UNITED STATES PATENT APPLICATION

Publication Data for the WATERPROOF SHOE WITH SIZE AND SHAPE-ADJUSTABLE BOOTIE.

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ABSTRACT
A footwear system is disclosed for protecting a user's foot from water or other liquid substances. In one embodiment, the footwear comprises a shoe having an upper, a seamless sock-shaped bootie, an inner lining, and a sole engaged to the upper. The seamless bootie may be composed of waterproof material and include at least one ribbed portion adapted to expand to allow the bootie to conform to the size of the inner lining. The bootie may be arranged between the upper and inner lining. Methods of manufacturing the aforementioned footwear system are also disclosed.
WATERPROOF SHOE WITH SIZE AND SHAPE-ADJUSTABLE BOOTTIE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of the filing date of U.S. Provisional Patent Application No. 61/911,696, filed Dec. 4, 2013, the disclosure of which is hereby incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] Aspects of the present invention relate, in general, to waterproof footwear, and specifically to an adjustable waterproof bootie for use in footwear of different sizes and/or shapes.

[0003] Footwear developed to withstand water or other liquids must be constructed to keep a user’s feet dry when contact with such water or other liquids. To that end, it is known to utilize a waterproof layer of material within certain shoe constructions to prevent water or another liquid from penetrating through the shoe. For instance, some waterproof shoe constructions involve the use of a waterproof liner that is positioned under an upper of the shoe. The liner prevents water from permeating all the way through the shoe and to the user’s foot.

[0004] In such constructions, however, shoes of different sizes generally utilize an individually sized liner that is dedicated exclusively to the specific shoe size. While this type of construction may be effective, it nonetheless requires a number of specifically sized components to produce the waterproof liner, and the liner is not usable with shoes of different sizes and/or shapes. Unfortunately, this can increase the time and expense needed to mass-manufacture the aforementioned waterproof shoes. Other deficiencies of such shoe constructions not noted here also exist.

BRIEF SUMMARY OF THE INVENTION

[0005] Aspects of the present invention provide a seamless waterproof bootie that can be adjusted to fit shoes of different sizes and/or shapes.

[0006] A first embodiment of the present invention includes a shoe having an upper with exterior and interior surfaces, a sole having an exterior surface for contacting the ground and an interior surface, the sole being secured to the upper, wherein the interior surface of the upper and the interior surface of the sole define a cavity for receiving a wearer’s foot, an inner lining being arranged within the cavity, and a seamless bootie formed of waterproof material in a sock shape, the seamless bootie overlying the inner lining within the cavity and including one or more ribbed portions adapted to expand to allow the bootie to conform to the size of the inner lining, the seamless bootie being configured to shield a wearer’s foot from contact with water or another liquid. In certain aspects of the first embodiment, the seamless bootie is made from a waterproof material that is selected from the group consisting of latex, polyurethane, rubber, or other materials that can be extruded or molded into a seamless thin material layer.

[0007] A second embodiment of the invention includes a method of constructing footwear comprising the steps of: (1) providing an upper, an inner lining, and a foot-shaped mold having an outer surface, the foot-shaped mold including at least one ribbed portion on its outer surface; (2) applying a waterproof material to the outer surface of the foot-shaped mold, thereby creating a seamless functional layer with at least one ribbed portion corresponding to the at least one ribbed portion on the outer surface of the foot-shaped mold, the seamless functional layer being in the form a seamless, sock-shaped bootie; (3) placing the seamless functional layer over the inner lining, such that the at least one rib expands to conform the seamless bootie to the size of the inner lining; (4) placing the upper over the seamless functional layer; and (5) affixing a sole to the upper. Additionally, in other aspects of the second embodiment, the foot-shaped mold includes multiple ribbed portions, at least some of the ribbed portions being arranged transverse to a longitudinal axis of the foot-shaped mold.

[0008] A third embodiment of the invention includes an article for waterproofing footwear comprising a seamless, sock-shaped bootie formed of waterproof material having at least one rib extending transversely from a surface of the bootie, the seamless bootie being configured for insertion over an inner lining of a shoe, and being adapted to conform to the size of the inner lining via the at least one rib. In some instances, at least one rib is placed vertically along an instep area of the bootie, and at least one rib is arranged transverse to the vertical rib.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1A is an exploded view of a shoe, according to one embodiment of the present invention.

[0010] FIG. 1B is a perspective view of a waterproof bootie formed from the foot-shaped mold of FIGS. 3A-B, while FIG. 1C is a bottom perspective view of the bootie.

[0011] FIG. 2 is a perspective, partial cutaway view of the shoe of FIG. 1A in assembled form.

[0012] FIG. 3A is a perspective view of a foot-shaped mold utilized to form a seamless waterproof bootie, which is incorporated, for example, within the shoe of FIG. 2.

[0013] FIG. 3B is a bottom perspective view of the foot-shaped mold of FIG. 3A.

DETAILED DESCRIPTION

[0014] In describing certain features of the present invention, specific terminology will be used for the sake of clarity. However, the invention is not intended to be limited to any specific terms used herein, and it is to be understood that each specific term includes all technical equivalents, which operate in a similar manner to accomplish a similar purpose.

[0015] FIG. 1A depicts a shoe 10 having an upper 20, a seamless sock-shaped bootie 30, an inner lining 50, and a sole 60. FIG. 1B further depicts the seamless bootie 30, while FIGS. 3A-B depict a foot-shaped mold 70 used to create the seamless bootie 30.

[0016] As shown in FIG. 1A, shoe upper 20, which comprises an exterior layer 26 and an interior layer 27, may be constructed of different fabrics that are sewn together. Upper 20 may include identifiable holes 22 to allow for shoelaces to be placed therein, as in traditional shoe constructions. In addition, upper 20 and sole 60 define an inner cavity 24, which is dimensioned to allow for insertion of the seamless bootie 30 and the inner lining 50 therein. Thus, seamless bootie 30 and inner lining 50 may be disposed under upper 20.

[0017] Upper 20 further includes a top perimeter portion 21. In one embodiment, the seamless bootie 30 and the inner lining are stitched or otherwise secured to the upper 20 at
perimeter portion 21 (e.g., during construction of shoe 10). As such, traditional hung lining techniques may be used during construction of shoe 10, thereby connecting upper 20, seamless bootie 30, and inner lining 50 via stitching along perimeter portion 21 of upper 20.

[0018] The seamless bootie 30 is, in one embodiment, made from a waterproof material(s) that is selected from the group consisting of latex, polyurethane, rubber, Ethyl Vinyl Acetate, or other materials that can be extruded into a seamless, thin material layer (or any combination of the foregoing). As shown, the seamless bootie 30 includes one or more functional ribs 31 on its surface that have hollow insides open to an inner cavity 35 of the bootie 30. In a particular construction of seamless booties 30, as illustrated in FIGS. 1B-C, one or more vertical ribs 31 may be formed along an instep area of the bootie 30, one or more ribs 32 may be placed transverse in relation to the vertical rib 31, one or more ribs 34 may be placed horizontally along a toe region 37 of the bootie 20, the rib(s) 34 spanning the ends of the toe region 37 of the bootie 30, and one or more ribs 33 may extend along a perimeter of toe region 37. In one example, each rib 33 may connect or be adjacent to a rib 34. Also, in certain embodiments, any of ribs 31, 32, 34 may completely or partially encircle bootie 30, such that a section of the applicable ribs 31, 32, 34 extends along a bottom surface of bootie 30 (e.g., each rib 31, 32, 34 extends along a bottom surface of bootie 30 or spaced apart by a particular distance at the bottom surface of bootie 30, thereby forming multiple, discontinuous rib segments 31, 32, 34). Continuous ribs are shown in FIG. 1C, while discontinuous ribs are not shown in the figures, but are nonetheless contemplated. In other cases, ribs 31, 32, 34 may not be formed on the bottom surface of bootie 30. While a particular configuration of ribs 31-34 is described herein, alternate configurations are contemplated, of course, and one or more ribs 31-34 may be removed from bootie 30, or alternatively other ribs (not shown) may be added to improve the functionality of bootie 30. As discussed herein, ribs 31-34 are configured to enable expansion of the bootie 30 to adjust to different shoe sizes as well as different shoe shapes.

[0019] Returning to FIG. 1A, an inner lining 50 may comprise various pieces of fabric that are sewn together to form a sock-shaped lining 50. As shown, in one embodiment the fabric pieces of inner lining 50 are stitched together to form a sock shape, such that a user’s foot may be accommodated within lining 50. Alternatively, other inner linings as known in the art may be utilized with shoe 10. In addition, while not depicted in the figures, a foot bed may be provided with shoe 10 (e.g., for placement between outsole 60 and inner lining 50 of shoe 10). In some cases, the foot bed may be stitched, cemented, or otherwise adhered to the upper 20 of shoe 10.

[0020] FIGS. 3A-B depict a foot-shaped form or mold 70, which may be utilized to manufacture seamless bootie 30. Foot-shaped mold 70 includes ribbed portions 71-74 that roughly, or in some cases exactly, mirror ribs 31-34 of seamless bootie 30. As shown, foot-shaped mold 70 includes a toe region 75 and a mid-foot region 76 and a longitudinal axis extending from mid-foot region 76 to toe region 75. As with bootie 30, one or more vertical ribs 71 are created along mid-foot region 76 of the foot-shaped mold 70, one or more ribs 72 are placed transverse in relation to the at least one vertical rib 71, one or more ribs 74 are arranged transverse to the longitudinal axis of foot-shaped mold 70 along toe region 75, and one or more ribs 75 are situated along a perimeter of toe region 75. In some case, as shown in FIG. 3B, ribs 71, 72, 74 can extend along a bottom surface of foot-shaped mold 70, such that a continuous rib is formed. Alternatively, although not shown, any of ribs 71, 72, 74 may be spaced apart along the bottom surface of mold 70 so that a discontinuous rib is formed. These ribbed portions 71-74 may be imparted onto the bootie 30 according to the method discussed below.

[0021] To construct seamless bootie 30 from foot-shaped form or mold 70, as depicted in FIGS. 3A-B, one may first provide a body of material(s) that is impermeable to water or other liquids, such as a body of latex, polyurethane, rubber, Ethyl Vinyl Acetate, or other water proof materials that can be extruded/molded into a seamless, thin material layer (or a combination of any of the aforementioned materials). The mold may then be dipped into the body of latex or other such material(s) using, for example, an automated process. After coating an outer surface of the foot-shaped mold 70 with the latex or other material(s), mold 70 may be removed from the vat of material(s), the material(s) may be allowed to cure, and then the material(s) may be removed from mold 70 to form seamless bootie 30. Bootie 30 then includes ribs 31-34 that substantially or exactly mirror ribs 71-74 formed on foot-shaped mold 70. In an alternate embodiment, prior to removing the waterproof material(s) from mold 70, mold 70 may be dipped into the body of material(s) one or more additional times to further coat foot-shaped mold’s 70 outer surface with the latex or other material(s). The material(s) may then be allowed to cure, at which point it can be removed from mold 70 to form a multi-layered seamless bootie 30. In some instances, during this process foot-shaped mold 70 may be immersed in the same material(s) multiple times, or mold 70 may be dipped into a first material(s) one or more times, and then into a second material(s) one or more times. Mold 70 may also be dipped into the vat of latex or other material(s) at an angle sufficient to keep air bubbles from being trapped between the mold 70 and the cured latex/material(s) so as to keep the cured latex/material(s) free of air bubbles once solidified.

[0022] During the curing of the material(s), it is also contemplated that a stimulus of some form may be used, such as heat provided by a heat source (not shown), to assist with curing of the material(s) applied to foot-shaped mold 70. Other stimuli besides heat, such as a combination of heat and forced air, might also be used to assist with curing of the waterproof material(s). Particular releasing agents and/or a couplant may also be used with mold 70 to more easily allow the material(s) to be removed from mold 70 after it cures. A couplant coating on the mold 70 may, for instance, help the latex or other material(s) to form a skin on the mold 70 allowing for easier release.

[0023] After construction of seamless bootie 30 according to the foregoing method, it may be incorporated into shoe 10, as follows. Inner lining 50 (FIG. 1A) may first be inserted into inner cavity 35 of seamless bootie 30, which is dimensioned to receive lining 50. Thus, seamless bootie may overlie substantially all or a portion of inner lining 50. Once situated thereon, one or both of seamless bootie 30 and inner lining 50 may be stitched to upper 20 of shoe 10 at its top perimeter portion 21. Alternatively, the bootie 30 and/or lining 50 may be cemented or otherwise adhered to upper 20 (e.g., along perimeter portion 21 or at other sections of upper 20). For instance, once bootie 30 is placed over inner lining 50, it may be glued, cemented, or otherwise adhered to portions or all of interior layer 27 of upper 20. If bootie 30 and lining 50 are stitched to upper 20 at its top perimeter portion 21, the result-
ing punctures through bootie 30 due to the stitching may remain unsealed, or alternatively may be sealed using, for example, a waterproof tape or other such device. Lastly, an inner surface of outsole 60 may be engaged to the bottom of seamless bootie 30 (as arranged over inner lining 50) to complete shoe 10.

[0024] During construction of shoe 10, it is advantageous that ribs 31-34 of seamless bootie 30 may act to accommodate, for example, various differently-sized and/or shaped inner linings 50. For instance, a particular seamless bootie 30, by virtue of any of ribs 31-34, may be usable with an inner lining that is designed to accommodate a user’s foot of any where between U.S. men’s or women’s size 8-12. Alternatively (or in addition), such a bootie 30 may also be usable with footwear having differently-shaped inner linings 50, such as a general purpose running shoe as compared to a hiking boot. Bootie 30 may adapt to the aforementioned situations via expansion of at least a portion of one or more of its ribs 31-34 longitudinally, laterally, or in any alternate direction. In other words, a particular rib, for example rib 34, may stretch or expand longitudinally by virtue of its position horizontally across toe region 37 of bootie 30, while another rib, for example rib 52, may permit expansion of bootie 30 in its instep area in both a vertical and longitudinal direction (the vertical direction extending top-to-bottom in FIGS. 1A-B, and the longitudinal direction extending left-to-right). Likewise, if the inner lining 50 includes, as an example, an enlarged toe region (which might be the case in certain hiking boots), rib 33 extending along the perimeter of toe region 37 of bootie 30 may act to expand and accommodate such an enlarged toe region of inner lining 50. Ribs 34 may also, in some cases, expand to assist in accommodating an enlarged toe region of the inner lining 50, if needed.

[0025] Bootie 30 including one or more of ribs 31-34, as described herein, therefore reduces the capital required to produce various waterproof shoes 10 (e.g., having different sizes and/or shapes). For instance, as ribs 31-34 may expand to accommodate different shoe sizes and/or shapes, a manufacturer need not produce a specifically-sized mold 70 for use in the method described herein, and may utilize a single or only a few differently-sized molds 70 for the production of a seamless bootie 30 that is usable with shoes of varying sizes/ shapes. Thus, manufacturing costs are decreased. In addition, time and labor are also decreased as it is not necessary to, for instance, change the particular foot-shaped mold 70 being used in an automated process for manufacturing seamless booties 30. Indeed, a single or only a few molds 70 may be utilized in the creation of many seamless booties 30 without having to constantly substitute one specifically-sized mold 70 for another.

[0026] A completely-constructed shoe 10, shown in partial cutaway, is depicted in FIG. 2. As can be appreciated, seamless bootie 30 incorporated between the shoe’s upper 20 and its inner lining 50 (shown at the cutaway section) can provide waterproofing characteristics for a user in undertaking various activities. The user’s foot is therefore adequately protected from contact with water or other liquids during use. While a general purpose shoe is shown, seamless bootie 30 may be utilized in any different type of shoe such as, for example, a hiking boot, a running shoe, etc.

[0027] In the devices depicted in the figures, particular structures are shown that are adapted for use in a waterproof shoe 10, and/or in methods of constructing the same. The use of alternative structures for such purposes, including structures having different lengths, shapes, and configurations is also contemplated. As an example, ribbed portions may be placed along different locations of seamless bootie 30, other than those described above. For instance, one or more ribs may be placed vertically or horizontally along a heel portion of the bootie 30. Alternatively, or in addition, ribbed portions may also be placed longitudinally along the bottom surface of the bootie 30. The ribbed portions, although rounded and semi-circular in shape, may also be created in a wave, trapezoidal, triangular, or other shaped patterns so long as such ribs enable the bootie 30 to adjust to shoes of different shapes and sizes. Also, any of the ribbed portions may be formed as a discontinuous rib so that the particular rib(s) is broken into sections that are individually spaced apart from one another and, in combination, form a substantially continuous rib(s). As an example, while rib 33 is shown as being continuous, it is equally contemplated that rib 33 could be formed into discrete sections so that a discontinuous rib 33 is formed that extends along a perimeter of toe region 37. The same is true of the other ribs 31, 32, 34 and, by extension, any of ribs 71-74 of mold 70.

[0028] While shoe 10 is also discussed as incorporating an inner lining 50, it is contemplated that inner lining 50 may be omitted and that solely bootie 30 may be situated along inner surface 27 of upper 20 to shield a user’s foot from contact with water. In some cases, bootie 30 may include one or more layers that act to substitute for inner lining 50, such as textile layers that are coated with a layer(s) of waterproof material(s) (e.g., latex or the other materials mentioned above).

[0029] Although aspects of the invention herein have been described with reference to particular embodiments, it is to be understood that these embodiments are merely illustrative of aspects of the present invention. It is therefore to be understood that numerous modifications may be made to the illustrative embodiments and that other arrangements may be devised without departing from the spirit and scope of the present invention as set forth in the appended claims.

[0030] It will also be appreciated that the various dependent claims and the features set forth therein can be combined in different ways that presented in the initial claims. It will also be appreciated that the features described in connection with individual embodiments may be shared with others of the described embodiments.

1. A shoe comprising:
an upper having an exterior surface and an interior surface; a sole having an exterior surface for contacting the ground and an interior surface, the sole being secured to the upper, wherein the interior surface of the upper and the interior surface of the sole define a cavity for receiving a wearer’s foot;
an inner lining arranged within the cavity; and a seamless bootie formed of waterproof material in a sock shape, the seamless bootie overlying the inner lining within the cavity and including one or more ribbed portions adapted to expand to allow the bootie to conform to the size of the inner lining, the seamless bootie being configured to shield a wearer’s foot from contact with water or another liquid.

2. The shoe according to claim 1, wherein the seamless bootie entirely covers the inner lining.

3. The shoe according to claim 1, wherein the inner lining is composed of pieces of fabric that are stitched together.

4. The shoe according to claim 1, wherein the waterproof material of the seamless bootie is selected from the group
consisting of latex, polyurethane, rubber, Ethyl Vinyl Acetate, or any combination thereof.

5. The shoe according to claim 1, wherein the bootie includes multiple ribbed portions configured to expand so that the bootie conforms to the size of the inner lining, at least some of the ribbed portions being arranged transverse to a longitudinal axis of the bootie.

6. The shoe according to claim 1, wherein the bootie includes a toe region with a perimeter, and the one or more ribbed portions extend along a portion of the perimeter of the toe region.

7. A method of manufacturing a shoe, the method comprising:
   - providing an upper, an inner lining, and a foot-shaped mold having an outer surface, the foot-shaped mold including at least one ribbed portion on its outer surface;
   - applying a waterproof material to the outer surface of the foot-shaped mold, thereby creating a seamless functional layer with at least one ribbed portion corresponding to the at least one ribbed portion on the outer surface of the foot-shaped mold, the seamless functional layer being in the form the seamless, sock-shaped bootie;
   - placing the seamless functional layer over the inner lining, such that the at least one rib expands to conform the seamless bootie to the size of the inner lining;
   - placing the upper over the seamless functional layer; and
   - affixing a sole to the upper.

8. The method according to claim 7, wherein the upper is stitched to a foot bed that is interposed between the sole and the upper.

9. The method according to claim 7, wherein the foot-shaped mold includes multiple ribbed portions on its outer surface, at least some of the ribbed portions being arranged transverse to a longitudinal axis of the mold.

10. The method according to claim 9, wherein the foot-shaped mold includes a toe region with a perimeter, and at least one of the ribbed portions extends along a portion of the perimeter of the toe region.

11. The method according to claim 7, further comprising the step of immersing the foot-shaped mold in a body of waterproof material to cover a substantial amount of the mold's outer surface with the waterproof material.

12. The method according to claim 11, further comprising the steps of removing the foot-shaped mold from the body of waterproof material, and heating the foot-shaped mold and waterproof material to cure the waterproof material.

13. The method according to claim 7, wherein the foot-shaped mold includes one or more ribs at a heel portion of the mold.

14. The method according to claim 7, wherein the foot-shaped mold comprises a seamless, sock-shaped bootie formed of waterproof material, the seamless bootie having at least one rib extending transversely from a surface of the bootie and being configured for insertion over the inner lining of a shoe, wherein the bootie is adapted to conform to the size of the inner lining via the at least one rib.

15. The article according to claim 13, wherein the seamless bootie includes multiple ribs.

16. The article according to claim 15, wherein the seamless bootie includes a toe region with a perimeter, and at least one of the ribs extends along a portion of the perimeter of the toe region.

17. The article according to claim 15, wherein at least one rib is placed vertically along an instep area of the bootie.

18. The article according to claim 15, wherein at least one rib is placed horizontally along a peripheral area of the bootie.

19. The article according to claim 15, wherein the waterproof material of the seamless bootie is selected from the group consisting of latex, polyurethane, rubber, Ethyl Vinyl Acetate, or any combination thereof.