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(72) Inventors:
• **Miyaji, Yusuke**
Wakayama-shi, Wakayama, 6418511 (JP)
• **Kodama, Masayuki**
Wakayama-shi, Wakayama, 6418511 (JP)

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(74) Representative: **Wagner, Karl H.**
Wagner & Geyer
Gewürzmühlstrasse 5
80538 Munich (DE)

(71) Applicant: **Shima Seiki Mfg., Ltd**
Wakayama-shi
Wakayama 641-8511 (JP)

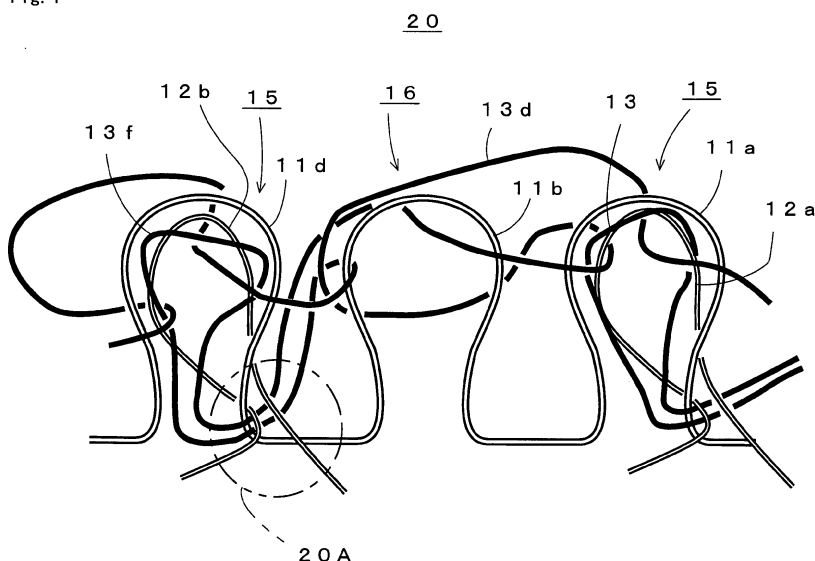
(54) **Piping process method for end part of knitted fabric**

(57) [Problem to be solved] There is provided a piping process method for an end part of a knitted fabric, which is capable of making it hard to form swelling even when bind off process is performed.

[Solution] A bind off loop 13 which is newly formed on a base knitted stitch 11x on an end part is transferred to a vacant needle of an FB so as to be hung in a state where floating yarns 11c, 13c cross over with a floating yarn 12c of a knit loop 12a at the upper side (S1). A base knitted stitch 11a on the termination end portion is transferred on the FB so as to be retained in a state where

the cross-over yarn 11c intersects with the cross-over yarn 12c of the knit loop 12a at the upper side (S2). Next, the knit loop 12a to be joined to the bind off loop 13 is transferred to a vacant needle of the BB so as to be hung in a state where the floating yarn 12c crosses over the floating yarn 13c at the upper side. The base knitted stitch 11a and the bind off loop 13 are transferred to the knitting needle hanging the knit loop 12a so as to be overlapped sequentially. Then, the end part is joined to a midstream portion of the base knitted fabric 11 while coupling them by the bind off loop 13.

Fig. 4



Description

[Technical Field]

[0001] The present invention relates to a piping process method for an end part of a knitted fabric, which folds back the end part of the knitted fabric to be knitted by a flatbed knitting machine and joins the end part to a midstream portion of the knitted fabric.

[Background Art]

[0002] Conventionally, piping process is performed for realizing a thick secured state by folding back an end part of a knitted fabric when knitting gloves, socks, openings of pants, and collars of clothes. In general piping process, an end part of a knitted fabric is knitted with thermal contraction yarns, and then as a post-process, the end part of the knitted fabric is applied with heat after the knitting so as to be firmly fixed and form a raveling-stop portion, and then, the end part of the knitted fabric is joined to a midstream portion of the knitted fabric, which is continuous to the end part, by a blind stitch sewing machine. Such a post-process can be omitted if a flatbed knitting machine including at least a pair of front and rear needle beds is used (for example, see, Patent Literature 1).

[0003] Fig. 6 schematically shows a stitch structure to which the piping process method disclosed in the Patent Literature 1 is applied. On the way, knitting a base knitted fabric, including a portion to be folded-back, to a vicinity an end part, tucks 2a to base knitted stitches 1a and knit loops 2b becomes hanging stitches to a vacant needles are alternately formed. While the remaining base knitted fabric is knitted to a base knitted stitch 1b at the end part, knit stitches are further added to the knit loops 2b in some cases. Knitting for forming a bind off stitch on a double overlapped stitch consisting of the base knitted stitch 1b and the knit loop 2b is performed, and then, a newly formed knitted loop is overlapped on an adjacent overlapped stitch so that a bind off loop 3 is formed. By such bind off process of repeating new knit operation on the state where the bind off loop 3 is overlapped on the double overlapped stitch, the end part of the base knitted fabric is joined to the midstream portion of the base knitted fabric so that the piping process is achieved.

[Citation List]

[Patent Literature]

[0004] [Patent Literature 1] Japanese Patent No. 2610208

[Summary of Invention]

[Technical Problem]

[0005] A glove to be knitted by a flatbed knitting machine including needle beds at front and rear sides becomes a tubular knitted fabric in which plain knitted fabrics to be knitted on the front and rear needle beds are continuous at both ends of a knitting width. With the stitch structure as shown in Fig. 6, the base knitted fabric corresponds to the plain knitted fabric, so that, if the base knitted fabrics are connected by the bind off loops 3, the base knitted fabric warps and slight swelling is formed undesirably. Further, the bind off loops 3 are arranged at the outer side of the base knitted fabric continuously. In the case of the glove, since joining portions by the bind off process are hidden inside, there arises no risk that appearance becomes worse, however, it is desired that the swelling is not formed on the joining portions touching the skin directly when a person puts the glove on.

[0006] It is an object of the present invention to provide a piping process method for an end part of a knitted fabric, which is capable of making it hard to form swelling even when bind off process is performed.

[Solution to Problem]

[0007] The present invention provides a piping process method for an end part of a knitted fabric, in which after knitting a base knitted fabric, which is knitted so as to be continuous to an end part, to a midstream portion by a flatbed knitting machine including a pair of front and rear needle beds, doing a tuck operation on a knitting needle hanging a base stitch as a stitch of the base knitted fabric using a different knitting yarn from the knitting yarn used for knitting the base knitted fabric, and forming a hanging stitch by a vacant needle knit to a vacant needle which hangs no stitch and belongs to the needle bed opposed to the needle bed to which the knitting needle belongs or forming a knit loop by a knit operation on the hanging stitch, knitting the base knitted fabric, continuous from the midstream portion, to the end part while hanging the knit loop with the knitting needle; and folding back the base knitted fabric from the midstream portion to the end part and joining the base knitted fabric to the base knitted stitches on the end part with bind off process utilizing the knit loop, **characterized in that** the bind off process is performed by repeating steps including:

a bind off loop hanging step, in which transferring a bind off loop, formed so as to correspond to a base knitted stitch as one of knitted loops on the end part, to a vacant needle on the needle bed opposed to the base knitted stitches on the end part and hanging the knit loop, and in which hanging the bind off loop

in an over cross state where a floating yarn of the bind off loop crosses a floating yarn of the knit loop at the upper side,;

a base knitted stitch hanging step, in which transferring the base knitted stitch to be joined to the bind off loop among the base knitted stitches on the end part to the needle bed hanging the transferred bind off loop, and hanging the base knitted stitch in an over cross state where a floating yarn of the base knitted stitch crosses a floating yarn of the knit loop at the upper side;

a knit loop hanging step, in which transferring the knit loop, to be joined to the bind off loop, to a vacant needle on the opposed needle bed and hanging the knit loop in an over cross state where the floating yarn of the knit loop crosses the floating yarn of the bind off loop, transferred in the bind off loop hanging step, at the upper side; and

a bind off loop joining step, in which transferring the base knitted stitch, hung in the base knitted stitch hanging step, and the bind off loop, hung in the bind off loop hanging step, to the knitting needle hanging the knit loop transferred in the knit loop hanging step, so as to overlap them sequentially and joining the end part to the midstream portion of the base knitted fabric while coupling the base knitted stitch of the end part on which the bind off loop has been formed in the bind off loop hanging step and the base knitted stitch of the end part, which has been transferred in the base knitted stitch hanging step, with the bind off loop.

[0008] In the piping process method for the end part of the knitted fabric according to the present invention, said bind off loop is knitted by using an elasticity yarn.

[0009] In the piping process method for the end part of the knitted fabric according to the present invention, said bind off loop hanging step is performed by alternately repeating:

a formation of a triple overlapped stitch by overlapping three stitches or loops, consisting of said base stitch by said bind off loop hanging step, said knit loop by said knit loop hanging step, and said bind off loop by said bind off loop hanging step; and
a formation of a double overlapped stitch by overlapping two stitches or loops, obtained by transferring the bind off loop to the base knitted stitch and overlapping them, or obtained by transferring the base knitted stitch to the bind off loop and overlapping them.

[0010] In the piping process method for the end part of the knitted fabric portion according to the present invention, said base knitted fabric is knitted as a tubular knitted fabric by using the pair of front and rear needle beds.

[Advantageous Effects of Invention]

[0011] According to the method of the present invention, in a state where a bind off loop and a base knitted stitch are transferred to opposed needle beds in a bind off loop hanging step and a base knitted stitch hanging step, respectively, and a knit loop is also transferred to the opposed needle bed in a knit loop hanging step, bind off process is performed by overlapping the base knitted stitch and the bind off loop on the knit loop sequentially. Cross-over of floating yarns are caused in each step and in the bind off loop joining step, at the same time of joining by the bind off loop, the cross over of the floating yarn on the knit loop makes the bind off loop to be arranged at the inner side of the base knitted fabric to be joined to the bind off loop, so that it is possible to form the bind off process part capable of preventing the base knitted fabric from curling and of suppressing swell.

[0012] Further, according to the method of the present invention, the bind off loop is knitted by using an elasticity yarn, so that the bind off processed portion can be made to have appropriate stretching properties.

[0013] In addition, according to the method of the present invention, a double overlapped stitch and a triple overlapped stitch are alternately formed with joining by overlapping the bind off loops, so that the bind off processed portion can be made thinner and it is possible to simplify preparation of vacant needles for hanging knit loops.

[0014] Further, according to the method of the present invention, preparation of vacant needles is simplified, so that bind off processing which makes it possible to suppress swelling on a tubular knitted fabric can be performed.

[Brief Description of Drawings]

[0015]

[Fig. 1] Fig. 1 is a part of a simplified knitting diagram showing a piping process method for an end part of a knitted fabric as an example of the present invention.

[Fig. 2] Fig. 2 is a remaining part of the simplified knitting diagram of Fig. 1.

[Fig. 3] Fig. 3 is a knitting diagram showing a piping process method for an end part of a knitted fabric as another example of the present invention with a part continuous to Fig. 1 and Fig. 2.

[Fig. 4] Fig. 4 is a view schematically showing a stitch structure to be formed by process of Fig. 1 to Fig. 3.

[Fig. 5] Fig. 5 is a simplified knitting diagram showing a part of a piping process method for an end part of a knitted fabric as still another example of the present invention.

[Fig. 6] Fig. 6 is a view showing a stitch structure formed by a conventional piping process method.

[Description of Embodiments]

[0016] Hereinafter, three examples of the present invention are described with reference to Fig. 1 to Fig. 5. In the description of each example, corresponding parts, if explained on ahead as well as common items, are sometimes labeled the same reference characters as used in the preceding explanation throughout the drawings, and omitted redundant explanation. It is to be noted that explanation of each drawing might be made by using a reference character as shown in the drawings which have been previously explained even if the reference character is not shown in the target drawing in some case.

[0017] A flatbed knitting machine including a front needle bed and a rear needle bed (hereinafter, abbreviated as "FB" and "BB", respectively) as a pair of front and rear needle beds is used for knitting of a knitted fabric. The FB and the BB are equivalent, and roles may be replaced between the FB and the BB in the following explanation.

[Example 1]

[0018] Fig. 1 and Fig. 2 show, in a simplified manner, basic process steps to perform a bind off process by a piping process method for an end part of a knitted fabric as an example of the present invention. Knitting operation preceding the bind off process can be performed in the same manner as that is performed preceding the bind off process shown in Fig. 6.

[0019] Upper side of the S1 process shows a state where a base knitted fabric 11 as a knitted fabric, on which piping process is to be performed, is knitted to an end part, base knitted stitches 11x, 11a, 11b on the end part are hung by knitting needles of the BB, and a bind off loop 13 is formed by a knit operation on the base knitted stitch 11x. For knitting needles of the FB, on the way of knitting the base knitted fabric 11, by using a different knitting yarn from the knitting yarn used to knit the base knitted fabric, tuck operation on needles hanging the base stitches of the base knitted fabric is performed, and knit loops 12a, 12b are formed with hanging stitches by vacant needle knit on vacant needles belonging to the FB opposed to the BB to which the needles, targeted by the tuck operation, belong. The base knitted fabric 11 is knitted to the end part continuous from a midstream portion while hanging these knit loops 12a, 12b on the knitting needles. The base knitted fabric 11 is folded back at a halfway point from the midstream portion to the end part and the base knitted folded-back portion is bonded to the base knitted stitches 11x, 11a, 11b of the end part are joined by the bind off process using the knit loops 12a, 12b. It is to be noted that the knit loops 12a, 12b may be replaced by knitted stitches by adding knit operation. The addition of the knit operation is effective for yarn break or the like when number of knitting courses of the base knitted fabric 11 to be folded back is large.

[0020] The start of the bind off process is done when a knitted loop corresponding to the new bind off loop 13

is formed on the base knitted stitch 11x at a knitting end on the end part, which is hung on the BB. It is to be noted that a hanging stitch 13b is desirably formed with movement of a carrier 13a which supplies knitting yarns for the bind off loop before the new bind off loop 13 is formed. By forming the hanging stitch 13b, the knitting yarn for forming the bind off loop 13 can be made hard to be returned and to be reduced. It is sufficient that the hanging stitch 13b might be cast off later.

[0021] Next, the bind off loop 13, formed so as to correspond to a base knitted stitch 11x which is one of stitches of the end part, is transferred to a vacant needle of the FB which is opposed to the base knitted stitches 11x, 11a, 11b of the end part and to which the knitting needles hanging the knit loops 12a, 12b belong. By the transfer, the bind off loop 13 is hung in a state where a floating yarn 13c crosses over a floating yarn 12c of the knit loop 12a at the upper side. Such S1 process corresponds to the bind off loop hanging step in the bind off process according to the present invention.

[0022] In a subsequent S2 process, the base knitted stitch 11a which is adjacent to the base knitted stitch 11x and is to be joined to the bind off loop 13 among the base knitted stitches 11x, 11a, 11b of the end part is transferred to the FB hanging the transferred bind off loop 13. The base knitted stitch 11a is hung in a state where a floating yarn 11c crosses over the floating yarn 12c of the knit loop 12a at the upper side. The S2 process corresponds to the base knitted stitch hanging step in the bind off process according to the present invention.

[0023] It is to be noted that the base knitted stitch 11a may be transferred to the knitting needle hanging the bind off loop 13 transferred in the S1 process. In particular, if the knitting needle is a compound needle capable of holding operation using a slider, the base knitted stitch 11a can be hung with the slider while hanging the bind off 13 with a hook of the same knitting needle.

[0024] In a subsequent S3 process, the knit loop 12a to be joined to the bind off loop 13 is transferred to a vacant needle of the opposed the BB. The knit loop 12a is hung in a state where the floating yarn 12c further crosses over the floating yarn 13c of the bind off loop 13 transferred in the bind off loop hanging step at the upper side. The S3 process corresponds to a knit loop hanging step in the bind off process according to the present invention.

[0025] In the subsequent S4 process, the base knitted stitch 11a hung in the base stitch hanging step and the bind off loop 13 hung in the bind off loop hanging step are transferred to the knitting needle hanging the knit loop 12a transferred in the knit loop hanging step from the FB to the BB so as to be overlapped on the knit loop 12a sequentially, then a triple overlapped stitch 15 by the knit loop 12a, the base knitted stitch 11a, and the bind off loop 13 is formed. With this, the base knitted stitch 11x on the end part on which the bind off loop 13 has been formed in the bind off loop hanging step, is joined to the base knitted stitch 11a of the end part, which has

been transferred in the base knitted stitch hanging step, through the bind off loop 13, and is joined to the knit loop 12a, so that the end part of the base knitted fabric 11 is joined to the midstream portion. Such S4 process corresponds to a bind off loop joining step in the bind off process according to the present invention.

[0026] Thereafter, the piping process for the end part of the knitted fabric according to the present invention can be achieved by repeating the bind off process including the processes of S1 to S4. In each process, cross over of the floating yarns 11c, 12c, and 13c are caused. In the bind off loop joining process, the bind off loop 13 is arranged at the inner side of the continuous base knitted fabric 11 with the cross over of the floating yarn to the knit loop 12a in addition to the joining through the bind off stitch loop 13, so that curling of the base knitted fabric 11 is prevented and swelling is suppressed.

[0027] It is to be noted that elasticity yarns can be preferably supplied as knitting yarns from the carrier 13a which supplies the knitting yarns for knitting the bind off loop 13. The bind off loop 13 is knitted by using the elasticity yarns so that the bind off stitch processed portion can be made to have appropriate stretching properties.

[Example 2]

[0028] Fig. 3 shows a piping process method for an end part of a knitted fabric as another example of the present invention. In the example, the processes in S1 to S4 are common to the example shown in Fig. 1 and Fig. 2, so that description thereof is omitted. In an S5 process subsequent to the S4 process in Fig. 2, a new bind off loop 13d is formed on the triple overlapped stitch 15. A hanging stitch 13e is preferably formed preceding to the bind off loop 13d.

[0029] In a subsequent S6 process, the bind off loop 13d is once transferred to the FB and the BB is shifted to the right side, then the bind off loop 13d is transferred from the FB to the BB and is overlapped on the base knitted stitch 11b to form a double overlapped stitch. In a subsequent S7 process, a new bind off loop 13f is formed on the double overlapped stitch 16. As in the case of the bind off loops 13, 13d, a hanging stitch 13g is preferably formed preceding the bind off loop 13f. If a base knitted stitch 11d adjacent to the base knitted stitch 11b is made to correspond to the base knitted stitch 11a in Fig. 1 and the bind off loop 13f is made to correspond to the bind off loop 13 in Fig. 1 respectively, the S7 process corresponds to the process S1 in Fig. 1, thereafter, if the process to the S7 are repeated, a thin bind off processed portion 20, on which the triple overlapped stitch 15 and the double overlapped stitch 16 are alternately formed repeatedly, can be obtained. The double overlapped stitch 16 does not include knit loop 12b so that it is not necessary to prepare a vacant needle for transferring the knit loop 12b and the bind off process can be simplified.

[0030] Fig. 4 schematically shows a stitch structure which is basically the same as the bind off processed

portion 20 to be formed by the piping process method in Figs. 1 to 3. The hanging stitches 13e, 13g, as shown in Fig. 3, to be formed before forming of the bind off loops 13d, 13f are omitted to show. In the example, while joining by overlapping the bind off loops 13, 13d, 13f respectively, the triple overlapped stitch 15 and the double overlapped stitch 16 are alternately formed, so that the bind off processed portion 20 can be made thinner and a knitting needle for hanging the knit loop 12b can be unnecessary. Further, when the double overlapped stitch 16 is formed, it is to be noted that overlapping manner may be reversed. In such a case, it is sufficient that the base knitted stitch 11b is overlapped after the base knitted stitch 11b is once retreated and the bind off loop 13d is transferred.

[0031] For the triple overlapped stitch 15 which is formed in the present example and the examples of Fig. 1 and Fig. 2, as shown as an overlapped portion 20A, the bind off loop 13f exits to the outer side with respect to the respective knitted loops of the base knitted stitches 11b, 11d and is pressed by the knit loop 12b so as to be arranged at the inner side. It is to be noted that the surface side of a paper plane corresponds to the inner side of the knitted fabric and the back surface thereof corresponds to the outer side of the knitted fabric.

[Example 3]

[0032] Fig. 5 shows a piping process method for an end part of a knitted fabric, which is applied to a tubular knitted fabric, as still another example of the present invention. In a T1 process, a state where base knitted stitches 11F, 11B of an end part are hung on the FB and the BB, respectively, and knit loops 12F, 12B formed with knitting yarns tucked on the midstream portion of the base knitted fabric 11 are hung on the FB and the BB, respectively, is shown. In order to perform the piping process for the end part of the knitted fabric according to the present invention, in a T2 process, the knit loop 12B is transferred to and hang on a vacant needle of the FB from the BB side, for example. A vacant needle is generated between the knitting needle hanging the base knitted stitch 11F and the knitting needle hanging the knit loops 12B on a right end of the FB. If a bind off loop is newly formed on the base knitted stitch 11B on the right end and the vacant needle of the FB is used therefore, the bind off process which is the same as that in other examples can be performed. In a T3 process, the base knitted stitch 11B is moved to the right side by holding operation.

[0033] It is to be noted that with the arrangement in the T1 process, after the bind off process on the BB is completed, the bind off process on the FB is performed. To knit the base knitted stitch 11 B of the BB in the bind off process, the knit loop 12B is moved to the opposed needle bed, and to knit the base knitted stitch 11F of the FB, the knit loop 12F is moved to the opposed needle bed. Further, in each example, the piping process for the end

part of the knitted fabric can be performed while the present invention is applied to not only the gloves but also socks and pants having similar openings and sweat-
ers having necks. Further, as for the knitted for operating
the bind off process, an effect that swelling of a joining
portion by the bind off process can be reduced is obtained
in the same manner on even rib structure other than the
flat knitted fabric (plain knitted fabric).

[Reference Signs List]

[0034]

11 Base knitted fabric
11a, 11b, 11d, 11x Base knitted stitch
11c, 12c, 13c Floating yarn
12a, 12b Knit loop
13, 13d, 13f Bind off loop
15 Triple overlapped stitch
16 Double overlapped stitch

Claims

1. A piping process method for an end part of a knitted fabric,
in which after knitting a base knitted fabric (11), which is knitted so as to be continuous to an end part, to a midstream portion by a flatbed knitting machine including a pair of front and rear needle beds,
doing a tuck operation on a knitting needle hanging a base stitch as a stitch of the base knitted fabric (11) using a different knitting yarn from the knitting yarn used for knitting the base knitted fabric (11), and forming a hanging stitch by a vacant needle knit to a vacant needle which hangs no stitch and belongs to the needle bed opposed to the needle bed to which the knitting needle belongs or forming a knit loop (12a, 12b) by a knit operation on the hanging stitch, knitting the base knitted fabric (11), continuous from the midstream portion, to the end part while hanging the knit loop (11a, 12b) with the knitting needle; and folding back the base knitted fabric (11) from the midstream portion to the end part and joining the base knitted fabric (11) to the base knitted stitches (11x, 11a, 11b) on the end part with bind off process utilizing the knit loop (12a, 12b),
characterized in that
the bind off process is performed by repeating steps including:

a bind off loop hanging step, in which transferring a bind off loop (13), formed so as to correspond to a base knitted stitch (11x) as one of knitted loops on the end part, to a vacant needle on the needle bed, opposed to the base knitted stitches on the end part and hanging the knit loop (12a), and in which hanging the bind off loop (13) in an over cross state where a floating yarn (13c) of the bind off loop (13) crosses a floating yarn (12c) of the knit loop (12a) at the upper side,
a base knitted stitch hanging step, in which transferring the base knitted stitch (11a) to be joined to the bind off loop (13) among the base knitted stitches (11a, 11b) on the end part to the needle bed hanging the transferred bind off loop (13), and hanging the base knitted stitch (11a) in an over cross state where a floating yarn (11c) of the base knitted stitch (11a) crosses a floating yarn (12c) of the knit loop (12a) at the upper side,
a knit loop hanging step, in which transferring the knit loop (12a), to be joined to the bind off loop (13), to a vacant needle on the opposed needle bed and hanging the knit loop (12a) in an over cross state where the floating yarn (12c) of the knit loop (12a) crosses the floating yarn (13c) of the bind off loop (13), transferred in the bind off loop hanging step, at the upper side, and a bind off loop joining step, in which transferring the base knitted stitch (11a), hung in the base knitted stitch hanging step, and the bind off loop (13), hung in the bind off loop hanging step, to the knitting needle hanging the knit loop (12a) transferred in the knit loop hanging step, so as to overlap them sequentially and joining the end part to the midstream portion of the base knitted fabric (11) while coupling the base knitted stitch (11x) of the end part on which the bind off loop (13) has been formed in the bind off loop hanging step and the base knitted stitch (11a) of the end part, which has been transferred in the base knitted stitch hanging step, with the bind off loop (13).
2. The piping process method for the end part of the knitted fabric according to claim 1,
wherein said bind off loop (13) is knitted by using an elasticity yarn.
3. The piping process method for the end part of the knitted fabric according to claims 1 or 2,
wherein said bind off loop hanging step is performed by alternately repeating
a formation of a triple overlapped stitch (15) by overlapping three stitches or loops, consisting of said base stitch (11a) by said bind off loop hanging step, said knit loop (12a) by said knit loop hanging step, and said bind off loop (13) by said bind off loop hanging step, and
a formation of a double overlapped stitch (16) by overlapping two stitches or loops, obtained by transferring the bind off loop (13) to the base knitted stitch (11b) and overlapping them, or obtained by transferring the base knitted stitch (11b) to the bind off loop (13) and overlapping them.

4. The piping process method for the end part of the knitted fabric portion according to claim 3, wherein said base knitted fabric (11) is knitted as a tubular knitted fabric by using the pair of front and rear needle beds.

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Fig. 1

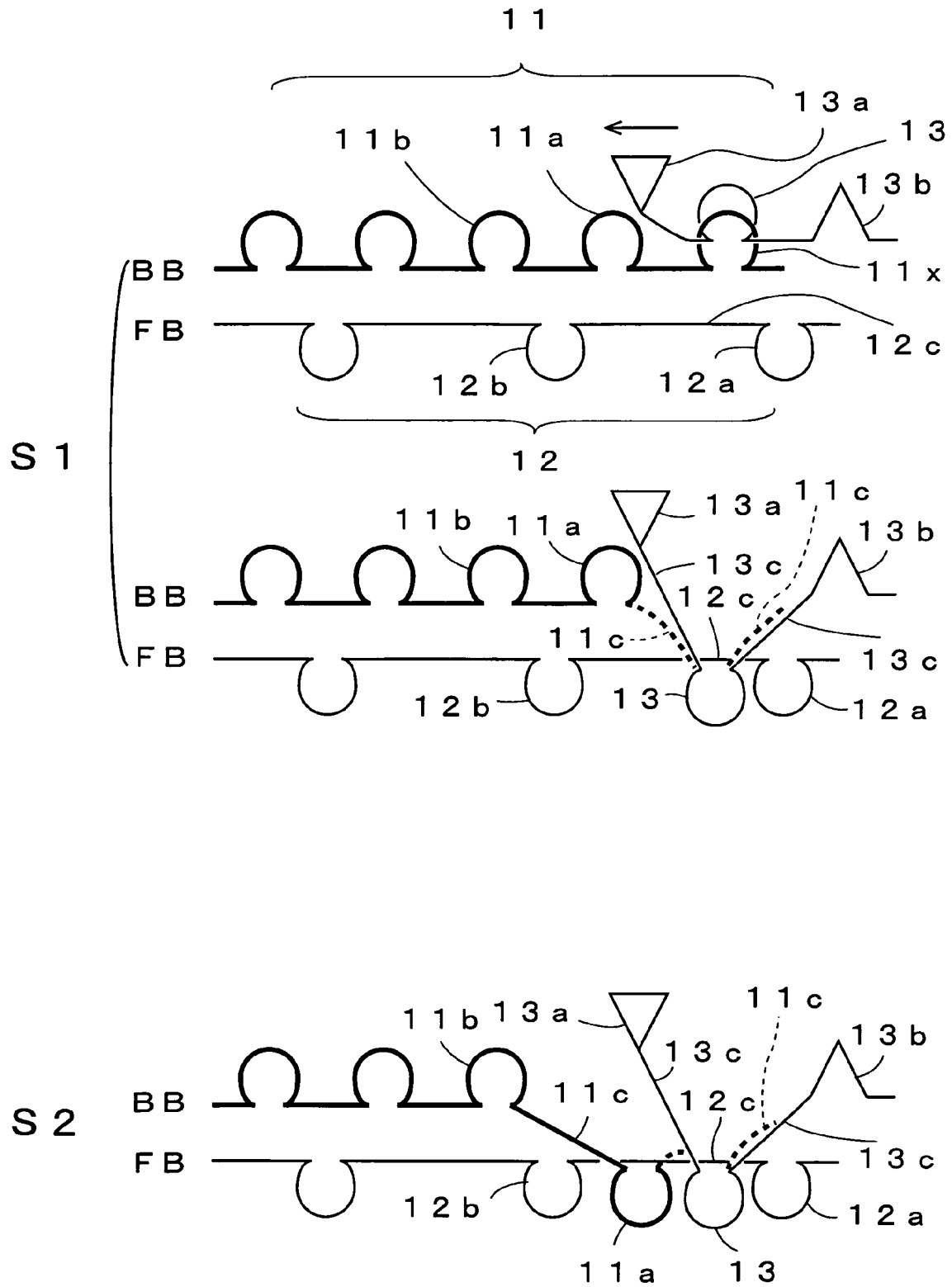


Fig. 2

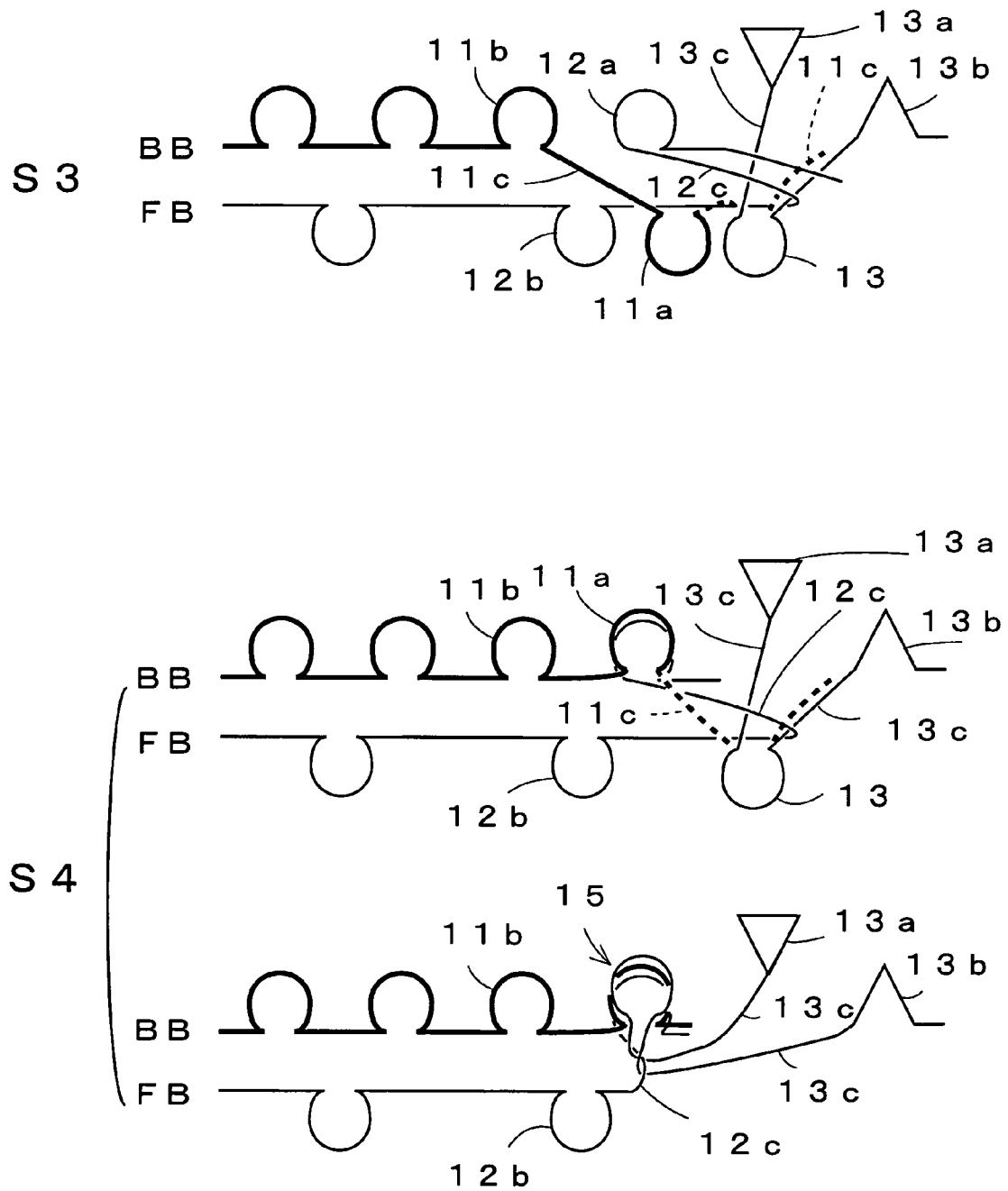


Fig. 3

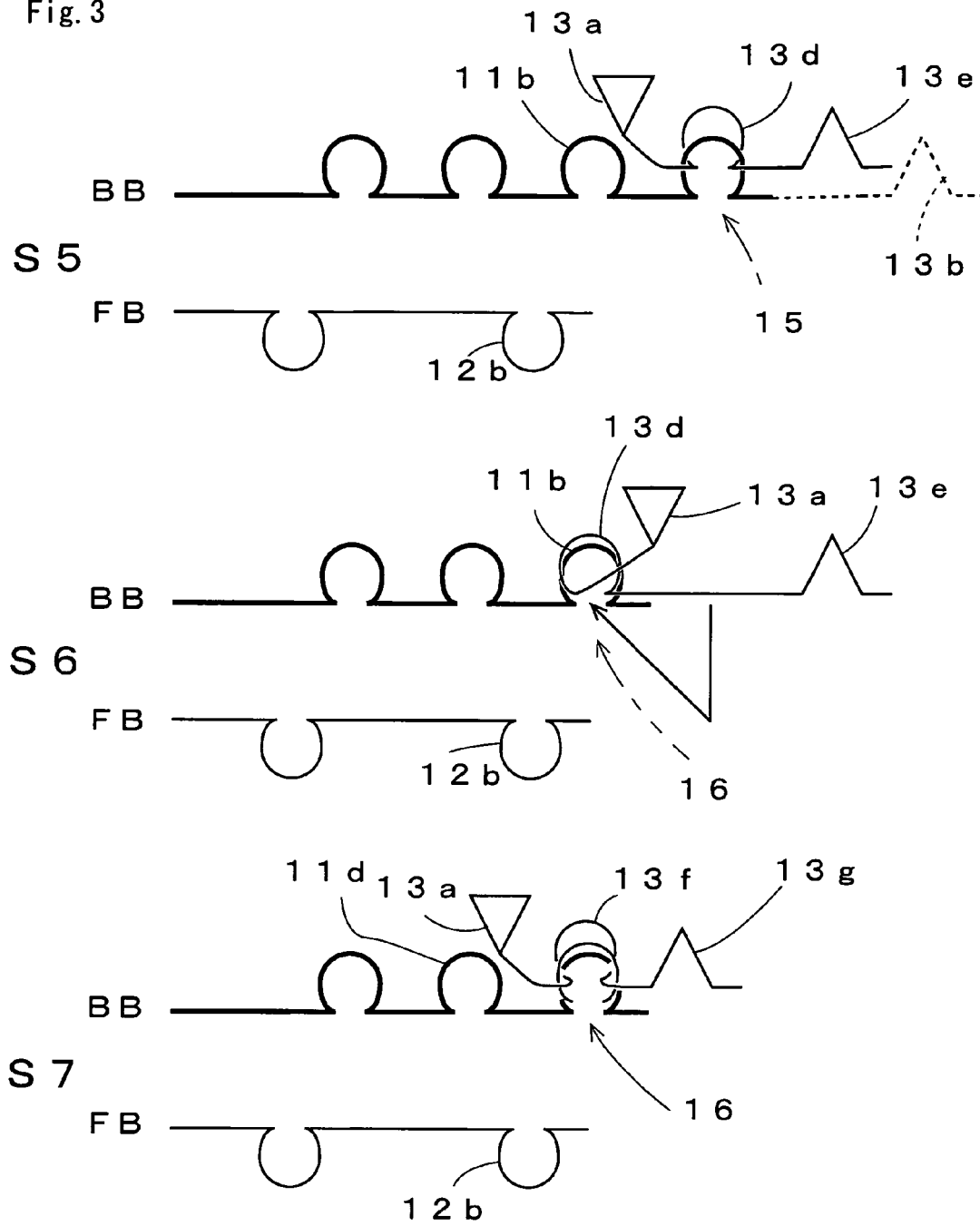
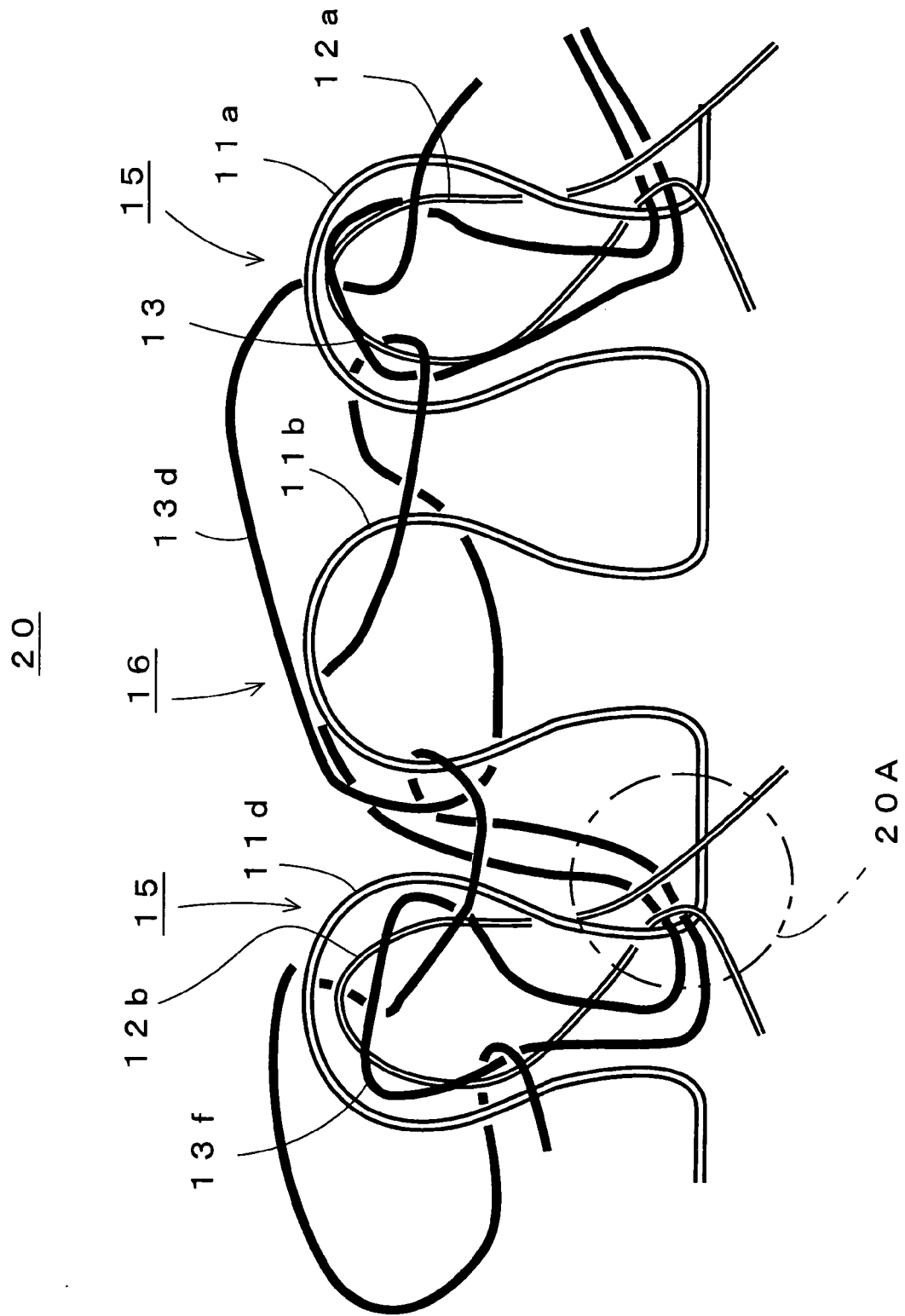


Fig. 4



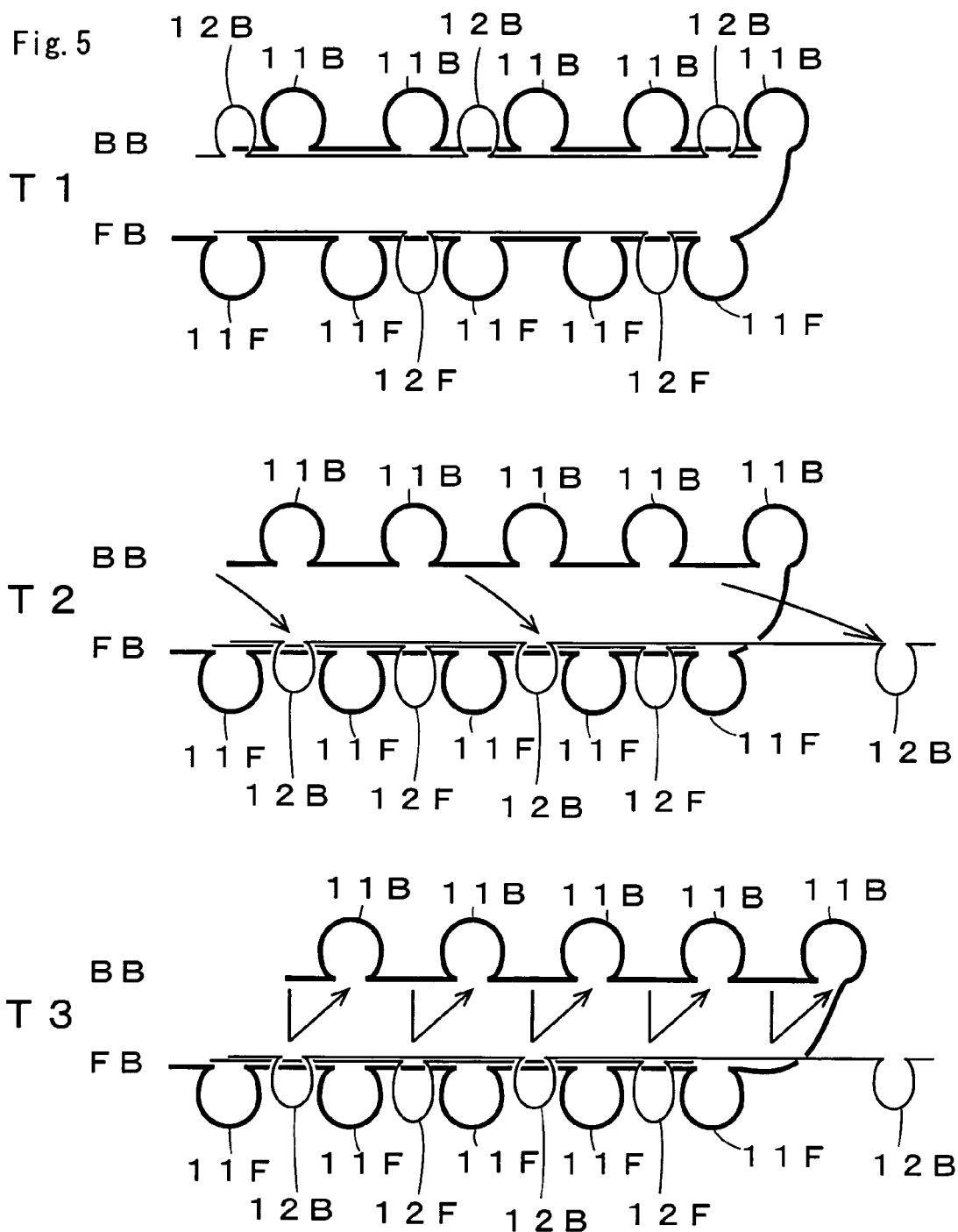
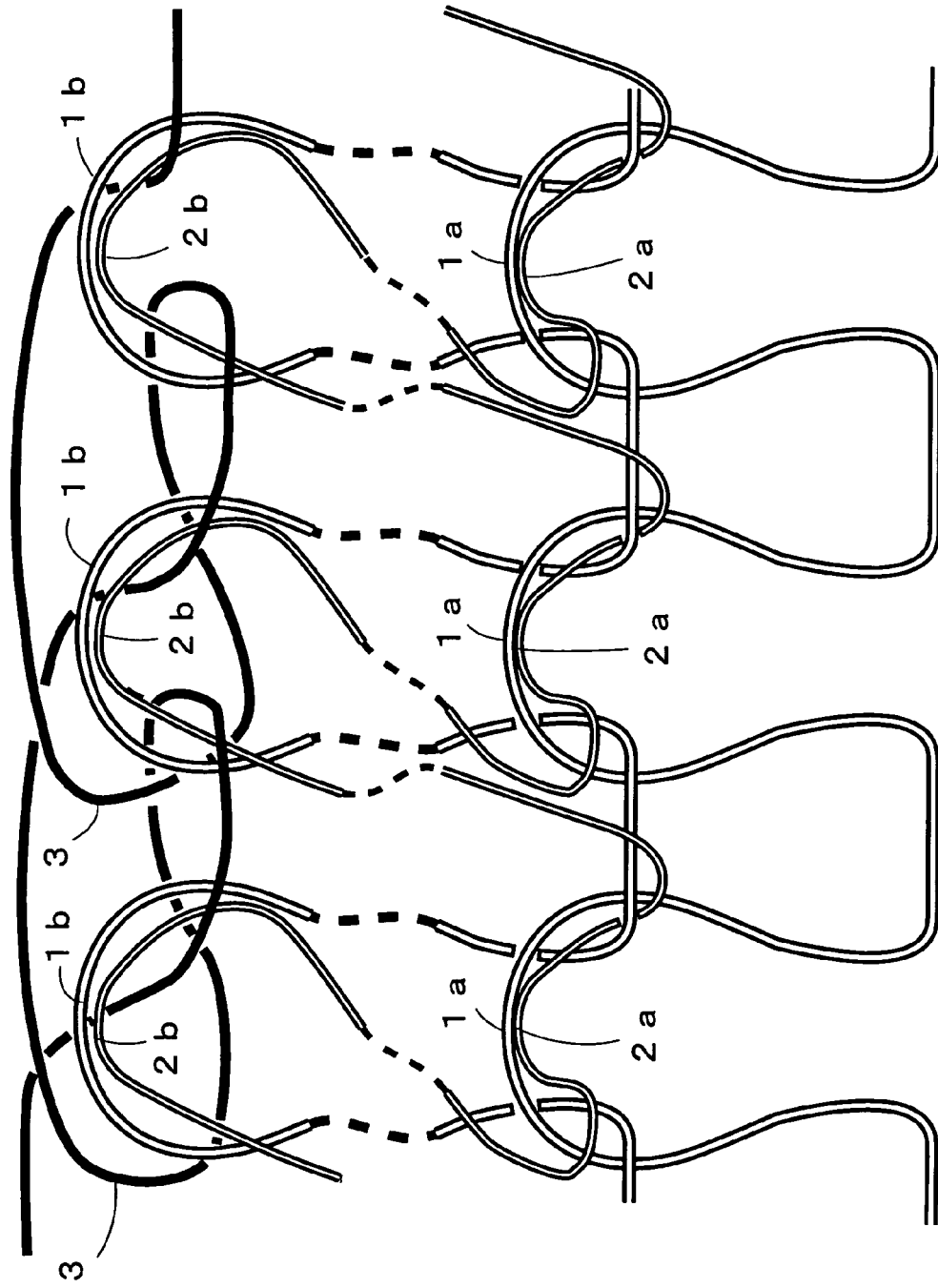


Fig. 6





EUROPEAN SEARCH REPORT

Application Number
EP 13 00 0934

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	EP 0 569 159 A2 (SHIMA SEIKI MFG [JP] SHIMA SEIKI MFG [DK]) 10 November 1993 (1993-11-10) * column 3, line 10 - column 4, line 44; figures 1-3 *	1-4	INV. D04B1/10 D04B1/28
A	----- WO 2007/020829 A1 (SHIMA SEIKI MFG [JP]; YUI MANABU [JP]) 22 February 2007 (2007-02-22) * figures 1-3 *	1-4	
A	----- US 2011/083475 A1 (WEIHERMUELLER STEFAN [DE]) 14 April 2011 (2011-04-14) * paragraphs [0004] - [0005] *	1-4	
			TECHNICAL FIELDS SEARCHED (IPC)
			D04B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 22 May 2013	Examiner Wendl, Helen
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (F04C01)

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

EP 13 00 0934

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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22-05-2013

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