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(54) **Natural arch support for footwear**

(57) The invention relates to a natural arch support for footwear, said natural arch support being characterised in that it comprises a cavity (3) at the point corresponding to the first metatarsal-phalangeal joint, a profile

of the medial arch wherein the slope of the arch descending toward the first metatarsal head is slightly steeper than the ascending curve, and flexure lines (4) on the inner and/or outer surface.

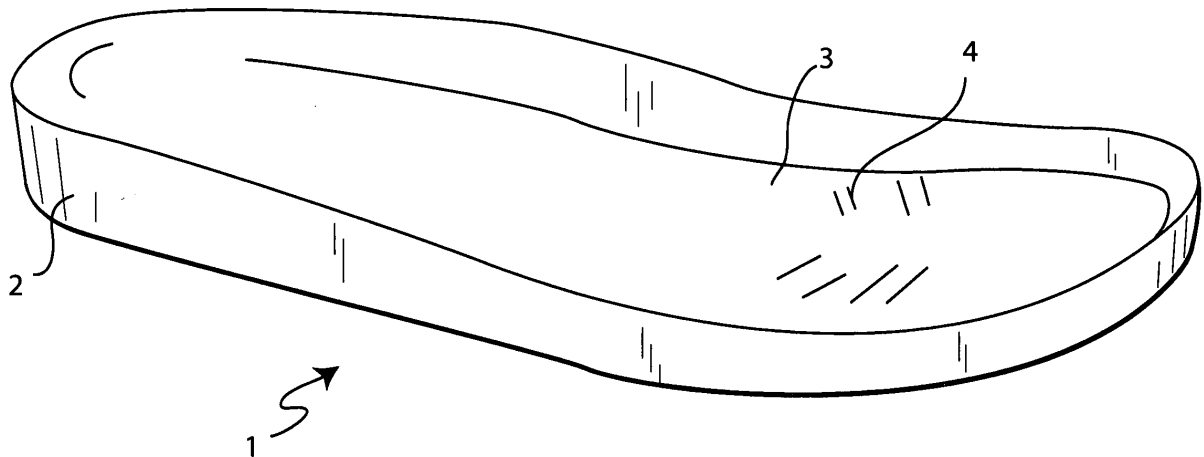


Fig. 1

Description

[0001] The present invention relates to a natural arch support for footwear.

[0002] More particularly, the invention relates to a natural arch support specifically designed to provide the foot with the most natural and comfortable support possible.

[0003] Hereinafter the description will focus on a plantar support, but it is clearly evident that the technical principles of the solution according to the invention may be applied to an arch support or directly to an item of footwear, such as for example a sandal, a clog and the like, without departing from the scope of protection thereof.

[0004] As is well known, in recent decades many solutions have been introduced into the market relating to footwear in general, or plantar inserts and/or orthotics to be used together with footwear, all having the purpose of supporting the foot in a correct and natural manner. Obviously, these solutions cannot be considered to include custom arch supports, which are individually prepared for each person after taking an impression of the foot in order to construct a specific support for the individual in question.

[0005] The solutions whereto reference is made are those adopted in footwear or for footwear that is sold and manufactured on a large scale, and which should provide a solution capable of being adapted to the foot of any basically healthy person (i.e. with a substantially normal plantar arch).

[0006] More specifically, the various solutions proposed over the years provide for a prominent raised portion in the area of the plantar arch and an equally prominent protuberance at the point of attachment of the phalanges.

[0007] It has however been noted that such solutions fail to achieve the intended results; on the contrary, in many cases they constitute a source of discomfort for the person who wears the footwear thus configured for a prolonged period of time.

[0008] In particular, all of the known solutions are to be considered invasive for the anatomy of the foot.

[0009] Based on these considerations, the Applicant has devised and developed an innovative solution that can resolve the specific problem of furnishing a natural arch support which is in no way invasive for the anatomy of the foot and is capable of providing the wearer with the most natural support possible and optimal comfort.

[0010] These and other aims are achieved according to the invention by means of a natural arch support featuring technical solutions such as to make it suitable for a wide range of feet.

[0011] The present invention thus specifically relates to a natural arch support for footwear, said natural arch support comprising a cavity in the area of the first metatarsal-phalangeal joint, a profile of the medial arch wherein the slope of the arch descending toward the first metatarsal head is slightly steeper than the ascending curve,

and flexure lines on the inner surface and/or outer surface.

[0012] Preferably, according to the invention, said natural arch support has a heel cup portion that is raised in relation to the normal plane the heel rests upon.

[0013] Again according to the invention, said natural arch support comprises flexure lines both on the inner or upper surface and on the outer or lower surface.

[0014] Additionally according to the invention, said natural arch support has a lightened core in areas subject to little stress during use.

[0015] The present invention shall now be described for illustrative, non-restrictive purposes, according to the preferred embodiments thereof, with particular reference to the appended drawings, in which:

figure 1 is a top perspective view of a natural arch support according to the invention;

figure 2 is a top view of the natural arch support of figure 1;

figure 3 is a bottom perspective view of the natural arch support of figure 1;

figure 4 is a front perspective view of the natural arch support of figure 1;

figure 5 is a rear perspective view of the natural arch support of figure 1;

figure 6 is a side perspective view of the natural arch support of figure 1;

figures 7 and 7a, 7b and 7c show the technical characteristics of the natural arch support of figure 1 in a transverse direction in three different sections; and figures 8 and 8a e 8b show the technical characteristics of the natural arch support of figure 1 in a longitudinal direction in two different sections.

[0016] The figures of the appended drawings show an arch support according to the invention, generically denoted by numerical reference 1, which has been specifically conceived so as to obtain the most natural support possible for the wearer's foot, carefully avoiding any characteristic invasive for the anatomy of the foot.

[0017] Furthermore, the solution described makes it possible to achieve an anatomical configuration adaptable to a wider range of feet.

[0018] As one may note, in particular, the arch support 1 according to the invention is characterised by four specific technical solutions, which enable the above-mentioned results to be achieved.

[0019] Firstly, it may be noted that the portion whereupon the heel rests, generically denoted by numerical reference 2, is raised in such a manner as to obtain a biomechanical aid to the action of walking, in a more pronounced manner compared to the known solutions.

[0020] The profile of the medial heel cup portion has been designed to control the motion of the rear part of the foot after the heel has been rested, also known as pronation. The adaptation is configured so as to control both the quantity and speed of pronation, so as to help

maintain correct forward movement. The shape of this portion is specifically designed to control not only the pronation of the foot, but also the speed of pronation after heel strike. Lacking this shape of the rear or heel cup portion, a different function and effect would be obtained.

[0021] In the metatarsal-phalangeal joint portion a cavity 3 is fashioned, which makes it possible to obtain a natural anatomical configuration, thus aiding the wearer in walking.

[0022] Furthermore, the profile of the medial arch portion, immediately behind said cavity 3, has been re-engineered in such a manner as to provide greater comfort with no 1st ray elevation. The profile of the arch support as constructed in the past tended to elevate the anatomy of the foot in this point, which could have the effect of limiting the motion of the first metatarsal joint, crucial for correct motion of the foot in the propulsion stage. The profile of the arch support 1 according to the invention, in the part descending toward the first metatarsal head, has a slightly steeper slope than in the ascending part, so as to help accommodate the thickness of the first metatarsal head without interfering with the self-support mechanism of the plantar fascia. This characteristic also helps to correct the sagittal motion of the 1st ray complex, so as to be more comfortable for the wearer.

[0023] This characteristic is very important, since the profile is specifically designed to enhance the function of the cavity 3, thus enabling the first metatarsal joint to remain in an ideal position during the propulsion stage of the gait cycle.

[0024] Furthermore, the arch support 1 according to the invention comprises linear cuts or grooves on the upper or inner portion, denoted by numerical reference 4, and on the lower or outer portion, generically denoted by numerical reference 5.

[0025] The inner grooves 4 contribute to reducing the bending stress, thereby facilitating walking in this case as well.

[0026] The outer grooves 5, on the other hand, reduce the strains due to bending.

[0027] It has been biomechanically demonstrated that the introduction of elastic grooves 4, 5, in addition to improving walking, reduces the possibility of impacts against the big toe.

[0028] Furthermore, as previously mentioned, the arch support 1 according to the invention has a lightened core in selected portions, thus allowing a reduction in weight and containment of costs.

[0029] The present invention has been described for illustrative, non-restrictive purposes, according to the preferred embodiments thereof, but it is understood that variants and/or changes may be introduced by experts in the art without departing from the scope of protection, as defined by the appended claims.

Claims

1. Natural arch support for footwear, said natural arch support being **characterised in that** comprises a cavity at the point corresponding to the first metatarsal-phalangeal joint, a profile of the medial arch wherein the slope of the arch descending toward the first metatarsal head is slightly steeper than the ascending curve, and flexure lines on the inner and/or outer surface.
2. Natural arch support according to claim 1, **characterised in that** it has a heel cup which is raised in relation to the normal plane the heel rests upon.
3. Natural arch support according to any of the previous claims, **characterised in that** it comprises flexure lines both on the inner or upper surface and the outer or lower surface.
4. Natural arch support according to any of the previous claims, **characterised in that** said natural arch support has a lightened core in areas subject to little stress during use thereof.
5. Natural arch support according to each of the previous claims, substantially as illustrated and described herein.

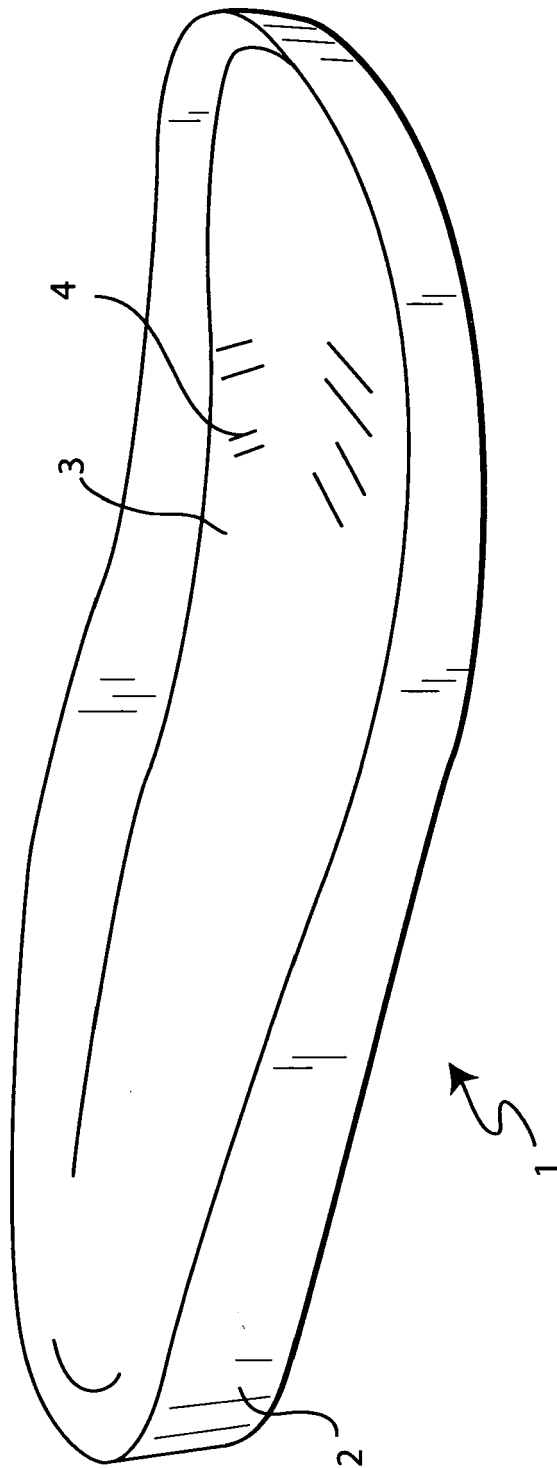


Fig. 1

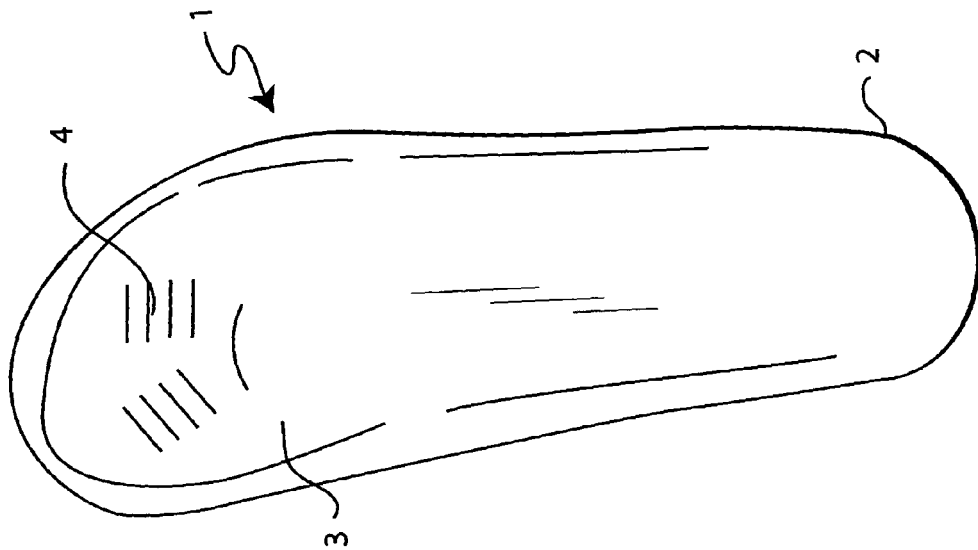


Fig. 2

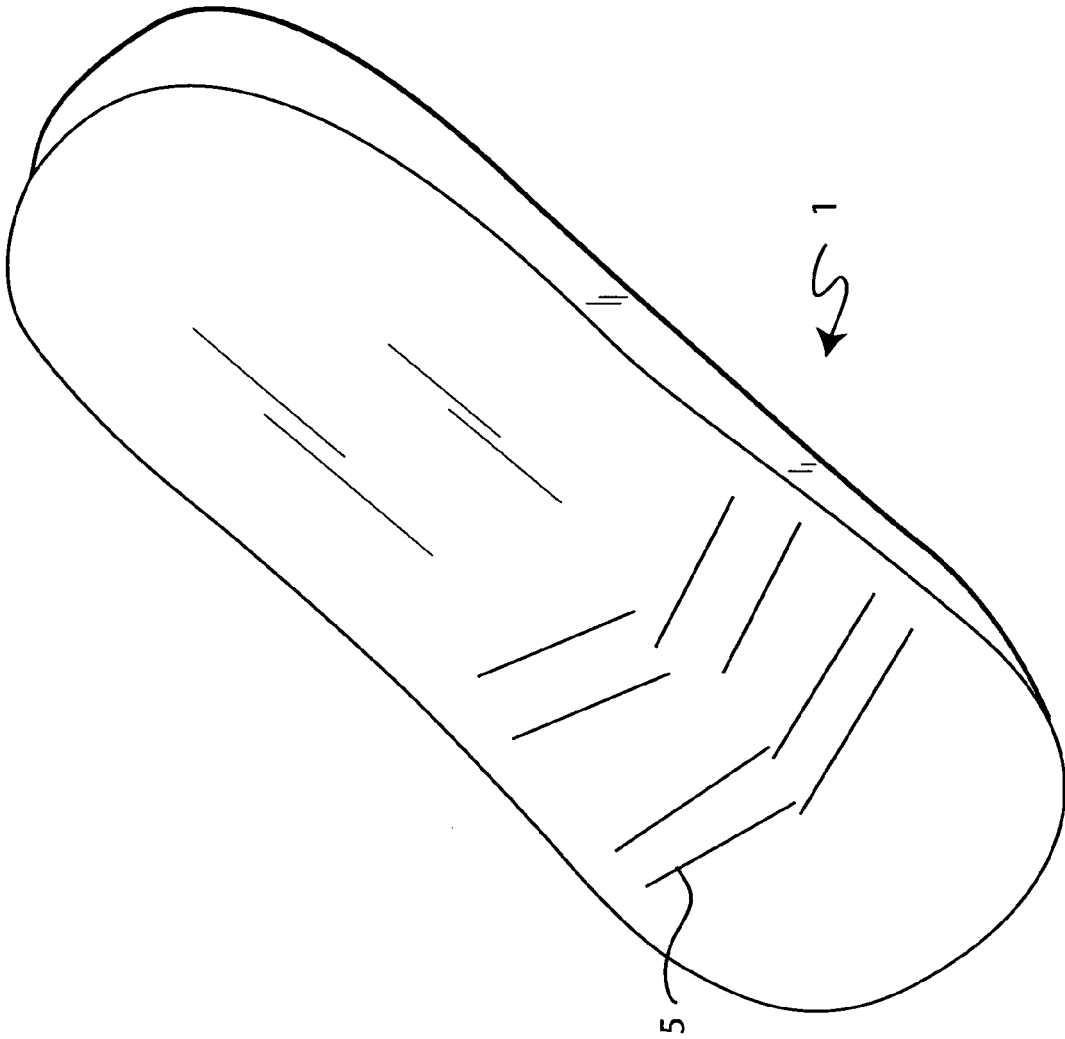


Fig. 3

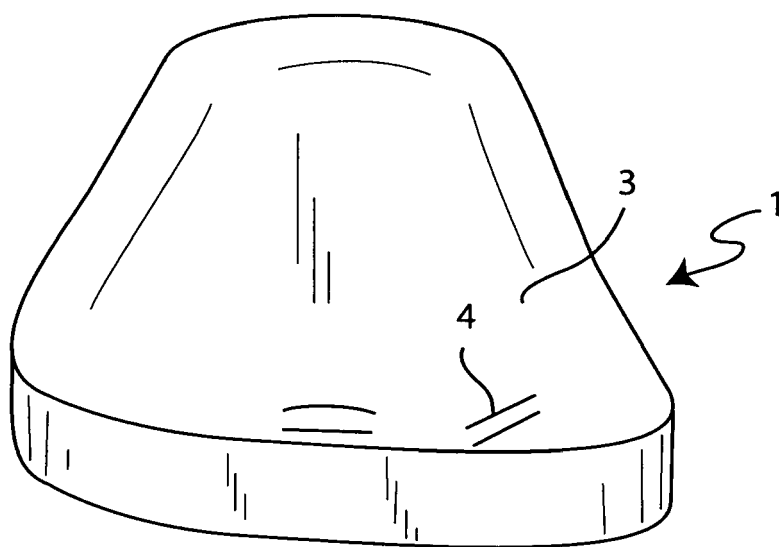


Fig. 4

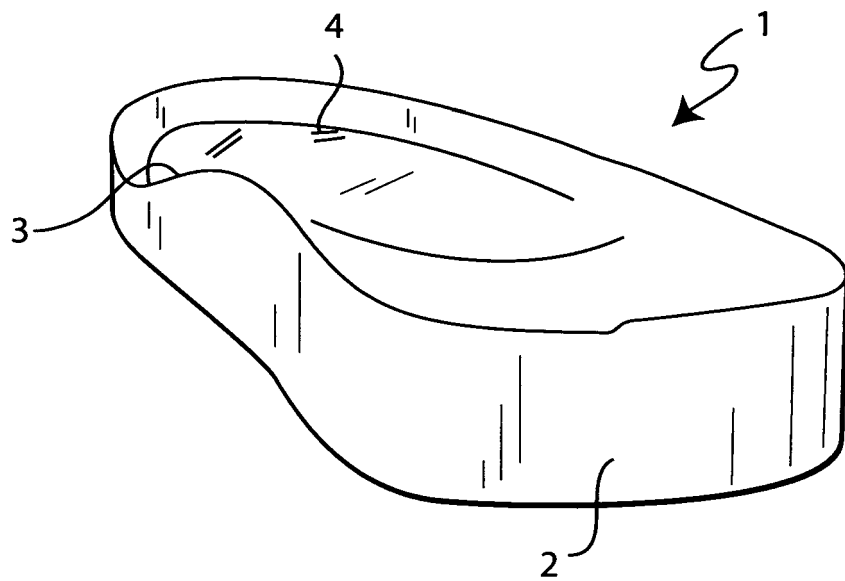
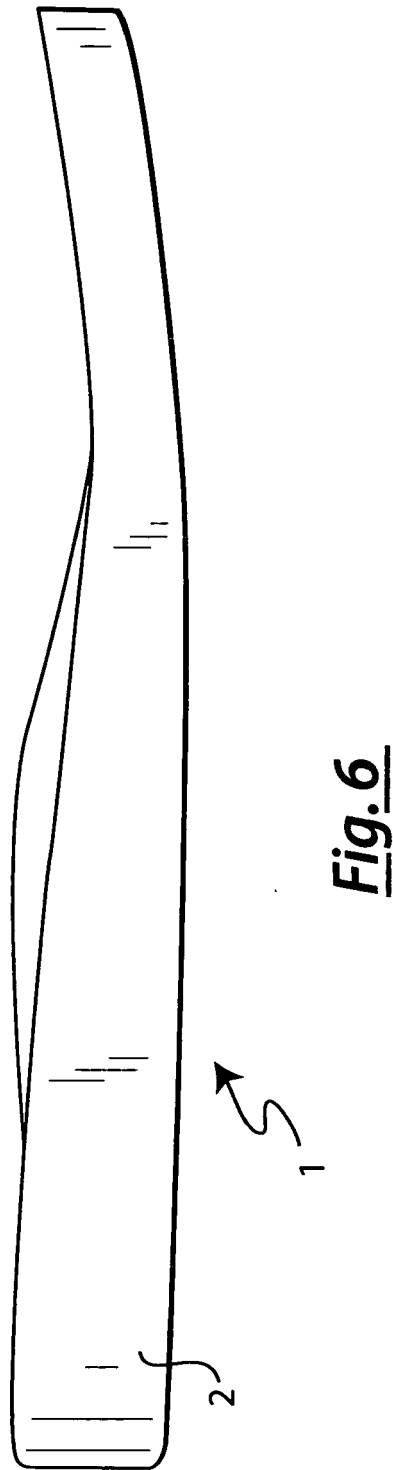
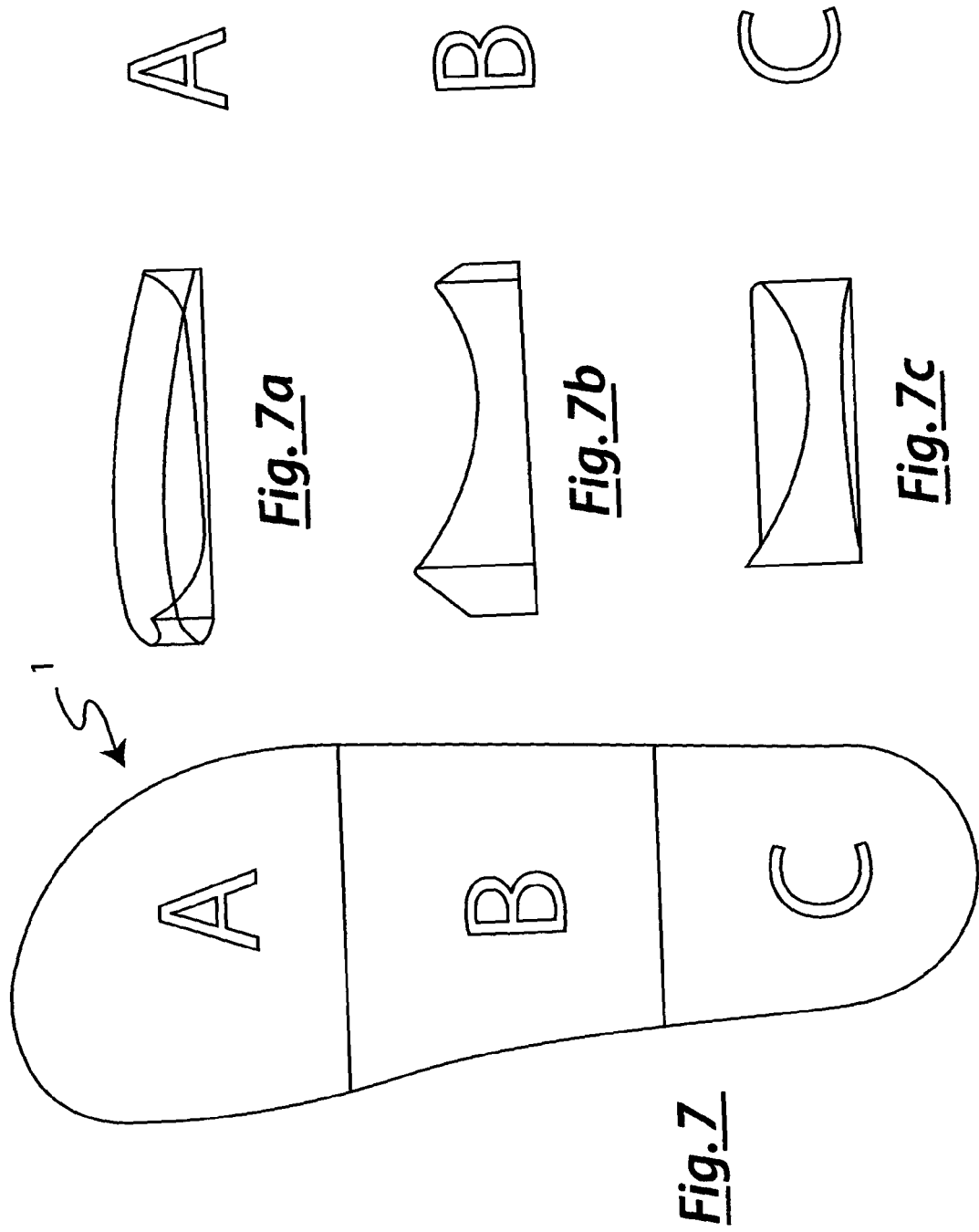
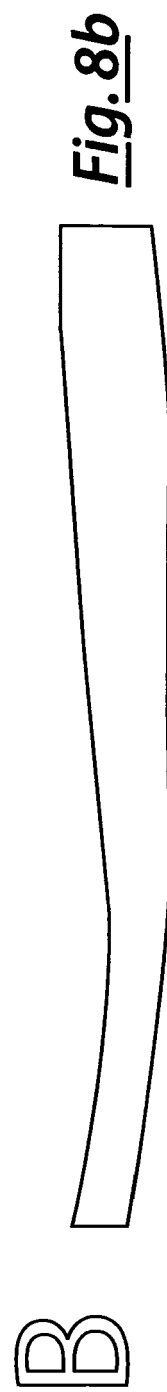
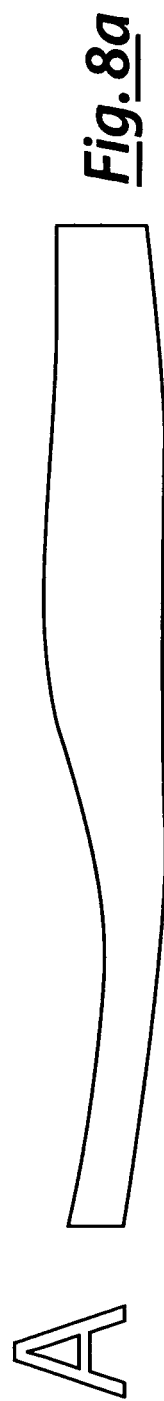
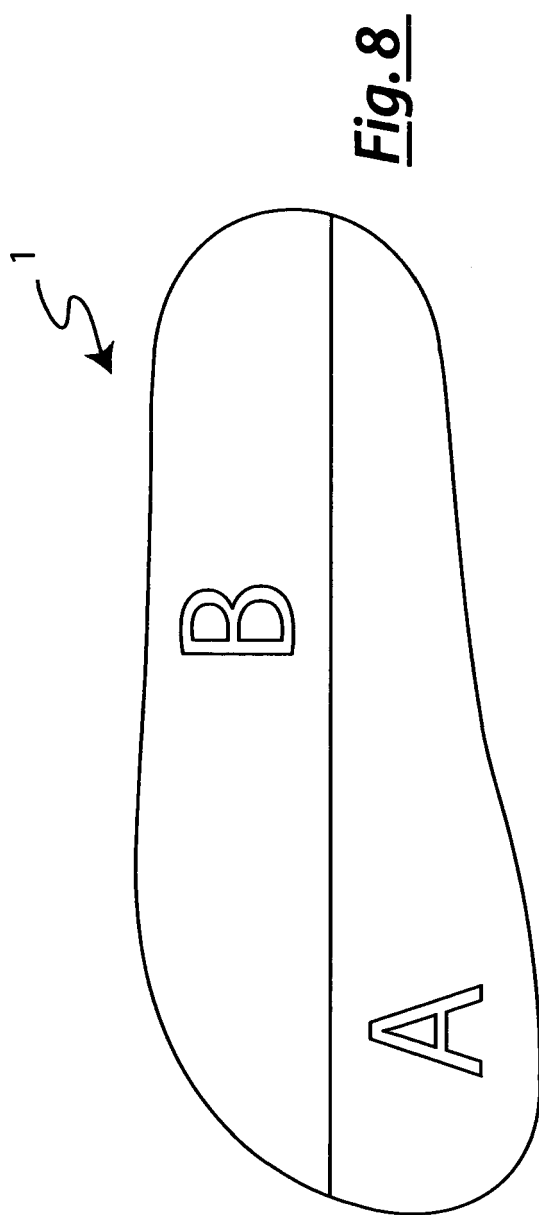


Fig. 5









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PARTIAL EUROPEAN SEARCH REPORT

Application Number

which under Rule 63 of the European Patent Convention EP 08 42 5303
shall be considered, for the purposes of subsequent
proceedings, as the European search report

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	DE 34 39 675 A1 (ORTHOTECH BERATUNGS UND VERTRI [DE]) 30 April 1986 (1986-04-30) * pages 8-9; figures * -----	1-4	INV. A43B7/22 A43B13/14 A43B17/00
Y	FR 2 628 300 A (BOISSY SA [FR]) 15 September 1989 (1989-09-15) * page 6, last paragraph - page 7, paragraph 1; figure 2 * -----	1-4	
Y	FR 2 466 206 A (HORT WALTER [DE]) 10 April 1981 (1981-04-10) * page 3, lines 6-15; figures * -----	1-4	
Y	NL 9 100 985 A (JOHANNIS WILLEM QUIST) 4 January 1993 (1993-01-04) * page 4, lines 18-21; figures * -----	1-4	
A	US 2 556 364 A (LUMBARD HENRY G) 12 June 1951 (1951-06-12) * figures * -----	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			A43B
INCOMPLETE SEARCH			
The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC to such an extent that a meaningful search into the state of the art cannot be carried out, or can only be carried out partially, for these claims. Claims searched completely : Claims searched incompletely : Claims not searched : Reason for the limitation of the search: see sheet C			
Place of search		Date of completion of the search	Examiner
Munich		26 August 2008	Vesin, Stéphane
CATEGORY OF CITED DOCUMENTS		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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**INCOMPLETE SEARCH
SHEET C**

Application Number
EP 08 42 5303

Claim(s) searched completely:
1-4

Claim(s) not searched:
5

Reason for the limitation of the search:

The claims must not, in respect of the technical features of the invention, rely on references to the description or drawings except where absolutely necessary (Rule 43(6) EPC and Guidelines C-III, 4.17).

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 42 5303

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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26-08-2008

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