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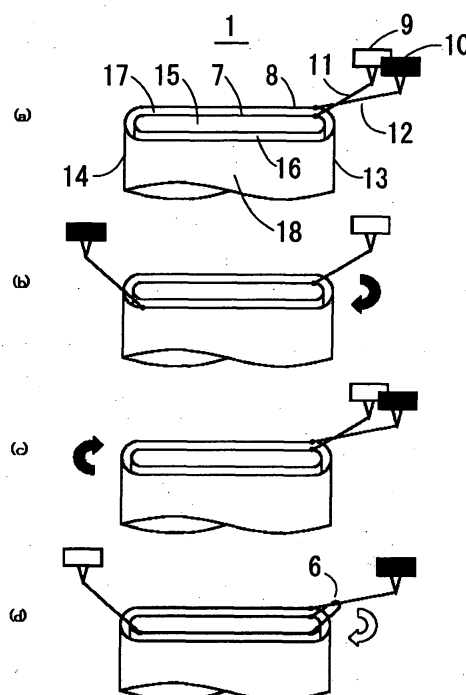
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(54) **END-CONNECTING METHOD FOR DOUBLY-CYLINDRICAL FABRIC**

(57) The present invention aims to join together the inner and outer knitted fabrics of the double-faced tubular knitted fabric at the ends, using interlacement between the knitting yarns, not using the sewing process. When the double-faced tubular knitted fabric 1 consisting of two tubular parts is knitted, using the yarn feeder 9 for feeding the knitting yarn 11 to the inner tubular part 7 and the yarn feeder 10, positioned at one side of the yarn feeder 9 with respect to the front-back direction, for feeding the knitting yarn 12 to the outer tubular part 8, the step of knitting in such a manner that the knitting yarn 12 extending from the knitting fabric of the outer tubular part 8 to the yarn feeder 10 can pass over and intersect with the knitting yarn 11 extending from the knitted fabric of the inner tubular part 7 to the yarn feeder 9 at the one end 13 of the double-faced tubular knitted fabric 1 and then the inner tubular part 7 is knitted to thereby form the interlaced part 6 at the one end 13 and the step of knitting in such a manner that when passing across the knitting needles of the front and back needle beds, the knitting yarn 12 of the outer tubular part 8 can pass over and intersects with the knitting yarn 11 extending from the knitted fabric of the inner tubular part 7 to the yarn feeder 9 at the other end 14 of the double-faced tubular knitted fabric 1 and then the inner tubular part 7 is knitted, to thereby form the interlaced part 6 at the other end 14 are repeated in a desired combination.

Fig. 3



Description

Technical Field

[0001] The present invention relates to a joining method for joining together inner and outer knitted fabrics of two tubular knitted fabrics at the ends.

Background Art

[0002] A glove, a sock and the like of two tubular knitted fabrics which is worn in a layer is known from for example Patent Citation 1. Patent Citation 1 shows an example of a sock of two tubular knitted fabrics, according to which after the two tubular knitted fabrics are knitted from toes of one tubular knitted fabric to toes of the other tubular knitted fabric so that they can be continuous to each other at the foot insertion openings, the one tubular knitted fabric on the inner side is folded into the other tubular knitted fabric on the outer side, for wearing in a layer. This double-faced tubular knitted fabric can allow the use of various types of knitting yarns for the inner and outer knitted fabrics, as well as can of course be used as a reversible knitted fabric. For instance, a thermal yarn or a soft-touch yarn is used for the inner side, while a fancy yarn, a stab-proof yarn, or a suitable-for-coating yarn can be used for the outer side.

Patent Citation 1: Japanese Unexamined Patent Publication No. Hei 11-323608

Disclosure of the Invention

Technical Problem

[0003] The double-faced tubular knitted fabric described above has a drawback that when wearing, slippage may occur between the inner knitted fabric and the outer knitted fabric so that a wearer may feel uncomfortable. When this double-faced tubular knitted fabric is used as a working glove and the like, such slippage may provide a safety problem depending on the use environment. The inner and outer knitted fabrics may be joined together by sewing, but such provides cost increase associated with the sewing process, as well as stretch reduction at the sewn parts.

[0004] The present invention aims to join together the inner and outer knitted fabrics of the double-faced tubular knitted fabric at the ends, using interlacement between the knitting yarns, not using the sewing process.

Technical Solution

[0005] The present invention provides a knitting method for knitting a double-faced tubular knitted fabric using a flatbed knitting machine comprising at least a pair of front and back needle beds, which are arranged to extend transversely and opposite to each other with respect to

a front-back direction to allow loop transfer between the needle beds, and yarn guide rails which are arranged over the needle beds and arranged in parallel with respect to the front-back direction and via which a first yarn feeder and a second yarn feeder positioned at one side of the first yarn feeder with respect to the front-back direction are slidably supported, wherein the double-faced tubular knitted fabric has an inner tubular part which is knitted circularly with a first knitting yarn fed from the first yarn feeder and an outer tubular part which is knitted circularly with a second knitting yarn fed from the second yarn feeder, the inner tubular part and the outer tubular part being joined to each other at the ends with respect to a knitting width, and wherein the double-faced tubular knitted fabric is knitted with one of a knitted fabric of the inner tubular part and a knitted fabric of the outer tubular part associated to one of the front needle bed and the back needle bed and with the other of the knitted fabric of the inner tubular part and the knitted fabric of the outer tubular part associated with the other of the front needle bed and the back needle bed, the method comprising:

- (1) the step of knitting the inner tubular part to one end of the double-faced tubular knitted fabric, starting at the one end, using the first yarn feeder,
- (2) the step of knitting the other knitted fabric of the outer tubular part to the one end, subsequently to the step 1, using the second yarn feeder,
- (3) the step of knitting the inner tubular part to the other end, subsequently to the step 2, to intersect the first knitting yarn and the second knitting yarn with each other so that an interlaced part is formed at the one end,
- (4) the step of knitting the inner tubular part to the other end of the double-faced tubular knitted fabric, starting at the other end, using the first yarn feeder,
- (5) the step of knitting the other knitted fabric of the outer tubular part to the one end, subsequently to the step 4, using the second yarn feeder,
- (6) the step of knitting the inner tubular part to the one end, subsequently to the step 5, to intersect the first knitting yarn and the second knitting yarn with each other so that the interlaced part is formed at the other end, and
- (7) the step of repeating the knitting of the steps 1 to 3 and the knitting of the steps 4 to 6 in a desired combination so that the interlaced parts are formed at both ends of the double-faced tubular knitted fabric with respect to the knitting width.

[0006] The present invention provides a double-faced tubular knitted fabric knitted using a general type of flatbed knitting machine comprising at least a pair of front and back needle beds arranged to extend transversely and opposite to each other with respect to a front-back direction, wherein its inner tubular part and outer tubular part are joined to each other at both ends of the double-

faced tubular knitted fabric via an interlaced part at which a knitting yarn of the inner tubular part comes out on an outside surface of the outer tubular part.

[0007] The present invention provides a double-faced tubular knitted fabric, wherein an inside surface of the inner tubular part and the outside surface of the outer tubular part are both formed from front stitches.

Advantageous Effects

[0008] According to the knitting method of the present invention, when the inner tubular part and the outer tubular part are formed with the knitting yarns fed from different yarn feeders, respectively, to form the double-faced tubular knitted fabric, the interlaced parts which are formed with the knitting yarn of the inner tubular part and the knitting yarn of the outer tubular part are formed at one end of the double-faced tubular knitted fabric and the other end of the same, and the both tubular parts are joined together via the interlaced parts. Therefore, slippage between the both tubular parts that may occur when wearing can be prevented without any sewing process. Also, the interlaced part is formed at the end of the inner tubular part, with the knitting yarn of the outer tubular part encompassed within the knitting yarn passing across the front and back needle loops. Therefore, the knitting yarns are not fixed to each other, so that the stretch reduction can be prevented.

[0009] In the double-faced tubular knitted fabric of the present invention, the interlaced parts are cyclically formed at both ends of the knitted fabrics, and the inner tubular part and the outer tubular part are joined to each other via the interlaced parts. Also, the knitting yarn of the inner tubular part comes out on the outside surface of the outer tubular part at the interlaced parts. Therefore, the slippage between the both tubular parts that may occur when wearing can be prevented and also a stitch-like embroidery design that can allow the tubular knitted fabric to be stretched in the direction of wale via the interlaced parts cyclically formed can be obtained.

[0010] In the double-faced tubular knitted fabric of the present invention, since the inside surface of the inner tubular part and the outside surface of the outer tubular part are both formed from the front stitches, the double-faced tubular knitted fabric can be made attractive in that a front-stitch pattern always appears on the front and back knitted fabrics whose texture is different in color, design and so on.

Brief description of drawings

[0011]

[Fig.1] Fig. 1 is a schematic view showing an external appearance of a glove formed by the knitting method of the present invention,

[Fig.2] FIG. 2 shows diagrams showing the schematic steps of the knitting method of an embodiment of

the present invention,

[Fig.3] FIG. 3 shows schematic views showing the process for forming interlacement by the knitting method of the present invention, and

[Fig.4] FIG. 4 shows schematic views showing the process for forming interlacement by the knitting method of the present invention.

Explanation of References

[0012]

1	Double-faced tubular knitted fabric
6	Interlaced part
7	Inner tubular part
8	Outer tubular part
9, 10	Yarn feeder
11, 12	Knitting yarn
13	One end
14	Other end
15	Inside surface of inner tubular part
16	Outside surface of inner tubular part
17	Inside surface of outer tubular part
18	Outside surface of outer tubular part
20'	Glove

Best Mode for Carrying out the Invention

[0013] Next, an embodiment of the present invention is described in detail with reference to the accompanying drawings. In the embodiment illustrated below, the double-faced tubular knitted fabric, whose inner tubular part and outer tubular part are joined to each other at the ends, is knitted using a flatbed knitting machine comprising at least a pair of front and back needle beds, which are arranged to extend transversely and opposite to each other with respect to a front-back direction to allow loop transfer between the needle beds, and yarn guide rails which are arranged over the needle beds and arranged in parallel with respect to the front-back direction and via which yarn feeders are slidably supported.

[0014] The tubular knitted fabrics are obtained in the method in which the knitted fabrics which are associated to the front and back needle beds respectively are knitted so that they can be joined to each other at the ends with respect to the knitting width, while the knitting yarns are fed around between the front and back needle beds. Some tubular knitted fabrics, such as for example sweaters, have to be knitted to include a knitting pattern which is called a rib at the hem and the cuffs. The knitting pattern of rib comprising front stitches and back stitches is knitted using both the front needle bed and the back needle bed. In order for the knitted fabric of the tubular knitted fabric which is associated to one of the front and back needle beds to be knitted without trouble using both of the front needle bed and the back needle bed, the knitted fabric of the tubular knitted fabric which is associated to the other of the front and back needle beds must be held

during this knitting process. Likewise, when knitted double, as in the illustrated embodiment, the tubular knitted fabric must be retracted properly by transferring the loops, in order not to interrupt the knitting.

[0015] Fig. 1 is a schematic view showing an external appearance of a glove 20 obtained by the knitting method of the embodiment. The glove 20 includes five fingers (2a, 2b, 2c, 2d, 2e), a four-finger trunk 3, a five-finger trunk 4, and a wrist 5, each being formed as the double-faced tubular knitted fabric. As the glove 20 can be knitted in the same manner as the known glove is, except that each of the parts of the glove is formed as the double-faced tubular knitted fabric, the explanation of all the processes is omitted here. The each of the parts of the glove 20 has interlaced parts 6 cyclically formed at both ends thereof, providing a stitch-like embroidery design.

[0016] Fig. 2 shows diagrams showing the schematic steps of the knitting method of the embodiment. With reference to FIG. 2, description is given on the knitting of the double-faced tubular knitted fabric 1 of the illustrated embodiment of which inside surface 15 of the inner tubular part and outside surface 18 of the outer tubular part are both formed from front stitches. The numerals on the left side of the drawing figure indicate the number of processes, and alphabets F and B indicate the front needle bed and the back needle bed, respectively. Square symbols indicate loops of the inner tubular part 7, and round symbols indicate loops of the outer tubular part 8. It is added on the loops that white circles and square symbols indicate that the loops are in the state of being held by the knitting needles of the needle bed. Black circles and square symbols indicate newly formed loops. Arrows indicate loop transference between the front and back needle beds. White triangular symbols and black triangular symbols indicate a yarn feeder 9 (first yarn feeder) for feeding the knitting yarn 11 (first knitting yarn) to the inner tubular part 7 and a yarn feeder 10 (second yarn feeder) for feeding the knitting yarn 12 (second knitting yarn) to the outer tubular part 8, respectively. The yarn feeder 10 is supported by the yarn guide rail placed anterior to the yarn feeder 9.

[0017] Fig. 3(a)-(d) and Fig. 4(e)-(f) show schematic views showing stepwise the processes for interlacement between the knitting yarn 11 used for knitting the inner tubular part 7 and the knitting yarn 12 used for knitting the outer tubular part 8. To facilitate understanding, illustration of the needle beds is omitted, while the double-faced tubular knitted fabric is illustrated to be formed in three dimensions by the inner tubular part 7 and the outer tubular part 8. For like reasons, illustration of the loop transference process on the knitting of the inner tubular part 7 is also omitted.

[0018] In the following, the knitting process of the double-faced tubular knitted fabric according to the embodiment is described with reference to Figs. 2, 3 and 4. In the knitting steps before the step 0, not shown, the inner tubular part 7 is knitted to one end 13, using the knitting yarn 11 fed from the yarn feeder 9. In the step 0, the inner

tubular part 7 and the outer tubular part 8 of the double-faced tubular knitted fabric 1 are in the state of being held by the knitting needles of the front needle bed and back needle bed, respectively, with empty needles for loop transference arranged on the opposed needle beds (corresponding to Fig. 3(a)). The yarn feeder 9 and the yarn feeder 10 are both positioned on the right-hand side of the one end 13 of the double-faced tubular knitted fabric 1, as viewed in the drawing. The knitting yarn 11 and the knitting yarn 12 fed from their respective yarn feeders are held on the side of the one end 13 by different needles on the back needle bed, respectively. It is to be noted on the inner tubular part 7 and the outer tubular part 8 in the step 0 that a knitted fabric held by the needles of the front needle bed is referred to as the front knitted fabric and a knitted fabric held by the needles of the back needle bed is referred to as the back knitted fabric.

[0019] In the step 1, loops of the front knitted fabric of the inner tubular part 7 held by the knitting needles of the front needle bed are transferred to the knitting needles of the back needle bed. Thereafter, in the step 2, the knitting yarn 12 is fed from the yarn feeder 10 to the knitting needles of the front needle bed and the front knitted fabric of the outer tubular part 8 is knitted (corresponding to Fig. 3(b)).

[0020] Likewise, in the steps 3 and 4, a row of loops of the front and back knitted fabric of the inner tubular part 7 are transferred to the needles of the front needle bed, and thereafter the knitting yarn 12 is fed from the yarn feeder 10 to the needles of the back needle bed and the back knitted fabric of the outer tubular part 8 is knitted (corresponding to Fig. 3(c)). Now, when attention is paid to Fig. 3(c), the knitting yarn 12 extending to the yarn feeder 10 from the end of the back knitted fabric of the outer tubular part 8 which is on the back needle bed extends over and intersects with the knitting yarn 11 extending to the end of the back knitted fabric of the inner tubular part 7 from the yarn feeder 9 as was retracted on the side of the one end 13.

[0021] In order to form front stitches on an inside surface 15 of the inner tubular part 7, a row of loops of the front and back knitted fabrics of the inner tubular part 7 are transferred to the back needle bed in the step 5. Thereafter, in the step 6, the knitting yarn 11 is fed from the yarn feeder 9 to the knitting needles of the back needle bed and the front knitted fabric of the inner tubular part 7 is knitted (corresponding to Fig. 3(d)). Likewise, in the steps 7 and 8, the back knitted fabric of the inner tubular part 7 is knitted with the knitting needles of the front needle bed. Now, when attention is paid to Fig. 3 (d), the knitting yarn 11 as was in the state of Fig. 3(c) is fed to the knitting needles to knit the front knitted fabric of the inner tubular part 7. When the yarn feeder 9 is turned around from the back knitted fabric of the inner tubular part 7 to knit the front knitted fabric of the same, an interlaced part 6 is formed with the knitting yarn 12 extending from the final loop of the outer tubular part 8 to the yarn feeder 10 being encompassed within the inner

tubular part 7.

[0022] In the knitting process of the steps 1 through 8 described above, a single row of loops or a single course going round is formed in each of the inner tubular part 7 and the outer tubular part 8, returning to the same state as that of the step 0 (corresponding to Fig. 4(e)). It should be noted here that the interlaced part 6 is formed only on the side of the one end 13 of the double-faced tubular knitted fabric but is not formed on the side of the other end 14.

[0023] Next, in the steps 9-14, the knitting order of the steps 1-8 is rearranged so that the interlaced part 16 can be formed at the other end 14 of the double-faced tubular knitted fabric 1.

[0024] In the steps 9 and 10, the front knitted fabric of the outer tubular part 8 is knitted in the same manner as in the steps 1 and 2 described above. In the next step 11, the front knitted fabric of the inner tubular part 7 is knitted in the same manner as in the step 6 (corresponding to Fig. 4(f)). Either of the knitting of the front knitted fabric of the outer tubular part 8 and the knitting of the front knitted fabric of the inner tubular part 7 may proceed first. Even if either one proceeds first, the state of Fig. 4 (f) develops.

[0025] In the step 12, a row of loops of the inner tubular part 7 are transferred to the knitting needles of the front needle bed. Then, in the step 13, the back knitted fabric of the outer tubular part 8 is knitted in the same manner as in the step 4 (corresponding to Fig. 4(g)). Now, when attention is paid to Fig. 4(g), the knitting yarn 12 of the outer tubular part 8 extending from the front needle bed to the back needle bed in the shuttle knitting extends over and intersects with the knitting yarn 11 extending to the end of the front knitted fabric of the inner tubular part 7 from the yarn feeder 9 as was on standby on the side of the other end 14.

[0026] When the back knitted fabric of the inner tubular part 7 is knitted with the knitting yarn 11 in the step 14, the interlaced part 6 is formed with the knitting yarn 12 encompassed within the inner tubular part 7 (corresponding to Fig. 4(h)).

[0027] By repeating the steps 1 to 14 illustrated in the embodiment, the interlaced parts 6 can be formed alternately at the one end 13 and the other end 14 of the double-faced tubular knitted fabric 1. The knitting of the steps 1 to 8 and the knitting of the steps 9 to 14 may be repeated in any desired combination, without being repeated alternately. In the illustrated embodiment, since the inside surface 15 of the inner tubular part 7 and the outside surface 18 of the outer tubular part 8 of the double-faced tubular knitted fabric 1 are both formed from the front stitches, the double-faced tubular knitted fabric 1 can be used as a reversible knitted fabric which is attractive in that a front-stitch pattern always appears on the front of the front and back knitted fabrics whose texture is different in color, design and so on.

[0028] In the illustrated embodiment, when the interlaced part 6 is formed at the one end 13, the inner tubular

part 7 is knitted from the state of Fig. 3(c) to the other end 14, as shown in Fig. 3(d). However, even when the outer tubular part 8 is first knitted from the state of Fig. 3 (c) to the other end 14, since the relation that the knitting yarn 12 extending between the front and back needle beds extends over and intersects with the knitting yarn 11 extending from the inner tubular part 7 to the yarn feeder 9 does not vary, the interlaced part 16 can be formed at the one end 13, as in the case of the illustrated embodiment.

[0029] In the illustrated embodiment, the example that the inner tubular part 7 and the outer tubular part 8 are knitted circularly in the same direction is illustrated. However, even when the knitting yarn 11 extending from the yarn feeder 9 is in the state of being held on either of the front needle bed and the back needle bed, the intersection relation between the knitting yarn 11 and the knitting yarn 12 described above does not vary. Thus, even when the two tubular parts are knitted circularly in the opposite directions opposite to each other, differently from the illustrated embodiment wherein they are knitted circularly in the same direction, the interlaced parts 6 can be formed at both ends of the double-faced tubular knitted fabric 1.

[0030] Likewise, in the illustrated embodiment, the yarn feeder 9 is positioned on the fore side of the yarn feeder 10 with respect to the front-back direction. However, even when the positional relationship is opposite to this, since such corresponds to the needle arrangement obtained when the respective process drawings of Fig. 2 are turned around at 180°, the interlaced parts 6 can be formed at both ends of the double-faced tubular knitted fabric 1 in the same manner as in the embodiment illustrated above.

[0031] In the illustrated embodiment, the inside surface 15 of the inner tubular part 7 and the outside surface 18 of the outer tubular part 8 are both formed from the front stitches. Alternatively, both the inside surface 15 of the inner tubular part 7 and the outside surface 18 of the outer tubular part 8 may be formed from the back stitches. Alternatively, the inside surface 15 of the inner tubular part 7 may be formed from the front stitches, while on the other hand, the outside surface 18 of the outer tubular part 8 may be formed from the back stitches, and vice versa. Further, it is needless to say that changes and modifications may be made without departing from the spirit of the present invention. For instance, the knitting may be made so that the front stitch and the back stitch can appear alternately on the front surface every other round course or may be combined with a known stitch pattern.

[0032] While the flatbed knitting machine having two knitting beds arranged in front and back and opposite to each other is used herein, a four-bed type of flatbed knitting machine including two additional needle beds for loop transference may be used for the knitting described above. In this variant, there is no need to provide the empty needles in the two needle beds used for knitting the knitted fabric and thus a dense texture can be pro-

duced.

Claims

1. A knitting method for knitting a double-faced tubular knitted fabric using a flatbed knitting machine comprising at least a pair of front and back needle beds, which are arranged to extend transversely and opposite to each other with respect to a front-back direction to allow loop transfer between the needle beds, and yarn guide rails which are arranged over the needle beds and arranged in parallel with respect to the front-back direction and via which a first yarn feeder and a second yarn feeder positioned at one side of the first yarn feeder with respect to the front-back direction are slidably supported, wherein the double-faced tubular knitted fabric has an inner tubular part which is knitted circularly with a first knitting yarn fed from the first yarn feeder and an outer tubular part which is knitted circularly with a second knitting yarn fed from the second yarn feeder, the inner tubular part and the outer tubular part being joined to each other at the ends with respect to a knitting width, and wherein the double-faced tubular knitted fabric is knitted with one of a knitted fabric of the inner tubular part and a knitted fabric of the outer tubular part associated to one of the front needle bed and the back needle bed and with the other of the knitted fabric of the inner tubular part and the knitted fabric of the outer tubular part associated with the other of the front needle bed and the back needle bed, the method comprising:

(1) the step of knitting the inner tubular part to one end of the double-faced tubular knitted fabric, starting at the one end, using the first yarn feeder,

(2) the step of knitting the other knitted fabric of the outer tubular part to the one end, subsequently to the step 1, using the second yarn feeder,

(3) the step of knitting the inner tubular part to the other end, subsequently to the step 2, to intersect the first knitting yarn and the second knitting yarn with each other so that an interlaced part is formed at the one end,

(4) the step of knitting the inner tubular part to the other end of the double-faced tubular knitted fabric, starting at the other end, using the first yarn feeder,

(5) the step of knitting the other knitted fabric of the outer tubular part to the one end, subsequently to the step 4, using the second yarn feeder,

(6) the step of knitting the inner tubular part to the one end, subsequently to the step 5, to in-

tersect the first knitting yarn and the second knitting yarn with each other so that the interlaced part is formed at the other end, and

(7) the step of repeating the knitting of the steps 1 to 3 and the knitting of the steps 4 to 6 in a desired combination so that the interlaced parts are formed at both ends of the double-faced tubular knitted fabric with respect to the knitting width.

2. A double-faced tubular knitted fabric knitted using a general type of flatbed knitting machine comprising at least a pair of front and back needle beds arranged to extend transversely and opposite to each other with respect to a front-back direction, wherein its inner tubular part and outer tubular part are joined to each other at both ends of the double-faced tubular knitted fabric via an interlaced part at which a knitting yarn of the inner tubular part comes out on an outside surface of the outer tubular part.
3. The double-faced tubular knitted fabric according to Claim 2, wherein an inside surface of the inner tubular part and the outside surface of the outer tubular part are both formed from front stitches.

Fig. 1

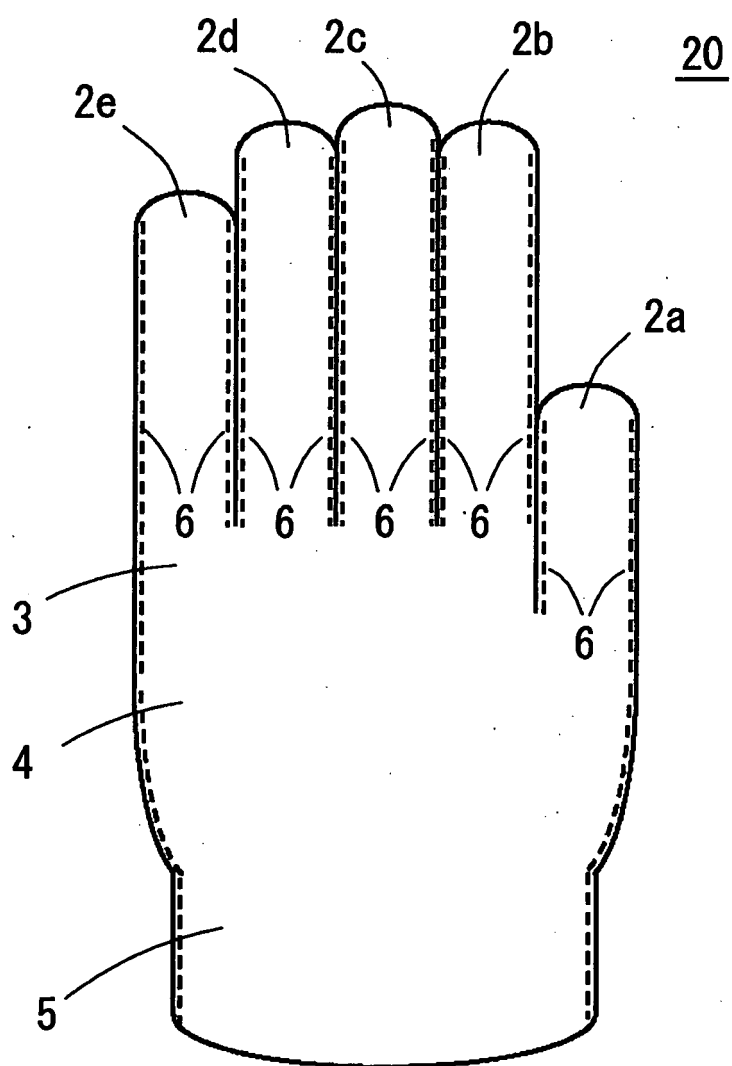


Fig. 2

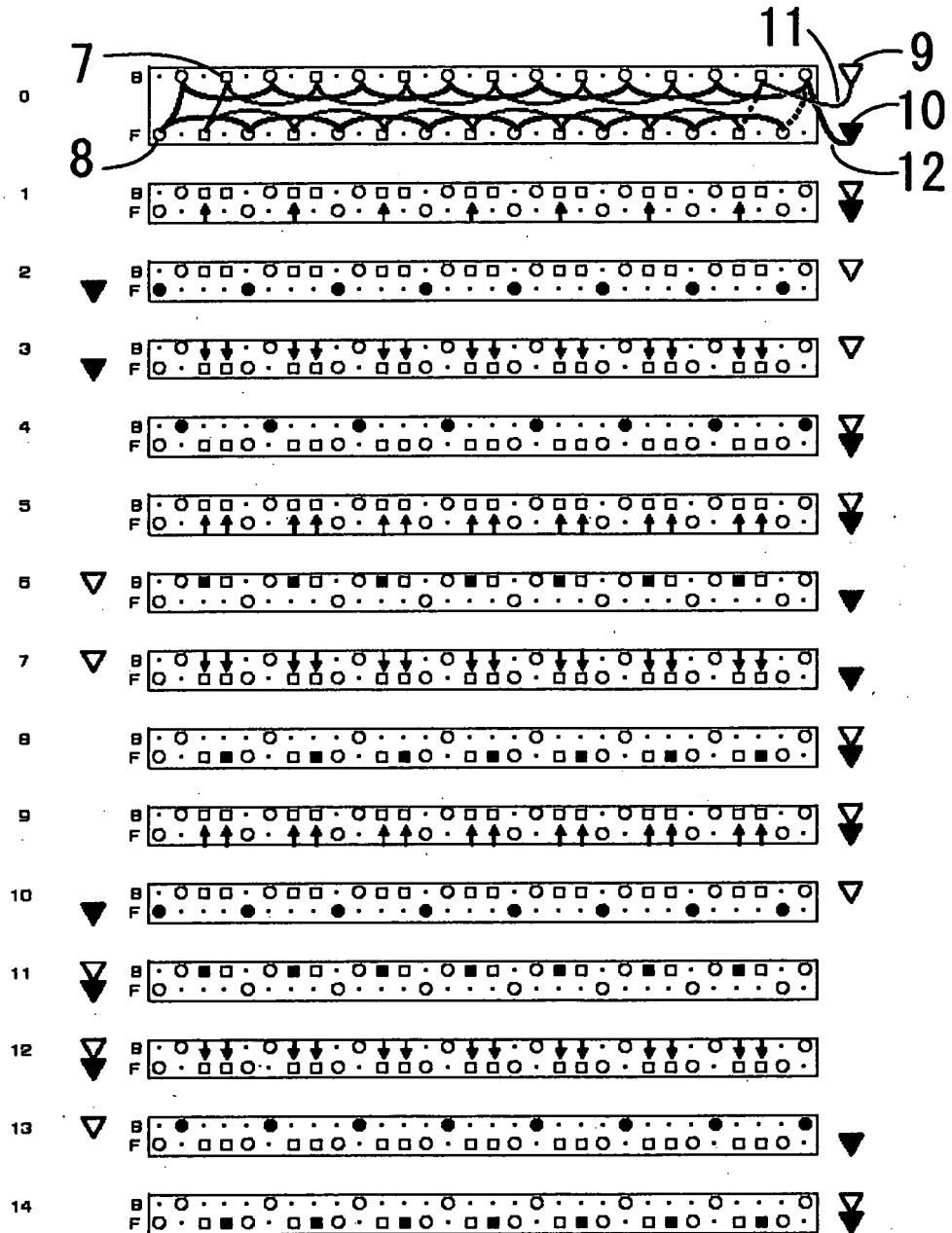


Fig. 3

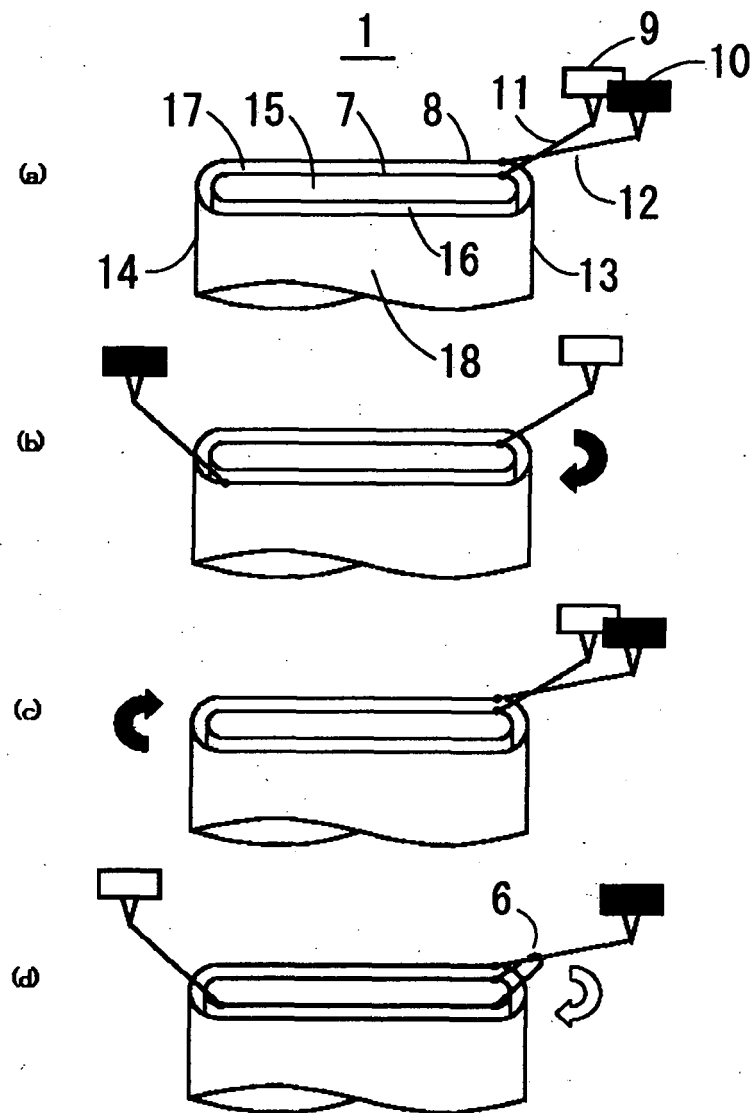
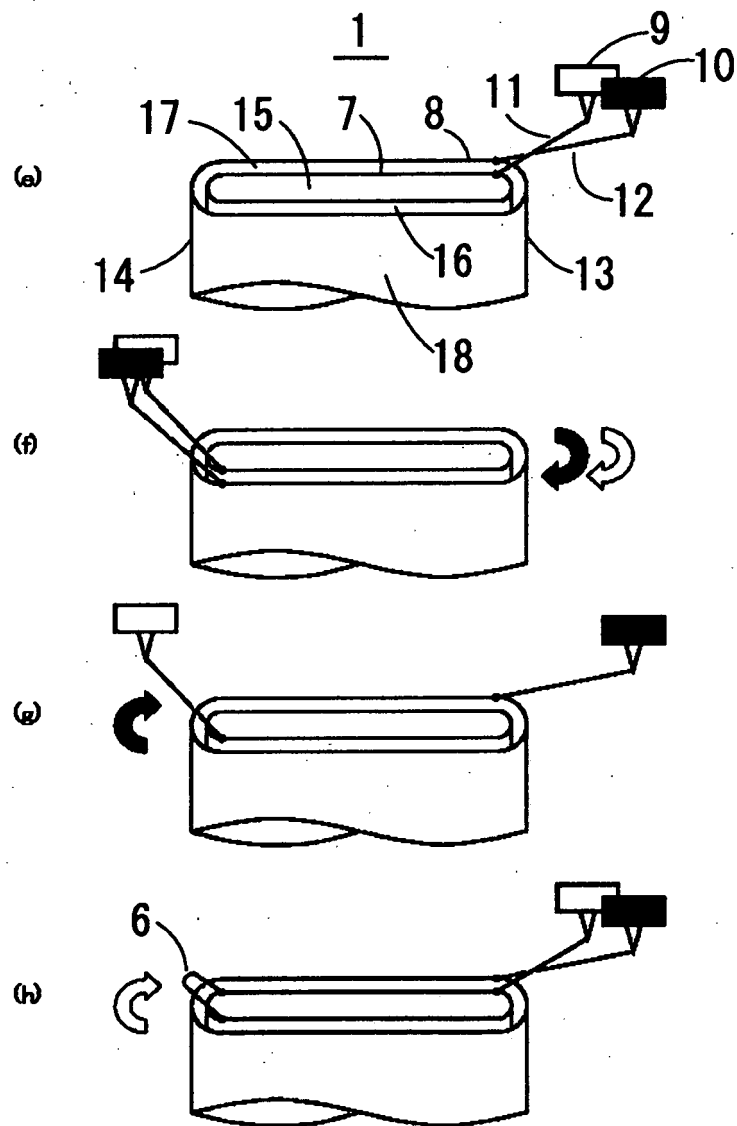


Fig. 4



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2008/070005

A. CLASSIFICATION OF SUBJECT MATTER

D04B1/24(2006.01)i, D04B7/32(2006.01)i, A41B11/00(2006.01)n, A41D19/00(2006.01)n

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)

D04B1/00-1/28(2006.01)i, D04B21/00-21/20(2006.01)i, D04B7/32(2006.01)i, A41B11/00(2006.01)i, A41D19/00(2006.01)i

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

Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2009
Kokai Jitsuyo Shinan Koho 1971-2009 Toroku Jitsuyo Shinan Koho 1994-2009

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

WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A X	JP 04-126852 A (Shima Seiki Mfg., Ltd.), 27 April, 1992 (27.04.92), Claims; page 7, lower right column, line 6 to page 8, upper right column, line 18 & WO 1992/005304 A & EP 504412 A1 & US 5271249 A	1 2, 3
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A	JP 2000-256946 A (Shima Seiki Mfg., Ltd.), 19 September, 2000 (19.09.00), Claims (Family: none)	1-3

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

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Date of the actual completion of the international search
03 February, 2009 (03.02.09)

Date of mailing of the international search report
24 February, 2009 (24.02.09)

Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2008/070005

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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