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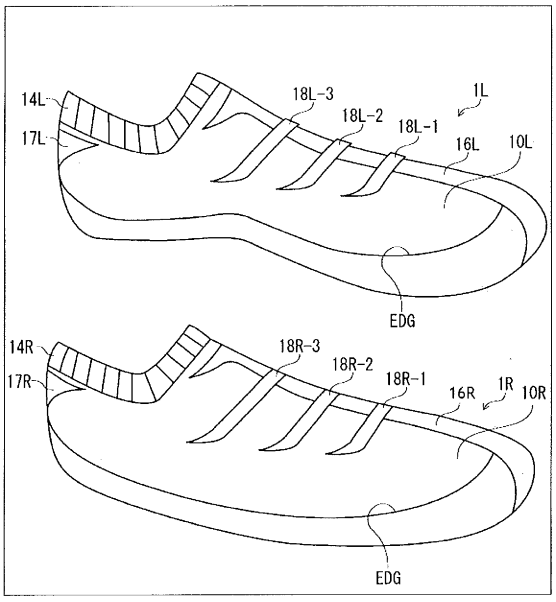
(54) **ATHLETIC FOOTWEAR**

(57) A footwear for exercise providing a superior portability to that of a sports shoe and providing a comparative comfort of exercise with that of a sports shoe is provided. The footwear 1L includes a covering member 10L and an insole member 11L. On an outer surface of the covering member 10L, a rubber member 15L to cover an entire bottom side portion of the covering member 10L where the insole member 11L is placed, a rubber member 16L to extend from a front end of the covering member 10L to a nearby portion of a step-in opening 13L of the covering member 10L, and a rubber member 17L to extend from a rear end of the covering member 10L to a nearby portion of a step-in opening 13L of the covering member 10L, are provided.

Fig. 1



EP 2 762 024 A1

Description

Technical Field

[0001] This invention relates to footwear to be worn on during exercise.

Background Art

[0002] Running shoes or jogging shoes which are kinds of exercise shoes are widely used. An art of this kind of shoes is disclosed in Patent literature 1. In Patent literature 1, a running shoe is disclosed in which a ring shaped portion is provided in a heel portion of a shoe to be engaged with a fixing belt, and the engaged fixing belt is wrapped around an ankle region of a user above a malleolus. With the art, the foot does not slip out from the shoe even in a case the heel portion is stepped on by a following runner in a packed group of runners. Thus, with the art, a case in which a runner is stepped on by the following runner at the heel portion and caused to be felled and injured is prevented to be occurred.

Citation List

Patent Literature

[0003] Patent Literature 1: Japanese Patent Application Publication No. 2003-009907

Summary of invention

Technical Problem

[0004] Incidentally, in persons doing exercises such as running as daily activities, some eager to carry exercise shoes to business trip destinations or travel destinations and to do exercises there. However, the conventional exercise shoes of this kind are bulky and thus cause a problem to occupy a large space inside of a suitcase and so forth.

[0005] This invention is intended to provide a footwear for exercise both providing a superior portability to that of a sports shoe and providing a comparative comfort in exercise with that of a sports shoe.

Solution to Problem

[0006] In order to solve the above problem, this invention provides a footwear for exercise comprising: a covering member formed by sewing with elastic fabric in a conforming sock shape to a lower part of a malleolus of a user's foot; an insole member made of impact absorption material formed in a conforming sheet-like shape to the foot sole shape of the user, the insole member being placed between the covering member and the foot sole of the user in the covering member; a first rubber member attached on the outer surface of the covering member as to cover an entire bottom side portion of the covering member where the insole member is placed; a second rubber member attached on the outer surface of the covering member as to extend from a front end of the covering member to a nearby portion of a step-in opening of the covering member; and a third rubber member attached on the outer surface of the covering member as to extend from a rear end of the covering member to a nearby portion of a step-in opening of the covering member.

[0007] In the footwear of this invention, a covering member formed by sewing with elastic fabric and rubber members attached on a part of the outer surface of the covering member are provided. The covering member is rolled as its front end being inserted into the step-in opening and then is packed in a substantially same size of a fist. In addition, the first rubber member is attached on the outer surface of the covering member as to cover an entire bottom side portion of the covering member where the insole member is placed. With the feature, a user can wear the footwear on the foot and can run in the forward direction with kicking the ground surface firmly. In addition, on the outer surface of the covering member, a second rubber member is attached as to extend from a front end of the covering member to a nearby portion of a step-in opening of the covering member, and a third rubber member is attached as to extend from a rear end of the covering member to a nearby portion of a step-in opening of the covering member. With the feature, in a running with the footwear worn on, the covering member is reduced to be twisted in the right and left and the foot is reduced to be popped out from the covering member. Accordingly, with this invention, a user can carry the footwear for exercise to a difficult destination to carry sports shoes such as business trip destinations, travel destinations and so forth, for example, and can do exercises there comfortably as if he wears a sports shoe on.

Brief Description of Drawings

[0008]

Fig. 1 is a perspective view of a footwear for exercise according to an embodiment of this invention;
Fig. 2 shows an internal structure and an insole member of the footwear in Fig. 1;
Fig. 3 is a bottom view and top view of a covering member of the footwear of Fig. 1; and
Fig. 4 is a rear view of a covering member of the footwear of Fig. 1.

Description of Embodiments

[0009] An embodiment of this invention is described below with referring to the drawings. Fig. 1 is a perspective view of a footwear 1L for exercise and a footwear 1R for exercise according to an embodiment of this invention. The footwear 1L and the footwear 1R are worn on

a left foot and a right foot of a user when the user does various exercises such as running and gymnastic exercises.

[0010] Fig. 2(A) shows an internal structure of the footwear 1L in Fig. 1. As shown in Fig. 2(A), the footwear 1L includes a covering member 10L and an insole member 11L. Fig. 2(B) is a perspective view of the insole member 11L in Fig. 2(A). Fig. 2(C) shows the insole member 11L in Fig. 2(B) viewing from the bottom. Fig. 3(A) is a top view of the covering member 10L of the footwear 1L. Fig. 3(B) is a bottom view of the covering member 10L. Fig. 4 is a rear view of the covering member 10L. In the footwear 1R, a covering member 10R and an insole member 11R are formed in mirror symmetric structures to the covering member 10L and the insole member 11 L of the footwear 1L.

[0011] The covering member 10L is formed by sewing with fabric for socks having both water repellency and elasticity, more preferably, with fabric woven with front yarns of cotton or silk and back yarns of nylon or polyurethane, and is formed in a conforming sock shape to a lower part of a malleolus of a user's foot. In addition, the insole member 11 L is made of an EVA (ethylene-vinyl acetate) material having impact absorption capability, and is formed in a conforming sheet-like shape to the foot sole shape of a user.

[0012] As shown in Fig. 3(A) and Fig. 4, an step-in opening 13L is provided in the top portion near the rear end of the covering member 10L. The step-in opening 13L is formed within an elastic ring shaped band 14L, and the band 14L is made from fabric woven with rubber thread. On the outer surface of the covering member 10L, rubber members 15L, 16L, 17L and 18L-k (k = 1 to 3) are attached.

[0013] The rubber members 15L, 16L, 17L, and 18L-k (k = 1 to 3) are made of rubber material, and the measured hardness of the rubber material is in a range from 30 to 60 at 20 degrees Celsius with a type A durometer defined in JIS K 6253. More specifically, rubber member 15L covers an entire bottom side portion 40L in Fig. 3(C) of the outer surface of the covering member 10L where the insole member 11L is placed. The rubber member 15L has a peripheral edge EDG extending in an upper side of the outer surface of the bottom portion 40L of the covering member 10L. Both of the width of the front end portion of the covering member 10L covered by the rubber member 15L and the gap between the peripheral edge EDG of the rubber member 15L in the front end side of the bottom portion 40L are wider than both of the width of the foot arch portion of the covering member 10L covered by the rubber member 15L and the gap between the peripheral edge EDG of the rubber member 15L in the foot arch side of the bottom portion 40L.

[0014] The rubber member 16L is formed on the outer surface of the covering member 10L in an extending bar shape from a front end of the covering member to a nearby portion of elastic band 14L. The rubber member 16L is bended to be formed in a hook shape in the side view. The front end of the rubber member 16L is connected with the rubber member 15L at a front end of a longitudinal groove 31L in Fig. 3(B). The rear end portion of the rubber member 16L to the side of the elastic band 14L is formed in a substantially crescent shape as to extend in the right side and left side. The side extended portions by the crescent shape of the rubber member 16L are bended inwardly to conform to the round shape of the instep of a user's foot.

[0015] The rubber member 17L is formed on the outer surface of the covering member 10L in an extending bar shape from a rear end of the covering member to a nearby portion of elastic band 14L. The lower end of the rubber member 17L is connected with the rubber member 15L at a rear end of the longitudinal groove 31L in Fig. 3(B). As shown in Fig. 4, the upper end portion of the rubber member 17L to the side of the elastic band 14L is formed in a shape as to extend in the right side and left side. The side extended portions in the right side and the left side at the upper end of the rubber member 17L are bended inwardly to conform to the round shape of the base portion of the Achilles tendon of a user's foot.

[0016] Each of the rubber members 18L-k (k = 1 to 3) is formed in an elongated bar shape. Within the rubber member 18L-k (k = 1 to 3), the rubber member 18L-3 is placed at a distant position in the front end side from the rear end of the rubber member 16L, and formed in a extending bar shape in the right direction and the left direction from the rubber member 16L. The rubber member 18L-2 is placed at a distant position in the front end side from the rubber member 18L-3, and is formed in a extending bar shape in the right direction and the left direction. The rubber member 18L-1 is placed at a distant position in the front end side from the rubber member 18L-2, and is formed in a extending bar shape in the right direction and the left direction. The length of the rubber member 18L-2 is longer than that of the rubber member 18L-1. The length of the rubber member 18L-3 is longer than that of the rubber member 18-2. The rubber members 18L-k (k = 1 to 3) are bended inwardly to conform to the round shape of the instep of a user's foot.

[0017] As shown in Fig. 3(B), in the bottom surface of the rubber member 15L, a longitudinal groove 31 L and transverse grooves 32L-i (i = 1 to 6) and 33L-i (i = 1 to 6) are formed. The longitudinal groove 31L is formed in a straight line shape from the front end to the rear end in the bottom surface of the rubber member 15L. The transverse grooves 32L-i (i = 1 to 6) are formed in a extending shapes from the longitudinal groove 31L in the angled left back direction, and arrayed by a distance W1, for example W1 is 2 centimeters, started from the front end of the longitudinal groove 31L. The crossing angles $\theta 2$ of the longitudinal groove 31L and the transverse grooves 32L-i are 45 degrees. Each of the outer ends of the transverse grooves 32L-i (i = 1 to 6) reaches at the peripheral edge of the bottom surface of the rubber member 15L.

[0018] The transverse grooves 33L-i (i = 1 to 6) are formed in a extending shapes from the longitudinal

groove 31L in the angled right back direction, and arrayed by a distance W1, started from the front end of the longitudinal groove 31L. The crossing angles θ2 of the longitudinal groove 31L and the transverse grooves 33L-i are 45 degrees. Each of the outer ends of the transverse grooves 33L-i (i = 1 to 6) reaches at the peripheral edge of the bottom surface of the rubber member 15L.

[0019] The depth of the longitudinal groove 31L is 1 millimeter, for example, and thus is greater than the depths of the transverse grooves 32L-i (i = 1 to 6) and 33L-i (i = 1 to 6) which are formed in 0.5 millimeter depth, for example. The widths in the perpendicular directions to the extending directions of the longitudinal groove 31L and the transverse grooves 32L-i (i = 1 to 6) and 33L-i (i = 1 to 6) are formed in the same size, for example, 5 millimeters widths.

[0020] Fig. 3(C) is a cross sectional view along with the line C-C' in Fig. 4. As shown in Fig. 3(C), in the bottom portion 40L of the covering member 10L where the insole member 11L is placed, a plurality of project portions S are formed with rubber material. The project portion S is formed in a perfect circle shape. The project portions S are arrayed in same adjacent distances on the bottom portions 40L. These project portions S are projected in the above direction of the bottom portion 40L as to form a patterned indented portion on the bottom portion 40L.

[0021] As shown in Fig. 2(B), in the top surface 51L of the insole member 11L, a dimple portion 53L to the side of the bottom surface 52L is formed at a beneath portion of a heel bone of a user. In the top surface 51L of the insole member 11L, a dimple portions 54L to the side of the bottom surface 52L is formed at a beneath portion of a metatarsal bones of the user. In the top surface 51L of the insole member 11L, a dimple portion 55L to the side of the bottom surface 52L is formed at a beneath portion of a toe bones of the user.

[0022] The depths of the dimple portions 53L, 54L and 55L are 5 millimeters from the top surface 51L of the insole member 11L to the bottoms of the dimple portions. In addition, as shown in Fig. 2(C), the bottom surface 52L of the insole member 11L is formed in a flat. As described above, the insole member 11L of the footwear 1L and the insole member 11R of the footwear 1R are in mirror symmetric structures each other. And thus, the insole member 11L in the covering member 10L and the insole member 11R in the covering member 10R can be exchangeable each other with each of them turned the top surface and the bottom surface over.

[0023] Above descriptions are the detailed structures of this embodiment. With this embodiment, technical effects described below are obtained.

[0024] First, the footwear 1L of this embodiment includes a covering member 10L formed with elastic fabric, and rubber members 15L, 16L, 17L and 18L-k (k = 1 to 3) covering a part of the outer surface of the covering member. In addition, the footwear 1R includes a covering member 10R formed with elastic fabric, and rubber members 15R, 16R, 17R and 18R-k (k = 1 to 3) covering a part of the outer surface of the covering member. The measured hardness of the rubber members 15L, 16L, 17L and 18L-k (k = 1 to 3) on the covering members 10L and 10R are in a range from 30 to 60 with a type A durometer defined in JIS K 6253 and thus are softer than that of a sole of a sports shoe. Thus, the covering members 10L and 10R can be rolled as their front ends being inserted into the step-in openings 13L and 13R and then are packed in the substantially same sizes of fists. The rolled covering members 10L and 10R are about in the fist sizes and can be carried easily. In addition, the rubber members 15L and 15R of the footwears 1L and 1R cover the entire bottom side portions on the outer surfaces of the covering members where the insole members 11L and 11R are placed. With the features, a user can worn the footwear 1L and 1R on the feet and can run in the forward direction with kicking the ground surface firmly. In addition, on the outer surfaces of the covering member 10L and 10R, the rubber members 16L and 16R are attached as to extend from front ends of the covering members 10L and 10R to a nearby portions of the step-in openings 13L and 13R of the covering members 10L and 10R, and rubber members 17L and 17R are attached on the outer surfaces of the covering members as to extend from rear ends of the covering members to a nearby portions of the step-in openings of the covering members. With the features, when a user wears the footwears 1L and 1R on the left foot and the right foot and runs, the internal surfaces of the covering members 10L and 10R and the insole members 11L and 11R are tightly fit around the left foot and the right foot of the user. As a result, according to this embodiment, a user can carry the footwears 1L and 1R for exercise to a difficult destination to carry sports shoes such as business trip destinations, travel destinations and so forth, and can do exercises there comfortably as if he wears a sports shoe on.

[0025] Second, on the outer surfaces of the covering member 10L and 10R of this embodiment, the rubber members 18L-k and 18R-k are formed as to bended inwardly to conform to the rounds of the insteps of user's feet. In addition, the rear end portions of the rubber members 16L and 16R in the end portion sides of the elastic bands 14L and 14R are formed as to extend in the right sides and the left sides, and the extended portions in the right sides and the left sides are bended inwardly to conform to the round of the insteps of user's feet. In addition, the upper ends of the rubber members 17L and 17R in the end portion sides of the elastic bands 14L and 14R are formed as to extend in the right sides and the left sides, and the extended portions in the right sides and the left sides are bended inwardly to conform to the round of the base portions of Achilles tendons of user's feet. Thus, when a user wears the covering members 10L and 10R on the left foot and the right foot, the insteps of the left foot and the right foot are held by the inwardly bended portions of the rubber members 18L-k and 18R-k and by the inwardly bended rear end portions of the rubber members 16L and 16R, and the heels of the left foot and the

right foot are held by the inwardly bended portions of the rubber members 17L and 17R. Accordingly, even in a case a user moves in a side direction as the weight being shifted, for example, jumps to the side direction, the covering members 10L and 10R are reduced to be twisted in the side direction. As a result, when a user does this kind of exercises, the left foot is reduced to be popped out from the covering member 10L and the right foot is reduced to be popped out from the covering member 10R.

[0026] Third, because the footwears 1L and 1R of this embodiment are constituted with the covering members 10L and 10R of fabric or cloth and the rubber members 15L, 16L, 17L and 18L-k (k = 1 to 3) being bonded or fixed on the outer surfaces of the covering members, the footwears can be washed with water in a washing machine and the dirt on the fabric can be easily removed.

[0027] Fourth, in this embodiment, in the bottom portions 40L and 40R of the internal surfaces of the covering members 10L and 10R where the insole members 11L and 11R are placed, the indented portions are formed. Thus, with this embodiment, the insole members 11L and 11R can be gripped with stronger forces.

[0028] Fifth, in this embodiment, the insole members 11L and 11R are made of EVA. EVA is known as a material having a more flexible and thus gives softer feel than other resin materials used in the same purpose. Thus, this embodiment can provide a higher comfort in a running than a case in which the other resin material is used for the insole members 11L and 11R.

[0029] Sixth, in this embodiment, the bottom surfaces 52L and 52R of the insole members 11L and 11R are formed in flat surfaces, and the top surfaces 51L and 52R of the insole members 11L and 11R are formed in the patterned indented surfaces at a beneath portion of a heel bone, at a beneath portion of a metatarsal bones and at beneath portion of a toe bones of the user's feet. Thus, the insole member 11L in the covering member 10L and the insole member 11R in the covering member 10R can be exchangeable each other with each of them turned the top surface and the bottom surface over. Some users of the footwears 1L and 1R may prefer the flat surfaces in exercise of the insole members 11L and 11R for the left foot and the right foot, some users may prefer the conformed dimpled shapes in exercise to the foot soles at the beneath portions of the left foot and the right foot of the insole member 11L and 11R. In addition, some users may prefer the flat surfaces in a exercising case with jumps such as running for the left foot and the right foot, and may prefer the conformed dimpled shapes in other exercising case without jumps such as gymnastic exercises to the foot soles at the beneath portions of the left foot and the right foot. With this embodiment, users can select the fitting feels of the insole members 11L and 11L in accordance with each of preferred conforming themselves, and can do their exercises more comfortably.

[0030] Seventh, in this embodiment, the grooves 31L and 31R are formed from the front end to the rear end of the rubber members 15L and 15R. Thus, this embodiment can improve the straight-running stability when users wear the footwears 1L and 1R on and run.

[0031] Eighth, in this embodiment, at the step-in openings 13L and 13R of the covering members 10L and 10R, the elastic bands 14L and 14R with woven rubber thread is provided. Thus, with this embodiment, the feet are prevented from being popped out from the covering members 10L and 10R.

[0032] The above description is an embodiment of this invention, and the embodiment may be modified as follows.

(1) In the above embodiment, the project portions S formed on the bottom section 40L is formed in perfect circle shapes. Instead of the structure, the project portions S may be replaced to project portions shaped in stripes.

(2) In the above embodiment, the rubber members 18L-k are provided by three. Instead of the structure, the rubber members 18L-k may be provided by one or two, or provided by five or more.

(3) In the above embodiment, in the bottom surface of the rubber member 15L, both of the longitudinal groove 31L and the transverse grooves 32L-i (i = 1 to 6) and 33L-i (i = 1 to 6) are provided. Instead of the structure, only the longitudinal groove 31L may be provided in the bottom surface of the rubber member 15L.

Reference Signs List

[0033] 1 ... footwear, 10 ... covering member, 11 ... insole member, 13 ... step-in opening, 14 ... elastic band, 15, 16, 17, 18 ... rubber member, 31 ... longitudinal groove, 32, 33 ... transverse groove, 40 ... bottom portion, 51 ... top surface, 52 ... bottom surface, 53, 54, 55 ... dimple portions

Claims

1. Footwear (1) for exercise comprising:

a covering member (10) formed by sewing with elastic fabric in a conforming sock shape to a lower part of a malleolus of a user's foot;

an insole member (11) made of impact absorption material formed in a conforming sheet-like shape to the foot sole shape of the user, the insole member (11) being placed in the covering member (10) between the covering member (10) and the foot sole of the user;

a first rubber member (15) attached on the outer surface of the covering member (10) as to cover an entire bottom side portion of the covering member (10) where the insole member (11) is

placed;
a second rubber member (16) attached on the outer surface of the covering member (10) as to extend from a front end of the covering member (10) to a nearby portion of a step-in opening (13) of the covering member (10); and
a third rubber member (17) attached on the outer surface of the covering member (10) as to extend from a rear end of the covering member (10) to a nearby portion of a step-in opening (13) of the covering member (10).

2. The footwear (1) for exercise according to claim 1, wherein
a fourth rubber member (18) attached on the outer surface of the covering member (10) as to be in an elongated shape of a perpendicular direction to a extending direction of the second rubber member (16).

3. The footwear (1) for exercise according to claim 2, wherein
the first rubber member (15), the second rubber member (16), the third rubber member (17) and the fourth rubber member (18) are made of rubber material, the measured hardness of the rubber material being in a range from 30 to 60 with a type A durometer defined in JIS K 6253.

Fig. 1

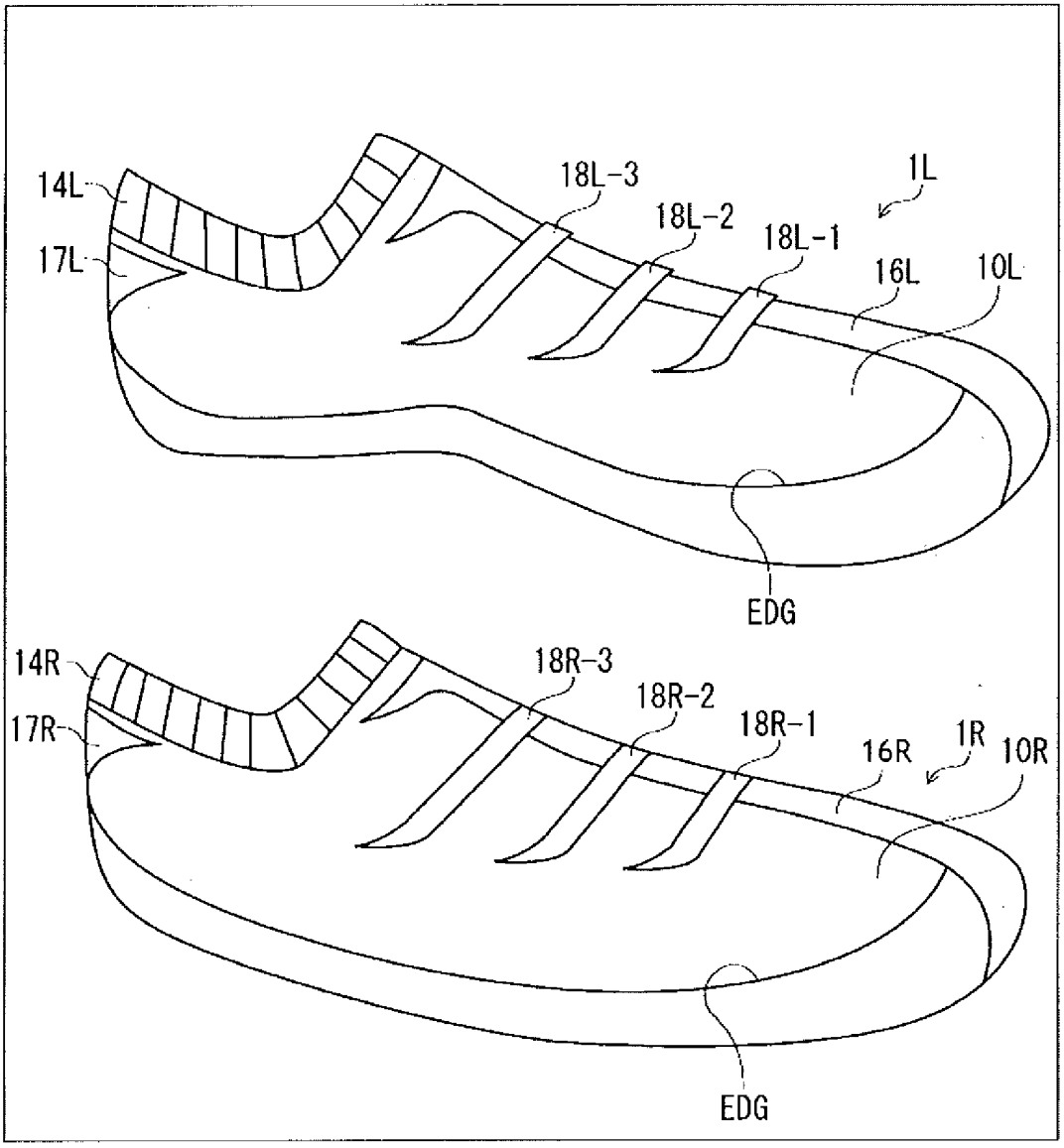

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Fig. 2

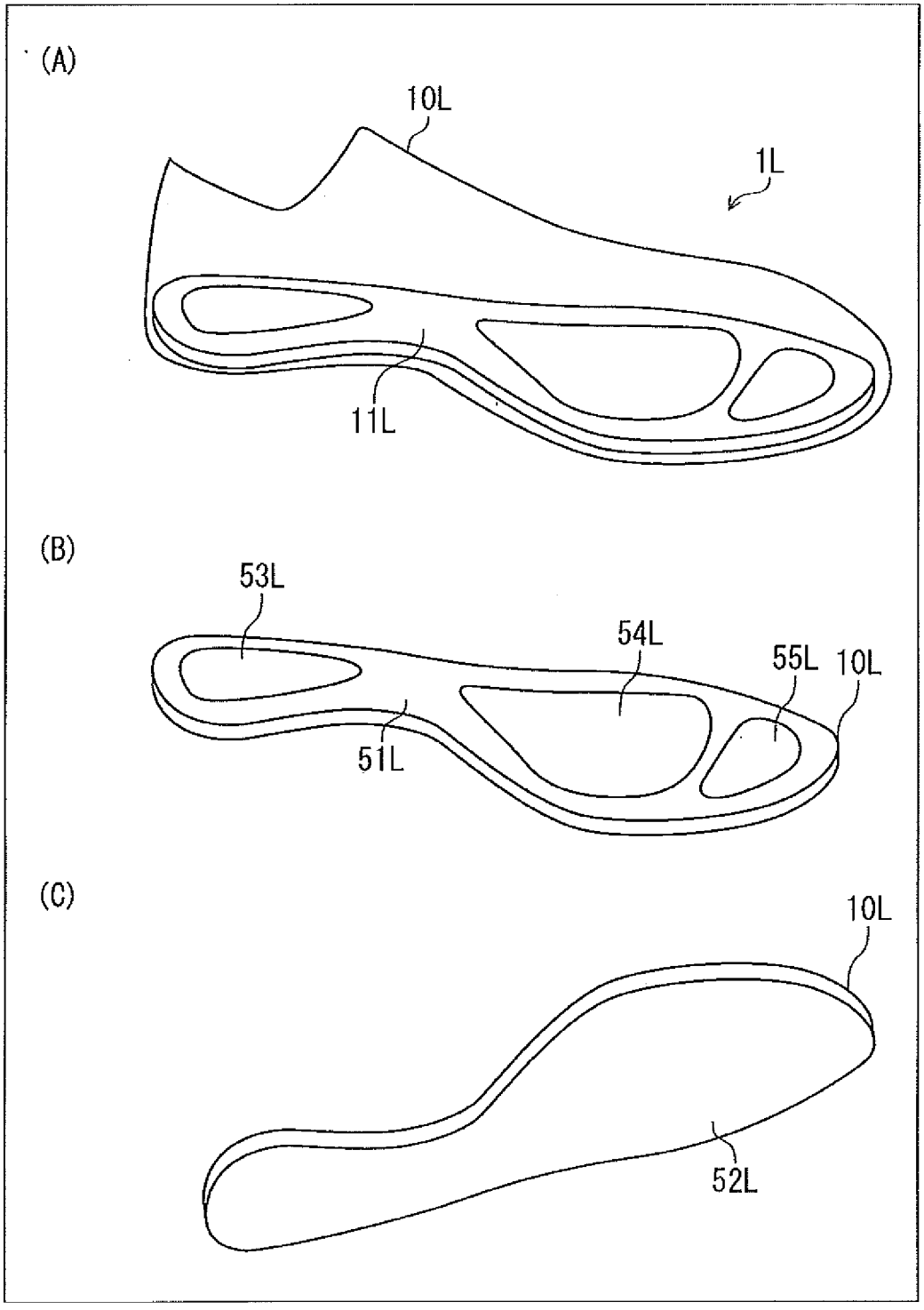

Fig. 3

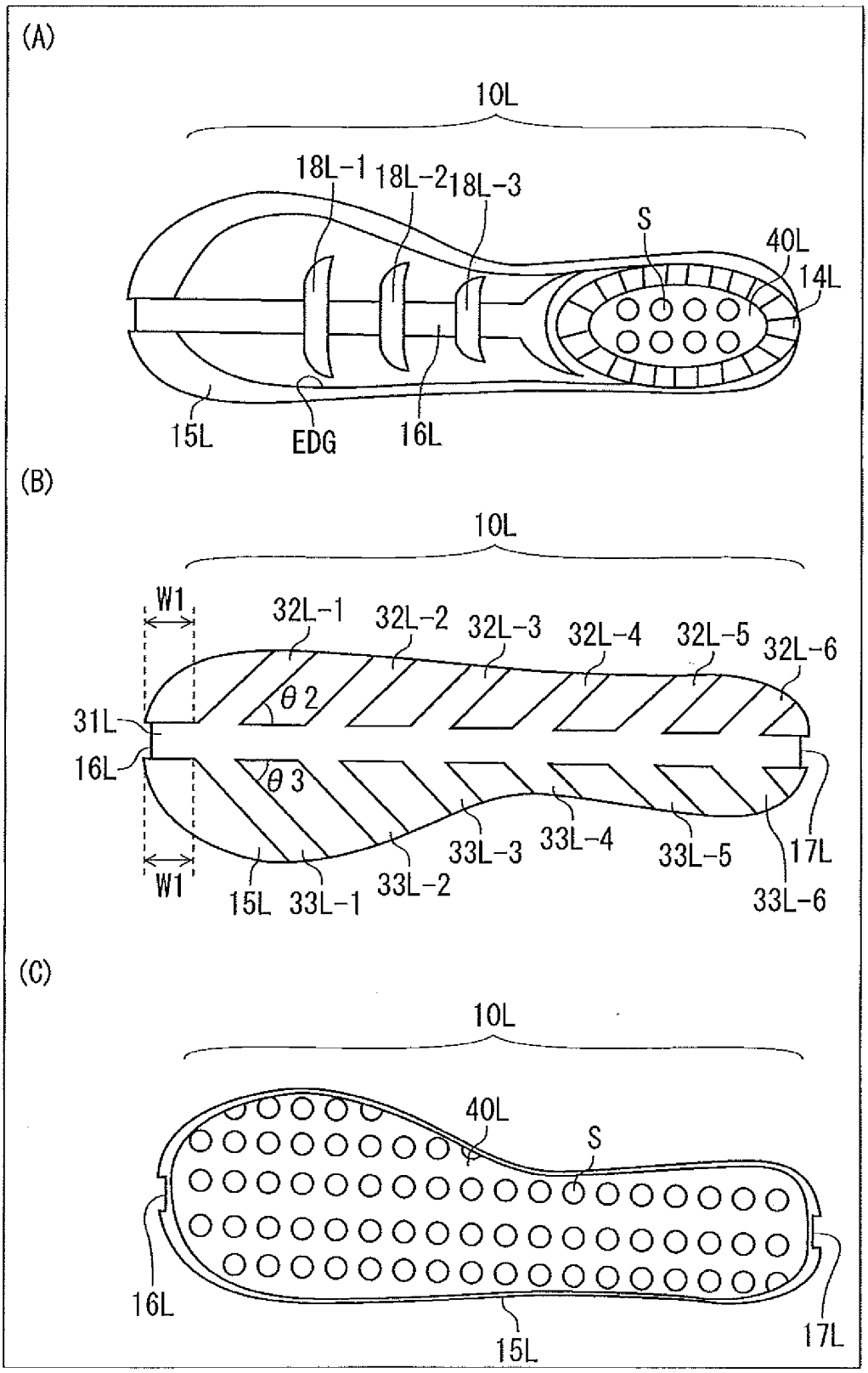
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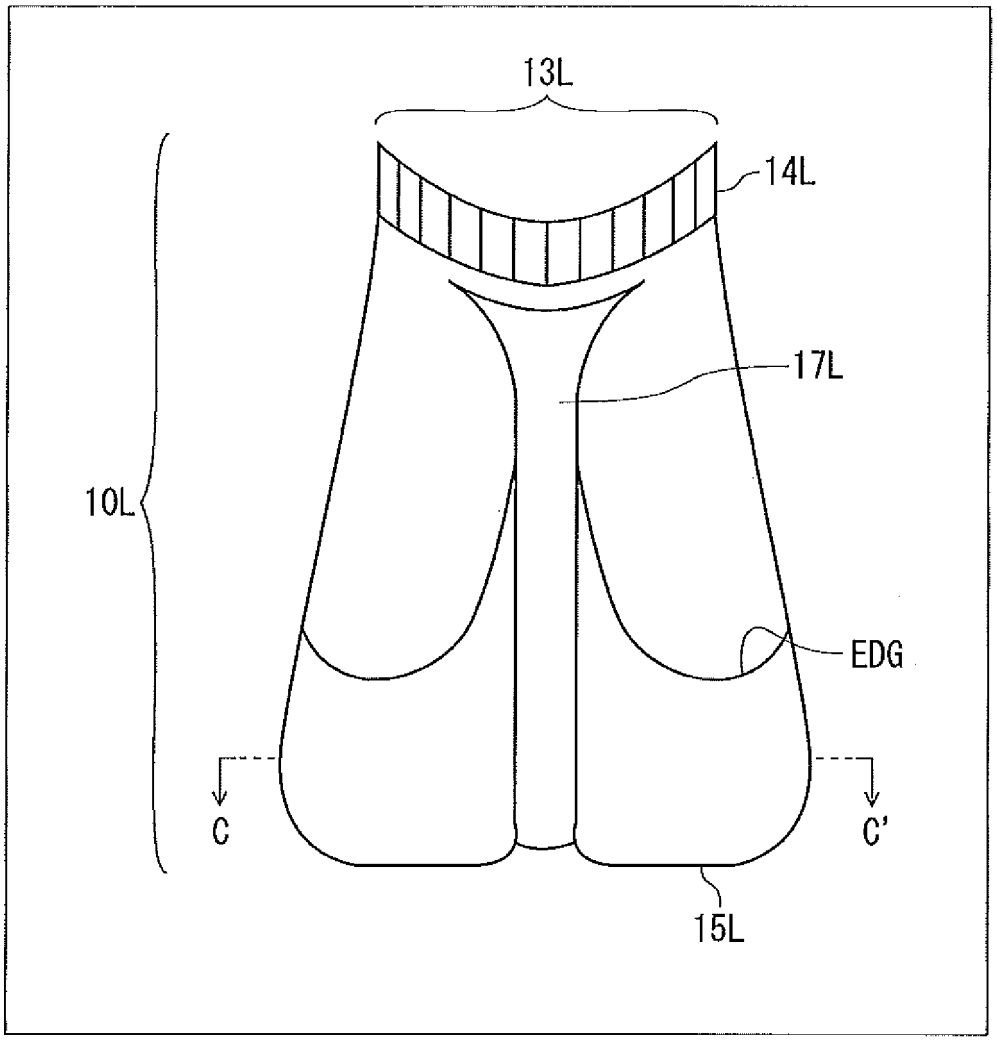
Fig. 4



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2013/069592

A. CLASSIFICATION OF SUBJECT MATTER
A43B3/24(2006.01)i, *A43B1/10*(2006.01)i, *A43B5/06*(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A43B3/24, A43B1/10, A43B5/06

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

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2013
Kokai Jitsuyo Shinan Koho	1971-2013	Toroku Jitsuyo Shinan Koho	1994-2013

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.
Y A	JP 38-17910 Y1 (Shin'ichi MASUTANI), 24 August 1963 (24.08.1963), page 1, left column, line 20 to right column, line 4; right column, lines 20 to 24; drawings (Family: none)	1 2-3
Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 23712/1981(Laid-open No. 136204/1982) (Kazuko NEGISHI), 25 August 1982 (25.08.1982), page 2, line 8 to page 3, line 2; drawings (Family: none)	1

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search 01 August, 2013 (01.08.13)	Date of mailing of the international search report 13 August, 2013 (13.08.13)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2013/069592

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2008-178687 A (Wolverine World Wide, Inc.), 07 August 2008 (07.08.2008), claim 1; paragraph [0015] & US 2008/0168681 A1 & EP 1943913 A1	1-3

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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