



US 20100186139A1

(19) **United States**
(12) **Patent Application Publication**
KURTZ

(10) **Pub. No.: US 2010/0186139 A1**
(43) **Pub. Date: Jul. 29, 2010**

(54) **MITTEN**

(30) **Foreign Application Priority Data**

(76) Inventor: **Nicola Jowett KURTZ**, London
(GB)

Jan. 26, 2009 (GB) 0901252.7
Jun. 19, 2009 (GB) 0910684.0

Publication Classification

Correspondence Address:
INTELLECTUAL PROPERTY GROUP
FREDRIKSON & BYRON, P.A.
200 SOUTH SIXTH STREET, SUITE 4000
MINNEAPOLIS, MN 55402 (US)

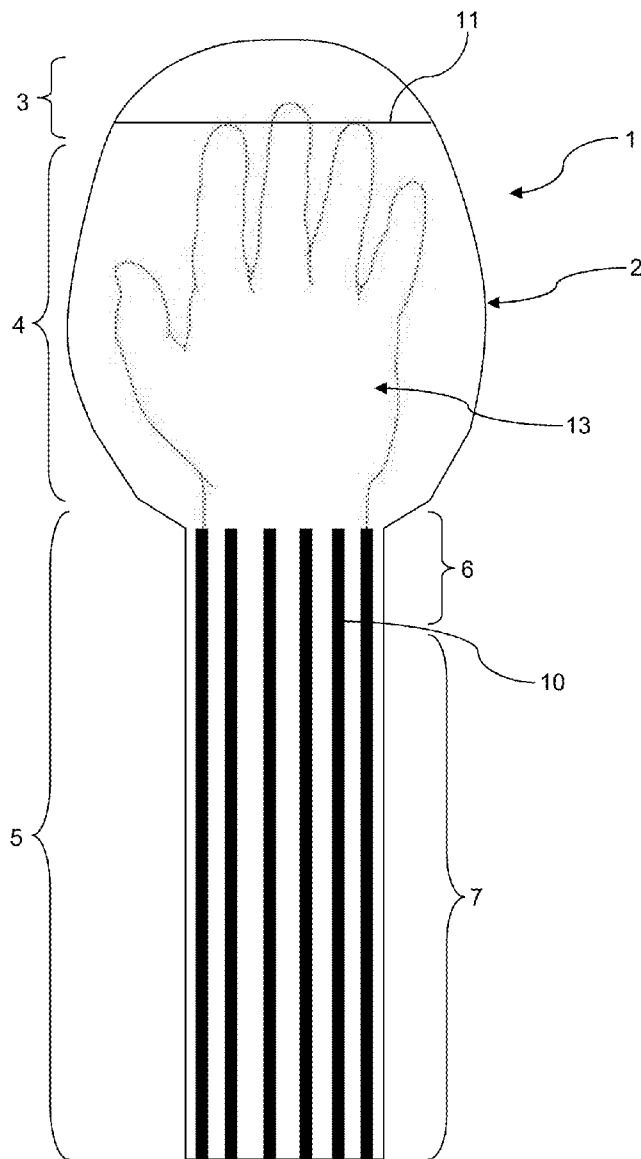
(51) **Int. Cl.**
A41D 19/01 (2006.01)
(52) **U.S. Cl.** **2/158**

(57) **ABSTRACT**

A thumb-less mitten comprising an elastic seamless tube of knitted fabric, having a first end section at which the tube is closed, a hand section and a second end section at which the tube is open, the sections being integrally formed; wherein the second end section comprises a first portion which has a smaller lateral extent than the hand section.

(21) Appl. No.: **12/693,895**

(22) Filed: **Jan. 26, 2010**



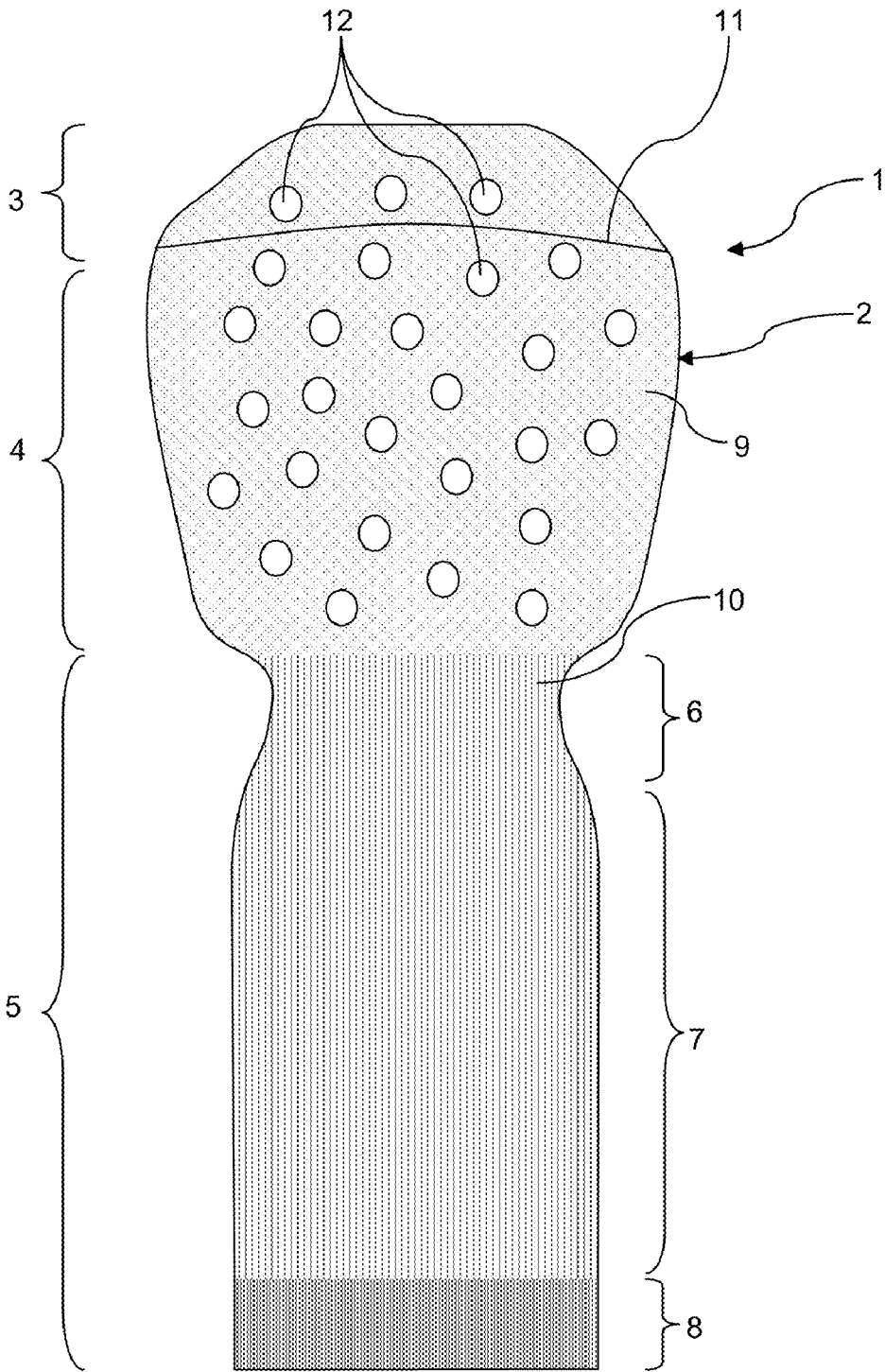


Figure 1

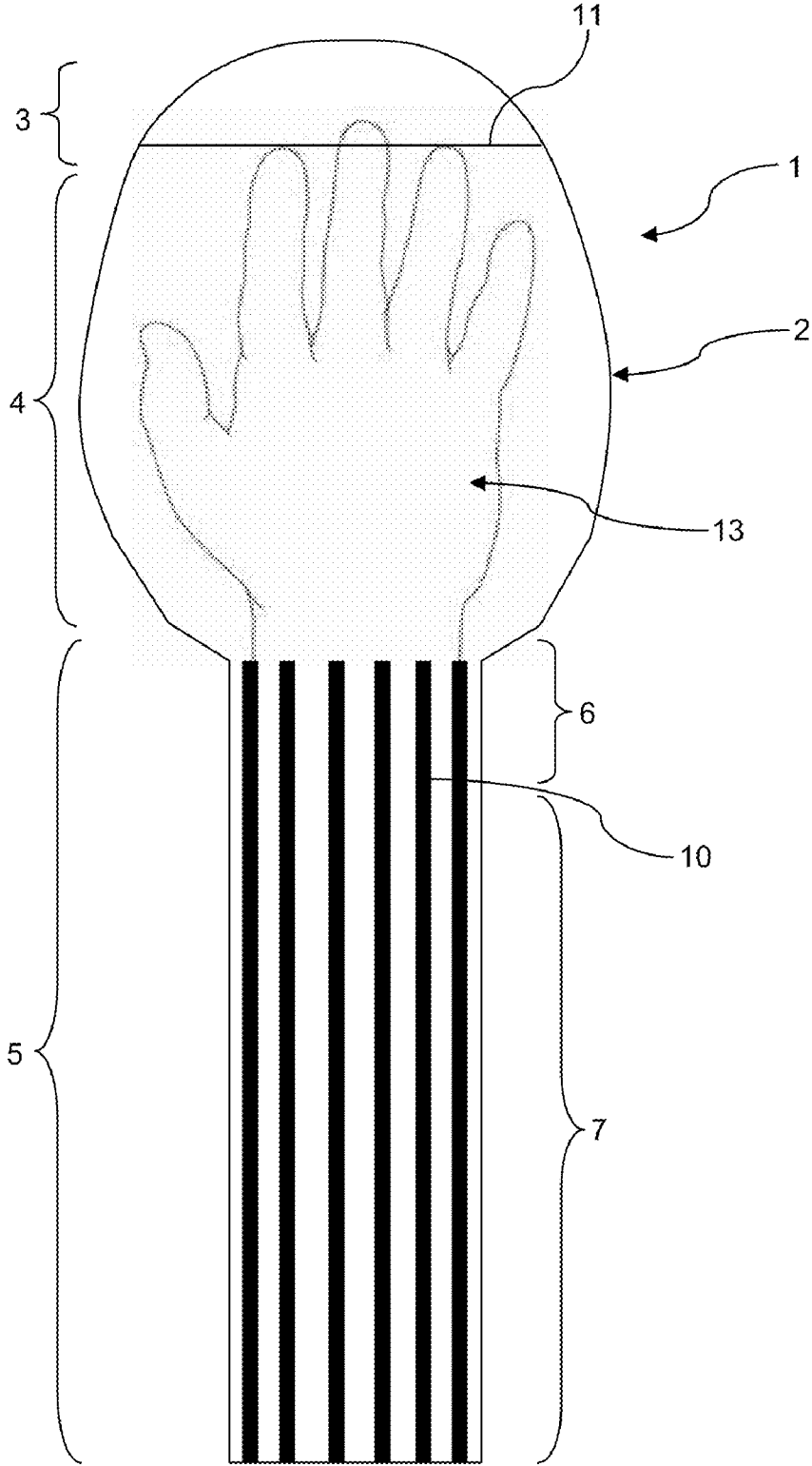


Figure 2

MITTEN

BACKGROUND

[0001] The present invention relates to mittens, in particular to mittens not having a separate thumb section—“thumb-less mittens”, especially to thumb-less mittens that are suitable for children. More particularly, the invention relates to thumb-less mittens made from fabric in a seamless tube.

[0002] The problem with traditional hand-wear (e.g. mittens and gloves), especially those designed for children or for users who are incapable of putting mittens or gloves on by themselves, is that it is often very difficult to fit the hand-wear on the user. This can be on account of several factors, including a difficulty in getting the hand into the opening of the hand-wear and a difficulty in getting the correct digits (i.e. fingers and thumbs) in the correct portion of the hand-wear; such difficulties are exacerbated in young child users who are often unwilling to co-operate with the person who is fitting the glove on them.

[0003] The problem of fitting the hand-wear is made even worse by the fact that it is often very easy for the user to remove the glove. In other words, whilst it is difficult to get the hand-wear on the user, it is easy for the user to pull them off. In the case of a child, the problem is that both gloves and mittens are difficult put on a child, but the child finds them easy to get off.

[0004] Thus, there is a need for a hand-wear article which overcomes the problems of traditional hand-wear as set out above.

[0005] U.S. Pat. No. 6,058,509 (Was) describes a fingerless garment made from a fleece material (specifically Polarfleece®). The garment is formed by stitching together two halves, both of which are made from the same material over their whole extent. The material and construction of the disclosed garment would not satisfactorily overcome the problems outlined above. In particular, because the material used to construct the garment has a relatively low stretchability/elasticity, the narrowest portion of the garment (i.e. the portion around the wrist when in use) must be sufficiently wide to allow the widest dimension of a user's hand to pass through. Thus, once the user's hand has been inserted into the garment, it will be easy for the user to pull or shake off the mitten. In addition, the relatively low stretchability/elasticity of the fabric requires the opening of the garment (i.e. the arm and upper wrist portion) to be flared and have a plurality of slits, in order that the opening is large enough for a third party to fit the garment on the hand of a user (e.g. a child). Another problem, which follows from the construction of the disclosed garment, is that there is a seam running around its entire periphery. This would be uncomfortable for a user, and could cause rubbing and irritation; this is of great importance when the user of the garment is a child: such discomfort could prompt the child to attempt to remove the garment.

STATEMENT OF INVENTION

[0006] The invention in its various aspects is defined in the independent claims below, to which reference may now be made. Advantageous features are set forth in the appendant claims.

[0007] According to the present invention there is provided a thumb-less mitten made from a seamless tube of knitted fabric, comprising a first end section at which the tube is closed, a hand section and a second end section at which the

tube is open, the sections being integrally formed; wherein the second end section comprises a first portion which has a smaller lateral extent than the hand section. The seamless tube of knitted fabric may be elastic. The first portion may be sufficiently elastic such that it may be elastically stretched to a lateral extent which is larger than the largest width of the hand section (e.g. larger than the largest width of a user's hand).

[0008] This solves the problems associated with garments of the prior art for several reasons as detailed below. The thumb-less design of the mitten presents an advantage in the ease with which the mitten may be fitted on a user, particularly where that user is a child. The removal of a separate thumb portion means the user need not be persuaded to place the correct digit in the correct portion, meaning correct orientation of the hand in the mitten is made easier. Further, the lack of a thumb portion renders it more difficult for a user to pull off the mitten once it has been fitted. Firstly, although the mitten of the present invention provides sufficient dexterity for gripping objects (e.g. using a clenched fist grip), the dimensions of the hand section, coupled to the lack of a thumb portion, mean that gripping one gloved hand with the other and removing the mittens is made less easy. Secondly, with conventional gloves/mittens having a thumb portion, the user (especially a child user) often attempts to remove the glove/mitten by using the thumb portion as a tag to pull on, for example by placing the thumb portion in the user's mouth and moving the hand away from the mouth; the lack of a thumb portion in the present invention removes this possibility of removal, thereby making it harder to remove the mitten. In addition, the mitten does not have a right or wrong hand (i.e. the mitten can be worn equally on either hand), further increasing the ease of fitting for a young child user.

[0009] The mitten is constructed from a seamless tube (i.e. a continuous tube) of knitted fabric, preferably a seamless tube (i.e. a continuous tube) of a loop pile lined knitted fabric (e.g. a terry fabric, or terry cloth). The seamless tube may comprise a single layer. A seam running around the entire periphery of the mitten (for example as in U.S. Pat. No. 6,058,509) is not required, which greatly increases the comfort for the user: such a long seam could cause irritation for the user, which in the case of the child could prompt the child to attempt to remove the mitten. In addition, due to the continuous tube construction, when fitted the mitten creates a single uninterrupted airspace comprising both the hand and the arm; in other words, because the hand section and second end section (i.e. arm section) are integrally formed, no seam is required, and there is therefore no seam (i.e. protruding portion) to interfere with air flow within the mitten. Accordingly, warmth generated by body heat emanating from the arm can circulate and travel to the hand section, thereby providing additional warmth to the hand (which would otherwise be more likely to become cold). This object is obtaining particularly when the tube is loop pile lined.

[0010] The mitten comprises a first end section at which the tube is closed, e.g. by a single, optionally straight, recessed seam; a hand section, which is large enough to accommodate the hand of a user; and a second end section at which the mitten is open. The second end section is preferably the same length as, or longer than, the hand section of the mitten; thus, the mitten is difficult to shake off. Such a construction, wherein the second end section is the equal or greater in length than the hand section is particularly useful in keeping the mitten on a user once fitted—even if an attempt is made by

the user (e.g. a child) to pull the mitten off, the length of the second end section makes it much harder for the user to remove the mitten completely. This is especially the case where the whole second end section has a smaller lateral extent than the hand section as discussed below.

[0011] The sections are integrally formed, which means that no join is required between the sections, and hence no potentially irritating seam is present between the various sections, in particular between the hand section and the second end section. Additionally, a one-piece construction is advantageous from a cost, durability and comfort perspective. Two piece constructions require additional manufacturing steps (hence increasing costs), and leave a seam around a circumference of the mitten, which could decrease durability and cause discomfort to a user; the present invention may overcome such disadvantages.

[0012] The hand section may be of a generally round shape in profile (i.e. a round area for the hand), which increases the ease with which the mitten is fitted.

[0013] The second end section comprises a first portion which, when the mitten is in its natural unstretched state (i.e. prior to being fitted on a user), is narrower than the hand section, preferably narrower than the maximum width of a user's hand. This can be achieved, for example, by using a different stitch/weave in the second end section to that used in the hand section, by using a different yarn/thread composition in each section, or by using a combination of both of these means. Such techniques allow for the unstretched diameter (i.e. the relaxed diameter of the tube) to be varied along the length of the mitten (e.g. without the need for an internal seam around the periphery of the mitten).

[0014] When a mitten of the present invention is worn by a user, and the mitten's dimensions are designed for the user's hand and arm size, it will be appreciated that the user's hand will fit in the hand section (possibly with fingers extending into the closed first end section), the user's arm will be positioned in second end section (the second end section could be called an "arm section"), and the first portion of the second end section will be positioned approximately around the user's wrist (the first portion could be called a "wrist section").

[0015] The second end section may comprise a first portion which is knitted using a stitch pattern that has a greater tendency to contract laterally than the stitch pattern with which the hand section is knitted, such that the first portion adopts a first relaxed configuration having a smaller lateral extent than the hand section. The term "stitch pattern" refers to the repeating sequence of stitches (e.g. 1 knit, 1 purl) used to knit a particular portion/section of the mitten, as would be well known to one skilled in the art. Preferably the first portion is knitted using a stitch pattern having longitudinal ribbing, for example mock rib, for example 3x1 mock rib. The hand section may, on the other hand, be plain knit. The ribbing in the first portion of the second end section may have a tendency to contract laterally, such that the ribbed first portion of the tube is narrower than the hand section when in an unstretched (i.e. relaxed) state. Such a ribbed stitch may be particularly advantageous because it may still be stretched to a maximum width that is approximately equal to the maximum stretched width of the hand section, despite starting from a smaller width.

[0016] The first portion of the second end section may in addition or alternatively comprise a different material composition to that used in the hand section. The first portion of

the second end section may be knitted from a material which has a higher elasticity than the material from which the hand section is knitted, such that the first portion adopts a first relaxed configuration having a smaller lateral extent than the hand section. The first portion may contain a greater proportion of a material with a higher elasticity than the other materials used in mitten, when compared to the hand section. For example, the first portion of the second end section may contain a greater proportion of elastane than the hand section. The first portion may contain, for example, between 0-25% of elastane, preferably between 2-10% elastane, preferably between 4-8% elastane, preferably 6% elastane. The hand section may also contain elastane, but preferably in a proportion which is less than that contained in the first portion of the second end section.

[0017] The use of such knitting techniques and materials provides very satisfactory results in the finished article. Such knitting techniques also allow the finished article to have only a single layer construction. This maintains a good degree of dexterity and comfort for the user, by preventing shearing between layers that can occur with a dual (or multi-) layer construction.

[0018] Preferably, when the mitten is in its natural unstretched state (i.e. prior to being fitted on a user), the whole or entire second end section is narrower than the hand section, preferably narrower than the widest part of a user's hand. This can be achieved by extending the same or similar weaves/materials as described above for the first portion to the whole of the second end section.

[0019] Preferably, the first portion of the second end section is immediately adjacent to the hand section (such that it is positioned approximately around the wrist of a user when the mitten is fitted). Preferably the first portion is narrower than the remainder of the second end section. This can be achieved using combinations of the techniques and materials described above; for example the first portion could contain more elastane than the remainder of the second end section, or the first portion could be knitted with a weave that has a greater tendency to contract than the remainder of the second end section. Alternatively, or in addition, the first portion may be knitted in a tighter quality than the remainder of the second end section.

[0020] Such tightening around the first (wrist) portion ensures the hand section remains in place. Further, the first (wrist) portion is particularly stressed during use (e.g. as it is liable to be stretched and contracted more times than other parts of the mitten). Thus, it is particularly advantageous if this portion does not loosen during wear, as this could allow the hand to move out of the hand section, causing uncomfortable restriction of hand movement, and also creating a space at the first end section which could be chewed and also pulled off when grasped in the mouth. Such action could cause the hand section and first end section to become less securely fitting on account of it being stretched during normal wearing. For these reasons it is preferably for the first portion to be narrower than the remainder of the second end section. A mitten having these features may display increased the longevity, durability and comfort of the mitten.

[0021] The mitten is easy to fit on the hand of a user: the material from which the mitten is made, along with the weave that is employed in the first portion (and second end section), provides the first portion with sufficient stretchability (and elasticity) such that it may be stretched to a diameter which is larger than the maximum width of a user's hand. Thus, the

hand may easily be inserted into the hand section. Preferably, due to the specific stretchability (and elasticity) of the arm section (i.e. the second end section including the first portion and end portion), it is possible for two adult hands to gather up the arm section and pull it over the hand of a user (e.g. a child). Subsequently, when the mitten is released, the mitten (in particular the second end section) will then contract to fit snugly over the arm/forearm of the user. This makes it easier to put the mitten on the user/wearer. Once the mitten has been fitted on a user, the first portion will tend to contract back to its natural/relaxed diameter (on account of its elasticity). This relaxed diameter is smaller than the maximum diameter of the hand of a user. Thus, the mitten will be retained on the user since the mitten cannot be removed without stretching of the first portion, which requires some effort. Preferably, the first portion is narrower than the wrist/arm of a user. In this case, after fitting the mitten, the first portion will contract around the wrist/arm of the user, gripping the arm and helping to retain the mitten. Preferably, the entire second end section is narrower than the hand section, such that after the mitten is fitted, the whole second end section will contract around the wrist/arm of a user, thereby gripping on the wrist/arm and preventing the mitten being removed without substantial effort.

[0022] Thus, mittens of the present invention require little skill or effort to put on, and will be suitably retained on the user until sufficient effort is imparted to remove them.

[0023] The second end section may also comprise an end portion, positioned at the open end of the mitten, which is integrally formed with the second end section (i.e. no seam is required to join the various parts of the second end section). The end portion of the second end section is preferably a turnover portion, as is known in the art, and is preferably not terry fabric (i.e. it is preferably not loop pile lined). Preferably, the end portion is of a different stitch pattern/weave or of a different material than the rest of the second end section. For example, the end portion of the second end section may be a 1×1 mock rib turnover, whereas the rest of the second end section may be a different stitch pattern/weave, e.g. a 3×1 mock rib turnover. Having a turnover portion at the open end of the mitten is particularly advantageous as it prevents fraying at the end of the tube and provides a neat and durable finish. The stitch pattern/weave of the end portion may also be chosen to be more or less elasticated than the rest of the second end section, as is desired.

[0024] The end portion of the second end section may serve several advantageous purposes. The end portion may be knitted to have increased elasticity and strength (e.g. using the techniques described above); this is particularly important as the end portion may receive the most stress during wearing and putting on. An end portion of a different stitch pattern/weave, material, and/or having a turnover, may therefore increase the durability of the mitten and reduce distortion of the mitten itself which may occur during wearing. Further, an end portion of greater elasticity may increase the amount with which the end portion grips the arm, thus improving the ability of the mitten to stay in place on the arm in the desired location.

[0025] The end portion may have a smooth finish at the open end of the mitten, for example by using a turnover (e.g. such that the inside of the end portion is smoother than the terry loops inside the rest of the second end section). This may increase the comfort of the mittens on the user, for example by reducing rolling up or ridding up of the open edge of the

mitten, and also creating a smoother profile when a coat or sleeve is being pulled over it. The smooth finish to the open end of mitten reduces the likelihood of it catching or snagging on things, thereby increasing comfort and durability of the mitten.

[0026] The mitten may also include written information (e.g. a brand name) woven into its fabric. Preferably such writing may be incorporated in the end portion of the second end section.

[0027] Thumb-less mittens of the present invention may be made from a continuous tube of knitted fabric, preferably a continuous tube of loop pile lined fabric (e.g. terry fabric). Such continuous knitted tubes can be manufactured using processes well known in the art, for example by circular knitting (e.g. on circular or double-pointed needles), preferably using a modern industrial knitting machine. Thumb-less mittens of the present invention may be made, for example, on a standard SanGiacomo Lintoe machine.

[0028] Various textile materials can be used in conjunction with the present invention, for example yarns and threads of various materials. The materials may be natural, such as wool (e.g. sheep wool), cotton or the like, man made, such as elastane, polyester, acrylic, nylon or the like, or a combination of more than one of these materials. Preferably, the material is a blend of wool (preferably merino wool) and acrylic, preferably in the ratio of wool:acrylic of between 2:1 to 1:2, preferably in a ratio of 1:1, optionally with other components such as nylon and elastane. Such a material provides good warmth and durability to the finished garment, as well as allowing a high level of comfort for the user. Preferably, the overall composition of the mitten is 0-50% (preferably 42%) merino wool, 0-50% (preferably 42%) acrylic, 0-25% (preferably 12%) nylon (polyamide) and 0-25% (preferably 4%) elastane. As previously described, the composition may vary along the length of the tube making up the mitten (e.g. so all the elastane is located in the second end section, with none in the hand section or first end section). For example, the hand section and first end section may have a composition of 44% merino wool, 44% acrylic and 12% nylon; the second end section may have a composition of 41% merino wool, 41% acrylic, 12% nylon and 6% elastane. Preferably, the material from which the mitten is made is not a fleece material (e.g. is not a polyester fleece material).

[0029] According to one aspect of the present invention, the mitten has one or more elements disposed thereon, preferably disposed at least on the hand section and/or first end section of the mitten. Preferably the elements are made from a polymer material, such as a plastics material (e.g. PVC), or the like. Other suitable polymer/plastics materials would be known to those skilled in the art. In the present specification, the term “a polymer material such as a plastics material or the like” is intended to include silicone (which advantageously includes no phthalate) and other such materials. Preferably the elements are disposed on both sides of the first end section and hand section, such that the “ambidextrous” nature of the mittens is retained. Preferably the elements are made of silicone. Preferably the one or more elements are a plurality of silicone dots. The elements may be applied using methods and techniques known in the art.

[0030] The one or more elements may provide the mitten with a pleasing aesthetic appearance—an important consideration in children’s clothing—and the elements may be in the form of a pattern (either individually, e.g. as individual snow flakes, or together forming a larger pattern). The ele-

ments may be in a variety of colours, using techniques well known in the art (e.g. including dyes in the polymer/plastics material). Where the elements are silicone elements, the dye may be a non-water-based dye.

[0031] Preferably, the elements may also provide an enhanced grip for a user of the mittens. For example, the element material may be chosen to have a ‘tacky’ feel to aid such grip: silicone is particularly advantageous in this respect. Further, the plurality of spots may provide a further important advantage, namely that they may help to reduce pilling of the knitted fabric making up the mitten, and may also reduce the pull-through of loops which make up the knitted fabric. The elements may therefore increase the durability of the mittens, and maintain a tidy visual appearance throughout the life of the mittens. Thus, although it will be appreciated that the precise number and positioning of the elements is not critical, there will preferably be sufficient coverage of the hand section by the elements to provide a reasonable increase of grip to the user and protection to the surface from pilling and snagging, preferably on both sides of the mitten.

[0032] According to a further aspect of the present invention, the one or more elements may be made of a material which is reflective to light—for example a reflective component (e.g. a reflective dye) may be included in the material from which the elements are made. The elements may be made of silicone which has been impregnated with a fluorescent or luminescent dye, in particular a non-water-based dye. This can increase the visibility of a user of the gloves, which is particularly advantageous when the user is a child, for example to make the child user more visible to car drivers or similar. Alternatively, or in addition, the mittens may be knitted with a material (e.g. wool) which includes a reflective, fluorescent, or luminescent dye.

[0033] In a further aspect of the present invention, the open end of the mitten may have some silicone or rubber on the inside edge. This can prevent the second end section, in particular the forearm section, from riding down the arm when being worn.

[0034] The present invention provides several further advantages in addition to those outlined above. The mitten of the present invention provides the arm of a user with additional insulation. The single unit for the hand means it is easy to get on and keeps the hand warm, while the stretch of the fabric allows for movement of the hand and fingers and thumb. In addition, the construction of the present invention leads to several advantages (in addition to those previously described) which may not have previously been realised: (i) the lack of separate finger/thumb sections means that the surface area of the mitten is reduced, thereby reducing heat loss; (ii) there are no double section of fabric (as would occur at any regular seam or where a section folds back on another section—e.g. a thumb section onto the palm of the hand), and thus the fabric of the mitten can be thicker without the usual resulting loss of movement or discomfort caused by increased bulk at doubled sections. The mitten can therefore be made of a thicker and possibly more insulating fabric without the usual resulting discomfort that comes with increased bulk; (iii) the lack of a thumb section can reduce the likelihood of thumbs being bent back during a fall.

[0035] It will be appreciated that although the present invention has been described with reference to a thumb-less mitten, it would be possible to apply some of the techniques described herein to mittens having a separate thumb portion.

Such mittens would benefit from many of the advantages described herein, although would be more difficult to put on (because the correct digits would need to be inserted in the correct portions). The applicant therefore currently prefers to use thumb-less mitten designs, particularly when the mittens are designed for children, especially young children.

[0036] Throughout this specification, “children” refers to a young human being below the age of full physical development, e.g. below the age of 10, and in particular to toddlers (i.e. young children who are just beginning to walk), e.g. below the age of 5, 4, 3 or 2.

[0037] The terms “radial”, “lateral”, and “longitudinal” relate to the tube of material which makes up the mitten of the present invention. The tube of material can be broadly described as having a longitudinal axis, running through the centre of the tube (i.e. from the open end of the mitten to the closed end of the mitten); thus a “longitudinal direction” refers to a direction approximately parallel to this longitudinal axis. The terms “radial direction” and “lateral direction” refer to directions which are approximately perpendicular to the longitudinal axis. Thus a radial or lateral expansion of a portion of the mitten refers to the tube being stretched from having a smaller diameter or circumference, to having a larger diameter or circumference. The term “lateral extent” refers to the size of the mitten in a direction perpendicular to the longitudinal axis; it is approximately equivalent in meaning to the width of the mitten or the narrowness of the mitten. Further, if the tube is held in a broadly cylindrical configuration (e.g. approximately as the second end section is when fitted around the arm of a user), the term “lateral extent” is approximately equivalent in meaning to the circumference of the tube. This also applies in relation to the hand section.

[0038] The term “stretchable” and “stretchability” refers to the ease with which the fabric making up the mitten can be stretched (i.e. increased in length); this is related, in an inverse relationship, to the elastic resistance of the fabric to a deforming force imparted on the fabric. A number of factors may influence the stretchability of a fabric, including the material from which the fabric is made, and the particular weave used to make the fabric. The terms “elasticity” and “elasticated” have their normal meanings and refer to the tendency of a body or material to return to its original shape after it has been stretched or compressed. A material with a higher elasticity will have a greater tendency to return to its original shape after it has been stretched. “Elastically stretched” means that the mitten (or portion thereof) is subjected to a deforming force that stretches the mitten (or portion thereof) to a point within its elastic limit, such that it returns to its original shape once the deforming force is removed.

[0039] The degree of ribbing may be denoted in the form “ $n \times m$ ” (e.g. 1×1 or 3×1) as is well known in the art. A fabric with $n \times m$ standard ribbing has a repeating pattern of n knit stitches, followed by m purl stitches.

BRIEF DESCRIPTION OF THE FIGURES

[0040] The invention will now be described in more detail, by way of example, with reference to the drawings, in which:

[0041] FIG. 1 is a plan view of a thumb-less mitten embodying the present invention;

[0042] FIG. 2 is a sectional view through a thumb-less mitten embodying the present invention, in which the mitten has been fitted on the hand of a user;

DETAILED DESCRIPTION

[0043] FIG. 1 shows a thumb-less mitten 1 is made from a seamless tube of knitted fabric 2. The mitten 1 comprises a

first end section 3 at which the tube 2 is closed by a recessed and flat seam 11. The seam 11 is a lintoe seam which uses nylon thread. Immediately next to the first end section 3, the mitten 1 has a hand section 4, which is designed to accommodate the hand of a user. It will be appreciated that the user's hand (e.g. the ends of their fingers) can also be partially positioned in the first end section 3. The first end section 3 and the hand section 4 are both made of a plain knit terry fabric, with the terry loops (not shown) facing the interior of the mitten 1; the material is plain knit on 24 gauge (112 needle machine). The first end section 3 and hand section 4 are knitted from a material which is a blend of merino wool, acrylic and nylon (polyamide), for example approximately in the following amounts: 44% merino wool, 44% acrylic and 12% nylon.

[0044] The mitten 1 further has a second end section 5, at the end of which the tube 2 is open. The second end section 5 is immediately adjacent to and integrally formed with the hand section 4. The second end section 5 has a first (wrist) portion 6 adjacent to the hand section 4, a second (arm) portion 7 and a third (end) portion 8. The wrist portion 6 and the arm portion 7 are both made of terry fabric, knitted to a 3x1 mock rib pattern, with the terry loops again facing the interior of the mitten 1. The ribs 10 are illustrated on the figure. The end portion 8 is a turnover (i.e. the end of the tube 2 is folded inside itself and sewn), knitted to a 1x1 mock rib pattern; it is not made of terry fabric. The entire second end section 5 is knitted from a material which is a blend of merino wool, acrylic, nylon (polyamide) and elastane, for example approximately in the following amounts: 41% merino wool, 41% acrylic, 12% nylon and 6% elastane.

[0045] The second end section 5 is narrower than the hand section 4 when both sections are in their relaxed states. This is as a result of the different weaves of the second end section 5 and hand section 4, and also because the second end section 5 comprises elastane. The second end section 5 is therefore more elasticated and has a tendency to contract laterally (i.e. in a radial direction), thus making the knitted tube 2 in the second end section 5 narrower than the knitted tube 2 in the hand section 4. The weave and composition of the second end section 5 is also more stretchable than the hand section 4, such that the second end section 5, stretched to a maximum, can have the same diameter as the hand section 4 when it is stretched to its maximum. The wrist portion 6 is made of the same weave as the arm portion 7, and has the same composition of material. However, the wrist portion 6 is narrower in its relaxed state than the arm portion 7; this is because the wrist portion 6 is knitted in tighter quality than the arm portion 7, which causes the wrist portion 6 to have an even greater tendency to contract than the arm portion 7.

[0046] The hand section 4 and first end section 3 are wide and long enough to accommodate the hand of a user (i.e. the mitten 1 can be made in different sizes for different users—e.g. for different age ranges of children). The second end section 5 is designed to be, in its relaxed (i.e. unstretched) configuration, narrower than the width of a user's hand, and have preferably approximately the same or narrower diameter than the diameter of a user's wrist and arm. The wrist portion 6 is narrower than the remainder of the second end section 5, and is designed to be narrower in diameter than the diameter of a user's wrist, such that the wrist portion 6 is stretched laterally away from its relaxed configuration when the mitten

1 is fitted on the user. The wrist portion can, however, stretch sufficiently to allow easy access to the hand section 4 for the user's hand.

[0047] Thus, the mitten 1 may be fitted on a user, with the user's hand in the hand section 4 and first end section 3. The second end section 5 is designed to fit on the arm of a user, and may therefore extend such that it reaches up to the elbow, or even further up a user's arm. The second end section 5, for example, has a length equal to or greater than the hand section 4.

[0048] The mitten 1 may be easily fitted on a user, for example because the second end section 5 can be stretched sufficiently to be greater in diameter than the largest width of a user's hand. Further, because there are no separate sections for individual digits (e.g. no thumb, and no fingers), the mittens 1 are very easy to fit on a user.

[0049] Once fitted on a user, the diameter of the second end section 5 (e.g. the diameter of the wrist portion 6 and arm portion 7) relative to the diameter of the user's arm, wrist and the width of their hand, mean that the mitten 1 is retained satisfactorily on the user. This is in part because with the mitten 1 fitted on the user, the second end section 5 (in particular the wrist portion 6) will be in a stretched configuration, and will tend to contract around the arm and wrist (because of its elasticity), thereby gripping the user's arm and wrist and retaining the mitten 1. Further, in order for the mitten 1 to be removed, the second end section 5 would have to be stretched further to pass over the widest part of the user's hand. Thus removing the mitten 1 is more difficult.

[0050] All parts of the mitten 1 are integrally formed and make up the tube of knitted fabric, although different weaves are present along the length of the mitten 1. The mitten 1 has, for example, the following overall composition: 42% merino wool, 42% acrylic, 12% nylon and 4% elastane.

[0051] The mitten 1 comprises a plurality of elements (spots or dots) 12 on the hand and end sections, which are made of silicone. The exact position of these spots 12 is not of critical importance and they are shown in FIG. 1 for illustrative purposes. Preferably the elements are positioned to avoid the seam 11.

[0052] FIG. 2 shows a thumb-less mitten 1 which has a round area 3,4 for the hand comprising a hand section 4 and an end section 3, which is easy to get on. The figure shows a faint image of a hand 13 to show the positioning of the mitten 1 on the hand 13 and arm.

[0053] The long, more elasticated section 5 from wrist to elbow means the mitten 1 stays on even with the most vigorous shaking. The lack of side or joining seams means there is much less irritation and the item is a continuous construction, smoothly forming to the arm and hand.

[0054] The mitten 1 is made from a continuous knitted loop pile lined tube 2. The loop pile stretchy tube 2 fabric is cushioned and terry loop lined (not shown).

[0055] The area 3,4 into which the hand goes has a minimal seam 11 just below the top on one side that seals the tube 2. The seam 11 is a recessed flat seam and is on one side of the mitten 1 only.

[0056] Not having a right/wrong or left/right reduces the time and fussing involved. The lack of finger separation keeps the hand and fingers in the same areas and reduces heat loss.

[0057] The construction is circular and therefore there is no right or wrong way around or right or left mitten—though they do come as a “pair”.

[0058] The entire piece **1** is made of the same construction though of a different weave (as shown at **10** and **9**). The wrist section **5** is ribbed **10** and is more elasticated and so fits along the arm up to or over the elbow joint. This ensures that the item stays on without additional fastenings or openings. In other words, the section **5** is ribbed **10** and is elasticated more strongly than the hand section **4** to keep the tube snug to the arm.

[0059] The section **5** from the wrist up the arm is longer than the length of the area **3,4** into which the hand goes. There is no seam joining the hand section **4** and the arm section **5**; thus, there are seamless transitions between different type of ribbed weave **10** for the wrist section **5**.

[0060] The open end of the mitten **1** (at the end of the wrist section **5**) reaches approximately up to the inside elbow bend of the arm of a user when worn.

[0061] The thumb-less mitten shown in FIG. **1** comes in pairs; they are the same back, front and sides with the exception of the recessed seam **11**. They do not create any separation for the fingers, thumb or hand **13** when worn but good movement is possible because of the fabric, being of a continuous knitted loop pile lined tube construction **2**. The length of the wrist section **5** is at least the length of the area **3,4** for the hand.

[0062] The following numbered paragraphs disclose further aspects of the present invention:

[0063] 1. A thumb-less mitten made from continuous knitted loop pile lined fabric.

[0064] 2. A thumb-less mitten with the wrist section the same or greater length as the hand section.

[0065] 3. A thumb-less mitten that can be worn on either hand.

[0066] 4. A thumb-less mitten with a long elasticated wrist section that fits snugly to the arm without additional fastenings or openings.

[0067] 5. A thumb-less mitten that is put on and removed by the stretching of the fabric without additional fastenings or openings.

[0068] 6. A thumb-less mitten that has only a single seam near the top of the hand section that seals the tube.

1. A thumb-less mitten comprising an elastic seamless tube of knitted fabric, having a first end section at which the tube is closed, a hand section and a second end section at which the tube is open, the sections being integrally formed;

wherein the second end section comprises a first portion which has a smaller lateral extent than the hand section.

2. A thumb-less mitten according to claim **1**, wherein the first portion is sufficiently elastic such that it may be elastically stretched to a lateral extent which is larger than the largest width of the hand section.

3. A thumb-less mitten according to claim **1**, wherein the whole second end section has a smaller lateral extent than the hand section.

4. A thumb-less mitten according to claim **1**, wherein the second end section is as long as or longer than the hand section.

5. A thumb-less mitten according to claim **4**, wherein the second end section is as long as or longer than the combined length of the hand section and first end section.

6. A thumb-less mitten according to claim **1**, wherein the first portion of the second end section is knitted using a stitch pattern that has a greater tendency to contract laterally than the stitch pattern with which the hand section is knitted, such

that the first portion adopts a first relaxed configuration having a smaller lateral extent than the hand section.

7. A thumb-less mitten according to claim **6**, wherein the first portion of the second end section is knitted using a stitch pattern having longitudinal ribbing.

8. A thumb-less mitten according to claim **6**, wherein the first portion of the second end section is knitted using a 3×1 mock rib stitch pattern.

9. A thumb-less mitten according to claim **6**, wherein the whole second end section is knitted in a stitch pattern that has a greater tendency to contract laterally than the stitch pattern with which the hand section is knitted, such that the whole second end section adopts a first relaxed configuration having a smaller lateral extent than the hand section.

10. A thumb-less mitten according to claim **1**, wherein the first portion of second end section has a smaller lateral extent than the rest of the second end section.

11. A thumb-less mitten according to claim **10**, wherein the first portion of the second end section is knitted in a tighter quality than the rest of the second end section.

12. A thumb-less mitten according to claim **1**, wherein the first portion of the second end section is knitted from a material which has a higher elasticity than the material from which the hand section is knitted, such that the first portion adopts a first relaxed configuration having a smaller lateral extent than the hand section.

13. A thumb-less mitten according to claim **1**, wherein the first portion of the second end section is made of a material which has a higher proportion of elastane than the hand section.

14. A thumb-less mitten according to claim **13**, wherein the first portion of the second end section comprises between 4-8% elastane and wherein the hand section comprises no elastane.

15. A thumb-less mitten according to claim **12**, wherein the whole second end section is knitted from a material which has a higher elasticity than the material from which the hand section is knitted, such that the whole second end section adopts a first relaxed configuration having a smaller lateral extent than the hand section.

16. A thumb-less mitten according to claim **1**, wherein the first portion of the second end section is immediately adjacent to the hand section.

17. A thumb-less mitten according to claim **1**, wherein the first portion of the second end section is more stretchable in a lateral direction than the hand section.

18. A thumb-less mitten according to claim **1**, wherein the knitted fabric is knitted loop pile lined fabric.

19. A thumb-less mitten according to claim **1**, wherein the material from which the mitten is knitted comprises wool and acrylic in a ratio of wool:acrylic of between 2:1 to 1:2.

20. A thumb-less mitten according to claim **19**, wherein the material further comprises nylon.

21. A thumb-less mitten according to claim **1**, wherein the second end section is sufficiently long to extend up the arm of a user for which the mitten is designed, to reach at least the elbow of that user.

22. A thumb-less mitten according to claim **1**, wherein the mitten has one or more elements disposed on its outer surface.

23. A thumb-less mitten according to claim **22**, wherein the one or more elements are made of a polymer material such as a plastics material or the like.

24. A thumb-less mitten according to claim **23**, wherein the one or more elements are made of silicone or PVC.

25. A thumb-less mitten according to claim **22**, wherein the one or more elements are made from a material that comprises a substance which is highly reflective to light.

26. A thumb-less mitten according to claim **22**, wherein the one or more elements are made from a material that comprises a fluorescent or luminescent substance.

27. A thumb-less mitten comprising a seamless tube of knitted fabric, having a first end section at which the tube is closed, a hand section and a second end section at which the tube is open, the sections being integrally formed;

wherein the mitten has one or more elements made of a polymer material such as a plastics material or the like disposed on its outer surface.

28. A thumb-less mitten according to claim **27**, wherein the one or more elements are made of silicone or PVC.

29. A thumb-less mitten according to claim **27**, wherein the one or more elements are made from a material that comprises a substance which is highly reflective to light.

30. A thumb-less mitten according to claim **27**, wherein the one or more elements are made from a material that comprises a fluorescent or luminescent substance.

31. A thumb-less mitten according to claim **27**, wherein the seamless tube of knitted fabric is an elastic seamless tube of knitted fabric.

* * * * *