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(54) **Sole stabilizer**

(57) The present invention relates to a sole stabilizer for integrating in a sole for a shoe, wherein said sole stabilizer extends in at least a subpart of the sole area and wherein said sole stabilizer comprises multiple elongated elements extending in a substantially transverse direction of the shoe. The invention further relates to a shank with an integrated sole stabilizer and a shoe with a sole stabilizer. Thereby, the stiffness of the shoe can be changed in a transverse direction, without changing

the flexibility of the shoe in its longitudinal direction. When bending the shoe in the transverse direction also the elongated elements of the sole stabilizer needs to be bent and therefore the sole stabilizer increases the stiffness of the shoe in the transverse direction. In the longitudinal direction the elongated elements will not have to be bent and therefore flexibility in the longitudinal direction is not changed.

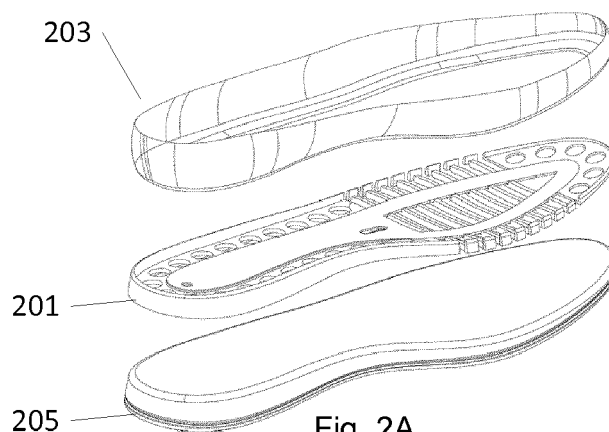


Fig. 2A

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Description**[FIELD OF THE INVENTION]**

[0001] The present invention relates to a sole stabilizer for a shoe. The invention further relates to a shank with an integrated sole stabilizer and a shoe with a sole stabilizer.

[BACKGROUND]

[0002] Flexibility of shoes and requirements to such flexibility can vary according to the actual type of shoe and more specifically the environment in which the shoe is to be used. E.g. is it a shoe for use when trekking or for use when playing golf. It is of interest to have shoes where the flexibility properties are quite specific according to the actual environment in which the shoe is intended to be used.

[GENERAL DESCRIPTION]

[0003] In accordance with the invention, there is provided a sole stabilizer for integrating in a sole or a midsole of a shoe, wherein said sole stabilizer extends in at least a subpart of the sole area and wherein said sole stabilizer comprises multiple elongated elements extending towards a side of a shoe in a substantially transverse direction of the shoe.

[0004] Thereby the stiffness of the shoe can be changed in a transverse direction, without changing the flexibility of the shoe in its longitudinal direction. When bending the shoe in the transverse direction also the elongated elements of the sole stabilizer needs to be bent and therefore the sole stabilizer increases the stiffness of the shoe in the transverse direction. In the longitudinal direction the elongated elements will not have to be bent and therefore flexibility in the longitudinal direction is not changed. By using a sole stabilizer a shoe being stiff only in the transverse direction can be obtained, without compromising the longitudinal flexibility. Such a combination of properties is e.g. interesting in relation to golf shoes. When walking in a shoe, the shoe has to be flexible in the walking direction, thereby the shoe flexes to follow the flexing of the foot wearing the shoe, the transverse direction is the direction transverse the flex direction of the foot and shoe. The longitudinal direction therefore also corresponds to the flex direction of the foot and the transverse direction corresponds to the width of the foot.

[0005] In the following there will be referred to a longitudinal direction of the sole stabilizer and a transverse direction of the sole stabilizer, these directions are to be interpreted corresponding to directions as defined above. Thereby the longitudinal direction is also the flex direction of the sole stabilizer and thereby the flex direction of the shoe and foot wearing the shoe. The stiff transverse direction is the direction transverse the flex direction, corresponding to the width of the sole stabilizer and thereby

the width of the shoe and the foot wearing the shoe.

[0006] When walking using a shoe with a sole stabilizer according to the present invention, the shoe will maintain the flexibility of the sole material in the flex direction, whereas the sole stabilizer and elongated elements ensures due to their stiffness that the sole material combined with the sole stabilizer are stiff at a direction transverse the flex direction. A number of factors influences the transverse stiffness obtained by adding a sole stabilizer and these factors are:

- Stiffness of the material from which the sole stabilizer is made,

- o if the elongated elements extending transverse the flex direction of the shoe are made from a very stiff material, then the elements would be very stiff and bending of the elements would either not be possible or at least only possible to a very little degree, even though the remaining sole are made from a flexible material. Thereby using a sole stabilizer like this in a shoe, the shoe will remain flexible in the flex direction mainly determined by the material of the sole, whereas the transverse stiffness increases due to the stiffness of the elongated elements.

- The number of elongated elements,

- o Using many elongated elements positioned closely after each would further increase stiffness since therefore more stiff elongated elements contribute to the stiffness in the transverse direction.

- The distance between elongated elements,

- o Elements positioned at a large distance from each other would have to be from a stiffer material to add a similar stiffness as less stiff elements positioned closer to each other.

- The width and thickness of each elongated elements.

- o Elongated elements having a larger cross sectional area due to large thickness and large width would be stiffer than an elongated element made from the same material but having a smaller cross-sectional area.

[0007] The sole stabilizer comprises subparts of elongated elements and covers an area of a sole and is used together with a sole. The sole stabilizer changes the flex properties of at least sub parts of the sole in a direction transverse to the longitudinal direction or to the flex direction of the sole.

[0008] In an embodiment said sole stabilizer is dimen-

sioned for extending the entire sole area.

[0009] Thereby the sole stabilizer influences the flexibility of the entire sole and the design of the sole stabilizer affects the entire shoe. A sole stabilizer could be shaped having a contour and covering an area similar to a sole and where the entire area of the sole stabilizer is comprised of elongated elements connected e.g. extending from a centre element or connected at a centre line or at the sides.

[0010] In an embodiment the multiple elongated elements are positioned in at least one subarea of said sole stabilizer. Alternatively, the sole stabilizer covering the entire sole area, could only at specific subparts comprise areas with elongated elements, whereas the remaining part is solid or have another structure. Thereby the sole stabilizer is used for changing the sole flexibility differently at specific areas. Thereby, it is only in specific areas the transverse stiffness is increased, e.g. in the side areas or the forefoot area.

[0011] In an embodiment the entire sole stabilizer is constituted by multiple elongated elements.

[0012] Thereby transverse stiffness is increased in the entire sole. A sole stabilizer can then be modified afterwards by connected elongated elements to the sole surface and/or by interconnecting a number of neighbouring elongated elements. Thereby standard sole stabilizers can be produced, and these standard elements can then afterwards be modified according the properties of interest in the type of shoe where the stabilizer is to be used. In an embodiment the elongated elements are integrated with a shank.

[0013] Thereby the shank and the sole stabilizer can be produced as one unit, reducing production cost of these elements.

[0014] In an embodiment a substantial part of said elongated elements extends to the outer periphery of the shoe and wherein the endpoints of the elongated elements are connected with plate elements being substantially perpendicular to the elongated elements.

[0015] Thereby the plate elements introduce an edge surface to which material can be connected e.g. by gluing, whereby e.g. leather can be used for decorating the sides of the sole.

[0016] In an embodiment the sole stabilizer is made from material stiffer than the material of the sole.

[0017] Thereby, the elongated elements of the sole stabilizer further increase transverse stiffness of the sole.

[0018] In an embodiment the distance between neighbouring elongated elements are lower than 10 mm.

[0019] This has proven to introduce transverse stiffness to the sole being advantageous and resulting in good shoe properties, while simple to produce. Further a quite wear resistant sole stabilizer is obtained.

[0020] In an embodiment the elongated elements are solely positioned at the front subpart of the shoe. Thereby flexibility in the flex direction of the shoe in which the sole stabilizer is maintained, whereas transversal stiffness is increased.

[0021] The present invention further relates to a sole for a shoe comprising a sole stabilizer according to the above and a shoe comprising a sole stabilizer according to the above.

[BRIEF DESCRIPTION OF DRAWINGS]

[0022] The invention is explained in detail below with reference to the drawings, in which

Fig. 1A, 1B and 1C illustrate a sole stabilizer integrated with a shank according to the present invention. In 1A the stabilizer is shown from an isometric angle, in 1B the stabilizer is seen from above and in 1C the stabilizer is seen from the side.

Fig. 2A - 2D illustrate the sole stabilizer being mounted in a shoe.

Fig. 3 illustrates the sole stabilizer positioned in a shoe in a cut, whereby load on the stabilizer is illustrated.

Fig. 4A - D illustrates elongated elements positioned at different areas of a shoe sole.

[DETAILED DESCRIPTION OF DRAWINGS]

[0023] Fig. 1A, 1B and 1C illustrate a sole stabilizer 101 according to the present invention integrated with a shank 105. The sole stabilizer is shaped similar to a sole for supporting a foot wearing a shoe and the stabilizer comprises multiple elongated elements 103 extending at the edge of the stabilizer as well as in the middle of the front part. In one embodiment the elongated element has a thickness of 3 mm and a width of 2 mm. This is just one example of dimensions used with a sole stabilizer material having a specific stiffness, where similar results with another material being less stiff, would require larger dimensions.

[0024] As can be seen from the figures the elongated elements extend substantially in a transverse direction (transverse direction relative to sole is marked by arrow B, longitudinal direction relative to sole is marked by arrow A). Note that the longitudinal direction A is also similar to the flex direction of the shoe when walking) The elongated elements will also extend in the transverse direction of the shoe wherein the sole stabilizer is mounted. Further in the illustrated embodiment the endpoints of each elongated element are connected with plate elements 107. In the figure square shaped elements are shown, but other shapes may also be possible, the purpose of these plate elements is to obtain a surface for connecting a cover material at the edge of the shoe, e.g. leather material. Further the size of the plate elements changes along the side surface, this is due to design requirements, where typically the shoe tip is required to be thin and therefore the plate elements need to be small-

er at the tip.

[0025] It is further to be noted that the elongated elements at the tip and at the heel are not extending in the transverse direction, but are still there to support plate elements 107 around the entire shoe.

[0026] In the middle part of the sole stabilizer a shank has been integrated for further supporting the foot and for giving the shoe its inner structure. In the present embodiment the shank and the elongated elements are made from the same material, which will be stiffer than the material used for the remaining sole. Further the elongated elements are extending from the shank and the entire sole stabilizer could e.g. be produced by a molding.

[0027] In another embodiment the sole stabilizer is not integrated with a shank, instead the shank and sole stabilizer is two separate elements.

[0028] Fig. 2A-D illustrate the sole stabilizer 201 being mounted in a shoe and more specifically where the sole stabilizer is mounted between the upper shoe and the sole. In figure 2A and 2B the parts comprising the sole stabilizer 201, the upper part 203 and the sole 205 are shown being separate. In fig. 2C the sole stabilizer 201 has been connected to the upper part 203 of the shoe and in figure 2D also the sole 205 has been connected. A production process could be to position the sole stabilizer in a mold, and then inject the sole material into the mold to shape the sole. The process is similar to injection molding without a sole, only difference is that the sole stabilizer is positioned in the mold before injecting. The sole stabilizer could in one embodiment be inserted as the only element (e.g. with or without an integrated shank or the sole stabilizer and the shank could be inserted as separate elements before injecting).

[0029] The sole stabilizer is typically not solid whereby the injected material can float through the sole stabilizer e.g. through the spaces between the elongated elements and/or through holes made in other parts of the sole stabilizer. Thereby injected material is present on both sides of the stabilizer and thereby the stabilizer is completely integrated in the sole material after hardening.

[0030] In case the sole stabilizer comprises plate elements along its edge, these elements are typically not integrated inside the sole, but extend from the side of the sole and are used for forming an edge around the shoe adapted for adding an edge cover material.

[0031] Fig. 3 illustrates the sole stabilizer positioned in a shoe in a cut, whereby load on the stabilizer is illustrated. A heel cut is seen in the line A-A. The shoe comprises an upper part 301 and a sole 303. Further the sole stabilizer 305 is shown inside the sole 303 and the sole stabilizer 305 comprises respectively elongated elements 307, a shank 309 and plate elements 311 positioned at the endpoint of the elongated elements 307. During use the elongated elements are bent due to pressure from the foot and further the stiffness of the elongated elements increases the stiffness of the sole in the transverse direction of the sole, whereas the flexibility in the longitudinal direction of the sole is not changed due to the

sole stabilizer comprising transverse elongated elements, not changing flexibility in the longitudinal direction of the sole.

[0032] Alternative embodiments of the present invention is sole stabilizers made as segment elements only covering a subpart of the sole area, e.g. a specific segment with elongated elements having a first flexibility could be positioned at the front part of the shoe and another segment having a second flexibility could be positioned at the back part of the shoe. Again third and fourth segments could be added in the sides of the shoe. The transverse flexibility of these sole stabilizers can be different based on the flexibility of the material in which they are made or based on the distance between neighbouring elongated elements. Fig. 4A - D illustrate elongated elements positioned at different areas of a shoe sole. In figure 4A elongated elements 401 are positioned at an area at the heel and at an area at the forefoot, in figure 4B elongated elements 401 are positioned at an area at the forefoot extending to the middle part of the foot, in figure 4C elongated elements 401 are positioned at an area at both sides of the forefoot and at one side of the middle foot, in figure 4D elongated elements 401 are positioned at a narrow area at the forefoot.

[0033] In the above examples have been given where the elongated elements extend towards the side of in one transverse direction. The transverse elements could alternatively extend in a direction corresponding to the flex direction of a foot wearing the shoe.

[0034] Figure 5A - C illustrate some of the areas as illustrated in fig. 4A-D, but where the elongated elements could be angled differently still extending towards the side of the shoe in a substantial transverse direction. Further the distance between elongated elements could also vary in different areas of the same shoe.

Claims

1. A sole stabilizer for integrating in a sole or a midsole of a shoe, wherein said sole stabilizer extends in at least a subpart of the sole area and wherein said sole stabilizer comprises multiple elongated elements extending towards a side of a shoe in a substantially transverse direction of the shoe.
2. A sole stabilizer according to claim 1, wherein said sole stabilizer is dimensioned for extending the entire sole area.
3. A sole stabilizer according to claim 2, wherein said multiple elongated elements are positioned in at least one subarea of said sole stabilizer.
4. A sole stabilizer according to claim 2, wherein said entire sole stabilizer is constituted by multiple elongated elements.

5. A sole stabilizer according to claim 1-4, wherein said elongated elements are integrated with a shank.
6. A sole stabilizer according to claim 1-5, wherein a substantial part of said elongated elements extend to the outer periphery of the shoe and wherein the endpoints of the elongated elements are connected with plate elements being substantially perpendicular to the elongated elements.
7. A sole stabilizer according to claim 1-6, wherein said sole stabilizer is made from material stiffer than the material of the sole.
8. A sole stabilizer according to claim 1-7, wherein the distance between neighbouring elongated elements are lower than xx mm.
9. A sole stabilizer according to claim 1-9, wherein the elongated elements are solely positioned at the front subpart of the shoe.
10. A sole for a shoe comprising a sole stabilizer according to claim 1-9.
11. A shoe comprising a sole stabilizer according to claim 1-10.

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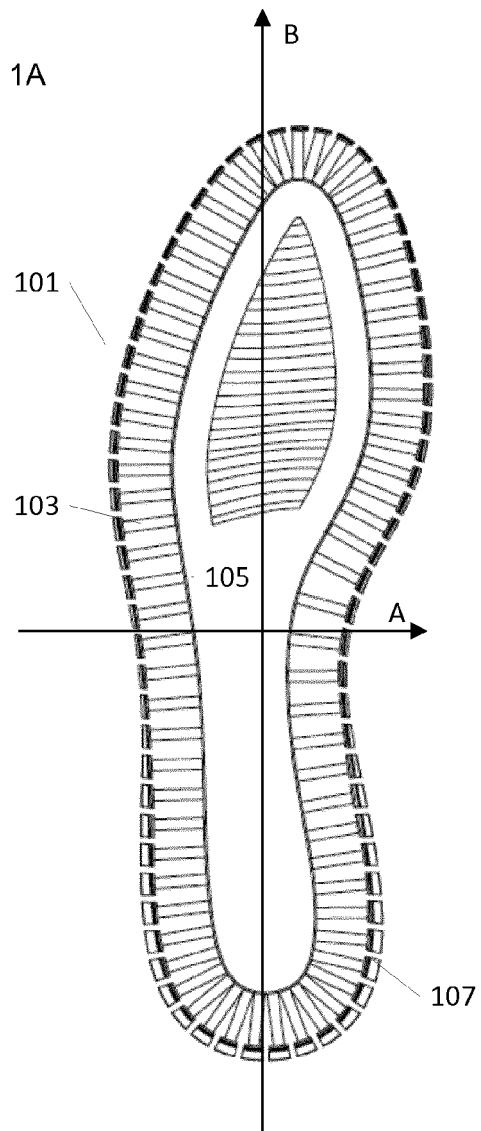
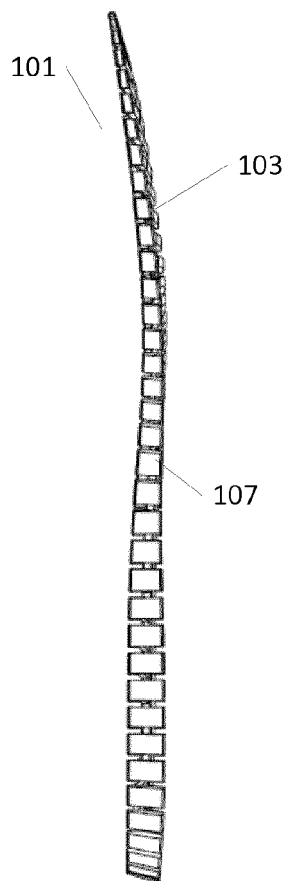
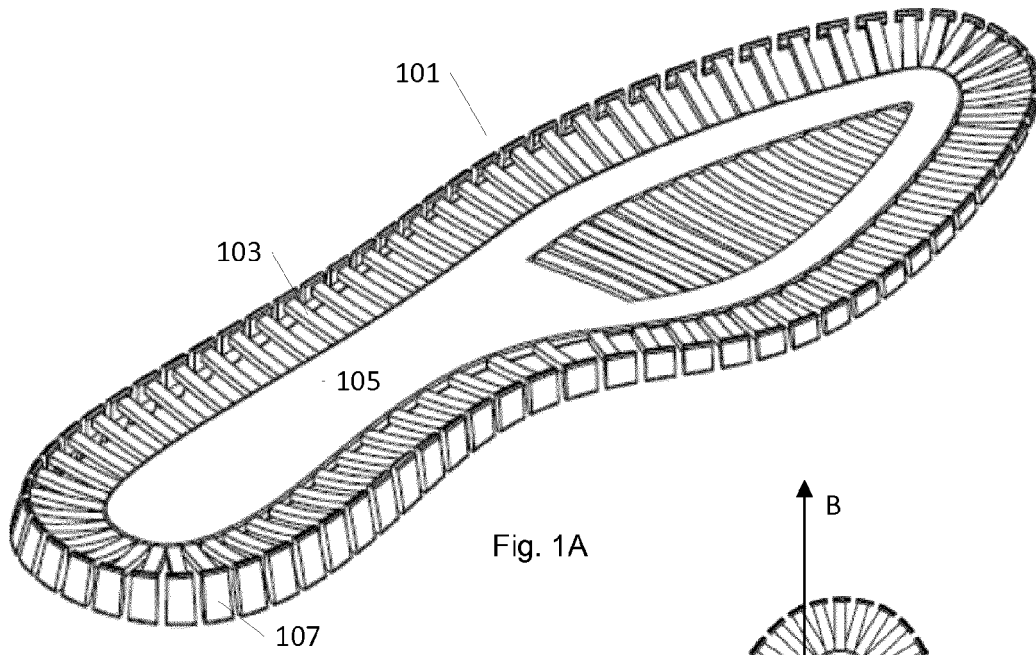


Fig. 1C

Fig. 1B

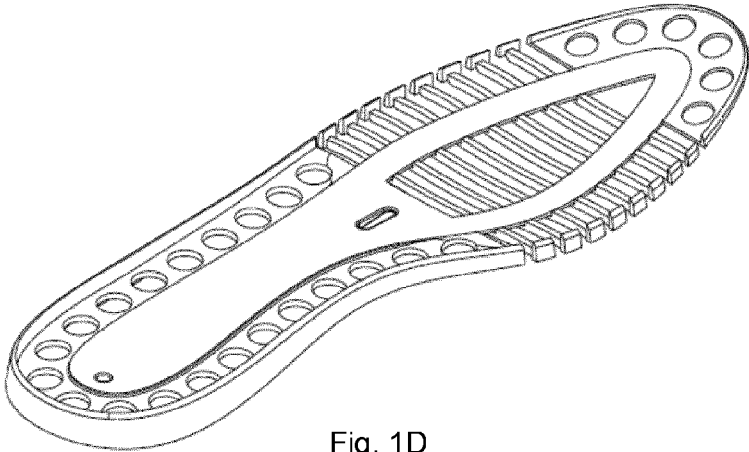


Fig. 1D

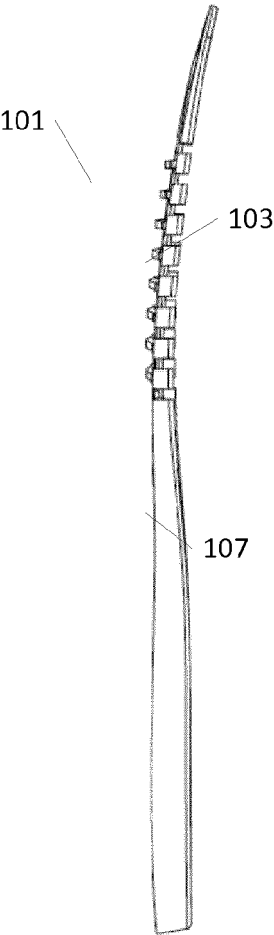


Fig. 1F

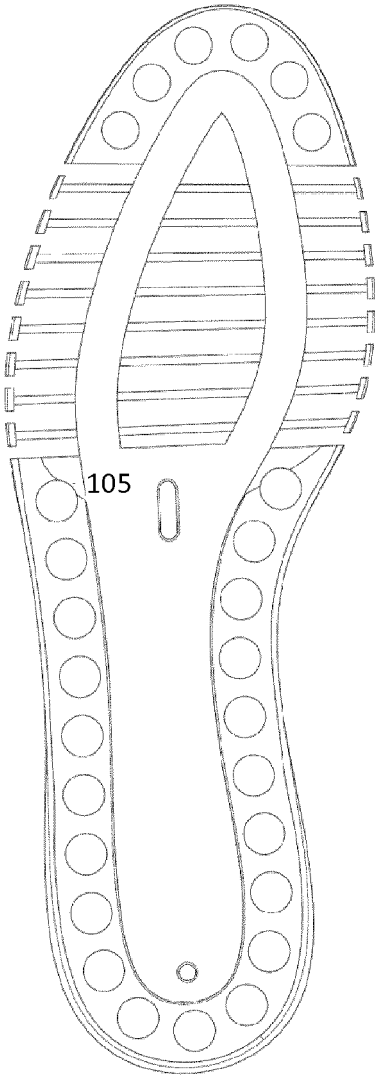
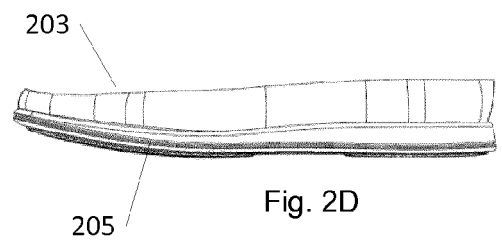
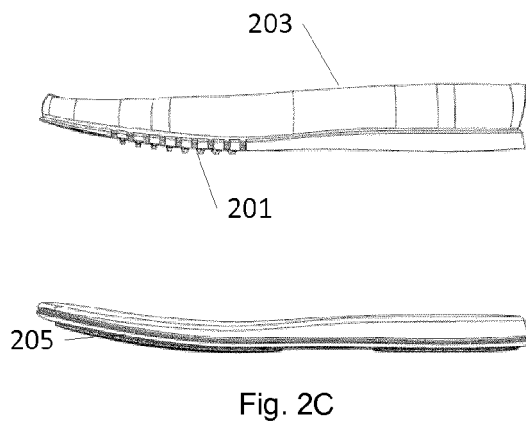
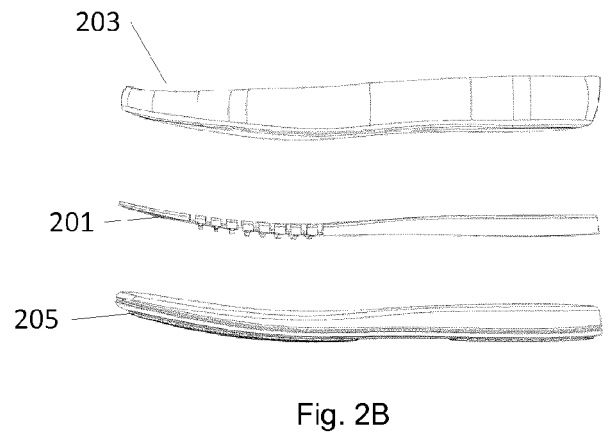
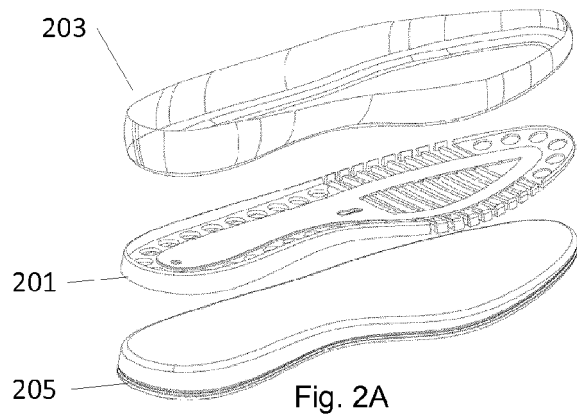


Fig. 1E



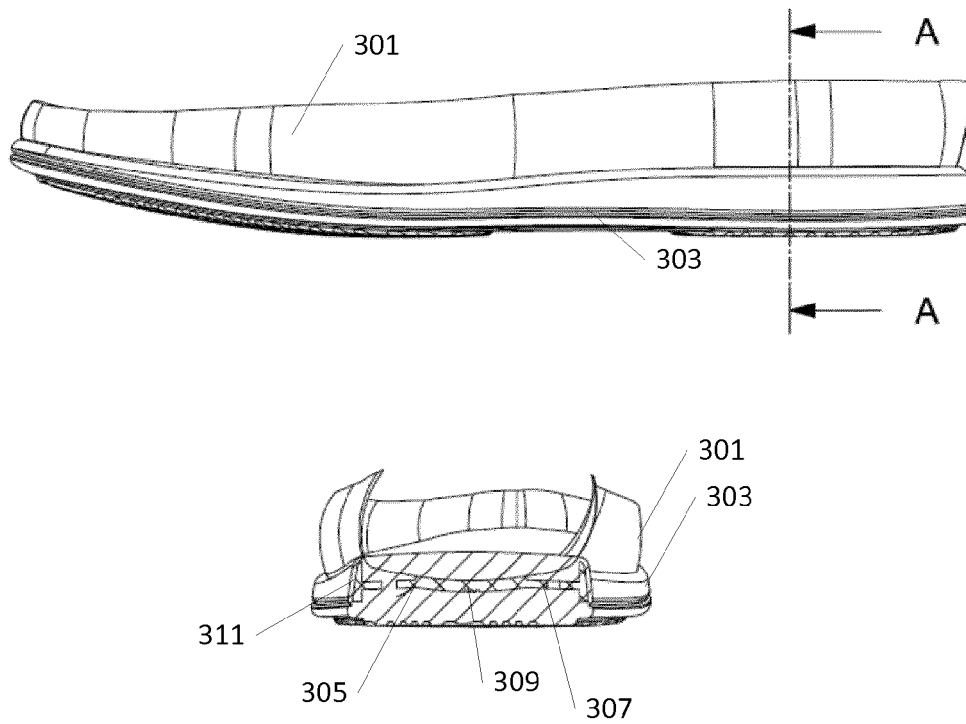


Fig. 3

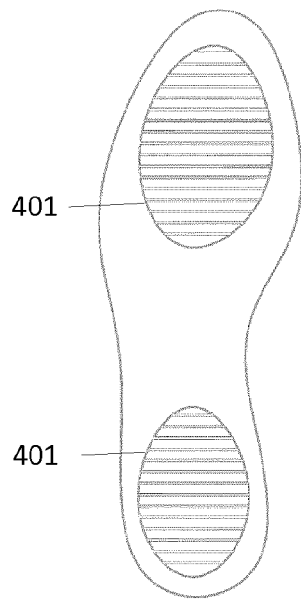


Fig. 4A

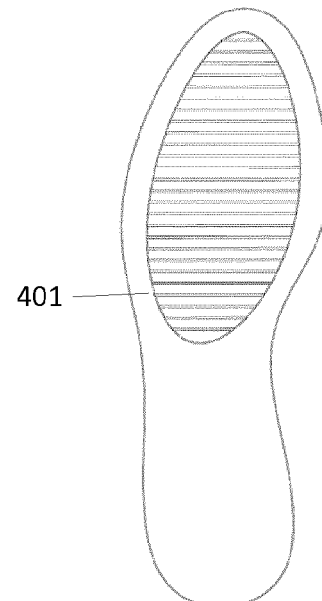


Fig. 4B

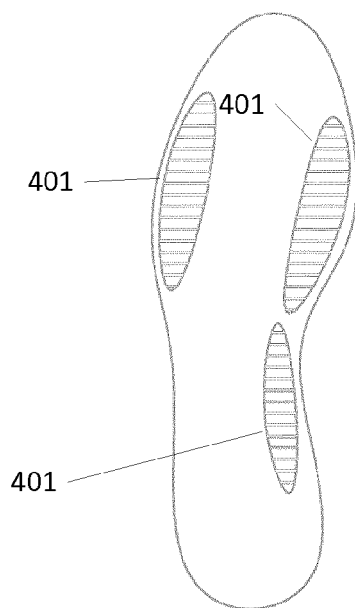


Fig. 4C

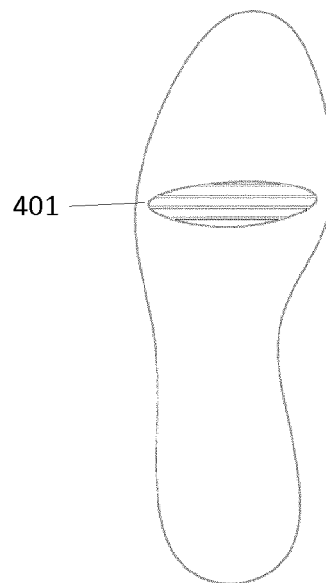


Fig. 4D

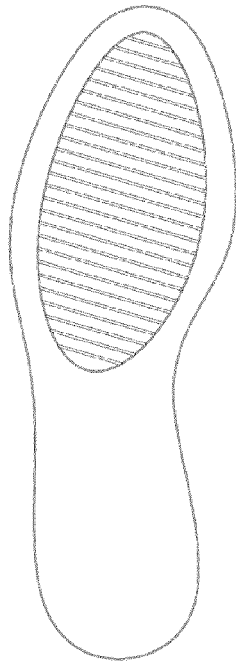


Fig. 5A

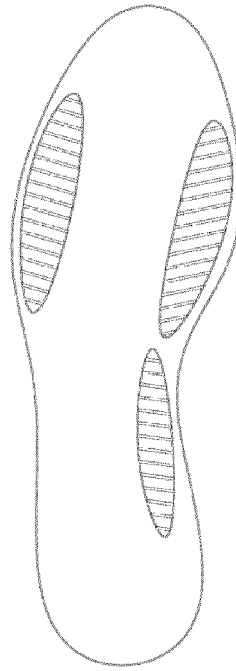


Fig. 5B

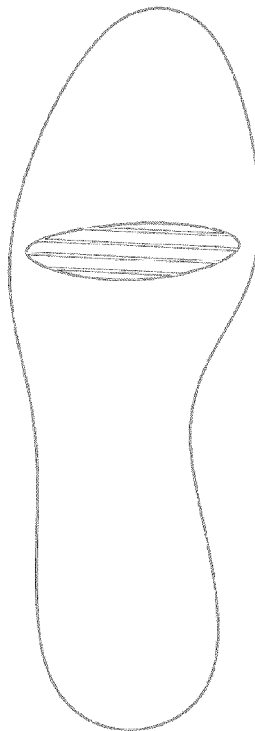


Fig. 5C



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 Application Number
 EP 14 19 2607

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X	WO 2005/009162 A2 (RED WING SHOE CO [US]; GEER KENTON D [US]) 3 February 2005 (2005-02-03) * pages 1-33; figures 1-63 *	1-11	INV. A43B13/12 A43B13/14 A43B23/22
X	US 4 506 460 A (RUDY MARION F [US]) 26 March 1985 (1985-03-26) * column 6, line 55 - column 16, line 37; figures 1-9 *	1-11	
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X	WO 2008/114909 A1 (SON DAE KEUN [KR]) 25 September 2008 (2008-09-25) * the whole document *	1-11	
			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 13 April 2015	Examiner Oelschläger, Holger
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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