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(54) High visibility hand covering

(57) A high visibility hand covering (10), comprising a textile shell (12), a reflective material (50e) incorporated with the textile shell, a reinforcing material (40e) covering at least a portion of the shell; and wherein at least a portion of the reflective material provides relatively high visibility.

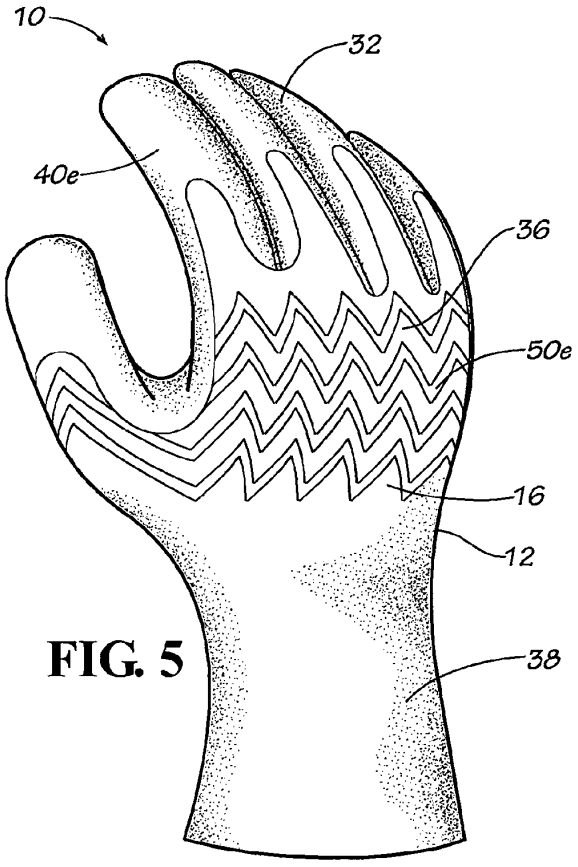

FIG. 5

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Description

BACKGROUND

[0001] The inventive subject matter disclosed herein relates to a high visibility hand covering, and more specifically to a high visibility glove with a coated frontal side.

[0002] In some applications, it is desirable to have hand coverings that are readily visible in dark and low light conditions.

[0003] Leather work gloves, e.g., pigskin leather palm gloves, have been provided with a strip of reflective material across the back of the hand. The reflective strip provides enhanced visibility and safety, e.g., when the wearer is working under dark conditions such as may be encountered by road and construction crews. Typically, the reflective strip is ironed on or sewn on to a non-knitted glove. An example of such a glove with a reflective material across the back of the hand is described in U.S. Patent No. 3,787,897. Gloves with reflective material across the back of the hand are commercially available, e.g., from Kinco International.

[0004] High visibility knitted gloves are also available. For example, Polygenex International, Inc., sells "neon" gloves (available either in "neon" orange or "neon" green) for traffic safety under the trade name "TETRA™." Polygenex International, Inc. also sells "neon" colored gloves that have reflective stripes knit in the glove under the trade name "TETRA-GLO™." In the "TETRA-GLO™" gloves the reflective stripes extend around the palm and back of the hand immediately above and below the thumb, apparently so that the front and back of the wearer's hands will be visible when the wearer is directing traffic. They are sized to be worn alone or over other gloves.

[0005] U.S. Patent No. 5,799,333 to McGarry, et al. (which is assigned to Polygenex International, Inc.) describes a seamless knitted glove and glove liner with a cuff having an ambidextrous (wear on either hand) and universal size made from crimped and textured stretchable continuous filament nylon yarn of four ply of about 70 deniers or less. McGarry, et al. also describes a method of making a seamless knitted glove with a cuff having an ambidextrous and universal size comprising the steps of knitting an eight and a half inch to nine inch glove using crimped and textured stretchable continuous filament nylon yarn of four ply of about 70 deniers or less with a 13 gage knitting machine, heat shrinking the glove to less than seven inches, and heat stretching the glove to about seven inches. The Polygenex gloves, however, have several disadvantages as further discussed below.

[0006] Many hand coverings have been developed. However, none of the prior art hand coverings provide the design versatility and ease of use and manufacturing.

[0007] Accordingly, there is a need for hand coverings including a textile shell with integrated high visibility features and covered with a reinforcement material in an efficient and effective manner.

Summary

[0008] The inventive subject matter offers a solution for these problems by providing a high visibility hand covering according to claim 1, and a method for making a high visibility hand covering according to claim 15.

[0009] A hand covering such as a textile glove has a frontal side and a dorsal/back side. The glove may have (a) a glove body defining fingers, a thumb, a palm region and a back region; (b) a reinforcing material at least partially covering said frontal side; and (c) at least part of said dorsal/back side including a high visibility pattern associated therewith. The glove body may be a knitted glove body. The glove may have a high visibility pattern that includes a reflective thread, for example, a silver thread. In some embodiments, the high visibility pattern may include a high visibility thread having a color selected from neon orange, neon green, and neon yellow, and the body is knitted from a thread of a contrasting color. The high visibility pattern may be knitted in the same manner as the remainder of the glove body. The reinforcing material also may covers a portion of the fingers. The reinforcing material may include a polymeric coating. The reinforcing material may be a material selected from the group consisting of PVC, vinyl, latex rubber, nitrile, and neoprene. The reinforcing material may have a thickness of from about 1 to 5 mm. The reinforcing material may cover one or more fingers on a frontal side of the glove and a portion of a dorsal/back side of the glove. The reinforcing material may comprise a sheet material joined to the glove body. The reinforcing material may be selected from the group consisting of leather, synthetic leather, polymeric films, and canvas. The reinforcing material may be joined to the fabric body by knitting by stitching, adhering, or melt-bonding. The reinforcing material may have two or more layers of the same material or two or more layers of different materials.

[0010] A high visibility hand covering may include a textile shell having a frontal side and a dorsal side, a reinforcing material at least partially covering the frontal side, and at least part of the dorsal side comprising a high visibility pattern. The hand covering may further include one or more finger coverings extending wholly or partially up a finger of a wearer from the shell of the hand covering. The hand covering may further include a high visibility pattern on a cuff of the hand covering and the cuff may be substantially free of reinforcing material.

[0011] A high visibility hand covering may have a textile shell, a reflective material incorporated with the shell, a reinforcing material covering at least a portion of the shell and wherein at least a portion of the reflective material is visible under low light conditions, and/or provides high visibility, or relatively high visibility. The hand covering may have a wrist portion that includes a reflective material without reinforcing material. The textile shell may include knitted thread or woven thread. The reflective material may have reflective fibers and non-reflective fibers knitted into a high-visibility design. The shell may be coated

with one or more layers of reinforcement material. The reinforcement material may be resistant to liquid.

[0012] A method for making a high visibility hand covering includes the steps of knitting a shell of a textile material, providing a high visibility material to at least a portion of the shell, and applying at least one coat of a reinforcing material to at least a portion of the shell. The shell may be dipped in melted reinforcement material, and allowed to cool and dry.

[0013] These and other embodiments are described in more detail in the following detailed descriptions and the figures.

[0014] The foregoing is not intended to be an exhaustive list of embodiments and features of the inventive subject matter. Persons skilled in the art are capable of appreciating other embodiments and features from the following detailed description in conjunction with the drawings.

Brief Description of the Drawings

[0015] The attached figures show embodiments according to the inventive subject matter, unless noted as showing prior art.

FIGS. 1A-C show a simplified view of a first embodiment with respectively a front view, a back view, and a cross-sectional view taken from the top of the middle finger to the bottom of the cuff along a line 1C-1C'.

FIGS. 2A-C show a simplified view of a second embodiment with respectively a front view, a back view, and a cross-sectional view taken from the top of the middle finger to the bottom of the cuff along a line 2C-2C'.

FIGS. 3A-C show a simplified view of a third embodiment with respectively a front view, a back view, and a cross-sectional view taken from the top of the middle finger to the bottom of the cuff along a line 3C-3C'.

FIGS. 4A-C show a simplified view of a fourth embodiment with respectively a front view, a back view, and a cross-sectional view taken from the top of the middle finger to the bottom of the cuff along a line 4C-4C'.

FIG. 5 shows a simplified perspective view of the back of a hand covering with a high visibility pattern according to another embodiment.

FIG. 6 shows a simplified front view of the hand covering of FIG. 5.

Detailed Description

[0016] Representative embodiments according to the inventive subject matter are shown in the attached Figs. 1-6, wherein the same or generally similar features share common reference numerals.

[0017] The inventive subject matter is directed to high visibility hand coverings having an at least partially coated (reinforced) frontal side and a high visibility feature on the dorsal/back side. Examples of such hand coverings may include gloves, mittens, 'lobster claw' looking mitten, fingerless gloves or other types of hand coverings wherein some or all fingers are partially or entirely covered or not covered at all. These gloves have one or more of the following advantages: durability, protecting capability, gripping enhancement, abrasion resistance, liquid (e.g. water) resistance, light weight, breathable, washable, ergonomic, and heat resistance. In addition to the high visibility feature on the dorsal/back side, the gloves may include additional high visibility features on the frontal side and/or on the wrists.

[0018] The term "shell" as used herein refers to an outer covering of a hand, either partially or entirely. The shell may be a flexible covering of knitted or woven threads. Generally, a knitted shell is more stretchy than a woven shell. However, in some embodiments, the shell may also include rigid or semi-rigid sections.

[0019] FIGS. 1-4 show four exemplary embodiments of the inventive subject matter. The figures are divided into four sets by number (1, 2, 3, 4), each set having three parts (A, B, C). Part A shows the front of an exemplary glove. Part B shows the back of an exemplary glove. Part C shows a cross section of an exemplary glove taken from the middle finger to the bottom of the cuff. These figures are meant to be exemplary and are not meant to limit the scope of the invention. These figures will be discussed in more detail in the example section below.

[0020] The figures show a glove 10 that includes a glove body 12 that has a frontal side 14 and a dorsal/back side 16. The glove body 12 may also define fingers 32, a palm 34, a back (section of the hand opposite the palm) 36, and a cuff 38. Reinforcing material 40a, 40b, 40c, 40d (discussed generally as 40) at least partially covers the glove body 12 of the glove 10. A high visibility pattern 50a, 50b, 50c, 50d (discussed generally as 50) is incorporated into the dorsal/back side 16 of the glove 10. In many cases, the cuff 38 is relatively long, so as to extend well beyond the wrist bones of a wearer and protect the wearer's wrist. For example, the cuff 38 may be at least 6 cm long, e.g., 6 to 10 cm long, in an unstretched state.

[0021] It should be noted that the space/gap shown in the figures between the glove 10 and the reinforcing material 40 is only for purposes of representation and is not actually present. In a true depiction the reinforcing material 40 would be attached to the surface of the glove 10 or at least partially permeating the glove body 12 itself.

Glove Body:

[0022] In one possible embodiment, the glove body 12 is a knitted glove body. A knitted glove body may be knitted from yarn. The yarn used to form the glove body 12 may be synthetic yarn, natural yarn, or blend yarns (e.g. poly-cotton blend). Suitable yarns include yarns having one or more of the following features: good durability light weight, breathable, washable, ergonomic, and heat resistance. Examples of yarn may include cotton, wool,

acrylic, nylon, KEVLAR®, KYLON™, or blended yarns such as yarn of 45% wool, 45% nylon, and 10% acrylic.

[0023] In other embodiments, the glove may be partially knitted or have sections of a knitted structure, while other portions of the glove may have a different structure, for example, made of leather or molded plastic materials. Some embodiments may have a padding material incorporated in portions of the glove, for example, at the palm of the glove body or thumb portion.

Reinforcing Material:

[0024] The reinforcing material 40 may be applied, for example, to the palm 34 alone, the fingers 32 alone, the entire frontal side 14 (FIGS. 1A, 1B, and 1C), the frontal side 14 and the sides of the fingers 32, the frontal side 14 and the tips of the backs of the fingers 32 (FIGS. 2A, 2B, and 2C), the frontal side 14 and the lengths of the backs of the fingers 32 (FIGS. 3A, 3B, and 3C), and the frontal side 14 and the dorsal/back side 16 (FIGS. 4A, 4B, and 4C). The sides of the fingers 32 may also be coated. It should be noted that this list is meant to be exemplary and not to limit the scope of the inventive subject matter. The reinforcing material 40 may be a suitable coating. The reinforcing material 40 is selected to provide the glove 10 with desired durability and/or tactile properties for a particular application. For example, the reinforcing material 40 may be selected to resist abrasion during industrial use or use of the glove 10 as a work glove. The reinforcing material 40 may also be selected to provide the wearer with good gripping, e.g., of smooth or wet surfaces. In some instances, the reinforcing material 40 may provide the coated portions of the glove 10 with liquid (e.g. water) resistance. Depending on the particular reinforcing material 40 and the glove's intended use, the reinforcing material 40 may have a thickness of approximately 1 to 5 mm. This thickness is meant to be exemplary and is not meant to limit the scope of the inventive subject matter. Suitable reinforcing materials 40 include, for example, polymeric (of or relating to or consisting of a polymer) materials, PVC, vinyl, latex rubber, nitrile, and neoprene coatings and other materials having at least one of the characteristics described herein.

[0025] The glove 10 may be dip coated, spray coated, or coated using any other suitable technique. One possible embodiment uses a reinforcing material 40 that is applied by dipping at least part of the glove body 12 into a melted coating and then allowing the coated glove 10 to cool and to dry, the glove body 12 would have to be able to withstand temperatures suitable to keep the reinforcing material 40 in liquid form. Natural and blend yarns are generally excellent choices for withstanding such heat. Nylons and other yarns that melt when heated would not be suitable for such an embodiment. It should be noted that the Polygenex International, Inc. "TETRA-GLO™" glove is made from a nylon knit that most likely would not be able to withstand such temperatures.

[0026] In other embodiments, a reinforcing sheet material may be applied to at least part of the frontal side 14 of the glove 10. Suitable sheet materials have sufficient durability to protect the palm and fingers of the glove 10 in the intended application.

[0027] In some implementations, the sheet material also provides tactile properties such as gripping, as discussed above. The sheet material may be sewn or glued on, melt bonded, or joined to the glove 10 body using any suitable technique. It should be noted that the reinforcing material 40 may be clear or at least partially "see-through." This would be particularly suitable for embodiments in which the high visibility pattern 50 is also on the frontal side 14 of the glove 10.

[0028] In further possible embodiments, the hand covering may have one or more layers of reinforcing material. For example, a glove may have several layers of a melted coating material that are applied by repeated steps of dipping the glove body into the melted coating material and allowing the glove body to cool and dry in between dipping. In other embodiments, the hand covering may include several layers of reinforcing material that are a combination of different materials. For example, by dipping the glove body into a first melted coating material, allowing the glove body to cool and dry, and subsequently repeating the process with a second melted coating material. In further embodiments, the layers may cover different portions of the hand covering and overlap with each other partially.

[0029] The reinforcing material 40 allows the user to wear the glove 10 as he works with his hands on dirty, messy, wet, or heavy duty projects. This is a significant distinction from the Polygenex International, Inc. gloves that are primarily used for traffic safety. The Polygenex gloves, because they are made of unprotected knitted yarn would have to be cleaned if they became dirty or messy - whereas the inventive subject matter could simply be wiped clean because the reinforcing material 40 would resist dirt. Also, because the Polygenex gloves are made of unprotected knitted yarn, they would quickly become wet, causing the user to remove the gloves and defeat the gloves' safety purposes. Gloves 10 would resist getting wet because the reinforcing material 40 may be liquid (e.g. water) resistant. Finally, the Polygenex gloves are simply not suitable for heavy duty use. They would quickly become worn and/or torn if used for abrasive heavy-duty applications. In the advertising for the "TETRA-GLO™" glove it suggests that the "TETRA-GLO™" glove be worn over other gloves (that most likely would be suitable for heavy duty use). The inventive subject matter can be used on its own for heavy duty projects.

High Visibility Pattern:

[0030] The back 36 includes a high visibility pattern 50. The pattern may be, for example, stripes, zig-zags, waves, signage (e.g. "STOP," "SLOW," or "DANGER"), a plurality of dots, a solid pattern, or any other pattern.

[0031] The high visibility pattern 50 may cover a suffi-

cient amount of the surface area of the back 36, so as to make the dorsal/back side 16 of the glove readily visible under low light conditions. In some cases, the pattern may be configured to make the glove visible from a distance. However, in many applications it will only be necessary for the glove to be visible to the wearer, e.g., if the wearer is working inside a machine. In such cases it is only necessary that the pattern be visible at arm's length, typically about 1 meter. In some embodiments, the glove body includes at least 5% of the high visibility yarns.

[0032] The yarn used to form pattern 50 may be reflective. For example, the yarns may have a coefficient of retroreflection (R_A) of at least 300 when measured at an entrance angle of-4.0" and an observation angle of 0.2", and at least 200 when measured at an entrance angle of +5.0" and an observation angle of 0.33, according to ASTM E809 and E810. Suitable yarns include those commercially available from 3M under the tradename SCOTCHLITE® Reflective Material Yarns. Suitable yarns typically have an elongation of less than 100%, for example less than 70%.

[0033] Moreover, while some embodiments may have a pattern 50 that is formed of a reflective yarn, other embodiments may have reflective threads replaced by, or combined with, other types of high visibility yarn or thread that are non-reflective or that exhibit less reflectivity. For example, the high visibility pattern may include silver yarn and/or one or more yarns of neon colors, e.g., orange, green and/or yellow. In this case the yarn(s) forming the body of the glove may have a contrasting color.

[0034] The pattern 50 may be knitted using the same stitch as the remainder of the glove body, which is advantageous for ease of manufacturing, or may be knitted using a different stitch if desired.

[0035] Generally, if reflective yarns are used, the glove will contain less than about 40% reflective yarn, to provide a relatively low cost product. However, if desired, the glove can contain a high percentage of high visibility yarn, e.g., about 80% or more.

[0036] The high visibility yarns generally exhibit low or no electrical conductivity. However, even if electrically conductive yarns are used as the high visibility yarns, they are typically used in sufficiently low amounts so that the glove itself does not exhibit significant electrical conductivity.

[0037] It should be noted that in other embodiments the high visibility pattern 50 may be incorporated into the glove using alternative methods including, but not limited to sewing the high visibility pattern 50 to the glove 10, or heat transferring the high visibility pattern 50 to the glove 10.

[0038] It should be noted that if the high visibility pattern 50 is on the frontal side 14 of the glove 10, the high visibility pattern 50 may be three-dimensional (e.g. raised or lowered) to enhance the gripping properties of the glove 10.

Examples:

[0039] FIGS. 1A, 1B, and 1C show a first exemplary embodiment of a glove according to the inventive subject matter. In this embodiment only the frontal side 14 (shown as the fingers 32, the palm 34, and the cuff 38, but could be the fingers 32 alone or the palm 34 alone) has reinforcing material 40a thereon. In this embodiment only the dorsal/back side 16 has a high visibility pattern 50a (shown as stripes).

[0040] FIGS. 2A, 2B, and 2C show a second exemplary embodiment of a glove according to inventive subject matter. In this embodiment the frontal side 14 (shown as the fingers 32 and the palm 34, but could be the fingers 32 alone or the palm 34 alone) has reinforcing material 40b thereon. Also, the tips of the fingers on the dorsal/back side 16 are shown as having reinforcing material 40b thereon. In this embodiment both the dorsal/back side 16 and the frontal side 14 have a high visibility pattern 50b (shown as zig-zags or waves). In this embodiment the reinforcing material 40b may be clear or at least partially "see-through" such that the high visibility pattern 50b on the frontal side 14 of the glove 10 is visible.

[0041] FIGS. 3A, 3B, and 3C show a third exemplary embodiment of a glove according to the inventive subject matter. In this embodiment the frontal side 14 (shown as the fingers 32 and the palm 34, but could be the fingers 32 alone or the palm 34 alone) has reinforcing material 40c thereon. Also, the lengths of the fingers on the dorsal/back side 16 are shown as having reinforcing material 40c thereon. In this embodiment only the dorsal/back side 16 has a high visibility pattern 50c (shown as the word "STOP").

[0042] FIGS. 4A, 4B, and 4C show a fourth exemplary embodiment of a glove according to the inventive subject matter. In this embodiment the frontal side 14 (shown as the fingers 32, the palm 34, and the cuff 38, but could be the fingers 32 alone or the palm 34 alone) and the dorsal/back side 16 (shown as the fingers 32, the back 36, and the cuff 38) have reinforcing material 40a thereon. In this embodiment both the dorsal/back side 16 and the frontal side 14 have a high visibility pattern 50d (shown as dots). In this embodiment the reinforcing material 40d may be clear or at least partially "see-through" such that the high visibility pattern 50d on the frontal side 14 of the glove 10 is visible.

[0043] FIGS. 5 and 6 show a fifth exemplary embodiment of a hand covering according to the inventive subject matter. In this embodiment, the front side 34 and part of the back side 16 have a reinforcing material extending partially over the sides of fingers 32 to the back/dorsal side of the fingers 32. The back side of the glove and part of the thumb are exposed to show a high visibility pattern 50e. The high visibility pattern is in the form of zig-zag lines extending over the back side of the glove and some of the zig-zag lines extending to part of the thumb.

[0044] Persons skilled in the art will recognize that

many modifications and variations are possible in the details, materials, and arrangements of the parts and actions which have been described and illustrated in order to explain the nature of the inventive subject matter, and that such modifications and variations do not depart from the spirit and scope of the teachings and claims contained therein.

[0045] All patent and non-patent literature cited herein is hereby incorporated by references in its entirety for all purposes.

Claims

1. A high visibility hand covering, comprising:

a textile shell;
a reflective material incorporated with the textile shell;
a reinforcing material covering at least a portion of the shell; and
wherein at least a portion of the reflective material provides relatively high visibility.

2. The hand covering of claim 1, wherein the hand covering is a glove having a frontal side and a dorsal/back side, and the textile shell is a textile glove body defining fingers, a thumb, a palm region and a back region.

3. The hand covering of claim 2, said glove comprising a reinforcing material at least partially covering said frontal side and at least part of said dorsal/back side including a high visibility pattern associated therewith.

4. The hand covering of claim 1 wherein said glove body is a knitted glove body.

5. The hand covering of claim 1 wherein the high visibility pattern includes a reflective thread or a silver thread.

6. The hand covering of claim 1 wherein the high visibility pattern includes a high visibility thread having a color selected from neon orange, neon green, and neon yellow, and the body is knitted from a thread of a contrasting color.

7. The hand covering of claim 1 wherein the reinforcing material also covers a portion of the fingers.

8. The hand covering of claim 1 wherein the reinforcing material comprises a polymeric coating.

9. The glove of claim 1 wherein the reinforcing material is a material selected from the group consisting of PVC, vinyl, latex rubber, nitrile, neoprene, leather, synthetic leather, polymeric films, and canvas.

10. The glove of claim 1 wherein the reinforcing material covers one or more fingers on a frontal side of the glove and a portion of a dorsal/back side of the glove.

11. The glove of claim 1 wherein the reinforcing material comprises a sheet material joined to the glove body.

12. The glove of claim 1 wherein the reinforcing material is joined to the fabric body by knitting by stitching, adhering, or melt-bonding.

13. The hand covering of claim 1 further comprising a wrist portion that includes a reflective material without reinforcing material.

14. The hand covering of claim 1 wherein the shell is coated with one or more layers of reinforcement material.

15. Method for making a high visibility hand covering by knitting a shell of a textile material, providing a high visibility material to at least a portion of the shell, and applying at least one coat of a reinforcing material to at least a portion of the shell.

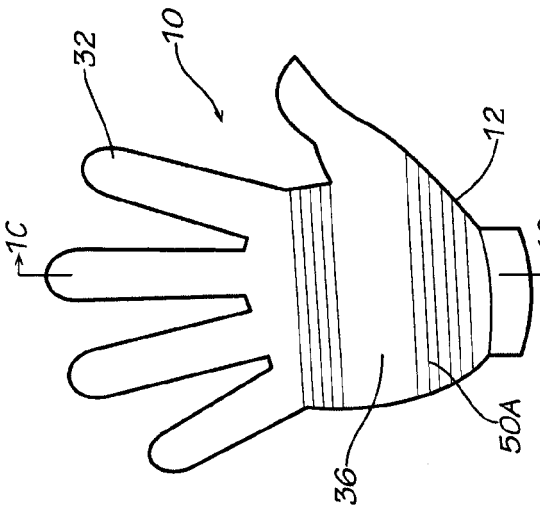

FIG. 1B

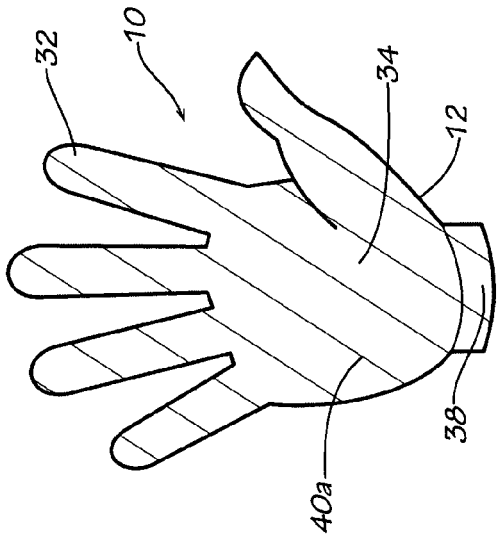

FIG. 1A

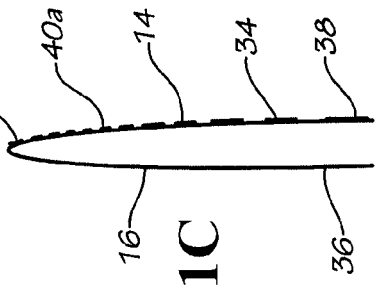

FIG. 1C

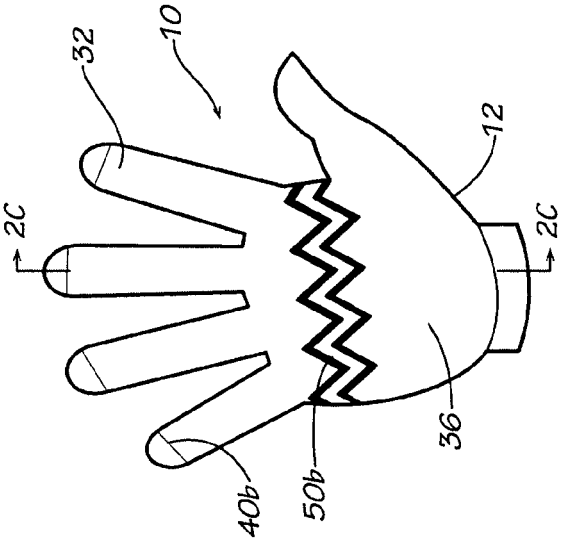

FIG. 2B

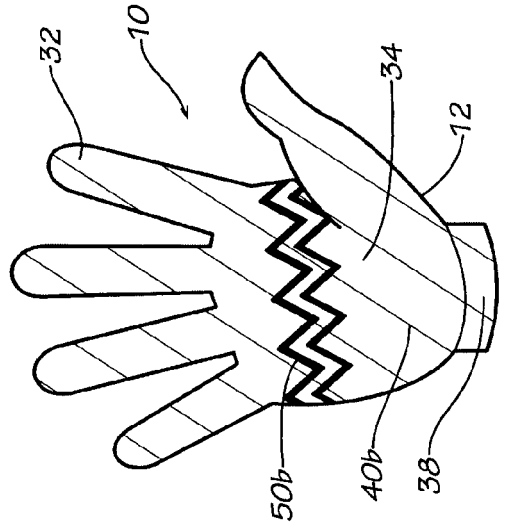

FIG. 2A

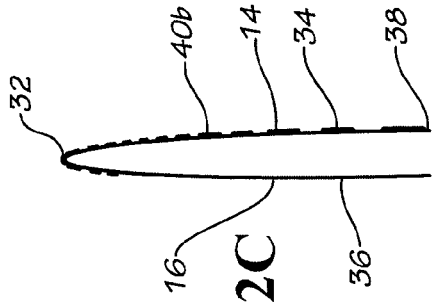

FIG. 2C

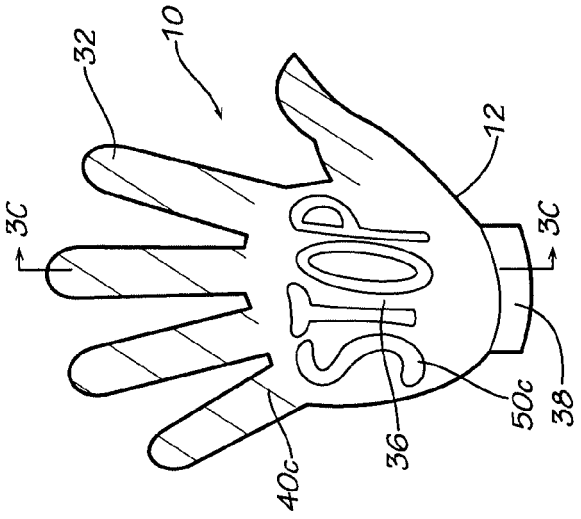

FIG. 3B

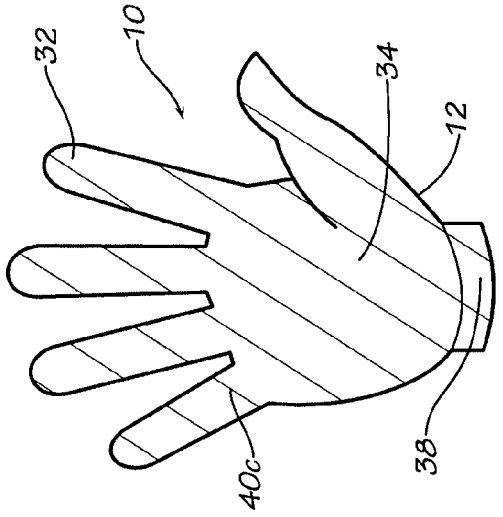

FIG. 3A

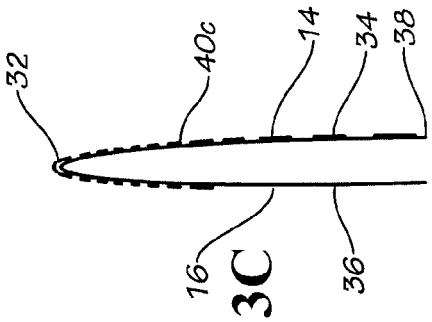

FIG. 3C

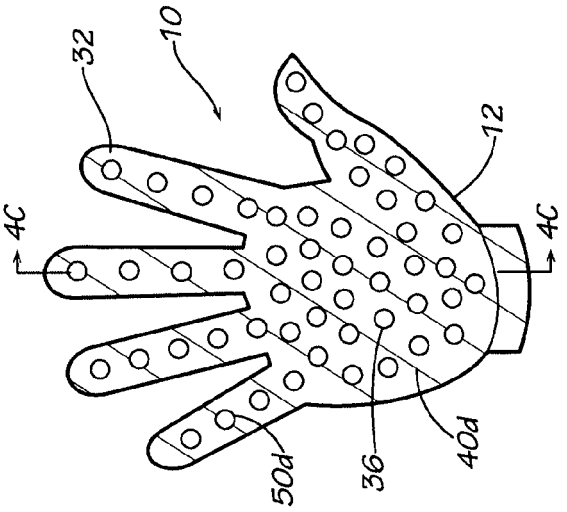

FIG. 4B

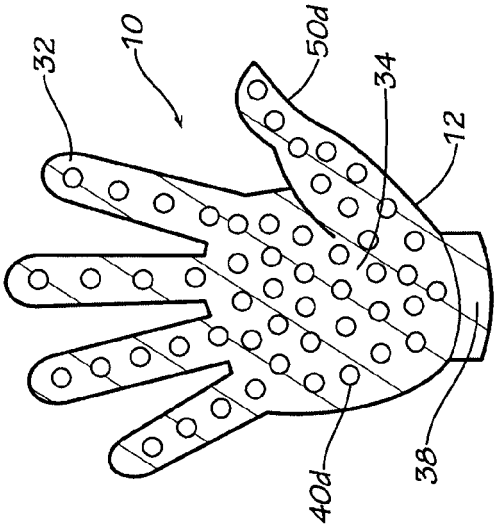

FIG. 4A

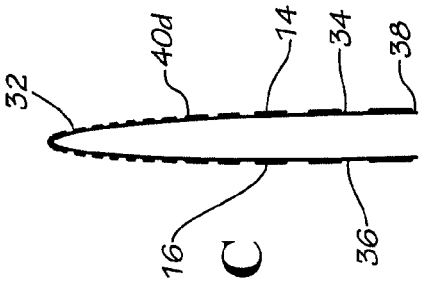

FIG. 4C

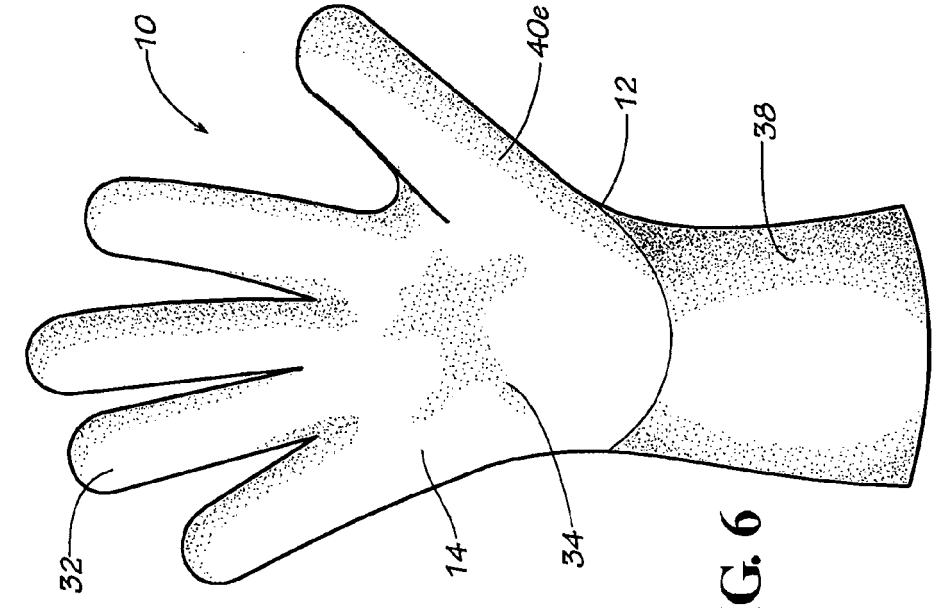

FIG. 6

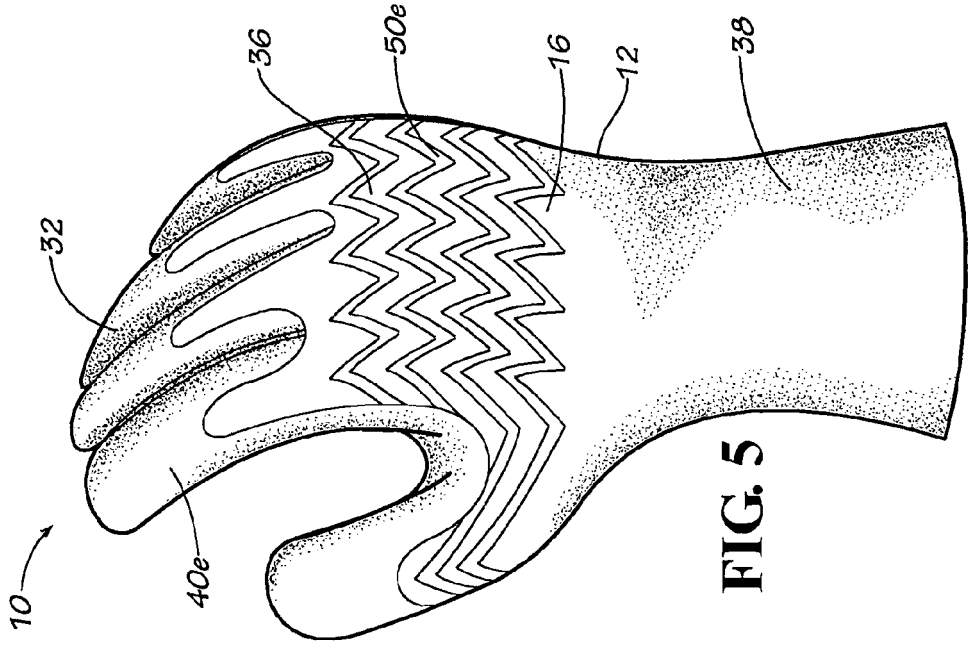

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 12 00 7661

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Place of search	Date of completion of the search	Examiner
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