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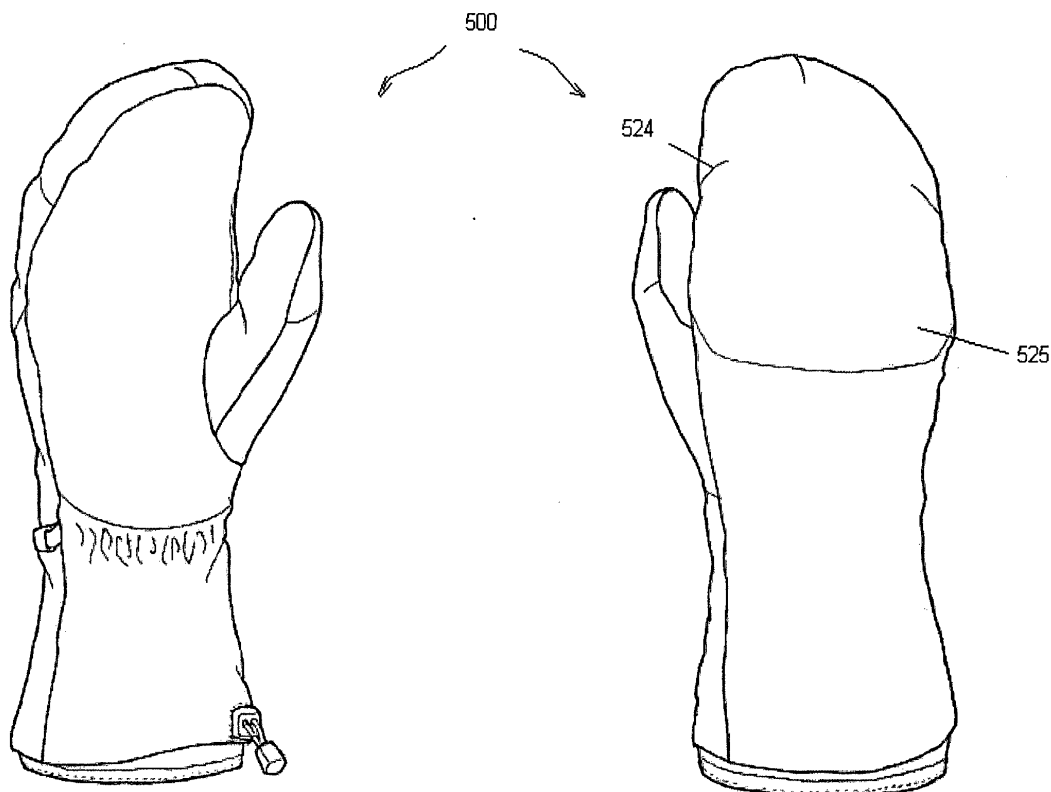
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(54) **Waterproof glove or mitten with laminated leather**

(57) A leather laminating method and an apparatus manufactured by applying the leather laminating method. A waterproof membrane (204) may be sandwiched between two layers of breathable materials, and a waterproof breathable (WPB) material (102) may be formed.

The WPB material (102) may be laminated to a leather material (101) by using a dot adhesive, and a laminate construction may be created. The laminate construction may be cut into pieces, and the pieces may be sewn together into a hand-covering garment.



Description

TECHNICAL FIELD

[0001] The present invention generally relates to a method of laminating leather, which is applied for making gloves or mittens that can be used for a variety of indoor and outdoor activities, especially in environments abundant with water or humidity.

BACKGROUND

[0002] One of the most important objectives of making gloves and mittens that are exposed to water is to ensure that they are waterproof while being breathable.

[0003] Currently in the art, gloves are most commonly waterproofed by inserting a bag, made of a waterproof material, into a glove. The bag is shaped according to the glove that contains it. Further, it is tacked at the fingertips and either sewn or glued to the glove. This process seals the glove in its entirety, but only on its inner side. However, the outer layer of the glove is made by sewing pieces of a desired material, e.g., leather, to each other, which in turn produces seams in the outer layer. The drawback of this method is that, as a result, the outer layer ceases to be waterproof at the seams and allows water to penetrate through it and fill the glove in the portion between the outer layer and the laminated bag. Consequently, several important properties of the glove made in this manner are diminished, some of them being breathability, weight, and the insulating and the drying capability of the glove.

[0004] Another technique of waterproofing gloves, known in the art, is developed to eliminate the void between an outer layer and a waterproof membrane by laminating the two materials to each other in their flat form. As a result, however, this technique tilts the balance between the waterproof capabilities of the glove and its breathability against the breathability of the glove due to the direct integration of the outer layer with the membrane. Namely, the lamination process creates an overly robust and impermeable construction consisting of the two materials. Next, the laminate sheath is cut out into pieces and the pieces are sewn together to form a glove, inevitably producing seams in the glove. Having too many seams further affects the ability of the glove to allow vapor from perspiration to pass through, because, in order for the glove to remain waterproof, the seams must be taped. Excessive taping diminishes the breathability of the glove made by this method.

[0005] Accordingly, there is a need for a leather lamination technique for manufacturing gloves and mittens, which ensures that they are waterproof without hindering their breathability.

SUMMARY

[0006] One aspect of the present invention relates to

a method of laminating leather, which is applied for making apparatus that can be used for a variety of indoor and outdoor activities, especially in environments abundant with water or humidity. One example of such an apparatus may include a dorsal section and a palmar section, wherein the dorsal section and the palmar section may be made of a laminate construction.

[0007] The laminate construction may include at least two materials laminated to each other, where a first of the at least two materials may be leather and a second of the at least two materials may be a waterproof breathable material. The waterproof breathable material may include a plurality of layers, where one of the plurality of layers may be a waterproof membrane. The waterproof membrane may be sandwiched between at least two other layers of the plurality of layers. The at least two other layers of the plurality of layers may be made of breathable materials. Then, the palmar section may be joined with the dorsal section.

[0008] Specifically, the palmar section and the dorsal section may be sewn to each other to form at least one seam, where the at least one seam may be taped to prevent water from penetrating through the seam. Moreover, the laminate construction may include an adhesive material placed between the leather material and the waterproof breathable material, where the adhesive material may be a dot adhesive material.

[0009] The leather material may be a natural leather material or a synthetic leather material, and it may be perforated.

[0010] In one example, the waterproof breathable material may be a shell fabric "sandwich" comprising a face fabric layer, the waterproof membrane, and a tricot or woven backer. In another embodiment, the waterproof breathable material may be a soft shell fabric "sandwich" comprising a face fabric layer, the waterproof membrane, and a fleece or tricot backer. Another example of the waterproof breathable material may be a "pocket-liner" fabric "sandwich" comprising the waterproof membrane, and two layers of tricot or woven backer which may be laid above and below the waterproof membrane.

[0011] One example of a method of manufacturing hand-covering garments may include the steps of forming a waterproof breathable construction by sandwiching a waterproof membrane between at least two layers, where the at least two layers may be made of breathable materials, forming a laminate construction by using an adhesive material to laminate the waterproof breathable construction to a leather material, cutting the laminate construction into pieces, and sewing the pieces of the laminate construction into a hand-covering garment.

[0012] In one embodiment, this method may include creating seams along a line of sewing of the pieces of the laminate construction to each other and waterproofing the hand-covering garment by taping said seams.

[0013] Another example of this method may further include sewing the pieces of the laminate construction into a glove, where the glove may be formed in a "reverse-

gunn-cut" pattern, or, more specifically, where the glove may be formed by sewing a dorsal section and a palmar section to each other in a manner where the palmar section may include a front portion of four finger cavities other than a thumb cavity, and the dorsal section may include a back portion of a second and a fifth finger cavity.

[0014] One embodiment of the present invention may be a hand-covering garment which may include a dorsal section and a palmar section joined together, where the dorsal section and the palmar section may be made of a laminate construction, which may include at least two materials laminated to each other. A first of the at least two materials may be leather and a second of the at least two materials may be a waterproof breathable material.

[0015] The waterproof breathable material may include a plurality of layers that may be stacked on top of each other to form a "sandwich" of layers. In such embodiment, one of the plurality of layers may be a waterproof membrane, where the waterproof membrane may be sandwiched between at least two other layers of the plurality of layers, the two layers being made of breathable materials.

[0016] Further, the "sandwich" of layers may be one of the following: a shell fabric "sandwich," a soft shell fabric "sandwich," and a "pocket-liner" fabric "sandwich." While the shell fabric "sandwich" may comprise a face fabric layer, the waterproof membrane, and a tricot or woven backer, the soft shell fabric "sandwich" may include a face fabric layer, the waterproof membrane, and a fleece or tricot backer. Finally, the "pocket-liner" fabric "sandwich" may comprise the waterproof membrane and two layers of tricot or woven backer that may be laid above and below the waterproof membrane.

[0017] In addition, the hand-covering garment may constitute a mitten. Finally, the hand-covering garment may include darts on its top portion, and the darts may provide a pre-curve fit at the top portion of the garment.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The present invention will become more fully understood from the detailed description given below and from the accompanying drawings. The drawings are intended to disclose but a few possible examples of the present invention, and thus do not limit the present invention's scope.

FIG. 1 shows one example of leather laminating where an adhesive material is used to laminate a leather material to a waterproof breathable material; FIG. 2 shows one example of leather laminating where a waterproof breathable material is sandwiched between two layers prior to being laminated to a leather material; FIG. 3 shows one example of a long-gauntlet that is manufactured by sewing pieces of a laminate including a leather material and a waterproof breathable material;

FIG. 4 shows one example of a short-gauntlet, i.e. under-cuff glove that is manufactured by sewing pieces of a laminate including a leather material and a waterproof breathable material;

FIG. 5 shows one example of a mitten manufactured by sewing pieces of a laminate of a leather material and a waterproof breathable material.

DETAILED DESCRIPTION

[0019] The present invention generally relates to a method of laminating leather, which may be applied for making gloves or mittens that can be used for a variety of indoor and outdoor activities, especially in environments abundant with water or humidity. While a preferred example of laminating leather is described in detail below, a construction in accordance with the present invention may be used in a broad range of products, such as indoor and outdoor garments, as well as a variety of gloves, mittens and other apparel and accessories.

[0020] One example of laminating leather in accordance with the present invention is shown in FIG. 1, where laminate 100 construction is described. The laminate 100 may include three materials arranged on top of each other in their flat form: leather 101, which may constitute an outer layer of the laminate 100, waterproof breathable material (WPB) 102, which may be an inner element of the laminate 100 construction, and adhesive 103, which may be placed between the leather 101 and the WPB 102. The function of the adhesive 103 may be to attach the leather 101 to the WPB 102 in a high-temperature environment, when the laminate 100 may be formed as a result.

[0021] One of the advantages of laminating the leather 101 to the WPB 102 is that the end product, the laminate 100, may constitute a waterproof leather construction, i.e., a material which may prevent water from penetrating through the leather 101 and from being accumulated between the leather 101 and the WPB 102. Joining the two materials in this manner may improve breathability, weight, and the insulating and the drying capability of a garment made of the laminate 100, as compared to the existing technologies, for the reasons that will be discussed in detail.

[0022] A material used for the leather 101 may be a natural leather material, for example, goat, cow, pig, or sheep leather, or any other leather material deemed suitable for making leather garments. Further, the material used for the leather 101 may be any synthetic leather material including, but not limited to, synthetic suede or rubber. Moreover, leather 101 may be vented, or perforated, in order to increase the overall vapor permeability of the laminate 100 compared to existing lamination technologies. On the other hand, in instances where waterproof properties are preferred to breathability, non-perforated leather may be applied.

[0023] Moreover, the adhesive 103 may constitute a film adhesive, or it may be a dot adhesive, illustrated in

FIG. 1. Applying dot adhesive material improves breathability of the laminate 100 in comparison with existing lamination technologies, due to intermittent placement of glue within the adhesive material.

[0024] As shown in FIG. 2, the WPB 102 may include three layers: membrane 204, and two additional layers which may sandwich the membrane 204. A material used for the membrane 204 may be waterproof, which may render the entire WPB 102 construction impenetrable to water. In addition, the other two layers of the WPB 102 may be made of materials that may enhance the breathability of the WPB 102. Namely, sandwiching the membrane 204 between two such materials may place a layer in-between the membrane 204 and the leather 101, which may allow vapor from perspiration to pass through, without diminishing the waterproof properties of the WPB 102, and consequently, the laminate 100.

[0025] In one embodiment, illustrated in FIG. 2(a), the WPB 102 may constitute shell fabric "sandwich" (SFS) 205 construction, which may include the membrane 204, face fabric (FF) 206, and tricot or woven backer (TWB) 207. The FF 206 may be made of any material deemed suitable for permeating vapor. Moreover, the FF 206 may be made of nylon, polyester, or any other synthetic material. In one example, the FF 206 may be used as an interface between the WPB 102 and the leather 101, joined together to form the laminate 100.

[0026] In another embodiment, depicted in FIG. 2(b), the WPB 102 may constitute soft shell fabric "sandwich" (SSFS) 208 construction, which may include the membrane 204, the FF 206, and fleece or tricot backer (FTB) 209. The FF 206 of this embodiment may be made of any material deemed suitable for allowing vapor from perspiration to pass through. In addition, the FF 206 of the SSFS 208 may be used as an interface between the WPB 102 and the leather 101, joined together to construct the laminate 100.

[0027] In yet another example, shown in FIG. 2(c), the WPB 102 may constitute "pocket-liner" fabric "sandwich" (PLFS) 210 construction, which may include the membrane 204 and two TWB 207 layers laid over and under the membrane 204. One of the two TWB 207 layers may be used as an interface between the WPB 102 and the leather 101, joined together to form the laminate 100.

[0028] Next, the laminate 100 may be cut into pieces to manufacture a variety of garments. In comparison with the existing technologies, a garment made of such material shows improved durability, because the inserted layer protects the membrane 204 in case of delamination.

[0029] In one of the examples shown in FIG. 3(a), the laminate 100 may be used to form long-gauntlet (LG) glove 300, by sewing together pieces of the laminate 100. As a result, seams 311 may form along lines where the pieces of the laminate join. Thus, in order to maintain the LG glove 300 fully waterproof, the seams 311 may be taped with a waterproof tape (not shown in the drawing).

[0030] Moreover, assembling the LG glove 300 by using as few pieces of the laminate 100 as possible may

be desirable, in order for fewer seams 311 to be created, resulting in fewer paths for water to pass through the LG glove 300. Accordingly, less tape would need to be used to tape the seams 311, which would, in turn, enhance the breathability of the glove, considering the general characteristic of taping materials to block the vapor from passing through. In one embodiment, a "reverse-gunn-cut" pattern may be applied to minimize the number of the pieces used for manufacturing the LG glove 300, as illustrated in FIG. 3.

[0031] The "reverse-gunn-cut" pattern may be created by sewing dorsal section 312 to palmar section 313. In one example, the dorsal section 312 may include a back-side of the second and the fifth finger cavities of the LG glove 300, and the palmar section 313 may incorporate front portions of all four finger cavities of the LG glove 300, not counting a thumb cavity. Sewing the dorsal section 312 to the palmar section 313 may be performed along a single seam, i.e. lateral seam 314, thereby minimizing the number of seams created. Next, back middle portion 315 may be joined with the palmar section 313 and the dorsal section 312 along knuckle seam 316. Further, inner thumb section 317 may be sewn to outer thumb section 318 and the construction of the two may be attached to the remainder of the LG glove 300. Subsequently, all the seams may be taped, in order to preserve the waterproof capabilities of the LG glove 300. On the other hand, the seams of the "reverse-gunn-cut" pattern may remain not taped, and this construction may be built with a traditional insert construction. Finally, the "reverse-gunn-cut" pattern may be made with no insert at all.

[0032] One of the advantages of this glove manufacturing pattern, in addition to limiting the number of seams in a glove, may be that, in comparison with a regular "gunn-cut" pattern, known in the art, gloves made in the "reverse-gunn-cut" pattern may be more comfortable and more durable. Namely, by reversing the gunn-cut pattern, the middle portion 315 may be attached to a base of the LG glove 300 at the knuckles area, and not at a palmar crease area, in contrast with the regular "gunn-cut" pattern. Thus, when an object is held while wearing the LG glove 300, the seam attaching the middle portion 315 may not be located in a grab area of the LG glove 300, and, thus, it would neither interfere with the bending motion of the fingers, nor be placed in a direct contact with the grabbed object. As a result, the "reverse-gunn-cut" pattern may reduce tearing of the LG glove 300 at the seam, and it may also render the glove 300 more comfortable to wear.

[0033] One embodiment of the current invention may include darts 319 at the middle knuckle of each finger. Such feature of the LG glove 300 may further improve its durability, because it may prevent puckering of taped areas of the LG glove 300 by providing a pre-curve fit at finger cavities.

[0034] In another example, illustrated in FIG. 4, laminate 100 may be used to form short-gauntlet (SG) glove 400, by sewing together pieces of the laminate 100. The

SG glove 400 may be under-cuff, i.e. shortened around the wrist area.

[0035] FIG. 5 shows an embodiment that may prioritize thermal insulation and breathability related benefits of a hand-cover garment made of the laminate 100 over its functionality and over the tactile sense that the garment permits to the fingers. In one of the examples of the present invention, pieces of the laminate 100 may be sewn together to form mitten 500. The mitten 500 may contain four fingers in a same cavity, thereby further decreasing the number of seams needed to manufacture it. Namely, the mitten 500 may omit the middle portion 315 depicted in FIG. 3(b), and, thus, the knuckle seam 316 may be eliminated. Consequently, the taping of the seams may be reduced, which may, in turn, increase the breathability of the mitten 500. Moreover, by containing four fingers together, the mitten 500 may expose less area surface of the fingers to the garment, thereby decreasing heat exchange between the fingers and the surrounding environment.

[0036] In one embodiment, darts 524 may be created in back portion 525 of the mitten 500. Such feature of the mitten 500 may further improve its durability, because it may prevent puckering of taped areas of the mitten 500 by providing a pre-curve fit at a top portion of the mitten 500.

[0037] Finally, similarly to the glove embodiments discussed above, the mitten 500 may be either a long-gauntlet mitten or an under-cuff mitten, shortened around the wrist area.

[0038] While various embodiments have been described, other embodiments are plausible. It should be understood that the foregoing descriptions of various examples of using laminated leather to manufacture gloves or mittens are not intended to be limiting, and any number of modifications, combinations, and alternatives of the examples may be employed.

[0039] The examples described herein are merely illustrative, as numerous other embodiments may be implemented without departing from the spirit and scope of the present invention. Moreover, while certain features of the invention may be described above only in the context of certain examples or configurations, these features may be exchanged, added, and removed from and between the various embodiments or configurations while remaining within the scope of the invention.

Claims

1. An apparatus, comprising:

a dorsal section and a palmar section, wherein the dorsal section and the palmar section are made of a laminate construction; wherein the laminate construction includes at least two materials laminated to each other; wherein a first of the at least two materials is

leather and wherein a second of the at least two materials is a waterproof breathable material; wherein the waterproof breathable material comprises a plurality of layers; wherein one of the plurality of layers is a waterproof membrane; wherein the waterproof membrane is sandwiched between at least two other layers of the plurality of layers; wherein the at least two other layers of the plurality of layers are made of breathable materials; and wherein the palmar section is joined with the dorsal section.

2. The apparatus of claim 1, wherein the palmar section and the dorsal section are sewn to each other to form at least one seam; wherein the at least one seam is taped to prevent water from penetrating through the at least one seam.

3. The apparatus of claim 1, wherein the laminate construction further comprises an adhesive material placed between the leather material and the waterproof breathable material.

4. The apparatus of claim 3, wherein the adhesive material is a dot adhesive material.

5. The apparatus of claim 1, wherein the leather material is one of the following: a natural leather material and a synthetic leather material.

6. The apparatus of claim 5, wherein the leather material is perforated.

7. The apparatus of claim 1, wherein the waterproof breathable material is a shell fabric sandwich, wherein the shell fabric sandwich comprises a face fabric layer, the waterproof membrane, and a tricot or woven backer.

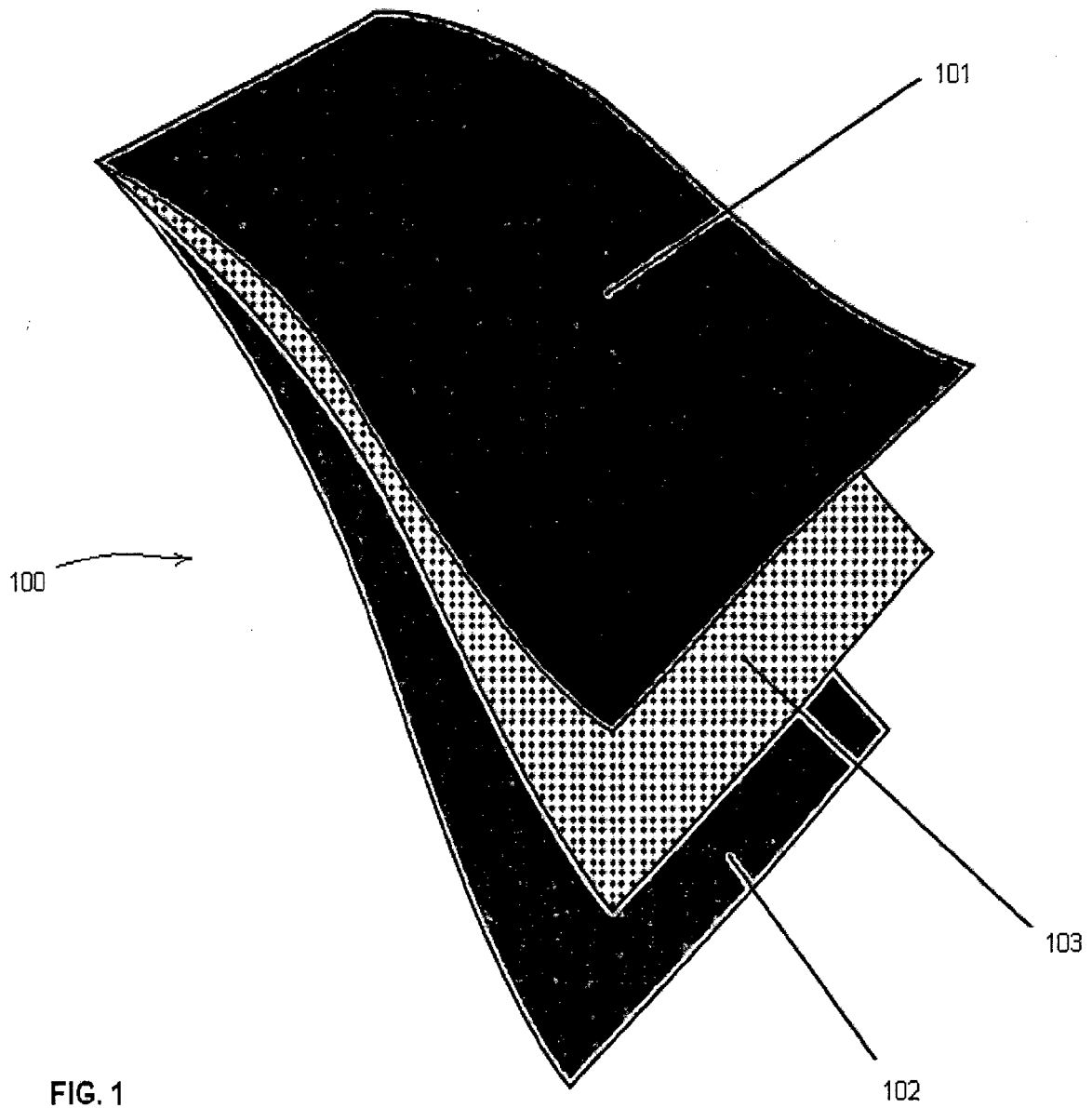
8. The apparatus of claim 1, wherein the waterproof breathable material is a soft shell fabric sandwich, wherein the soft shell fabric "sandwich" comprises a face fabric layer, the waterproof membrane, and a fleece or tricot backer.

9. The apparatus of claim 1, wherein the waterproof breathable material is a pocket-liner fabric sandwich, wherein the pocket-liner fabric sandwich comprises the waterproof membrane, and two layers of tricot or woven backer which are laid above and below the waterproof membrane.

10. A method of manufacturing hand-covering garments comprising the steps of:

forming a waterproof breathable construction by

- sandwiching a waterproof membrane between at least two layers, wherein the at least two layers are made of breathable materials; forming a laminate construction by using an adhesive material to laminate the waterproof breathable construction to a leather material; cutting the laminate construction into pieces; and sewing the pieces of the laminate construction into a hand-covering garment.
11. The method of manufacturing hand-covering garments of claim 10, comprising:
- creating seams along a line of sewing of the pieces of the laminate construction to each other; and waterproofing the hand-covering garment by taping said seams.
12. The method of manufacturing hand-covering garments of claim 10, comprising:
- sewing the pieces of the laminate construction into a glove, wherein the glove is formed in a "reverse-gunn-cut" pattern.
13. The method of manufacturing hand-covering garments of claim 12, further comprising:
- providing a pre-curve fit at the top portion by including darts.
14. The method of manufacturing hand-covering garments of claim 10, comprising:
- sewing the pieces of the laminate construction into a glove, wherein the glove is formed by sewing a dorsal section and a palmar section to each other; wherein the palmar section includes a front portion of four finger cavities other than a thumb cavity; and wherein the dorsal section includes a back portion of a second and a fifth finger cavity.
15. A hand-covering garment, comprising:
- a dorsal section and a palmar section, wherein the dorsal section and the palmar section are made of a laminate construction; wherein the laminate construction includes at least two materials laminated to each other; wherein a first of the at least two materials is leather and wherein a second of the at least two materials is a waterproof breathable material; wherein the waterproof breathable material comprises a plurality of layers that are stacked on top of each other to form a "sandwich" of layers; wherein one of the plurality of layers is a waterproof membrane; wherein the waterproof membrane is sandwiched between at least two other layers of the plurality of layers; wherein the at least two other layers of the plurality of layers are made of breathable materials; wherein the sandwich of layers is one of the following: a shell fabric sandwich, a soft shell fabric sandwich, and a pocket-liner fabric sandwich, and wherein the palmar section is joined with the dorsal section.
16. The hand-covering garment of claim 15, wherein the shell fabric "sandwich" comprises a face fabric layer, the waterproof membrane, and a tricot or woven backer.
17. The hand-covering garment of claim 15, wherein the soft shell fabric sandwich comprises a face fabric layer, the waterproof membrane, and a fleece or tricot backer.
18. The hand-covering garment of claim 15, wherein the pocket-liner fabric sandwich comprises the waterproof membrane and two layers of tricot or woven backer that are laid above and below the waterproof membrane.
19. The hand-covering garment of claim 15 is one of the following: long-gauntlet glove, under-cuff glove, long-gauntlet mitten, and under-cuff mitten.
20. The hand-covering garment of claim 15, wherein a top portion of the garment includes darts which provide a pre-curve fit at the top portion.



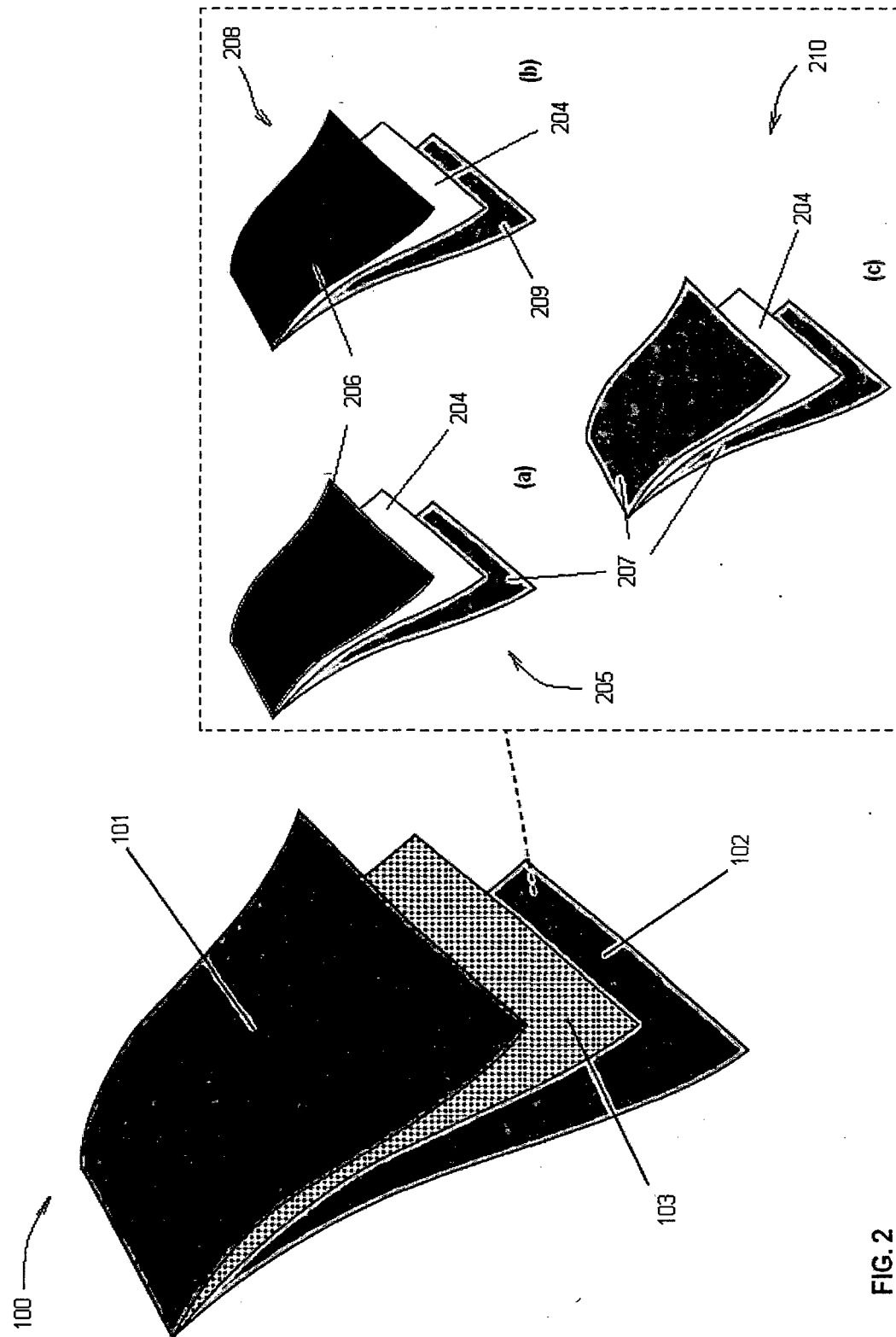


FIG. 2

FIG. 3

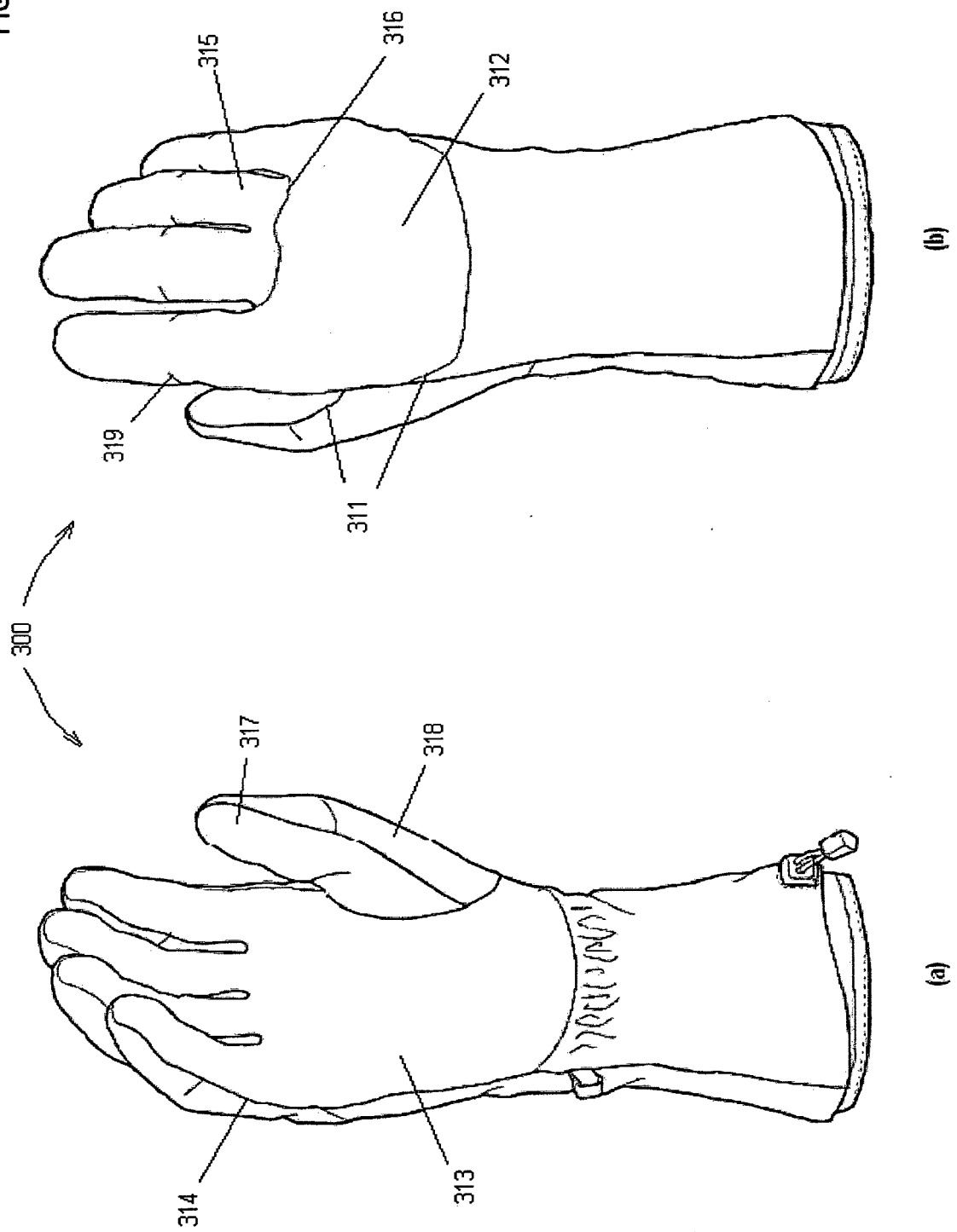


FIG. 4

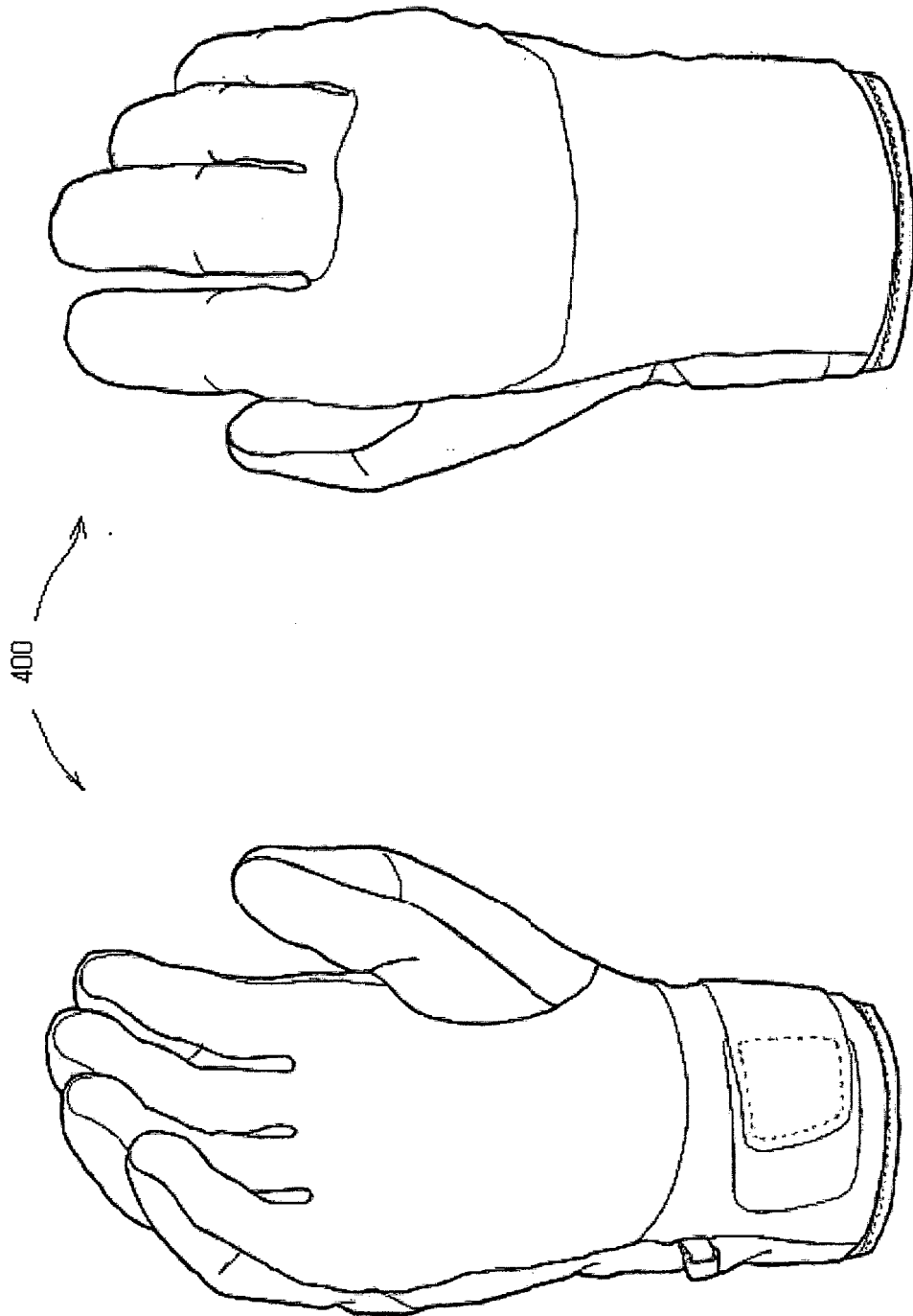


FIG. 5

