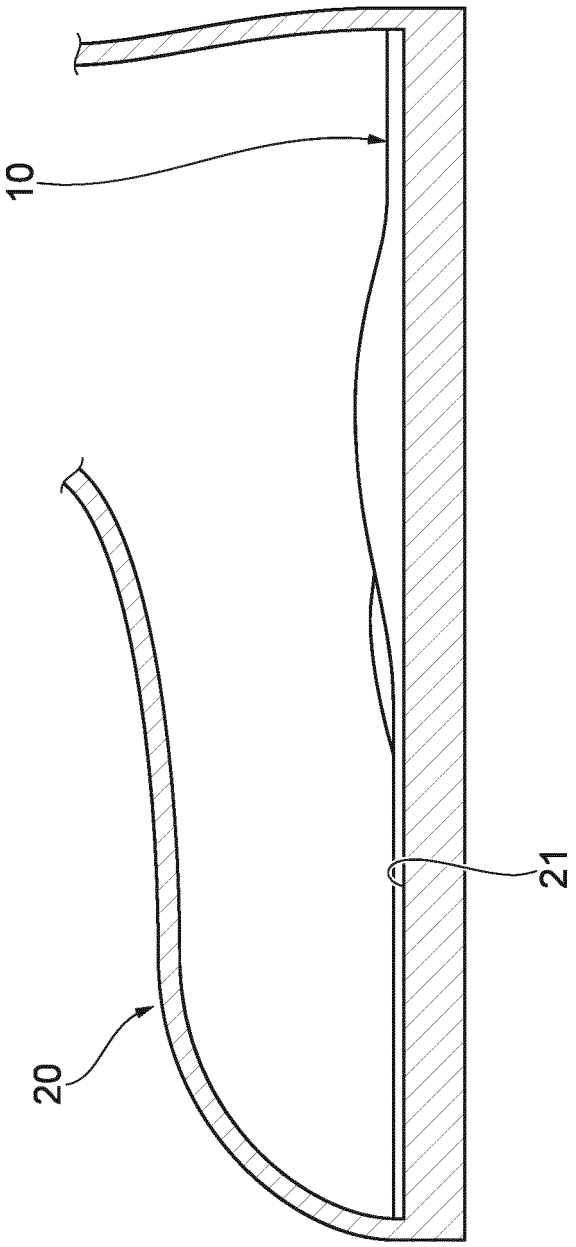


FIG.5

FIG.6

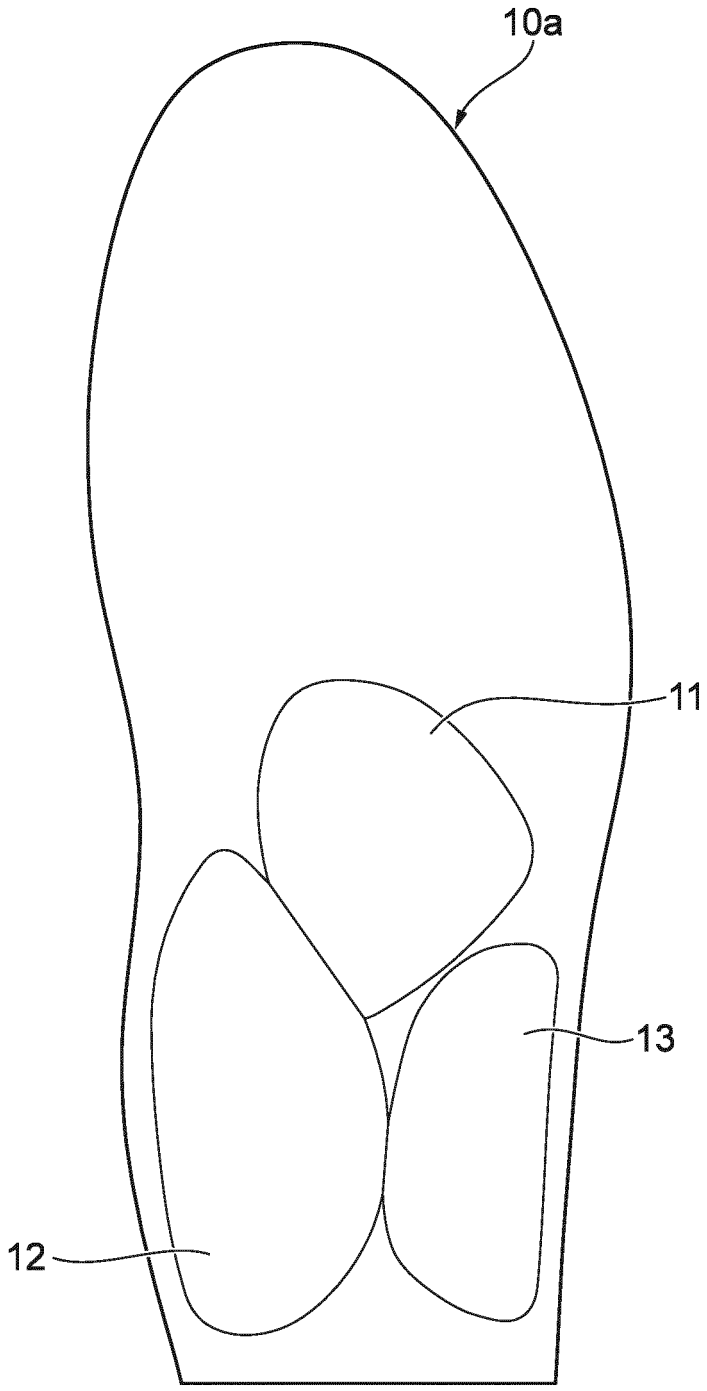
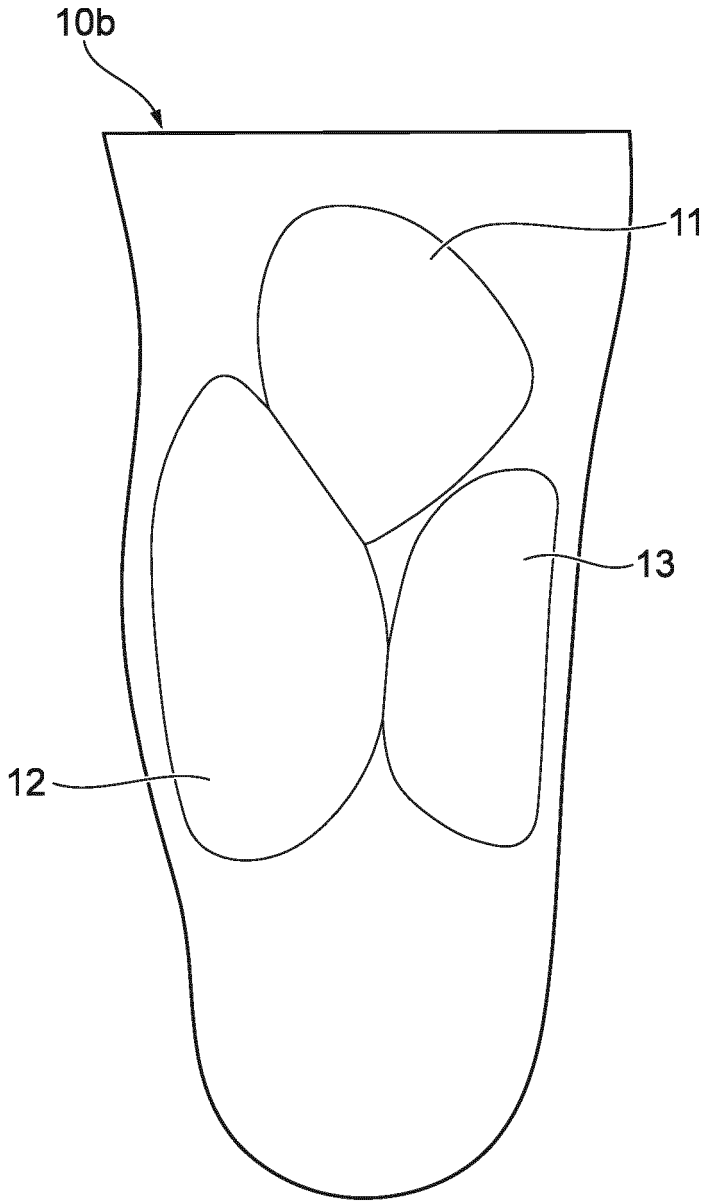


FIG.7



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2019/044265

A. CLASSIFICATION OF SUBJECT MATTER
A43B 13/14(2006.01)i; A43B 17/00(2006.01)i
FI: A43B17/00 E; A43B13/14 B

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)
A43B13/14; A43B17/00

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

Published examined utility model applications of Japan	1922–1996
Published unexamined utility model applications of Japan	1971–2020
Registered utility model specifications of Japan	1996–2020
Published registered utility model applications of Japan	1994–2020

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	JP 3189107 U (JET CROWN INTERNATIONAL CO., LTD.) 20.02.2014 (2014-02-20) paragraphs [0017]-[0018], fig. 1-3	1-5
A	JP 2010-274107 A (MURAI INC.) 09.12.2010 (2010-12-09) paragraphs [0049]-[0051], fig. 11	1-5

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
10 January 2020 (10.01.2020)	21 January 2020 (21.01.2020)

Name and mailing address of the ISA/	Authorized officer
Japan Patent Office 3-4-3, Kasumigaseki, Chiyoda-ku, Tokyo 100-8915, Japan	Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/JP2019/044265

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
JP 3189107 U	20 Feb. 2014	(Family: none)	
JP 2010-274107 A	09 Dec. 2010	(Family: none)	

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2013150797 A **[0004]**
- JP 2017023706 A **[0004]**