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(54) Title: FITTING SYSTEM AND METHOD FOR CUSTOMIZABLE FOOTWEAR

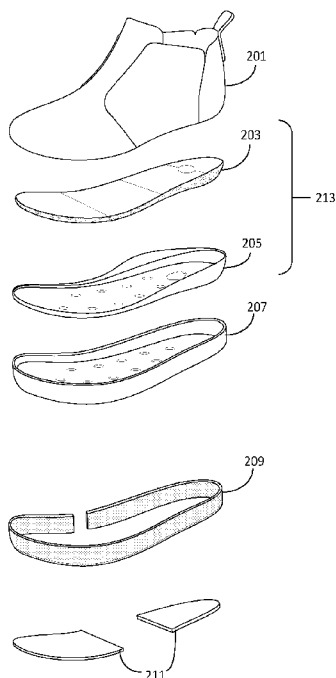


FIG. 2

(57) Abstract: Disclosed embodiments relate to a footwear (100) system. The footwear (100) system includes a shoe (100), a first insole (203B, 203), and a second insole (203B, 203). The first insole (203B, 203) is a fitting insole (203A, 203, 502A) having a first volume. It is positioned within the shoe (100) during a fitting of a potential wearer of the shoe (100). The fitting insole (203A, 203, 502A) is removed after the fitting is completed. The second insole (203B, 203) has a volume substantially similar to the first volume. The second insole (203B, 203) adapted for positioning within the shoe (100) if the first insole (203B, 203) demonstrates an appropriate fit. The second insole (203B, 203) is self-customizable and further adapted to conform to the imprint of the sole of the potential wearer.

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FITTING SYSTEM AND METHOD FOR CUSTOMIZABLE FOOTWEAR

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] This application relates to a fitting system for self-customizing footwear. More particularly, this application relates to insole systems and methods which provide a precision fit for footwear.

Description of the Related Technology

[0002] Traditionally, fitting footwear required the wearer to test various sizes of the footwear by trying them on at a point of sale establishment. In a traditional fitting scenario, a customer interested in purchasing new shoes would be sized by a sales associate using a brannock device to determine the length and width of the customer's feet and a sales person would then bring the customer one or more sizes of a particular item of interest. The customer would insert his or her foot into the shoe to determine whether the shoe provided a snug and comfortable fit. If the shoe did not provide a snug and comfortable fit, the customer would typically put it aside and try on another size. This process would be repeated until the customer found a size that provided the desired comfort and fit. Still, often times an ideal fit cannot be realized by way of conventional sizing scales.

[0003] More recently, designers of footwear have attempted to improve the fit of footwear by providing customized footwear items. Some customizable footwear has been made using molds taken of the foot of the customer. Using these molds, customized footwear was produced which was then delivered to the customer. Of course, there were certain disadvantages of this approach, including the fact that the fitting process took quite a bit of time, as the shoe needed to be designed after the mold was taken of the customer's foot.

[0004] Another type of customizable footwear approach has been developed using digital imaging technology. In these types of customizable footwear, digital scans of the customer's foot are taken, and using those scans a customer-specific item of footwear is created to closely conform to the shape and contour of the customer's feet. As with the use of a mold, this approach suffers from certain disadvantages. For example, in order to obtain the digital image of the foot, special equipment is needed. This type of equipment can tend to be expensive, require special training for

operation of such equipment, and may not always be readily available in every retail shoe-selling establishment. Moreover, even though the digital scans can be transmitted digitally to the manufacturer, there is still lead time and delay between the fitting and the delivery of the shoe.

[0005] Accordingly, improvements in the fitting and customization of footwear are needed which do not suffer from the problems identified above.

SUMMARY OF THE INVENTION

[0006] Disclosed herein is an optimized shoe footwear fitting system. More particularly, systems and methods for providing a self-customized fit for footwear are provided.

[0007] In one aspect, a kit for providing customizable fit for footwear is disclosed. The kit may include a first imprint insole system having an insole affixed to a cradle; a second imprint insole system having a pressure-sensitive insole affixed to a second cradle; and instructions for activating the customized insole. Advantageously, the first imprint insole system is a fitting insole dimensioned to fit within a shoe. The second imprint insole system may be dimensioned substantially similarly to said first insole and is trimmable to accommodate a plurality of shoe shapes. Optionally, the second insole includes a pressure sensitive layer configured to conform to the shape of a wearer's foot upon the application of pressure. The first and second cradle may be constructed from a polyurethane foam material.

[0008] In certain aspects, the imprint insole systems may include a cutting guide. The kit may likewise include instructions for trimming the first or second imprint insole systems or both the first and second imprint insole systems along the cutting guide to promote a better fit of the insoles in a shoe. In other aspects, the kit can include thermoformed plastic packaging of the first and second insole system. Optionally, the packaging may include at least one cut out window.

[0009] In yet another aspect, the pressure sensitive layer of the second insole system is a thermoset polymer.

[0010] In still another aspect, the kit for providing customizable fit for footwear can include instructions for activating the second pressure sensitive insole. The instructions may include advising the wearer to insert the first insole system into a shoe. The wearer may then confirm the fit of the shoe by inserting his or her foot in the shoe having the first fitting insole. The instructions may further include a directive to remove the first insole system and replace the first insole system with said second insole system.

[0011] The instructions may further instruct the wearer to apply pressure to the insole to activate the second imprint insole system. Finally, the instructions may include a directive that the wearer reinsert his or her foot into the shoe with the second insole system such that the second insole can conform to the shape of said wearer's foot. Pressure may be applied by hand activation, by stepping on insole when it is in a shoe, or by manipulating the insole to pre-mix the mold-on-demand components prior to placing the insoles directly on a hard surface. The activation of the mold-on-demand insert can be performed one insert at a time or both the left and right insole can be activated substantially simultaneously.

[0012] In one aspect of the invention, a footwear system is provided. The system may include a shoe, a first insole system, and a second insole system. The first insole system may include a fitting insole having a first volume, and adapted to be positioned within the shoe during a fitting of a potential wearer of the shoe and removed after the fitting is completed. The second insole system may include an insole having a volume substantially similar to the first volume. Advantageously, the second insole is adapted to be positioned within the shoe if the first insole demonstrates an appropriate fit, and wherein the second insole is self-customizable and further adapted to conform to the imprint of the sole of the potential wearer. The shoe may include an athletic shoe, sport shoe and the like, casual shoe, sandal, heel, boot, or an orthopedic shoe.

[0013] In yet another aspect, the second insole includes a thermoset polymer. Optionally, the second insole can include an antibacterial layer.

[0014] Also disclosed is a method of customizing the fit of footwear. The method may include providing a shoe; wherein the shoe includes an outsole having a top layer and a bottom layer; a cushioning element attached to the top layer of said outsole; a first imprint insole system comprising a fitting insole affixed to a cradle and removably inserted in the shoe; and an upper shell. The method further includes confirming fit of the shoe; removing the first imprint insole system from the shoe; replacing the first imprint insole system with a mold-on-demand insole system; applying pressure to the mold-on-demand insole system; and imprinting the mold-on-demand insole to the shape of a wearer's foot. In some aspects, the fitting insole comprises a memory foam. In another aspect, the memory foam is a slow return memory foam.

[0015] In another aspect, a customized footwear system is provided. The footwear system may include a shoe; a fitting insole; and a mold-on-demand insole; wherein the fitting insole has a first volume; wherein the mold-on-demand insole has a volume substantially similar to the first

volume; and wherein the mold-on-demand insole is configured to conform with the shape of the wearer's foot upon application of pressure. The mold-on-demand insole may be a thermoset resin. In yet another aspect, the shoe is selected from the group consisting of an athletic shoe, a sandal, a heel, a boot, and an orthopedic shoe.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] Figure 1 is an example of an item of footwear according to one or more embodiments disclosed herein.

[0017] Figure 2 is an exploded view of various components of the item of footwear shown in Figure 1.

[0018] Figure 3 is a more detailed view of the fitting insole components shown in Figure 2.

[0019] Figure 4 is an example of a self-customizing insole according to one or more embodiments.

[0020] Figure 5 is a block diagram illustrating components in a shoe system according to one or more embodiments.

[0021] Figure 6 is a flow diagram providing an illustration of a fitting process according to one or more embodiments.

DETAILED DESCRIPTION OF CERTAIN INVENTIVE EMBODIMENTS

[0022] Embodiments will be described with respect to the accompanying figures. Like reference numerals refer to like elements throughout the detailed description. As used herein, the term "substantially" includes the meanings of completely, almost completely, or to any significant degree under some applications as understood by those skilled in the art. The phrase "imprint insole system" as used herein refers to an insole permanently affixed to a cradle. While an insole or cradle may be described separately, it will be appreciated that the imprint insole system comprises the combination of an insole and a cradle, wherein the component parts (namely the insole and cradle) are permanently joined to form the imprint insole system. The imprint insole system may or may not include a cushioning element, which will be described in greater detail below.

[0023] Embodiments of this application relate generally to footwear fitting systems comprising a fitting insole and a mold-on-demand insole to provide a customizable fit to a consumer. Advantageously, the fitting insole is provided in order to prevent activation of mold-on-demand insoles during a fitting process. As will be described in greater detail below, kits comprising a fitting insole and a mold-on-demand insole are specifically contemplated. Additionally, in certain embodiments, footwear is provided to a consumer prior to purchase which includes a fitting insole and a separate mold-on-demand insole. The fitting insole has the same initial thickness and volume as the mold-on-demand insole, ensuring a proper fit from heel to toe, tip to tail, and side to side. Once a proper fit is found and a purchase decision is made, the consumer may remove the fitting insole from the shoes and replace them with the mold-on-demand insoles. Once inserted, the consumer puts on the shoes and secures the shoes to the feet. The consumer then activates the mold-on-demand technology in the mold-on-demand insole by application of pressure as will be described in greater detail below. For example, activation can be accomplished by the consumer standing up and applying pressure throughout the footbed. Alternative methods of activation include bursting and kneading the mold-on demand imprint insole (by hand or with the aid of a tool such as a roller), placing the imprint insole on a hard surface and manipulating the insole in a rocking motion to ensure activation and mixing of component parts, then placing the insole assembly in a footbed of a shoe, and securing the shoe to a consumer. Once the shoe is secured, the consumer may stand, thereby applying the pressure of the consumer's weight load on the insole to activate and cure the insole as described in the instructions for use. The material contained in the mold-on-demand insole flows into areas of the foot where voids exist, and solidifies to form a customized insole.

[0024] With reference now to the Figures, Figure 1 is an example of an item of footwear 100 which may be used to implement various aspects of the features disclosed herein. The item of footwear may take various forms. It may be any one of types and/or style of shoe, including but not limited to, athletic shoes including specialized athletic shoes such as cleats, ski and snow boots, roller skates, and the like, comfort orthopedic shoes, orthotic shoes, ordinary casual wear shoes, boots, dress shoes, high heels, fashion shoes, slippers, house shoes, sandals, and the like. Footwear construction types may include but are not limited to flat lasting, double lasted, string lasted, strobel stitched, and waterproofing constructs such as full bootie and gasket type. The shoe 100 may include various constituent parts which are described in Figure 2.

[0025] Turning now to Figure 2, an exploded view of various components of the shoe from Figure 1 are shown. The shoe and constituent parts can be configured for use with either a right or a left foot. For example, as illustrated in Figure 2, the shoe and constituent parts are shaped for use with a left foot. As shown in Figure 2, the shoe may include an upper shell 201. The shell may be of any pattern such as a high leg boot, court shoe, slingback, mule, sandal, ankle boot, wedge brogue, Derby/Gibson, causal, monk, tasseled loafer, Chelsea boot, moccasin, or combinations thereof. As is well-known, the upper comprises the portions of the shoe that cover the toes, the top of the foot, the sides of the foot, and the back of the heel. The upper may be constructed from any number of suitable materials including, for example, leather, textile, synthetic (nonwoven and microfiber backed), microfiber, spacer meshes, plastic, rubber, wood, natural fibers such as jute and the like. The upper shell 201 can be open toed or closed toed. Similarly, the heel of the upper shell 201 can be open heeled or closed heeled.

[0026] The shoe 100 may also include an insole 203. The insole 203 may be a mold-on-demand insole or a fitting insole as will be described in greater detail below with reference to Figures 3 and 4. The insole 203 is permanently affixed to a cradle 205, the insole 203 and cradle 205 together form an imprint insole system 213. The imprint insole system 213 is removable and when in use, can be positioned within the enclosure formed by the upper shell 201 and the outsole 211 of a shoe.

[0027] The imprint insole 213 is preferably constructed from materials which afford the imprint system 213 the properties of being substantially lightweight, providing the consumer with cushioning for comfort and fit, flexibility for ease in inserting and removing said imprint insole system 213 into a shoe, and providing a platform as well as support for the foot. Thus, the cradle 205 is preferably a foam material which offers cushioning, support, heel stabilization, and acts as a foundation for the shoe. Suitable foam materials contemplated for use in the manufacturing of the cradle 205 include, without limitation, EVA foam, polyethylene foam, polyurethane foam, foam, and blown polyurethane foam. The cradle 205 may optionally include an antimicrobial additive to inhibit the growth of odor-causing bacteria. The cradle 205 generally has a shape of the inner base of a shoe and is designed to fit within the cavity of a shoe. In some embodiments, the cradle 205 includes markings around the exterior perimeter of the cradle to delineate to a consumer where the cradle may be cut/trimmed to accommodate different toe box shapes as will be described in greater detail below. The cradle 205 may be positioned within a foam (or foam-

like) cushioning element 207 to provide added comfort and support. The cradle 205 can thus include a single layer of foam or may include a plurality of layers such as a plurality of durometer foam layers, die out or injection stabilization components such as shanks and the like. These stabilization components may be formed from metal, die out, and injection plastics or in any other suitable material as will be appreciated by a person having ordinary skill in the art. The cradle 205 can be formed in a variety of forming processes such as but not limited to reaction, rotary, injection, direct pour, and compression molding. The cradle 205 provides dynamic shock attenuation and stabilization characteristics. Table 1 sets forth exemplary characteristics of the cradle 205 when fabricated from a pour molded polyurethane.

Table 1: Material/Component Specifications for Pour Molded Polyurethane Cradle

CHARACTERISTICS	MIN-MAX STANDARD
DUROMETER	32-38 Asker C
COMPRESSION SET	0.80%
SPECIFIC GRAVITY	.35-.45 g/cc
TENSILE	10.0 kgf/cm ²
ELONGATION	190%
DIE C TEAR	4.5 kgf/cm -
NON MARKING	NO MARKS
HYDROLYSIS RESISTANCE	After 10 days: Tensile Strength: 2.4 kgf Extension at Break: 190%

[0028] In certain embodiments, the midsole cushioning element 207 may provide additional dynamic shock attenuation, stabilization, comfort and support. The midsole cushioning element 207 is constructed of a material adapted for shock absorption such as, for example, EVA, polyurethane, blown polyurethane, and blown rubber. The midsole cushioning element 207 is fabricated via reaction, rotary, injection, direct pour, compression molding, injection molding or any other techniques known by a person having ordinary skill in the art of foam fabrication. In some embodiments, the insole imprint system 213 may further include the cushioning element 207 when the midsole cushioning element 207 is exterior to the midsole of a shoe. In some embodiments, the cushioning element is internal to the midsole of a shoe and is thus not part of the insole imprint system 213.

[0029] Tables 2 and 3 set forth exemplary materials and characteristics of certain embodiments of the midsole cushioning element 207. Table 1 sets forth the raw materials and characteristics including the minimum-maximum standard for a polyurethane (PU) exposed insole. Table 2 sets forth the raw materials and characteristics including the min-max standards for an EVA foam insole:

Table 2: PU Exposed Midsole Cushioning Element

CHARACTERISTICS	MIN - MAX STANDARD
Durometer	55-60 Asker C
Compression Set	6.40%
Specific Gravity	.30-.33 g/cc
Tensile	16.0-16.5 kgf/cm ²
Elongation	175%
Die C Tear	12.8 kgf/cm -
Stitch Tear (Dry)	6.4N/mm min
Din Abrasion	345
Ross Flex, Oil#3	125,000 cycles - 4mm growth Max
Discoloration	3.5 u.v class -
Volume Swell (Fuel B@46 Hrs)	7.6 max
Non Marking	NO MARKS
Hydrolysis Resistance	After 10 days: Split Tear Strength: 1.7kgf Tensile Strength: 2.4kgf Extension at Break: 175%

Table 3: EVA Exposed Midsole Cushioning Element

CHARACTERISTICS	MIN - MAX STANDARD
Durometer	52-58 Asker C
Compression Set	20-25%
Specific Gravity	.19-.24 g/cc
Elongation	175%
Split Tear Strength	1.7 kgf
Tear Strength (Dry)	6kgf min
Din Abrasion	Per Material Specification
Discoloration	3.5 u.v class -
Non Marking	NO MARKS

[0030] The outsole 211 comprises the exterior bottom portion of a shoe which is in direct contact with the ground. The outsole may be constructed from any number of materials including, without limitation, leather, natural or synthetic rubber, fabric, plastic, or combinations thereof and may be attached to the bottom of the cushioning system 207, and it forms the outer boundary between the shoe and the ground. When the imprint system 213 is integrated into footwear, the upper shell 201, midsole cushioning element 207, and outsole 211 may be bound together by any conventional means of adhesion. As illustrated in Figure 2, the upper shell 201, midsole cushioning element 207, and outsole 211 can be bound together at the midsole using a binder 209. The binder 209 may be a foxing tape such as crepe foxing tape, or some other binding material known in the art. It is specifically contemplated, however, that in some embodiments, no binder 209 is required for connecting the upper shell 201, midsole cushioning element 207, and the outsole 211. For example, when the footwear is a sandal or high heel, the upper shell 201 can be attached/adhered directly to the outsole 211 with or without a midsole cushioning element 207.

[0031] As discussed above, the footwear fitting system may include two different insoles—one for trying on the shoe and the other a mold-on-demand insole which customizes to the anatomical shape of the wearer's foot. Turning now to Figures 3 and 4, examples of a fitting insole 203A and a mold-on-demand insole 203B are provided. Though shown as separate

components in Figure 3, the fitting insole 203A is permanently affixed to the top surface of the cradle 205 and adhered by any of a number of fusing techniques such as stock fitting, direct pour, insert molding, and flame lamination. The fitting insole 203A may be fabricated from any suitable material including, without limitation, polyurethanes and ethyl vinyl acetates (EVA). In one embodiment, the fitting insole 203A is fabricated from a slow return memory foam. The fitting insole 203A may be fabricated to achieve a variety of densities or hardness as will be appreciated by a skilled artisan. For example, by varying the air, gas, or blowing agent, the imprint insole can be modified. Likewise, EVAs of different density or hardness can be fabricated by varying the amount of monomeric units (e.g. ethylene or vinyl acetate). Other materials such as polyethylenes, foam rubbers, memory foam, plastazote, dyanof foam, or other foam plastics or elastomers can be used. Features of preferred insole material provide durability and comfort while also being substantially light in weight. In certain embodiments, the fitting imprint insole, comprising the fitting insole 203A and the cradle 205, includes a top layer having a substantially soft texture to improve fit and feel of the shoe. The top layer can be felt or imitation felt and may include special ventilation features such as air channels, shock absorption features, anti-bacterial features, antifungal features, or the like.

[0032] The fitting insole 203A can be manufactured in any suitable manner known to a person having ordinary skill in the art of insole manufacturing. The outline of the fitting insole 203A, defined by its outer edge, may substantially follow the profile of a left or a right foot. In some embodiments, the outer edge is sized and shaped to follow the outline of the user's shoe so that the fitting insole 203 can be used within a shoe. The fitting insole 203A permanently affixed to the cradle 205 has substantially similar dimensions as a mold-on-demand insole 203B permanently affixed to a cradle 205, which will be described in greater detail below with reference to Figure 4. In general, the fitting insole 203A may have a flexible, absorbing surface and is dimensioned to have a thickness and volume that is substantially the same as the thickness and volume of the mold-on-demand insole 203B and cradle 205. This allows for the customer to get a sense of how the shoe will fit when the mold-on-demand insole 203B is activated.

[0033] Now with reference to Figure 4, after removing the fitting imprint insole comprising the fitting insole 203A and the cradle 205 (as illustrated in Figure 3) from a shoe and replacing the fitting insole 203A with the mold-on-demand imprint insole comprising a mold-on-demand insole

203B coupled to a cradle 205, the mold-on-demand insole 203B and cradle 205 are positioned within a shoe.

[0034] The mold-on-demand imprint insole comprises the mold-on-demand insole 203B and cradle 205 and provides precision fit, cradling support, and stability to the user. Additionally, the mold-on-demand insole serves to unify the foot of a user with the shoe to improve overall fit of the shoe, propulsion, fatigue reduction, enhance lateral and arch support, and promote proper alignment of the foot and ankle of the user. The mold-on-demand insole 203B may take various forms. In general, the mold-on-demand insole 203B is configured to provide personalized support in areas of the foot which need it the most. The mold-on-demand insole 203B may be configured to provide a form-fit to the contours of the foot of the consumer, while at the same time providing gel-like pliability and feel. In addition, the mold-on-demand insole 203B may be formed using flexible, resilient materials which provide a fully customized fit. In general, the mold-on-demand insole is configured to mold to the foot of the wearer without needing any 3D scan of the foot or any casting whatsoever. Additionally, the mold-on-demand insole may provide customization in real-time, generally within a few minutes of activation. As illustrated in Figure 4, the mold-on-demand insole 203B is a thermoset formed insole configured to take on the imprint of the wearer's foot.

[0035] The mold-on-demand insole 203B is fabricated from material which can take on the ability to mold to a user's foot. In one embodiment, the mold-on-demand insole 203B is fabricated from a thermoset polymer such as a thermoset resin. The mold-on-demand insole may be fabricated from a slow return memory foam. In other embodiments, the mold-on-demand insole 203B can include a top and bottom elastomeric layer. In between the top and bottom layers may be a middle layer having curable fluid stored in pressure sensitive packets which are pressure activated and may burst to release the curable fluid. The packets contain components that set or cure upon release from the activated packets and may combine and react with contents of adjacent packets to initiate curing. Exemplary curable fluids suitable for use include, without limitation, polyurethane resins, silicone resins, and epoxy resins.

[0036] In some embodiments, curable fluid is contained within a plurality of bladders which are arranged along the length and width of the insole to optimize fit once the fluid cures. The fluid may pool to areas of the foot where voids exist, and a curing process takes place. After a short period of time, the fluid may solidify, surrounding and defining the perimeter of the foot,

and also flowing in between the toes and across the metatarsal area. In some embodiments, curing can be achieved in less than five minutes. In another aspect, curing can be achieved in approximately three minutes. In addition, the curing material may also flow under the midfoot or arch area, ultimately leaving a cured, soft, flexible and lasting impression of the foot. In some embodiments, the curable fluid may be compartmentalized to control the flow of the material to different areas of the foot. For example, the toe area may include one compartment of curing material, the ball and arch area another, and the heel yet another to ensure proper support in those areas.

[0037] In one embodiment, the mold-on-demand insole 203B may include memory foam infused with a pressure-activated resin. In use, when a consumer applies pressure to the insole 203B by, for example, stepping on the insole 203B, the memory foam takes the shape of the consumer's foot and the insole molds to that shape. The application of pressure also activates a resin. The resin is released and sets the memory foam in the shape of the consumer's foot imprint.

[0038] As detailed above, the mold-on-demand insole 203B is permanently affixed to the cradle 205. The cradle 205 can include markings (not illustrated) around the exterior perimeter of the cradle to delineate to a consumer where the cradle may be cut/trimmed to accommodate different toe box shapes as well as different shoe sizes.

[0039] In certain inventive embodiments self-customizing footwear may be provided as a footwear system which includes both a fitting imprint insole and a mold-on-demand imprint insole. Turning now to Figure 5, a block diagram provides an example of contents and configuration of a footwear system 500 as delivered to a consumer. As shown, the footwear system 500 includes left and right shoes 502A and 502B. Inside the shoes 502A and 502B are the left fitting insole 504A and right fitting insole 504B, respectively. The fitting insoles are provided within the shoe so that the consumer may try on the shoe without activating the mold-on-demand technology provided in the customizable insoles 506A and 506B. The customizable insoles 506A and 506B are positioned outside of the shoe so that they can replace the fitting insoles 504A and 504B after a purchase has been made.

[0040] Turning now to Figure 6, an example of a fitting process for according to one or more embodiments is provided. The process begins at block 601, where a pair of shoes is prepared with the fitting insole (such as fitting insole 502A and 502B) inserted into each shoe. Next, the mold-on-demand insoles (such as insoles 504A and 504B) are provided in the shoe packaging, but

not within the upper. The process next moves to block 605. There, the customer selects a pair of shoes and tries on the pair of shoes using the fitting insole. As discussed above, the fitting insoles and the mold-on-demand insoles (in a pre-activated state) will generally have substantially the same initial thickness from heel to insuring a proper fit from heel to toe, tip to tail, and front to back. Next, the process moves to decision block 607, where the customer decides whether the shoes are a good fit. If not, the process returns to block 605, and the customer selects a new pair of shoes and tries them on with the fitting insole.

[0041] If at decision block 607 the customer determines that the shoes are a good fit, the process moves ahead to block 609. There, the fitting insoles are removed from the shoes. Once the fitting insoles are removed, the process moves to block 611, where the mold-on-demand insoles are inserted to replace the fitting insoles. Once the mold-on-demand insoles have been placed within the shoes, the process moves to block 613. There, the customer secures the shoes to their feet. The process then moves to block 615, where the customer, now wearing the shoes, activates the mold-on-demand insole. Activation is generally accomplished by the application of pressure. In practice, the application of pressure can be achieved in any number of ways. For example, activation can be achieved by stepping into a shoe with the mold-on-demand insert, applying a force to the sole of the shoe having the mold-on-demand insole inside the shoe, standing up with the shoe and insole on the consumer's foot such that the weight of the customer applies sufficient pressure throughout the footbed to activate the mold-on-demand technology. Additionally, pressure may be applied by hand activation or by manipulating the insole to pre-mix the mold-on-demand components prior to placing the insoles directly on a hard surface. The activation of the mold-on-demand insert can be performed one insert at a time or both the left and right insole can be activated substantially simultaneously.

[0042] Once the mold-on-demand technology has been activated the customer may stand with his or her feet shoulder width apart as the molding process begins. Depending upon the configuration of the mold-on-demand insole, the customer may stand for one or two minutes, or possibly more. Next, the process moves to block 617 where the customer stands with their feet shoulder width apart, and the material in the footbed flows. The curing material may flow into those areas of the foot where a void exists and the pre-existing shape of the mold-on-demand insole fails to provide adequate support. In particular, material will surround and define the perimeter of the foot, flow in between the toes and across the metatarsal area, and under the midfoot or arch

area leaving a cured, soft, flexible and lasting impression of the foot in intricate detail. Generally, curing occurs within around five minutes of activation.

[0043] In some embodiments, a kit for promoting fit and customized footwear is disclosed. The kit comprises an insole/imprint system having at least one mold-on-demand insole adhered to a cradle. The kit can include a left footed mold on demand insole/imprint system, a right footed insole/imprint system, or both. In some embodiments, the kit further comprises a fitting insole permanently affixed to a cradle. The fitting insole/imprint system can include a left footed fitting insole/imprint system, a right footed fitting insole/imprint system, or a combination thereof. The insole/imprint system is provided in various sizes for use with different sized feet. In some embodiments, the sizes correspond to typical men's, women's and children's shoe sizes. Advantageously, the sizes of insole/imprint systems disclosed herein are all purpose and can include wide, narrow, children's sizes, as well as sizes and shapes suitable for use in any number of shoe types including heels, athletic shoes, orthopedic footwear, sandals, etc. In some embodiments, sizes can range from size 3-14.

[0044] The insole/imprint system may include a marking/cutting guide along the perimeter of the cradle. In some embodiments, the marking/cutting guide appears on the top surface of the insole. The cutting guide designates the boundaries for which further customization of fit can be achieved by trimming the edges of the insole/imprint system to accommodate sizing as well as different toe box shapes in various shoe designs. The cutting guide can be printed, etched, engraved, or molded onto the surface of the insole/imprint system. In operation, the user will be instructed that if further sizing optimization is necessary to promote better fit of the insole/imprint system in a shoe, the insole/imprint system may be trimmed by the user provided such trimming is restricted to the exterior boundaries of the insole/imprint system and should not exceed beyond the area of the insole/imprint system indicated by the cutting guide. Thus, the kit can further include instructions for guiding the consumer to further customize the fit of an insole/imprint system by trimming the edges of the insoles relative to the cutting guide on the top surface of the imprint/insole system. Instructions also include a directive not to cut beyond the cutting guide to avoid activation of the mold-on-demand.

[0045] In another embodiment, the kit can optionally include instructions to size the insole/imprint system by removing the manufacturer's insole from a shoe and using said manufacture insole as a template for trimming the insole/imprint system to optimize fit.

Instructions can include directions to remove the manufacture insole, trace the outline of the manufacturer insole onto the insole/imprint system, and trim the insole/imprint system along the trace lines to fit. Instructions would further include directions to insert the trimmed insole/imprint system into the shoe prior to activation.

[0046] In some embodiments, the kit includes packaging to prevent unintentional activation of the mold-on-demand insole. The packaging may be a thermoformed clamshell. In some embodiments, the packaging comprises a cut-away window to provide visualization of the insole as well as an opportunity for the consumer to tactilely interact with the insole.

[0047] While certain embodiments are described herein in detail, it is to be understood that this disclosure is illustrative and exemplary, and is made merely for the purposes of providing a full and enabling disclosure. The detailed disclosure herein of one or more embodiments is not intended, nor is to be construed, to limit the scope of patent protection, for which scope is to be defined by the claims and the equivalents thereof. It is not intended that the scope of patent protection be defined by reading into any claim a limitation found herein that does not explicitly appear in the claim itself.

WHAT IS CLAIMED IS:

1. A kit for providing customizable fit for footwear, comprising:
 - a first imprint insole system comprising an insole affixed to a cradle;
 - a second imprint insole system comprising a mold-on-demand insole affixed to a second cradle; and
 - instructions for activating the second imprint insole system;wherein said first imprint insole system is a fitting insole dimensioned to fit within a shoe;
 - wherein the second imprint insole system is dimensioned substantially similarly to said first insole and is trimmable to accommodate a plurality of shoe shapes; and
 - wherein said second insole comprises a mold-on-demand layer configured to conform to the shape of a wearer's foot upon the application of pressure.
2. The kit of claim 1, wherein said second imprint insole system includes a cutting guide.
3. The kit of claim 2, further comprising instructions for trimming said second imprint insole system along the cutting guide.
4. The kit of claim 1, further comprising thermoformed plastic packaging of said second insole system.
5. The kit of Claim 1, wherein said mold-on-demand layer is a thermoset polymer.
6. The kit of Claim 1, wherein said instructions for activation comprise:
 - advising the wearer to insert said first insole system into a shoe;
 - confirming the fit of the shoe by inserting the foot of the wearer in the shoe having said first insole system;
 - removing said first insole system and replacing said first insole system with said second insole system;
 - applying pressure to said second insole to activate said second imprint insole system; and
 - instructing said wearer to reinsert said foot into the shoe with the second insole system such that the second insole can conform to the shape of said wearer's foot.
7. The kit of Claim 1, wherein said first cradle is polyurethane foam.

8. The kit of Claim 4, wherein said packaging further comprises at least one cut-out window.
9. A footwear system comprising:
a shoe;
a first insole system; and
a second insole system,
wherein the first insole system comprises a fitting insole having a first volume, and adapted to be positioned within the shoe during a fitting of a potential wearer of the shoe and removed after the fitting is completed, and
wherein the second insole system comprises an insole having a volume substantially similar to the first volume, and wherein the second insole is adapted to be positioned within the shoe if the first insole demonstrates an appropriate fit, and wherein the second insole is self-customizable and further adapted to conform to the imprint of the sole of the potential wearer.
10. The footwear system of Claim 9, wherein said shoe is selected from the group consisting of an athletic shoe, a sandal, a heel, a boot, and an orthopedic shoe.
11. The footwear system of Claim 9, wherein said second insole comprises memory foam.
12. The footwear system of Claim 9, wherein said second insole comprises an antibacterial layer.
13. A method of customizing the fit of footwear, comprising:
providing a shoe; said shoe comprising:
an outsole having a top layer and a bottom layer;
a cushioning element attached to the top layer of said outsole;
a first imprint insole system comprising a fitting insole affixed to a cradle;
wherein said first imprint insole system is removably inserted in said shoe; and
an upper shell;
confirming fit of said shoe;
removing said first imprint insole system from said shoe;
replacing said first imprint insole system with a mold-on-demand insole system;
applying pressure to said mold-on-demand insole system; and

imprinting said mold-on-demand insole to the shape of a wearer's foot.

14. The method of Claim 13, wherein said fitting insole comprises is memory foam.

15. The method of Claim 14, wherein said memory foam is a slow return memory foam.

16. A customized footwear system, comprising:

a shoe;

a fitting insole; and

a mold-on-demand insole;

wherein said fitting insole is dimensioned to fit within said shoe;

wherein said mold-on-demand insole is dimensioned substantially similar to said fitting insole; and

wherein said mold-on-demand insole is configured to conform with the shape of the wearer's foot upon application of pressure.

17. The footwear system of Claim 16, wherein said mold-on-demand insole is a thermoset resin.

18. The footwear system of Claim of Claim 16, wherein said shoe is selected from the group consisting of an athletic shoe, a sandal, a heel, a boot, and an orthopedic shoe.

100

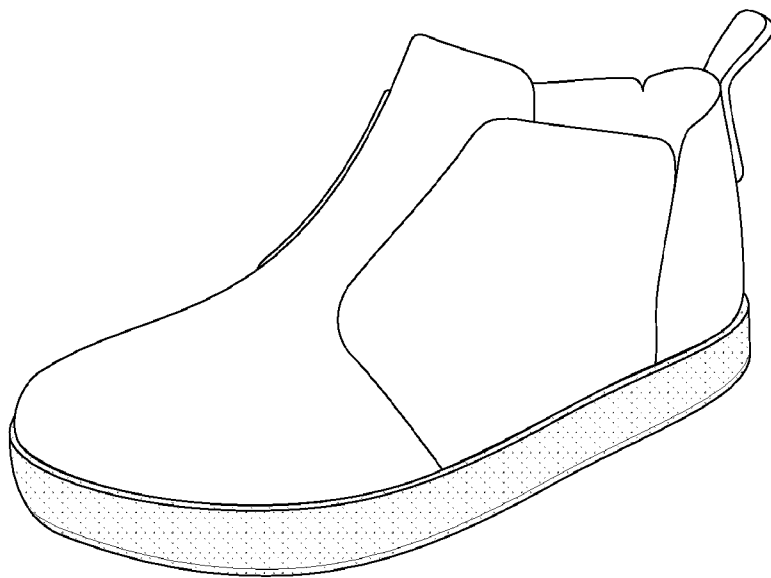


FIG. 1

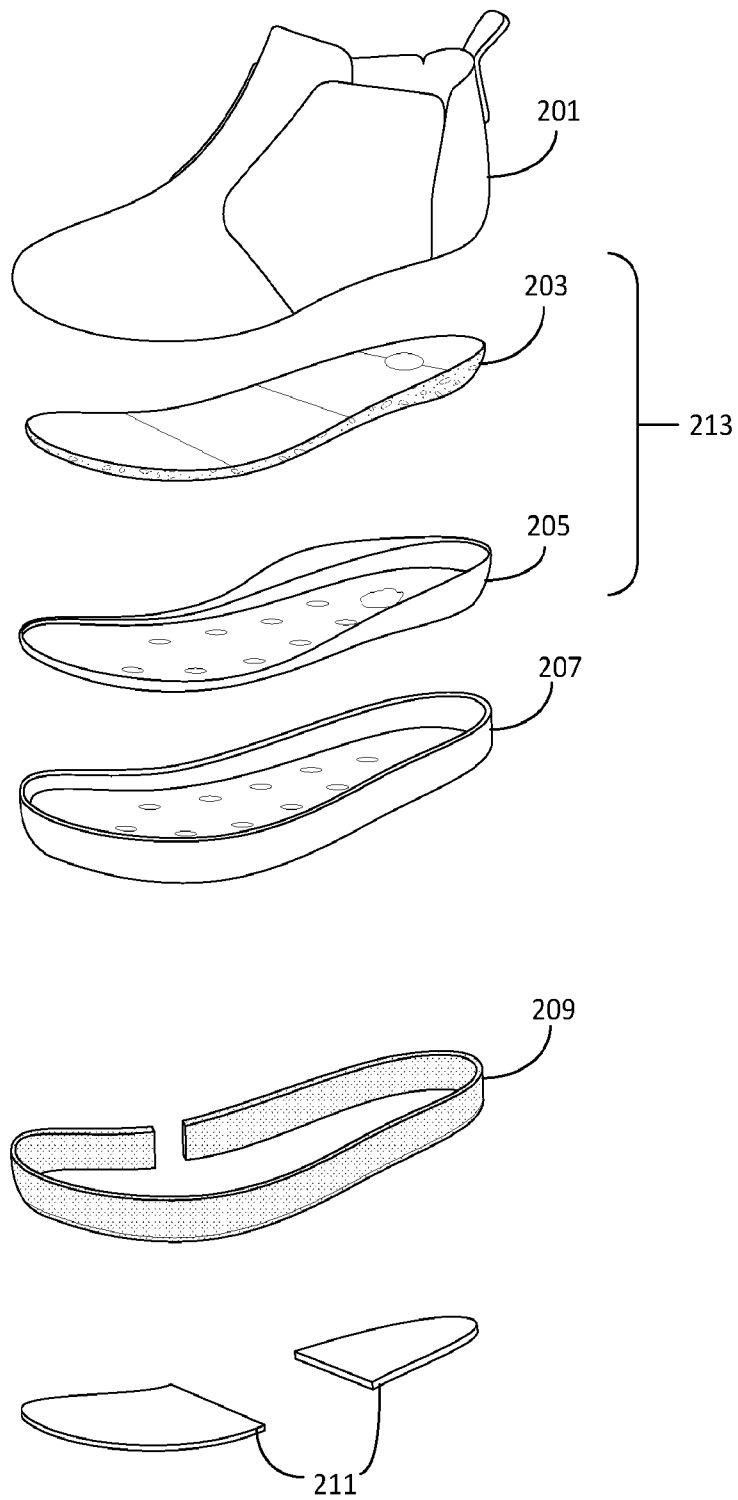


FIG. 2

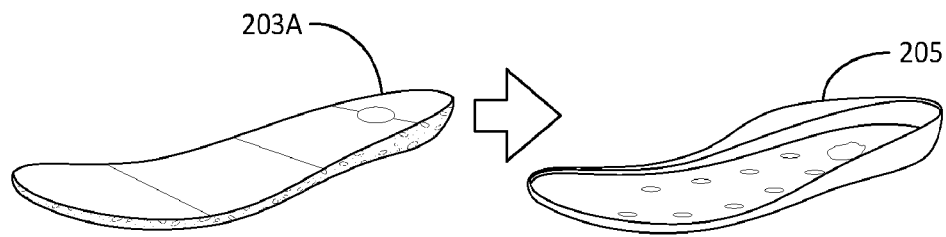


FIG. 3

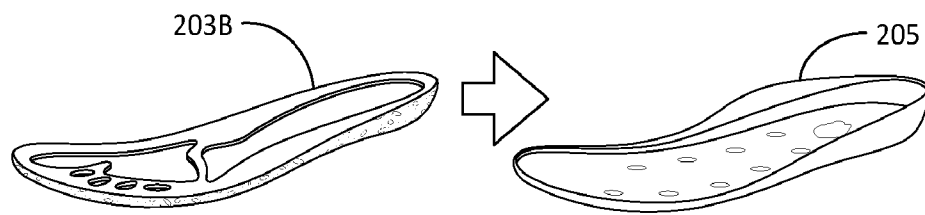
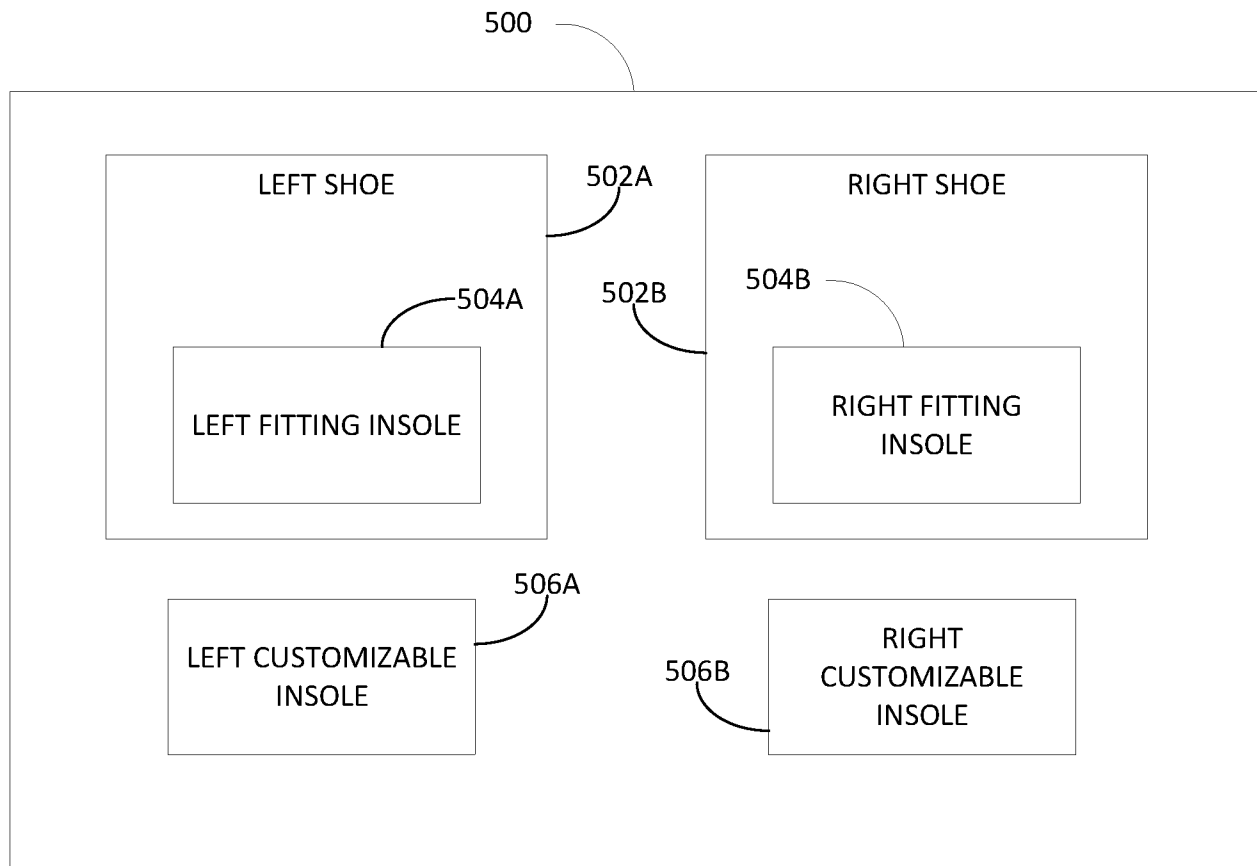
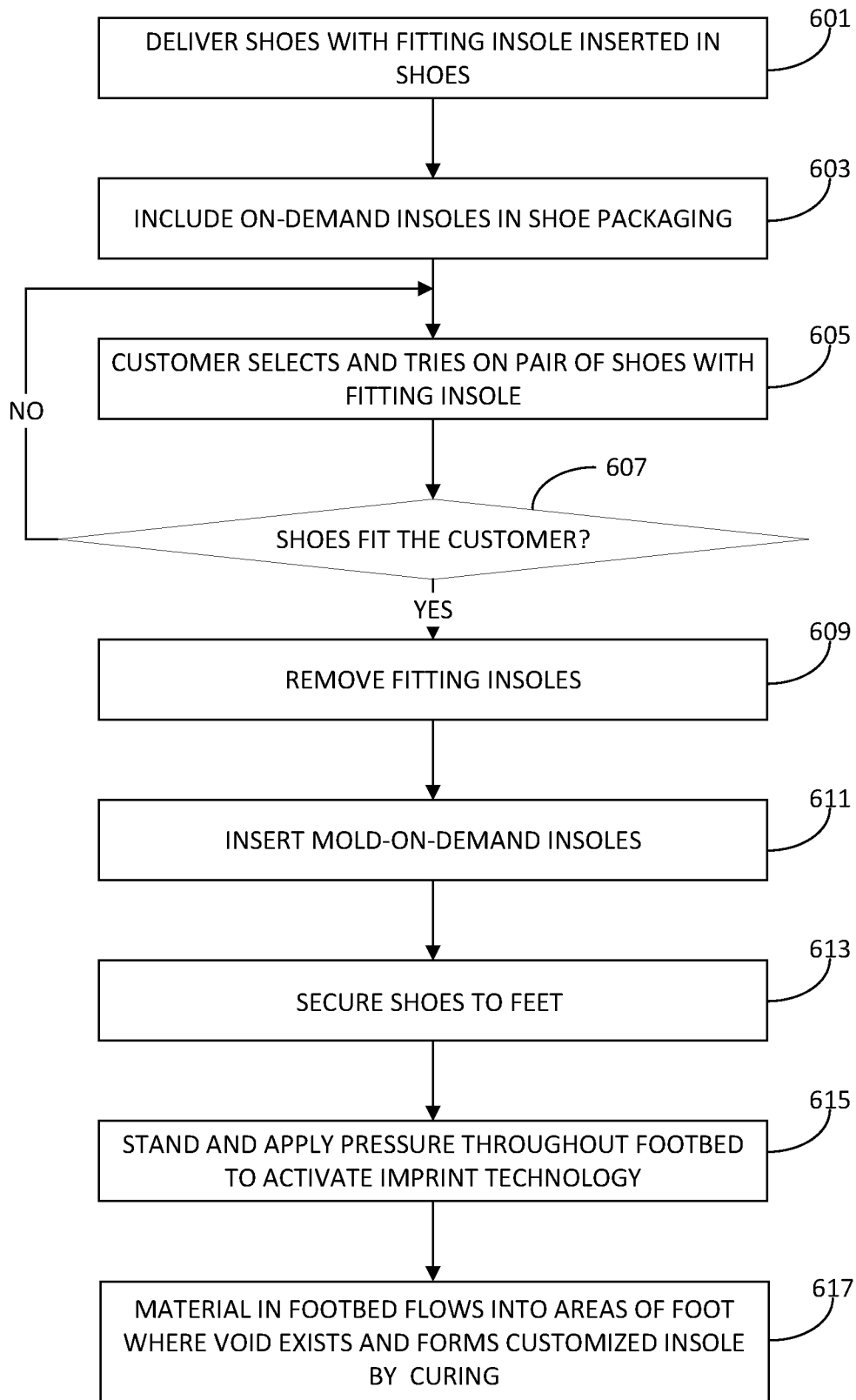


FIG. 4

**FIG. 5**

**FIG. 6**

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2017/018001

A. CLASSIFICATION OF SUBJECT MATTER INV. A43B17/00 A43B17/14 A43B7/28 ADD.		
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) A43B		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	The Insole Store: "Trim to Fit Shoe Insoles, Inserts, & Arch Supports @ The Insole Store.com", 5 September 2014 (2014-09-05), XP002769824, Retrieved from the Internet: URL: https://youtu.be/7Q0h1S_2x1k [retrieved on 2017-05-04]	1,3,4,6, 8,13
Y	the whole document	2,5,7, 13-15
Y	----- US 7 073 277 B2 (ERB ROBERT [US] ET AL) 11 July 2006 (2006-07-11)	5,7
A	column 3, line 65 - column 4, line 5 column 10, line 21 - line 25 column 10, line 36 ----- -/--	1,13-15
☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "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 8 May 2017		Date of mailing of the international search report 19/05/2017
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Ariza De Miguel, Jon

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2017/018001

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 1 623 642 A1 (SCHERING PLOUGH HEALTHCARE [US]) 8 February 2006 (2006-02-08)	2
A	figure 3 paragraph [0028] paragraph [0044]	14,15
Y	----- US 2014/250727 A1 (VANDERNOOT JOSH [US] ET AL) 11 September 2014 (2014-09-11) figures 1A, 1B paragraph [0004] -----	13-15

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2017/018001

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 9-12, 16-18
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 9-12, 16-18

In view of the number of independent claims (4 independent claims) and also the wording of the claims presently on file, which render it difficult, if not impossible, to determine the matter for which protection is sought, the present application fails to comply with the clarity and conciseness requirements of Article 6 PCT (see also Rule 6.1(a) PCT) to such an extent that a meaningful search is impossible.

In the present case and prima facie, the claimed subject-matters is drafted in such a way that it simply preclude the detailed analysis necessary to come to a firm conclusion regarding to the essential technical features of the invention and also the unity of the present application.

At least some of the independent claims differ from independent claim 1, in that they are drafted by means of removing features and/or adding features, thus lacking conciseness and clarity about the subject-matter to be searched.

Consequently, the search has been carried out for those parts of the application which do appear to be clear (and concise), namely independent claim 1 (product claim) and dependent claims 2-8, and independent claim 13 (method claim) and dependent claims 14-15.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guidelines C-IV, 7.2), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2017/018001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 7073277	B2	11-07-2006	NONE

EP 1623642	A1	08-02-2006	AT 397392 T 15-06-2008
		CA 2514278 A1	06-02-2006
		CN 101031212 A	05-09-2007
		EP 1623642 A1	08-02-2006
		MX PA05008398 A	09-02-2006
		US 2006026866 A1	09-02-2006
		WO 2006017651 A1	16-02-2006

US 2014250727	A1	11-09-2014	NONE
