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- (71) Applicant (for all designated States except US): **TOTES ISOTONER CORPORATION** [US/US]; 9655 International Blvd., Cincinnati, OH 45246-5658 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **HATFIELD, Michelle, Renee** [US/US]; 1630 East Crittenden Avenue, Fort Wright, KY 41011 (US).
- (74) Agents: **VISCONTE, Barry et al.**; 2200 PNC Center, 201 East Fifth Street, Cincinnati, OH 45202 (US).
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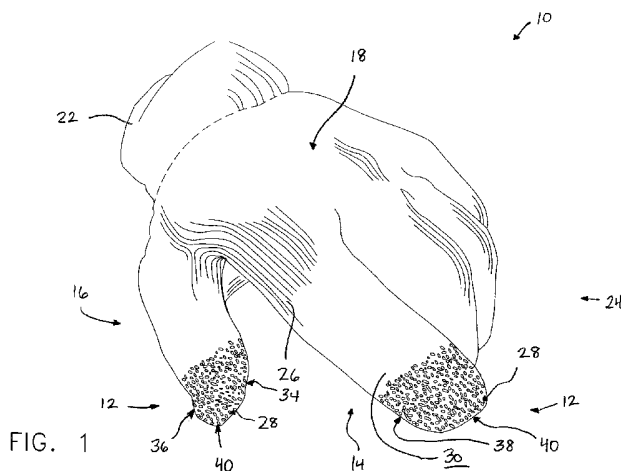
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(57) Abstract: A glove operably configured for use with a capacitive touchscreen comprises a plurality of fingertips, an outer surface, and an inner surface, wherein at least one of the fingertips comprises conductive thread or yarn extending from the outer surface of the glove to the inner surface of the glove to create a conductive pathway from the inner surface of the glove to the outer surface of the glove.

WO 2011/031536 A1

- 1 -

## GLOVE WITH CONDUCTIVE FINGERTIPS

Michelle Renee Hatfield

### PRIORITY

**[0001]** This application claims priority to U.S. Provisional Patent Application Serial No. 61/237,524, filed August 27, 2009, entitled "GLOVE WITH CONDUCTIVE FINGERTIPS," the disclosure of which is incorporated by reference herein.

### BACKGROUND

**[0002]** This disclosure relates to a glove for operating an electronic device, particularly a device with a touchscreen. To operate capacitive touchscreens requires electric conductivity between the screen and a user's fingers. Thus, users of such electronic devices can find it difficult to operate the device while wearing gloves. The exemplary gloves described herein overcome this difficulty by providing gloves with conductive fingertips.

**[0003]** While a variety of gloves have been made and used, it is believed that no one prior to the inventor(s) has made or used an invention as described herein.

### SUMMARY

**[0004]** A glove comprises a plurality of fingertips, an outer surface, and an inner surface, wherein at least one of the fingertips comprises conductive thread or yarn extending from the outer surface of the glove to the inner surface of the glove.

- 2 -

## BRIEF DESCRIPTION OF THE DRAWINGS

- [0005] While the specification concludes with claims which particularly point out and distinctly claim the invention, it is believed the present invention will be better understood from the following description of certain examples taken in conjunction with the accompanying drawings, in which like reference numerals identify the same elements and in which:
- [0006] FIG. 1 depicts a perspective view of an exemplary glove;
- [0007] FIG. 2 depicts a bottom view (from the palm side) of the glove of FIG. 1;
- [0008] FIG. 3 depicts a bottom view of the fingertip portion of the index finger of the glove of FIG. 1;
- [0009] FIG. 4 depicts an end view of the fingertip portion of the index finger of the glove of FIG. 1, with the glove turned inside-out to show conductive thread extending to the interior of the glove;
- [00010] FIG. 5 depicts a perspective view of another exemplary glove;
- [00011] FIG. 6 depicts a bottom view (from the palm side) of the glove of FIG. 5;
- [00012] FIG. 7 depicts an end view of the fingertip portions of the index finger and thumb of the glove of FIG. 5;
- [00013] FIG. 8 depicts an end view of the fingertip portions of the index finger and thumb of the glove of FIG. 5, with the glove turned inside-out to show conductive thread extending to the interior of the glove; and
- [00014] FIG. 9 depicts a perspective view of another exemplary glove.
- [00015] The drawings are not intended to be limiting in any way, and it is contemplated that various embodiments of the invention may be carried out in a variety of other

- 3 -

ways, including those not necessarily depicted in the drawings. The accompanying drawings, incorporated in and forming a part of the specification, illustrate several aspects of the present invention, and together with the description serve to explain the principles of the invention; it being understood, however, that this invention is not limited to the precise arrangements shown.

#### DETAILED DESCRIPTION

- [00016]** The following description of certain examples of the invention should not be used to limit the scope of the present invention. Other examples, features, aspects, embodiments, and advantages of the invention will become apparent to those skilled in the art from the following description. As will be realized, the invention is capable of other different and obvious aspects, all without departing from the invention. Accordingly, the drawings and descriptions should be regarded as illustrative in nature and not restrictive.
- [00017]** In this application, the word “finger” and “fingertip” apply equally to fingers/fingertips and thumbs/thumbtips. Similarly, the word “thumb” and “thumbtips” apply equally to thumbs/thumbtips and fingers/fingertips. “Glove” can also mean mitten. The words “yarn” and “thread” can be used interchangeably.
- [00018]** FIGS. 1-4 illustrate an exemplary glove (10) having fingertips (12). At the index finger position (14) and the thumb position (16) fingertips (12) are conductive. In the present example, glove (10) comprises a backhand side (18) as shown in FIG. 1, a palm side (20) as shown in FIG. 2, a first end (22) comprising an opening (not shown) for a user to insert their hand, and a second end (24) where the distal portion of fingertips (12) are located.
- [00019]** Glove (10) is knit substantially from non-conductive yarn (26) and also includes conductive yarn (28) knit into fingertips (12) at index finger position (14) and thumb position (16). Of course, conductive yarn (28) can be knit into fingertips

- 4 -

(12) at only a single finger position, at all finger positions, or even throughout all of glove (10) in some versions. In the present example, glove (10) is first knit of yarn (26), then conductive yarn (28) is knit into glove (10) at index finger position (14) and thumb position (16) as best shown in FIGS. 3 and 4. In the illustrated versions of FIGS. 1-4, the entire fingertip (12) at index finger position (14) and thumb position (16) are knit of a combination of conductive yarn (28) and non-conductive yarn (26). With this construction, conductive yarn (28) extends from an outer surface (30) of glove (10) to an inner surface (32) of glove (10) to create a conductive pathway from the user's fingertip, which contacts inner surface (32) of glove (10), to a touchscreen, which contacts outer surface (30) of glove (10). In some other versions, instead of fingertips (12) being knit of a combination of non-conductive yarn (26) and conductive yarn (28), fingertips (12) can be knit entirely of conductive yarn (28). In the present example, the distribution of conductive yarn (28) and non-conductive yarn (26) in certain fingertips (12) is substantially uniform. In some other versions, the distribution of conductive yarn (28) and non-conductive yarn (26) in certain fingertips (12) can be not uniform. For example, certain fingertips (12) can be knit to include an area of non-conductive yarn (26) along with one or more dense areas of conductive yarn (28).

**[00020]** The shape of the knit area and the length of fingertips (12) that include conductive yarn (28) can take into consideration the portion of the finger and/or thumb that is used to operate a touchscreen. In the present example, about one and one-half inches at the end of fingertips (12) at index finger position (14) and thumb position (16) include conductive yarn (28); of course greater or lesser lengths may be used. Also, conductive yarn (28) can be knit into all areas of fingertips (12). For instance, in the illustrated version, at index finger position (14) and thumb position (16), conductive yarn (28) is located on the pad (34), the back (36), the sides (38), and the distal-most tip (40) of those fingertips (12). In some other versions, conductive yarn (28) is located in select areas of fingertips (12) instead of all areas. In the illustrated version, the user can operate the touchscreen by

- 5 -

contacting the touchscreen with any part of fingertip (12) containing conductive yarn (28) (e.g., pad (34), sides (38), tip (40), etc.) in an amount and arrangement sufficient to create the electrical pathway between the user's finger and the touchscreen.

**[00021]** The non-conductive portions of glove (10) can be knit using processes known in the art, using materials known in the art, including but not limited to acrylic yarn, Lycra, or feather yarn (100% nylon). The conductive portions of glove (10) can also be knit using processes known in the art, using any conductive yarn. In some versions conductive yarn (28) is comprised of two ends of conductive thread mixed with non-conductive thread. In some versions, conductive yarn (28) can conduct 82 ohms/foot to 14 ohms/foot. Glove (10) can be machine-knit hand-knit.

**[00022]** FIG. 2 further illustrates a palm patch (42) that is stitched onto palm side (20) of glove (10). In the present example palm patch (42) is constructed from leather and can aide in gripping objects, (e.g., objects having touchscreens, etc.). Other materials of construction for palm patch (42) will be apparent to those of ordinary skill in the art in view of the teachings herein, and may include suede, synthetic leather, synthetic suede, pigsplit, embossed polyurethane, silicone, among others.

**[00023]** In view of the teachings herein, various other configurations and modifications to glove (10) will be apparent to those of ordinary skill in the art. By way of example only, and not limitation, conductive yarn (28) may be knit into any decorative pattern so long as there is sufficient conductive thread to conduct an electrical impulse from the user's finger to the touchscreen. In some versions, all or some of fingertips (12) of one glove (10) from a pair of gloves are conductive, while in other versions all or some of fingertips (12) of both gloves (10) from the pair are conductive.

- 6 -

**[00024]** FIGS. 5-8 illustrate another exemplary glove (110) having fingertips (112). At the index finger position (114) and the thumb position (116) fingertips (112) are conductive. In the present example, glove (110) comprises a backhand side (118) as shown in FIG. 5, a palm side (120) as shown in FIG. 6, a first end (122) comprising an opening (not shown) for a user to insert their hand, and a second end (124) where the distal portion of fingertips (112) are located.

**[00025]** Glove (110) is constructed by assembling cut fabrics together using processes known in the art (e.g., sewing together cut fabrics forming seams). In the present example, glove (110) comprises a palm fabric (144), a backhand fabric (146), a seaming fabric (148), an index finger fabric (150), and a thumb fabric (152). These fabrics are generally non-conductive fabrics (126) sewn together as shown to form glove (110). Conductive thread (128) is embroidered or stitched into or onto the fabrics that make-up fingertips (112) at index finger position (114) and thumb position (116) to provide conductive pathways between the user's fingertip and a touchscreen. Any well-known embroidery technique may be used to apply conductive thread (128) to fingertips (112) of glove (110). This embroidery or stitching with conductive thread (128) can be done before the fabrics (144, 146, 148, 150, 152) are assembled to form glove (110) or after the fabrics (144, 146, 148, 150, 152) have been assembled to form glove (110). In either approach conductive thread (128) passes from the inner surface (132) of glove (110) to the outer surface (130) of glove (110) to provide conductive pathways between the user's fingertip inside glove (110) and the conductive embroidery or stitching on the outside of glove (110), which in turn would contact the capacitive touchscreen.

**[00026]** In the present example, the embroidery or stitching with conductive thread (128) is directly onto index finger fabric (150) and thumb fabric (152) such that the embroidery or stitching itself extends from outer surface (130) of glove (110) to inner surface (132) of glove (110) as best seen in FIGS. 7 and 8. In other

- 7 -

versions, the embroidery or stitching with conductive thread (128) is completed on a separate piece of fabric that is sewn onto outer surface (130) at fingertips (112) in index finger position (114) and thumb position (116). The attachment of the separate embroidery or stitched piece is done with conductive thread (128) that extends from and contacts both the conductive embroidery or stitching on outer surface (130) of glove (110), and the user's fingertip on inner surface (132) of glove (110). In this arrangement conductive thread (128) that attaches the conductive embroidered or stitched piece to glove (110) completes the circuit to establish the pathway between the user's fingertip within glove (110) and the conductive embroidery or stitching on the separate piece of fabric outside glove (110). In still other versions, conductive thread (128) is laid on index finger fabric (150) and thumb fabric (152) at index finger position (114) and thumb position (116) respectively, and conductive thread (128) is then stitched to fabrics (150, 152) with non-conductive thread.

**[00027]** While the illustrated version in FIGS. 5-8 show conductive fingertips (112) at index finger position (114) and thumb position (116), in other versions conductive thread (128) can be embroidered or stitched into fingertips (112) at only a single finger position, at all finger positions, or even other places throughout glove (110). Where conductive thread (128) is positioned at locations of glove (110) (e.g., the backhand area or palm area) that would not typically directly contact and operate a touchscreen, a link between such location and the area contacting and operating the touchscreen (e.g., fingertips (112)) is established by connecting the areas with conductive thread (128) to complete the circuit.

**[00028]** The shape and length of the embroidered or stitched area (154) at fingertips (112) that include conductive thread (128) can take into consideration the portion of the finger and/or thumb that is used to operate a touchscreen. In the present example, conductive embroidery or stitching (154) located at index finger position (114) and thumb position (116) comprises an hour glass shape having a top portion

- 8 -

(156), a bottom portion (158), and a neck portion (160) having a narrower width compared to top and bottom portions (156, 158). Neck portion (160) of the hour glass shape wraps the distal-most tip (140) of fingertips (112), thus top portion (156) extends to the back (136) of fingertip (112) on backhand side (118) of glove (110) while bottom portion (158) extends to the pad (134) of fingertip (112) on palm side (120) of glove (110). This configuration for conductive embroidery or stitching (154) provides a continuous area of conductive thread (128) from pad (134) to back (136) of fingertips (112) at index finger position (114) and thumb position (116). In this arrangement, the user could operate the touchscreen by contacting the touchscreen with any part of fingertip (112) containing conductive thread (128) (e.g., pad (134), back (136), tip (140)) in an amount and arrangement sufficient to create the electrical pathway between the user's finger and the touchscreen.

**[00029]** As shown in FIG. 6, bottom portion (158) of conductive embroidery or stitching (154) comprises a curved lower edge (162) and chevrons (164). In the present example, curved lower edges (162) at index finger position (114) and thumb position (116) are configured to extend conductive embroidery to portions of the index finger and thumb that the user may use to operate a touch screen. Also in the present example, chevrons (164) represent an area not embroidered or stitched with conductive thread (128). However, in some versions chevrons (164) represent areas of greater conductivity where chevrons (164) are embroidered or stitched with thread having greater conductivity. Still yet in some versions, only chevrons (164) include conductive thread (128), without additional surrounding embroidery or stitching. In view of the teachings herein, other shapes and dimensions for conductive embroidery or stitching (154) will be apparent to those of ordinary skill in the art.

**[00030]** The non-conductive portions of glove (110) can be assembled using materials known in the art of glove/mitten making. For example, in some versions spandex

- 9 -

(77% nylon, 23% Spandex) is laminated to 100% polyester fleece to form glove (110). In some versions glove (110) is made of stretch fleece (94% polyester, 6% Spandex), or glove (110) is made of stretch fleece and jersey sides with gripper silicone printing (142) on palm side (120). In other versions, glove (110) includes textured stretch material (60% Tactel, 30% Coolmax, 10% Lycra Spandex) laminated to 100% polyester fleece for use in backhand side (118). Another version includes stretch ottoman (96% polyester, 4% spandex) in the backhand side (118). In other versions, textured water resistant or water repellent microfiber fabric is laminated to 100% polyester fleece. Still in other versions, gloves (110) are made of textured knit (100% polyester) laminated to 100% polyester fleece. Leather, either hairsheep or goatskin, can be used in the backhand side (118) of glove (110) in some versions. The cuffs, palm, and fourchettes of gloves (110) can be made of a blend of 80% nylon and 20% Lycra Spandex, or a blend of 79% nylon and 21% Lycra Spandex, or a stretch fleece material (94% polyester, 6% Lycra Spandex) that can also be used for seaming fabric (148). Synthetic suede (60% polyurethane, 40% nylon) can be used as appliqués or tabs. Gloves (110), in some versions, include palm patches made of pigsplit or embossed polyurethane. In view of the teachings herein, other materials of construction for gloves (110) will be apparent to those of ordinary skill in the art.

**[00031]** Any conductive thread can be used in making glove (110) so long as there is sufficient conductivity to conduct an electrical impulse from the user's finger to the touchscreen. In the present example, conductive thread (128) can conduct 82 ohms/foot to 14 ohms/foot. As mentioned previously, glove (110) is machine-sewn in some versions, with machine embroidery or stitching. In the present example, when embroidering or stitching conductive thread (128) into glove (110), conductive thread (128) is used in both the top and bottom bobbins. In some other versions, when embroidering or stitching conductive thread (128) into glove (110), conductive thread (128) is used in the top bobbin only. Still in some

- 10 -

other versions, when embroidering or stitching conductive thread (128) into glove (110), conductive thread (128) is used in the bottom bobbin thread only. In other versions, conductive thread (128) is hand-sewn into glove (110). Conductive thread (128) for stitching or embroidery can be comprised of a finer thread with four ends that conducts 90 ohms/foot to 95 ohms/foot. Such conductive thread (128) can be a 100% nylon thread with silver coating, with a thickness before coating of 280D and 340D after coating. In view of the teachings herein, other types of conductive thread (128) for use in making gloves (110) will be apparent to those of ordinary skill in the art.

**[00032]** FIG. 6 further illustrates silicone printing (142) on palm side (120) of glove (110). In the present example silicone printing (142) is printed in a diamond pattern and aides in gripping objects, (e.g., objects having touchscreens, etc.). Other materials of construction for enhancing the grip of palm side (120) will be apparent to those of ordinary skill in the art in view of the teachings herein, and may include various palm patches constructed of suede, synthetic leather, synthetic suede, pigsplit, embossed polyurethane, among others.

**[00033]** In view of the teachings herein, various other configurations and modifications to glove (110) will be apparent to those of ordinary skill in the art. By way of example only, and not limitation, conductive thread (128) may be embroidered or stitched into any decorative pattern so long as there is sufficient conductive thread to conduct an electrical impulse from the user's finger to the touchscreen. In some versions, all or some of fingertips (112) of one glove (110) from a pair of gloves are conductive, while in other versions all or some of fingertips (112) of both gloves (110) from the pair are conductive. In some versions the thumb and index finger of glove (110) can be the only fingertips (112) that are conductive. In some versions conductive portions of fingertips (112) can be placed on the side portions of the index fingertip and thumbtip, especially for users who often press touchscreens with the side of their thumb, rather than directly on the area covering

- 11 -

pad (134) of the thumb.

[00034] FIG. 9 illustrates another exemplary glove (210) having fingertips (212) that are conductive. Similar to glove (110) of FIGS. 5-8, glove (210) comprises a backhand side (218), a palm side (not shown), a first end (222) comprising an opening (not shown) for a user to insert their hand, and a second end (224) where the distal portion of fingertips (212) are located. Glove (210) is constructed in a similar fashion as glove (110)—by assembling cut fabrics together using processes known in the art (e.g., sewing together cut fabrics forming seams). In the present example, glove (210) comprises a palm fabric (not shown), a backhand fabric (246), and a seaming fabric (248). The palm and backhand fabrics are generally non-conductive fabrics (226) sewn together to form glove (210). Seaming fabric (248) is sewn between and joins palm and backhand fabrics. In the present example, seaming fabric (248) comprises a tape (e.g., a knit or a woven tape), where conductive thread (228) is knit or woven into the tape. In some other versions a twill tape incorporating conductive thread (228) can be used. The tape can then be laid from seam to seam across fingertips (212) of glove (210), and the ends of the tape can be sewn so as to touch a user's fingers on the inside of the glove. In the present example all of seaming fabric (248) comprises the tape having conductive thread (228); however, in other versions the portion of seaming fabric (248) containing conductive thread (228) is limited to the area surrounding fingertips (212). In view of the teachings herein, various other configurations and modifications to glove (210) will be apparent to those of ordinary skill in the art.

[00035] Having shown and described various embodiments of the present invention, further adaptations of the methods and systems described herein may be accomplished by appropriate modifications by one of ordinary skill in the art without departing from the scope of the present invention. Several of such potential modifications have been mentioned, and others will be apparent to those

- 12 -

skilled in the art. For instance, the examples, embodiments, geometrics, materials, dimensions, ratios, steps, and the like discussed above are illustrative and are not required. Accordingly, the scope of the present invention should be considered in terms of the following claims and is understood not to be limited to the details of structure and operation shown and described in the specification and drawings.

- 13 -

I/we claim:

1. A glove comprising a plurality of fingertips, an outer surface, and an inner surface, wherein the fingertips comprise a pad, a back, sides, and a tip, wherein at least one of the fingertips comprises conductive yarn positioned at the pad of the at least one of the fingertips and extending from the outer surface of the glove to the inner surface of the glove.
2. The glove of claim 1, wherein the conductive yarn establishes a conductive pathway from the inner surface of the glove to the outer surface of the glove.
3. The glove of claim 1, wherein the at least one of the fingertips comprises conductive yarn and non-conductive yarn.
4. The glove of claim 3, wherein the distribution of the conductive yarn and the non-conductive yarn is generally uniform.
5. The glove of claim 1, wherein the at least one of the fingertips is comprised of all conductive yarn.
6. The glove of claim 1, wherein the conductive yarn is further positioned at the sides of the at least one of the fingertips.
7. The glove of claim 1, wherein the conductive yarn is further positioned at the tip of the at least one of the fingertips.
8. The glove of claim 7, wherein the conductive yarn is further positioned at the back of the at least one of the fingertips.
9. The glove of claim 8, wherein the conductive yarn is further positioned at the sides of the at least one of the fingertips.
10. The glove of claim 1, comprising an index finger position and a thumb position, wherein the fingertips at the index finger position and the thumb position are

- 14 -

comprised of conductive yarn.

11. The glove of claim 1, wherein the conductive yarn conducts about 82 ohms/foot to about 14 ohms/foot.
12. The glove of claim 1 further comprising a palm side, wherein the palm side comprises a palm patch.
13. The glove of claim 1, wherein the glove is knit.
14. The glove of claim 1, wherein the glove is one of a pair of gloves, wherein each of the gloves of the pair of gloves comprise the at least one of the fingertips comprising the conductive yarn.
15. A glove comprising a plurality of fingertips, an outer surface, and an inner surface, wherein the fingertips comprise a pad, a back, sides, and a tip, wherein at least one of the fingertips comprises an embroidered area covering at least a portion of the pad of the at least one of the fingertips, wherein the embroidered area comprises conductive thread extending from the outer surface of the glove to the inner surface of the glove.
16. The glove of claim 15, wherein the conductive thread establishes a conductive pathway from the inner surface of the glove to the outer surface of the glove.
17. The glove of claim 15, wherein the embroidered area further covers the tip of the at least one of the fingertips.
18. The glove of claim 17, wherein the embroidered area further covers the back of the at least one of the fingertips.
19. The glove of claim 15, wherein the embroidered area provides a continuous area of conductive thread from the pad to the back of the at least one of the fingertips.
20. The glove of claim 15, wherein the embroidered area comprises a top portion

- 15 -

connected with a bottom portion, which connects with a neck portion, wherein the top portion covers the at least a portion of the pad, wherein the bottom portion covers at least a portion of the back of the at least one of the fingertips, wherein the neck portion covers at least a portion of the tip of the at least one of the fingertips, wherein the neck portion has a narrower width than adjacent top and bottom portions.

21. The glove of claim 15, comprising an index finger position and a thumb position, wherein the fingertips at the index finger position and the thumb position comprise the embroidered area having the conductive thread extending from the outer surface of the glove to the inner surface of the glove.
22. The glove of claim 15, wherein the conductive thread conducts about 82 ohms/foot to about 14 ohms/foot.
23. The glove of claim 15, wherein the conductive thread conducts about 90 ohms/foot to about 95 ohms/foot.
24. The glove of claim 15 further comprising a palm side, wherein the palm side comprises silicone printing.
25. The glove of claim 15, wherein the glove is sewn together from two or more fabrics.
26. The glove of claim 15, wherein the glove is one of a pair of gloves, wherein each of the gloves of the pair of gloves comprise the at least one the fingertips comprising the embroidered area having the conductive thread.
27. A glove comprising a plurality of fingertips, an outer surface, and an inner surface, wherein the glove further comprises a palm fabric, a backhand fabric, and a seaming fabric, wherein the seaming fabric extends along at least a portion of the plurality of fingertips and connects the palm fabric and the backhand fabric,

- 16 -

wherein at least a portion of the seaming fabric comprises conductive thread that extends from the outer surface of the glove to the inner surface of the glove creating a conductive pathway from the inner surface of the glove to the outer surface of the glove.

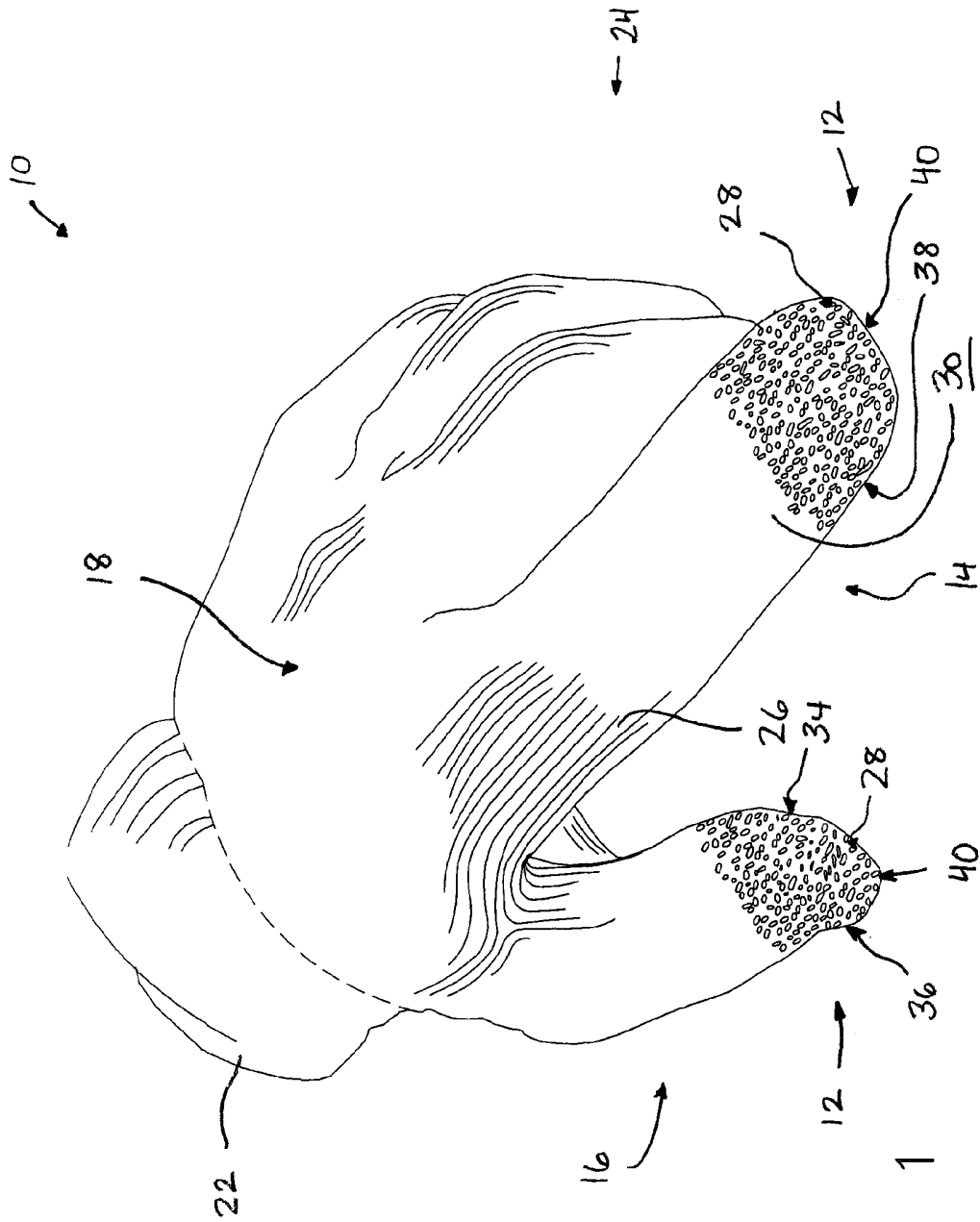


FIG. 1

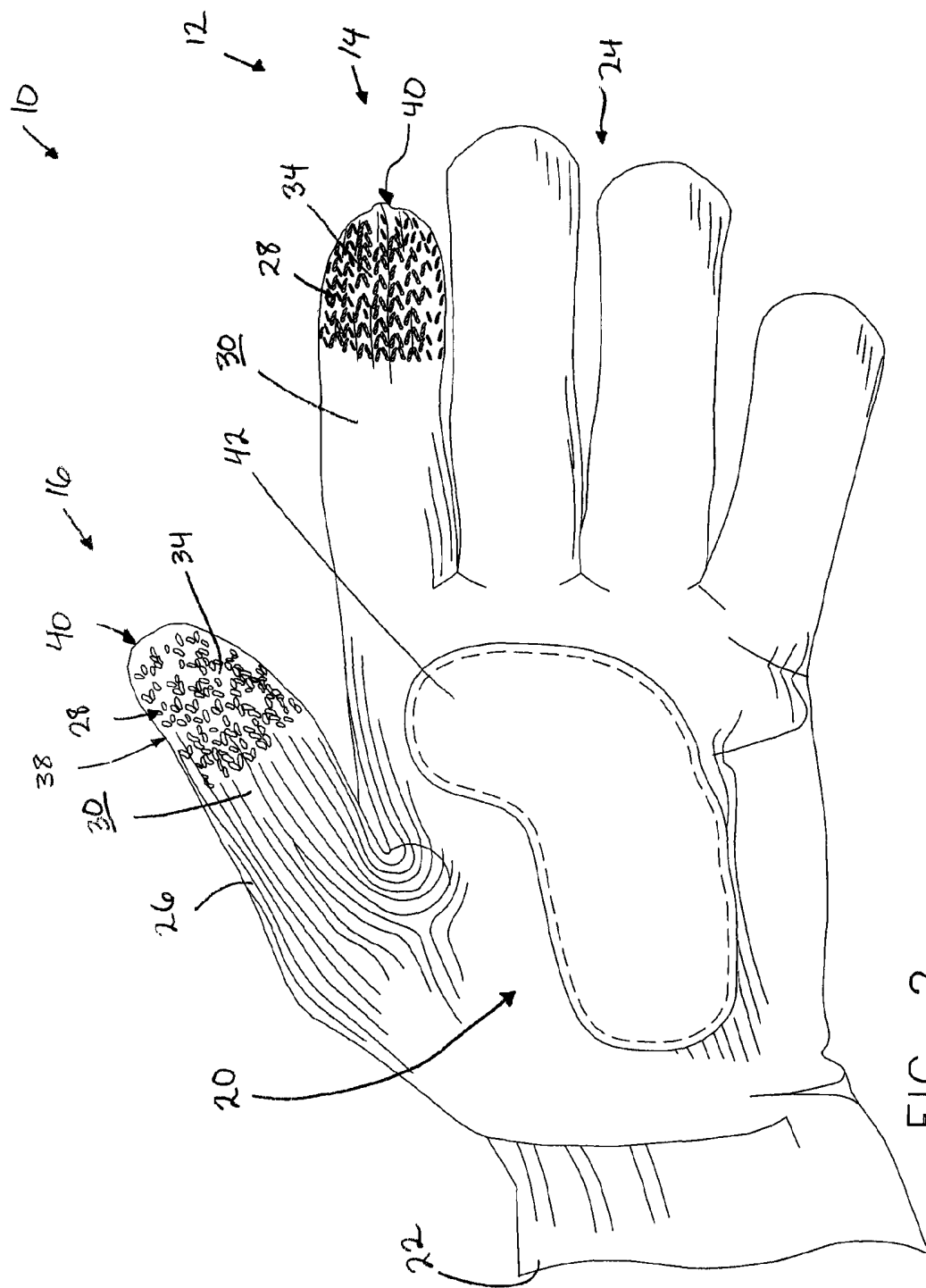


FIG. 2

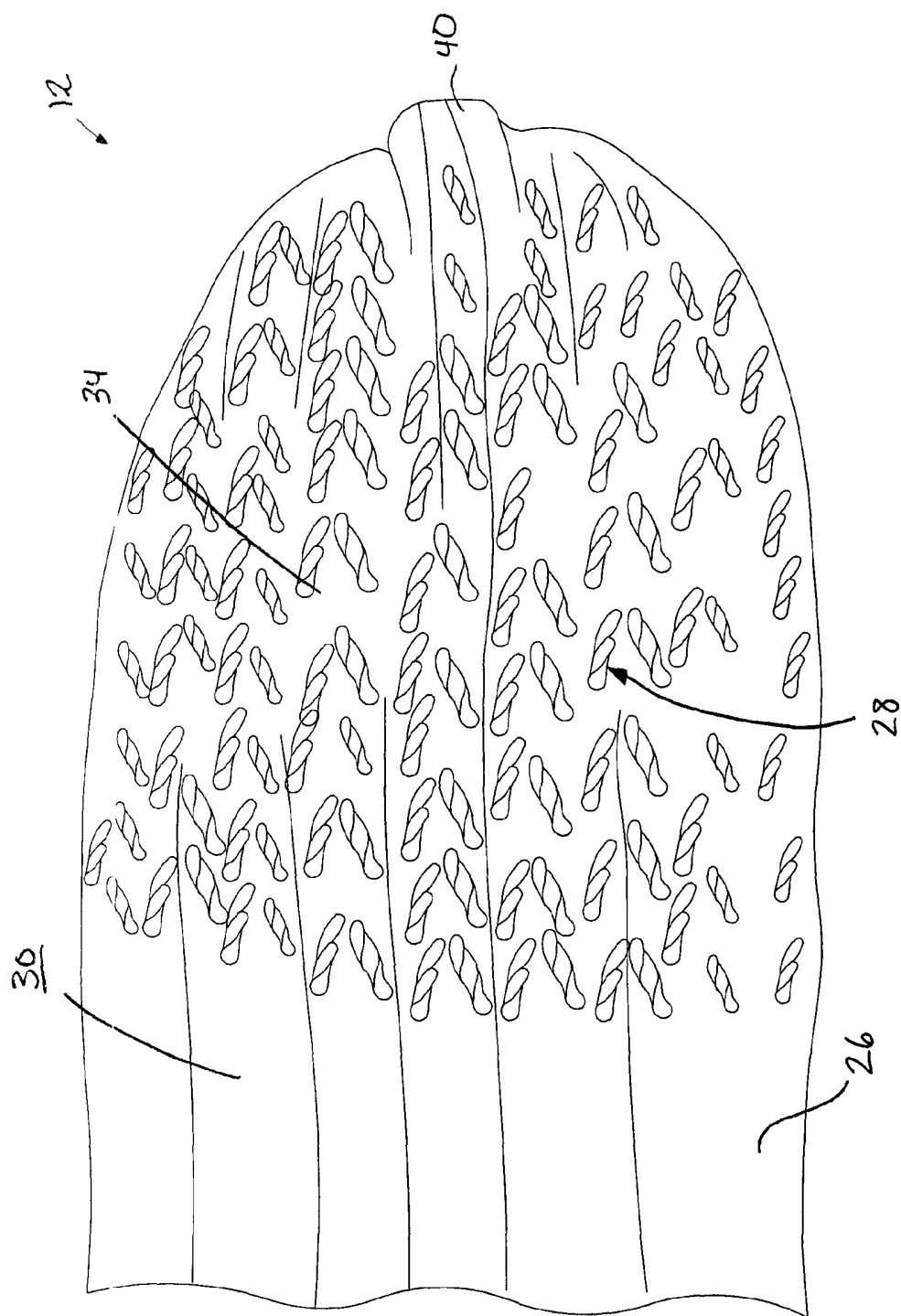


FIG. 3

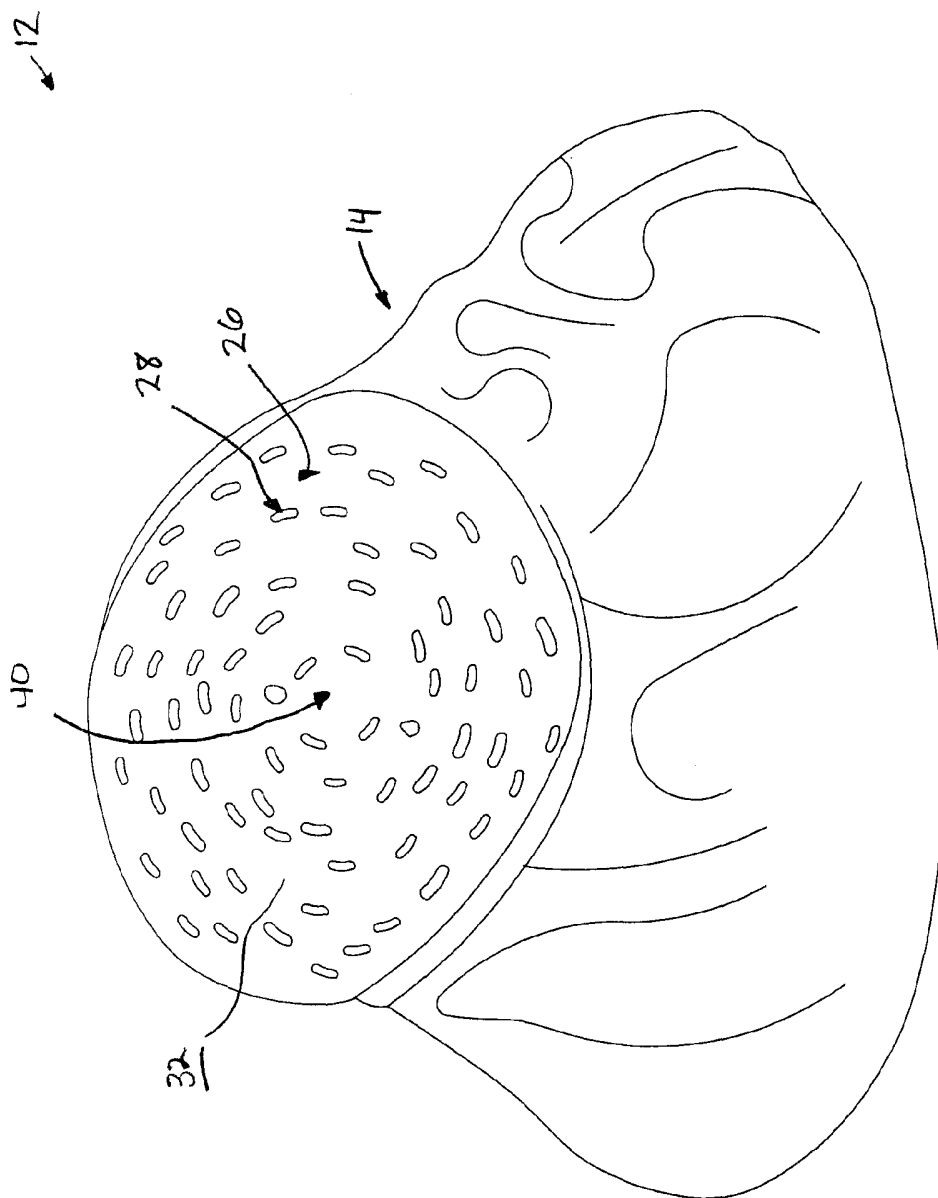


FIG. 4

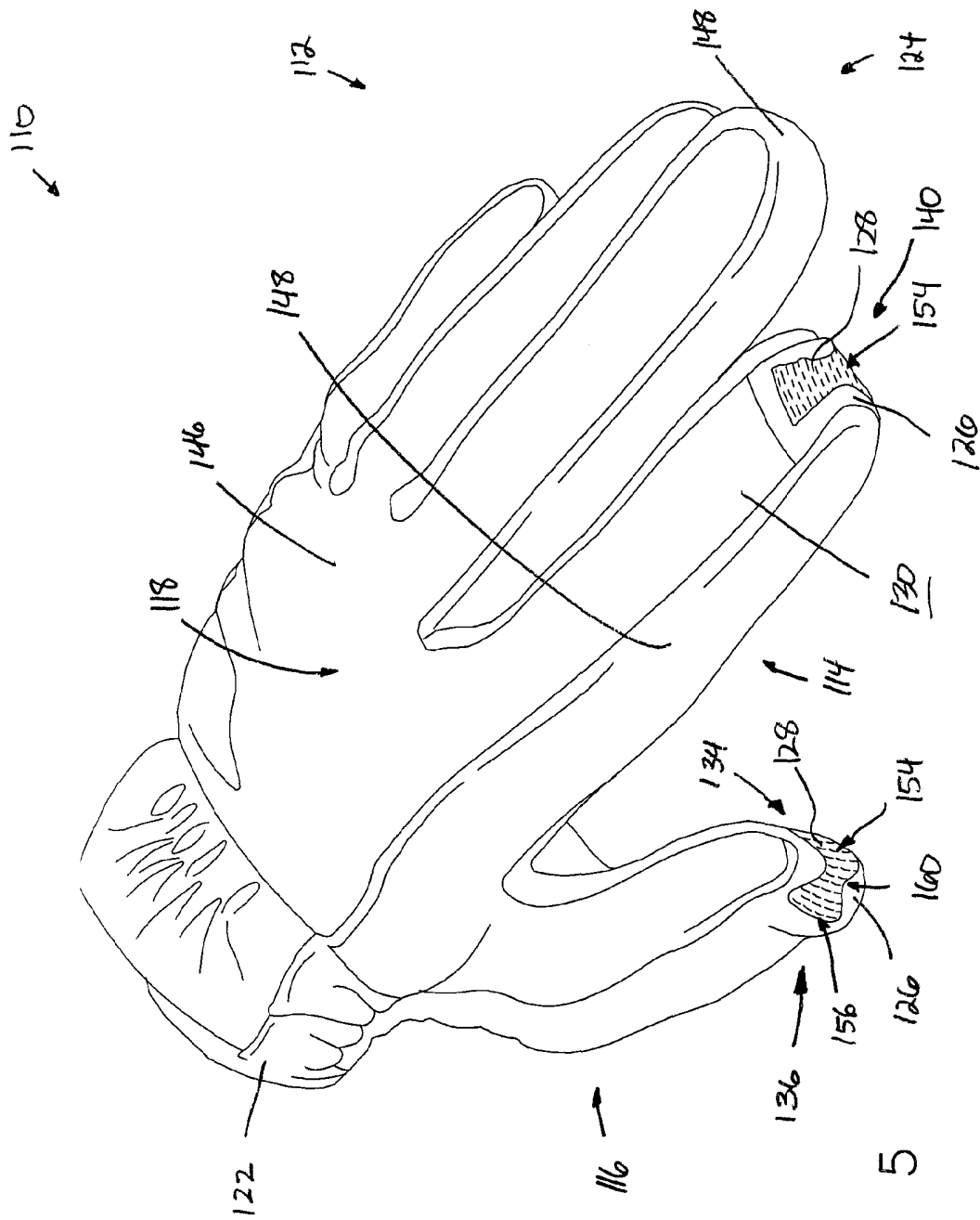


FIG. 5



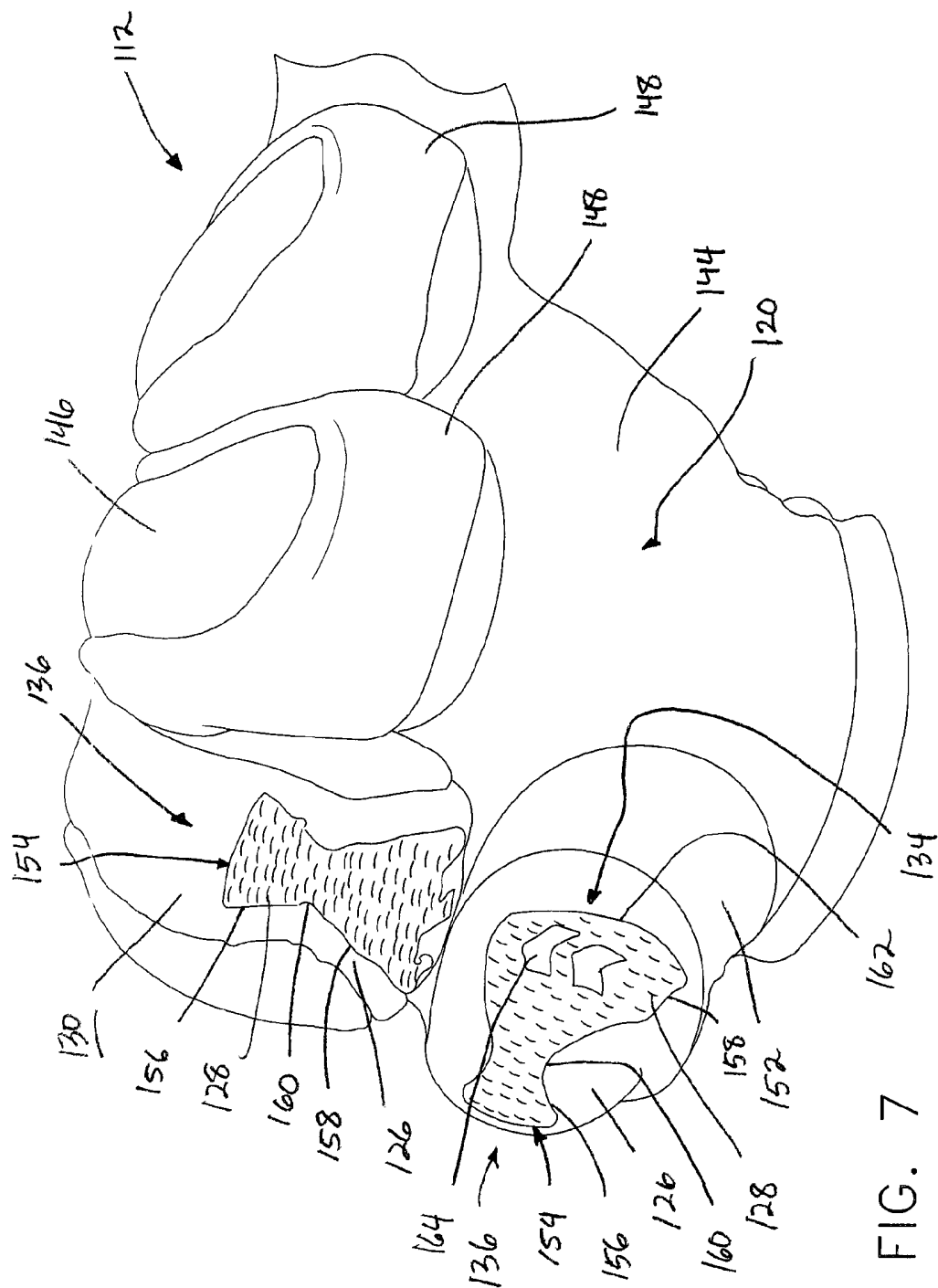


FIG. 7

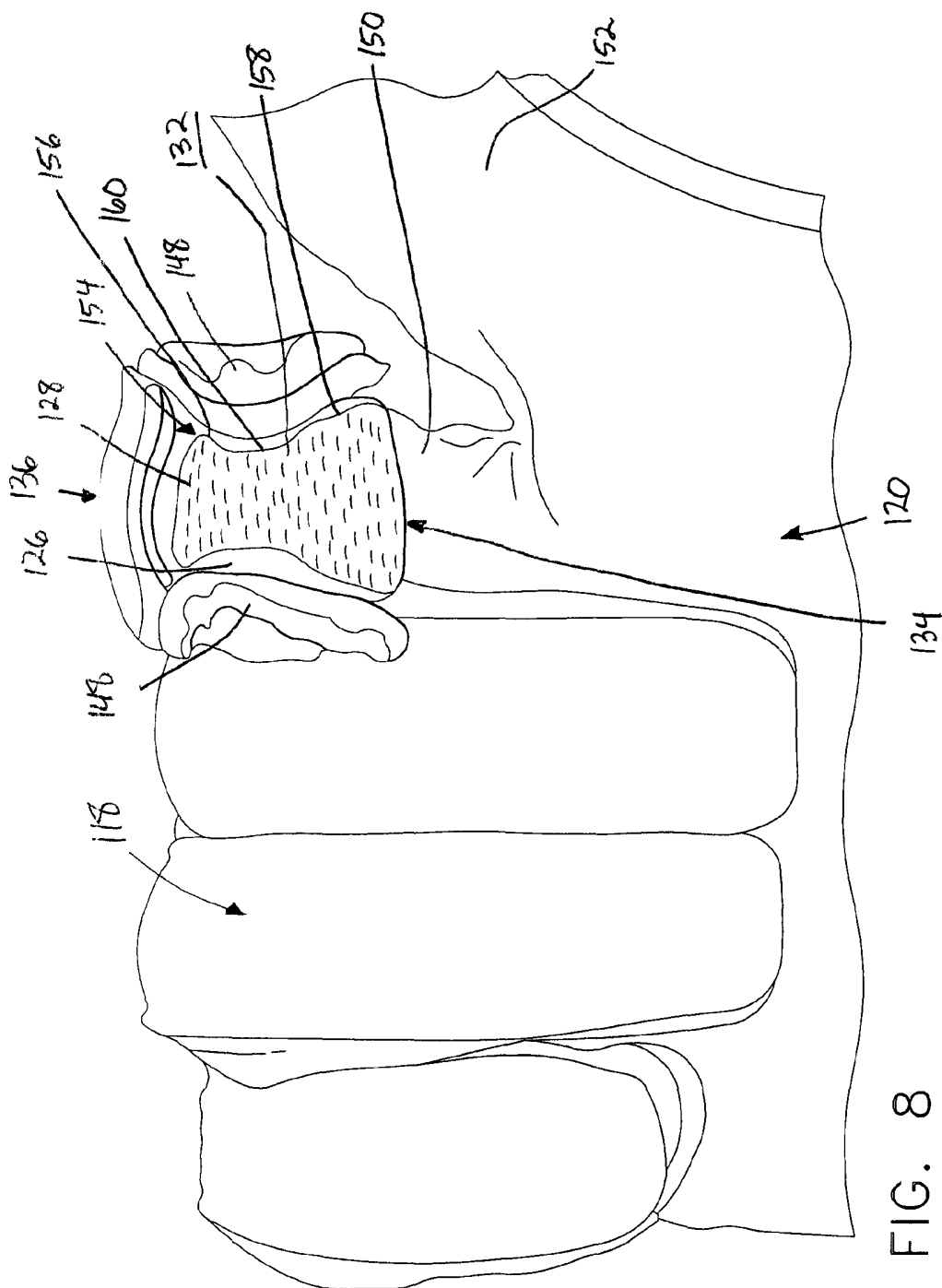


FIG. 8

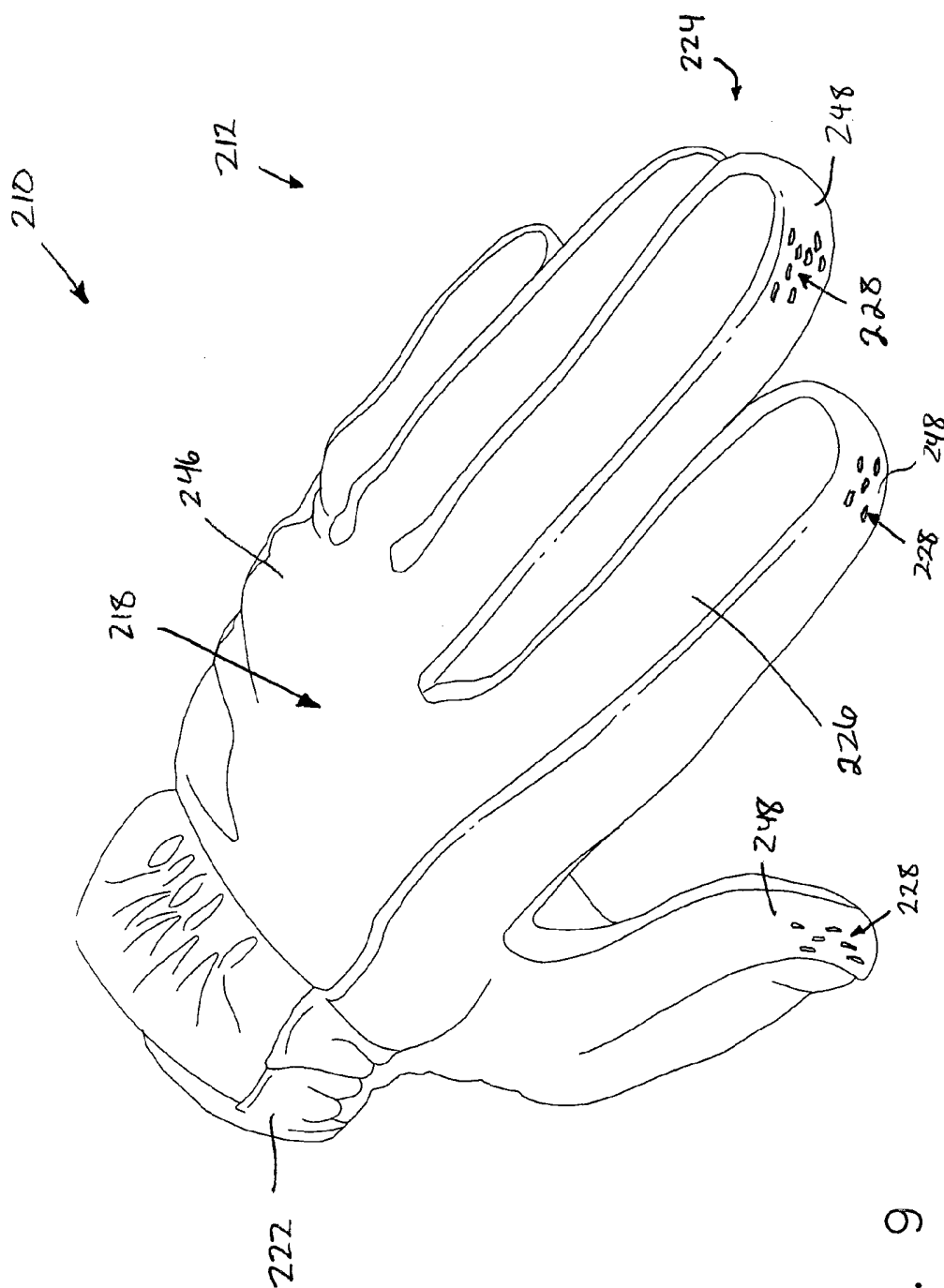


FIG. 9

## INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2010/046899

**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. A41D19/00 G06F3/01  
 ADD. A41D1/00

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
 A41D G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2006 063456 A (MORITO CO LTD) 9 March 2006 (2006-03-09)	1-3, 6-12, 14-23, 25,26 27
Y	* abstract; figures -----	
X	JP 2008 081896 A (YOKOGAWA ELECTRIC CORP) 10 April 2008 (2008-04-10)	1,2,7,8, 10, 14-17, 21,26
	* abstract; figures -----	
X	WO 2005/102088 A1 (4SIGHT INC [US]; MALLARD DAVID E [US]; LESLIE STUART M [US]) 3 November 2005 (2005-11-03) paragraph [0050]; figures -----	1-3,15, 16
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 Further documents are listed in the continuation of Box C. See patent family annex.

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\*&amp;\* document member of the same patent family

Date of the actual completion of the international search

17 January 2011

Date of mailing of the international search report

26/01/2011

Name and mailing address of the ISA/  
 European Patent Office, P.B. 5818 Patentlaan 2  
 NL - 2280 HV Rijswijk  
 Tel. (+31-70) 340-2040,  
 Fax: (+31-70) 340-3016

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## INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2010/046899

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009/183297 A1 (DROSIHN LONNIE [US]) 23 July 2009 (2009-07-23) paragraph [0088]; figure 25 -----	1
X	US 5 799 333 A (MCGARRY JOSEPH D [US] ET AL) 1 September 1998 (1998-09-01) the whole document -----	1-14
X,P	WO 2010/044962 A2 (IMMERSION CORP [US]; GREGORIO PEDRO [CA]) 22 April 2010 (2010-04-22) the whole document -----	1-5,7, 10,14,27
E	WO 2010/141574 A2 (180S INC [US]; PHELPS DEBORAH LYNN [US]; DROSIHN LONNIE [US]) 9 December 2010 (2010-12-09) paragraph [0188]; figure 44 paragraph [0180] -----	1,2,12
Y	US 5 924 137 A (GOLD DANNY [HK]) 20 July 1999 (1999-07-20) figures -----	27

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/046899

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US 5924137	A	20-07-1999	NONE	