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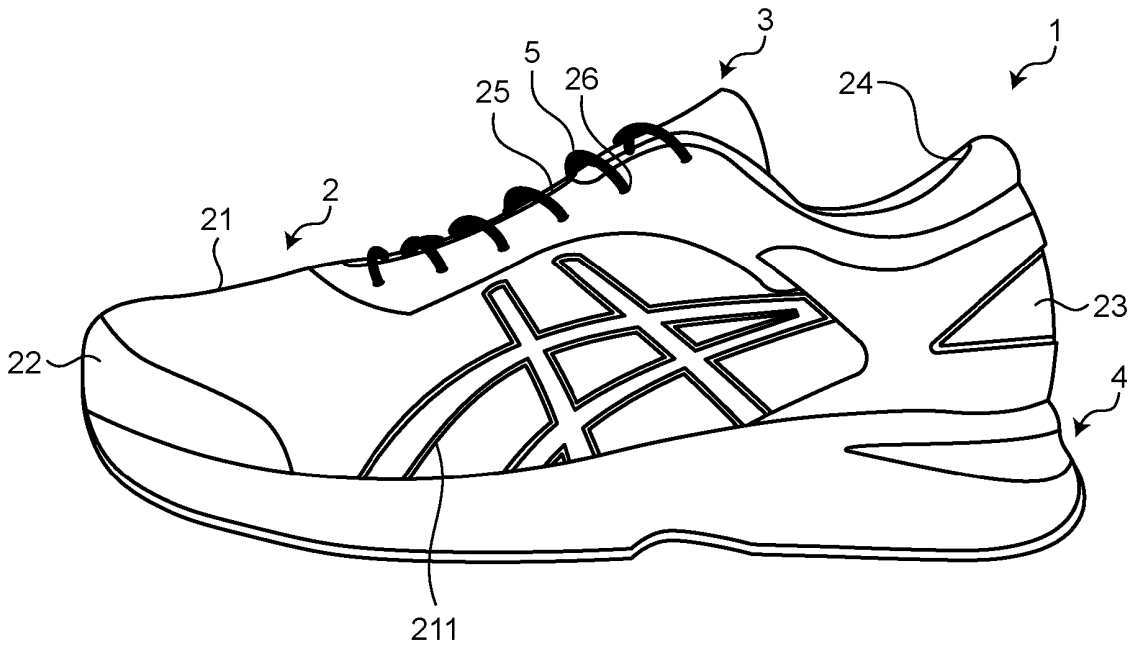
(54) SHOE AND METHOD OF MANUFACTURING SHOE

(57) A shoe (1) includes an upper body (2) covering at least an instep of a foot. The upper body (2) includes a main material (21) formed of a first thread body made of a chemically-similar material. At least a part of the main material (21) is an embroidered portion (211) formed by embroidering and/or sewing with a second thread body made of a chemically-similar material having a melting point lower than a melting point of the chemically-similar material. At least a part of the embroidered portion (211) is a solidified portion (212) having a high hardness.

FIG.1



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Description

BACKGROUND

Technical field

[0001] The present disclosure relates to a shoe and a method of manufacturing a shoe.

Background Information

[0002] A shoe includes an upper covering at least an instep of a foot of a wearer (see, JP 2021-058641 A, for example).

[0003] Using a large number of parts for the upper will reduce the production efficiency of the upper as a material or a shoe, and cause an increased loss of the material after cutting at the time of manufacturing, having a possibility to increase the environmental load from the viewpoint of heat source and disposal. Moreover, the upper is formed by combining parts made of a plurality of materials, and thus, has low recyclability, and is often finally incinerated or landfilled.

[0004] In addition, in a most universal manufacturing method of the upper, different parts of different materials are fabricated for individual areas of the upper in accordance with the function of the individual areas, and the fabricated parts are joined to each other, increasing the number of parts of the upper. Fabricating the upper with one part in order to reduce the number of parts, for example, would not be able to obtain functional variations for individual areas as compared with the case of fabricating the upper with a plurality of parts, and this would lower fittability required for performance shoes and the like.

SUMMARY

[0005] The present disclosure has been made in view of the above, and aims to provide a shoe and a method of manufacturing the shoe capable of simultaneously achieving reduction of environmental load, facilitation of recycling, and retention of the fittability.

[0006] In order to solve a problem(s) as described above and achieve an object(s), a shoe according to the present disclosure includes an upper body covering at least an instep of a foot, wherein the upper body includes a main material formed of a first thread body made of a chemically-similar material, at least a part of the main material is an embroidered portion formed by embroidering and/or sewing with a second thread body made of a chemically-similar material having a melting point lower than a melting point of the chemically-similar material, and at least a part of the embroidered portion is a solidified portion having a high hardness.

[0007] According to the shoe and the method of manufacturing the shoe of the present disclosure, it is possible to simultaneously achieve the reduction of environmental load, facilitation of recycling, and retention of the fittability.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008]

FIG. 1 is a side view illustrating a shoe according to an embodiment of the present disclosure;
FIG. 2 is an exploded view (part 1) illustrating an upper body of the shoe according to the embodiment of the present disclosure;
FIG. 3 is an exploded view (part 2) illustrating the upper body of the shoe according to the embodiment of the present disclosure; and
FIG. 4 is a view illustrating a method of manufacturing a shoe according to the embodiment of the present disclosure.

DETAILED DESCRIPTION

[0009] Hereinafter, an exemplary embodiment of a shoe and a method of manufacturing a shoe according to the present disclosure will be described in detail with reference to the drawings. Note that the present disclosure is not limited by the exemplary embodiment. In the following description, the same portions are denoted by the same reference numerals, and redundant description thereof will be omitted.

[0010] FIG. 1 is a side view illustrating a shoe 1 according to an embodiment of the present disclosure. Each of figures including FIG. 1 illustrates only the shoe 1 for the left foot. Since the shoe 1 has a symmetrical structure for the left foot and the right foot, only the shoe 1 for the left foot will be described in the present embodiment, and the description of the shoe 1 for the right foot will be omitted.

[0011] In the following description, an extending direction of a shoe center axis C (see FIG. 2), which is a perpendicular line passing through the center of the shoe 1 in a plan view of the shoe 1, is referred to as a fore-rear direction, and a direction orthogonal to the fore-rear direction in a plan view of the shoe 1 is referred to as a foot width direction.

[0012] In the following description, a direction from the heel to the toe of the shoe 1 in the fore-rear direction is referred to as a fore direction, and a direction from the toe to the heel of the shoe 1 in the fore-rear direction is referred to as a rear direction.

[0013] In the following description, the median side in the anatomical position of the foot is referred to as a medial foot side, and the side opposite to the median side in the anatomical position of the foot is referred to as a lateral foot side. That is, the side closer to the median line in the anatomical position is referred to as the medial foot side, while the side farther from the median line in the anatomical position is referred to as the lateral foot side.

[0014] In the following description, a vertical direction represents a direction orthogonal to both the fore-rear direction and the foot width direction unless otherwise specified.

[0015] An example of the shoe 1 is a shoe in running shoes. The shoe 1 is not limited to the shoe in running shoes, and may be a shoe for other uses, such as sports shoes and casual shoes.

[0016] As illustrated in FIG. 1, the shoe 1 includes an upper body 2, a shoe tongue 3, and a sole 4. The upper body 2 is positioned above the sole 4 described below. Upper body 2 includes main material 21. At least a part of the main material 21 is an embroidered portion 211 formed by embroidering and/or sewing. Details of the main material 21 and the embroidered portion 211 will be described below with reference to FIG. 2. The upper body 2 covers at least the instep of the foot of the wearer.

[0017] The upper body 2 covers the toe of the wearer. In the following description, a portion of the upper body 2 corresponding to the toe of the wearer is referred to as a toe area (toe area 22). The upper body 2 covers the heel of the wearer. In the following description, a portion of the upper body 2 corresponding to the wearer is referred to as a heel area (heel area 23).

[0018] A top line 24 and a throat 25 are formed at an upper portion of the upper body 2. The top line 24 is an opening for allowing the foot of the wearer to insert into the upper body 2. The throat 25 is an opening connecting to the top line 24 and extending in the fore direction from the top line 24.

[0019] FIG. 1 illustrates only eyelets 26 disposed at a side edge of the throat 25 on the lateral foot side. The eyelet 26 only needs to be able to allow the passage of a shoelace 5 to be described below. The eyelet 26 is a through hole penetrating the upper body 2. The eyelet 26 may be reinforced at its edge with an annular reinforcing member made of metal or resin. The eyelet 26 may be reinforced at its edge with a sewing thread or the like.

[0020] The shoe tongue 3 is disposed at the throat 25. The shoe tongue 3 is a member for protecting the instep of the foot of the wearer. The shoe tongue 3 covers the throat 25 which is an opening. The shoe tongue 3 is fixed to the upper body 2 by stitching, welding, bonding, or a combination of these. The shoe 1 may have an integrated structure integrating the upper body 2 and the shoe tongue 3 to each other.

[0021] The sole 4 is positioned below the upper body 2. The sole 4 covers the sole of the wearer. The sole 4 is fixed to the upper body 2 by stitching, welding, bonding or a combination of these. The sole 4 alleviates impact on the foot of the wearer during walking and running.

[0022] The shoelace 5 is a string-like member that is allowed to alternately pass through the eyelet 26 disposed on one side edge in the foot width direction of the throat 25 and the eyelet 26 disposed on the other side edge in the foot width direction. The shoelace 5 is detachably attached to the upper body 2. The shoelace 5 can be used in a manner such that the extent of the close contact of the upper body 2 to the foot, that is, the tightening degree of the shoe 1, can be adjusted by pulling the shoelace 5 to narrow the width of the throat 25.

[0023] The means of bringing the upper body 2 into close contact with the foot is not limited to the shoelace 5, and may be a hook-and-loop fastener, for example. When the means of bringing the upper body 2 into close contact with the foot is a hook-and-loop fastener, the shoelace 5 is not necessary, and thus, there is no need to dispose the eyelet 26 on the upper body 2.

[0024] FIGS. 2 and 3 are exploded views illustrating the upper body 2 of the shoe 1 according to the embodiment of the present disclosure.

[0025] As illustrated in FIG. 2, upper body 2 includes main material 21 described above. The main material 21 is formed of a first thread body (not illustrated) made of a chemically-similar material. At least a part of the first thread body may be a thread (monofilament) formed of a single fiber. At least a part of the first thread body may be a thread (multifilament) formed of a plurality of fibers. At least a part of the first thread body may be a spun thread formed by spinning short fibers.

[0026] At least a part of the main material 21 is the above-described embroidered portion 211. The embroidered portion 211 is formed of a second thread body (not illustrated) made of a chemically-similar material having a lower melting point than the chemically-similar material that is the material of the main material 21. The embroidered portion 211 is formed by embroidering and/or sewing using the second thread body. At least a part of the second thread body may be a thread (monofilament) formed of a single fiber. At least a part of the second thread body may be a thread (multifilament) formed of a plurality of fibers. At least a part of the second thread body may be a spun thread formed by spinning short fibers.

[0027] In a case where the embroidered portion 211 is formed by the embroidering, the second thread body is arranged to overlap the main material 21. On the other hand, when the embroidered portion 211 is formed by sewing, only the second thread body is arranged.

[0028] Here, the chemically-similar material represents a material having a chemically similar structure, such as a polyester-based material. The chemically-similar material is a material including a common functional group or chemical code. In the present embodiment, the chemically-similar material is a polyester-based material. The chemically-similar material, represented by a polyester-based material, includes polyester resins such as polyethylene terephthalate (PET), polybutylene terephthalate (PBT) and polytrimethylene terephthalate (PTT). The chemically-similar material, represented by a polyester-based material, includes Thermoplastic Polyester Elastomer (TPEE).

[0029] In the present embodiment, one thread body out of the main material 21 and the embroidered portion 211 is a polyester resin as a chemically-similar material,

and the other thread body these portions is TPEE as a chemically-similar material. In the present embodiment, the first thread body forming the main material 21 is a polyester resin, and the second thread body forming the embroidered portion 211 is TPEE. With this configuration, the second thread body has a melting point lower than the melting point of the first thread body. Both the first thread body and the second thread body may be a polyester resin. The second thread body may contain both the polyester resin and TPEE.

[0030] At least a part of the embroidered portion 211 is a solidified portion 212 having a high hardness. The solidified portion 212 is a portion where the embroidered portion 211 is melted and solidified by heat. Formation of the solidified portion 212 is not limited to melting and solidification by heat. For example, the solidified portion 212 may be formed by melting and solidifying the embroidered portion 211 by irradiation with energy rays such as microwaves.

[0031] FIG. 2 illustrates an example in which the shoe 1 (see FIG. 1) includes: a first embroidered portion 211A disposed on the lateral foot side of the shoe 1; and a second embroidered portion 211B disposed on the medial foot side of the shoe 1. FIG. 2 illustrates a schematic cross section taken along line A-A in the drawing to depict a cross section of the first embroidered portion 211A.

[0032] As illustrated in FIG. 2, at least a part of the first embroidered portion 211A is a first solidified portion 212A. At least a part of the first solidified portion 212A is formed by melting and solidification. Therefore, this part has a thickness smaller than the thickness of other portions of the main material 21 including the embroidered portion 211 which has not been melted. Accordingly, the first solidified portion 212A forms a recess in the main material 21. This makes it possible form an uneven shape formed by the first solidified portion 212A in the main material 21.

[0033] In the first embroidered portion 211A, the first solidified portion 212A is located on an outer edge side of the first embroidered portion 211A. Therefore, in the first embroidered portion 211A, a recess is disposed on the outer edge side of the first embroidered portion 211A. On the other hand, in the second embroidered portion 211B, a second solidified portion 212B is located inside the second embroidered portion 211B. Therefore, in the second embroidered portion 211B, a recess is disposed inside the second embroidered portion 211B.

[0034] In this manner, the first embroidered portion 211A disposed on the lateral foot side of the shoe 1 and the second embroidered portion 211B disposed on the medial foot side of the shoe 1 make it possible to achieve functional variations in individual areas of the upper body 2.

[0035] At least a part of the second thread body forming the embroidered portion 211 is transparent and/or translucent. Furthermore, at least a part of the second thread body forming the embroidered portion 211 is colored. In this manner, the second thread body can be formed with options of transparent, translucent, colorless, and colored, and can use these options flexibly in combination, making it possible to improve the design of the shoe 1 (see FIG. 1).

[0036] Furthermore, when the second thread body forming the embroidered portion 211 is colored, it is preferable to use a pre-colored thread colored for at least a part of the second thread body. The pre-colored thread is uniformly colored including the inner portion of the thread. Therefore, by using the pre-colored thread, it is possible to dispose the embroidered portion 211 and the solidified portion 212 with no unevenness in color. This makes it possible to improve the design of the shoe 1.

[0037] Furthermore, the embroidered portion 211 has a portion where the hardness gradually changes up to the solidified portion 212 that has been melted and solidified. The portion where the hardness of the embroidered portion 211 gradually changes makes a gradation and improves the degree of freedom of hardness of the upper body 2, which suppresses deterioration of fitting and wearing comfort due to a rapid change in hardness. When the second thread body is colored, this makes a gradation in color, making is possible to improve the design of the shoe 1.

[0038] The second thread body forming the embroidered portion 211 include a plurality of types having different melting points. In this case, by material selection such as using two or more types of second thread bodies, it is possible to obtain a plurality of types of second thread bodies having different melting points.

[0039] Incidentally, it is allowable to dispose a plurality of the solidified portions 212 having different hardness at optional positions in the embroidered portion 211. This increases the degree of freedom in hardness of the upper body 2.

[0040] As illustrated in FIG. 3, the embroidered portion 211 may be located at the toe area 22 of the upper body 2 or may be located at the heel area 23 of the upper body 2. Furthermore, the embroidered portion 211 may be located at a portion around the eyelet 26 (hereinafter, referred to as an eyelet area (eyelet area 27)). In this manner, by disposing the embroidered portion 211 at various locations of the upper body 2 such as the toe area 22, the heel area 23, and the eyelet area 27, it is possible to achieve further functional variations of the upper body 2 for individual areas.

[0041] FIG. 4 is a view illustrating a manufacturing method, that is, a method of manufacturing the shoe 1, according to the embodiment of the present disclosure. FIG. 4 illustrates the surface shape of the main material 21 from a fabrication step of the main material 21 to a solidification step of the solidified portion 212 in the manufacturing step.

[0042] As illustrated in FIG. 4, the method of manufacturing the shoe 1 includes a fabrication step of the main material 21, an embroidering step of the embroidered portion 211, and a solidification step of the solidified portion 212. The fabrication step of the main material 21

fabricates the main material 21 formed of the first thread body such as a thread made of polyester resin being a chemically-similar material.

[0043] Next, the embroidering step of the embroidered portion 211 performs embroidering or sewing over the main material 21 by using the second thread body such as a thread made of TPEE having a melting point lower than the melting point of the polyester resin. This step forms the embroidered portion 211. Next, the solidification step of the solidified portion 212 performs, for example, heating of the embroidered portion 211 to melt and solidify the second thread body made of TPEE having a melting point lower than the melting point of the polyester resin. This step forms the solidified portion 212.

[0044] According to the shoe 1 of the embodiment described above, the number of parts of the upper body 2 is reduced and the chemically-similar material is used for the main material 21, making it possible to achieve reduction of environmental load and facilitation of recycling. Furthermore, it is possible to achieve functional variations of the upper body 2 for individual areas, and possible to retain the fittability required for the performance shoes and the like at the same level as the case of fabricating with a plurality of parts. In this manner, according to the shoe 1 of the embodiment, it is possible to simultaneously achieve the reduction of the environmental load, the facilitation of recycling, and the retention of the fittability.

[0045] In addition, it is possible to achieve functional variations of the upper body 2 for individual areas with a small number of parts without increasing the number of parts. Furthermore, the upper body 2 can be reinforced with no connection of another part.

[0046] In addition, by forming the recess by the solidified portion 212, an uneven shape can be formed in the upper body 2. The uneven shape makes it possible to improve the gripping property to the ball when the shoe 1 is used for a football game such as soccer or rugby, for example. In addition, the grip performance can be improved also by the material of the second thread body.

[0047] Some aspects of the present disclosure will be described below.

[0048] A shoe according to a first aspect includes an upper body covering at least an instep of a foot, wherein the upper body includes a main material formed of a first thread body made of a chemically-similar material, at least a part of the main material is an embroidered portion formed by embroidering and/or sewing with a second thread body made of a chemically-similar material having a melting point lower than a melting point of the chemically-similar material, and at least a part of the embroidered portion is a solidified portion having a high hardness.

[0049] A shoe according to a second aspect is the shoe according a first aspect, wherein the chemically-similar material is a polyester-based material.

[0050] A shoe according to a third aspect is the shoe according to a second aspect, wherein the chemically-similar material includes TPEE.

[0051] A shoe according to a fourth aspect is the shoe according to any one of first to third aspects, wherein the upper body further covers a toe, and the embroidered portion is located at an area of the embroidered portion corresponding to the toe.

[0052] A shoe according to a fifth aspect is the shoe according to any one of first to fourth aspects, wherein the upper body further covers a heel, and the embroidered portion is located at an area corresponding to the heel.

[0053] A shoe according to a sixth aspect is the shoe according to any one of first to fifth aspects, wherein the upper body includes an eyelet, and the embroidered portion is located around the eyelet.

[0054] A shoe according to a seventh aspect is the shoe according to any one of first to sixth aspects, wherein at least a part of the second thread body is transparent and/or translucent.

[0055] A shoe according to an eighth aspect is the shoe according to any one of first to seventh aspects, wherein at least a part of the second thread body is colored.

[0056] A shoe according to a ninth aspect is the shoe according to an eighth aspect, wherein at least a part of the second thread body is a pre-colored thread.

[0057] A shoe according to a tenth aspect is the shoe according to any one of first to ninth aspects, wherein at least a part of the second thread body is a monofilament.

[0058] A shoe according to an eleventh aspect is the shoe according to any one of first to tenth aspects, wherein at least a part of the second thread body is a multifilament.

[0059] A shoe according to a twelfth aspect is the shoe according to any one of first to eleventh aspects, wherein the embroidered portion includes a portion whose hardness gradually changes.

[0060] A shoe according to a thirteenth aspect is the shoe according to any one of first to twelfth aspects, wherein the second thread body include a plurality of types having different melting points.

[0061] A shoe according to a fourteenth aspect is the shoe according to any one of first to thirteenth aspects, wherein at least a part of the solidified portion has a smaller thickness than other parts of the main material.

[0062] A method of manufacturing a shoe according to a fifteenth aspect is a method of manufacturing a shoe including an upper body covering at least an instep of a foot, the upper body including a main material formed of a first thread body made of a chemically-similar material, the method including a step of forming, on at least a part of the main material, an embroidered portion formed by embroidering and/or sewing with a second thread body made of a chemically-similar material having a melting point lower than a melting point of the chemically-similar material, and a step of forming a solidified portion having a high hardness on at least a part of the embroidered portion.

Claims

1. A shoe (1) comprising

   an upper body (2) covering at least an instep of a foot,
   wherein the upper body includes a main material (21) formed of a first thread body made of a chemically-similar material,
   at least a part of the main material (21) is an embroidered portion (211) formed by embroidering and/or sewing with a second thread body made of a chemically-similar material having a melting point lower than a melting point of the chemically-similar material, and
   at least a part of the embroidered portion (211) is a solidified portion (212) having a high hardness.

2. The shoe (1) according to claim 1,
   wherein the chemically-similar material is a polyester-based material.

3. The shoe (1) according to claim 2,
   wherein the chemically-similar material includes TPEE.

4. The shoe (1) according to any one of claims 1 to 3,

   wherein the upper body (2) further covers a toe, and
   the embroidered portion (211) is located at an area of the embroidered portion (211) corresponding to the toe.

5. The shoe (1) according to any one of claims 1 to 4,

   wherein the upper body (2) further covers a heel, and
   the embroidered portion (211) is located at an area corresponding to the heel.

6. The shoe (1) according to any one of claims 1 to 5,

   wherein the upper body (2) includes an eyelet (26), and
   the embroidered portion (211) is located around the eyelet (26).

7. The shoe (1) according to any one of claims 1 to 6, wherein at least a part of the second thread body is transparent and/or translucent.

8. The shoe (1) according to any one of claims 1 to 7, wherein at least a part of the second thread body is colored.

9. The shoe (1) according to claim 8,
   wherein at least a part of the second thread body is a pre-colored thread.

10. The shoe (1) according to any one of claims 1 to 9, wherein at least a part of the second thread body is a monofilament.

11. The shoe (1) according to any one of claims 1 to 10, wherein at least a part of the second thread body is a multifilament.

12. The shoe (1) according to any one of claims 1 to 11, wherein the embroidered portion (211) includes a portion whose hardness gradually changes.

13. The shoe (1) according to any one of claims 1 to 12, wherein the second thread body include a plurality of types having different melting points.

14. The shoe (1) according to any one of claims 1 to 13, wherein at least a part of the solidified portion (212) has a smaller thickness than other parts of the main material (21).

15. A method of manufacturing a shoe including an upper body (2) covering at least an instep of a foot, the upper body (2) including a main material (21) formed of a first thread body made of a chemically-similar material, the method comprising:

   a step of forming, on at least a part of the main material (21), an embroidered portion (211) formed by embroidering and/or sewing with a second thread body made of a chemically-similar material having a melting point lower than a melting point of the chemically-similar material, and
   a step of forming a solidified portion (212) having a high hardness on at least a part of the embroidered portion (211) .

FIG.1

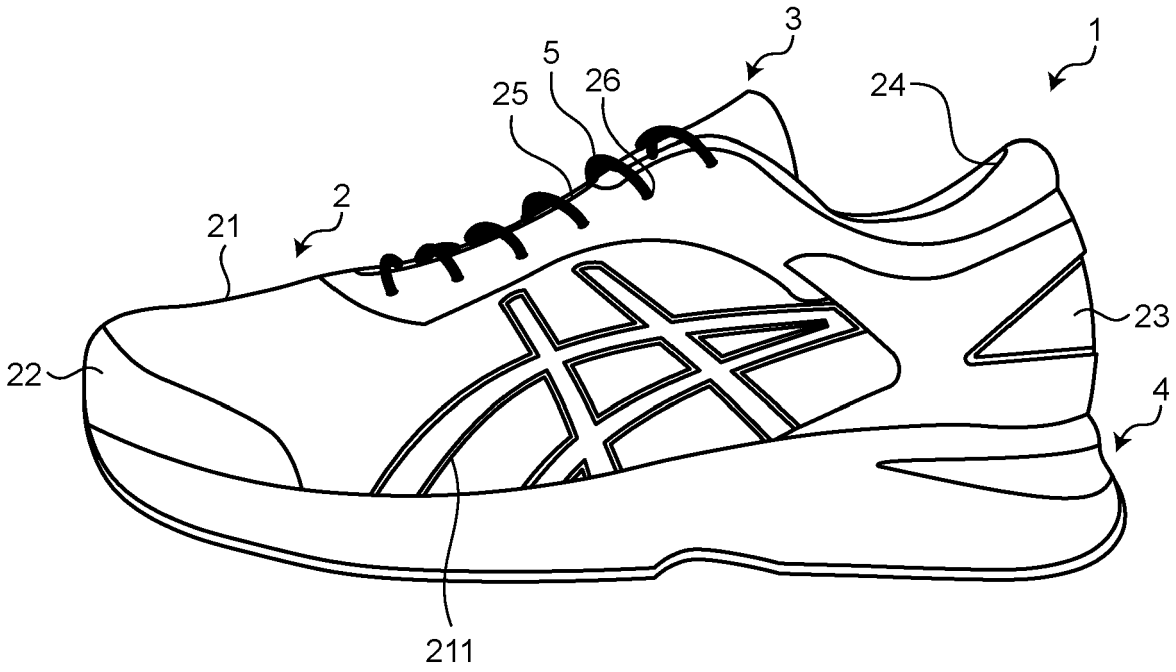
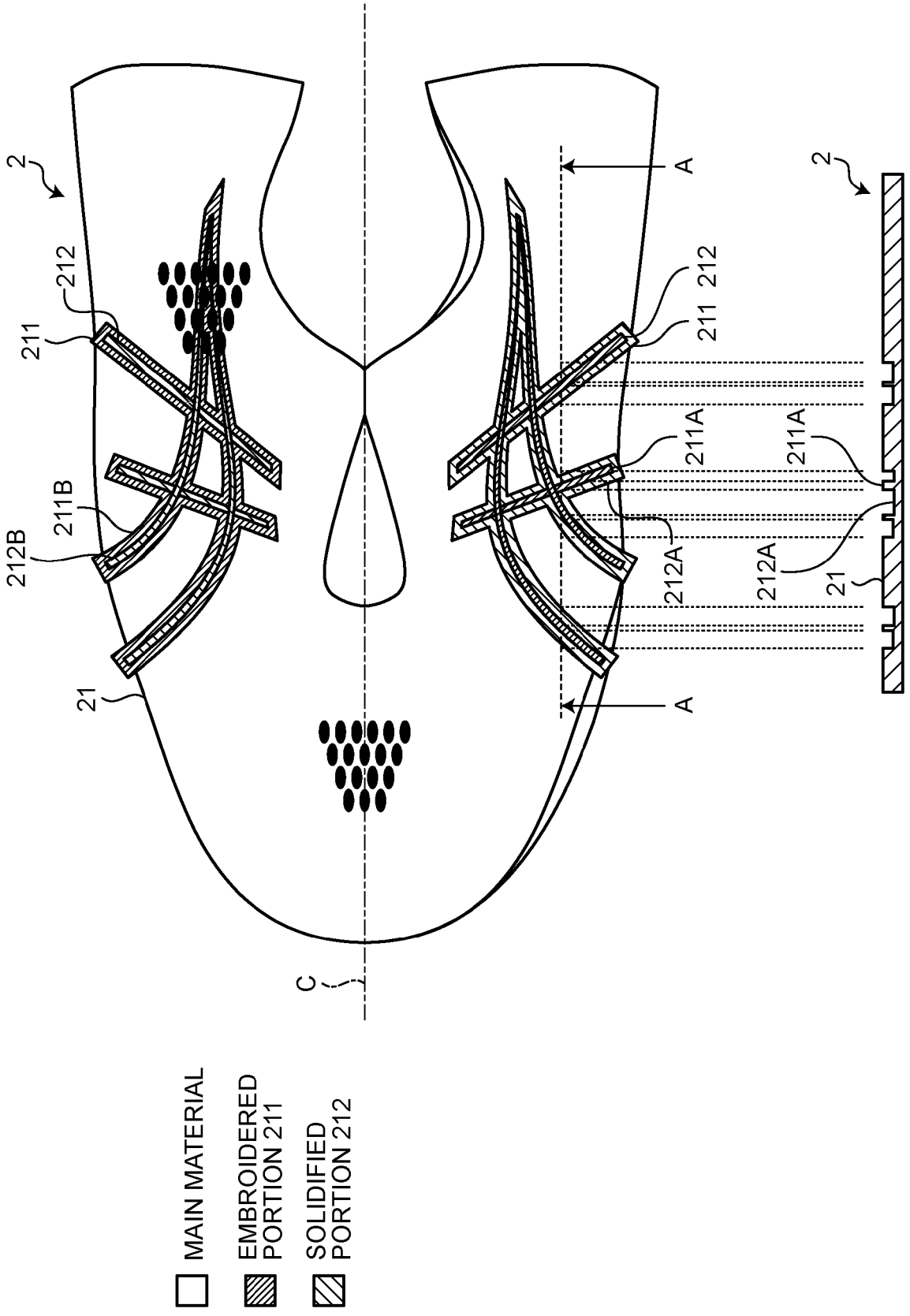


FIG.2


2
212
211
211B
212B
21
C
A
A
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211 212
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MAIN MATERIAL
EMBROIDERED PORTION 211
SOLIDIFIED PORTION 212

FIG.3

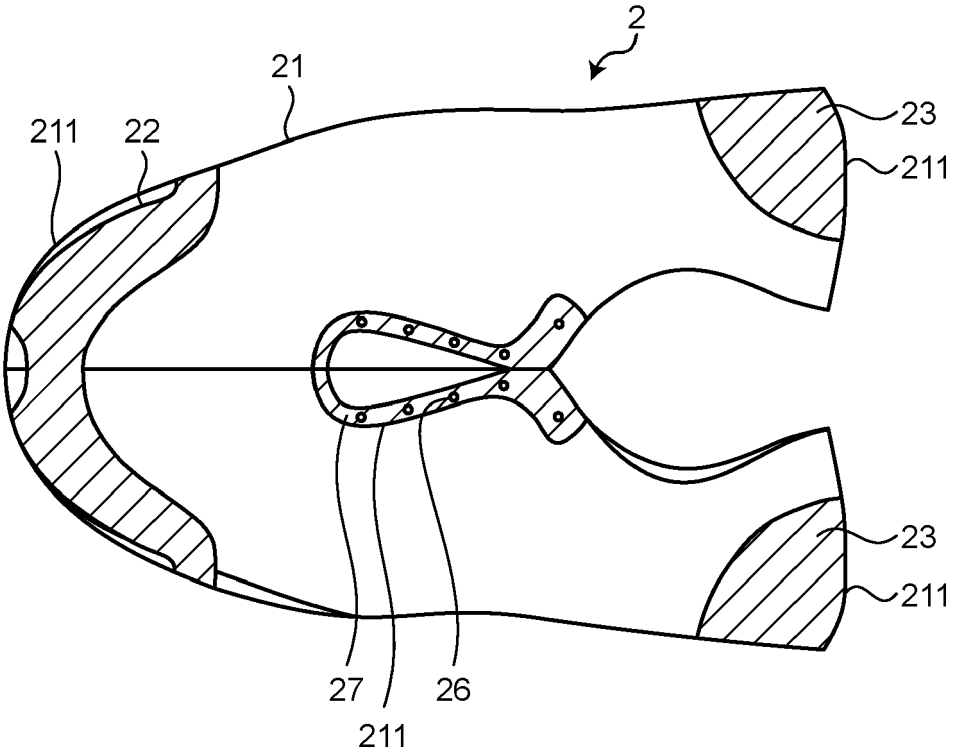
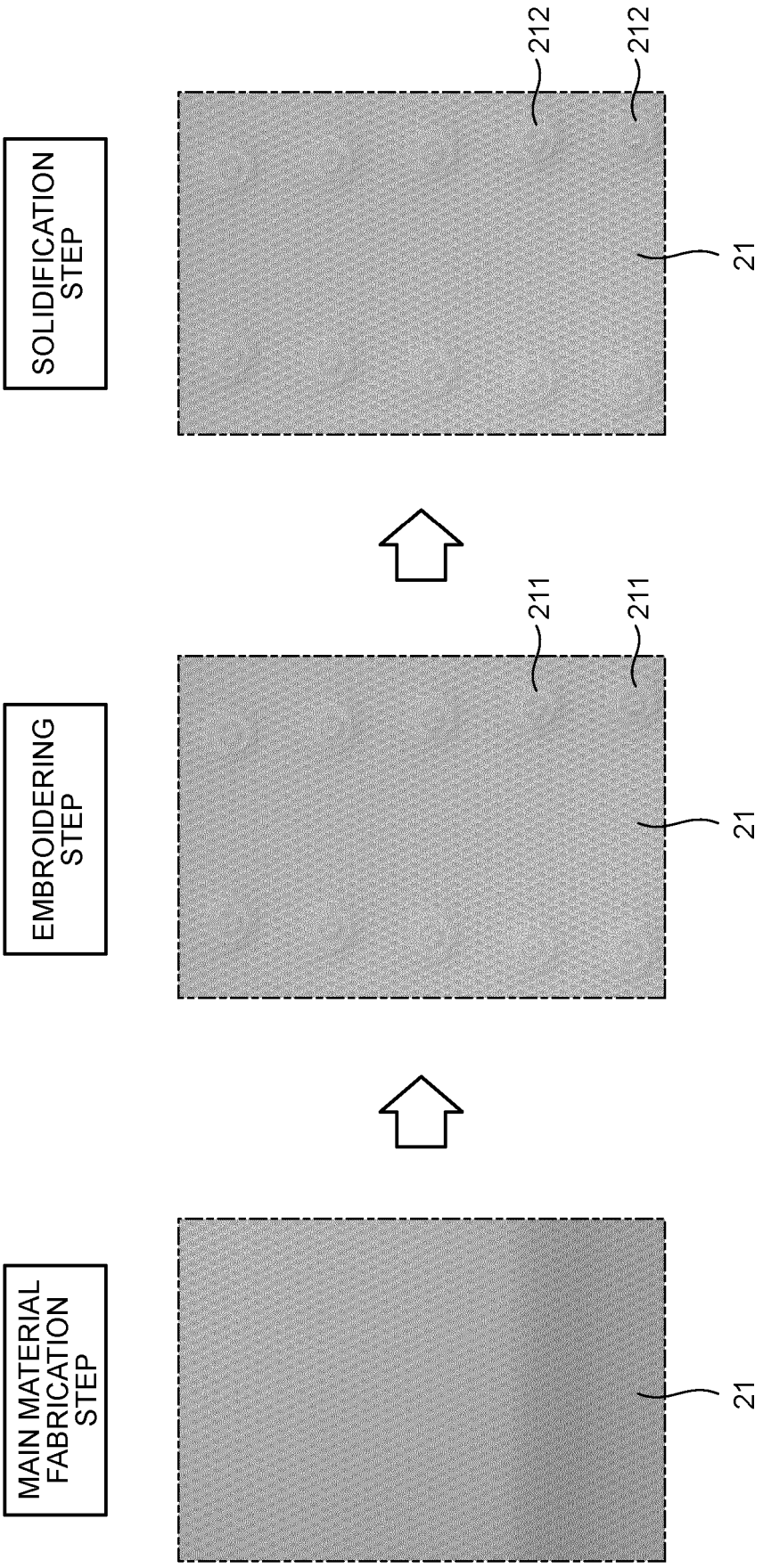


FIG.4


MAIN MATERIAL FABRICATION STEP
21
EMBROIDERING STEP
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211
21
SOLIDIFICATION STEP
212
212
21

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EUROPEAN SEARCH REPORT

Application Number
EP 24 16 8128

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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X	EP 3 641 580 B1 (NEW BALANCE ATHLETICS INC [US]) 11 May 2022 (2022-05-11) * the whole document *	1-15	

TECHNICAL FIELDS SEARCHED (IPC)

A43B
A43D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	1 August 2024	Cianci, Sabino

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 24 16 8128

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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01-08-2024

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