



(22) Date de dépôt/Filing Date: 2013/09/16

(41) Mise à la disp. pub./Open to Public Insp.: 2014/03/14

(45) Date de délivrance/Issue Date: 2021/01/26

(30) Priorité/Priority: 2012/09/14 (US61/701,320)

(51) Cl.Int./Int.Cl. *B29D 35/06* (2010.01),
A43B 3/16 (2006.01), *A43B 9/02* (2006.01),
A43D 25/00 (2006.01), *B29C 65/08* (2006.01)

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(54) Titre : FIXATION SANS COUTURE POUR COMPOSANTES DE CHAUSSURE PREFORMEES

(54) Title: SEAMLESS ATTACHMENT OF PRE-FORMED FOOTWEAR COMPONENTS



(57) **Abrégé/Abstract:**

An item of footwear comprises an upper having a first overlap area and the bottom having a second overlap area. The upper is attached to the bottom by stitching high frequency adhesive tape to the overlap area of the upper and separately to the overlap area of the bottom. The upper and the bottom are brought together so that the two overlap areas are in solid contact with one another when the footwear is subjected to the high frequency signal which turns the solid adhesive tapes into a molten liquid. When the liquid cools, the upper and bottom are welded to one another. The seal between the components is waterproof.

ABSTRACT

[0021] An item of footwear comprises an upper having a first overlap area and the bottom having a second overlap area. The upper is attached to the bottom by stitching high frequency adhesive tape to the overlap area of the upper and separately to the overlap area of the bottom.

- 5 The upper and the bottom are brought together so that the two overlap areas are in solid contact with one another when the footwear is subjected to the high frequency signal which turns the solid adhesive tapes into a molten liquid. When the liquid cools, the upper and bottom are welded to one another. The seal between the components is waterproof.

Applicant Claims The Benefit Of United States Provisional Patent Application Serial No.
61/701,320 Filed On September 14, 2012

SEAMLESS ATTACHMENT OF PRE-FORMED FOOTWEAR COMPONENTS

BACKGROUND OF THE INVENTION

5 FIELD OF THE INVENTION

[0001] This invention relates to footwear having two or more components attached together by high frequency adhesives and to a method of attaching the components to one another without stitching any components together.

DESCRIPTION OF THE PRIOR ART

10 [0002] Attaching two or more parts together using adhesives or high frequency adhesives is known.

[0003] In US Patent No. 7,556,861 issued on July 7, 2009 for High Frequency Weldable Articles and a Method of Constructing the same, there is described high frequency-weldable articles and method for connecting the articles.

15 [0004] When two or more components of footwear are presently attached to one another, the overlapping areas of the two or more components are coated with adhesive and the components are stitched together along the overlapping areas. For example, an upper of a boot can be attached to a middle of a boot in this manner. A disadvantage of this method is that the boot is not waterproof at the joint where the two components are joined to one another because
20 of the openings created by stitching the two components together. The two components will therefore allow water to leak into the boot along the joint. It is also known to join two footwear components to one another by using adhesives without stitching. However, when stitching is not used, for example, to join an upper to a mid sole, the joint is not strong enough to withstand the stress that footwear is subjected to and will often fail prematurely.

25 SUMMARY OF THE INVENTION

[0005] It is an object to the present invention to bring together two components of an item of footwear using high frequency welding and high frequency adhesives in which the adhesives are affixed to the overlapping area of each of the components to be joined by stitching the high frequency adhesives to each component separately. It is a further object of the present

invention to hold the two components to be attached to one another together with the overlap areas and the high frequency adhesives aligned with one another and subjecting the high frequency adhesives to a high frequency signal to weld the two components together. The finished product has no stitching openings extending through the two components and the stitching openings that had been contained in each of the two components prior to welding are filled with solidified adhesive. The two components are welded together with a strength that is durable and will not result in premature failure when subjected to stress that footwear components are subjected to. The well can be as strong or stronger than the bond between components that are glued and stitched together. The resulting seam between the two components is waterproof.

[0006] An item of footwear comprises a first component and a second component, the first component having a first overlap area and the second component having a second overlap area. The components are footwear components and are sized and shaped to be attached to one another in the overlap areas, the first overlap area having a first high frequency adhesive stitched thereto and the second overlap area having a second high frequency adhesive stitched thereto. The first high frequency adhesive is compatible to bond with the first component and the second high frequency adhesive is compatible to bond with the second component. The first and second high frequency adhesives are compatible to bond with one another when the two components are held in a position to attach the two components to one another in the first and second overlap areas with the first and second high frequency adhesives in contact with one another, the high frequency adhesives being subjected to a high frequency signal to cause the first and second components to weld to one another along the first and second overlap areas.

[0007] A method of attaching a first component of an item of footwear to a second component of an item of footwear uses high frequency adhesives, the first component having a first overlap area and the second component having a second overlap area. The method comprises choosing compatible high frequency adhesives, stitching a first high frequency adhesive to the first overlap area and stitching a second high frequency adhesive to the second overlap area, the first overlap area and the second overlap area being sized relative to one another, holding the first overlap area in contact with the second overlap area with the first and second high frequency adhesives in between, subjecting the high frequency adhesives to a high frequency signal to cause the high frequency adhesives to bond together, thereby fusing the first and second components to one another with no stitch openings extending through both the first and second overlap areas.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Figure 1 is a perspective view of a boot when viewed from one side;

[0009] Figure 2 is an exploded perspective view of a boot where a bottom is separated from an upper; and

5 [0010] Figure 3 is a partial perspective view of an overlap area of the upper.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

[0011] In Figure 1, a boot 2 has an upper 4 affixed to a bottom 6. The bottom 6 has a sole 8 and a midsole 10. The upper 4 is attached to the midsole 10 of the bottom 6 along a joint 12.

10 [0012] In Figures 2 and 3, the bottom 6 has a first overlap area 14 and the upper 4 and a second overlap area 16. The bottom 6 and upper 4 are located separate and apart from one another in Figure 2. The first overlap area 14 has a first adhesive 18 affixed thereto by stitching 20. The second overlap area 16 has a second adhesive 22 affixed thereto by stitching 24. When the first adhesive 18 and the second adhesive 22 are in place as shown, the upper 4 and the bottom 6 are brought together so that the two overlap areas 14, 16 are in contact with one
15 another with the two adhesives 18, 22 located in between. The respective stitching preferably extends along the overlap areas substantially one end to the other end as do the respective adhesives. In the drawings, the stitching 20, 24 is only partially shown. The respective adhesives are not shown in the drawings in the overlap areas where the stitching is located so as not to observe the stitching.

20 [0013] With the upper 4 and the bottom 6 held in the contact position, the high frequency adhesives 18, 22 are subjected to a high frequency signal, which causes the two overlapped areas 14, 16 to be welded to one another.

[0014] Since the stitching 20 extends only through the first overlap area 14 of the bottom 6 and the stitching 24 extends only through the second overlap area 16 of the upper 22, there is no
25 stitching that extends through both the bottom and the upper and the stitch openings in the bottom are generally not aligned with the stitch openings in the upper. However, even if some of the stitch openings in the bottom are aligned with the stitch openings in the upper, after the high frequency welding process, the high frequency adhesives 18, 22 solidify and fill the threaded openings in the bottom 6 and in the upper 4.

30 [0015] The high frequency welding produces a strong bond between the bottom and the upper that is at least as strong as stitching the upper and bottom together with adhesives located

therebetween. The boot, shoe or other footwear is completely waterproof along the joint between the upper and the bottom when constructed in accordance with the present invention.

[0016] The upper can be made of nylon, fabrics, or coated fabrics, for example, polyurethane and leathers and the bottom can be made of different materials, for example, ethylene vinylacetate, thermoplastic rubber, polyurethane, polyvinylchloride, rubber, thermoplastic urethane or other plastics.

[0017] Projection molding, compression molding, or vulcanization can be used to create a bottom or sole.

[0018] The adhesive is preferably a tape, yarn or other preformed solid adhesive that is compatible with the material of the upper and the material of the midsole of the bottom or the bottom where the upper is attached directly to the sole. For example, modified polyethylene terephthalate can be used as solder in high frequency welding to weld compatible materials to one another.

[0019] No stitches extend through both the overlap area of the upper and the overlap area of the bottom. One adhesive is preferably sewn onto the inner surface of the upper and another adhesive is preferably sewn onto the outer surface of the bottom. When the high frequency tapes or other adhesives are subjected to a high frequency signal while the two overlap areas are held in contact with one another, the tapes or other adhesives melt and, when the joint between the upper and the bottom cools, the adhesives have filled any stitch openings in either the upper or the bottom. There are no single stitch openings at any time that extend through both the upper and the bottom. The high frequency tape or other adhesive acts as a solder.

[0020] While an upper is described as being affixed to the bottom, the product and method of the present invention can be used to attach any two or more components of an item of footwear together.

The embodiments of the invention in which an exclusive property or privilege are claimed are as follows:

CLAIMS:

1. An item of footwear comprising a first component and a second component, the first component having a first overlap area and the second component having a second overlap area, the components being footwear components and being sized and shaped to be attached to one another in the overlap areas, the first overlap area having a first high frequency adhesive stitched thereto and the second overlap area having a second high frequency adhesive stitched thereto, the first high frequency adhesive being compatible to bond with the first component, the second high frequency adhesive being compatible to bond with the second component, the first and second high frequency adhesives being compatible to bond with one another when the two components are held in a position to attach the two components to one another in the first and second overlap areas with the first and second high frequency adhesives in contact with one another, the high frequency adhesives being subjected to a high frequency signal to cause the first and second components to weld to one another along the first and second overlap areas.
2. The item of footwear as claimed in Claim 1 wherein there are no single stitching openings extending through both the first and second overlap areas when the first and second components are joined together.
3. The item of footwear as claimed in Claim 1 wherein the components are pre-formed.
4. The item of footwear as claimed in Claim 1 wherein the first component is an upper and the second component is a bottom.
5. The item of footwear as claimed in Claim 1 wherein the first component is an upper shaft and the second component is a bottom, the footwear being a boot.
6. The item of footwear as claimed in Claim 1 wherein the high frequency adhesives are identical to one another.
7. The item of footwear as claimed in Claim 1 wherein stitch openings in each of the two components are filled with solidified adhesive after the two components are welded to one another.

8. A method of attaching a first component of an item of footwear to a second component of an item of footwear using high frequency adhesives, the first component having a first overlap area and the second component having a second overlap area, the method comprising choosing compatible high frequency adhesives, stitching a first high frequency adhesive to the first overlap area and stitching a second high frequency adhesive to the second overlap area, the first overlap area and the second overlap area being sized relative to one another, holding the first overlap area in contact with the second overlap area with the first and second high frequency adhesives in between, subjecting the high frequency adhesives to a high frequency signal to cause the high frequency adhesives to bond together, thereby fusing the first and second components to one another with no stitch openings extending through both the first and second overlap areas.
9. The method as claimed in Claim 8 including the step of choosing the first and second adhesives to be identical to one another.

FIGURE 1



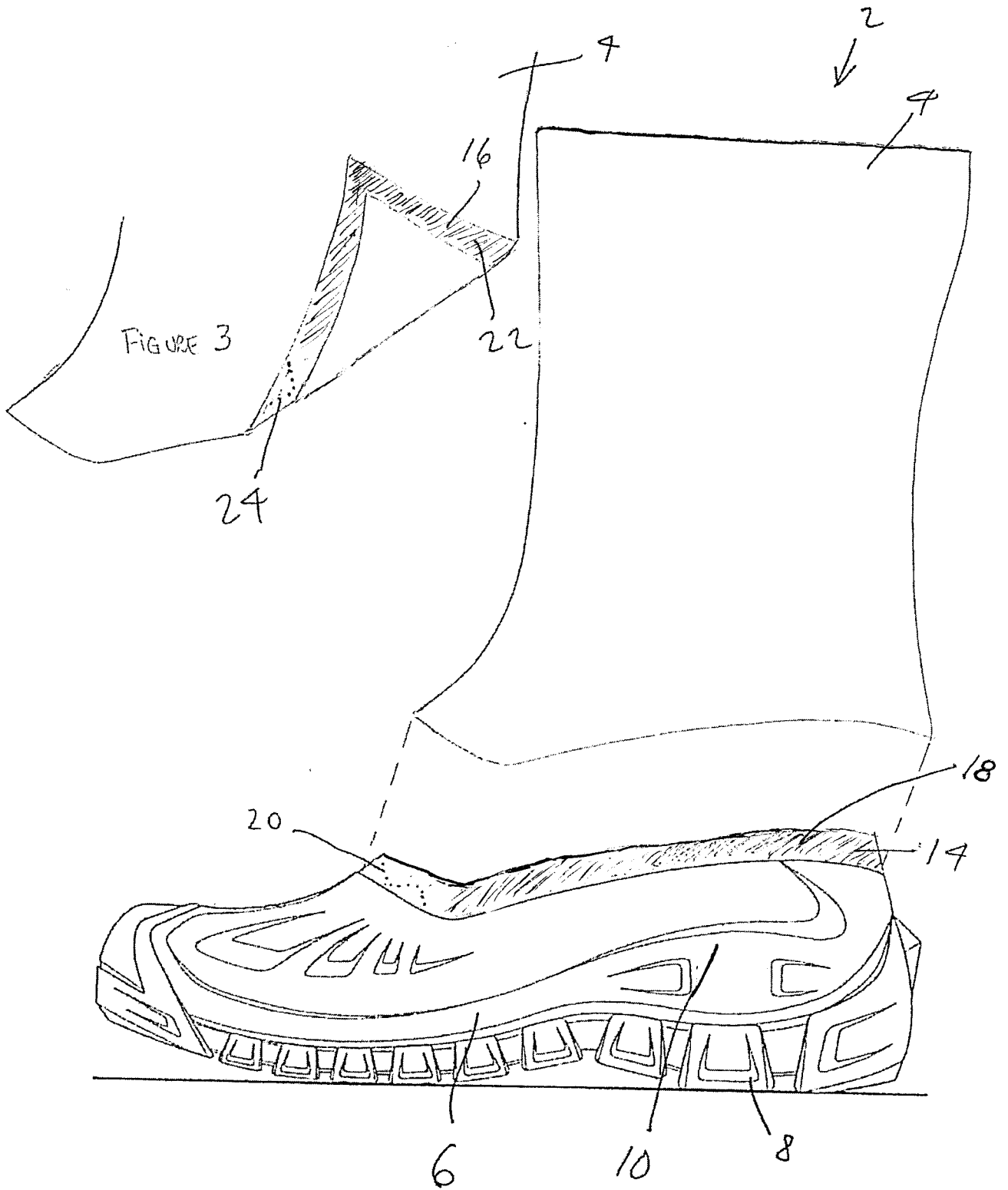


FIGURE 2

2

