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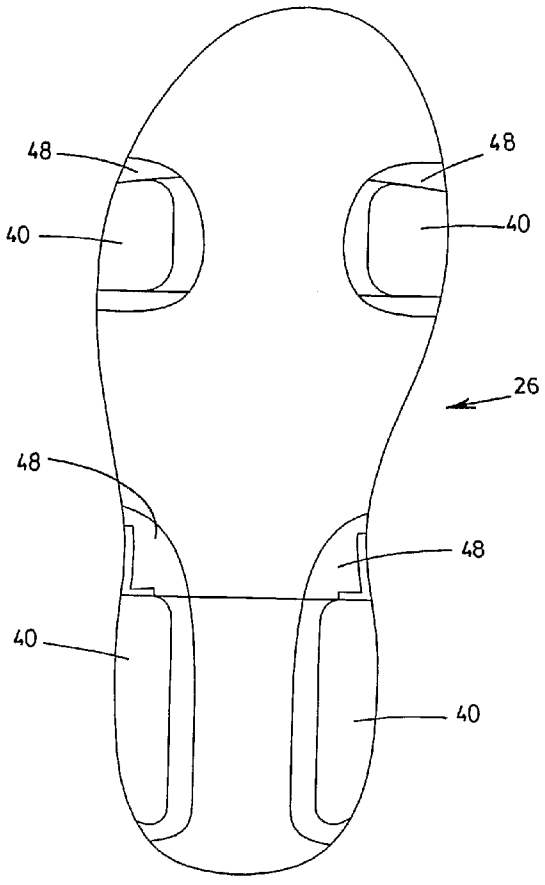
(54) Title: DYNAMIC ADAPTABLE SHOE WITH VENTILATION



(57) Abstract: There is provided an adaptable shoe for dynamically fitting to a foot while allowing ventilation. The shoe has an upper shell and a support sole peripherally connected thereto to allow insertion of a foot. The shoe includes a footbed provided above the supporting sole and defining a compartment for the foot therebetween and biasing members for inwardly biasing the foot when the footbed is subjected to a downward pressure. Each biasing member includes a side portion extending upward and a bottom portion being connected to the side portion at a fulcrum and engageable by the footbed. The bottom portion moves between an upward position and a downward position when the footbed is pressed upon. This causes the side portion to inwardly pivot about the fulcrum to inwardly bias the foot. The shoe also includes air passage means letting air exit and enter the space when the footbed is displaced.

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DYNAMIC ADAPTABLE SHOE WITH VENTILATION

FIELD OF THE INVENTION

The present invention generally relates to the field of footwear and more specifically to shoes that enable dynamic adaptable fitting and ventilation.

BACKGROUND OF THE INVENTION

The field of footwear and shoes – which also includes boots, runners, dress shoes, and specialized sporting shoes – is one that demands performance and comfort for the wearer. It is desirable that shoes fit properly to the wearer's foot for the given application, whether walking, running, dashing, changing direction, standing still or performing a variety of other sporty movements. A balance between tightness and comfort should be struck to give the shoe a good fit and enable it to adequately adapt to movement and impact forces.

Some shoes currently known in the art attempt to provide adaptability to the movement and shape of the foot using a plethora of methods – from liquid pouches to complex mechanisms to flexible materials.

The United States Patent No. 4,924,605 (SPADEMAN), for instance, describes a shoe having a dynamic fitting and shock absorbing system. This shoe includes a U-shaped pivot bar straddling a movable footbed and attached to a strap extending over the instep and forefoot. In response to a downward pressure on the footbed, the pivot bar pivots forward, thereby pulling down the strap and increasing its tightness on the foot. SPADEMAN also describes in another United States Patent No. 4,924,324 a similar system for dynamic fitting in a sport shoe, and specifically in a ski boot.

A number of other United States Patents, such as Nos. 5,444,926 (ALLEN et al.) and 6,860,035 (GIRARD), describe various dynamic fitting mechanisms for adapting to the user's foot and movements.

It is also desirable that a shoe have a certain level of ventilation to allow the foot to "breathe" while being surrounded and supported. The prior art describes ventilation systems for shoes that include duct-ridden soles, complicated fan mechanisms and gas permeable materials.

As examples, the United States Patents Nos. 6,665,048 B2, 6,041,519, 6,006,447, describe various ventilation systems that encourage air circulation in different parts of a shoe.

The problems and disadvantages associated with shoe ventilation and adaptability are well known to a person skilled in the art, and there is a need for a shoe that overcomes at least some of these disadvantages.

SUMMARY OF THE INVENTION

The present invention provides an adaptable shoe that responds to the above-mentioned need.

Accordingly, the present invention provides a dynamic adaptable shoe having an upper shell with an opening therein for receiving a foot, and a support sole peripherally connected to the upper shell to define a compartment therebetween for the foot. The shoe includes a footbed provided above the support sole and defining a space therebetween. The shoe also includes at least one biasing member for inwardly biasing the foot when the footbed is subject to a downward pressure. Each biasing member includes a side portion extending upward along the upper shell of the shoe and a bottom portion being connected to the side portion at a fulcrum and engageable by the footbed. The bottom portion is displaceable between an upward position when the footbed is subject to no pressure and a downward position when

the footbed is subject to the downward pressure, and thereby causes the side portion to inwardly pivot about the fulcrum to inwardly bias the foot. The shoe further includes air passage means in fluid communication with the space to allow air to exit the space when the footbed is displaced toward the downward position and enter the space when the footbed is displaced toward the upward position.

By "dynamic adaptable shoe" is meant that, upon being worn next to the foot of the wearer and used for walking, jogging or running, the shoe is adapted to dynamically fit on the foot as a function of the pressure exerted by the foot during a foot strike.

Thanks to the structure of the biasing members and the footbed which acts on the biasing member during a foot strike, the whole being combined with the fact that a space is provided under the footbed, a shoe according to the invention achieves improved ventilation and dynamic foot fit.

Foot fit and comfort, both statically and dynamically, and ventilation are thus provided for by the structure of the shoe of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention and its advantages will become more apparent upon reading the detailed description of preferred embodiments and upon referring to the drawings, in which:

Figs 1a and 1b are perspective exploded top views of adaptable shoes according to two preferred embodiments of the present invention.

Fig 2 is a bottom view of the support sole of the shoe of Figs 1a and 1b.

Fig 3 is a top view of the footbed of the shoe of Figs 1a and 1b.

Fig 4 is a side view of the footbed of Fig 3.

Fig 5 is a perspective view of the support sole and biasing members of the shoe of Figs 1a and 1b.

Figs 6a and 6b are top plan views of the support sole and biasing members of Fig 5, in open and closed positions respectively.

Figs 7a and 7b are cross-section views along line VIIa and VIIb of Figs 6a and 6b respectively.

Figs 8a and 8b are cross-section views along line VIIIa and VIIIb of Figs 6a and 6b respectively.

Figs 9a and 9b are top views of the shoe of Figs 1a and 1b, in an open position and closed position respectively.

Figs 10a and 10b are side views of the shoe of Fig 1a, in an open position and closed position respectively.

Figs 11a and 11b are perspective views of the shoe of Fig 1a, in an open position and closed position respectively.

Figs 12a and 12b are perspective views of an adaptable shoe according to another preferred embodiment of the invention, in an open position and closed position respectively.

Figs 13a and 13b are schematic front isolation views of a preferred embodiment of a biasing member, in an open position and closed position respectively.

DESCRIPTION OF PREFERRED EMBODIMENTS OF THE INVENTION

In the following description, similar features in the drawings have been given similar reference numerals in order not to unduly weigh down the figures. Also, some

elements are not referred to in some figures if they were already identified in a precedent figure.

While the benefits of the present invention can be enjoyed in virtually all footwear types such as boots, runners, sneakers, urban street shoes and specialized sporting shoes, the invention will be disclosed with respect to the figures as preferred embodiments of a dynamic adaptable shoe.

Referring to any of Figs 1a, 1b or 9a to 12b, the shoe 20 according to the present invention has an upper shell 22 with an opening 24 therein for receiving a foot (not shown) and a support sole 26 peripherally connected to the upper shell 22 to define therebetween a compartment for the foot. In one variant of the invention, shown in Fig 1a, the support sole 26 is the ground-contacting sole of the shoe 20. In another variant which is shown in Fig 1b, the shoe 20 further comprises an outer sole 28 under the support sole 26. In that variant, the ground-contacting sole is the outer sole 28. The shoe 20 also includes a footbed 30 provided above the support sole 26. The footbed 30 is provided between the upper shell 22 and the support sole 26 and has a top surface 32 engageable by the wearer's foot.

As seen in Fig 7a, the footbed 30 and the support sole 26 define a space 34 therebetween. The effect of this space 34 in relation to the movement of the footbed 30 will be further discussed herebelow.

Still referring to Fig 7a and also to Fig 7b, the shoe 20 also includes at least one biasing member 36 for inwardly biasing the foot when the footbed 30 is subjected to a downward pressure P. Each biasing member 36 includes a side portion 38 extending upward along the upper shell 22, and a bottom portion 40 connected to the side portion 38 at a fulcrum 42. The bottom portion 40 is engageable by the footbed 30 to be displaced between an upward position (see Fig 7a) when there is insufficient or no pressure on the footbed 30, and a downward position (see Fig 7b) when the footbed 30 is subjected to a downward pressure P. This downward

pressure P displaces the bottom portion 40 downward and causes the side portion 38 to pivot about the fulcrum 42 to inwardly bias the foot. The side and bottom portions 38, 40 are preferably made of a rigid material and are strip-shaped, but may also have another appropriate shape.

As mentioned above, the shoe 20 also has air passage means, which are in fluid communication with the space 34 to allow air to exit the space 34 when the footbed 30 is displaced toward the downward position and enter the space 34 when the footbed 30 is displaced toward the upward position. This enables the ventilation of the shoe 20. Any air passage means that can be contemplated by a person skilled in the art and enabling the air to cross the footbed are within the scope of the present invention. As for example, the footbed 30 could be perforated or made with a breathable material. Also, the air passage means may include breathable fabric making up at least a portion of the upper shell 22 of the shoe. Indeed, a variety of air passages such as holes, perforations and canals may be provided at various positions about the shoe (e.g. in the ground-contacting sole, in side wall adjacent to the space, etc.) so that the space is in fluid communication with the outside air and the air in the space may be expelled through the air passage means when the footbed is pressed downward.

Referring now to Fig 4, the footbed 30 preferably has an ergonomic shape designed for the sole of the wearer's foot. The footbed 30 has a flat heel part 46, a central arch part 48 which is convex relative to the foot and a toe part 50 which is concave relative to the foot. The footbed 30 may also be provided with one or more orifices, disposed as slot-shaped orifices 44a or on its periphery in the form of notches 44b. These orifices 44a, 44b are other examples of the air passage means described above that allow air to pass in and out of the space 34 beneath the footbed 30, to aerate the shoe compartment.

Referring now to Fig 5, the biasing members 36 are preferably connected to the support sole 26. Alternatively, the biasing members 36 may be adhered to, molded

with or incorporated with the upper shell and support sole 26. It should also be understood that there is at least one biasing member 36 provided in the shoe 20, and thus there may be one or more of such members. Each biasing member 36 allows the inward biasing of the foot in response to downward pressure on the footbed 30 during a foot strike. Preferably, there is a plurality of biasing members 36 strategically arranged around the shoe 20 to provide the desired clamping effect, depending, of course, on the application of the shoe.

Preferably, pairs of biasing members 36 are provided, each biasing member 36 being opposite another. The two opposite side portions 38 of the pair of biasing members 36 thus exert opposite inward biasing forces on the foot. The foot may thus be clamped from both sides by opposite biasing members 36, to provide an advantageously adaptive fit. Alternatively, the biasing members 40 may be arranged on one side of the shoe, in the front and/or at the heel end, to provide clamping (on one side or more) in a desired area. As feet are not symmetrical, the biasing members may be different, depending on which side they are arranged, be it instep or outstep, toe end or heel end. For example, a biasing member 36 may be arranged on an extremity of the toe portion of the shoe 20 to clamp the toe part of the foot. Likewise, a biasing member 36 may be arranged on an extremity of the heel portion of the shoe 20 to clamp the heel part of the foot. Of course, both heel and toe biasing members 36 may be provided.

The preferred embodiment illustrated in Figs 1a, 1b, 5 to 6b and 9a to 12b, shows the shoe having two pairs of biasing members, a first pair being positioned at the toe end and the second pair at the heel end.

Referring now to Figs 1a, 1b, 2 and 5, the biasing members 36 are preferably connected to the support sole 26. More specifically, the support sole 26 is preferably made of a rigid material and comprises a plurality of flexible webbings 48 each connecting the bottom portion 40 of a respective biasing member 36 to the support sole 26. For clarity purposes, the area of the support sole 26 surrounding the

webbing 48 will hereinafter be referred to as the central rigid base 46 of the support sole 26. The webbings, which make a flexible connection, enable the bottom portions 40 of the biasing members to be displaceable with respect to the rigid base 46. By interconnecting the biasing members 36 with the support sole 26, there is a simplicity and cohesion of the moving parts, which may increase durability and fitting of the adaptable shoe. Furthermore, the rigid base 46 reinforces the sole and enables the concentration of the strains in the flexible webbings 48.

The flexible webbings 48 preferably have a width that depends on the flexibility required and the material used. The flexible webbings 48 facilitate the clamping ability of the biasing members 36 by stretching when a downward pressure is brought on the bottom portions 40. The webbings 48 thus define a specific stress-strain region, enabling the shoe to display selective flexibility, that is, predetermined stress-strain characteristics in predetermined areas of the shoe. Of course, the particular rigidity of the side and bottom portions 38, 40 and the flexibility of the webbings 48 may be adjusted by a person skilled in the art.

Referring to Figs 7a and 7b, each bottom portion 40 is preferably in contact with the bottom surface 49 of the footbed 30, so that the footbed 30 directly forces the bottom portion 40 to pivot downward about the fulcrum 42 when a foot exerts a pressure P thereon. Preferably, the bottom portions 40 each include an upward projection 50 for supporting the footbed 30 above the support sole 26. The projections 50 are preferably elongated rib shaped.

As shown in Fig 3, the footbed 30 preferably has corresponding recesses 52, each receiving the upward projection 50 of the bottom portion 40 of a corresponding one of the biasing members 36. Alternatively, the footbed 30 may be held above the support sole 26 in other ways. For example, the footbed 30 may be arched and thus touch opposite peripheral parts of the sole while defining the space in the central area and having a flexibility sufficient to enable it to be bent downward in response to a pressure. Also, the footbed 30 may be connected to an inner wall of the upper

shell 22 using a flexible connector (not shown) to be held above the support sole 26 while allowing it to be displaced there-toward. The footbed 30 may also be supported from beneath by an element other than the bottom portions, such as small compressible or flexible elements (not shown).

Referring back to Figs 7a and 7b, the bottom portion 40 preferably supports the footbed 30 from below to allow the footbed 30 to be positioned above the support sole 26 to define the space 34. This upward position is also called the "open" position since the side portions 38 have a more outward, open orientation. In Fig 7a, there is no pressure exerted on the footbed 30, and thus the bottom portions 40 support the footbed 30 to define the space 34. In Fig 7b, the space 34 has been reduced due to the downward displacement of the footbed 30. In this downward position (also called the "closed" position, since the side portions 38 are inwardly biasing the foot), the bottom portion 40 exerts an upward force so that once the pressure P is removed, the footbed 30 is displaced upward, thereby increasing the volume of the space 34. In this way, by alternating between the upward and downward positions, the biasing members 36 enable alternating clamping and unclamping as well as ventilation through the reciprocal movement of the footbed 30.

Referring now to Figs 9a to 12b, the side portion 38 of each biasing member 36 extends upward along the upper shell 22. The side portion 38 may be contiguous with or adhered to or molded with the upper shell 22 of the shoe 20, but may alternatively extend upward and slightly away therefrom or be disposed within the compartment defined between the upper shell 22 and the ground-contacting sole. In Figs 9a to 11b, the side portions 38 include upper extremities 54 that are inwardly curved and extend over the upper shell 22 of the shoe 20. In contrast, Figs 12a and 12b illustrate side portions 38 that are shorter and reach only the lateral side walls of the upper shell 22. Indeed, the side portions 38 may have a variety of shapes and lengths, and may extend at diverse angles with respect to the bottom portions 40.

They may be, for instance, curved or straight. The side portions 38 are preferably composed of the same rigid material as the bottom portions 40 and may be made integral therewith. Alternatively, the side and bottom portions 38, 40 may be connected together using glue, stitching, or any suitable means known in the art. The portions 38, 40 are preferably composed of polymeric material, but may also be constructed using other materials.

The side and bottom portions 38, 40 as well as the fulcrum 42 of the biasing member 36, have rigidities enabling them to clamp in response to a downward pressure on the bottom portion 40. When the biasing member 36 is adhered to, stitched to or integral with other parts of the shoe, the side and bottom portions 38, 40 thereof should have a greater rigidity than the immediately adjacent part to which they are attached, to allow them to be pivoted about the fulcrum.

Referring to Fig 5, the side and bottom portions 38, 40 are attached to the fulcrum 42 and the clamping action results from a pivoting about the axis 56 of the fulcrum 42. It should be understood that axis 56 of the fulcrum 42 is a mathematical one that may move as the bottom and/or side portions are displaced or shift during use. The angle α between side and bottom portions 38, 40 is chosen so as to enable the side portion 38 to be inwardly biasable for clamping a foot inserted in the shoe 20 and improving an adaptive fit of the shoe 20.

Referring now to Figs 13a and 13b, the angle α may be seen between the side and bottom portions 38, 40. This angle α is preferably less than about 90°, the side portion 38 thereby being inwardly biasable and pivotable against the foot for clamping the foot inserted within the shoe. Still preferably, the angle α is between about 85° and about 45°, and may be determined by a person skilled in the art depending on materials used and applications of the shoe. By changing the angle α and the stiffness of the material, one can tune the contact force at the top of side portion 38. Fig 13a shows the biasing member 36 in a relaxed position (also called the "open" position and the "upward" position) when the wearer's foot is not exerting

a pressure. In this position, the bottom portion 40 is angled with respect to a horizontal plane 58 and defines an angle β with the horizontal plane 58 that is more than about 0°, thereby enabling the side portion 38 to rotate about the fulcrum 42 and toward a side of the foot inserted within the shoe, to an inward position (also called the "closed" position or the "downward" position) when a downward pressure P is exerted on the bottom portion 40. Fig 13b shows this inward position of the side portion 38, when the bottom portion 40 has been brought to be flush with the ground. The angle β of the bottom portion 40 is preferably between about 5° and about 30°, but may be determined by a person skilled in the art.

It should also be understood that the biasing members 36 are provided on the shoe at predetermined locations, and preferably conforming to the shape of those locations. As the biasing members 36 may be curved with the periphery and surface of the shoe, the angles α and β may be varied within the same biasing member. Thus, for example, an angle α may be greater nearer one end of a biasing member than the other. Similarly, the side and bottom portions 38, 40 may be curved, or flat, to adapt to the shoe and/or have the desired effect.

Preferably, the outer sole 28 is provided with gripping means to improve traction. In the case where the support sole 26 consists of the ground-contacting sole, the bottom portions themselves and/or the central rigid base may be provided with various gripping means.

Materials of construction

The preferred materials of construction of the flexible parts of the support sole 26 are materials such as thermoplastics and rubbers, which preferably have a low density to enable flexibility and elasticity. High elasticity materials are preferred, such as a thermoplastic elastomer (TPE), in order to substantially avoid permanent deformation of the flexible zones, which undergo amplified stress-strain.

The rigid material is preferably selected from thermoplastic elastomers, thermoplastic rubbers, hardened rubbers, reinforced polymers, thermosetting plastics, and polyurethanes, or any synthetic material selected by a skilled workman. Also alternatively, the rigid zones may be non polymeric materials known in the art. For instance, when extra rigidity is desired or when material costs dictate, the rigid zones may be made of wood or metal or other reinforcement materials. Of course, in these latter cases, the method of fabricating the shoe and its components may be adapted accordingly.

Preferably, the flexible zones and rigid zones are made of the same material, but of different stiffnesses.

Alternatively, the different portions of the support sole 26 may be made of various materials having varying degrees of hardness, elasticity, flexibility and adherence properties. Other parts of the support sole may be of variable thicknesses or materials. For instance, the arch portion may be made of an extra flexible, soft material to facilitate bending of the shoe during the gait of a wearer.

The areas of the footbed, which are engageable with the bottom portion of the biasing members, are preferably fabricated with the same material used for the rigid bottom and side portions of the biasing member, or any other material with the desired degrees of rigidity, lightweightness and molding feasibility. The areas of the footbed not in contact with the biasing members may be made of a material having less rigidity. The footbed may be made, therefore of a plethora of appropriate materials, as would be known to a person skilled in the art.

The upper shell 22 of the shoe is preferably composed, at least in part, of a breathable and waterproof fabric and may be knitted or glued to the ground-contacting sole. The upper shell is also preferably connected via knitting or glue or another appropriate means known to a person skilled in the art, to the side portions 38 of the biasing means. The upper shell 22 may also be made of extensible

breathable fabrics. In this case, such materials may comprise soft shell types of fabrics or any other material having extensible properties such as neoprene.

Preferably, the thickness of the material varies at different locations of the shoe cover in order to provide particular stress-strain behavior, for improved fit, adaptability and retaining capability.

Of course, the scope of the present invention is not limited to the preferred embodiments and variants described hereabove, but rather extends therebeyond to encompass what would be reasonably deduced by a person skilled in the art from the above description, the below claims and the appended drawings, as what was actually invented.

CLAIMS

1. A dynamic adaptable shoe having an upper shell with an opening therein for receiving a foot, and a support sole peripherally connected to the upper shell to define a compartment therebetween for the foot, the shoe comprising:

    - a footbed provided above the support sole and defining a space therebetween;

    - at least one biasing member for inwardly biasing the foot when the footbed is subjected to a downward pressure, each biasing member comprising:

        i. a side portion extending upward along the upper shell of the shoe;

        ii. a bottom portion being connected to the side portion at a fulcrum and engageable by the footbed, the bottom portion being displaceable between an upward position when the footbed is subjected to no pressure and a downward position when the footbed is subjected to the downward pressure and thereby causing the side portion to inwardly pivot about the fulcrum to inwardly bias the foot; and

    - air passage means in fluid communication with the space to allow air to exit the space when the footbed is displaced toward the downward position and enter the space when the footbed is displaced toward the upward position.

2. The shoe of claim 1, wherein the at least one biasing member comprises a first pair of biasing members, each disposed on opposite sides of the shoe.

3. The shoe of claim 2, wherein the first pair of biasing members is provided at a toe end of the shoe and the at least one biasing member further comprises a second pair of biasing members provided at a heel end of the shoe.

4. The shoe of claim 3, wherein the bottom portion of the biasing members is engageable with an area of the footbed that is made of a rigid material.

5. The shoe of claim 4, wherein the bottom portion comprises an upward projection for supporting the footbed above the ground-contacting sole.

6. The shoe of claim 5, wherein the footbed has a bottom surface comprising at least one recess, each recess receiving the upward projection of the bottom portion of a corresponding one of said biasing members.

7. The shoe of claim 5, wherein the upward projection has an elongated rib shape.

8. The shoe of claim 3, wherein the support sole comprises a central rigid base and a plurality of flexible webbings, the bottom portion of each one of the biasing members being connected to a respective one of said plurality of webbings, to allow the bottom portion to be displaceable with respect to the central rigid base.

9. The shoe of claim 8, comprising an outer sole on which the support sole is resting.

10. The shoe of claim 3, wherein the bottom and side portions are strip-shaped and composed of a rigid material.

11. The shoe of claim 10, wherein, for each of said at least one biasing member, an angle α measured between the bottom portion and the side portion is less than about 90°.

12. The shoe of claim 11, wherein the angle α is between about 85° and about 45°.

13. The shoe of claim 10, wherein, for each of said at least one biasing member, the bottom portion is angled with respect to a horizontal plane when in the upward position and defines an angle β with the horizontal plane that is more than about 0°, thereby enabling the bottom portion to downwardly rotate about an axis of the fulcrum in response to the downward pressure, to thereby cause the side portion to inwardly rotate about the axis of the fulcrum.

14. The shoe of claim 13, wherein the angle β is between about 5° and about 30°.

15. The shoe of claim 10, wherein the side portion comprises an inwardly curved upper extremity extending inwardly over the upper shell of the shoe.

16. The shoe of claim 1, wherein the air exit means comprise a breathable fabric composing at least a portion of the upper shell.

17. The shoe of claim 1, wherein the air exit means comprise orifices provided in the footbed.

18. The shoe of claim 1, wherein the side portion of each of the at least one biasing member is moulded on the upper shell.

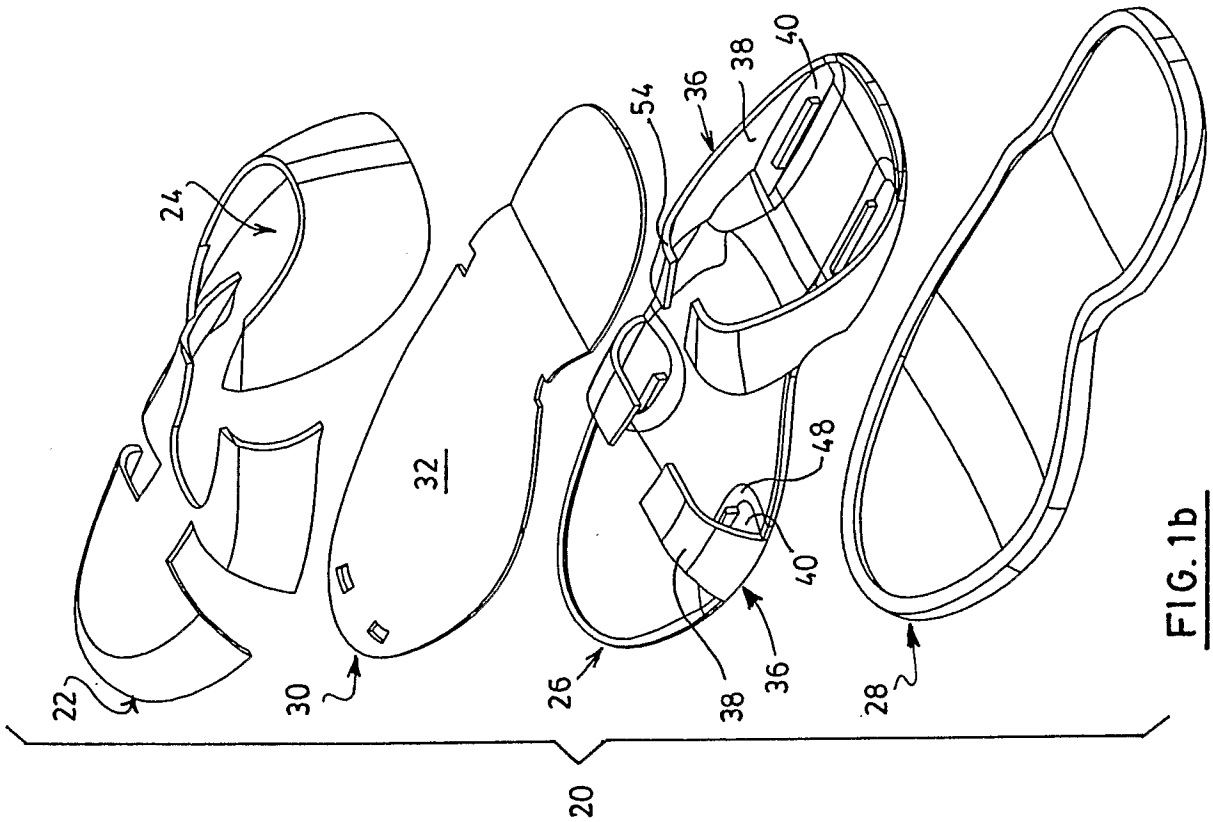
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FIG. 1b

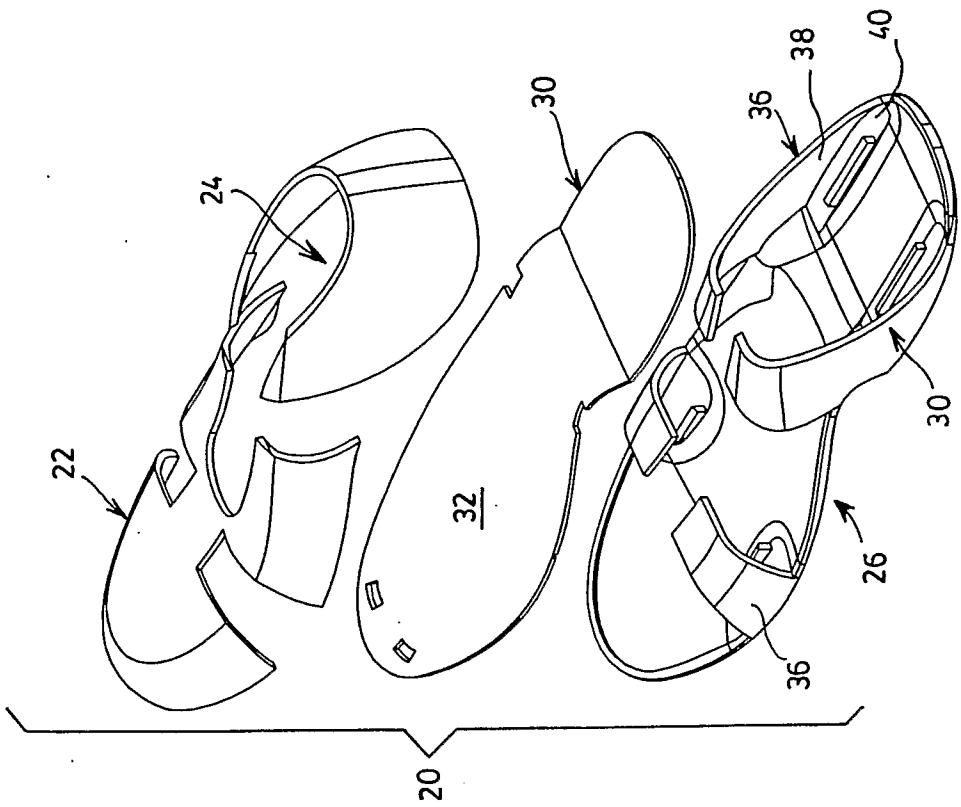
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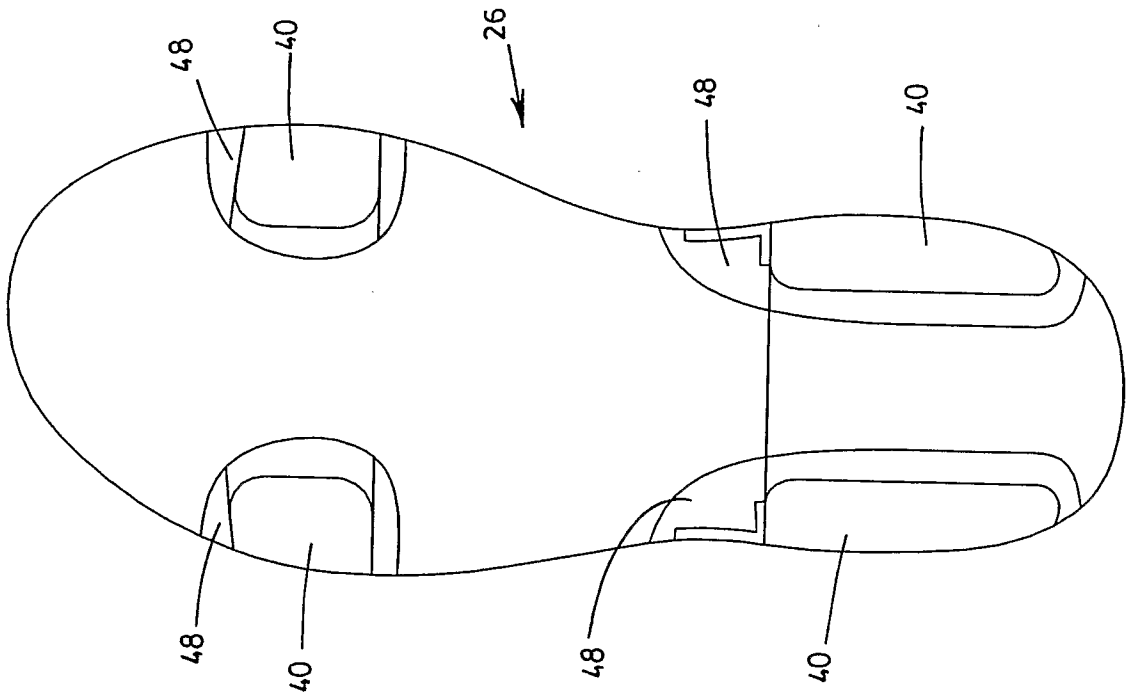
FIG. 1a

FIG. 2



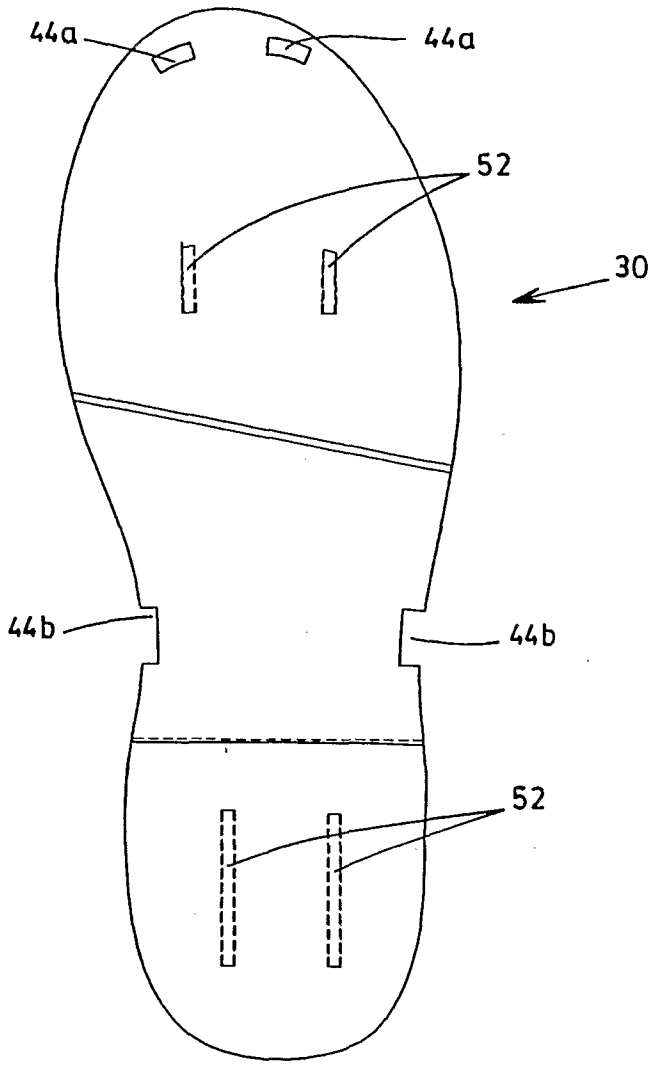


FIG. 3

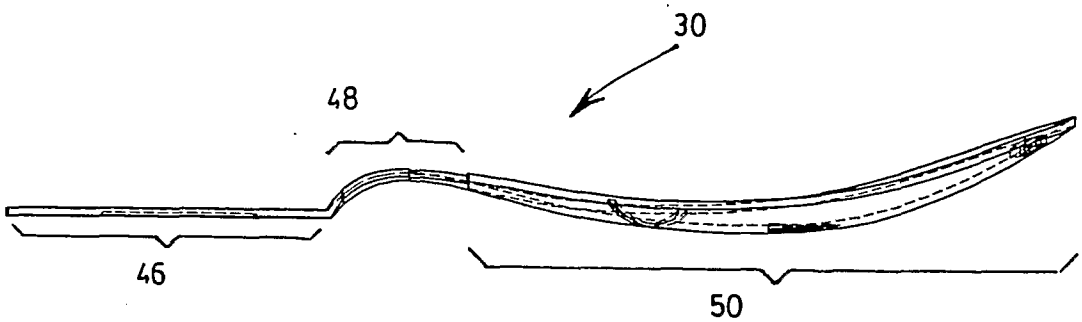


FIG. 4

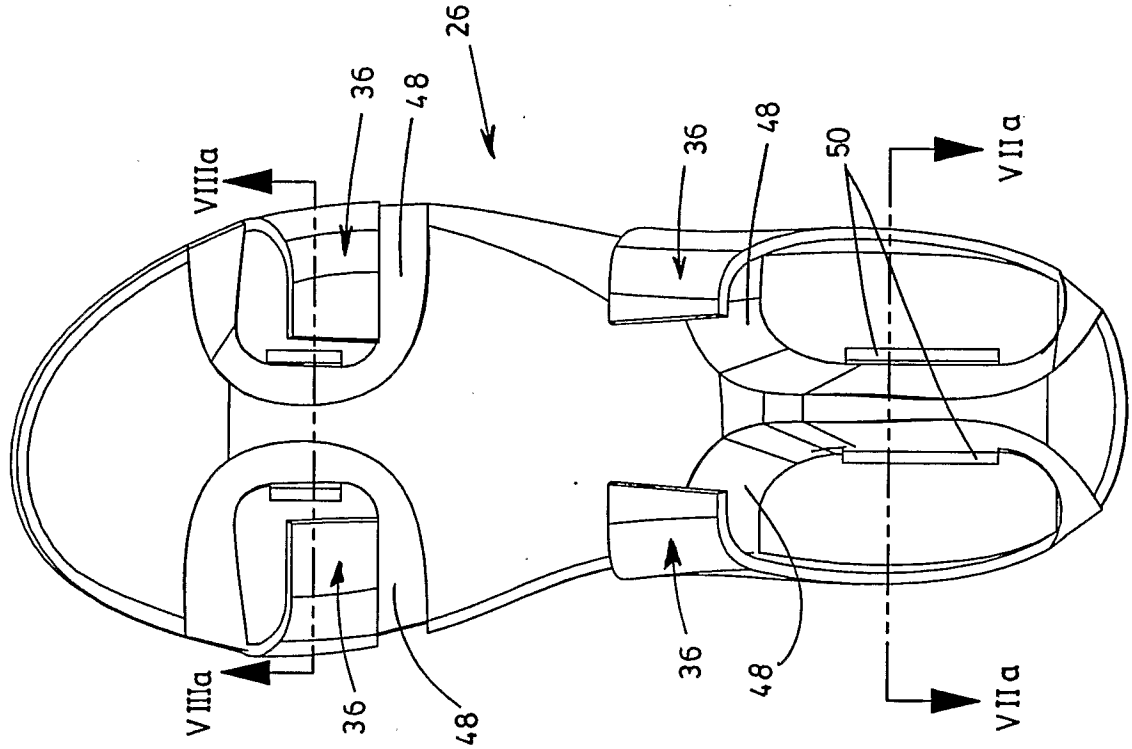

26
36
48
VIIIa
VIIIa
36
48
36
48
50
VIIa
VIIa
36
48

FIG. 6a

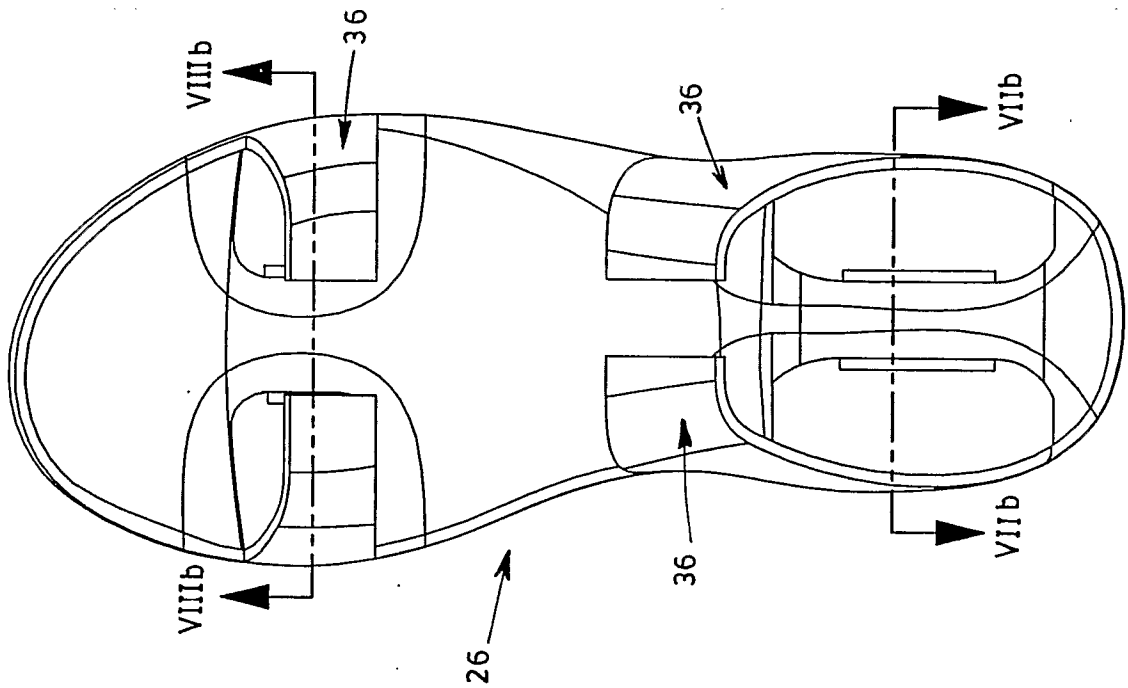

VIIIb
36
VIIIb
36
36
VIIb
VIIb
26

FIG. 6b

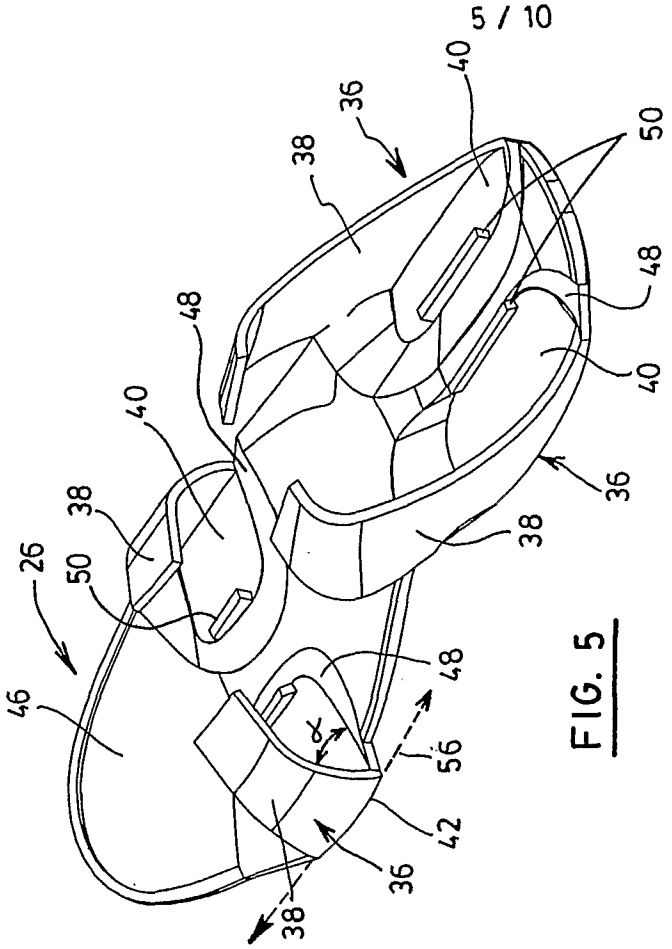


FIG. 5

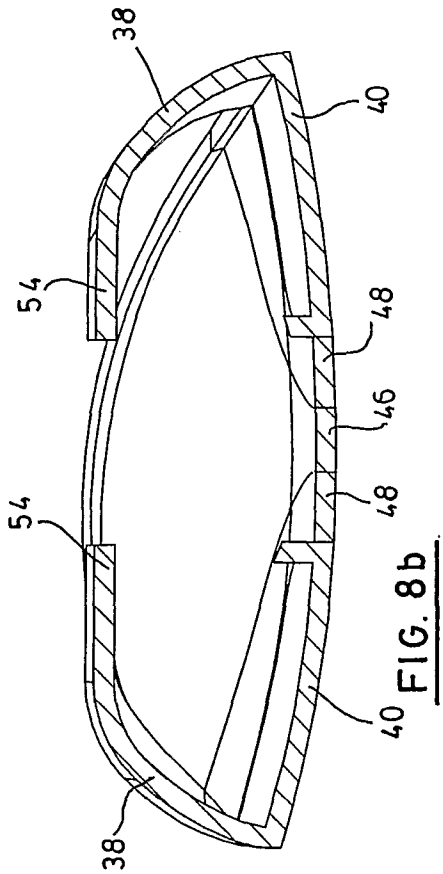


FIG. 8b

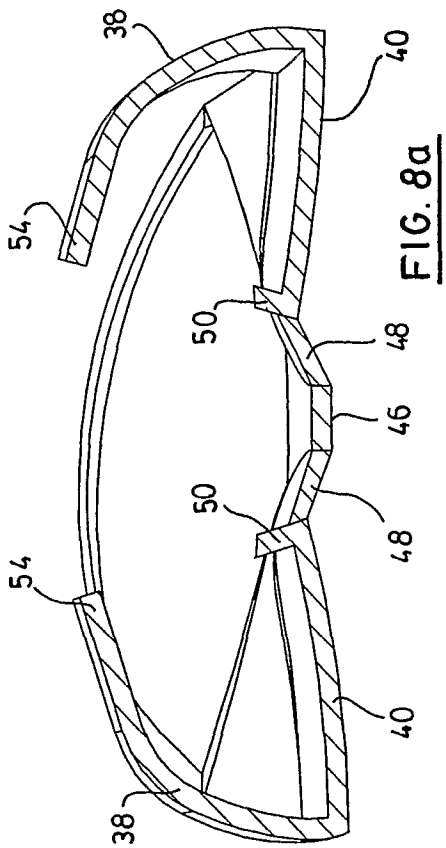


FIG. 8a

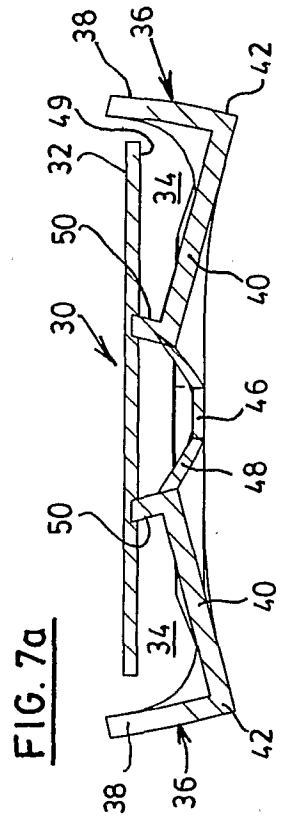


FIG. 7a

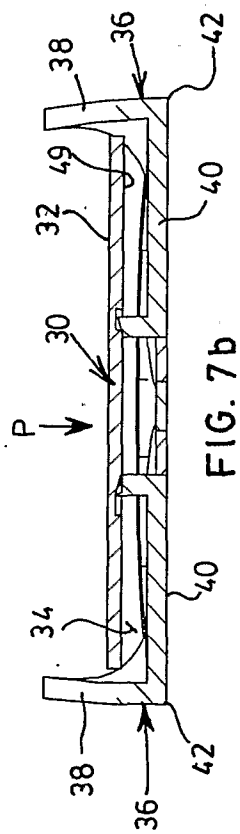


FIG. 7b

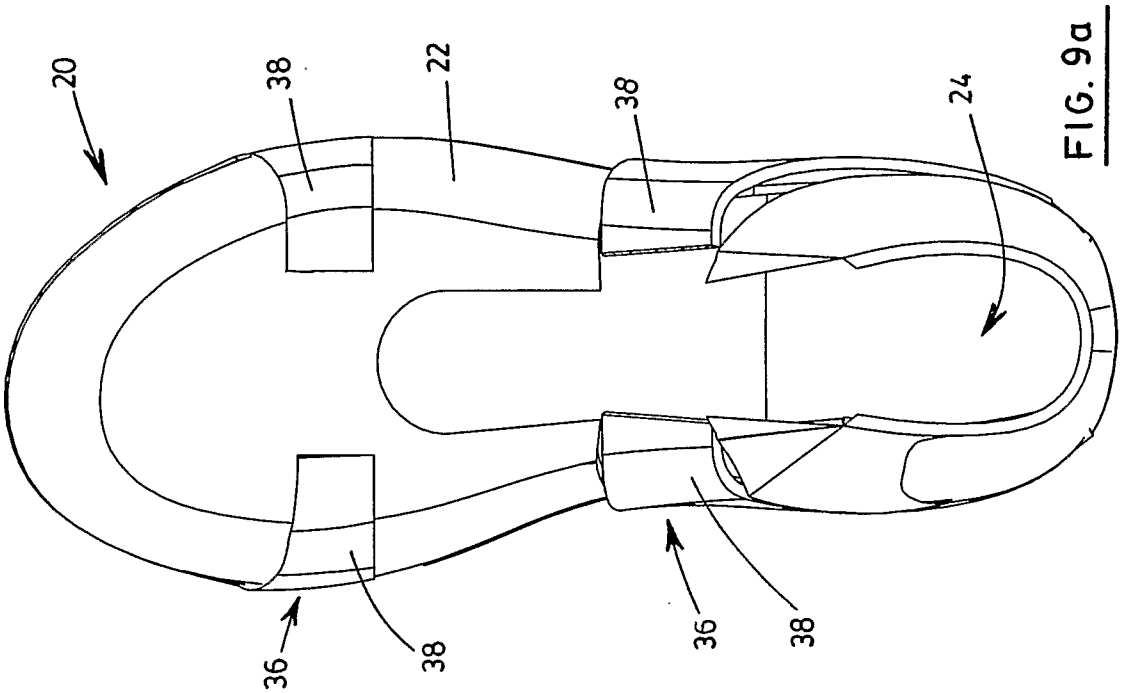


FIG. 9a

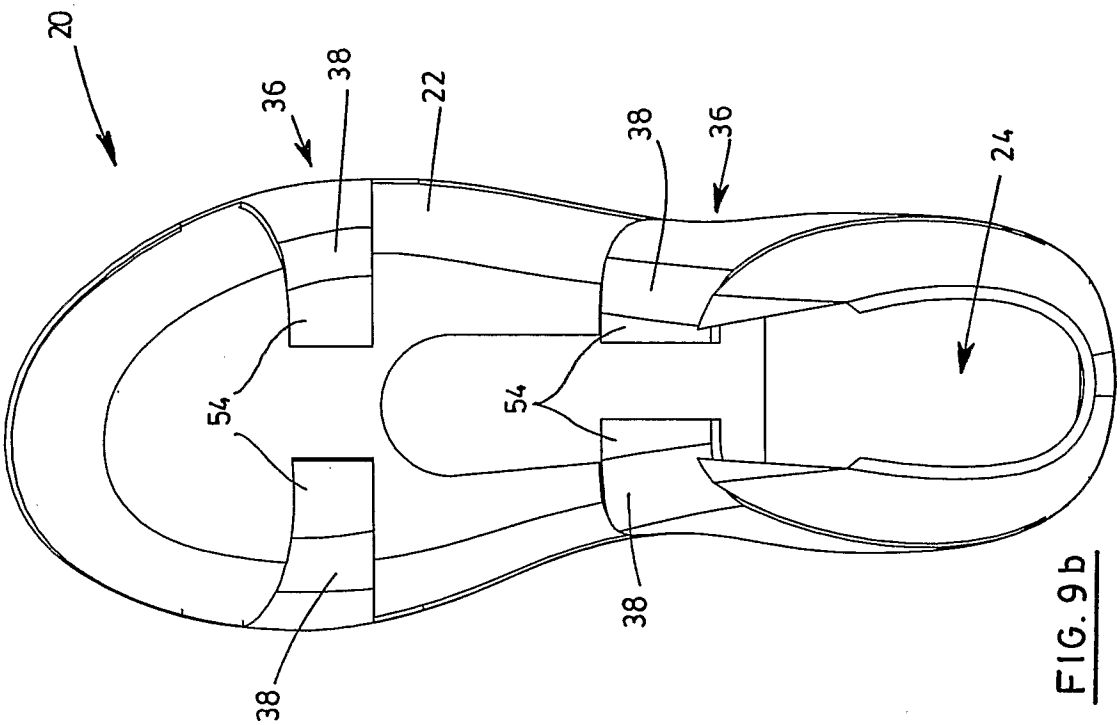


FIG. 9b

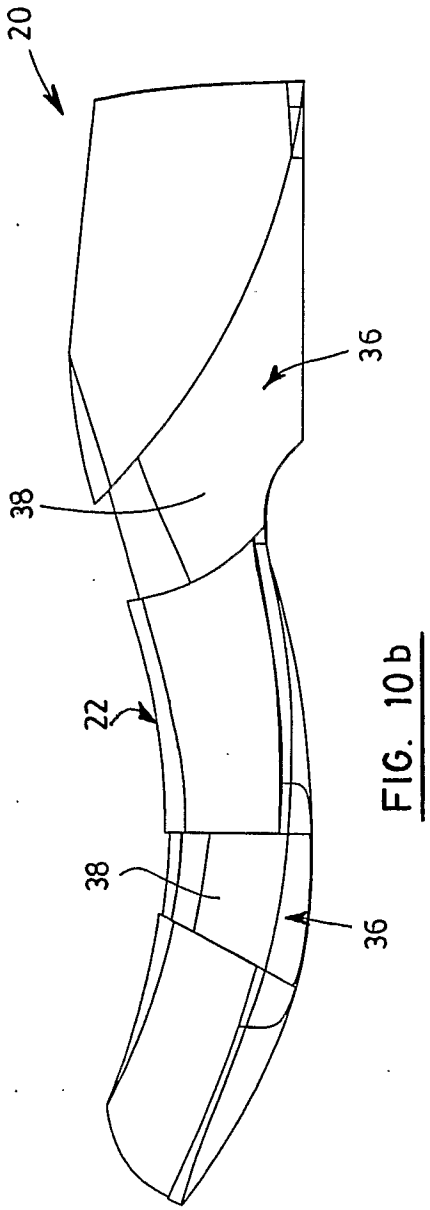


FIG. 10b

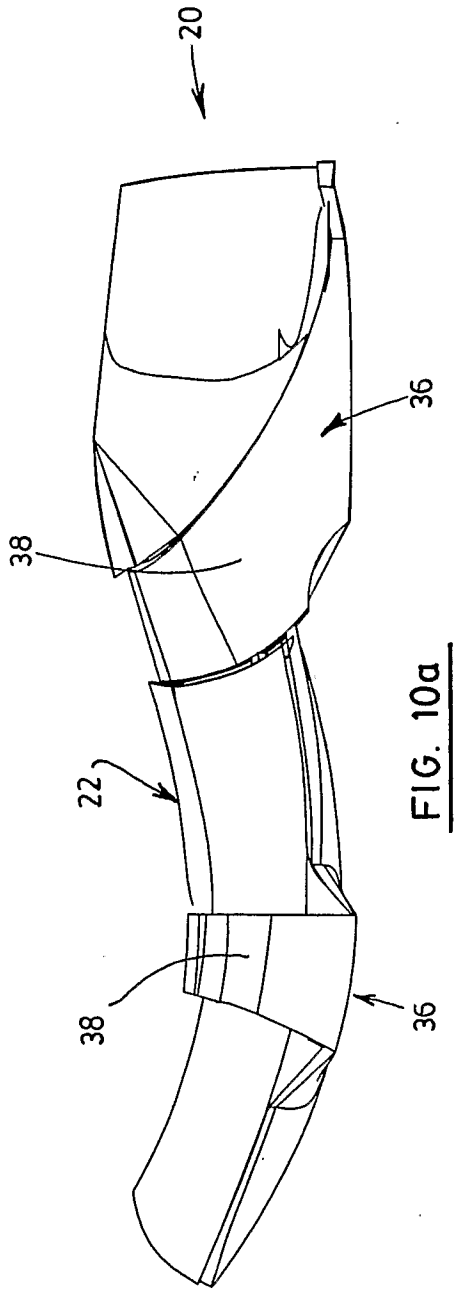


FIG. 10a

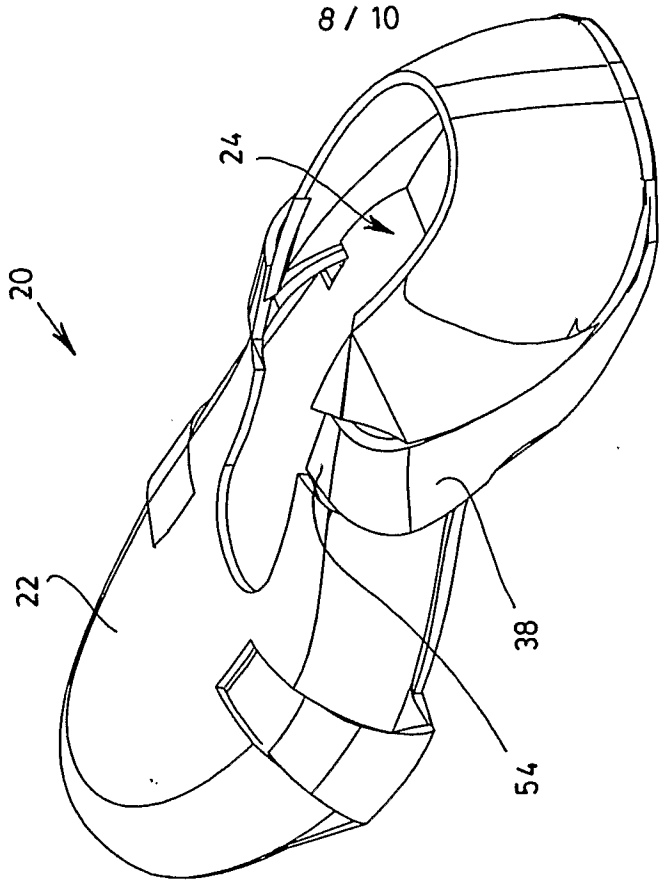


FIG. 11a

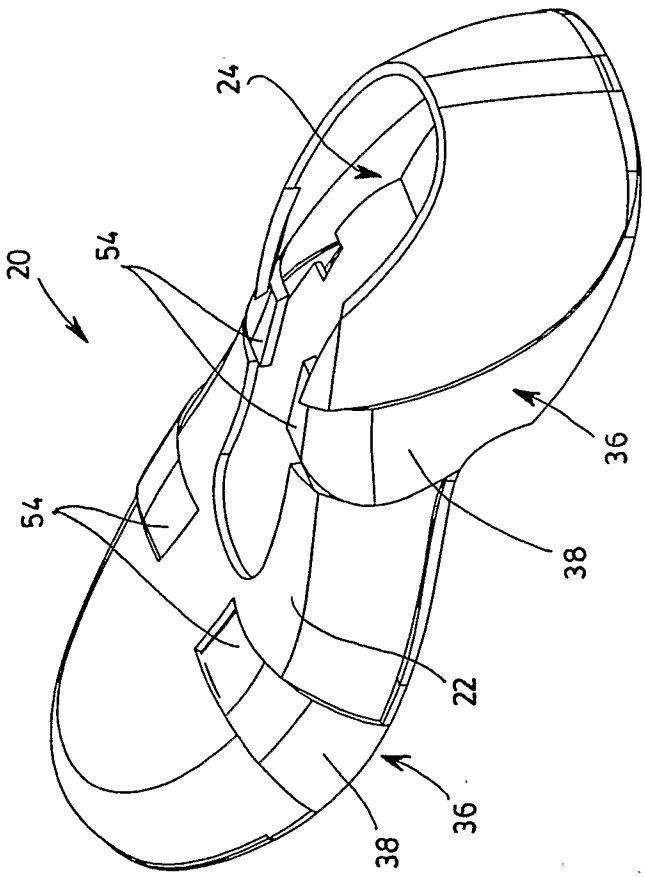


FIG. 11b

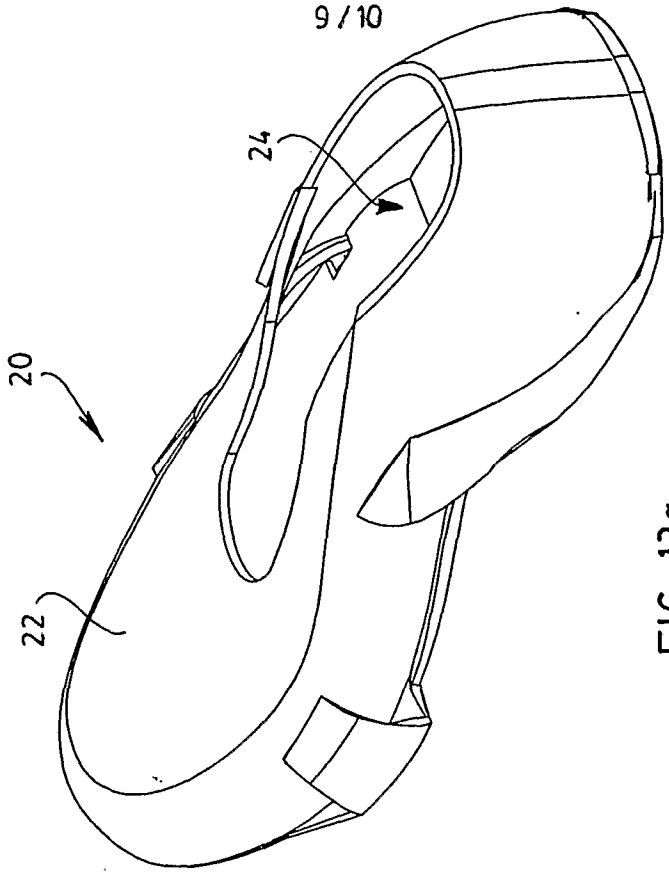


FIG. 12a

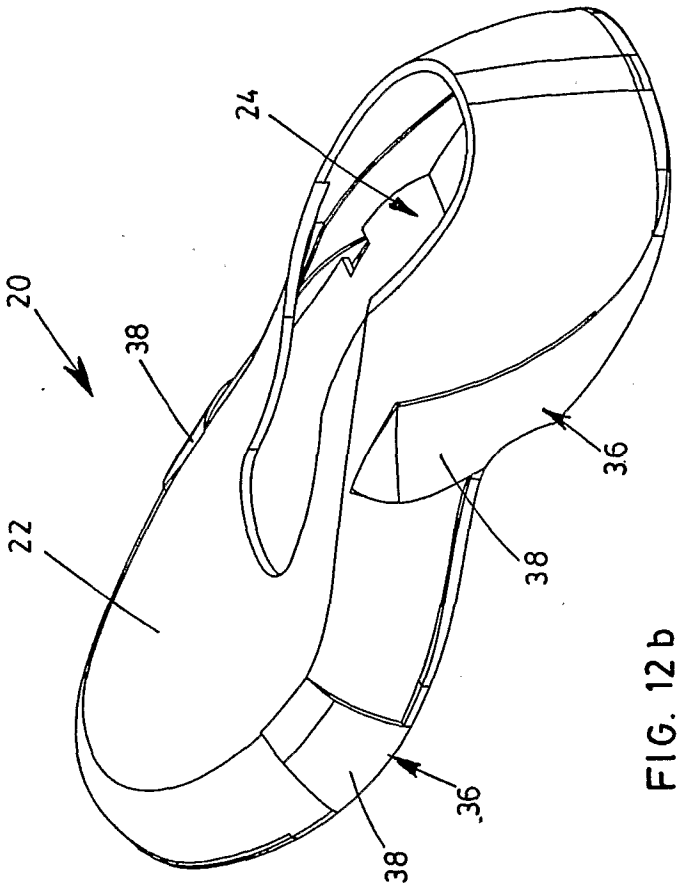


FIG. 12b

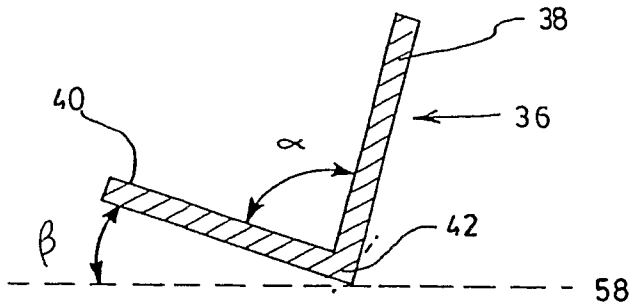


FIG. 13a

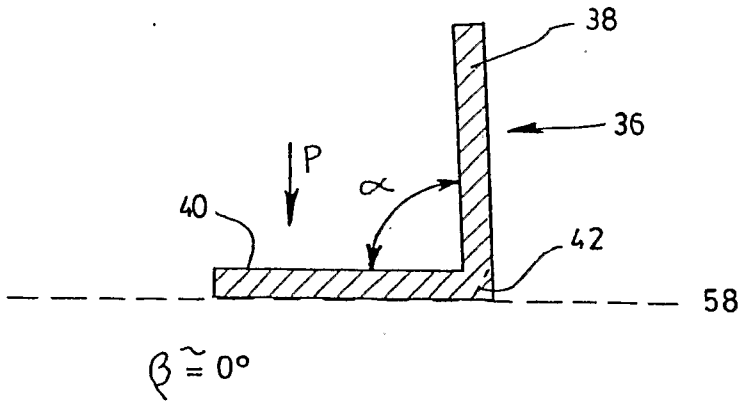


FIG. 13b

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2006/001508

A. CLASSIFICATION OF SUBJECT MATTER
IPC: ***A43B 7/14*** (2006.01) , ***A43B 7/08*** (2006.01) , ***A43B 23/02*** (2006.01) , ***A43B 5/00*** (2006.01)
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: ***A43B 7/14*** (2006.01) , ***A43B 7/08*** (2006.01) , ***A43B 23/02*** (2006.01) , ***A43B 5/00*** (2006.01)
USPC: 036/*; CPD: 36/*

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

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)
Delphion, Internet, Keywords: inward, bias, shoe, support, dynamic, orthopaedic, pivot, foot

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CA2480873 (RALUY et al.) 6 May 2004 (06-05-2004)	1 - 18
A	US5282327 (OGLE) 1 February 1994 (01-02-1994)	1 - 18
A	US4924605 (SPADEMAN) 15 May 1990 (15-05-1990)	1 - 18
A	US6006447 (NEAL et al.) 28 December 1999 (28-12-1999)	1, 16, 17
A	US4364186 (FUKUOKA) 21 December 1982 (21-12-1982)	1, 16, 17

[ ] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"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	Date of mailing of the international search report
18 December 2006 (18-12-2006)	29 December 2006 (29-12-2006)

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Authorized officer
Tanya Hanham 819- 953-4506

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CA2006/001508

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