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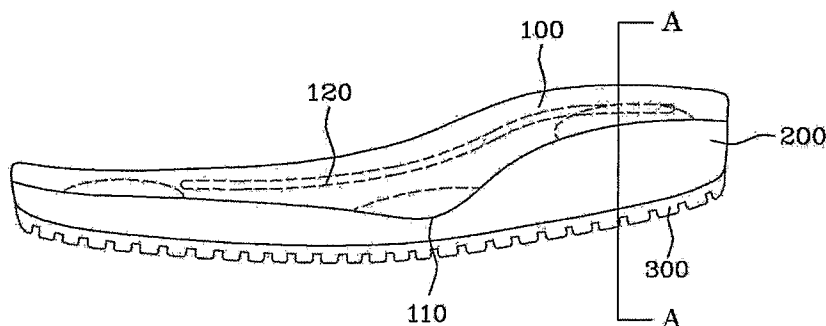
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(54) Title: SOLE FOR SEESAW FOOTWEAR



(57) Abstract: A footwear sole having a dual- structure midsole, in which a seesaw movement can be performed to enhance an exercise effect during walking. The seesaw-motion footwear sole includes a main midsole having a convex projection in the central portion of the underside thereof to define a walking axis; a sub-midsole coupled to the underside of the main midsole and made of a softer material than that of the main midsole in order to exhibit a primary shock absorbing function, wherein the sub-midsole allows the main midsole to perform a seesaw movement on the basis of the walking axis in backward and forward directions during walking; and an outsole coupled to the sub-midsole. The seesaw-motion footwear sole can be applied to a variety of shoes such as running shoes, and can advantageously provide an excellent exercise effect, which is superior to that provided by heelless shoes of the prior art.

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Description

SOLE FOR SEESAW FOOTWEAR

Technical Field

- [1] The invention relates to a footwear sole, and more particularly, to a footwear sole having a dual-structure midsole, with which a seesaw movement can be performed to enhance an exercise effect during walking.

Background Art

- [2] In general, a variety of shoes suitable for different purposes is provided to consumers as living standards and technologies advance, and in particular, special purpose shoes, to which various functions are added, have been recently developed. Examples of special purpose shoes include shoes suitable for medical treatment of diabetics and running shoes for exercise, etc. Also, as another kind of functional shoe that is well-known, there is a heelless shoe, in which a larger exercise effect can be realized during walking since there is no heelpiece.
- [3] Hereafter, the prior art related to the invention will be described.
- [4] There is disclosed a 'Functional Shoe' in Korean Utility Model Registration No. 418896, as shown in a cross-sectional view in Fig. 1 herein. The functional shoe as shown includes a shoe upper 1, a shoe sole 2, which is coupled to the shoe upper and is provided with a spacing portion 24 configured to space a portion, corresponding to the heel of a wearer's foot, apart from the ground, and a shock absorbing member 4, made of a flexible material, which is coupled to the spacing portion 24 and in which an end portion, facing the ground, is spaced apart from the ground.
- [5] In the functional shoe according to the prior art, the shock-absorbing member 4 is added to a spacing portion, which is concavely formed in an existing heelless shoe in order to complement the heelless shoe. The shock-absorbing member 4, however, is shaped as if it had no heel so as to be spaced apart from the ground. Therefore, both the existing heelless shoe and the functional shoe mentioned above as an example of the prior art have a problem in that consumers could experience discomfort.
- [6] In detail, in the case of the functional shoe of the prior art, the external shape thereof, which is different from that of a conventional shoe, discourages consumers from purchasing the shoe even if they are made aware of the excellent exercise effect of the functional shoe. Therefore, there is a need to develop a footwear sole having an external shape corresponding to that of a conventional shoe sole while ensuring an exercise effect that is equal to or better than that of the prior art.
- [7] In addition, when walking, the functional shoe of the prior art as mentioned above provides the exercise effect only when the heel portion thereof is spaced apart from the

ground. Consequently, when the load is transferred to the tip of the functional shoe after the heelpiece thereof has been in contact with the ground, the shoe behaves similarly to a conventional shoe, thereby causing a problem in that the amount of movement in the tip might not be balanced with that in the heelpiece.

Disclosure of Invention

Technical Problem

- [8] In order to solve the problems with the prior art as mentioned above, an object of the present invention is to provide a footwear sole having a dual-structure midsole made of different materials such that movement, such as a seesaw movement, can be performed to achieve an exercise effect that is balanced across both the tip and the heelpiece when a user is walking, thereby ensuring a superior function.

Technical Solution

- [9] To achieve the above objects, the invention provides a seesaw-motion footwear sole, which includes a main midsole having a convex projection in the central portion of the underside thereof to define a walking axis; a sub-midsole coupled to the underside of the main midsole and made of a softer material than the main midsole in order to exhibit a primary shock absorbing function, wherein the sub-midsole allows the main midsole to perform a seesaw movement on the basis of the walking axis in backward and forward directions during walking; and an outsole coupled to the sub-midsole.
- [10] Also, according to an embodiment of the invention, the main midsole may include a shank embedded therein, the shank having an elastic plate shape in order to maintain the shape of the main midsole.
- [11] Furthermore, according to another embodiment of the invention, the main midsole and the sub-midsole may be configured to mate and couple with each other, in which a portion of a coupling surface of the sub-midsole convexly projects and a corresponding portion of the main midsole is concavely recessed.
- [12] Furthermore, according to a further embodiment of the invention, the portion of the sub-midsole, which convexly projects, may project by varying amounts in response to load distributions thereon.
- [13] Furthermore, according to still another embodiment of the invention, the sub-midsole may have a polyol cloth having a waterproof function attached to the outer surface thereof.
- [14] Finally, according to yet another embodiment of the invention, the sub-midsole may be thinnest in a portion corresponding to the walking axis of the main midsole.
- [15] The seesaw-motion footwear sole according to the invention is applicable to a variety of shoes such as running shoes, and can advantageously provide an excellent

exercise effect that is superior to that provided by heelless shoes of the prior art. Moreover, the seesaw-motion footwear sole of the invention can provide a technique that is expected to be broadly applicable due to the external shape thereof, which corresponds to a conventional shoe sole.

Advantageous Effects

- [16] As set forth above, according to the invention described above, the dual-structure midsole can provide enhanced shock absorbing ability, and the seesaw movement during walking can provide a better exercise effect to users.
- [17] Also, since the coupling surfaces of the main midsole and the sub-midsole have convex and concave shapes, it is possible to prevent the sub-midsole from being deformed and to enhance the durability of the same. In addition, since the amount that the top surface of the sub-midsole projects into the main midsole can be varied, the footwear sole can provide an excellent wearing sensation.
- [18] Moreover, since the seesaw-moveable footwear sole of the invention has an external shape corresponding to a conventional shoe sole, the footwear sole can impart a quality expected to increase exports and domestic sales of the footwear by attracting consumers.

Brief Description of the Drawings

- [19] Fig. 1 is a cross-sectional view of a functional footwear according to the prior art;
- [20] Fig. 2 is a schematic elevational side view showing a footwear sole according to a first embodiment of the invention;
- [21] Fig. 3 is a cross-sectional view taken along the line A-A in Fig. 2; and
- [22] Fig. 4 is a side elevational view showing a footwear sole according to a second embodiment of the invention.
- [23] <Major Reference Numerals of the Drawings>
- [24] 100: main midsole 110: walking axis
- [25] 120: shank 200: sub-midsole
- [26] 21: polyol cloth 300: outsole

Best Mode for Carrying Out the Invention

- [27] Hereinafter, a seesaw-motion footwear sole of the invention will be described in more detail with reference to the accompanying drawings, which show exemplary embodiments of the invention. Accordingly, all modifications and changes that can be made by those skilled in the art are intended to fall within the scope of the invention.
- [28] Meanwhile, important features of the invention generally relate to a footwear sole, and thus, any known footwear uppers can be employed as a footwear upper to be coupled with the footwear sole.
- [29] The seesaw-motion footwear sole according to the invention generally includes a

main midsole 100, a sub-midsole 200 and an outer sole 300, in which the material of the sub-midsole 200 is softer than that of the main midsole 100, so that the sub-midsole 200 can have a primary shock absorbing function. In particular, the main midsole 100 has a convex projection in the center of the underside thereof to define a walking axis 110, which is formed in a position corresponding to an arch-shaped metatarsal in the foot structure. Therefore, front and back foot portions, relative to the walking axis 110 in the main midsole 100, are formed at a higher level in a floating state. In general, since the back foot portion, i.e. the heelpiece of the footwear, first touches the ground and thus receives the most severe shock thereon, the sub-midsole 200, coupled to the main midsole 100, is preferably configured to have a greater thickness in the back foot portion.

[30] The sub-midsole 200 is coupled to and conforms to the underside of the main midsole 100, and the outsole 300 is attached to the underside of the sub-midsole 200. The outsole 300 is generally used with a rubber material having a slip-prevention function and high wear resistance. When the main midsole 100 and the sub-midsole 200 are coupled to each other, an overall external shape corresponding to a conventional shoe sole is realized. However, since the walking axis 110 projects from the underside of the main midsole 100, the sub-midsole 200, which is made of softer material, can be compressed to absorb the shocks while providing a seesaw movement in the forward and backward direction on the basis of the walking axis 100 during actual walking.

[31] <First Embodiment>

[32] A first specific embodiment of the seesaw-motion footwear sole according to the invention has the structure shown in the schematic side elevational view of Fig. 2 in the accompanying drawings.

[33] As shown in Fig. 2, the main midsole 100, the sub-midsole 200 and the outsole 300 are sequentially coupled in this order from top to bottom, and the main midsole 100 can be provided in the inside thereof with a plate-shaped shank 120, made of a highly elastic material. For example, the shank 120 is preferably made of a metal, a non-ferrous metal, or a nonmetallic material, such as a plastic material. The shank 120, when embedded in the main midsole 100, can help to maintain the shape of the main midsole 100 while enhancing a shock absorbing function.

[34] The center of the underside of the main midsole 100 projects downwards convexly relative to the other portions therein so as to serve as the walking axis 110. The main midsole 100 can be inclined in backward and forward directions like a seesaw on the basis of the walking axis 110 so as to create an exercise effect during walking. The sub-midsole 200, which is made of a material softer than that of the main midsole 100, is coupled to the underside of the main midsole 100, such that a shock caused during

walking can be primarily absorbed in the sub-midsole 200. In particular, the first embodiment provides an external shape corresponding to the conventional shoe sole by coupling the sub-midsole 200 to the underside of the main midsole 100. Although the external shape of the seesaw-motion footwear sole according to the invention corresponds to a conventional footwear sole, the footwear sole of the invention has a dual-midsole structure of the main midsole 100 and the sub-midsole 200, which are made of materials having different degrees of hardness. In addition, the walking axis 110 projects from the center of the underside of the main midsole 100, and the sub-midsole 100, which is made of a softer material, is compressed upon contact with the ground. Therefore, the footwear sole of the invention provides a feature in which a seesaw movement is performed on the basis of the walking axis 110.

[35] The sub-midsole 200 is thinnest in a portion corresponding to the walking axis 110 of the main midsole 100, with the back foot portion thereof formed to be thicker than the front foot portion thereof. During walking, the back foot portion can absorb most of the shock because it first contacts the ground, such that the main midsole 100 can be slanted on the basis of the walking axis 110 in the backward direction and then in the forward direction as the load thereon is moved in the forward direction. Namely, the footwear sole of the invention can be slanted at a greater angle on the basis of the walking axis 110 to achieve an excellent exercise effect during walking compared to that of the conventional shoes.

[36] In the seesaw-motion footwear sole according to the invention, the main midsole 100 and the sub-midsole 200 are more preferably configured to be coupled to each other by concave and convex portions, i.e. male and female-shaped portions formed on coupling surfaces therebetween. Referring to Fig. 3, showing a cross-sectional view taken along the line A-A in Fig. 2, the center of the underside of the main midsole 100 is concavely recessed and, correspondingly, the top surface of the sub-midsole 200 projects convexly so as to be coupled with the concave recess of the main midsole 100. In other words, portions of the sub-midsole 200 in the vicinity of left and right edges thereof are formed to be lower than the center thereof. This causes the center, to which the greatest load is applied, to be strengthened and provide a better shock absorbing ability. In addition, using the sub-midsole 200 made of the softer material allows the thickness of the outer edges thereof to be decreased, thereby reducing deformation in the sub-midsole 200 when a load is biased to either side of the shoe in the case of walking on uneven ground.

[37] When coupling surfaces of the main midsole 100 and the sub-midsole 200 mate and are coupled with each other, the position or the projecting or recessed amount of the mating/coupling surfaces is preferably determined according to load distributions on the coupling surfaces.

[38] <Second Embodiment>

[39] Next, a seesaw-moveable shoe according to a second embodiment of the invention will be described below. Referring to Fig. 4, showing a schematic side view of the second embodiment, this embodiment is characterized in that the sub-midsole 200 has a polyol cloth 210 with a strong waterproof function attached to the outer surface thereof.

[40] The sub-midsole 200 is vulnerable to water since the sub-midsole 200 is made of a softer material than the main midsole 200. Therefore, when the sub-midsole 200 is constructed, the polyol cloth 210 is preferably attached to the outer surface of the sub-midsole 200 in order to maintain the original properties thereof for a long period of time. The polyol cloth may be selected from any of various known polyol cloths.

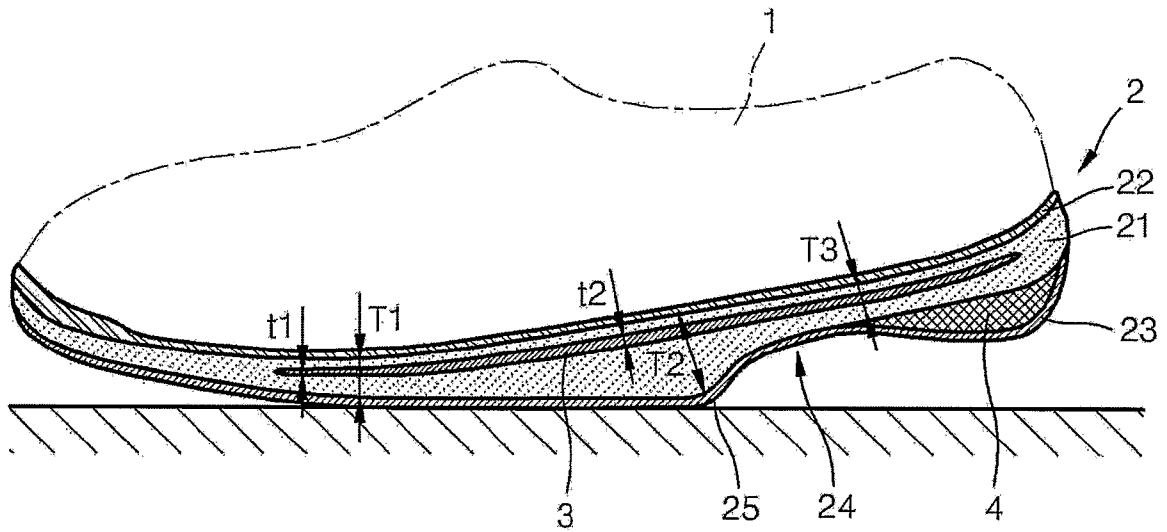
[41] In the seesaw-motion footwear sole according to the invention, since the midsole is formed by coupling the sub-midsole 200 of a softer material to the main midsole 100 of a harder material and the main midsole 100 has the walking axis 110 projecting from the underside thereof, the seesaw movement in forward and backward directions on the basis of the walking axis 110 can be performed so as to maximize the exercise effect during walking.

[42] Moreover, since the material of the sub-midsole 200 is softer than that of the main midsole 100, the sub-midsole 200 can absorb shocks well during walking and can also be compressed by a larger amount so as to allow seesaw movement of the main midsole 100 on the basis of the walking axis 110.

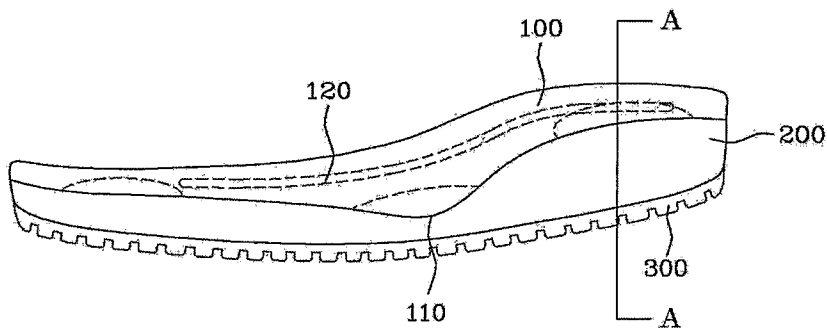
Claims

- [1] A seesaw-motion footwear sole, comprising:
a main midsole having a convex projection in a central portion of an underside thereof to define a walking axis;
a sub-midsole coupled to an underside of the main midsole and made of a softer material than that of the main midsole in order to exhibit a primary shock absorbing function, wherein the sub-midsole allows the main midsole to perform a seesaw movement on a basis of the walking axis in backward and forward directions when walking; and
an outsole coupled to the sub-midsole.
- [2] The seesaw-motion footwear as claimed in claim 1, wherein the main midsole includes a shank embedded therein, the shank having an elastic plate shape in order to maintain a shape of the main midsole.
- [3] The seesaw-motion footwear as claimed in claim 2, wherein the main midsole and the sub-midsole are configured to mate and couple with each other, in which a portion of a coupling surface of the sub-midsole convexly projects and a corresponding portion of the main midsole is concavely recessed.
- [4] The seesaw-motion footwear as claimed in claim 3, wherein the portion of the sub-midsole that convexly projects, projects by varying amounts in response to load distributions thereon.
- [5] The seesaw-motion footwear as claimed in any one of claims 1 to 4, wherein the sub-midsole has a polyol cloth having a waterproofing function attached to an outer surface thereof.
- [6] The seesaw-motion footwear as claimed in claim 5, wherein the sub-midsole is configured to be thinnest in a portion corresponding to the walking axis of the main midsole.

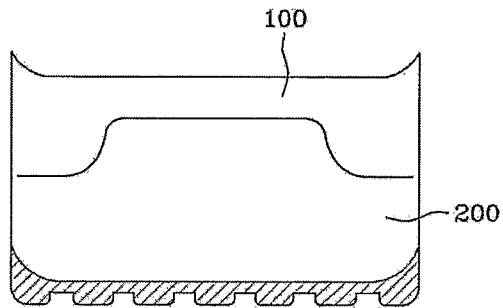
[Fig. 1]



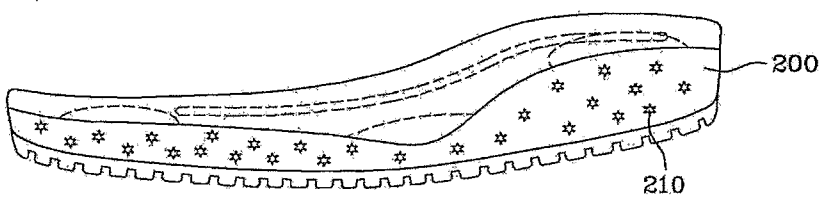
[Fig. 2]



[Fig. 3]



[Fig. 4]



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2007/004914**A. CLASSIFICATION OF SUBJECT MATTER***A43B 13/14(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)

IPC 8 A43B

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

Korean Utility models and applications for Utility models since 1975

Japanese Utility models and application for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS(KIPO internal) "midsole "

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5579591 A (SACHIKO KOUSAKA et al.) 03 DECEMBER 1996 See Claim 1, column 9, figures 1-3.	1,2
Y	KR 10-2006-0069352 A (SPRING BOOST S.A.) 21 JUNE 2006 See pages 4-5, Claim 5, figures 3a-4b.	1,2
A	KR 10-0603062 B1 (PARK, JONG HWA et al.) 24 JULY 2006 See the whole document	1-6
A	JP 2003-304904 A (HIRA YAMA YOSHIHIRO) 28 OCTOBER 2003 See the whole document	1-6



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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"&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2007/004914

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