(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 108 117 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
28.12.2022 Bulletin 2022/52

(21) Application number: **21180770.6**

(22) Date of filing: **22.06.2021**

(51) International Patent Classification (IPC):
A43B 7/14 *(2022.01)* ***A43B 13/12*** *(2006.01)*
A43B 13/18 *(2006.01)* ***A43B 17/00*** *(2006.01)*
A43B 17/06 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
A43B 7/146; A43B 7/141; A43B 13/125; A43B 13/127; A43B 13/181; A43B 13/183; A43B 17/006; A43B 17/06

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(71) Applicant: **Pro Arch International Development Enterprise Inc.**
Taichung City 407 (TW)

(72) Inventors:
- **CHEN, Yi-Chun**
  403 Taichung City (TW)
- **HSIEH, Po-Hsiang**
  406 Taichung City (TW)
- **TSAI, Chin-Yuan**
  540 Nantou City (TW)

(74) Representative: **Piotrowicz, Pawel Jan Andrzej et al**
Venner Shipley LLP
Byron House
Cambridge Business Park
Cowley Road
Cambridge CB4 0WZ (GB)

(54) SHOE ACCESSORY WITH ACTIVATING FUNCTION

(57) A shoe accessory of a shoe adaptive for activating a bottom (1) of a foot wearing the shoe is provided. The bottom (1) of the foot has a forefoot (11), a heel (12), and an arch (13) between the forefoot (11) and the heel (12). The shoe accessory includes a main body (2) and a plurality of stimulating elements (3) mounted to the main body (2). Each of the stimulating elements (3) is movable universally on the main body (2) and is adapted to exert a pressing force on a non-fixed point of the bottom (1) of the foot to stimulate the arch (13).

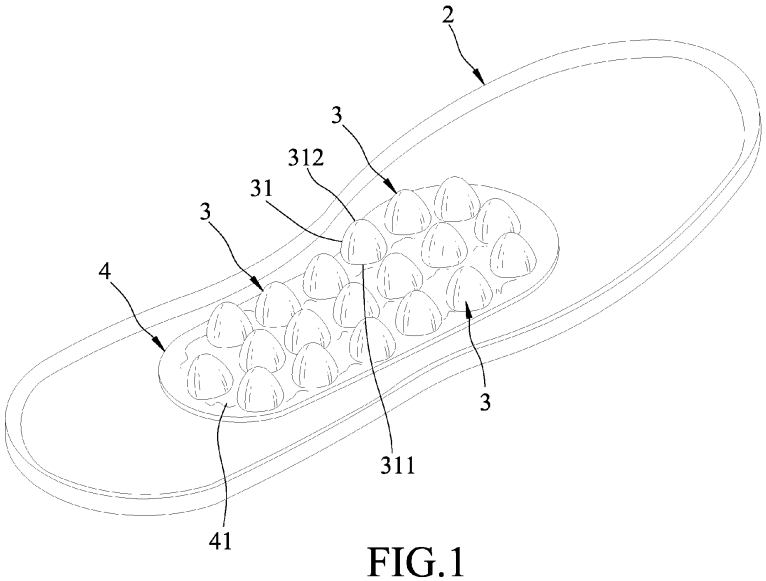

FIG.1

EP 4 108 117 A1

Description

[0001] The disclosure relates to a shoe accessory, more particularly to a shoe accessory of a shoe for activating a bottom of a foot wearing the shoe.

[0002] A conventional massage insole, e.g., a massage insole disclosed in U.S. Patent No. 10188172, generally includes a main body and a plurality of protrusions formed on the main body. The protrusions have different diameters and heights and contact a bottom of a foot to stimulate plantar reflex areas to promote blood circulation of the foot. However, the protrusions are densely formed on the main body and contact some regions of the foot that are subjected to a relatively high foot plantar pressure when walking. Consequently, tight muscle and fascia tension are caused, which may even incur pain and inflammation of soft tissues of the foot such as muscle and fascia.

[0003] Therefore, an object of the disclosure is to provide a shoe accessory of a shoe capable of alleviating the drawbacks of the conventional massage insole.

[0004] According to an aspect of the disclosure, a shoe accessory of a shoe adaptive for activating a bottom of a foot wearing the shoe is provided. The bottom of the foot has a forefoot, a heel, and an arch between the forefoot and the heel. The shoe accessory includes a main body and a plurality of stimulating elements mounted to the main body. Each of the stimulating elements is movable universally on the main body and is adapted to exert a pressing force on a non-fixed point of the bottom of the foot to stimulate the arch.

[0005] 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 a perspective view of a first embodiment of the shoe accessory according to the present disclosure;

FIG. 2 is a schematic sectional view of the first embodiment, illustrating a bottom of a foot being stimulated by a plurality of stimulating elements of the shoe accessory of the first embodiment;

FIG. 3 is a schematic sectional view similar to FIG. 2, but illustrating the stimulating elements being deformed;

FIG. 4 is a schematic sectional view taken along line IV-IV in FIG. 3;

FIG. 5 is a schematic sectional view similar to FIG. 4, but illustrating the stimulating elements being compressed by the bottom of the foot;

FIG. 6 is a schematic sectional view of the first embodiment, illustrating that a main body of the shoe accessory is bent so that the stimulating elements move universally therewith;

FIG. 7 is a schematic sectional view illustrating a modification of the stimulating elements of the first embodiment;

FIG. 8 is a schematic sectional view of a second embodiment of the shoe accessory according to the present disclosure;

FIG. 9 is a schematic sectional view of a third embodiment of the shoe accessory according to the present disclosure;

FIG. 10 is a schematic sectional view of a fourth embodiment of the shoe accessory according to the present disclosure;

FIG. 11 is a schematic sectional view of a fifth embodiment of the shoe accessory according to the present disclosure, illustrating a plurality of flexible elements interconnecting the stimulating elements in series;

FIG. 12 is a schematic sectional view of a modification of the flexible elements of fifth embodiment;

FIG. 13 is a schematic perspective view of a sixth embodiment of the shoe accessory according to the present disclosure; and

FIG. 14 is a schematic sectional view of a seventh embodiment of the shoe accessory according to the present disclosure.

[0006] Before the present disclosure is described in greater detail, it should be noted herein that like elements are denoted by the same reference numerals throughout the disclosure.

[0007] Referring to FIGS. 1 and 2, a shoe accessory of a shoe adaptive for activating a bottom 1 of a foot wearing the shoe is shown. The bottom 1 of the foot has a forefoot 11, a heel 12, and an arch 13 between the forefoot 11 and the heel 12. The shoe accessory includes a main body 2, a plurality of stimulating elements 3 and a flexible unit 4.

[0008] In this embodiment, the main body 2 is an insole of the shoe. The stimulating elements 3 are mounted to the main body 2. Each of the stimulating elements 3 is movable universally on the main body 2, is adapted to exert a pressing force on the bottom 1 of the foot to stimulate the arch 13, and is shaped as one of a sphere, a triangle, a polygon, and an irregular shape.

[0009] In this embodiment, the stimulating elements 3 correspond in position to the arch 13, which includes a transverse arch portion, a medial arch portion and a lateral arch portion. Each of the stimulating elements 3 includes a bag wall 31 defining a chamber 30 therein and including a connecting portion 311 and a stimulating portion 312.

[0010] For each of the stimulating elements 3, the chamber 30 is deformable to change a contact point between the bottom 1 of the foot and a corresponding one of said stimulating elements 3, and the stimulating portion 312 is adapted to contact the bottom 1 of the foot and to stimulate the bottom 1 of the foot. It should be noted that the chamber 30 may be omitted, so that each stimulating element 3 is configured as a solid sphere shown in FIG. 8.

[0011] The flexible unit 4 includes a soft layer 41 fixed on the main body 2, interconnecting the main body 2 and

the connecting portion 311 of each of the stimulating elements 3, and being flexible. In this embodiment, the soft layer 41 is made of a deformable material similar to gel, e.g., thermoplastic polyurethanes (TPU). In this embodiment, the stimulating elements 3 are formed integrally with the soft layer 4.

[0012] Further referring to FIGS. 3 to 5, when the bottom 1 of the foot is stepped on the shoe accessory, the stimulating elements 3 are deformed due to the fluidity of the soft layer 41 and thus move universally relative to the main body 2 to stimulate the arch 13. The movement of the stimulating elements includes but not limited to moving downwardly, returning to the original position after moving downwardly, shifting along a front-rear direction and a left-right direction transverse to the front-rear direction, and returning to the original position after shifting along the front-rear direction and the left-right direction.

[0013] In this way, when the bottom 1 of the foot is stepped on the shoe accessory, the stimulating portion 312 of each of the stimulation elements 3 stimulates the arch 13 to exert a pressing force on muscles of the arch 13 so as to activate the muscles and drive relative movement of toes of the forefoot 11. Thus, the muscles of the foot can be relieved, and blood circulation of the muscles of the foot can be enhanced. In the case that the shoe accessory is used for a long time, discomfort would not be caused to the foot wearing the shoe. Some deep muscles of the foot, small muscles of the calf and the bottom 1 of the foot that are rarely used can be activated by the shoe accessory so as to strengthen the abilities of the arch 13 to absorb shock from ground and to balance. Further, for people having muscle soreness after high-intensity exercise and wearing the shoe accessory of the present disclosure may reduce time for recovery.

[0014] It should be noted that the stimulating elements 3 can be moved universally in manners other than flexing and deforming the soft layer 41. For example, as shown in FIG. 6, the stimulating elements 3 are moved universally due to deformation of the main body 2. Additionally, the stimulating elements 3 are moved due to compression by the bottom 1 of the foot in different directions such that the stimulating portions 312 move universally.

[0015] Further, the bag wall 31 of each of the stimulating elements 3 may include more than one stimulating portions 312. For example, as shown in FIG. 7, the stimulating elements 3 are modified such that the bag wall 31 of each of the stimulating elements 3 includes a plurality of stimulating portions 312 disposed along a periphery thereof and connected to the soft layer 41 of the flexible unit 4 through the connecting portion 311.

[0016] Referring to FIG. 8, a second embodiment of the shoe accessory of the present disclosure is similar to the first embodiment and the difference therebetween resides in the following. In the second embodiment, each of the stimulating elements 3 includes a connecting portion 311' configured as a bendable pillar and a stimulating portion 312' connected to the connecting portion 311' and shaped as a sphere.

[0017] The flexible unit 4 includes a soft layer 41' interconnecting the connecting portion 311' of each of the stimulating elements 3 and the main body 2, and cooperating with the main body 2 to define a space 40 therebetween. In this embodiment, the soft layer 41' is a soft plastic sheet that is flexibly deformable through the space 40. In this way, when the bottom 1 of the foot is stepped on the shoe accessory, the stimulating elements 3 are moved universally due to the deformation of the soft layer 41' and bending of the connecting portions 311' caused by the force exerted by the bottom 1 of the foot in different positions and directions. Thus, the stimulating portions 312' of the stimulating elements 3 stimulate the arch 13 (see FIG. 2) at different positions.

[0018] Referring to FIG. 9, a third embodiment of the shoe accessory of the present disclosure is shown. In the third embodiment, each of the stimulating elements 3 also includes a connecting portion 311 and a stimulating portion 312. The flexible unit 4 includes a plurality of flexible elements 43 connected respectively to the stimulating elements 3, and connected to the main body 2. In this embodiment, each of the flexible elements 43 is a resilient member such as a compression spring. Thus, when the bottom 1 of the foot (see FIG. 2) is stepped on the shoe accessory, since the flexible elements 43 are deformed by the force exerted by the bottom 1 of the foot in different positions and directions, the stimulating portions 312 of the stimulating elements 3 are moved universally to stimulate and activate the muscles of the arch 13 at different positions.

[0019] Referring to FIG. 10, a fourth embodiment of the shoe accessory of the present disclosure is shown. In the fourth embodiment, the flexible unit 4 further includes a plated-shaped flexible plate 44 for supporting the stimulating elements 3 thereon, and a flexible element 45 disposed under and connected to the flexible plate 44, and the stimulating portion 312" of each of the stimulating elements 3 is shaped as a triangle. In this embodiment, the flexible element 45 is a resilient element such as a compression spring, and is connected between the flexible plate 44 and the main body 2.

[0020] The flexible plate 44 of the flexible unit 4 interconnects the stimulating elements 3 and the flexible element 45, and is deformable. Thus, when the bottom 1 of the foot (see FIG. 2) is stepped on the shoe accessory, since the flexible element 45 is deformed by the force exerted by the bottom 1 of the foot in different positions and directions, the stimulating portions 312" of the stimulating elements 3 are moved universally to stimulate and activate the muscles of the arch 13 at different positions.

[0021] Referring to FIG. 11, a fifth embodiment of the shoe accessory of the present disclosure is similar to the first embodiment and the difference therebetween reside in the following. The flexible unit 4 includes a plurality of flexible elements 46 connected to the main body 2 and connecting the stimulating elements 3 in series. In this

embodiment, each of the flexible elements 46 is a string element. Thus, when the bottom 1 of the foot (see FIG. 2) is stepped on the shoe accessory, since the flexible elements 46 are deformed by the force exerted by the bottom 1 of the foot in different positions and directions, the stimulating elements 3 connected to the flexible elements 46 are moved universally to stimulate and activate the muscles of the arch 13 (see FIG. 2) at different positions. Note that the flexible elements 46 may connect the stimulating elements 3 together in other manners, for example, a plurality of additional stimulating elements 3 are rotatably and respectively sleeved on corresponding ones of the flexible elements 46.

[0022] Referring to FIG. 12, a modification of the fifth embodiment is shown. In this modification, two pairs of flexible elements 46 are connected respectively to two opposite sides of a stimulating element 3, and thus the stimulating element 3 is movable relative to the main body 2 through the deformation the flexible elements 46.

[0023] Referring to FIG. 13, a sixth embodiment of the shoe accessory of the present disclosure is similar to the first embodiment and the difference therebetween reside in the following. In this embodiment, the stimulating elements 3 and the flexible unit 4 are integrally formed by a deformable and flexible material such as TPU, in a wavy configuration. The peak portions that are adjacent to the bottom 1 of the foot wearing the shoe constitute the stimulating elements 3, and the valley portions constitute the flexible unit 4. The sixth embodiment possesses the advantages of the first to fifth embodiments.

[0024] Referring to FIG. 14, a seventh embodiment of the shoe accessory of the present disclosure is similar to the first embodiment and the difference therebetween reside in the following. In this embodiment, the main body 2 defines an accommodation space 21 adapted to open toward the bottom 1 of the foot and accommodating the stimulating elements 3 therein. The stimulating elements 3 are movably mounted in the accommodation space 21. Thus, the seventh embodiment possesses the advantage of the first to sixth embodiments.

[0025] Additionally, in other embodiments, the main body 2 can be one of a midsole, an outsole, and a portion of an upper of the shoe extending toward the outsole of the shoe. For example, when the main body 2 is the outsole of the shoe, an insole and a midsole of the shoe can be modified to have a relatively thin thickness to ensure that the stimulating elements 3 are able to stimulate the bottom 1 of the foot. A person having ordinary skill in the pertinent art is able to make some modifications to the shoe accessory of the present disclosure and further examples are omitted for the sake of brevity.

[0026] To sum up, the advantages of the present disclosure are described in the following. By virtue of the stimulating elements 3 that are adapted to stimulate the muscles of the arch 13, the forefoot 11 of the bottom 1 of the foot is activated. Further, since the stimulating elements 3 are movable universally when being stepped on by the bottom 1 of the foot, contact points between the arch 13 and the stimulating elements 3 are frequently changed. That is to say, each of the stimulating elements 3 is movable universally on the main body to exert a pressing force on a non-fixed point of the bottom 1 of the foot to stimulate the arch 13. In this way, the stimulated points of the arch 13 are changed continuously, so that each of the stimulated points would not be continuously subjected to a pressing force exerted by a corresponding one of the stimulating elements 3 for a long time and the effect and comfort of massage to the muscle of the arch 13 can be improved.

[0027] In the description above, for the purposes of explanation, numerous specific details have been set forth in order to provide a thorough understanding of the embodiments. It will be apparent, however, to one skilled in the art, that one or more other embodiments may be practiced without some of these specific details. It should also be appreciated that reference throughout this specification to "one embodiment," "an embodiment, "an embodiment with an indication of an ordinal number and so forth means that a particular feature, structure, or characteristic may be included in the practice of the disclosure. It should be further appreciated that in the description, various features are sometimes grouped together in a single embodiment, figure, or description thereof for the purpose of streamlining the disclosure and aiding in the understanding of various inventive aspects, and that one or more features or specific details from one embodiment may be practiced together with one or more features or specific details from another embodiment, where appropriate, in the practice of the disclosure.

Claims

1. A shoe accessory of a shoe adaptive for activating a bottom (1) of a foot wearing the shoe, the bottom (1) of the foot having a forefoot (11), a heel (12), and an arch (13) between the forefoot (11) and the heel (12), said shoe accessory comprising a main body (2), said shoe accessory **characterized by**:

   a plurality of stimulating elements (3) mounted to said main body (2), each of said stimulating elements (3) being movable universally on said main body (2) and adapted to exert a pressing force on a non-fixed point of the bottom (1) of the foot to stimulate the arch (13).

2. The shoe accessory as claimed in Claim 1, **characterized in that** each of said stimulating elements (3) includes a bag wall (31) defining a chamber (30) therein that is deformable to change a contact point between the bottom (1) of the foot and a corresponding one of said stimulating elements (3).

3. The shoe accessory as claimed in Claim 1 or 2, **characterized in that** each of said stimulating elements

(3) is shaped as one of a sphere, a triangle, and a polygon.

4. The shoe accessory as claimed in any one of Claim 1 to 3, said shoe accessory further **characterized by** a flexible unit (4) that includes a soft layer (41) interconnecting said main body (2) and said stimulating elements (3) and being flexible and deformable, each of said stimulating elements (3) including a connecting portion (311) connected to said soft layer (41) and a stimulating portion (312, 312, 312") adapted to contact the bottom (1) of the foot so as to stimulate the bottom (1) of the foot.

5. The shoe accessory as claimed in any one of Claims 1 to 3, said shoe accessory further **characterized by** a flexible unit (4) that includes at least one flexible element (43, 45, 46) connecting said stimulating elements (3) to said main body (2).

6. The shoe accessory as claimed in Claim 5, **characterized in that** said flexible element (43, 45, 46) is one of a string element and a resilient element.

7. The shoe accessory as claimed in Claim 5 or 6, **characterized in that** said flexible unit (4) includes a plurality of said flexible elements (43), each of said flexible elements (43) being connected respectively to said stimulating elements (3) and being connected to said main body (2), and being a compression spring.

8. The shoe accessory as claimed in Claim 5 or 6, **characterized in that** said flexible unit (4) further includes a flexible plate (44) supporting said stimulating elements (3) thereon and disposed directly above and connected to said flexible element (45).

9. The shoe accessory as claimed in any one of Claims 1 to 8, **characterized in that** said main body (2) defines an accommodation space (21) adapted to open toward the arc portion (13) of the bottom (1) of the foot and accommodating said stimulating elements (3) therein.

10. The shoe accessory as claimed in any one of Claims 1 to 9, **characterized in that** said main body (2) is one of an insole, a midsole, an outsole, and a portion of an upper of the shoe.

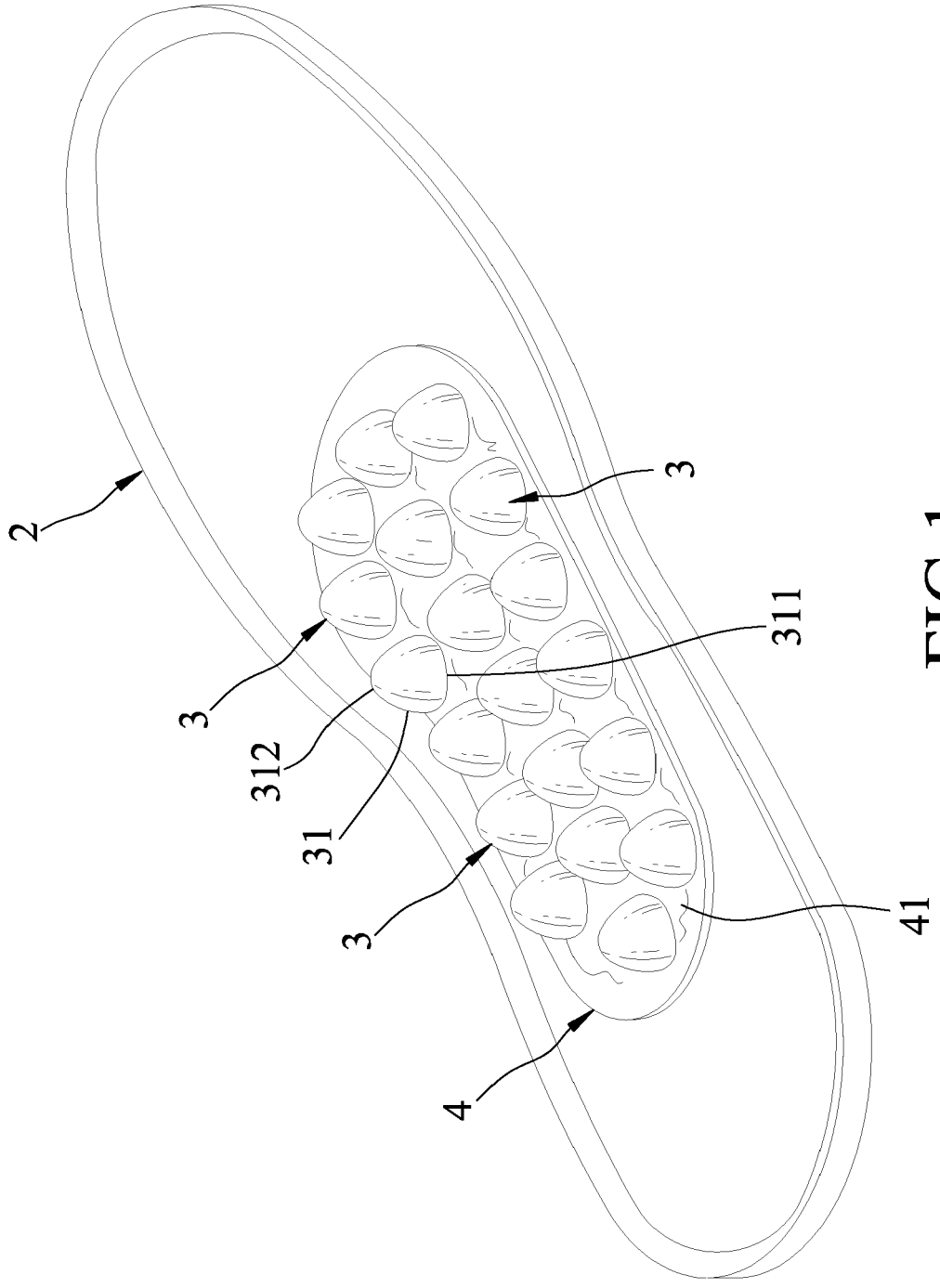

FIG.1

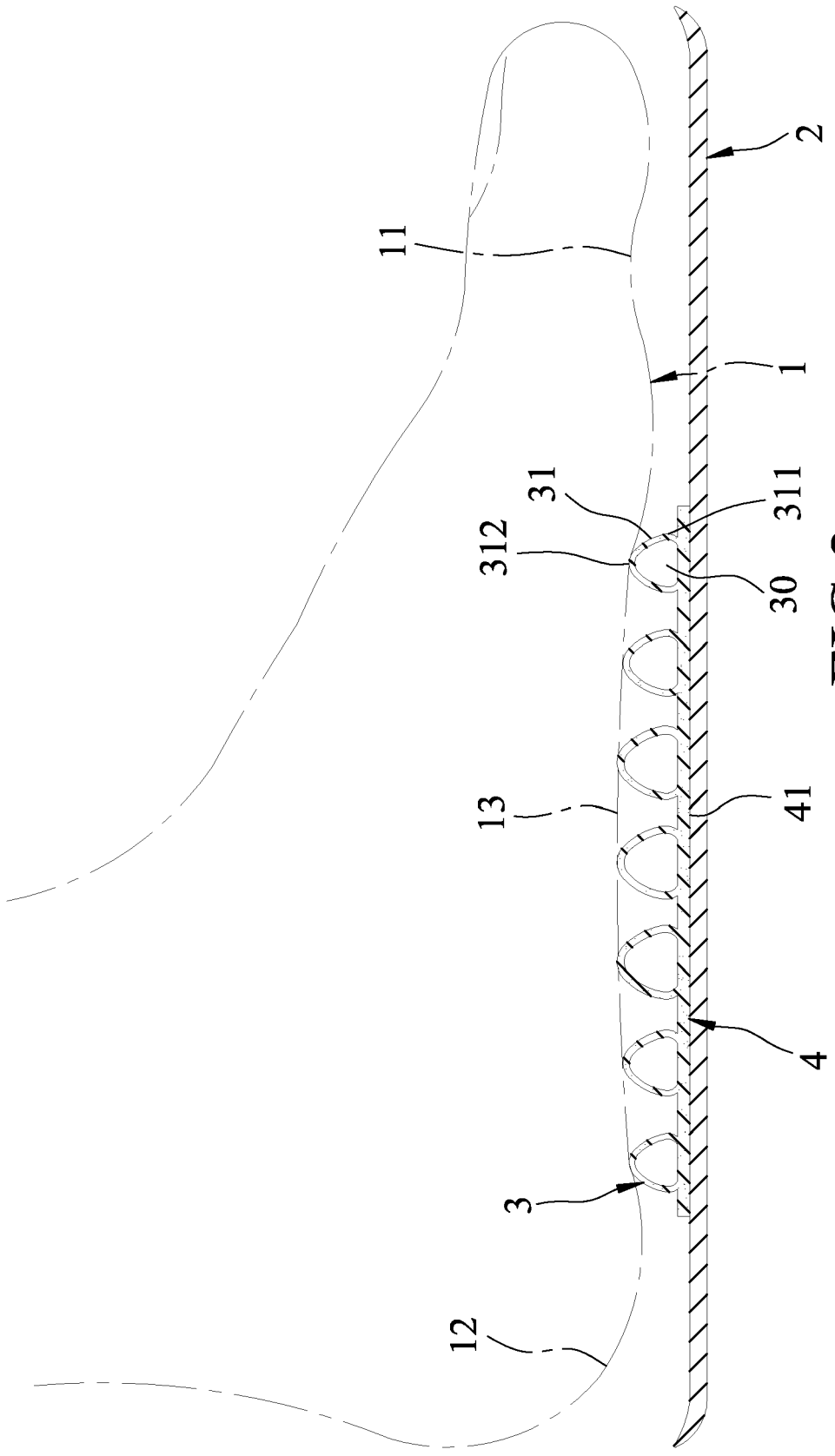

FIG.2

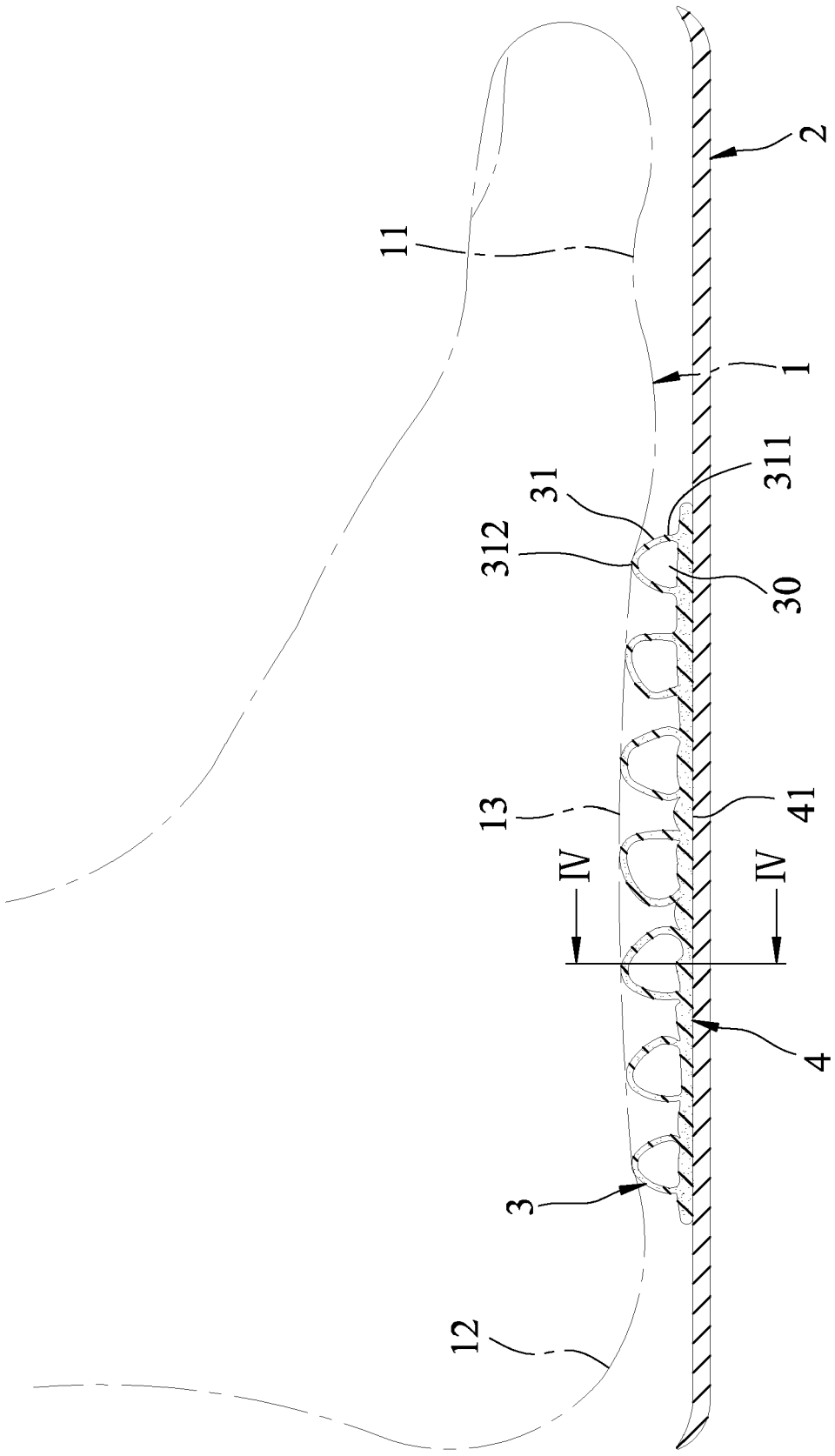

FIG.3

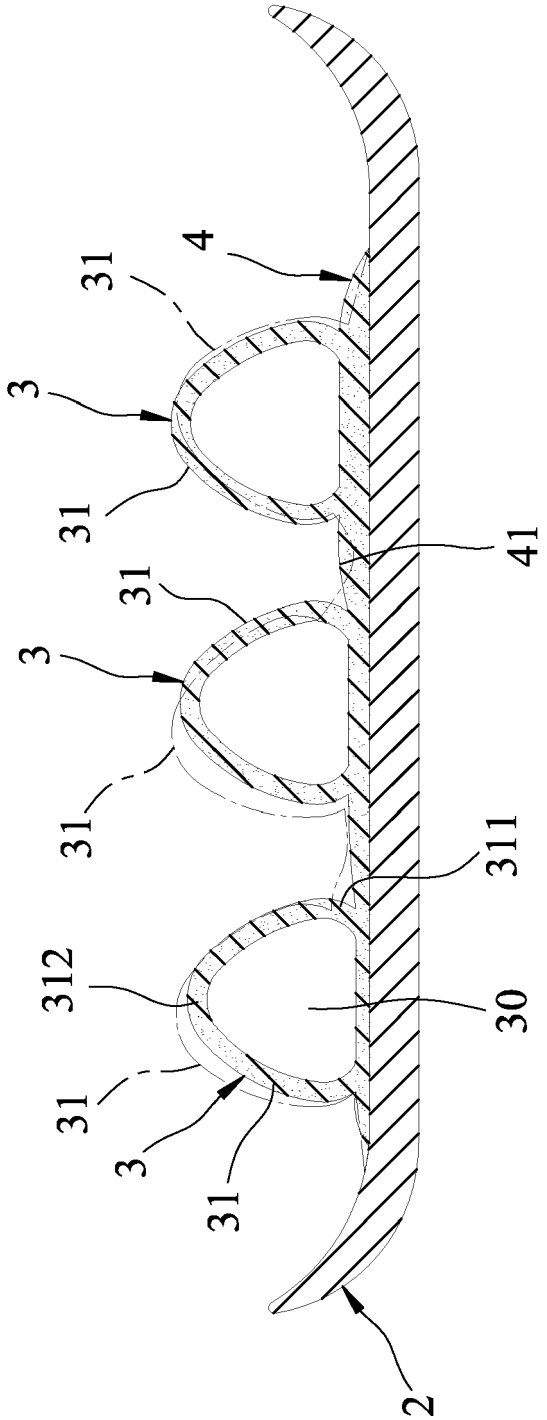

FIG.4

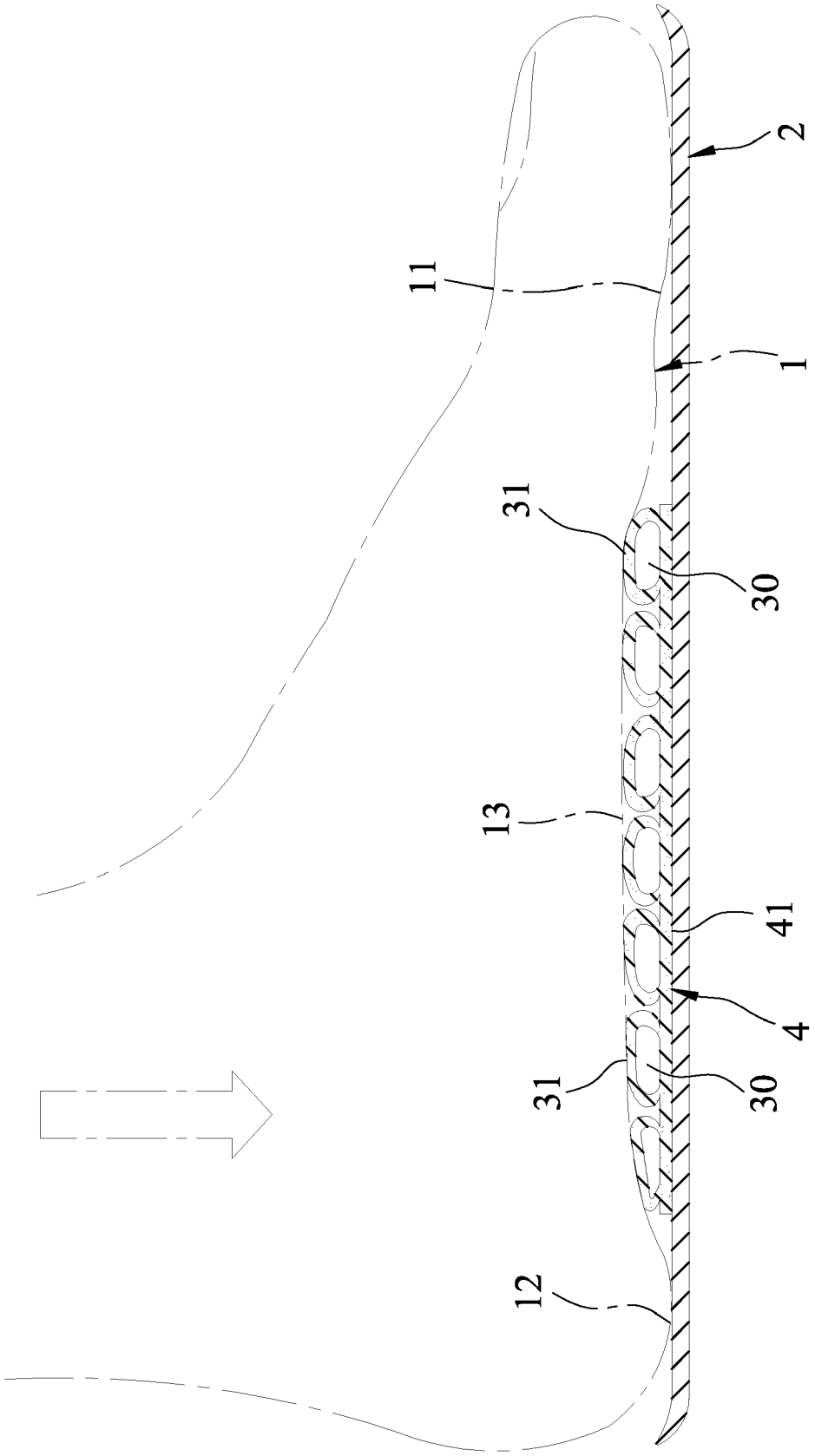

FIG.5

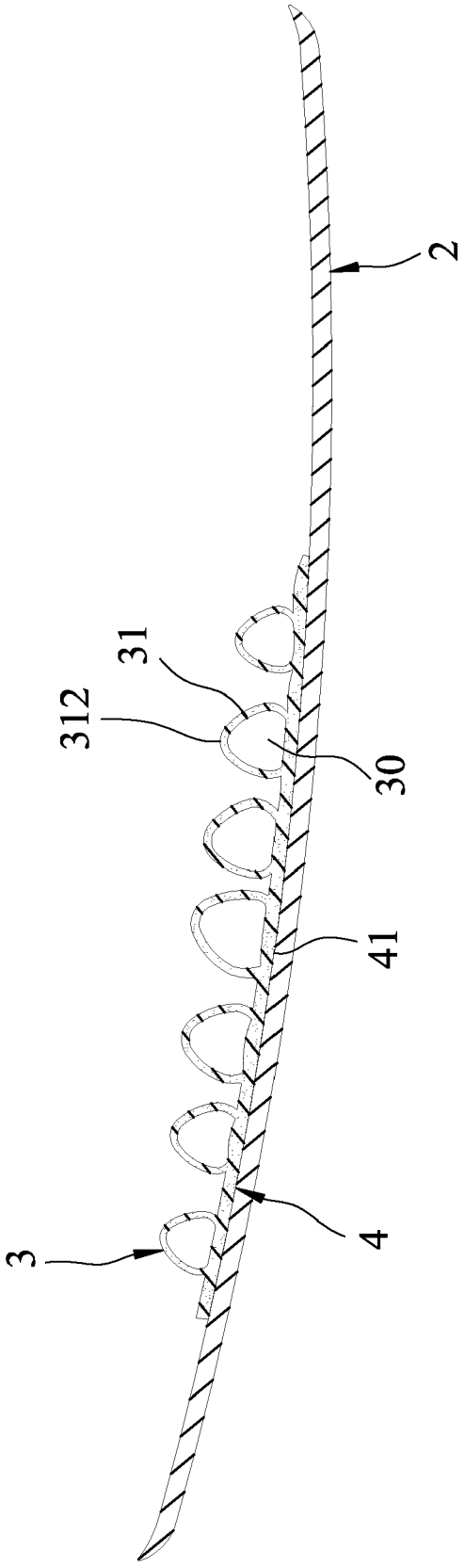

FIG.6

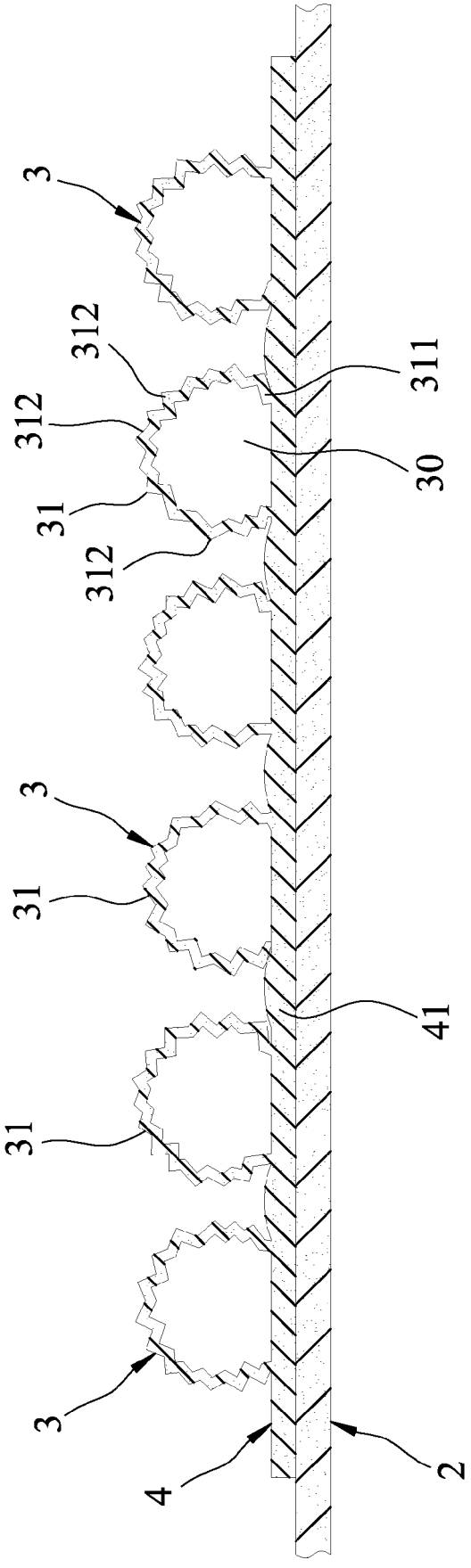

FIG.7

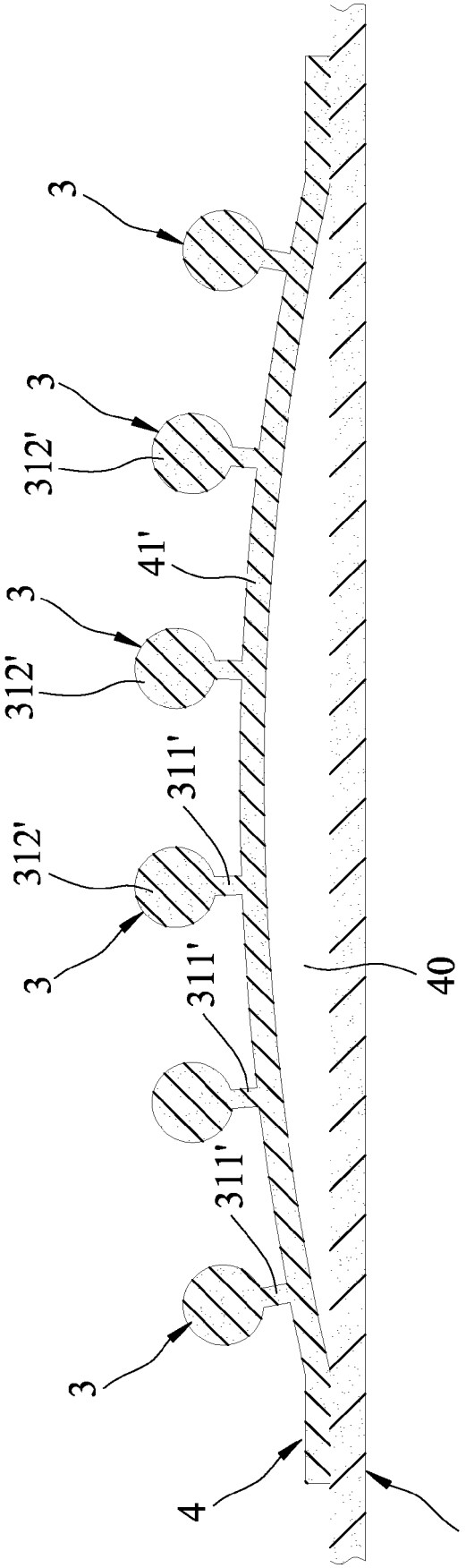

FIG.8

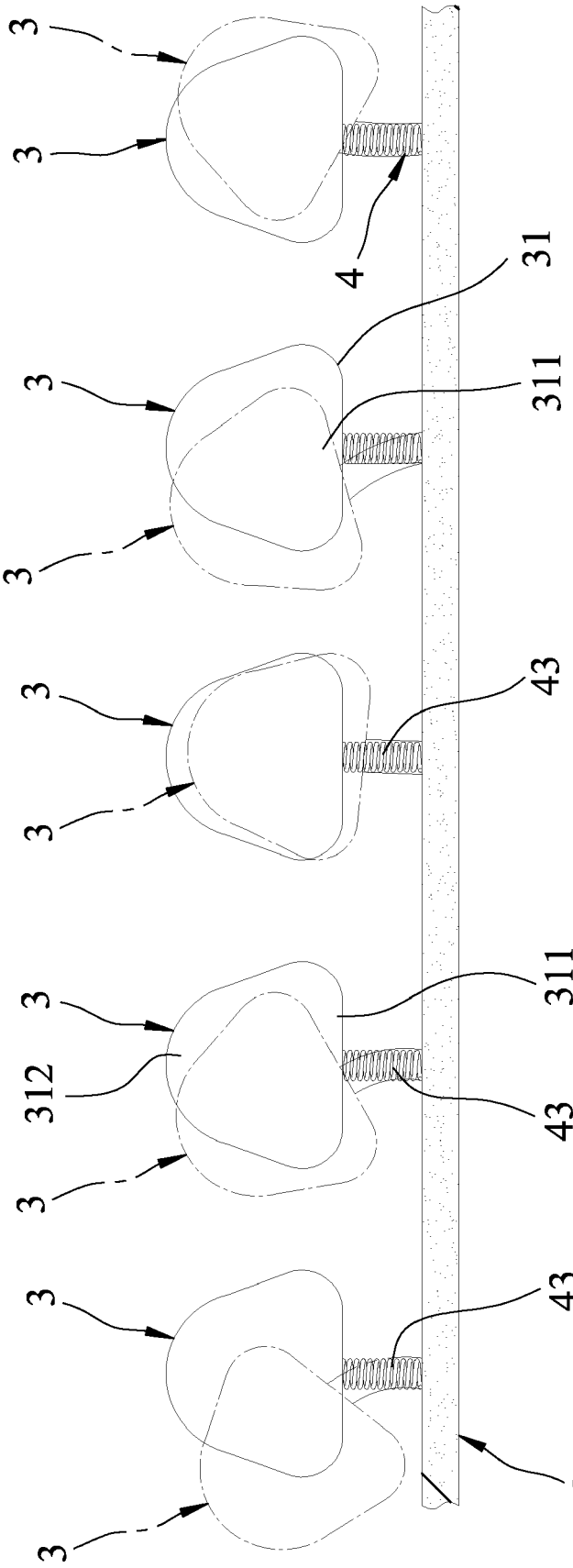

FIG.9

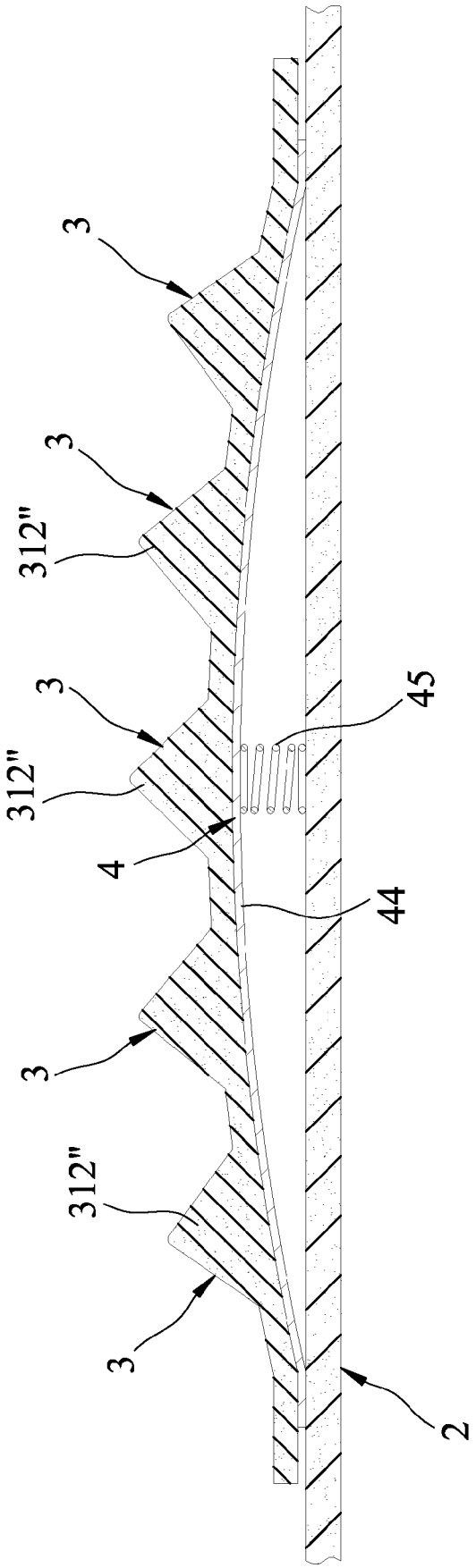

FIG.10

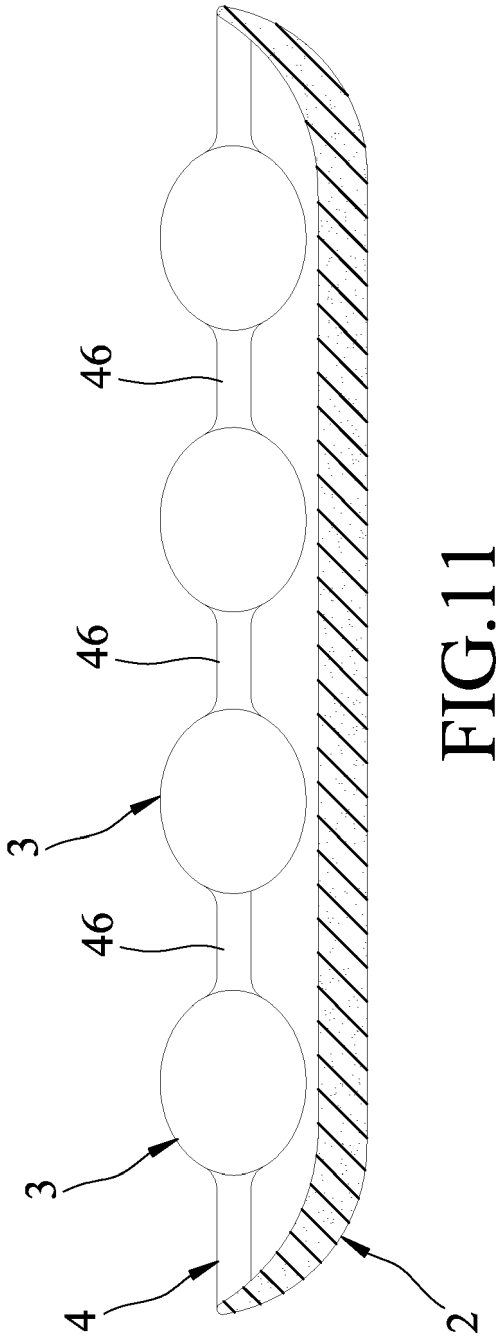

FIG.11

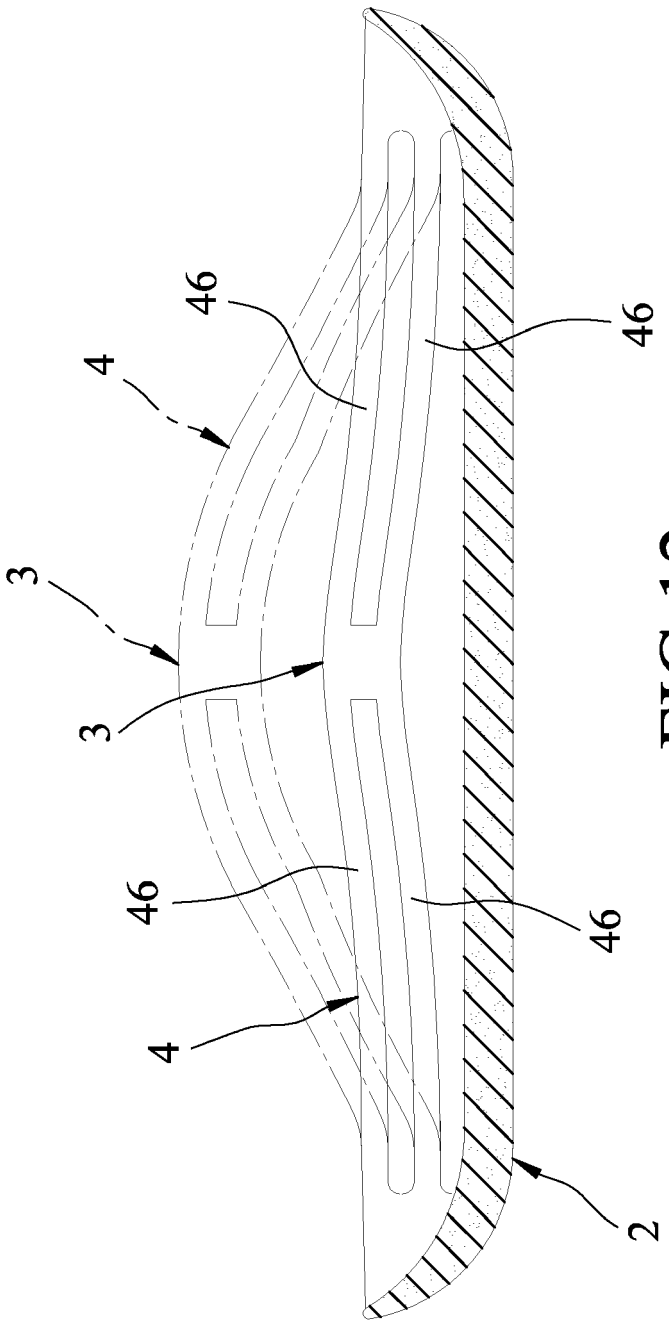

FIG.12

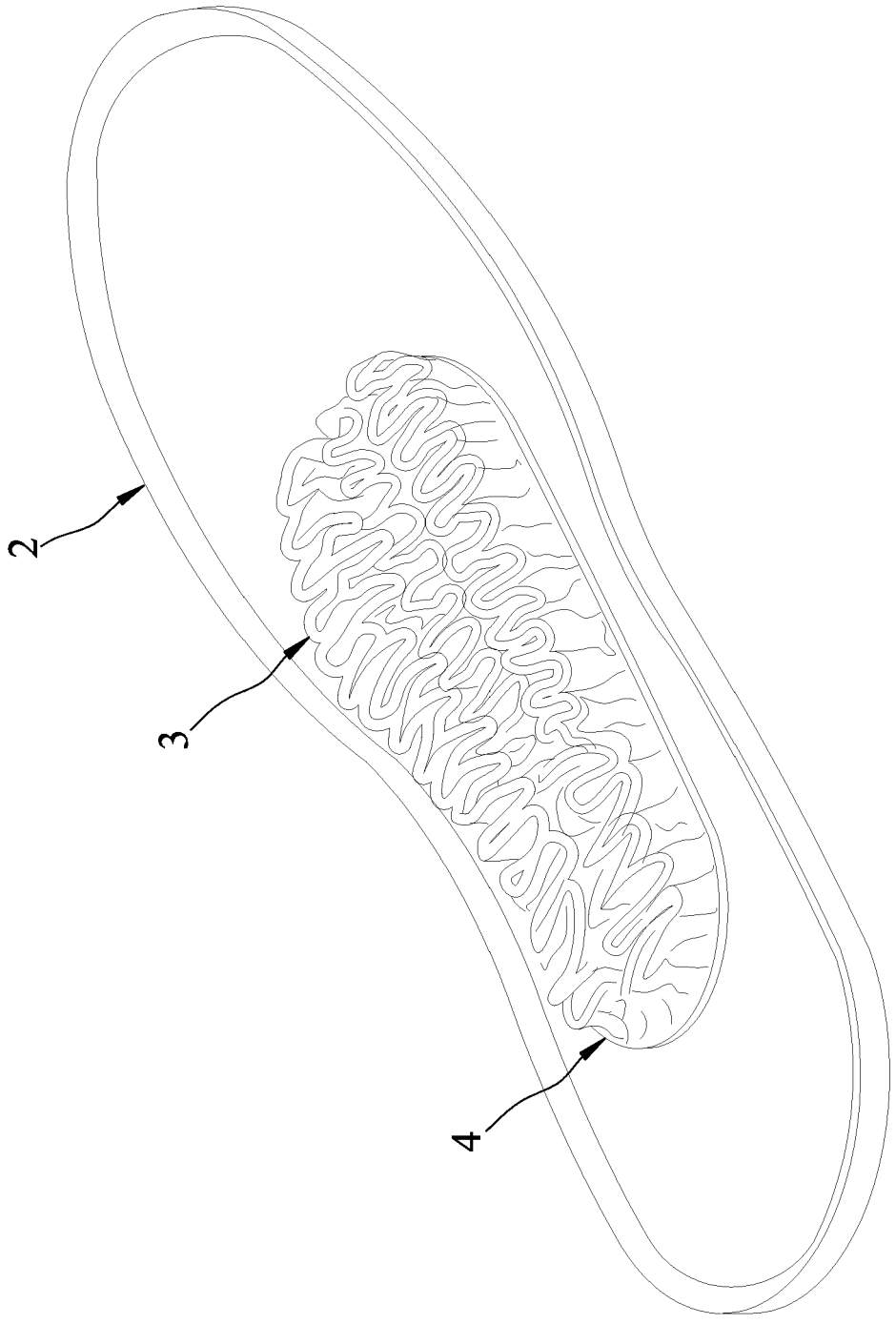

FIG.13

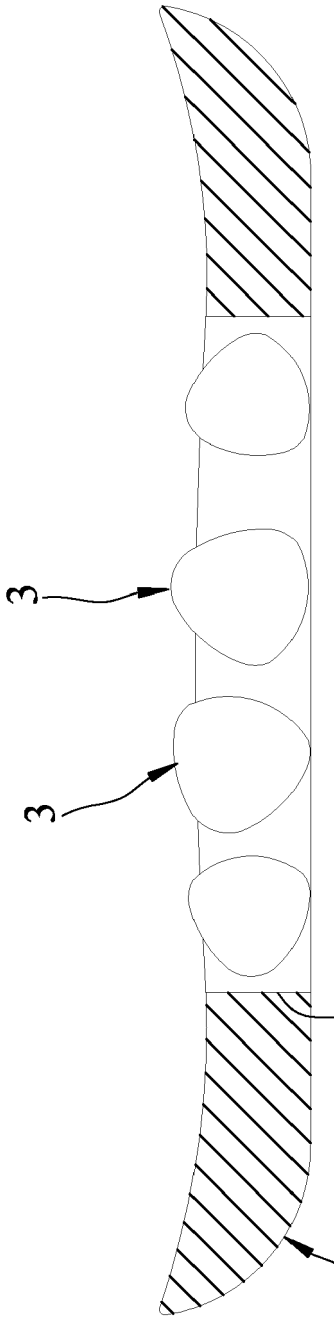

FIG.14

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 21 18 0770

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 99/32004 A1 (HA MU EON [KR]) 1 July 1999 (1999-07-01) * figures *	1-3,10	INV. A43B7/14
A		8	A43B13/12 A43B13/18
X	KR 102 016 981 B1 (NEWSTEP [KR]) 2 September 2019 (2019-09-02) * figures *	1,3-7,9,10	A43B17/00 A43B17/06
X	KR 2009 0036989 A (HWANGBO KUK JEONG [KR]) 15 April 2009 (2009-04-15) * figures *	1,3,9,10	
X	CN 110 771 988 A (NING FAKAI) 11 February 2020 (2020-02-11) * figures *	1,3,9,10	

TECHNICAL FIELDS SEARCHED (IPC)

A43B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	22 November 2021	Gkionaki, Angeliki

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 21 18 0770

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

22-11-2021

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9932004 A1	01-07-1999	AU 1510799 A	12-07-1999
		BR 9807712 A	02-05-2000
		CN 1248147 A	22-03-2000
		JP 2001520561 A	30-10-2001
		KR 19990028959 U	15-07-1999
		WO 9932004 A1	01-07-1999
KR 102016981 B1	02-09-2019	CN 111698922 A	22-09-2020
		EP 3756500 A1	30-12-2020
		JP 2021515606 A	24-06-2021
		KR 102016981 B1	02-09-2019
		US 2021212892 A1	15-07-2021
		WO 2020032484 A1	13-02-2020
KR 20090036989 A	15-04-2009	NONE	
CN 110771988 A	11-02-2020	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 10188172 B **[0002]**