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(54) **FOOTWEAR AND METHOD OF
MANUFACTURE THEREOF**

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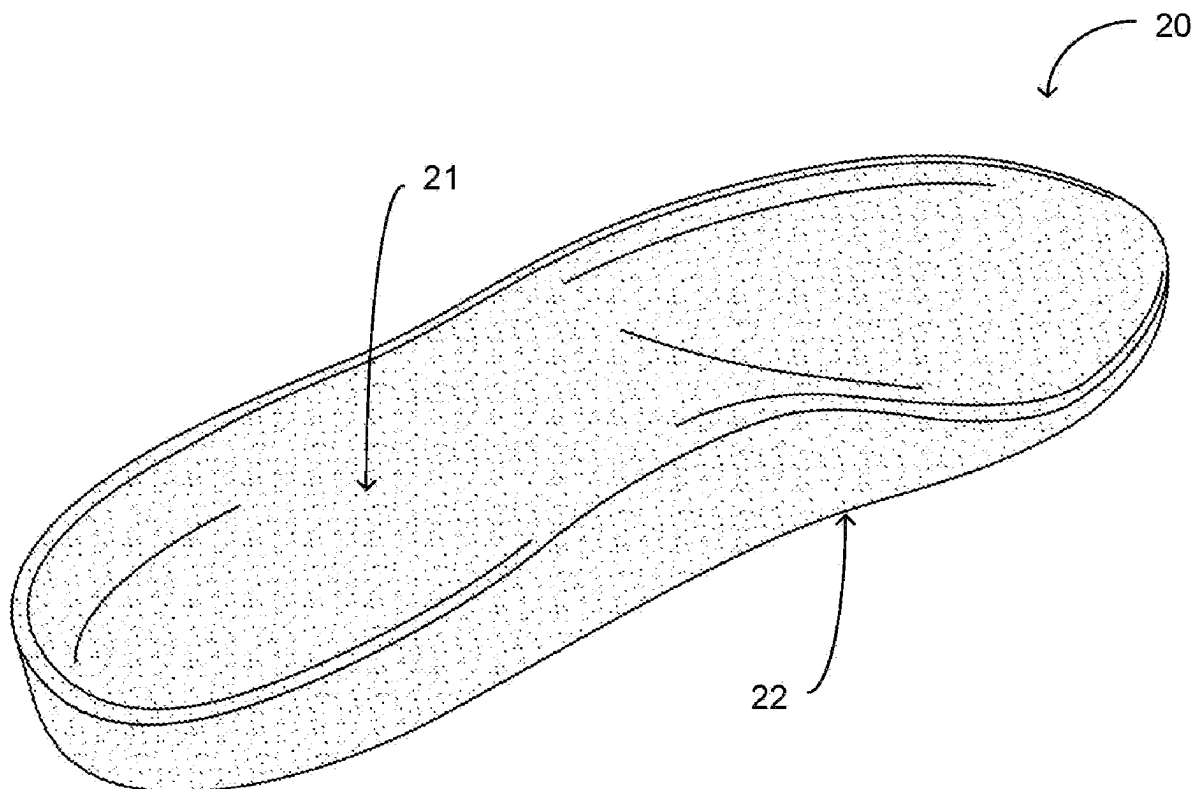
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(57)

ABSTRACT

A footwear and method of manufacture wherein the present invention includes capture and acquisition of a three-dimensional volumetric scan of feet of a user wherein the scan data is employed to manufacture a customized midsole for a sandal. The present invention includes a midsole that has an upper surface and a bottom surface wherein the upper surface is formed to mateably accommodate the hindfoot, midfoot and forefoot of the wearer. The midsole is manufactured from a cork-rubber blend in a preferred embodiment and includes a opposing side to which a strap member is secured thereto. The strap member has at least one strap segment configured to extend over the top of the wearer's foot. An outsole is secured to the bottom surface of the midsole. The outsole is manufactured from a closed cell polymer foam.



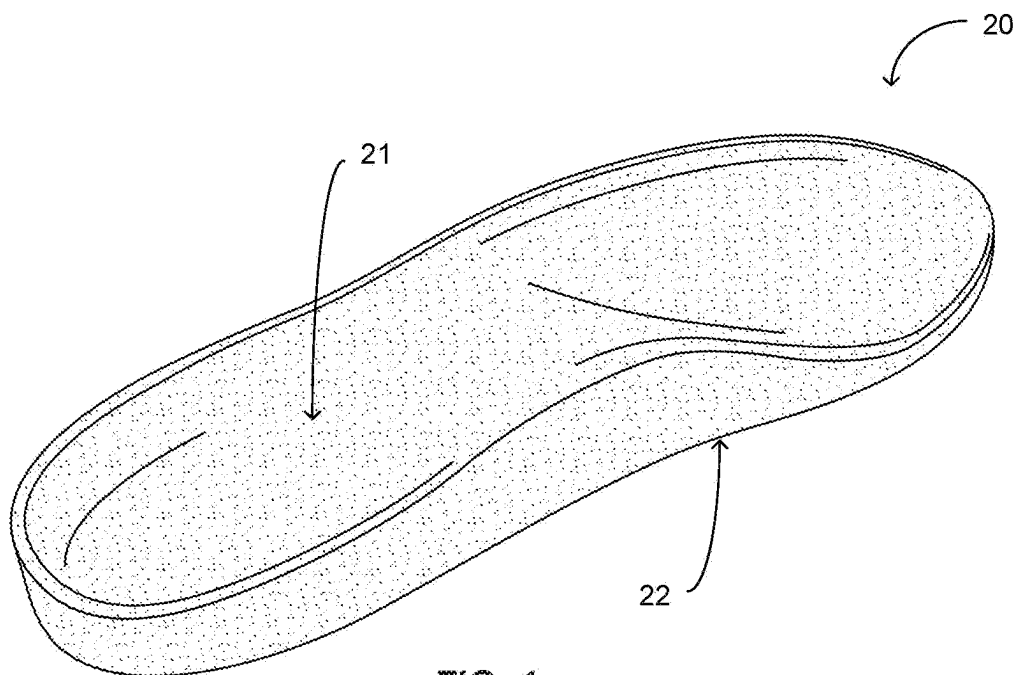


FIG. 1

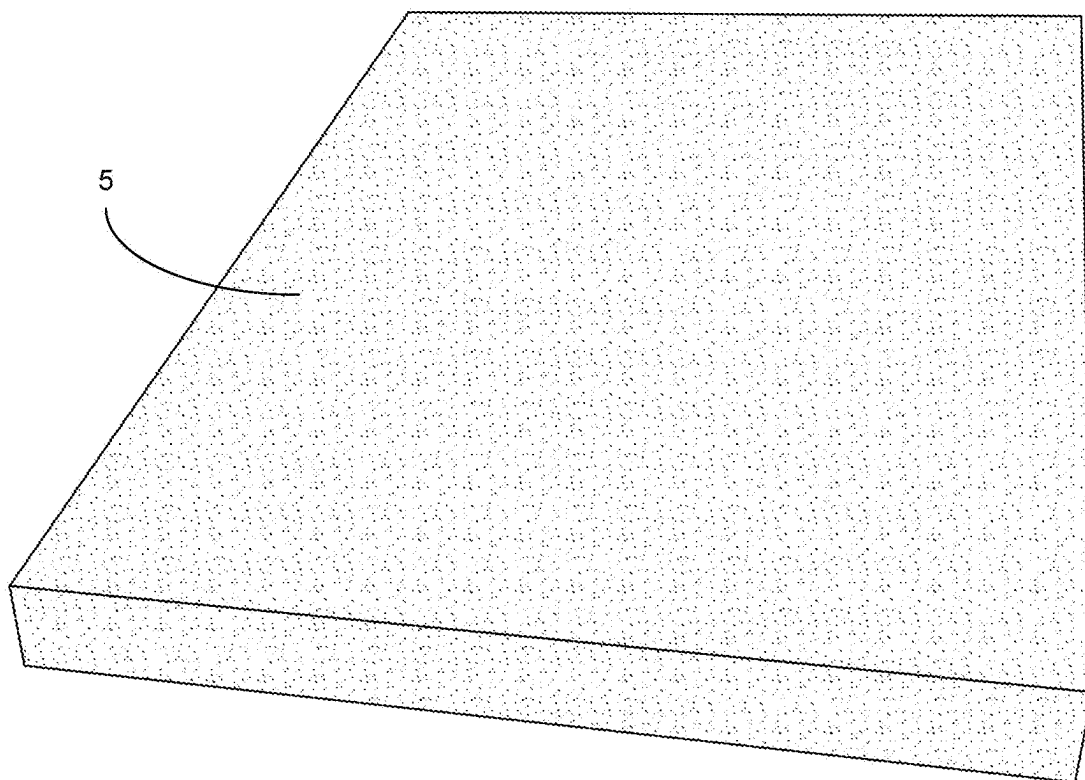


FIG. 2

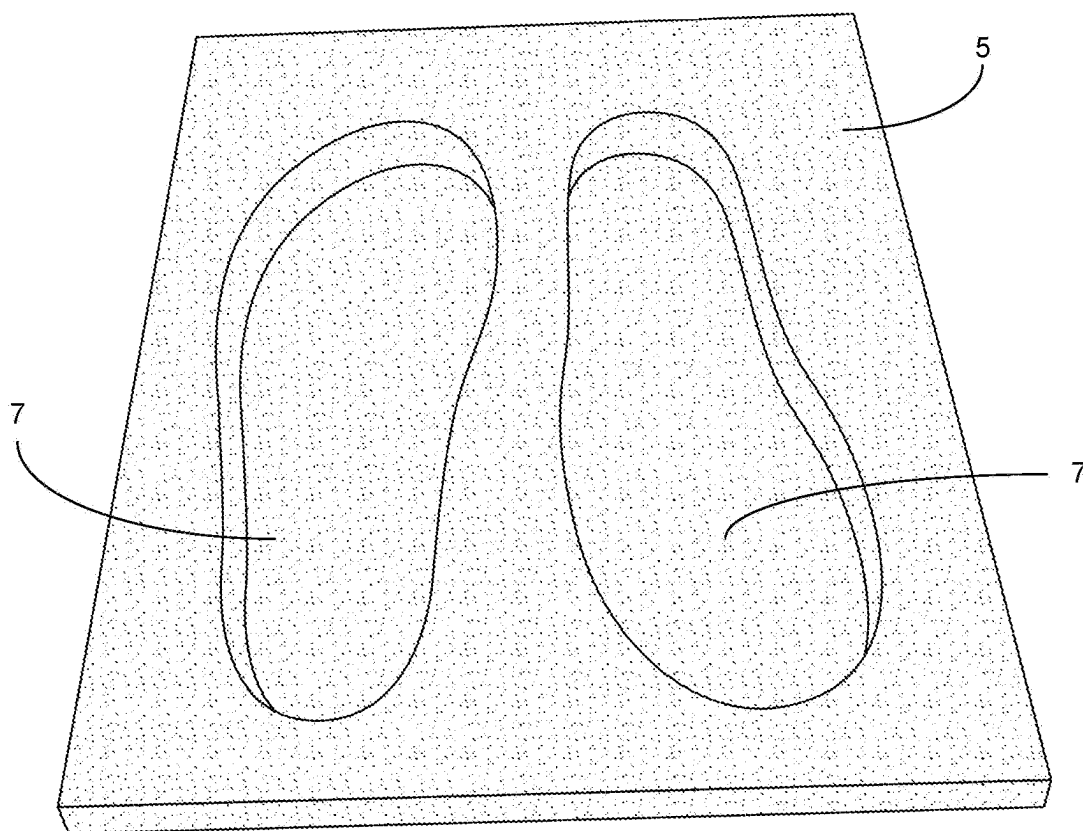


FIG. 3

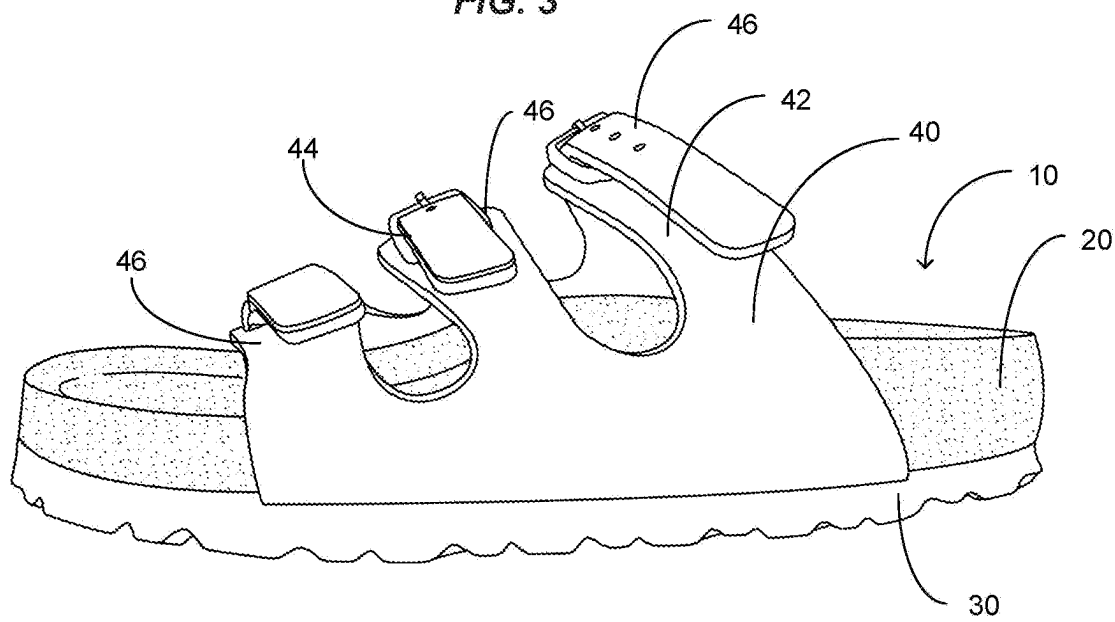


FIG. 4

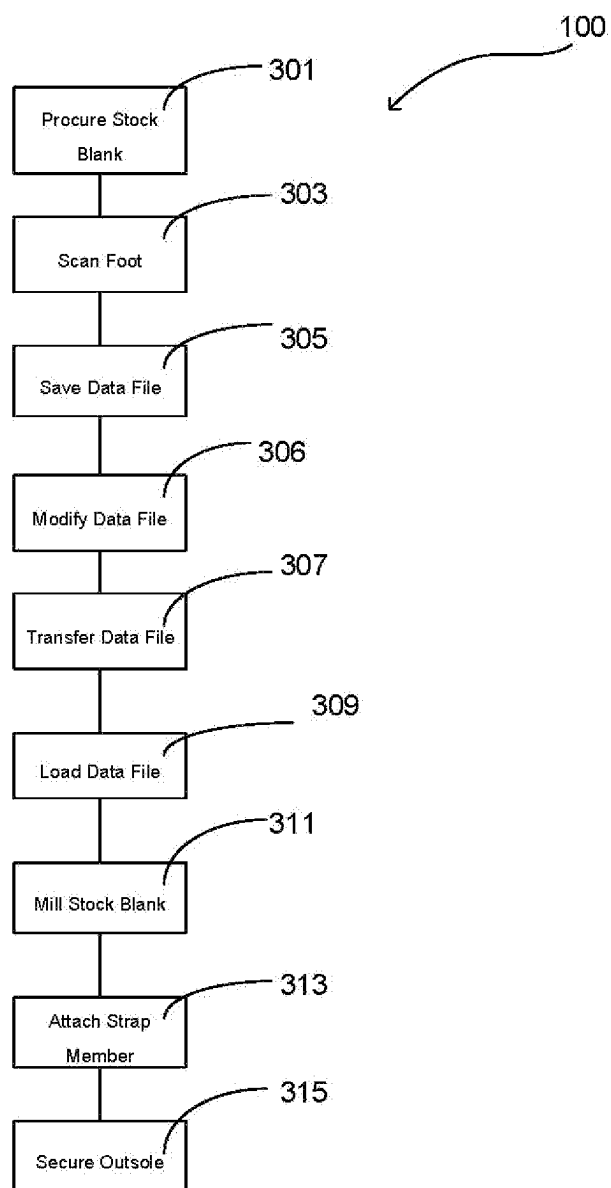


FIG. 5

FOOTWEAR AND METHOD OF MANUFACTURE THEREOF

FIELD OF THE INVENTION

[0001] The present invention relates generally to footwear and manufacturing thereof, more specifically but not by way of limitation, a method of creating a customized sandal wherein the method of the present invention includes scanning of a wearer's foot and subsequent milling of a cork-rubber blend to create a midsole that is utilized as a portion of the customized sandal.

BACKGROUND

[0002] Millions of people routinely wear orthopedic shoes or devices in their shoes in order to manage foot pain. Foot pain can occur on the top, bottom or sides of the feet. Foot pain can affect your heel, toes, arch and other areas of the feet. As most people use their feet every day, foot pain is common. In addition to overuse, individuals can develop foot pain from sporting injuries, underlying health conditions and wearing shoes that don't fit properly.

[0003] There are numerous ways to treat foot pain which can be caused by parameters such as but not limited to aging, obesity, overuse or shoes that don't fit properly. Proper shoes are extremely important in maintaining the health of the foot. Proper arch support is critical for shoes and many individuals do not wear shoes that have the appropriate arch support. Some individuals have flat feet with little to no arch while others have very large arches. Commonly available shoes most often do not have the correct arch support and as a result can cause or exacerbate any foot pain. While custom inserts can be manufactured to be inserted into shoes, there is a void of custom shoes, especially sandals, that can be manufactured to custom fit each individual.

[0004] Accordingly, there is a need for a method of manufacturing a sandal wherein the method of the present invention includes scanning of a wearer's foot and milling of a midsole material that is utilized in the assembly of the sandal.

SUMMARY OF THE INVENTION

[0005] It is the object of the present invention to provide a sandal and method of manufacturing the sandal wherein the method of the present invention includes utilizing three-dimensional volumetric scanning to acquire a layout of the wearer's foot.

[0006] Another object of the present invention is to provide customized footwear specific to the foot of the wearer wherein the present invention utilizes a cork-rubber blend stock material for manufacture of the midsole of the footwear.

[0007] A further object of the present invention is to provide a sandal and method of manufacturing the sandal wherein the method of the present invention further includes a step of securing a hard outsole to the bottom surface of the midsole.

[0008] Yet a further object of the present invention is to provide customized footwear specific to the foot of the wearer wherein the present invention includes at least one strap that is configured to be superposed the top of the wearer's foot.

[0009] Still another object of the present invention is to provide a sandal and method of manufacturing the sandal

wherein the method of the present invention is configured to produce various alternate types of footwear.

[0010] An additional object of the present invention is to provide customized footwear specific to the foot of the wearer wherein strap members of the sandal embodiment are secured to the bottom surface of the midsole.

[0011] Yet a further object of the present invention is to provide a sandal and method of manufacturing the sandal wherein three-dimensional mapping of the wearer's foot is executed utilizing volumetric scanning.

[0012] To the accomplishment of the above and related objects the present invention may be embodied in the form illustrated in the accompanying drawings. Attention is called to the fact that the drawings are illustrative only. Variations are contemplated as being a part of the present invention, limited only by the scope of the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] A more complete understanding of the present invention may be had by reference to the following Detailed Description and appended claims when taken in conjunction with the accompanying Drawings wherein:

[0014] FIG. 1 is a rear perspective view of an exemplary midsole of the present invention; and

[0015] FIG. 2 is a perspective view of exemplary stock material employed to manufacture the midsole; and

[0016] FIG. 3 is a perspective view of exemplary stock material with midsole recesses; and

[0017] FIG. 4 is a side view of a sandal embodiment manufactured from the method of the present invention; and

[0018] FIG. 5 is a flowchart of the method of the present invention.

DETAILED DESCRIPTION

[0019] Referring now to the drawings submitted herewith, wherein various elements depicted therein are not necessarily drawn to scale and wherein through the views and figures like elements are referenced with identical reference numerals, there is illustrated footwear and method of manufacture 100 constructed according to the principles of the present invention.

[0020] An embodiment of the present invention is discussed herein with reference to the figures submitted herewith. Those skilled in the art will understand that the detailed description herein with respect to these figures is for explanatory purposes and that it is contemplated within the scope of the present invention that alternative embodiments are plausible. By way of example but not by way of limitation, those having skill in the art in light of the present teachings of the present invention will recognize a plurality of alternate and suitable approaches dependent upon the needs of the particular application to implement the functionality of any given detail described herein, beyond that of the particular implementation choices in the embodiment described herein. Various modifications and embodiments are within the scope of the present invention.

[0021] It is to be further understood that the present invention is not limited to the particular methodology, materials, uses and applications described herein, as these may vary. Furthermore, it is also to be understood that the terminology used herein is used for the purpose of describing particular embodiments only, and is not intended to limit the scope of the present invention. It must be noted that as

used herein and in the claims, the singular forms “a”, “an” and “the” include the plural reference unless the context clearly dictates otherwise. Thus, for example, a reference to “an element” is a reference to one or more elements and includes equivalents thereof known to those skilled in the art. All conjunctions used are to be understood in the most inclusive sense possible. Thus, the word “or” should be understood as having the definition of a logical “or” rather than that of a logical “exclusive or” unless the context clearly necessitates otherwise. Structures described herein are to be understood also to refer to functional equivalents of such structures. Language that may be construed to express approximation should be so understood unless the context clearly dictates otherwise.

[0022] References to “one embodiment”, “an embodiment”, “exemplary embodiments”, and the like may indicate that the embodiment(s) of the invention so described may include a particular feature, structure or characteristic, but not every embodiment necessarily includes the particular feature, structure or characteristic.

[0023] Referring in particular to the Figures submitted herewith, the footwear and method of manufacture 100 is operable to produce sandal 10. While the preferred embodiment discussed herein comprises elements to produce a sandal 10, it should be understood within the scope of the present invention that alternate styles and types of footwear could be produced employing the elements of the present invention discussed herein. The sandal 10 includes a midsole 20 wherein the midsole 20 includes an upper surface 21 and a lower surface 22. The human foot is typically divided into three regions, the hindfoot, midfoot and forefoot. As is further discussed herein, the midsole 20 is manufactured based from a three-dimensional volumetric scan of a user's foot. The aforementioned scanning procedure captures the detailed structure of the hindfoot, midfoot and forefoot of the user which is employed to manufacture the upper surface 21 of the midsole 20 so as to match the features of the three regions of the wearer's foot.

[0024] The midsole 20 is manufactured from a stock blank 5, wherein in a preferred embodiment of the present invention the stock blank 5 is manufactured from a cork-rubber blend. The stock blank 5 is square in shape having a suitable thickness so as to mill the midsole 20 therefrom. It is contemplated within the scope of the present invention that the stock blank 5 could be provided in alternate shapes, sizes, thicknesses and materials and be utilized within the scope of the present invention. FIG. 3 submitted as a part hereof illustrates recesses 7 wherein the recesses 7 are formed subsequent the milling of the stock blank 5 to create the midsole 20. It should be understood within the scope of the present invention that the milling of the stock blank 5 is performed utilizing suitable durable techniques.

[0025] The sandal 5 further includes an outsole 30 that is operably coupled to the bottom surface 22 of the midsole 20. The outsole 30 is secured to the bottom surface 22 of the midsole 20 utilizing suitable durable techniques such as but not limited to chemical adhesion. The outsole 30 is manufactured from an alternate material from the midsole 20 and is designed for durability and wear resistance. It is contemplated within the scope of the present invention that the outsole 30 could be manufactured from various alternate suitable materials such as but not limited to a closed cell polymer foam.

[0026] A strap member 40 is operably coupled to the midsole 20 on opposing sides thereof. The strap member 40 is secured to the midsole 20 being intermediate the midsole 20 and the outsole 30. The strap member 40 is secured to the midsole 20 employing suitable techniques such as but not limited to chemical adhesion and/or mechanical fasteners. The strap member 40 includes upper portion 42 that is configured to extend over the top of the foot of the wearer. The upper portion 42 includes buckles 44 that provide adjustability of the strap member 40. It is contemplated within the scope of the present invention that the sandal 10 could be provided with a strap member 40 that was provided without buckles 44 and further having more or less than three strap segments 46.

[0027] Referring now to FIG. 5 submitted as a part hereof, the method of the present invention is outlined therein. In step 301, a desired quantity of stock blank 5 is procured through desired channels, wherein the stock blank 5 can be all of the same material or alternate quantities of different materials. Step 303, a three-dimensional volumetric scan is taken of both feet of a user for which a pair of sandals 10 is being manufactured. It should be understood within the scope of the present invention that the three-dimensional volumetric scan is acquired employing suitable equipment and technology. In step 305, the three-dimensional volumetric scan of the foot is saved into a created data file wherein the created data file is stored on acceptable computer media. Step 306, the data file is modified to adjust any area across the three regions of the foot discussed herein wherein the modified data provides accommodations for special requirements. By way of example but not limitation, an individual might need to have an area bored out to decrease pressure on a specific spot decrease pressure on that area due to a heel spur. Step 307, the created data file is transferred utilizing suitable techniques. In step 309, the created data file is loaded into the processor of a milling machine that will be utilized to mill the stock blank 5. Step 311, the stock blank 5 is milled to create the midsole wherein the midsole 20 includes an upper surface 21 that is matched to the hindfoot, midfoot and forefoot of the user's feet as a result of the three-dimensional volumetric scan. In step 313, the strap member 40 is secured to the midsole 20 wherein the strap member 40 includes lower portions secured to the bottom surface 22 of the midsole 20 and at least one strap segment 46 that extends from one side of the midsole 20 to the opposing side of the midsole 20. Step 315, an outsole 30 is secured to the bottom surface 22 of the midsole 20 utilizing suitable durable techniques.

[0028] In the preceding detailed description, reference has been made to the accompanying drawings that form a part hereof, and in which are shown by way of illustration specific embodiments in which the invention may be practiced. These embodiments, and certain variants thereof, have been described in sufficient detail to enable those skilled in the art to practice the invention. It is to be understood that other suitable embodiments may be utilized and that logical changes may be made without departing from the spirit or scope of the invention. The description may omit certain information known to those skilled in the art. The preceding detailed description is, therefore, not intended to be limited to the specific forms set forth herein, but on the contrary, it is intended to cover such alternatives, modifications, and equivalents, as can be reasonably included within the spirit and scope of the appended claims.

What is claimed is:

1. A method of manufacturing footwear wherein the method comprises the steps of:

procuring stock blank,

acquiring a three-dimensional volumetric scan of a wearer's feet, wherein the three-dimensional scan of the wearer's feet includes a hindfoot, midfoot and forefoot region of the wearer's feet, wherein the three-dimensional volumetric scan creates a data file;

saving the data file, wherein the data file containing data for the three-dimensional volumetric scan is stored on suitable computer media;

modifying the data file, wherein the data file is modified so as to alter at least one area to accommodate a physical requirement of a foot of a wearer;

loading the data file, wherein the data file is loaded into a controller for milling equipment;

milling the stock blank, wherein the stock blank is milled in accordance with the data file to create a midsole, said midsole having a bottom surface and an upper surface;

attaching a strap member to the bottom surface of the midsole; and

securing an outsole, wherein the outsole is secured to the bottom surface of the midsole.

2. The method of manufacturing footwear as recited in claim 1, wherein the strap member includes at least one strap segment, said strap segment configured to extend from a first side of the midsole to a second side of the midsole over a top of the wearer's feet.

3. The method of manufacturing footwear as recited in claim 2, wherein the stock blank is manufactured from a cork-rubber blend.

4. The method of manufacturing footwear as recited in claim 3, wherein the strap member includes a lower portion, said lower portion being secured to the bottom surface of the midsole, said lower portion being intermediate the outsole and midsole.

5. The method of manufacturing footwear as recited in claim 4, wherein said upper surface of said midsole is shaped to mateably accommodate a bottom of the wearer's feet that includes a hindfoot, midfoot and forefoot region.

6. The method of manufacturing footwear as recited in claim 5, and further including a step of transferring the data file, wherein the data file is transferred from the computer media to the controller of the milling equipment.

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