

WATERPROOF SHOE HAVING WATERPROOF LINING SLEEVE

This invention relates to a shoe. More particularly, the invention is directed to a shoe having a waterproof lining sleeve therein.

5 It is known in the art to produce a waterproof shoe by mounting thereinside a sock-like lining made of a waterproof material which is impervious to water but is pervious to vapors. The sock-like lining has a top open end connected to a top end of an upper and a sole area positioned between
10 an insole and an outsole of the shoe. Since the sole area of the sock-like lining is usually subjected to high pressure and mechanical stress produced by the foot of the wearer, the lining is prone to break and hence lose its waterproofing characteristics. Improvements for coping with such a
15 problem have been suggested in several patents.

U.S. Patent No. 5,526,584 discloses a waterproof breathable composite sock-like shoe insert which is made of a waterproof breathable material and which has a sole area of stretchable waterproof material that is stronger than the
20 waterproof breathable material. The sole area is stitched to the remaining part of the shoe insert.

U.S. Patent No. 5,678,326 suggests a shoe in which a waterproof breathable shoe insert is sandwiched between an inner surface of an upper and an outer surface of a lining.
25 The shoe insert is bonded adhesively to the inner surface of a lower part of the upper and to the outer surface of the lining disposed inside the shoe insert. The sole area of the shoe insert placed between an insole and an outsole is

not only glued to the insole and the outsole, but also to the lining. Although the arrangement as such provides a durable structure, the manufacturing process thereof is laborious because substantial gluing steps are needed to
5 position the shoe insert in the lower part of the shoe.

A main object of the present invention is to provide a waterproof shoe, which permits a waterproof lining sleeve to be mounted inside the shoe in a simple manner.

Another object of the present invention is to provide
10 a waterproof shoe, which permits water invading the inside of the shoe to be drained out of the shoe.

Accordingly, a shoe according the present invention comprises: an upper having a top portion and a bottom end; an insole connected to the bottom end; an outsole attached
15 to the insole and the bottom end of the upper, the outsole having an outer peripheral end extending along the bottom end of the upper; and a waterproof lining sleeve mounted inside the upper and having a top open end connected to the top portion of the upper, and a bottom open end bonded
20 adhesively to an inner surface of the upper in a waterproof manner without extending to the bottom end of the upper, the lining sleeve being separated from the inner surface of the upper between the top open end and the bottom open end of the lining sleeve and forming a waterproof seam with the upper
25 at the bottom open end to prevent water invading the space between the lining sleeve and the upper from flowing to the bottom end of the upper, the seam extending at a level higher than the outer peripheral end of the outsole to prevent the

invading water from reaching a level lower than the outer peripheral end of the outsole.

Preferably, the shoe further comprises a waterproof tape for sealing the seam. The tape extends along the seam and
5 is bonded to an inner surface of the bottom open end of the lining sleeve and an inner surface of the upper.

Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiments with reference to the
10 accompanying drawings, of which:

Figure 1 is a perspective view of the preferred embodiment of the shoe according to the present invention;

Figure 2 is a sectional view taken along line 2-2 of Figure 1;

15 Figure 3 is the same view as Figure 2 but with a waterproof tape covering a seam at the bottom open end of the waterproof lining sleeve; and

Figure 4 is the same view as Figure 3 but with a portion thereof omitted and with the waterproof tape extending to
20 the bottom end of an upper.

Referring to Figures 1 and 2, the preferred embodiment of a shoe according to the present invention is shown to include an upper 1 which has a bottom end 12. The upper 1 is formed by connecting and stitching together a toe cap 13,
25 a counter 14, and a quarter section 15 of the upper 1. Therefore, a seam 101 is formed between the toe cap 13 and the quarter section 15, while a seam 102 is formed between the quarter section 15 and the heel section 14.

A lining sleeve 2 is made of a waterproof material and is mounted inside the upper 1 by stitching a top open end 20 of the lining sleeve 2 to a top portion of the upper 1 along a seam 16 and by bonding adhesively a bottom open end 21 of the lining sleeve 2 directly to an inner surface of the upper 1 above the bottom end 12 of the upper 1. Alternatively, the top open end 20 of the lining sleeve 2 may be lengthened so as to extend to and connect with the top end 11 of the upper 1 via stitching. Preferably, the bottom open end 21 of the lining sleeve 2 is bonded to the upper 1 by applying an adhesive to an inner surface of the upper 1 adjacent to the bottom open end 21 of the lining sleeve 2, or/and to an outer surface of the bottom open end 21 of the lining sleeve 2. The adhesive is waterproof and is applied in a waterproof manner so that a watertight seam 9 is formed between the bottom open end 21 of the lining sleeve 2 and the upper 1. Since the bottom open end 21 of the lining sleeve 2 does not extend to the bottom end 12 of the upper 1 and since no stitches are provided at the bottom open end 21 of the lining sleeve 2, the mounting of the lining sleeve 2 inside the upper 1 according to the present invention is relatively simple as compared to the prior art mentioned hereinbefore. Note that the lining sleeve 2 is connected to the upper 1 only at the top open end 20 and the bottom open end 21 thereof, and the remaining parts thereof are separated from the upper 1. Furthermore, the lining sleeve 2 may be a one-piece construction made of the same breathable or non-breathable waterproof material, or a multi-piece

construction which is constituted by a plurality of waterproof sheets that are stitched together and sealed in a watertight manner at the stitch seams thereof. The waterproof sheets may be breathable or non-breathable, and
5 may be made of the same material or different materials.

After the lining sleeve 2 is mounted inside the upper 1, the bottom end 12 of the upper 1 is lasted in a conventional manner and connected to an insole 4. A filler 7 is disposed in an opening confined by the bottom end 12 of the upper 1,
10 and a waterproof cover 8 is provided beneath the filler 7 in a conventional manner. A conventional inner lining 6 is optionally mounted inside the lining sleeve 2 by stitching a top end of the inner lining 6 to the top end 11 of the upper 1 and by positioning a sole area of the lining 6 to the insole
15 4. Finally, an outsole 5 is attached to the bottom end 12 of the upper 1.

Referring to Figure 3, to ensure that the seam 9 is watertight, the seam 9 may be sealed by bonding adhesively a waterproof tape 3A to the inner surface of the lining sleeve
20 2 and to the inner surface of the upper 1 along the seam 9. The bottom end 31A of the waterproof tape 3A does not extend to the bottom end 12 of the upper 1. As the seam 9 is watertight, the water invading the space between the lining sleeve 2 and the upper 1 can be prevented effectively from
25 flowing downward to the bottom end 12 of the upper 1. The invading water in said space can flow outward through stitch seams 101, 102 of the upper 1. Drain holes 103 may be optionally provided in the upper 1 above the seam 9.

Although the waterproof tape 3A as shown in Figure 3 does not extend to the bottom end 12 of the upper 1, it is not limited thereto in the present invention. A waterproof tape 3B which has a bottom end 31B extending to the bottom end 12 of the upper 1, as shown in Figure 4, may be used in place of the waterproof tape 3A. The top end of the waterproof tape 3B is connected to the bottom open end 21 of the lining sleeve 2. The waterproof tape 3B serves as a waterproof liner to line the inner surface of the upper 1 beneath the bottom open end 21 of the lining sleeve 2.

Note that the seam 9 is waterproof and is kept at a level higher than the top end of an outer peripheral end 51 of the outsole 5 as shown in Figures 2 to 4. If the seam 9 is below the level of the outer peripheral end 51 of the outsole 5, the water invading the space between the lining sleeve 2 and the upper 1 can be trapped inside a part of the space lower than the outer peripheral end 51 because of the obstruction by the outer peripheral end 51. The seam 9 arranged according to the present invention permits the invading water to be drained out effectively.

Besides the aforesaid preferred embodiments, stitchdown shoes incorporating the present invention are shown in Figures 5, 6 and 7 in which like elements are represented by like numerals. Figure 5 shows a stitchdown shoe which includes an upper 1' with a bottom end 12' turned outward and stitched to an insole 41. An outsole 51 is attached to the insole 41 in a conventional manner. A bottom open end 21 of a lining sleeve 2 is connected to the upper 1', forming

a seam 9 which is sealed by a waterproof tape 3A in the same manner as that shown in Figure 3.

5 A stitchdown shoe shown in Figure 6 is substantially similar to that shown in Figure 5 except that an insole 42 is used in place of the insole 41. The insole 42 has an upward flange 421 which extends along the periphery of the insole 42 and whose outer surface is bonded to the waterproof tape 3A.

10 A stitchdown shoe shown in Figure 7 is substantially similar to that shown in Figure 6 except that a waterproof tape 3B, used in place of the waterproof tape 3A, is bonded to the inner surfaces of the flange 421 and connected to the insole 42.

**CLAIMS:**

1. A shoe comprising:

an upper having a top portion and a bottom end;
an insole connected to said bottom end;

5 an outsole attached to said insole and said bottom end
of said upper, said outsole having an outer peripheral end
extending along said bottom end of said upper; and

a waterproof lining sleeve mounted inside said upper and
having a top open end connected to said top portion of said
10 upper, and a bottom open end bonded adhesively to an inner
surface of said upper in a waterproof manner without
extending to said bottom end of said upper, said lining sleeve
being separated from said inner surface of said upper between
said top open end and said bottom open end of said lining
15 sleeve and forming a waterproof seam with said upper at said
bottom open end to prevent water invading the space between
said lining sleeve and said upper from flowing to said bottom
end of said upper, said seam extending at a level higher than
said outer peripheral end of said outsole to prevent the
20 invading water from reaching a level lower than said outer
peripheral end of said outsole.

2. The shoe as claimed in Claim 1, further comprising a
waterproof tape for sealing said seam, the tape extending
along said seam and being bonded to an inner surface of said
25 bottom open end of said lining sleeve and an inner surface
of said upper.

3. The shoe as claimed in Claim 2, wherein said waterproof
tape extends from said seam to said bottom end of said upper.

4. The shoe as claimed in Claim 1, wherein said lining sleeve is made of a waterproof, breathable material.
5. The shoe of Claim 1, wherein said upper has a stitch seam above said seam of said lining sleeve and said upper.

