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(54) **THREE-DIMENSIONAL SOCK-SHOE**

(57) A three-dimensional sock-shoe includes a shoe sole (11), a sock body (21) having a bottom portion (211) connected to the shoe sole (11), and a foam sleeve (22) inserted into the sock body (21). The foam sleeve (22) has a shape corresponding to that of the sock body (21), defines a three-dimensional foot space (221), and is made by stitching together at least two layered structures (220). The foam sleeve (22) successively consists of an inner lining layer (222), a foam layer (223) and an outer fabric layer (224). At least one adhesive layer (23) is disposed between the outer fabric layer (224) and the sock body (21) to adhere the outer fabric layer (224) to the sock body (21).

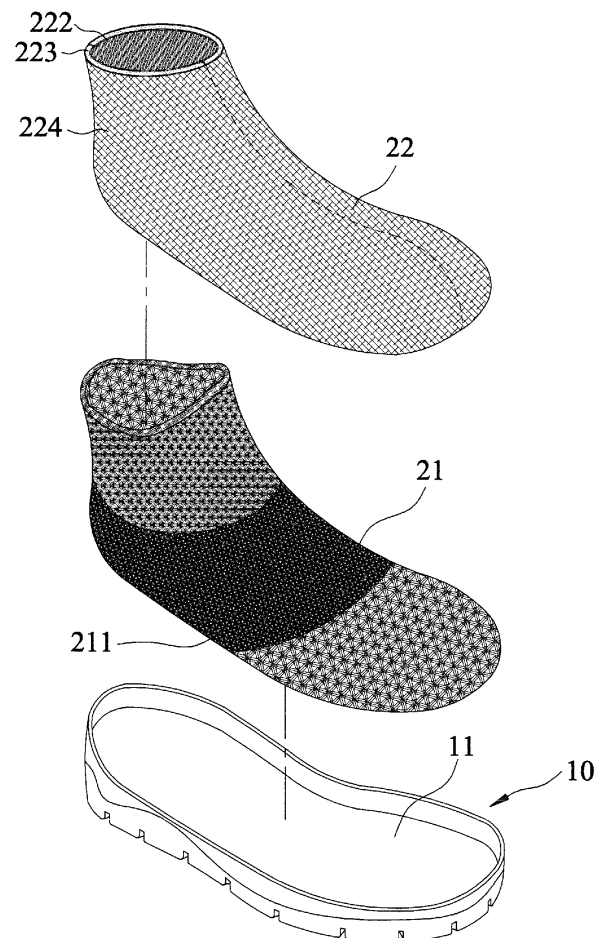


FIG.1

Description

[0001] The disclosure relates to a sock-shoe, more particularly to a three-dimensional sock-shoe that is stiff.

[0002] In recent years, woven shoes have gradually replaced shoes made of plastic or leather and have become trendy. In comparison with traditional shoes, woven shoes can provide better comfort feeling during wear thereof, and will not allow a wearer's foot to feel discomfort due to pressure and friction. However, the technical threshold and cost of the woven shoes are high. Thus, some industry has developed a one-piece sock-shoe with the sock as its main component, such as Taiwanese Patent Numbers M473088, M522581 and M526299.

[0003] However, the foregoing conventional sock-shoe, apart from being thin and cannot provide warmth, has a material that is not stiff so that it has to rely on the user's foot to form a three-dimensional shape. That is, when not in use, the conventional sock-shoe will collapse and has a creased appearance, which is unaesthetic and unattractive. Further, to wear the conventional sock-shoe is just like wearing an ordinary sock, that is, the user must first extend the fingers of his/her hands inside the conventional sock-shoe and then pull it outward to permit entry of the user's foot into the sock-shoe. Hence, use of the conventional sock-shoe is inconvenient.

[0004] Therefore, an object of the present disclosure is to provide a three-dimensional sock-shoe that is easy to wear and that can be kept upright when not in use.

[0005] Accordingly, a three-dimensional sock-shoe of this disclosure includes a shoe sole, a sock body having a bottom portion connected to the shoe sole, and a foam sleeve inserted into the sock body. The foam sleeve has a shape corresponding to that of the sock body, defines a three-dimensional foot space, and is made by stitching together at least two layered structures. The foam sleeve successively consists of an inner lining layer, an intermediate foam layer and an outer fabric layer. At least one adhesive layer is disposed between the outer fabric layer and the sock body to adhere the outer fabric layer to the sock body.

[0006] Other features and advantages of the disclosure will become apparent in the following detailed description of the embodiments with reference to the accompanying drawings, of which:

Fig. 1 is an exploded perspective view of a three-dimensional sock-shoe according to the first embodiment of this disclosure;

Fig. 2 is an assembled perspective view of Fig. 1;

Fig. 3 is an assembled sectional view of the first embodiment;

Fig. 4 is a perspective view of a foam sleeve of the first embodiment;

Fig. 5 is an exploded perspective view of a three-dimensional sock-shoe according to the second embodiment of this disclosure;

Fig. 6 is an assembled sectional view of the second

embodiment;

Fig. 7 is an enlarged fragmentary sectional view of Fig. 6;

Fig. 8 is an exploded perspective view of a three-dimensional sock-shoe according to the third embodiment of this disclosure; and

Fig. 9 is an assembled perspective view of the third embodiment.

[0007] Before the present disclosure is described in greater detail with reference to the accompanying embodiments, it should be noted herein that like elements are denoted by the same reference numerals throughout the disclosure.

[0008] Referring to Figs. 1 to 4, a three-dimensional sock-shoe according to the first embodiment of the present disclosure is shown to comprise a sole unit 10, a shoe pad 20, a sock body 21, a foam sleeve 22, and an adhesive layer 23.

[0009] The sole unit 10 includes a shoe sole 11.

[0010] The sock body 21 has a bottom portion 211 connected to the shoe sole 11. In this embodiment, the sock body 21 has a pattern, and is a one-piece woven sock.

[0011] The foam sleeve 22 is inserted into the sock body 21, has a shape corresponding to that of the sock body 21, and defines a three-dimensional foot space 221. The foam sleeve 22 is made by stitching together two layered structures 220, as shown in Fig. 4. The foam sleeve 22 successively consists of an inner lining layer 222, an intermediate foam layer 223 and an outer fabric layer 224. The intermediate foam layer 223 is adhered between the inner lining layer 222 and the outer fabric layer 224 by adhesives. The shoe pad 20 is disposed in the three-dimensional foot space 221 to absorb shock during walking of the user so that the user can feel comfortable during wear of the sock-shoe of this disclosure. The inner lining layer 222 is made of a material that is soft to touch or has a fluffy structure, but is not limited thereto, and may be made of a non-woven material and may be integrally formed as one piece. The intermediate foam layer 223 is a continuous open type porous structure, has excellent flexibility, and is able to maintain upright and not collapsed inward so as to retain the shape of the three-dimensional foot space 221. The intermediate foam layer 223 has a thickness ranging from 1 to 15 mm. The main function of the outer fabric layer 224 is to protect the intermediate foam layer 223 and to permit an object to stably connect with an outer side of the foam sleeve 22.

[0012] The adhesive layer 23 is disposed between the sock body 21 and the outer fabric layer 224 so as to adhere the outer fabric layer 224 closely to the sock body 21.

[0013] During manufacture of this disclosure, inner and outer sides of the intermediate foam layer 223 are first coated with adhesives, after which the inner side of the intermediate foam layer 223 is adhered to the inner lining layer 222 and the outer side thereof is adhered to the

outer fabric layer 224 to form a layered structure. The layered structure is then cut into two pieces, each of which has the shape of a shoe half. The two layered structures are stitched together to form the foam sleeve 22. Next, the foam sleeve 22 is sleeved on a shoe last, and the adhesive layer 23 is coated on the outer fabric layer 224. Afterwards, the sock body 21 is sleeved on the foam sleeve 22, and is fixed to the outer fabric layer 224 through the adhesive layer 23. The foam sleeve 22 and the sock body 21 together with the shoe last are then sent to an oven and are heated at a specific temperature for a certain period of time to cure the adhesive layer 23. After the adhesive layer 23 is cured, the foam sleeve 22 and the sock body 21 together with the shoe last are removed from the oven and are cooled. After cooling, the bottom portion 211 of the sock body 21 is adhered fixedly to the shoe sole 11, and the shoe last is removed from the foam sleeve 22 and the sock body 21, thereby completing the manufacturing process of this disclosure.

[0014] By virtue of the excellent flexibility of the intermediate foam layer 223 of the foam sleeve 22, the three-dimensional sock-shoe of this disclosure can be kept upright without collapsing inward when not in use, so that the three-dimensional sock-shoe of this disclosure is not only aesthetic, but also is easy for the user to wear.

[0015] Referring to Figs. 5 to 7, the second embodiment of the three-dimensional sock-shoe of this disclosure is shown to be generally identical to the first embodiment. However, the three-dimensional sock-shoe of this embodiment further comprises a moisture-permeable waterproof sleeve 24 disposed between the outer fabric layer 224 of the foam sleeve 22 and the sock body 21. Further, two adhesive layers 23 are used in this embodiment. That is, one of the adhesive layers 23 is disposed between the outer fabric layer 224 and the moisture-permeable waterproof sleeve 24 to adhere the moisture-permeable waterproof sleeve 24 closely to the outer fabric layer 224, and the other adhesive layer 23 is disposed between the moisture-permeable waterproof sleeve 24 and the sock body 21 to adhere the moisture-permeable waterproof sleeve 24 closely to the sock body 21.

[0016] The moisture-permeable waterproof sleeve 24 can prevent water from the outside to seep into the foam sleeve 22, but can permit moisture in the foam sleeve 22 to expel therethrough. Hence, the moisture-permeable waterproof sleeve 24 can achieve moisture-permeable and waterproof effect. It should be noted herein that in other embodiment, the moisture-permeable waterproof sleeve 24 may be formed on the foam sleeve 22 in many ways, for example, by a dipping process, in which the foam sleeve 22 is dipped into a moisture-permeable waterproof resin solution; a spraying process, in which a moisture-permeable waterproof resin solution is sprayed onto an outer side of the outer fabric layer 224; or, by forming a moisture-permeable waterproof membrane on a fabric substrate using the dipping or spraying process, after which the moisture-permeable waterproof membrane is adhered to the outer side of the outer fabric layer

224.

[0017] The moisture-permeable waterproof sleeve 24 is made of a material including one of the following resins: polyurethane (PU), thermoplastic polyurethane (TPU), latex, thermoplastic elastomer (TPE), polytetrafluoroethylene (PTFE), polyethylene (PE), and polypropylene (PP).

[0018] The moisture-permeable waterproof sleeve 24 can permit the three-dimensional sock-shoe of this disclosure to simultaneously have a moisture-permeable effect and a waterproof effect. In order to present the moisture-permeable and waterproof effect of the three-dimensional sock-shoe of this disclosure with specific data, two testing methods, namely, JIS L1092B and JIS L1099B1, were used to measure the waterproofing and moisture permeability of this disclosure. The results are: water pressure resistance of this disclosure is not less than 3000 mm H₂O, and the moisture permeability thereof is not less than 3000 g/m²/24hr.

[0019] Hence, aside from achieving the same advantages of the first embodiment, the second embodiment further has moisture-permeable and waterproof effect.

[0020] Referring to Figs. 8 and 9, the third embodiment of the three-dimensional sock-shoe of this disclosure is shown to be generally identical to the second embodiment. However, the three-dimensional sock-shoe of this embodiment further comprises a waterproof strip 25 and a tightening unit 30. The waterproof strip 25 is disposed between the moisture-permeable waterproof sleeve 24 and a stitching junction of the two layered structures 220 of the foam sleeve 22. The provision of the waterproof strip 25 can further ensure that water may not seep through the stitching junction of the foam sleeve 22. The tightening unit 30 is disposed transversely on a vamp portion of the sock body 21, and is used to tighten the three-dimensional sock-shoe over the user's foot that is inserted into the foot space 221. The tightening unit 30 includes a pair of tightening plates 31 respectively connected to left and right sides of the shoe sole 11, and three tightening strips 32 interconnecting the tightening plates 31. Each of the tightening plates 31 has a connecting end portion 311 connected to the respective left or right side of the shoe sole 11, and a free end portion 312 opposite to the connecting end portion 311. The tightening strips 32 interconnect the free end portions 312 of the tightening plates 31. The tightening unit 30 can permit the three-dimensional sock-shoe of this embodiment to tightly cover the user's foot.

[0021] The advantages of the second embodiment can be similarly achieved using the third embodiment.

[0022] The advantages of the three-dimensional sock-shoe of this disclosure can be summarized as follows:

- 1) Because the intermediate foam layer 223 of the foam sleeve 22 has excellent flexibility and is able to maintain upright and not collapsed inward so as to retain the shape of the three-dimensional foot space 221, the three-dimensional sock-shoe of this

disclosure has a stiffness that can be kept upright to maintain a three-dimensional shape even when not in use. Hence, the three-dimensional sock-shoe of this disclosure is not only aesthetic, but also can be easily and quickly worn by the user.

2) Through the provision of the moisture-permeable waterproof sleeve 24, this disclosure has good waterproof and moisture-permeable effect. When the user's foot sweats, moisture inside the sock-shoe can be expelled through the moisture-permeable waterproof sleeve 24. During rainy days, rainwater is prevented by the moisture-permeable waterproof sleeve 24 to seep into the foam sleeve 22 from the sock body 21, so that the user's foot can be kept dry and comfortable.

3) In comparison with the traditional shoe having a hollow bottom portion, which is usually not waterproof, water can easily seep into the shoe through the hollow bottom portion thereof. The moisture-permeable waterproof sleeve 24 of this disclosure can completely cover the foam sleeve 22, so that water is prevented from seeping into the three-dimensional space 221 of the foam sleeve 22 through a periphery or a bottom portion of the three-dimensional sock-shoe.

[0023] The object of the three-dimensional sock-shoe of this disclosure can indeed be achieved.

Claims

1. A three-dimensional sock-shoe comprising a shoe sole (11), a sock body (21) having a bottom portion (211) connected to said shoe sole (11), a foam sleeve (22) inserted into said sock body (21), and at least one adhesive layer (23), **characterized by:**

said foam sleeve (22) having a shape corresponding to that of said sock body (21), and defining a three-dimensional foot space (221), said foam sleeve (22) being made by stitching together at least two layered structures (220), said foam sleeve (22) successively consisting of an inner lining layer (222), an intermediate foam layer (223) and an outer fabric layer (224); and said at least one adhesive layer (23) being disposed between said outer fabric layer (224) and said sock body (21) to adhere said outer fabric layer (224) to said sock body (21).

2. The three-dimensional sock-shoe as claimed in Claim 1, further comprising a moisture-permeable waterproof sleeve (24) disposed between said outer fabric layer (224) and said sock body (21), said at least one adhesive layer (23) including two adhesive layers (23), wherein one of said adhesive layers (23) is disposed between said outer fabric layer (224) and

said moisture-permeable waterproof sleeve (24) to adhere said moisture-permeable waterproof sleeve (24) to said outer fabric layer (224), and the other one of said adhesive layers (23) is disposed between said moisture-permeable waterproof sleeve (24) and said sock body (21) to adhere said moisture-permeable waterproof sleeve (24) to said sock body (21).

3. The three-dimensional sock-shoe as claimed in Claim 2, further comprising a waterproof strip (25) disposed between said moisture-permeable waterproof sleeve and a stitching junction of said at least two layered structures (220) of said foam sleeve (22).
4. The three-dimensional sock-shoe as claimed in Claim 2, wherein said moisture-permeable waterproof sleeve (24) is formed by a dipping or spraying process.
5. The three-dimensional sock-shoe as claimed in Claim 2, wherein said moisture-permeable waterproof sleeve (24) is made of a material including one of the following resins: polyurethane (PU), thermoplastic polyurethane (TPU), latex, thermoplastic elastomer (TPE), polytetrafluoroethylene (PTFE), polyethylene (PE), and polypropylene (PP).
6. The three-dimensional sock-shoe as claimed in Claim 1, further comprising a tightening unit (30) which includes a pair of tightening plates (31) respectively connected to left and right sides of said shoe sole (11), and at least one tightening strip (32) interconnecting said tightening plates (31).
7. The three-dimensional sock-shoe as claimed in Claim 7, wherein said tightening unit (30) includes a plurality of said tightening strips (32), each of said tightening plates (31) having a connecting end portion (311) connected to a respective one of said left and right sides of said shoe sole (11), and a free end portion (312) opposite to said connecting end portion (311), said tightening strips (32) interconnecting said free end portions (312) of said tightening plates (31).
8. The three-dimensional sock-shoe as claimed in Claim 2, wherein said moisture-permeable waterproof sleeve (24) has a water pressure resistance of not less than 3000 mm H₂O.
9. The three-dimensional sock-shoe as claimed in Claim 2, wherein said moisture-permeable waterproof sleeve (24) has a moisture permeability of not less than 3000 g/m²/24hr.

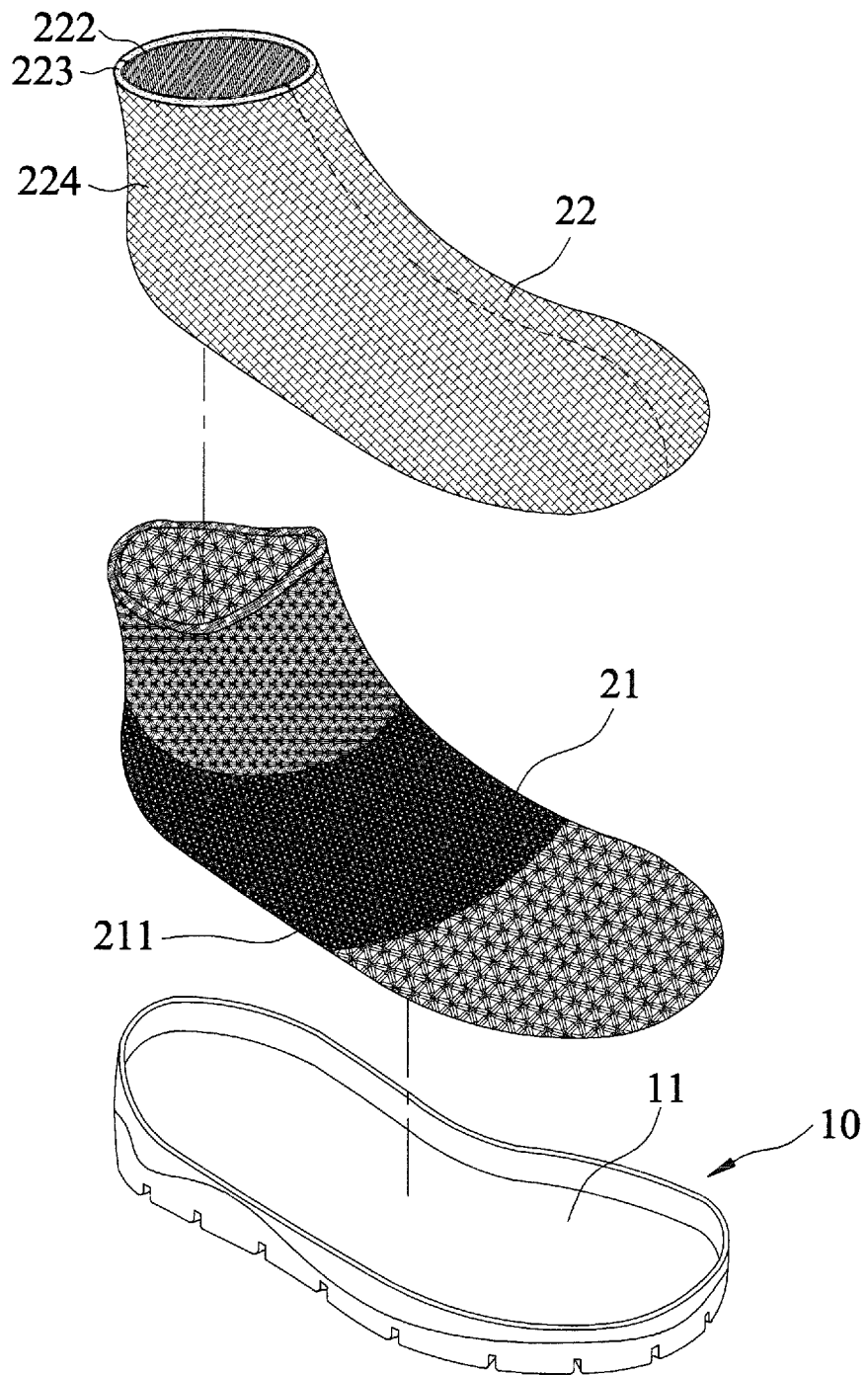


FIG.1

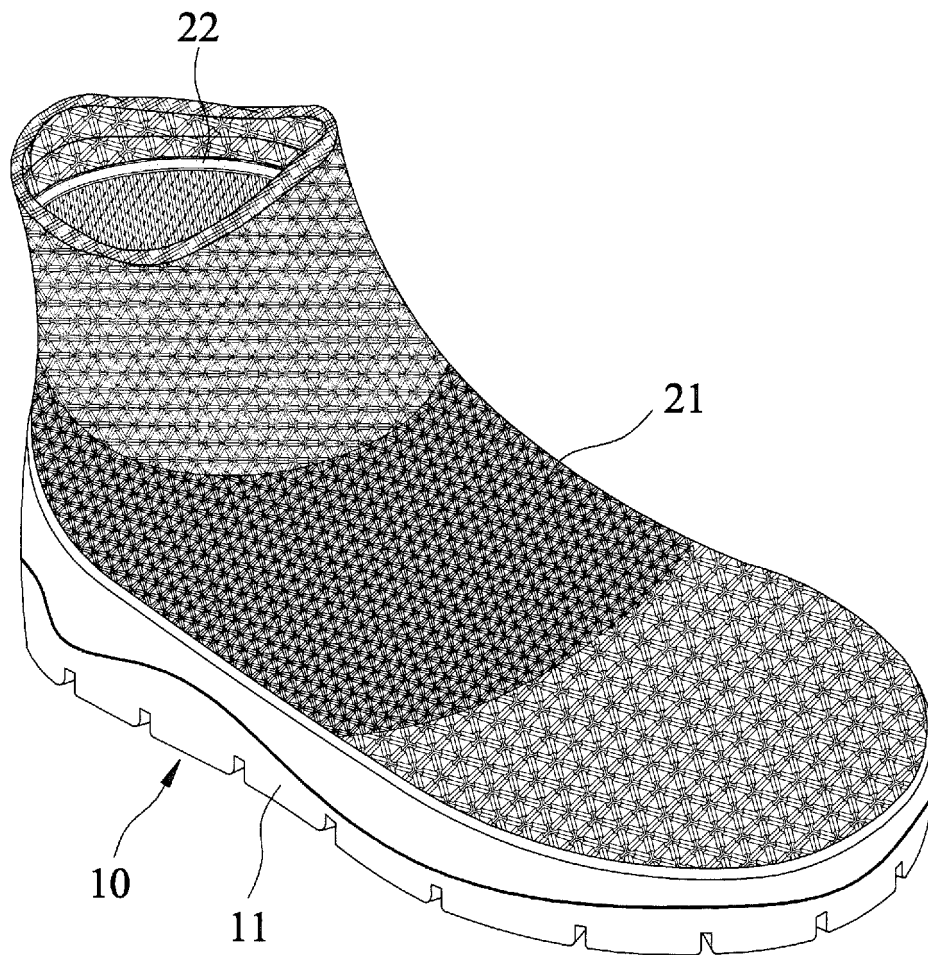


FIG.2

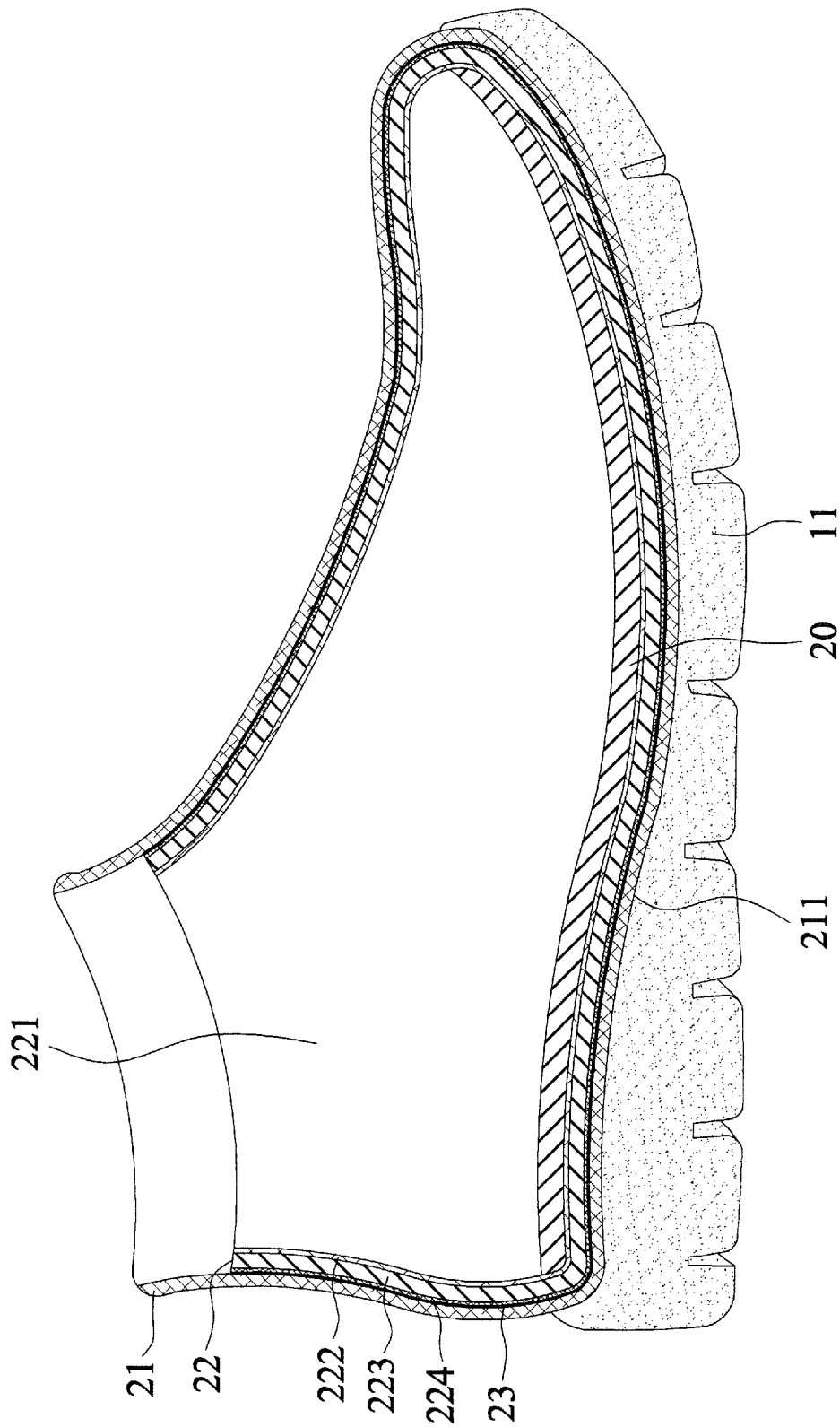


FIG.3

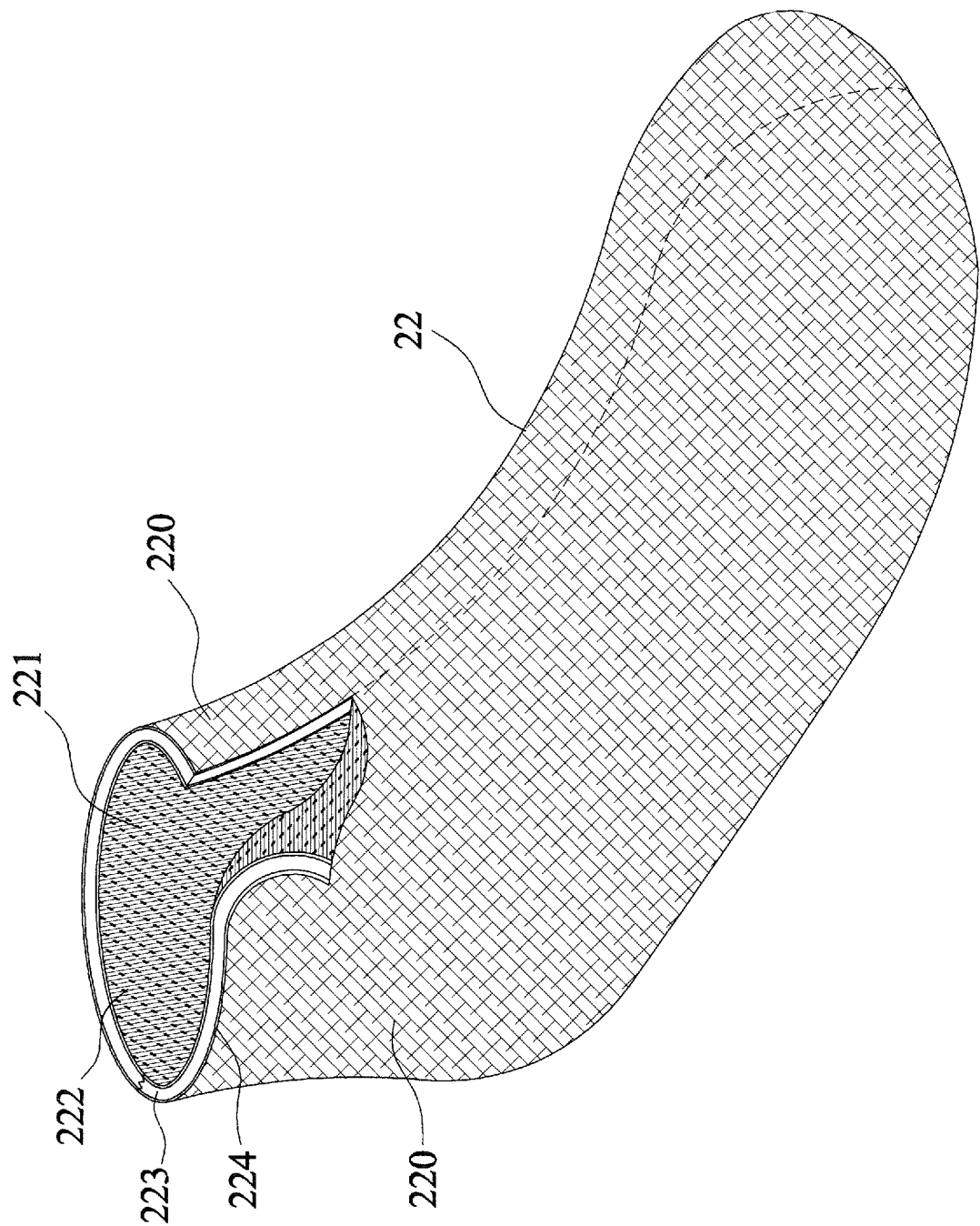


FIG.4

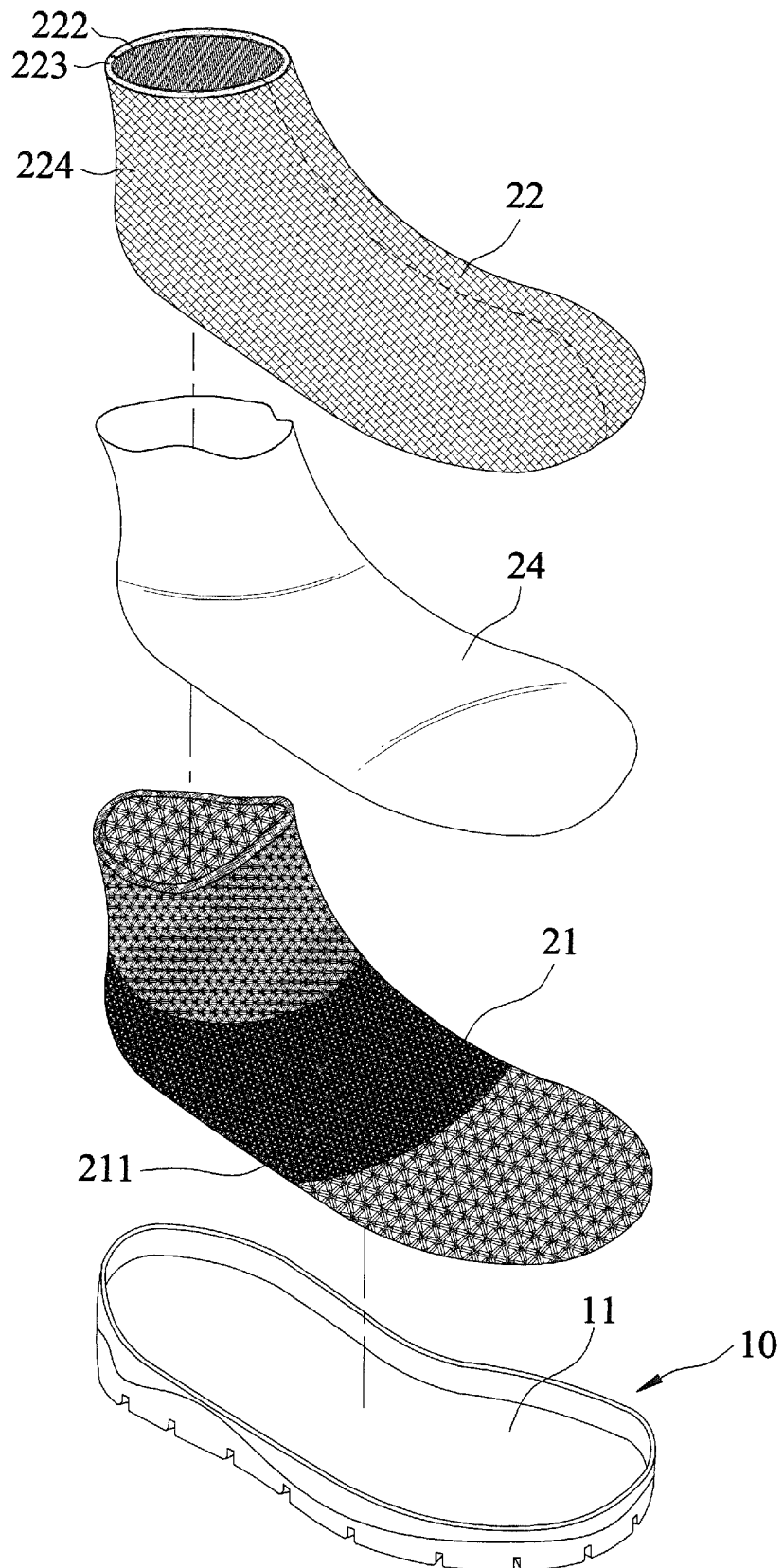


FIG.5

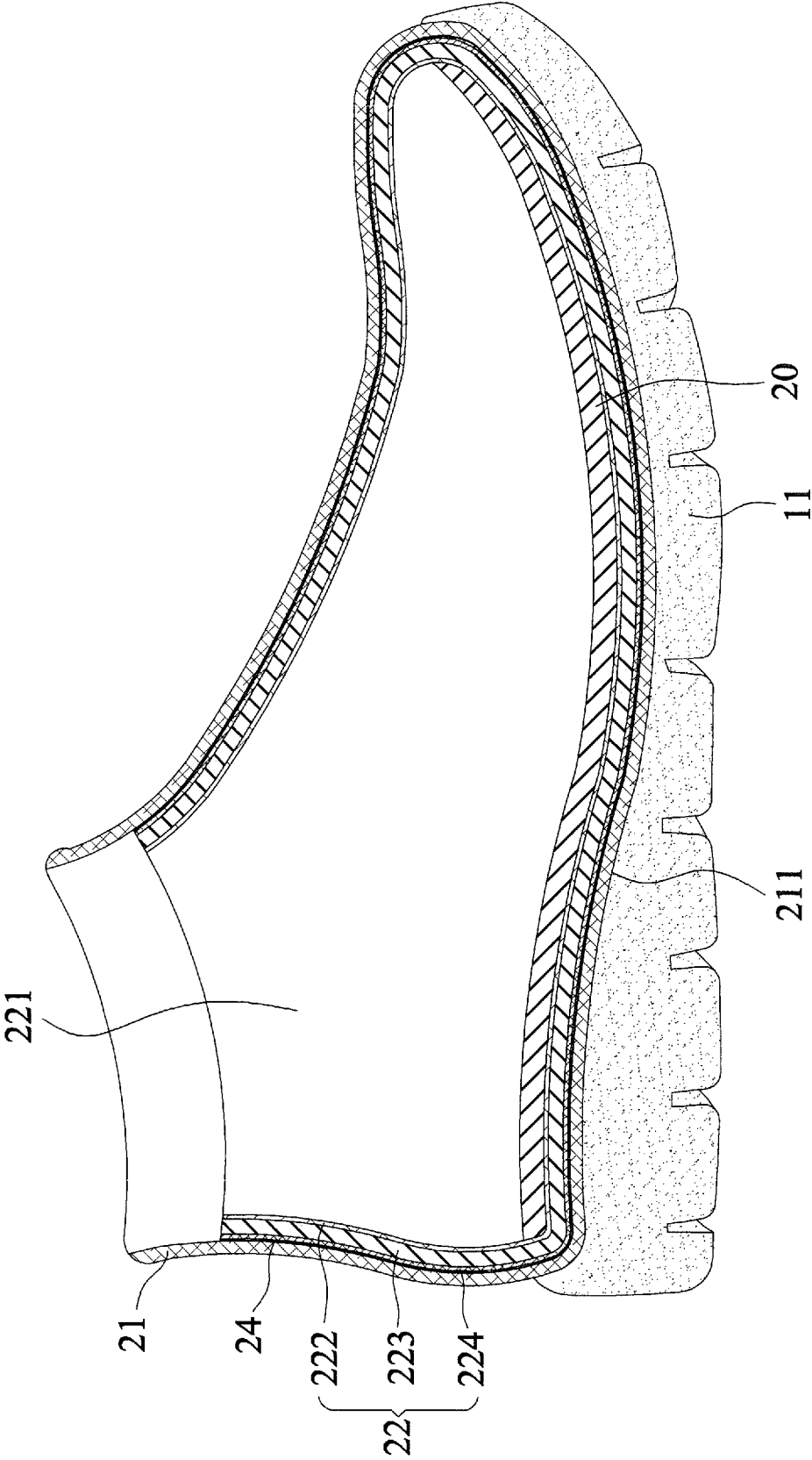


FIG.6

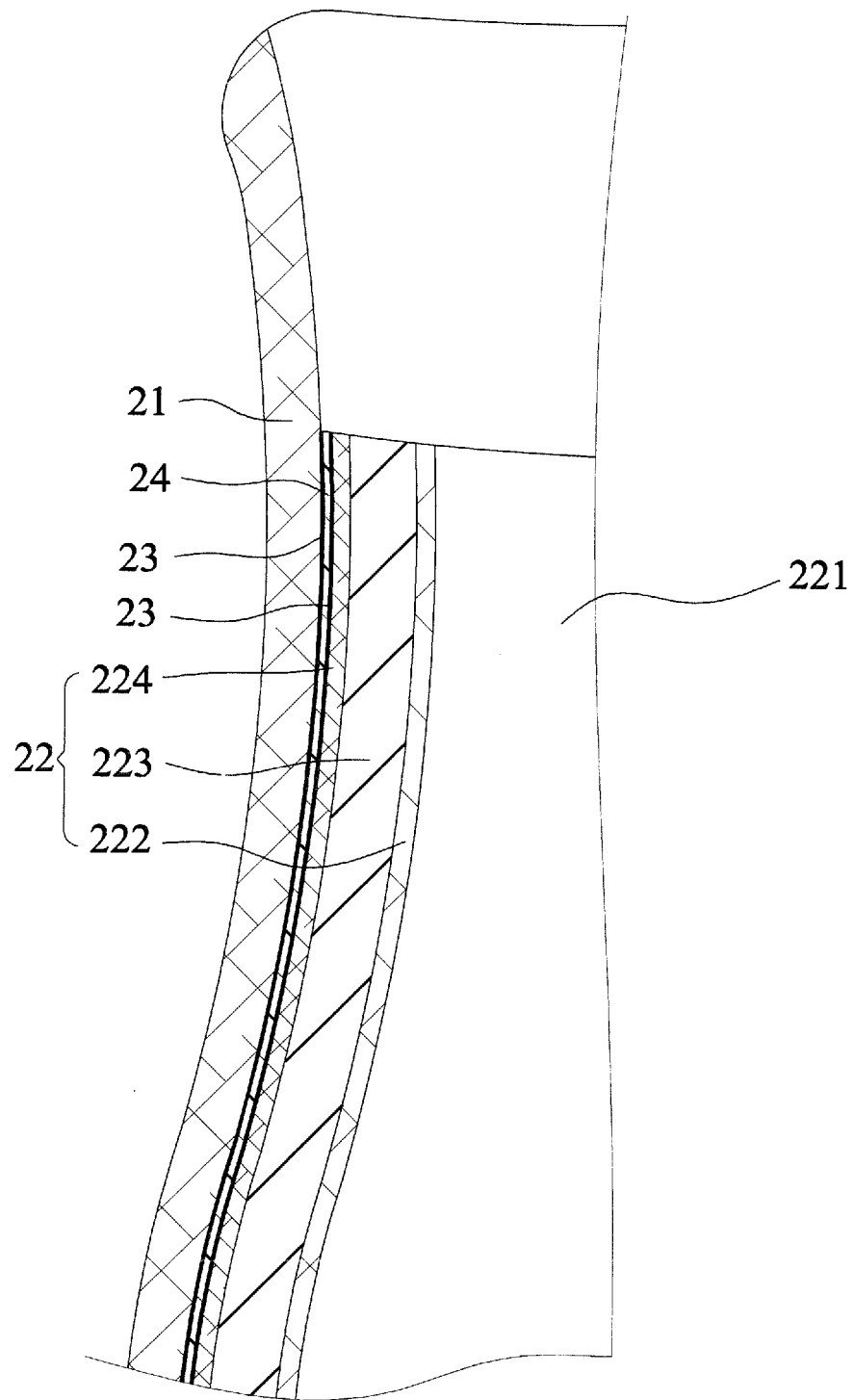


FIG.7

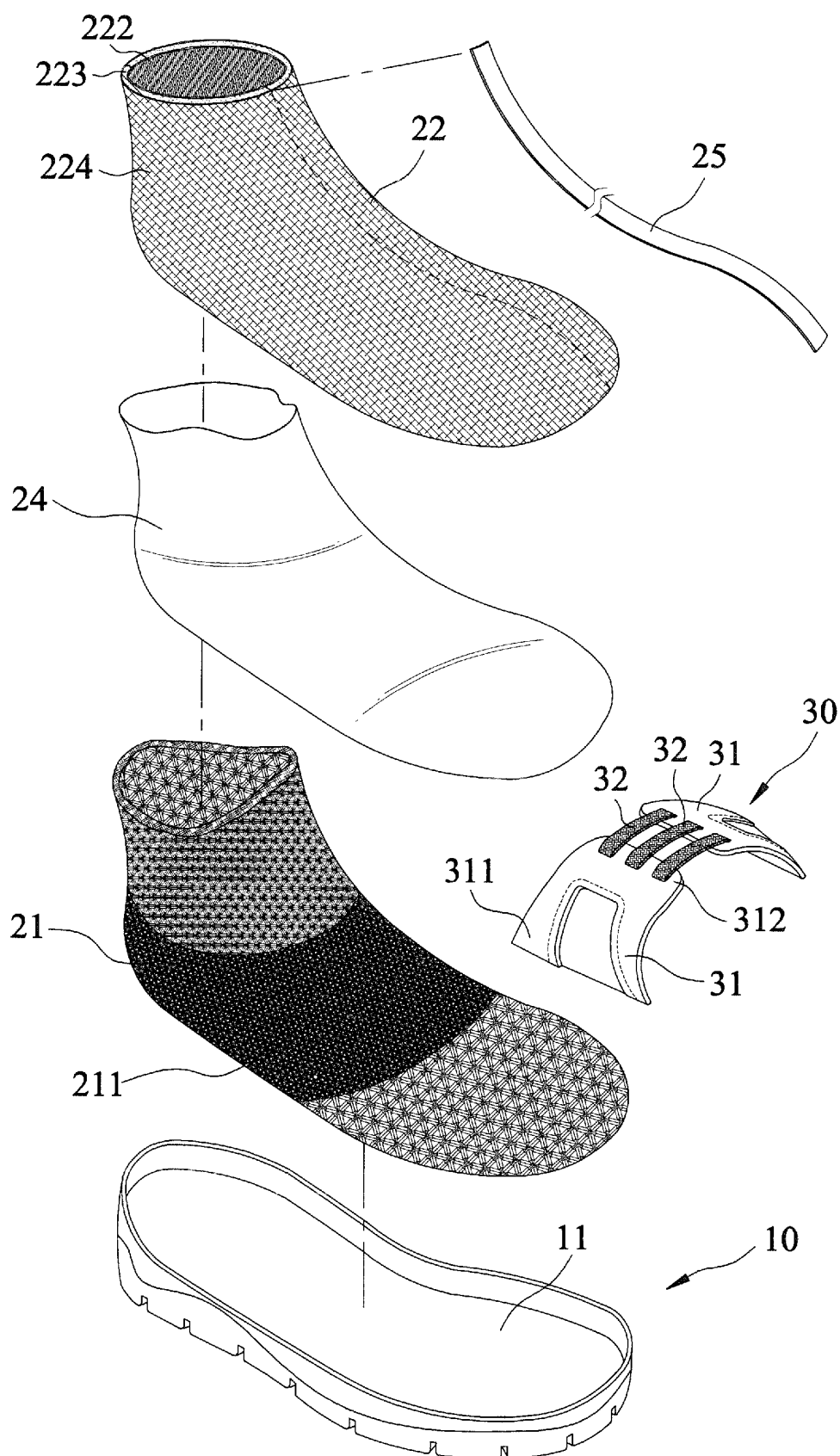


FIG.8

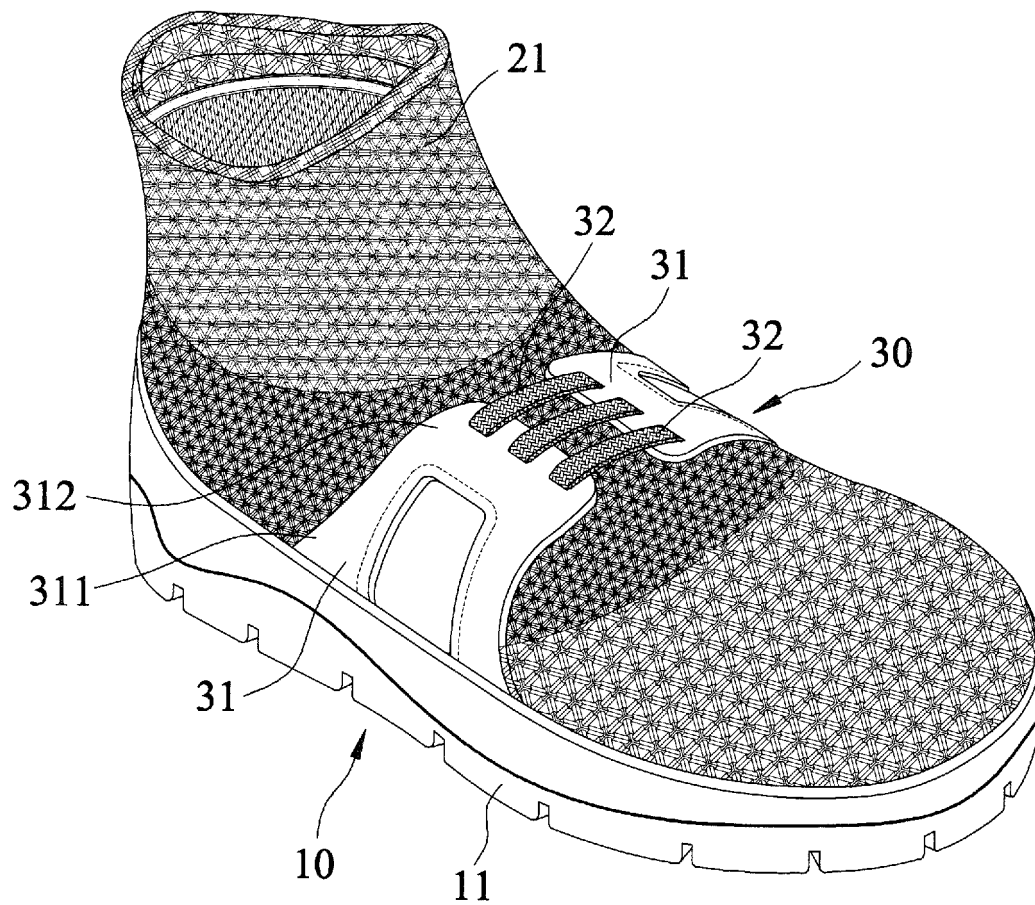


FIG.9



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Application Number
EP 17 18 8065

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 1 February 2018	Examiner Chirvase, Lucian
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