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(54) **PLANTAR FASCIITIS ORTHOTIC INSOLE**

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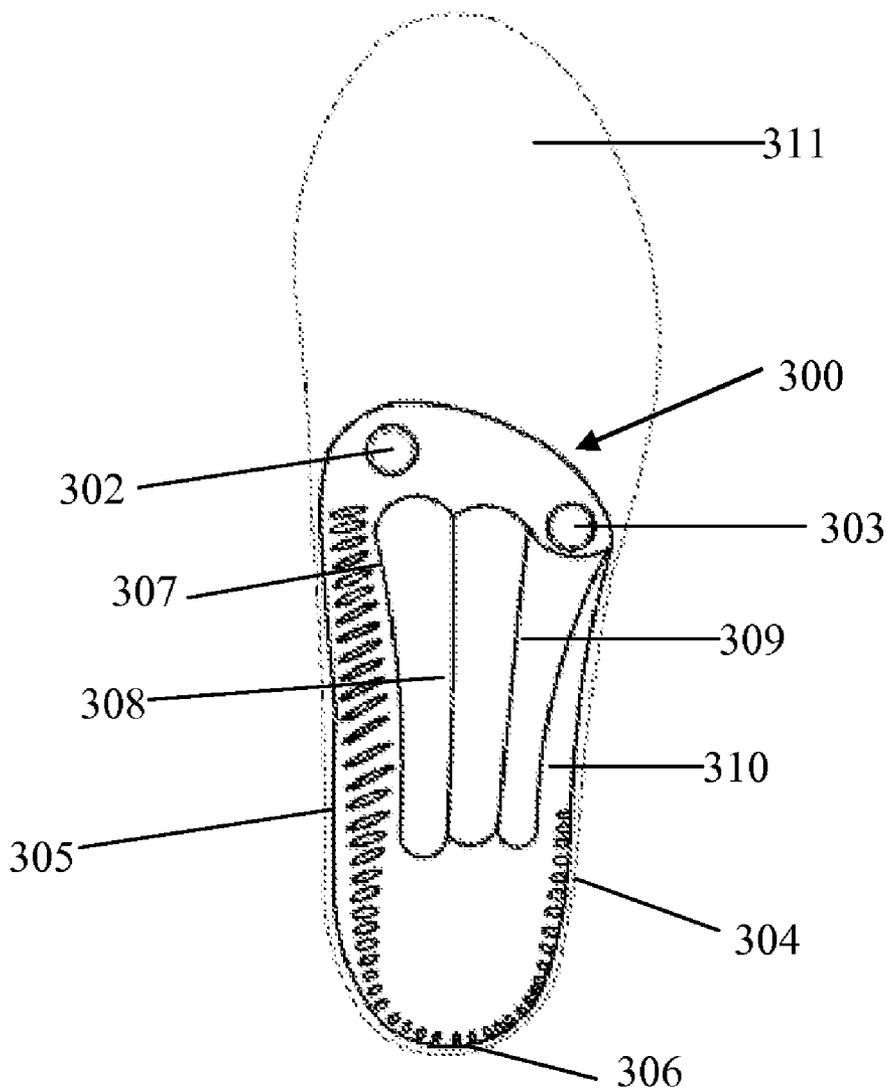
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**Related U.S. Application Data**

(60) Provisional application No. 61/887,261, filed on Oct. 4, 2013.

(57) **ABSTRACT**

A therapeutic insole, comprising: at least a plantar channel running onto the upper surface of the therapeutic insole for providing support to a user's foot structure; a section of outside ribbing adapted to secure the therapeutic insole into a user's shoe; a plurality of support ribs running underneath the therapeutic insole to aid providing support to a user's foot structure while maintaining the therapeutic insole's shape; and a heel cup working with the at least a plantar channel to prevent undesired changes in a user's plantar fascia and heel tissue.



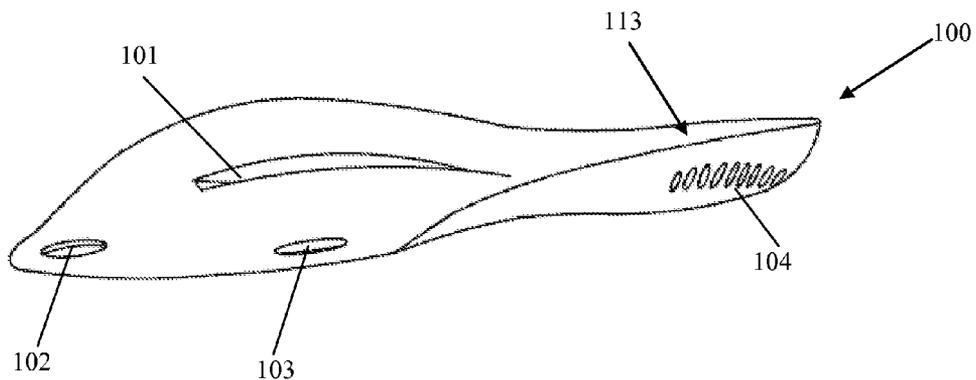


FIG. 1

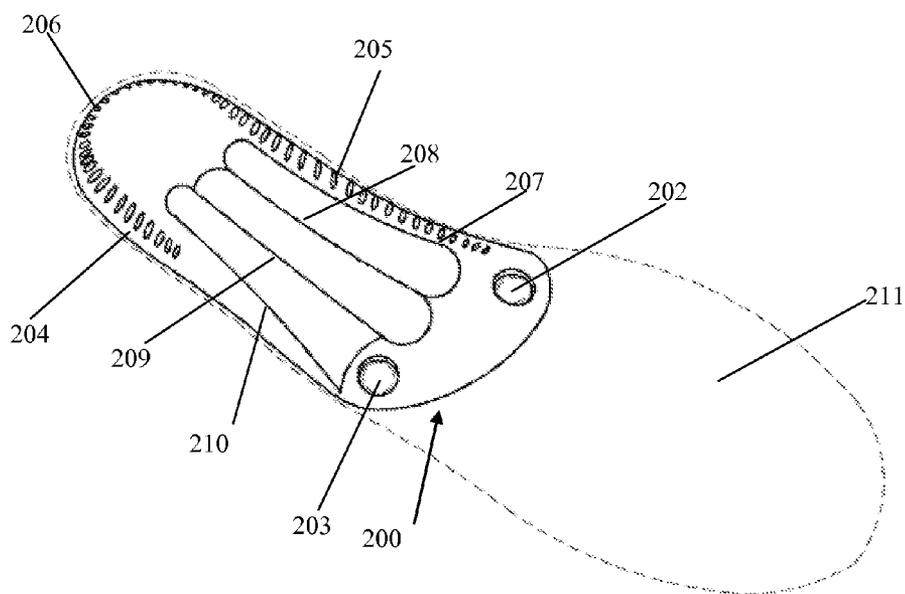


FIG. 2

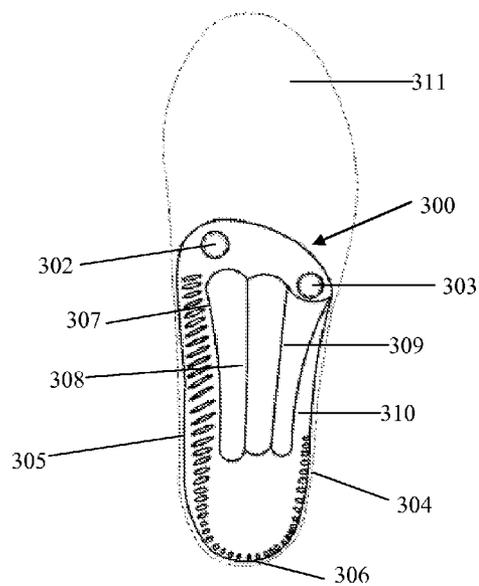


FIG. 3

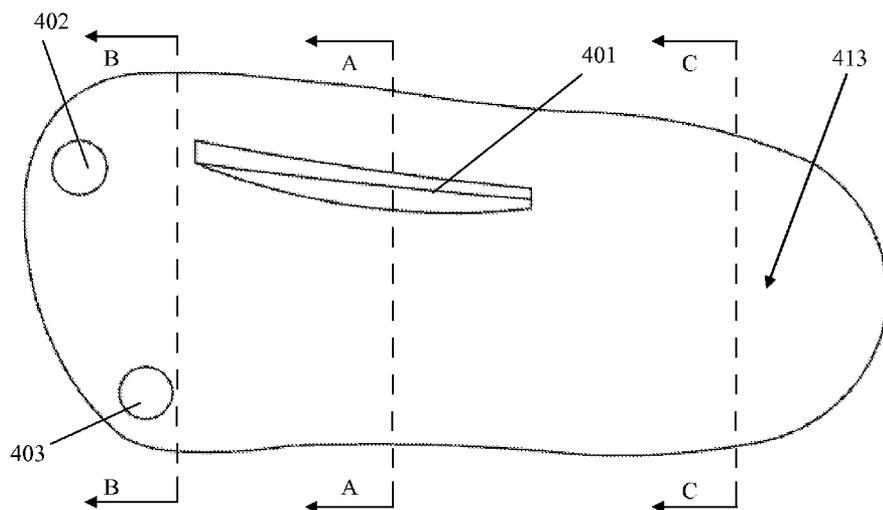


FIG. 4

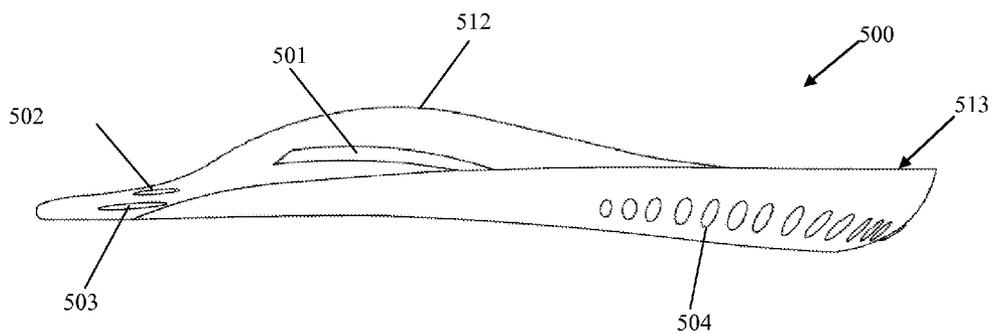


FIG. 5

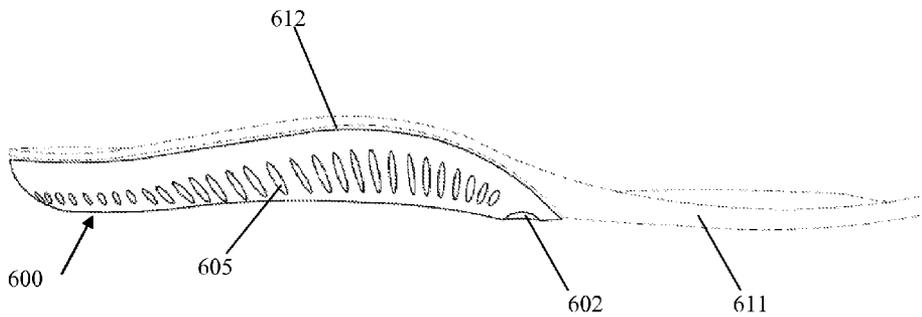


FIG. 6

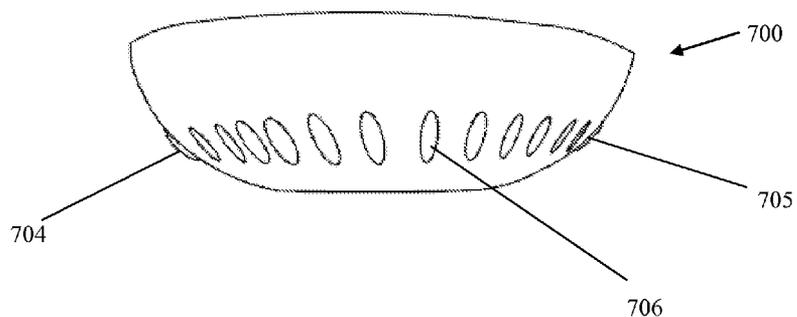
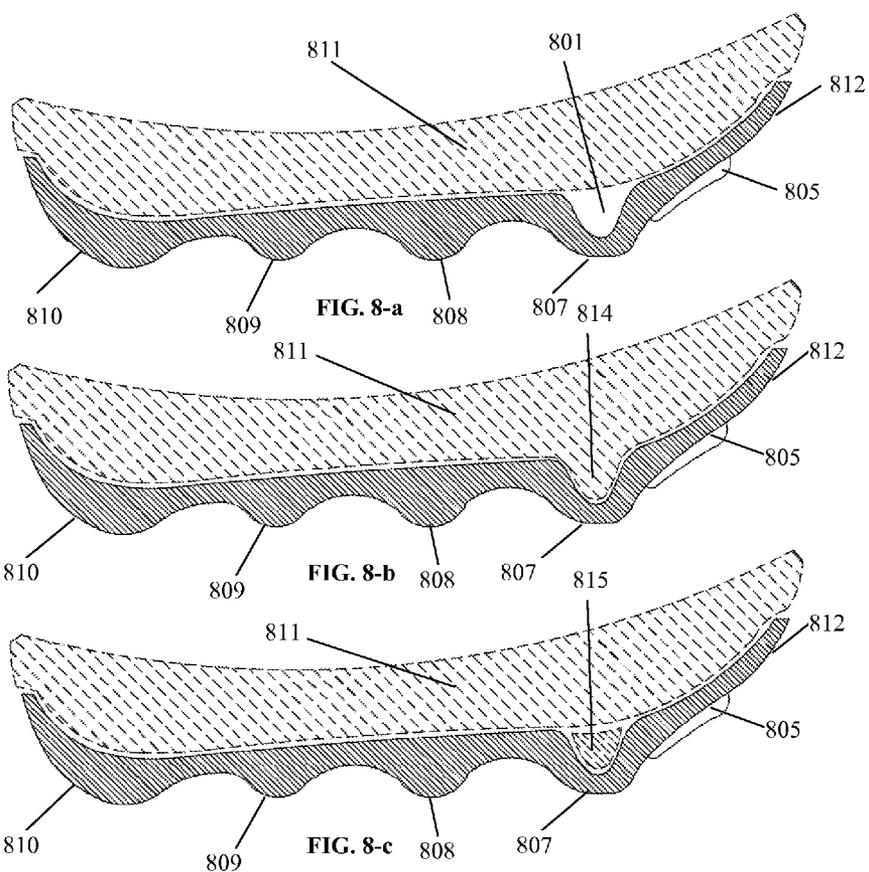


FIG. 7



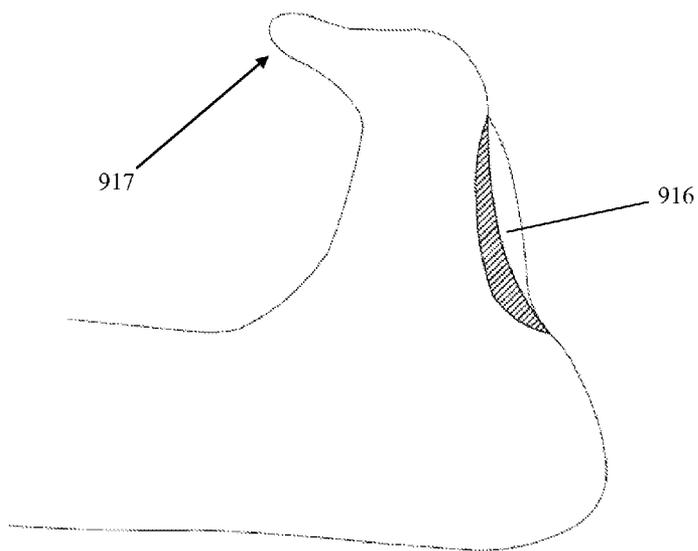


FIG. 9

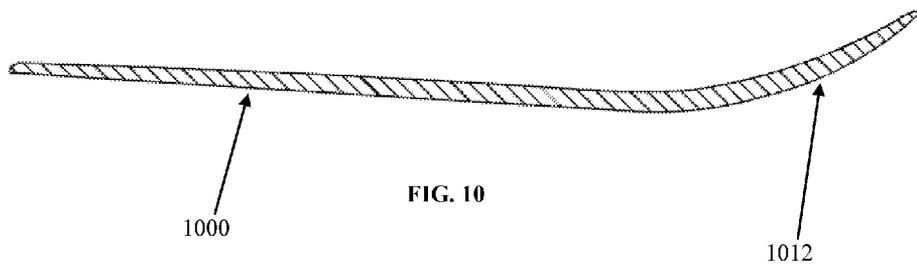


FIG. 10

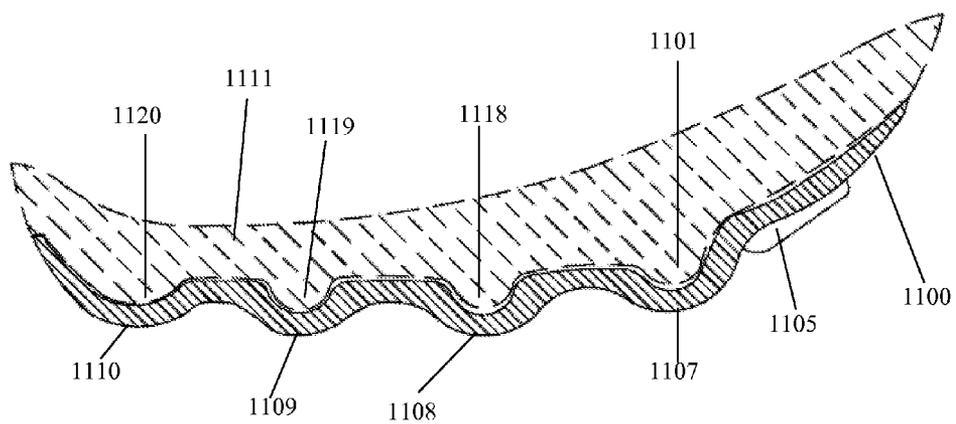


FIG. 11

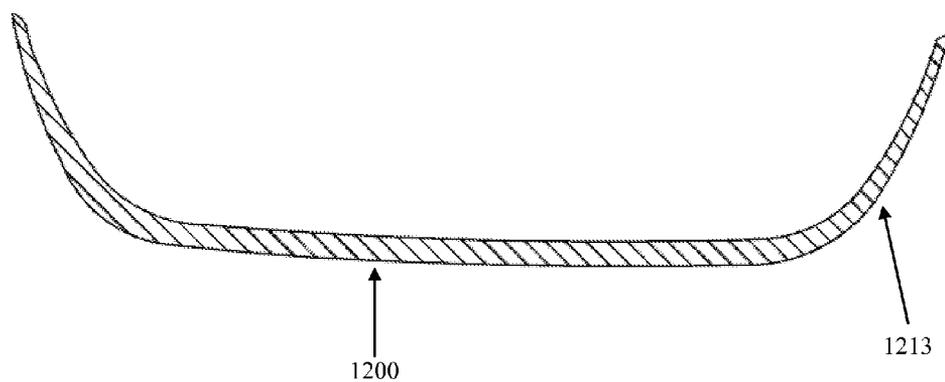


FIG. 12

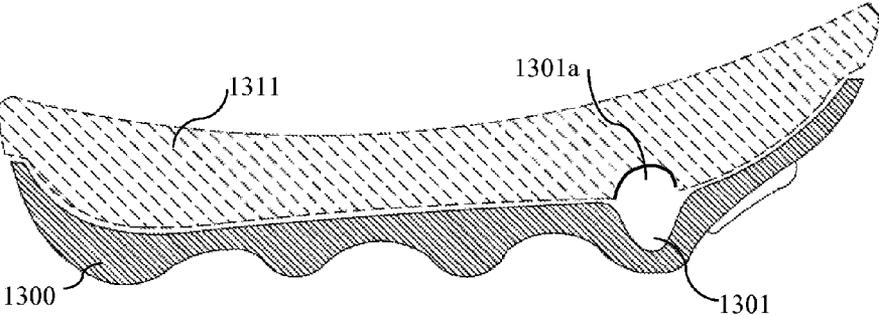


FIG. 13

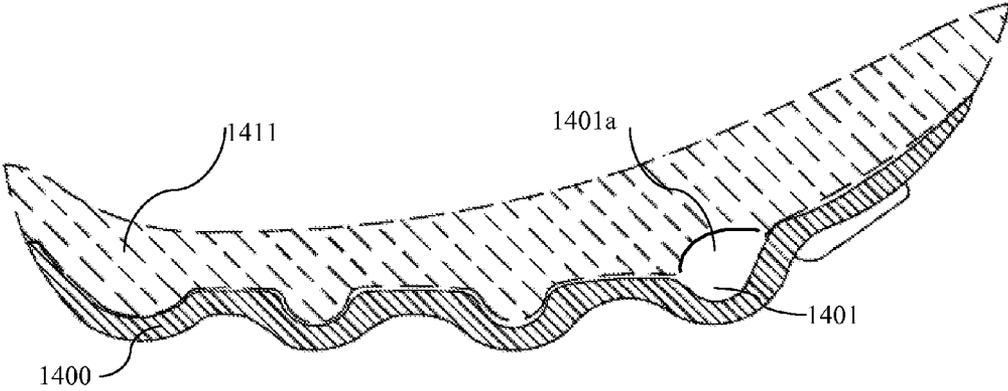


FIG. 14

**PLANTAR FASCIITIS ORTHOTIC INSOLE**

**CROSS-REFERENCE TO RELATED APPLICATIONS**

[0001] This application claims the benefit of U.S. Provisional Application No. 61/887,261, filed Oct. 4, 2013, which is hereby incorporated by reference, to the extent that it is not conflicting with the present application.

**BACKGROUND OF THE INVENTION**

[0002] 1. Field of the Invention

[0003] The invention relates generally to improving the structural support and therapeutic benefits of footwear, and specifically to providing support and therapeutic benefits to the plantar fascia.

[0004] 2. Description of the Related Art

[0005] Plantar fascia is a thick layer of tissue or ligament that runs along the majority of the bottom side of a human's foot. It connects the heel and metatarsals, forming a windlass or "bowstring" to the arch present in the soft tissue and skeletal structure of the foot. Plantar fasciitis is a common condition that is related to overuse and aggravation of the plantar fascia which supports the bowstring or windlass mechanism. The plantar fascia and underlying hallucis longus tendon supports the arch of the foot and creates the support of the big toe which in turn enables humans to walk or run. When the plantar fascia becomes strained, the plantar fascia becomes shortened, and lack of blood flow and the windlass effect cause micro tearing at the attachment site of the heel, thus causing the arch to weaken and becoming swollen and inflamed, forming unwanted collagen scar tissue. This condition displaces and causes damage to the soft fatty pad under the heel causing extreme pain thus limiting ones ability to stand or walk.

[0006] Within the plantar fascia, the medial region is the area which has the greatest tension, because the big toe is the most powerful aspect of the foot in the gait cycle. The fascia band and underlying muscle tendons attach to the periosteum membrane, which is the area where the tearing occurs across the plantar aspect of the heel bone. Because of this pulling, the plantar aspect of the heel is the most painful area, although the secondary area of pain, on the posterior medial arch, is the origin of plantar fasciitis. The windlass effect causes the most tension to the medial side of the arch and the underlying hallucis longus tendon attaches to the heel bone across the heel or calcaneus bone. This is where the most injuries (primarily tearing and subsequent scarring of tissue) occur. It is therefore important to focus on this section of the arch and heel attachment for any solutions to be successful.

[0007] Numerous therapeutic insoles appear to focus on the structure and support of the arch of a foot, as well as offloading pressures from bony prominences on the outside of the foot, but none appear to focus specifically on the mobility and support of the plantar fascia (particularly the medial region), such that to prevent its damage, for example during gait. Damage to this tissue (i.e., the plantar fascia) is the source of numerous pain manifestations in patients' feet. Thus, there is a need for a new and improved therapeutic insole that solves the above problems.

[0008] The problems and the associated solutions presented in this section could be or could have been pursued, but they are not necessarily approaches that have been previously conceived or pursued. Therefore, unless otherwise indicated,

it should not be assumed that any of the approaches presented in this section qualify as prior art merely by virtue of their presence in this section of the application.

**BRIEF SUMMARY OF THE INVENTION**

[0009] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key aspects or essential aspects of the claimed subject matter. Moreover, this Summary is not intended for use as an aid in determining the scope of the claimed subject matter.

[0010] In one exemplary embodiment, a thermoplastic (hard plastic) urethane insole is designed to assist users by providing tension relief to the plantar fascia with a plantar channel built into the hard flexible plastic base made from thermoplastic polyurethane or TPU, thus generally improving the support structure of the foot. This material can support and flex with the foot bones for extended periods of time compared to other lesser costly materials used in prior art. It also provides comfortable support for women who suffer from sciatica pain caused by overpronation; women have a greater femur bone angle called the Q angle which multiplies the problem over males. The thermoplastic urethane base can be used alone in shoes where a polyurethane upper is not desirable (women's high heels, tight fitting shoes, etc.), however the polyurethane foam upper material provides superior shock absorption, energy return and compressive massage that heals damaged tissue, so it is preferred.

[0011] Additionally, the thermoplastic urethane insole may benefit diabetic patients, as several of its physical properties may allow it to qualify for government healthcare use. This may result in easier accessibility of the insole for patients who can benefit from its advantages.

[0012] In another exemplary embodiment, the insole's arch is combined with a groove to form a plantar channel under the big toe fascia and tendon. Thus, creating a therapeutic advantage for free movement and rapid healing of the foot's plantar fascia, while supporting the windlass mechanism aspect. This channel is key in decreasing the tension caused by the windlass effect and avoiding excessive stress on the periosteum membrane which the plantar fascia attaches to and which causes serious injury.

[0013] In an alternate embodiment, the insole may contain a plurality plantar channels rather than just one. This may extend the benefits of the first channel to other sections of the plantar fascia, providing tension relief to the other four toe tendons ligaments and fascia on each foot.

[0014] In another exemplary embodiment the upper polyurethane foam upper can also have an upper channel that mirrors the lower channel in the hard plastic base. This combined, larger channel could be used to treat chronic cases of plantar fasciitis or diabetic patients suffering from plantar fasciitis. These patients may have increased sensitivity to pain and may require a higher reduction of the tension under the medial arch and heel attachment sites. Thus doubling the size of the plantar channel may be utilized.

[0015] In another exemplary embodiment, the ribs on the underside of the insole create a rigid support structure that still allows for the insole to flex with the foot and shoe. The flexibility may allow for an improvement in the insole's function, as well as improving the lifespan of the device. In addition, the ribs may provide empty space that allows for improved air circulation underneath the insole. The under-

sides of these ribs can also have a texture applied to, to increase traction inside the shoe, reducing slippage during all forms of gait (running, walking, working or hiking).

**[0016]** In another exemplary embodiment, the inside shape of the insole at the heel works to keep the tissues of the heel from spreading laterally and thinning out the layer of cushioning tissue that prevents injury to the heel. The outside ribs provide added strength to weight ratio to the heel cup shape. Excess tension from the plantar fascia will normally pull heel tissue out of its desired position, which often results in severe heel pain.

**[0017]** The above embodiments and advantages, as well as other embodiments and advantages, will become apparent from the ensuing description and accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0018]** For exemplification purposes, and not for limitation purposes, embodiments of the invention are illustrated in the figures of the accompanying drawings, in which:

**[0019]** FIG. 1 illustrates a perspective view of the therapeutic insole, according to an embodiment.

**[0020]** FIG. 2 illustrates a perspective view of the bottom of the therapeutic insole from FIG. 1, with the addition of an upper insert, according to another embodiment.

**[0021]** FIG. 3 illustrates the bottom view of the embodiment from FIG. 2.

**[0022]** FIG. 4 illustrates the top view of the therapeutic insole from FIG. 1.

**[0023]** FIG. 5 illustrates the left view of the therapeutic insole from FIG. 1.

**[0024]** FIG. 6 illustrates the right view of the therapeutic insole from FIG. 2.

**[0025]** FIG. 7 illustrates the back view of the therapeutic insole from FIG. 1.

**[0026]** FIGS. 8a-c illustrate the view of the sectional cut A-A shown in FIG. 4 (with upper insert), with different aspects related to the plantar channel, according to several embodiments.

**[0027]** FIG. 9 illustrates a reference drawing of prior art indicating the location of the medial region of the plantar fascia and flexor hallucis longus tendon.

**[0028]** FIG. 10 illustrates a view of the sectional cut B-B shown in FIG. 4.

**[0029]** FIG. 11 illustrates an alternate embodiment of that allows for multiple plantar channels with a sectional cut that shares its location and orientation with sectional cut A-A shown in FIG. 4.

**[0030]** FIG. 12 illustrates a view of sectional cut C-C shown in FIG. 4, according to another embodiment.

**[0031]** FIG. 13 illustrates a variation of the embodiment depicted in FIG. 8-a.

**[0032]** FIG. 14 illustrates a variation of the embodiment depicted in FIG. 11.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

**[0033]** What follows is a detailed description of the preferred embodiments of the invention in which the invention may be practiced. Reference will be made to the attached drawings, and the information included in the drawings is part of this detailed description. The specific preferred embodiments of the invention, which will be described herein, are presented for exemplification purposes, and not for limitation

purposes. It should be understood that structural and/or logical modifications could be made by someone of ordinary skills in the art without departing from the scope and essence of the invention.

**[0034]** It should be noted that all figures provided with this disclosure and described herein are of an insole intended for use on the left foot. It should be apparent that similar characteristics and features will apply to insoles intended for use on the right foot.

**[0035]** FIG. 1 illustrates a perspective view of the therapeutic insole, according to an embodiment. The therapeutic insole **100** is preferably made of thermoplastic urethane. The most important aspect illustrated by this figure is the plantar channel **101**, which may provide key support to the user's foot structure and allow the medial section of the plantar fascia (not shown) to operate without undue aggravation, as well as assist with the windlass mechanism, as it will be described in more details hereinafter. In addition to the plantar fascia, the flexor hallucis longus (FHL) tendon runs along the same channel. The FHL experiences high levels of tension during the gait cycle, and so it may also enjoy the benefits of the plantar channel **101**.

**[0036]** The windlass mechanism in the plantar fascia is comparable to the literal definition of a windlass, which is a cable wrapped around a cylinder for the purpose of mechanical advantage. The analogy compares the plantar fascia to the cable as it "wraps" around the metatarsal head when toes flex back. This results in the distance from the heel to the metatarsal head shortening, which causes the longitudinal arch to become shorter lengthwise and longer heightwise, and the plantar fascia to tense. When the arch pronates, the heel pulls the plantar fascia back, causing the toes to pull down and propel the body forward. The plantar channel in the insole assists with this mechanism by reducing the stress on the medial section of the plantar fascia when the windlass effect causes the muscles to be taut. This is done by allowing the medial section to sink into the channel rather than bow over the arc, reducing the distance it must cover and therefore reducing the stress.

**[0037]** Also shown in FIG. 1 is a section of outside ribbing **104**. In one aspect, this outside ribbing **104** may be used as a means to secure the insole firmly inside the user's shoe, preventing it from sliding/slipping out of position while in motion. This advantage is important, as it may ensure all elements of the insole **100** and insert (e.g., **201** in FIG. 2) are in the correct position to maximize the effect of the device. An added advantage is the elimination of any possible squeaking that may otherwise be present due to friction between the heel cup and the shoe. In another aspect, the outside ribs **104** also create a more rigid support structure that still allows for the insole **100** to flex with the foot and shoe while creating a flat base with more stability. The flexibility may allow for an improvement in the insole's function, as well as improving the lifespan of the insole device.

**[0038]** Elements **102** and **103** (see also **202** and **203**, **302** and **303**, **402** and **403**, **502** and **503**) are a pair of apertures that may act as the attachment interface that allows the insole to associate with an upper material or insert (see for example **611** in FIG. 6), which may be made, for example, from polyurethane foam. This interface may be in the form of a glue bonding at the apertures **102**, **103**, or the shape of a protrusion allowing it to "snap into place" in the apertures, or some other suitable attachment configurations.

[0039] Element 113 illustrates the “heel cup”, which works with plantar channel 101 to prevent undesired changes in the heel tissue. Excessive tension from the plantar fascia will shift the heel tissue’s orientation, spreading out the tissue laterally and resulting in a thinner protective layer. Element 101 works to reduce the amount of tension from the plantar fascia while the shape and structure of element 113 works to keep the heel tissue directly underneath the heel.

[0040] FIG. 2 illustrates a perspective view of the bottom of the therapeutic insole from FIG. 1, with the addition/association of an upper insert 211, according to another embodiment. Elements 204 through 206 show the full extent of ribbing present on the outside of the insole, among other benefits, allowing it to remain firmly in its appropriate place, as described earlier. Support ribbing, comprised of four longitudinal ribs, (207 through 210) run underneath the insole, and they aid in supporting the insole’s shape. These support ribs 207-210 may also allow the insole to comfortably flex with the bones of the feet and the design of the shoe during the gait cycle, while ensuring that it is able to retain its desired orientation. In addition to providing the intended functionality, this feature (i.e., the support ribs 207-210) may also benefit the insole’s life span.

[0041] Element 211 shows the upper insert and how it may associate with the therapeutic insole 200. Polyether variant of polyurethane is the preferred material for the upper insert 211 (see also 311/FIG. 3, 611/FIG. 6, 811/FIG. 8), as it has the ability to last 2 to 3 times longer than any other traditional material before losing its intended properties. The polyether variant of polyurethane also excels in shock absorption and in providing therapeutic compressions to improve blood flow. However, a polyester variant may also be viable, as it provides a high rebound-energy return material with shock absorption that is ideal for athletes as well as possibly offering compression qualities which can massage the feet.

[0042] Another exemplary alternative is a dual material upper insert 211 that combines the effects of the previous two materials. For example, by having a high energy return material under the toes, a shock absorbent material under the heel, and a combination of both under the arch (e.g., one on top of each other), the effectiveness of the upper insert 211 may be maximized. More than two materials for the upper insert 211 may also be used in order to achieve a combined benefit of shock absorption in the heel and energy return in the forefoot.

[0043] The benefits of a polyurethane upper material 211 are primarily related to its ability to utilize massage compressions. Among others, these benefits may include the repair of scar tissue at the heel, promotion of blood flow under the foot, and preventing the tight plantar fascia from over-stretching.

[0044] FIG. 3 illustrates the bottom view of the embodiment from FIG. 2. The outer ribbing 304 through 306 are shown in this view. As described earlier when referring to FIGS. 1 and 2, the ribbing anchors the insole to its desired position. The longitudinal support ribbing 307 through 310 (807-810 in FIG. 8) are also shown. The size of the therapeutic insole 300 relative to the size of the polyurethane upper insert 311 can be more clearly seen in this figure.

[0045] FIG. 4 illustrates the top view of the therapeutic insole from FIG. 1. Element 401 shows the lateral position and orientation of the plantar channel. As earlier described when referring to FIG. 1, the plantar channel 401 may provide key support to the user’s foot structure, among other features. This figure also provides a view of the position and direction of the sectional cuts A-A, B-B, and C-C presented in FIG. 8,

FIG. 10, FIG. 11, and FIG. 12. Ribbing on the outside of the insole (what would be 404 through 406) is not visible due to an outward curvature of the insole’s structure, as illustrated in FIGS. 5 through 7. Element 413 shows the region of the heel cup, which prevents a thinning of tissue underneath the heel and avoids severe heel pain.

[0046] FIG. 5 illustrates the left view of the therapeutic insole from FIG. 1. The vertical position and orientation of plantar channel 501 is presented in this view. The shape of the arch component 512 (612 in FIG. 6) of the therapeutic insole 500 is important, as it may assist users in maintaining the proper shape of the foot’s arch to prevent injury or aggravation. The interface apertures 502 and 503 are also shown. Element 513 shows the region of the heel cup, which prevents a thinning of tissue underneath the heel and avoids severe heel pain.

[0047] FIG. 6 illustrates the right view of the therapeutic insole from FIG. 2. Included is the upper insert 611 to demonstrate how it should fit over the top of the therapeutic insole 600. As described earlier when referring to FIG. 2, it is preferred to use polyether polyurethane as the material for the upper material insert 611, though other materials such as polyester polyurethane will work as well. The extent of the outer ribbing 605 on the right side is also visible in this figure. The upper insert 611 may have extra padding (e.g., 25%) in the medial arch and in the heel areas, which cause therapeutic compressions for blood flow and break down of collagen scar tissue.

[0048] FIG. 7 illustrates the back view of the therapeutic insole from FIG. 1. It demonstrates how the plurality of outer ribs (704-706) wraps entirely around the heel section of the therapeutic insole 700. Again, this may provide an effective anchor that keeps the heel portion of the insole 700 firmly in its desired position, as earlier described.

[0049] FIG. 8-a, 8-b, and 8-c illustrates the view of the sectional cut A-A shown in FIG. 4 (with upper insert 811). Each figure shows the polyurethane insert 811 interfacing with the plantar channel 801. FIG. 8-a shows the gap between the two materials which is the preferred embodiment due to manufacturing costs and limitations. The cross-sectional anatomy of the support ribs 807, 808, 809, and 810, so that they achieve the results earlier described when referring to FIG. 2, is also shown. The shape of the cross-section of the plantar channel 801 is also shown as resembling a U-shape. Arch component 812 is also shown.

[0050] FIG. 8-b shows an alternative aspect of the plantar channel interface wherein the polyurethane insert 811 is manufactured with additional material 814 designed to fit in the plantar channel 801. This aspect is more costly than the preferred embodiment.

[0051] FIG. 8-c shows a third alternative wherein an additional wedge piece 815 is inserted into the plantar channel 801

[0052] The preferred embodiment of the channel is that it remains clear to allow circulation of air underneath the upper insert. However, an alternate aspect allows for the possibility of manufacturing the upper insert such that it fills in the channel with similar or softer hardness material. A third aspect may be the insertion a similar or softer hardness material into the channel to provide additional support of the medial section of the plantar fascia.

[0053] FIG. 9 illustrates a reference view of the medial region of the plantar fascia and flexor hallucis longus tendon 916. The shaded region may visibly protrudes during dorsiflexion of the hallux, or “big toe” 917. This considerable

protrusion is the tense, stressed position of the plantar fascia and FHL tendon. When bowed around an arch, these muscles experience an increase in stress that may result in plantar fasciitis. The plantar channel (elements **101**, **401**, **501**, **801** in FIGS. **1**, **4**, **5**, and **8**, respectively) may allow these muscles and respective tendons and ligaments, to avoid the additional stress from bowing, may assist the body to heal the area of tissue stress, and reduce the probability of plantar fasciitis.

**[0054]** FIG. **10** illustrates sectional cut B-B of the front end of the thermoplastic insole **1000**. The cut is just past the interface holes (elements **102** and **103** in FIG. **1**), and shows the early formation of the medial arch **1012**. This arch assists in maintaining a desirable positioning of the foot, allows for natural pronation, and prevents aggravation due to frequent overpronation during the gait cycle. The support ribs are not present this far forward, as sectional cut B-B may be located where the metatarsal heads rest. This particular location sees much more pronounced flexing than the rest of the insole, and therefore requires more flexibility than other regions of the insole.

**[0055]** FIG. **11** illustrates an alternate embodiment of the thermoplastic urethane insole via sectional cut A-A. Rather than having the single plantar channel **1101**, the alternate design may contain additional channels **1118**, **1119**, and/or **1120** above each of the support ribs **1108**, **1109**, and **1110**. The channels may provide additional support for the rest of the plantar fascia and the polyurethane insert **1111** may be designed to have material fit into each channel. It should be understood that while the figure depicts four channels, an insole with only two or three channels may be used instead. Additionally, the exact shape of the channels may vary slightly from what is depicted in the figure, depending on what is deemed optimal for various factors such as foot support and material flex.

**[0056]** FIG. **12** illustrates sectional cut C-C of the heel cup **1213**. The structure of the heel cup may allow the insole **1200** to keep the heel tissue directly underneath the heel and stop the tissue from thinning due to tension stress caused by the plantar fascia. The curvature of the heel cup may prevent lateral spreading of the heel tissue while the structure of the medial arch may prevent forward and lateral spreading of the heel tissue. This may assist patients in avoiding severe heel pain due to thinning effects.

**[0057]** FIG. **13** illustrates a variation of the embodiment depicted in FIG. **8-a**. As shown, the embodiment depicted in FIG. **8-a** may be modified to obtain an alternative embodiment wherein an upper insert channel **1301a** may be provided into the upper insert **1311**, which corresponds with the plantar channel **1301**. The upper insert channel **1301a** may have substantially the same length as the plantar channel **1301**. Its cross section may be smaller than that of the plantar channel. The space provided by the upper insert channel **1301a** and the plantar channel **1301** may be filled with air. This configuration provides additional relief to the plantar tendon, and thus, it may be desirable in severe cases.

**[0058]** FIG. **14** illustrates a variation of the embodiment depicted in FIG. **11**. As shown, the embodiment depicted in FIG. **11** may also be modified to obtain an alternative embodiment wherein an upper insert channel **1401a** may be provided into the upper insert **1411**, which corresponds with the plantar channel **1401**. The upper insert channel **1401a** may have substantially the same length as the plantar channel **1401**. Its cross section may be smaller than that of the plantar channel. The space provided by the upper insert channel **1401a** and the

plantar channel **1401** may be filled with air. This configuration provides additional relief to the plantar tendon, and thus, it may be desirable in severe cases.

**[0059]** Thus, some of the key aspects of the plantar fasciitis therapeutic insole disclosed herein are the plantar channel, the longitudinal support ribs, the outer ribs and the polyurethane upper material. Again, the plantar channel assists the “windlass” effect that allows the plantar fascia to effectively propel the body forward. And, it may prevent overpronation of the plantar fascia, a common cause of plantar fasciitis.

**[0060]** The longitudinal support ribs allow the insole to comfortably flex with the foot and shoe during the gait cycle while still maintaining the desired shape and orientation to assist with foot support.

**[0061]** The polyurethane upper material absorbs shock from the foot during the gait cycle. It also uses compression massages to provide additional health benefits to the feet.

**[0062]** Although it is understood that other, typically cheaper materials, such as EVA or crosslinked polyethylene foam may be used, it is preferable to use polyester polyurethane due to its improved qualities with respect to comfort, shock absorption, lifespan and health benefits compared to more economic options. Even more preferable is to use polyurethane nano-formula foam, a self-molding memory foam, which works off the heat of the foot.

**[0063]** Again, it is important to focus on the medial side of the arch and heel attachment by reducing the tension through the use of a plantar tendon channel and allowing the tissue to heal faster by providing additional blood flow to the area by means of massaging muscle compressions provided by the upper material.

**[0064]** It may be advantageous to set forth definitions of certain words and phrases used in this patent document. The terms “include” and “comprise,” as well as derivatives thereof, mean inclusion without limitation. The term “or” is inclusive, meaning and/or. The phrases “associated with” and “associated therewith,” as well as derivatives thereof, may mean to include, be included within, interconnect with, contain, be contained within, connect to or with, couple to or with, be communicable with, cooperate with, interleave, juxtapose, be proximate to, be bound to or with, have, have a property of, or the like.

**[0065]** As used in this application, “plurality” means two or more. A “set” of items may include one or more of such items. Whether in the written description or the claims, the terms “comprising,” “including,” “carrying,” “having,” “containing,” “involving,” and the like are to be understood to be open-ended, i.e., to mean including but not limited to. As used in this application, “and/or” means that the listed items are alternatives, but the alternatives also include any combination of the listed items.

**[0066]** Throughout this description, the embodiments and examples shown should be considered as exemplars, rather than limitations on the apparatus and procedures disclosed. Although many of the examples involve specific combinations of method acts or system elements, it should be understood that those acts and those elements may be combined in other ways to accomplish the same objectives. Acts, elements and features discussed only in connection with one embodiment are not intended to be excluded from a similar role in other embodiments.

**[0067]** Although specific embodiments have been illustrated and described herein for the purpose of disclosing the preferred embodiments, someone of ordinary skills in the art

will easily detect alternate embodiments and/or equivalent variations, which may be capable of achieving the same results, and which may be substituted for the specific embodiments illustrated and described herein without departing from the scope of the invention. Therefore, the scope of this application is intended to cover alternate embodiments and/or equivalent variations of the specific embodiments illustrated and/or described herein.

What is claimed is:

- 1. A therapeutic insole, comprising:  
at least a plantar channel running onto the upper surface of the therapeutic insole for providing support to a user's foot structure;
- a plurality of support ribs running underneath the therapeutic insole to aid providing support to a user's foot structure while maintaining the therapeutic insole's shape;
- a heel portion having a cup shape and working together with the at least a plantar channel to prevent undesired changes in a user's plantar fascia and heel tissue; and
- a section of outside ribbing adapted to reinforce the heel portion and secure the therapeutic insole into a user's shoe.
- 2. The therapeutic insole according to claim 1, wherein the at least a plantar channel is configured to provide flexible support for the plantar fascia of the user's foot.
- 3. The therapeutic insole according to claim 1, wherein the at least a plantar channel is aligned with at least one of the plurality of support ribs.
- 4. The therapeutic insole according to claim 1, further comprising a pair of apertures acting as an attachment interface.
- 5. The therapeutic insole according to claim 4, wherein the attachment interface is a protrusion allowing the attachment interface to snap into place.
- 6. The therapeutic insole according to claim 1, wherein the therapeutic insole is made of thermoplastic urethane.
- 7. An insole system comprising a therapeutic insole associated with an upper insert, the therapeutic insole comprising:  
at least a plantar channel running onto the upper surface of the therapeutic insole for providing support to a user's foot structure;
- a plurality of support ribs running underneath the therapeutic insole to aid providing support to a user's foot structure while maintaining the therapeutic insole's shape;
- a heel portion having a cup shape and working together with the at least a plantar channel to prevent undesired changes in a user's plantar fascia and heel tissue; and
- a section of outside ribbing adapted to reinforce the heel portion and secure the therapeutic insole into a user's shoe.
- 8. The insole system according to claim 7, wherein an additional wedge piece is inserted in the at least a plantar channel.
- 9. The insole system according to claim 7, wherein the upper insert is made of polyether variant of polyurethane to provide a high energy rebound material with shock absorption.

10. The insole system according to claim 7, wherein the upper insert is a dual material upper insert that has a high energy return material under a user's toes, a shock absorbent material under a user's heel and a combination of both under a user's arch.

11. The insole system according to claim 7, wherein the upper insert has extra thickness in the posterior medial arch and in the entire heel area.

12. The insole system according to claim 7, wherein at least an upper insert channel is provided into the upper insert, the at least an upper insert channel being aligned with the at least a plantar channel.

13. The insole system according to claim 12, wherein the at least an upper insert channel and the at least a plantar channel are filled with air.

14. The insole system according to claim 7, wherein one or more of the at least a plantar channel is filled with corresponding one or more protrusions extending downwards from the bottom surface of the upper insert.

15. A method of treating foot conditions, comprising the steps of:

obtaining a therapeutic insole, the therapeutic insole comprising at least a plantar channel running onto the upper surface of the therapeutic insole for providing support to a user's foot structure; a plurality of support ribs running underneath the therapeutic insole to aid providing support to a user's foot structure while maintaining the therapeutic insole's shape; a heel portion having a cup shape and working together with the at least a plantar channel to prevent undesired changes in a user's plantar fascia and heel tissue; and a section of outside ribbing adapted to reinforce the heel portion and secure the therapeutic insole into a user's shoe; and

inserting the therapeutic insole into a user's shoe.

16. The method according to claim 15, wherein the foot condition that is being treated is plantar fasciitis.

17. The method according to claim 15, wherein the therapeutic insole is associated with an upper insert before insertion into the user's shoe, and wherein the upper insert is made of polyurethane nano-formula foam, a self-molding memory foam having small, microscopic cell structure.

18. The method according to claim 15, wherein at least an upper insert channel is provided into the upper insert, the at least an upper insert channel being aligned with the at least a plantar channel.

19. The method according to claim 18, wherein the at least an upper insert channel and the at least a plantar channel are filled with air.

20. The method according to claim 15, wherein one or more of the at least a plantar channel is filled with corresponding one or more protrusions extending downwards from the bottom surface of the upper insert.

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