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(54) **Glove system and method of manufacture**

(57) One embodiment of the present invention relates to a glove system (100) for covering a user's hand including four finger covering members (150), a thumb covering member (180), and a palm covering member (190). The four finger covering members each include a concave finger member (152) coupled to a finger cap (158) with only one continuous seam (154). The thumb covering member and palm covering member may also be coupled with a single continuous seam (184, 194).

The single seam is disposed toward the dorsal side of the corresponding user's finger, thumb, and/or palm, respectively. A second embodiment of the present invention relates to a method of manufacturing a glove system including molding the concave finger members, seam coupling the concave finger members with the finger caps to form the finger covering members, and intercoupling the finger covering members with the thumb covering member and palm covering member

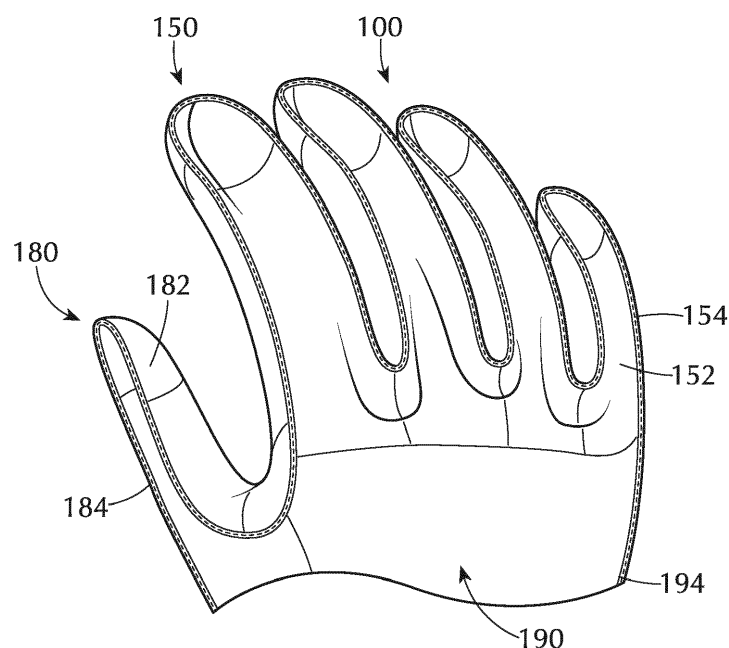


FIG. 2A

Description

FIELD OF THE INVENTION

[0001] The invention generally relates to hand covering gloves and methods of manufacturing thereof. In particular, the present invention relates to an improved glove system which improves dexterity via a novel manufacturing process.

BACKGROUND OF THE INVENTION

[0002] Gloves are a type of hand covering system configured to maintain independent figure articulation. Gloves are used to insulate or protect a user's hand for a variety of applications. For example, gloves are used to protect a user's hand from contact with various types of hazards including chemical, physical, thermal, etc. One particular type of glove is used to protect a user's hand(s) from cold temperatures via thermal insulation. The glove includes a continuous insulated covering over the user's fingers and palm. The insulated covering is generally composed of a thermal insulating material configured to retain heat within the user's finger's and palm, thereby insulating the hands from ambient cold air. Various well known breathable thermal insulating materials include compositions of fleece, nylon, polyester, wool, lycra, etc. One particular application of cold weather gloves is in association with winter sports, including but not limited to skiing, snowboarding, nordic skiing, ice climbing, etc. A user's performance at any winter sport in part corresponds to their available hand dexterity. Therefore, any reduction in hand dexterity may have a negative impact on overall sport performance.

[0003] One of the limitations of existing thermal insulating gloves is the negative dexterity effects caused by the thermal insulating material encircling the user's fingers. In particular, encasing the user's finger's and palm regions with the insulating material decreases dexterity with respect to an uncovered hand. The decrease in dexterity results from a variety of factors including material composition, thickness, seam locations, etc. Conventional solutions have attempted to maintain dexterity through the use of thinner insulating materials. Unfortunately, the use of thinner insulating materials reduces the thermal insulating properties of the glove. Allowing a user's hand to reduce in temperature also corresponds to a decrease in dexterity and therefore fails to adequately solve the problem of maintaining dexterity for cold weather activities.

[0004] Therefore, there is a need in the industry for a glove system and method of manufacturing that maintains thermal insulation and increases dexterity over conventional glove systems.

SUMMARY OF THE INVENTION

[0005] The present invention relates to hand covering

gloves and methods of manufacturing thereof. One embodiment of the present invention relates to a unique glove system for covering a user's hand including four finger covering members, a thumb covering member, and a palm covering member. The four finger covering members each include a concave finger member coupled to a finger cap with only one continuous seam. The thumb covering member and palm covering member may also be coupled with a single continuous seam. The single seam is disposed toward the dorsal side of the corresponding user's finger, thumb, and/or palm, respectively. A second embodiment of the present invention relates to a method of manufacturing a glove system including molding the concave finger members, seam coupling the concave finger members with the finger caps to form the finger covering members, and intercoupling the finger covering members with the thumb covering member and palm covering member.

[0006] Embodiments of the present invention represent a significant advance in the field of glove systems and associated methods of manufacturing. A single seam on each of the finger covering members of the glove system allows for greater user dexterity with respect to conventional multi-seam finger covering members. Likewise, single seam provides a closer feeling between the external surface of the finger covering member and the surface of the user's fingers. In addition, the single seam minimizes the space between the user's finger and the internal surface of the finger covering member, thereby improving water tightness. The single seam finger covering members also increase the durability of the overall system by eliminating the most common wear point of conventional glove systems.

[0007] These and other features and advantages of the present invention will be set forth or will become more fully apparent in the description that follows and in the appended claims. The features and advantages may be realized and obtained by means of the instruments and combinations particularly pointed out in the appended claims. Furthermore, the features and advantages of the invention may be learned by the practice of the invention or will be obvious from the description, as set forth hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The following description of the invention can be understood in light of the Figures, which illustrate specific aspects of the invention and are a part of the specification. Together with the following description, the Figures demonstrate and explain the principles of the invention. In the Figures, the physical dimensions may be exaggerated for clarity. The same reference numerals in different drawings represent the same element, and thus their descriptions will be omitted.

Figure 1A illustrates a perspective exploded view of a prior art finger covering member portion of a glove

system;

Figure 1B illustrates a perspective exploded view of a finger covering member portion of a glove system in accordance with one embodiment of the present invention;

Figure 2A illustrates a perspective cross-sectional view of a glove system including concave finger, thumb, and palm members;

Figure 2B illustrates a concave finger member in accordance with one embodiment of the present invention;

Figure 2C illustrates a concave finger member in accordance with an alternative embodiment of the present invention;

Figure 2D illustrates a molding process for the concave finger member illustrated in Figure 2C;

Figures 3A and 3B illustrate a compression system for molding a concave finger member in accordance with embodiments of the present invention;

Figure 4A and 4B illustrate perspective views of an unmolded finger member and a corresponding molded finger member in accordance with embodiments of the present invention; and

Figure 4C illustrates a seam coupled finger covering member disposed over a user's finger in accordance with embodiments of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0009] The present invention relates to hand covering gloves and methods of manufacturing thereof. One embodiment of the present invention relates to a unique glove system for covering a user's hand including four finger covering members, a thumb covering member, and a palm covering member. The four finger covering members each include a concave finger member coupled to a finger cap with only one continuous seam. The thumb covering member and palm covering member may also be coupled with a single continuous seam. The single seam is disposed toward the dorsal side of the corresponding user's finger, thumb, and/or palm, respectively. A second embodiment of the present invention relates to a method of manufacturing a glove system including molding the concave finger members, seam coupling the concave finger members with the finger caps to form the finger covering members, and intercoupling the finger covering members with the thumb covering member and palm covering member. Also, while embodiments are described in reference to glove systems and associated methods of manufacture it will be appreciated that the teachings of the present invention are applicable to other areas including but not limited to other human covering systems including but not limited to foot covering systems, etc.

[0010] Reference is initially made to Figure 1A, which illustrates a perspective exploded view of a prior art finger covering member, designated generally at 10. The illustrated prior art system 10 includes a bottom member 12,

a first seam 14, a middle member 16, a second seam 18, and a top member 20. The bottom member 12 is seam coupled to the middle member 16 via the first seam 14. Likewise, the top member 20 is seam coupled to the middle member 16 via the second seam 18. The intercoupled bottom, middle, and top member 12, 16, 20 form the finger covering member 10 and a partially enclosed internal region corresponding to a user's finger. The dorsal side of the user's finger is oriented toward the top member 20. The first and second seams 14, 18 are disposed adjacent to both the ventral and dorsal sides of the user's finger. One of the most common wear locations on a conventional finger covering member is first seam 14, located adjacent to the ventral side of the user's finger. Since the ventral side of the user's finger is used to touch and secure items, the first seam 14 receives an inordinate amount of wear. Likewise, the location of the first seam 14 may cause liquid penetration if the user touches or secures a wet or snow covered item. Finally, the location of the first and second seams 14, 18 cause a particular amount of resistance independent of the material compositions of the top, middle, and bottom members 12, 16, 20. The resistance caused by the seams 14, 18 thereby reduces the available dexterity of the user.

[0011] Reference is next made to Figure 1B, which illustrates a perspective exploded view of a finger covering member, designed generally at 150. The illustrated finger covering member 150 is a portion of a glove system 100 in accordance with embodiments of the present invention. The finger covering member 150 includes a concave finger member 152, a finger seam 154, and a finger cap 158. The concave finger member 152 may be composed of moldable material including but not limited to leather, canvas, etc. The finger cap 158 may be composed of an elastic or stretchable material including but not limited to nylon, lycra, etc.

[0012] The concave finger member 152 is seam coupled to the finger cap 158 via the finger seam 154 to form the finger covering member 150 and an interior partially enclosed region corresponding to a user's finger. It will be appreciated that the phrase "corresponding to the user's finger" may refer to either a general correspondence to a particular human finger or a custom correspondence to a human's finger. For example, a particular finger covering member 150 may be designed to correspond to a large sized human index finger. The interior partially enclosed region may have an interior circumference and volume corresponding to a particular user's finger. Likewise, the concave finger member 152 forms a partially enclosed interior region that also corresponds to the approximate volume of a particular user's finger. The concave finger member 152 may be configured to encase both the ventral and medial regions of a user's finger leaving only the dorsal side exposed. Likewise, the finger cap 158 may be shaped to correspond to at least the dorsal region of a user's finger. The shaping and coverage of the concave finger covering member 152 and finger cap 158 thereby positions the intercoupling finger

seam 154 adjacent to and/or toward the dorsal side of the user's finger.

[0013] The finger seam 154 extends continuously along the concave edge of the concave finger member 152. The finger seam 154 is thereby the only seam disposed on the finger covering member 150. It will be appreciated that an independent (noncontinuous) seam may be disposed at the base of the finger covering member 150 (not on the finger covering member 150) for coupling the finger coupling member 150 to other portions of the glove system 100. The finger seam 154 may be any type of material for seam coupling, including but not limited to stitching, welding, etc.

[0014] Reference is next made to Figure 2A, which illustrates a perspective cross-sectional view of a glove system, designated generally at 100. The illustrated portion of the system 100 includes the concave finger members 152 of the finger covering members 150, the concave thumb member 182 of the thumb covering member 180, and the palm member 190. The cross-sectional view is bisected along the thumb seam 184, finger seams 154, and palm seam 194. In the illustrated embodiment, the thumb, finger, and palm seams 184, 154, 194 are aligned to form a continuous single seam. As described above with reference to the finger covering system 150, the shape and orientation of the concave thumb member 182 causes the thumb seam 184 to be disposed in substantial proximity to the corresponding dorsal side of the user's thumb. Likewise, the illustrated portion of the palm covering member 190 may also be oriented to the palm seam 194 in substantial proximity to the corresponding dorsal side of the user's palm and/or wrist region. The finger covering members 150, thumb covering member 180, and palm covering member 190 are also intercoupled with one another corresponding to the anatomy of a user's hand. Each of the four finger covering members 150 may be disposed and individually sized to the particular user's finger. For example, the finger covering member 150 disposed on the opposite of the thumb covering member 180 corresponds to the location of the pinkie finger and is thereby sized smaller than the remaining finger covering members 150.

[0015] Reference is next made to Figure 2B, which illustrates a concave finger member 152 portion of a finger covering member 150 in accordance with embodiments of the present invention. The illustrated concave finger member 152 further includes a coupling region 159. The coupling region may be part of the palm member 190 or may be used for intercoupling with one or more of the thumb covering member 180, another finger covering member 150, and the palm member 190. The finger seam 154 may extend along the concave finger member 152 and the coupling region 159 as shown. It will be appreciated that various coupling schemes may be used between the finger, thumb, and palm covering members 150, 180, 190 in accordance with alternative embodiments of the present invention.

[0016] Reference is next made to Figure 2C, which il-

lustrates a concave finger member 252 portion of a finger covering member 250 in accordance with an alternative embodiment of the present invention. The illustrated concave finger member 252 includes a concave distal region and a flat proximal region. The alternative concave finger member 252 is therefore configured to seam couple with a corresponding finger cap (not shown) that includes a flat distal region and a concave proximal region. This alternative configuration then positions the finger seam in substantial proximity to the dorsal portion of the distal region of the finger and the ventral portion of the proximal region. This may be advantageous for increasing dexterity and/or durability. Likewise, alternative embodiments of a glove system may include a combination of the finger cover member embodiments 150, 250. Figure 2D illustrates a molding process for the concave finger member illustrated in Figure 2C. The process of molding an unmolded finger member into a concave finger member will be discussed in more detail below.

[0017] Reference is next made to Figures 3A and 3B, which illustrate a compression system for molding a concave finger member, designated generally at 400. The system 400 includes tightening system, a support system, and a positive mold 450. An un-molded finger member is placed over the positive mold 450 and within the compression system. The tightening system compresses the perimeter of the un-molded finger member thereby forcing the middle region over the positive mold 450 and molding the middle region into concave finger member 152. The un-molded finger member is composed of a moldable material that includes some form of molding memory such as leather or canvas. A molding memory refers to the ability to cause a flat piece of material to form a particular three dimensional shape through compression and/or temperature manipulation. The illustrated support system includes a top member 410, bottom member 420, four support posts 440, and a support platform 445. The four support posts extend through the corner regions of the top member 410, bottom member 420, and support platform 445. The illustrated tightening system includes a set of compression screws 430. The compression screws 430 extend through the top and bottom members 410, 420. The compression screws 430 are configured to compress the spacing between the top and bottom members 410, 420 in correspondence to the rotation of the compression screws 430. It will be appreciated that numerous other types of compression systems may be used to mold the concave finger members in accordance with embodiments of the present invention.

[0018] Reference is next made to Figure 4A and 4B, which illustrate perspective views of an unmolded finger member 151 and a corresponding molded finger member 152 in accordance with embodiments of the present invention. The un-molded finger member 152 is a piece of moldable material including but not limited to leather, canvas, etc. The unmolded finger member 151 includes extra material around the periphery which may be used to compression mold the interior region. The correspond-

ing concave finger member 152 therefore includes the molded interior region of the unmolded finger member 151 with the extra material removed. The finger seam 154 would be located on the concave side of the concave finger member 152.

[0019] Reference is next made to Figure 4C, which illustrates a seam coupled finger covering member 150. The illustrated finger covering member 150 includes the concave finger member 152 of Figure 4B seam coupled to a finger cap 158 (not visible) via the finger seam 154. The finger covering member 150 is positioned over the index finger of a user's hand 300. The user's hand includes multiple fingers 350, a thumb 380, and a palm 390.

[0020] It should be noted that various alternative system designs may be practiced in accordance with the present invention, including one or more portions or concepts of the embodiment illustrated in Figure 1 or described above. Various other embodiments have been contemplated, including combinations in whole or in part of the embodiments described above.

Claims

1. A glove system configured to encase a user's hand comprising:

four finger covering members configured to independently encase the user's fingers, wherein at least one of the four fingering covering members includes a concave finger member and a finger cap intercoupled with only one continuous finger seam;

a thumb covering member configured to independently encase the user's thumb; and
a palm covering member configured to independently encase the user's palm, wherein the palm covering member is coupled to the four finger covering members and the thumb covering member to form a continuous covering layer over the user's hand.

2. The system of claim 1, wherein all four fingering covering members include a concave finger member and a finger cap intercoupled with only one continuous finger seam.

3. The system of claim 1, wherein the concave finger covering members include a partially enclosed interior region corresponding to the volume of a user's finger.

4. The system of claim 1, wherein the thumb covering member includes a concave thumb member and a thumb cap intercoupled with only one continuous thumb seam.

5. The system of claim 1, wherein an interior circum-

ference of the concave finger members corresponds to the circumference of a user's finger.

6. The system of claim 1, wherein each of the four finger covering members is independently shaped with respect to the remaining finger covering members to correspond to a general relationship between each of the user's fingers with respect to the remaining fingers.

7. The system of claim 1, wherein the only seam on at least one of the four finger covering members is disposed in substantial proximity to the corresponding dorsal side of the user's finger.

8. The system of claim 1, wherein the four concave finger covering members are at least in part composed of a moldable material.

9. The system of claim 1, wherein the four finger caps are at least in part composed of an elastic material.

10. A glove system configured to encase a user's hand comprising:

four finger covering members configured to independently encase the user's fingers, wherein the four fingering covering members each include a concave finger member and a finger cap intercoupled with only one continuous finger seam, and wherein the only seam on each of the four finger covering members is disposed in substantial proximity to the corresponding dorsal side of the user's fingers;

a thumb covering member configured to independently encase the user's thumb, wherein the thumb covering member includes a concave thumb member and a thumb cap intercoupled with only one continuous thumb seam; and
a palm covering member configured to independently encase the user's palm, wherein the palm covering member is coupled to the four finger covering members and the thumb covering member to form a continuous covering layer over the user's hand.

11. A method for manufacturing a glove system comprising the acts of:

molding four independent concave finger members to have an interior partially enclosed volume corresponding to the volume of a corresponding user's finger;
seam coupling each of the four concave finger members to a corresponding finger cap to form four finger covering members each including an enclosed interior region corresponding to each of the user's fingers;

- intercoupling the four finger covering members with a thumb covering member and a palm covering member to form the glove system configured to encase a user's hand; and wherein the seam coupling of each of the four finger covering members is the only seam on each of the four finger covering members. 5
12. The method of claim 11, wherein the act of intercoupling the four finger covering members includes disposing the seam in substantial proximity to the dorsal side of the corresponding user's fingers. 10
13. The method of claim 11, wherein the act of intercoupling the four finger covering members with a thumb covering member further includes molding a concave thumb member to have an interior partially enclosed volume corresponding to the volume of a corresponding user's thumb; and seam coupling the concave thumb member to a corresponding thumb cap to form the thumb covering member including an enclosed interior region corresponding to the user's thumb. 15 20
14. The method of claim 13, wherein the seam coupling on the thumb covering member is the only seam on the thumb covering member. 25
15. The method of claim 11 further including the act of aligning the seam couplings of the four finger covering members to be continuous with one another. 30
16. The method of claim 11, wherein the act of molding the four concave finger members includes compressing a unmolded finger member over a positive mold and cutting the unmolded finger member along the perimeter of the positive mold. 35
17. The method of claim 16, wherein the act of compressing further includes providing a compression system including a top member, a bottom member, a tightening system, and a positive mold, and wherein tightening system is configured to compress the top member toward the bottom member around the perimeter of the positive mold. 40 45
18. The method of claim 17, wherein the tightening system includes a plurality of compression screws.
19. The method of claim 11, wherein the four concave finger covering members are at least composed in part of a moldable material. 50
20. The method of claim 11, wherein the four finger caps are at least composed in part of an elastic material. 55

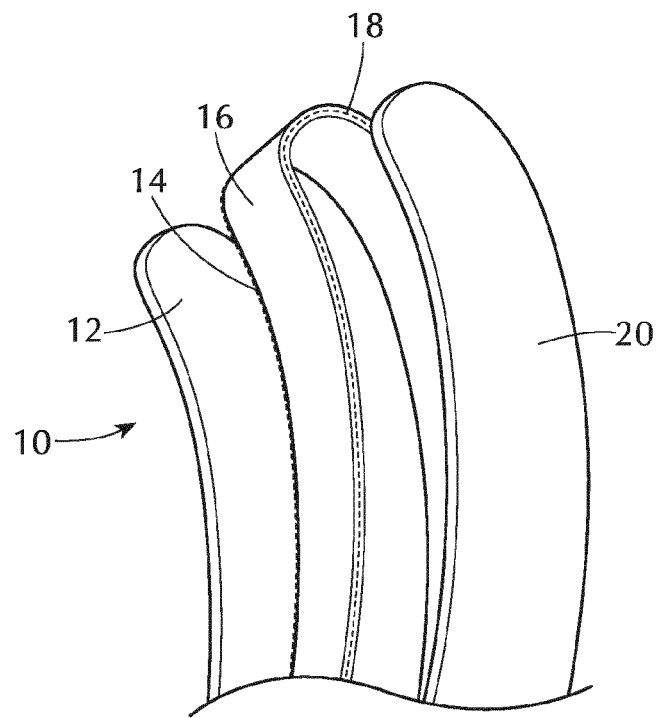


FIG. 1A
PRIOR ART

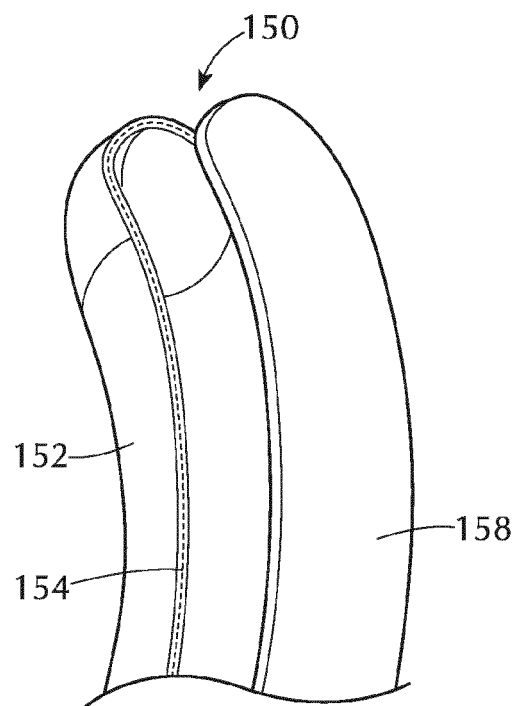


FIG. 1B

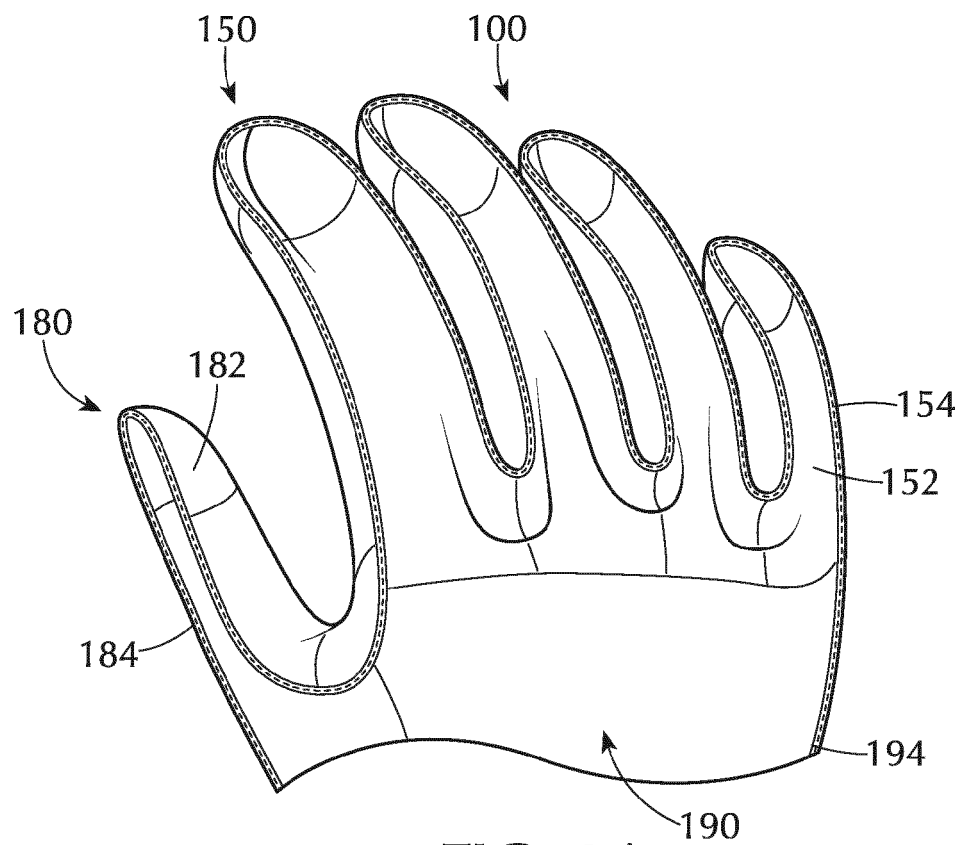


FIG. 2A

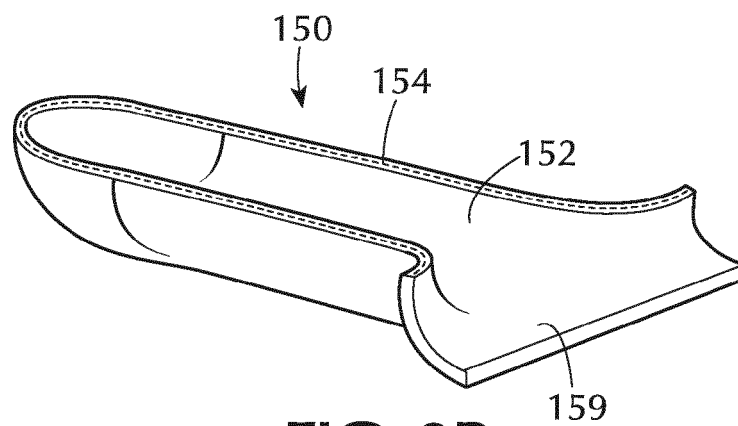


FIG. 2B

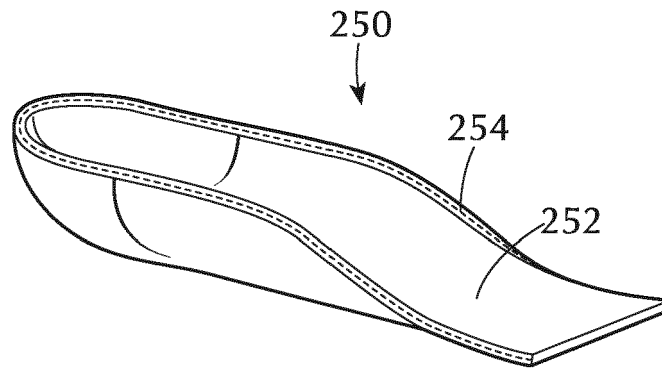


FIG. 2C

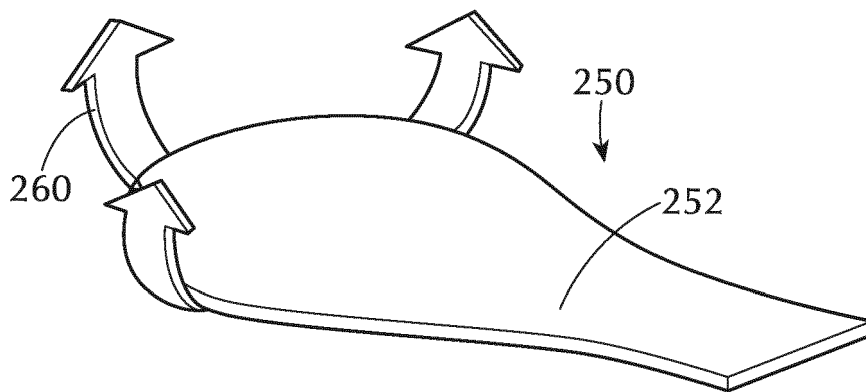
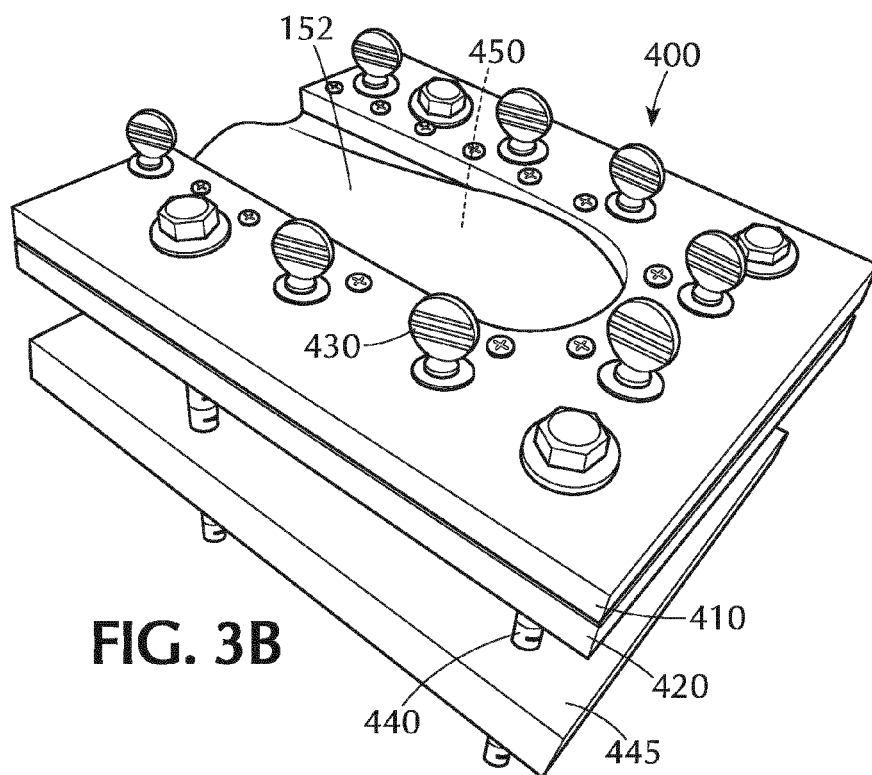
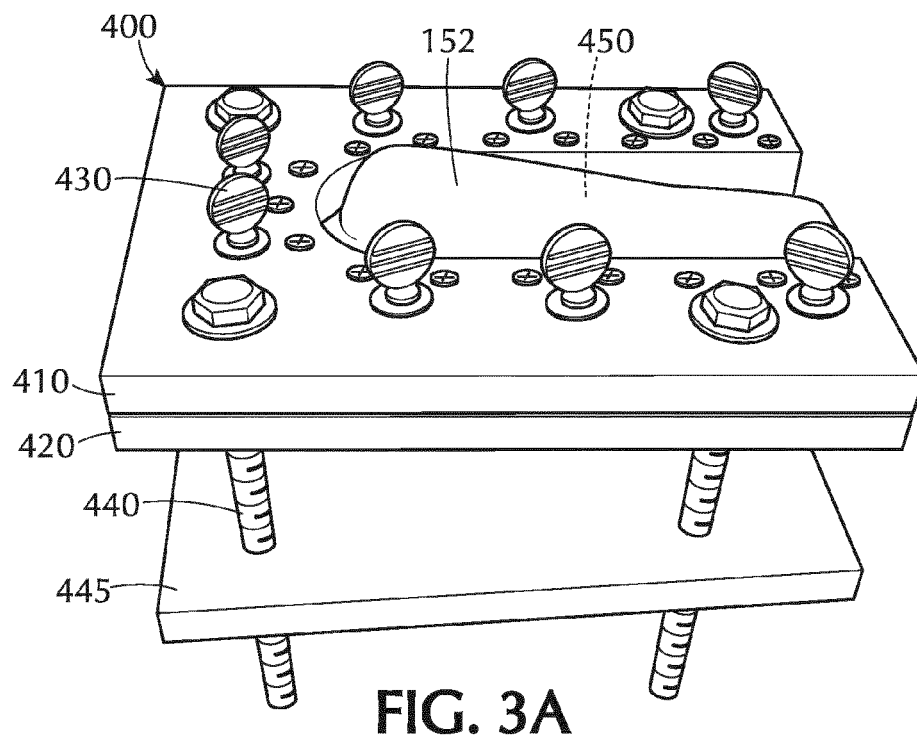


FIG. 2D



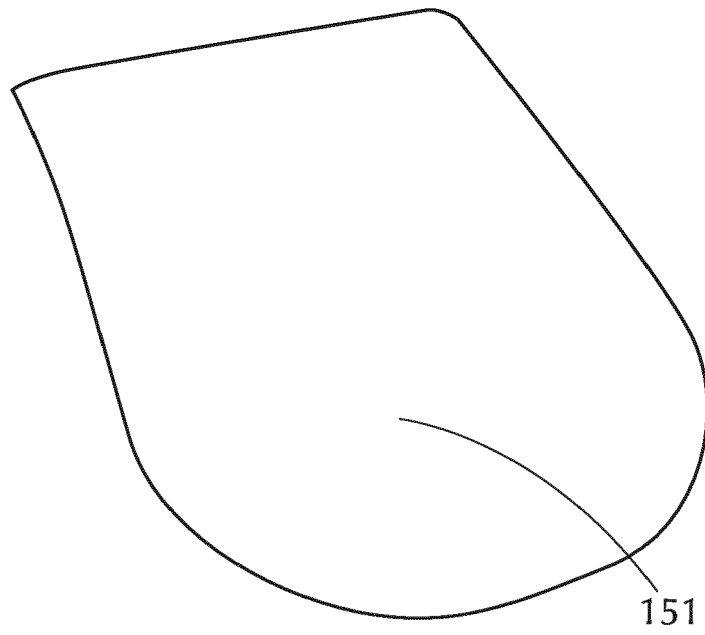


FIG. 4A

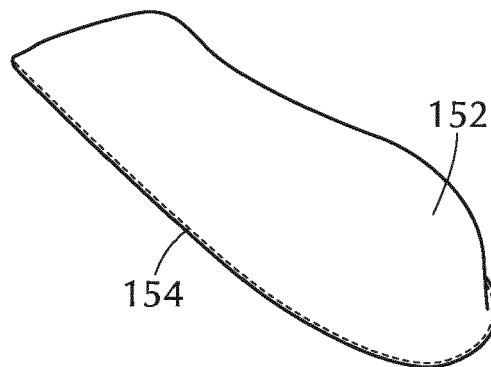


FIG. 4B

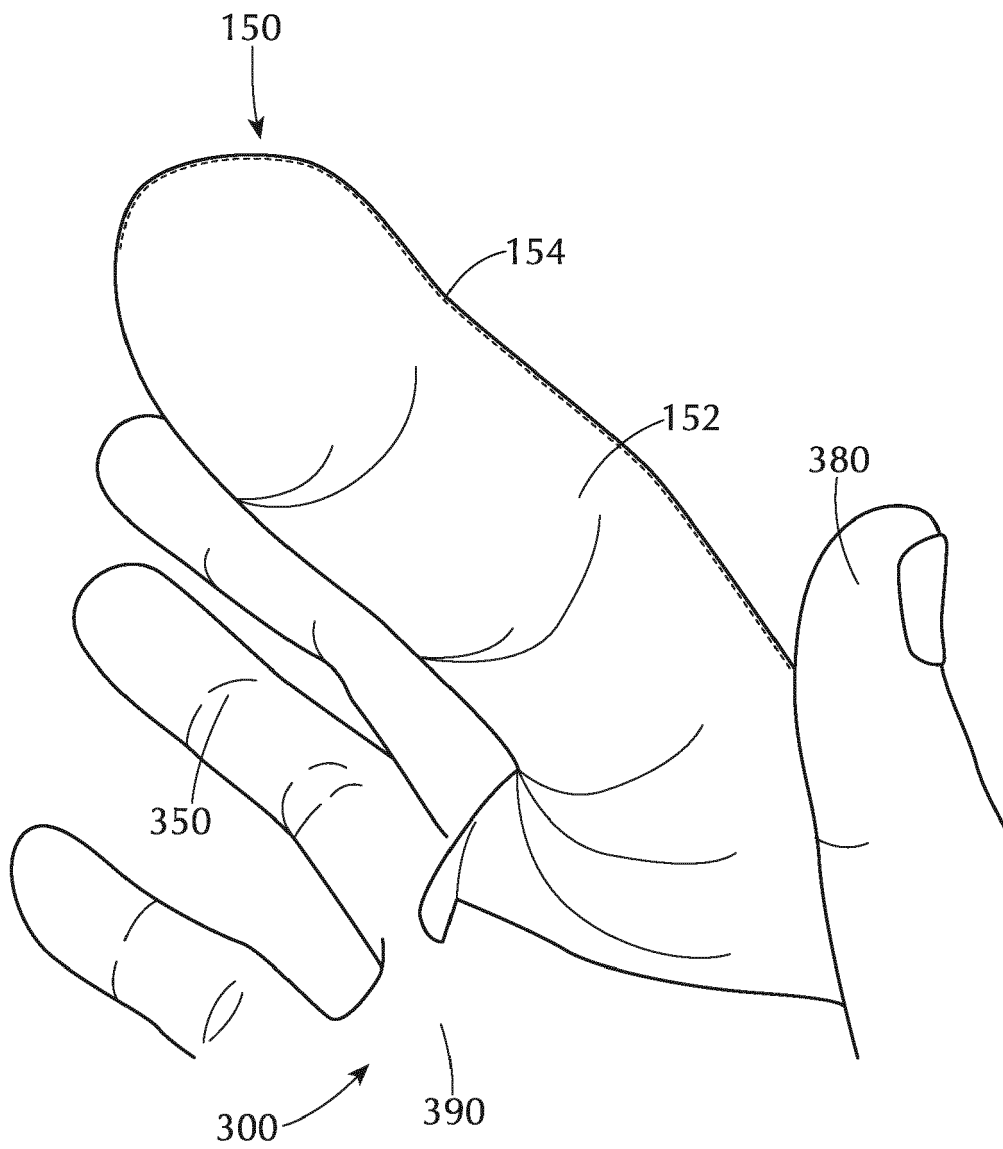


FIG. 4C



EUROPEAN SEARCH REPORT

Application Number
EP 15 15 0883

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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 20 May 2015	Examiner D'Souza, Jennifer
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 15 15 0883

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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