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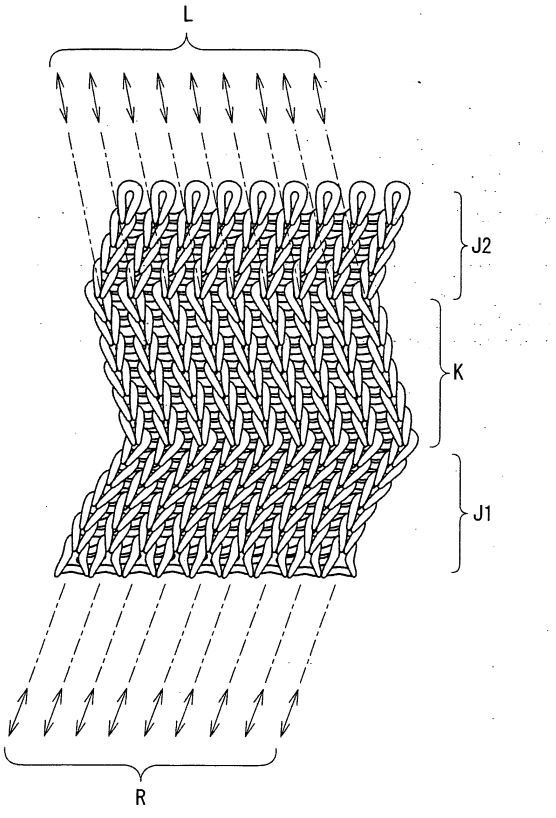
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(54) CYLINDRICAL FABRIC HAVING A RACKED PATTERN, AND ITS KNITTING METHOD

(57) A method of knitting a tubular fabric which can continuously form a racked pattern with stitches transversely inclined on a circumferential face of the tubular fabric is provided.

The method of knitting a tubular fabric is a method of knitting a tubular fabric knitted using a weft knitting machine provided with at least a front and back pair of needle beds, the front and back needle beds being configured capable of relative racking, and the tubular fabric having a racked pattern with stitches transversely inclined, and the method is **characterized in that** when an inclination direction of the stitches is to be changed from right to left, the stitches at the left end of the front fabric retained by knitting needles of the front needle bed are transferred to empty needles of the back needle bed, and the stitches at the right end of the back fabric retained by the knitting needles of the back needle bed are transferred to the empty needles of the front needle bed.

Fig. 1



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Description

Technical Field

[0001] The present invention relates to a tubular fabric knitted by a weft knitting machine and a method of knitting the fabric and more particularly to a tubular fabric having a racked pattern and a method of knitting the fabric.

Background Art

[0002] A technique for knitting a rib-loop fabric in which a front stitch and a back stitch appear alternately on the front side of a tubular fabric is knitted by a weft knitting machine provided with at least a front and back pair of needle beds is disclosed in the following Patent Document 1.
Also, it is publicly known that by using a weft knitting machine having front and back needle beds configured capable of relative racking, a fabric made of a non-tubular flat fabric having a racked pattern with inclined stitches can be knitted.
Such a non-tubular flat fabric having a racked pattern includes a fabric in which a racked pattern with an inclination of the stitches changed at a predetermined spot in the fabric, and it is known that this fabric can also be knitted by a weft knitting machine having front and back needle beds configured capable of relative racking.
[0003] A fabric of the flat knit in which a racked pattern with an inclination of the stitches changed at a predetermined spot in a fabric is formed is in a state as described below.
For example, a part of a knitting diagram when a ridge pattern with stitches transversely inclined is formed in a flat knitted fabric is shown in Fig. 4. In a knitting course 1, using a weft knitting machine with two beds, that is, a back needle bed indicated as BD and a front needle bed as FD, a racked pattern having inclination of stitches changed from right to left is formed in a flat knitted fabric retained by knitting needles a to h of the FD indicated by black circles.
In this case, in a knitting course 2, stitches retained by the knitting needles b, d, f, and h of the FD indicated by white circles are transferred from the knitting needles of the FD to the empty needles B, D, F, and H of the BD, and in a knitting course 3, racking is performed to move the BD to the left only by 2 pitches with respect to the FD so as to have L2.5P so that relative positions of the stitches remaining on the knitting needles a, c, e, and g of the FD and the stitches having been transferred to the knitting needles B, D, F, and H of the BD are changed and then, the stitches retained by the knitting needles a, c, e, and g of the FD are knitted by tucking indicated by V letters and the stitches having been transferred to the knitting needles B, D, F, and H of the BD are knitted by knitting indicated by the black circles, respectively.
In this case, knitting is performed alternately between the FD and the BD, and discontinuity in the pattern does not occur.
[0004] Subsequently, if the inclination direction of the stitches is to be changed from right to left, since the BD racking direction needs to be made opposite to that in the knitting course 3, the racking is performed to move the BD to the right by 2 pitches with respect to the FD so as to have R1.5P in a knitting course 4.
After that, the stitches retained by the knitting needles a, c, e, and g of the FD are knitted by tucking indicated by V letters and the stitches having been transferred to the knitting needles B, D, F, and H of the BD are knitted by knitting indicated by the black circles, respectively.
[0005] In the knitting course 4, stitches retained by the respective opposing needle beds are not formed between the knitting needles a and c of the FD and the knitting needles F and H of the BD, and discontinuous patterns in which the tucking and the knitting are continued are formed at both ends of the knitted fabric.
If the flat knitted fabric in which the discontinuous pattern is formed as above is to be formed into a tubular fabric such as a sweater, for example, since the knitted fabric end portion is removed by cutting, there is no problem of discontinuity of the pattern in the tubular fabric obtained by sewing after the cutting.
[0006]

Patent Document 1: Japanese Examined Patent Application Publication No. 3-75656

Disclosure of the Invention

Problem To be solved by the Invention

[0007] However, if a sweater or the like in which a racked pattern with the inclination of the stitches changed at a predetermined spot of the fabric is formed is to be manufactured by the above knitting method as a tubular fabric capable of suppressing a manufacturing cost and saving labors without generating a cut loss in the cutting, it has been impossible to knit a tubular fabric in which a pattern does not lose shape over the circumferential face of the tubular fabric since the fabric end portion is not removed by cutting.
[0008] The present invention was made in view of the above problems and has an object to provide a method of knitting a tubular fabric capable of continuously forming a racked pattern having stitches transversely inclined on a circumferential face of the tubular fabric.

Means for Solving the Problem

[0009] In order to achieve the above object, a method of knitting a tubular fabric having a racked pattern according to the present invention is a method of knitting a tubular fabric knitted using a weft knitting machine provided with at least a front and back pair of needle beds, the front and back needle beds being capable of relative racking, and having a racked pattern with stitches trans-

versely inclined, characterized by including a step in which first racking is performed by transferring stitches of a fabric forming the racked pattern in the fabric retained by knitting needles of either one of the front and back needle beds from the knitting needles of the one needle bed to empty needles of the other needle bed so that relative positions of the stitches remaining on the knitting needles of the one needle bed and the stitches having been transferred to the knitting needles of the other needle bed are changed and then, second racking is performed by knitting the stitches retained by the knitting needles of the one needle bed and the stitches having been transferred to the knitting needles of the other needle bed so that the relative positions are returned to those before the first racking and transferring the stitches of a stitch row having been transferred to the knitting needle of the other needle bed to the empty needles of the one needle bed; and a step of performing knitting without racking after the stitches are transferred from the one needle bed to the empty needles of the other needle bed and of transferring the stitches of the transferred stitch row to the same positional relationship as the stitches on the one needle bed before the transfer, in which when the inclination direction of the stitches is to be changed from left to right, the stitches on the right end of a front fabric retained by the knitting needles of the front needle bed are transferred to the empty needles of the back needle bed and the stitches on the left end of a back fabric retained by the knitting needles of the back needle bed are transferred to the empty needles of the front needle bed, while when the inclination direction of the stitches is to be changed from right to left, the stitches on the left end of the front fabric retained by the knitting needles of the front needle bed are transferred to the empty needles of the back needle bed and the stitches on the right end of the back fabric retained by the knitting needles of the back needle bed are transferred to the empty needles of the front needle bed.

[0010] Also, when the racked pattern of the above configuration is to be formed, the front fabric retained by the knitting needles of the front needle bed is knitted in a state displaced in advance by a predetermined amount in a direction opposite the inclination direction of the stitches with respect to the back fabric retained by the knitting needles of the back needle bed.

[0011] The tubular fabric having the racked pattern according to the present invention is a tubular fabric having a racked pattern knitted using a weft knitting machine provided with at least a front and back pair of needle beds, the front and back needle beds being configured capable of relative racking, and having the racked pattern with stitches transversely inclined and **characterized in that** when the inclination direction of the stitches is to be changed from left to right, the stitches on the right end of a front fabric retained by the knitting needles of the front needle bed are transferred to the empty needles of the back needle bed and the stitches on the left end of a back fabric retained by the knitting needles of the back needle bed are transferred to the empty needles of the front needle bed, while when the inclination direction of the stitches is to be changed from right to left, the stitches on the left end of the front fabric retained by the knitting needles of the front needle bed are transferred to the empty needles of the back needle bed and the stitches on the right end of the back fabric retained by the knitting needles of the back needle bed are transferred to the empty needles of the front needle bed so that the racked pattern is formed.

Effect of the Invention

[0012] In the method of knitting a tubular fabric having a racked pattern according to the present invention, when a tubular fabric having a racked pattern with stitches transversely inclined are knitted using a weft knitting machine provided with at least a front and back pair of needle beds, the front and back needle beds being configured capable of relative racking, if the inclination direction of the stitches is to be changed from left to right, the stitches on the right end of a front fabric retained by the knitting needles of the front needle bed are transferred to the empty needles of the back needle bed and the stitches on the left end of a back fabric retained by the knitting needles of the back needle bed are transferred to the empty needles of the front needle bed, while when the inclination direction of the stitches is to be changed from right to left, the stitches on the left end of the front fabric retained by the knitting needles of the front needle bed are transferred to the empty needles of the back needle bed and the stitches on the right end of the back fabric retained by the knitting needles of the back needle bed are transferred to the empty needles of the front needle bed. Thus, even if the inclination direction of the stitches is changed, the positional relationship between the front and back stitches is not affected, and a tubular fabric in which a continuous racked pattern is formed even at a boundary between the front and back fabrics can be knitted, which is an advantage.

[0013] Also, when a racked pattern is to be formed, if the front fabric retained by the knitting needles of the front needle bed is to be knitted from a state displaced in advance by a predetermined amount in a direction opposite the inclination direction of the stitches with respect to the back fabric retained by the knitting needles of the back needle bed, since a bridge yarn bridging the fabrics retained by the knitting needles of the front and back needle beds can be made short, stretching or cutting of the bridge yarns can be prevented.

[0014] In the tubular fabric having a racked pattern according to the present invention, since if the inclination direction of the stitches is to be changed from left to right, the stitches on the right end of a front fabric retained by the knitting needles of the front needle bed are transferred to the empty needles of the back needle bed and the stitches on the left end of a back fabric retained by the knitting needles of the back needle bed are trans-

ferred to the empty needles of the front needle bed, while when the inclination direction of the stitches is to be changed from right to left, the stitches on the left end of the front fabric retained by the knitting needles of the front needle bed are transferred to the empty needles of the back needle bed and the stitches on the right end retained by the knitting needles of the back needle bed are transferred to the empty needles of the front needle bed so as to form the racked pattern, a tubular fabric with a racked pattern with a high commodity value can be obtained.

Brief Description of the Drawings

[0015]

[Fig. 1] Fig. 1 is a partially enlarged diagram of a tubular fabric having a racked pattern according to an embodiment of the present invention.
[Fig. 2] Fig. 2 is a knitting diagram of the tubular fabric.
[Fig. 3] Fig. 3 is a knitting diagram of the tubular fabric.
[Fig. 4] Fig. 4 is a knitting diagram of a tubular fabric having a prior-art racked pattern.

Reference Signs List

[0016]

L, R inclination direction

Best Mode for Carrying out the Invention

[0017] A preferred embodiment of a tubular fabric having a racked pattern and a method of knitting the pattern according to the present invention will be described below referring to the attached drawings.
In this embodiment, though not shown, a so-called "four-bed weft knitting machine" in which a front and back pair of needle beds are disposed vertically and both of the front and back needle beds are provided with a lower back needle bed, an upper back needle bed, an upper front needle bed, and a lower front needle bed capable of transverse racking is used, and by supplying yarns to knitting needles of the both front and back needle beds while the upper and lower back needle beds are relatively displaced by 0.5 pitches from reference positions, a back fabric is knitted by the lower back needle bed and the upper front needle bed and a front fabric by the upper back needle bed and the lower front needle bed so as to obtain a tubular fabric.
[0018] A weft knitting machine with only one of the front and back needle beds capable of transverse racking may be used or a so-called "two-bed knitting machine" in which a front and back pair of needle beds are disposed may be used.
If the fabric of this embodiment is to be knitted by this two-bed knitting machine, it can be carried out by "half gauge" in which knitting is performed using knitting needles by every other pitch.
The method of knitting fabric will be described referring to knitting courses 1 to 14 shown in Figs. 2 and 3.
[0019] Fig. 1 is a partially enlarged view of a back fabric retained by the knitting needles of the lower back needle bed of a tubular fabric having a racked pattern according to an embodiment of the present invention when seen from the rear side. This fabric has a pattern with stitches transversely inclined, and an inclination direction R of a part of the stitches on a lower stage J1 and an upper stage J2 is right from the vertical direction in Fig. 1, while an inclination direction L of the stitches on a middle stage K is left, and the racked pattern in which the inclination direction is changed from right to left and from left to right at a boundary between the lower stage J1 and the middle stage K and a boundary between the middle stage K and the upper stage J2, respectively, is obtained.
[0020] Figs. 2 and 3 are knitting diagrams of the tubular fabric having the racked pattern shown in Fig. 1, and numerals on the left side indicate the knitting courses.
Each of the knitting courses indicates each of the needle beds of the four beds, in which a lower back needle bed is indicated as BD, an upper back needle bed as BU, an upper front needle bed as FU, and a lower front needle bed as FD.
Also, upper-case letters A, B, C, ..., and I indicate the knitting needles of the BD and the BU, while lower-case letters a, b, c, ..., and i indicate the knitting needles of the FU and the FD.
In the knitting courses 1 to 14, the upper-case and lower-case letters are omitted as appropriate for convenience, and the number of the knitting needles is smaller than the actual number in the figures for convenience of explanation.
[0021] Alphanumeric characters shown in the right side of the knitting courses 1 to 14 indicate racking positions of the needle bed, that is, the racking to the right is indicated by R and the racking to the left by L, and alphanumeric characters L0.5P of the BD and the BU in the knitting course 1, for example, indicates that the BD and the BU are located at positions of 0.5 pitches left from the reference positions.
Black circles shown at the positions of the knitting needles indicate knitting, the V-letters indicate tucking, white circles indicate former loops, arrows indicate stitch transfers, broken lines indicate bridging of yarns retained by the knitting needles of the front and back needle beds as the former loops, and solid lines indicate bridging of yarns of fabrics retained by the knitting needles of the front and back needle beds in knitting.
[0022] The knitting course 1 is in a state in which when a racked pattern having stitches inclined to the right is to be formed on a circumferential face of a tubular fabric for a knitted portion of the tubular fabric or a fabric with knitting for a predetermined amount, the front fabric retained by the knitting needles a to h of the FD is displaced in

advance by a predetermined amount with respect to the back fabric retained by the knitting needles B to I of the BD.

That is, the front fabric retained by the knitting needles a to h of the FD and the back fabric retained by the knitting needles B to I of the BD are formed such that the stitch inclination direction R is inclined to the right as shown in the lower stage J1 and the upper stage J2 in Fig. 1 by stitch transfer and racking shown in the knitting courses 2 to 11, which will be described later. In performing such knitting, the stitches at both ends of the fabric retained by the knitting needles a and h of the FD are in a state displaced to the left by 1 pitch with respect to the stitches at both ends of the fabric retained by the knitting needles B and I of the BD.

[0023] The knitting course 2 shows a state in which, from the above state, the stitches retained by the knitting needles B, D, F, and H of the BD have been transferred to the empty needles b, d, f, and h of the FU from the knitting needles of the BD, and the knitting course 3 shows a state in which first racking is performed to move the FU and the FD to the right only by 2 pitches so that the relative positions of the stitches retained by the knitting needles C, E, G, and I of the BD and the stitches having been transferred to the knitting needles b, d, f, and h of the FU are changed so as to have R2.0P and then, yarns are fed to the stitches retained by the knitting needles C, E, G, and I of the BD and the stitches having been transferred to the knitting needles b, d, f, and h of the FU and knitting is performed.

At that time, in order to form a racked pattern as a one-side ridge, the stitches retained by the BD are tucked, and the tucking and the knitting are repeated.

[0024] In the knitting course 4, second racking to move the FU and the FD to the left by 2 pitches is performed so that the relative positions of the stitches retained by the knitting needles of each of the BD and the FU become the relative positions before the first racking so as to return to the positions of L0.0P, and the stitches of a stitch row having been transferred to the knitting needles b, d, f, and h of the FU are transferred to the empty needles B, D, F, and H of the BD.

[0025] In the knitting course 5, in order to knit the front fabric retained by the knitting needles of the FD, the stitches retained by the knitting needles b, d, f, and h in the stitches retained by the knitting needles a to h of the FD are transferred from the knitting needles of the FD to the empty needles B, D, F, and H of the BU, and in the knitting course 6, the first racking to move the BU and the BD to the left only by 2 pitches is performed so that the relative positions of the stitches remaining at the knitting needles a, c, e, and g of the FD and the stitches having been transferred to the knitting needles B, D, F, and H of the BU are changed so as to have the BU and the BD at L2.5P.

The yarns are fed to the stitches.retained by the knitting needles a, c, e, and g of the FD and the stitches having been transferred to the knitting needles B, D, F, and H of the BU and knitting is performed, and the tucking is also performed by the knitting needles of the FD similarly to the knitting course 3.

[0026] In the knitting course 7, the second racking to move the BU and the BD to the right by 2 pitches is performed so that the relative positions of the stitches retained by the knitting needles B, D, F, and H and a, c, e, and g of each of the BD and the FU become the relative positions before the first racking in the knitting of the front fabric so as to return to the positions of the L0.5P, the stitches of the stitch row having been transferred to the knitting needles B, D, F, and H of the BU are transferred to the empty needles b, d, f, and h of the needle bed of the FD, by which a round knitting for one course of the front and back fabrics retained by the knitting needles of the BD to FD is finished.

[0027] In the subsequent knitting of the back fabric retained by the knitting needles of the BD in the knitting course 7, totally similarly to the stitch transfer shown in the knitting course 2, the stitches retained by the knitting needles B, D, F, and H of the BD are transferred to the empty needles b, d, f, and h of the FU, and without performing the first racking, yarns are fed to the stitches retained by the knitting needles C, E, G, and I of the BD and the stitches having been transferred to the knitting needles b, d, f, and h of the FU and knitting is performed in the knitting course 8.

At that time, the stitches retained by the knitting needles C,'E, G, and I of the BD are knitted differently from the knitting course 3.

The knitting course 9 shows a state in which without performing the second racking, the stitches of the stitch row having been transferred to the knitting needles b, d, f, and h of the FU are transferred to the same knitting needles B, D, F, and H as before the stitch transfer.

[0028] In the subsequent knitting of the front fabric retained by the knitting needles of the FD in the knitting course 9, the stitches retained by the knitting needles b, d, f, and h of the FD are transferred to the empty needles B, D, F, and H of the BU similarly to the stitch transfer in the knitting course 5 and then, without performing the first racking in the knitting course 10, yarns are fed to the stitches retained by the knitting needles a, c, e, and g of the FD and the stitches having been transferred to the knitting needles B, D, F, and H of the BU and knitting is performed.

At that time, knitting is performed by the knitting needles a, c, e, and g of the FD similarly to the knitting course 8.

The knitting course 11 shows a state in which the stitches retained by the knitting needles B, D, F, and H of the BU are transferred to the knitting needles b, d, f, and h at the same positions as the positions of the FD before the transfer.

[0029] By repeating the above knitting courses 1 to 11, the front fabric retained by the knitting needles a to h of the FD and the back fabric retained by the knitting needles B to I of the BD both form the racked pattern with stitches inclined to the right.

By forming the racked pattern in the knitting course 1 in the state with the front fabric displaced by 1 pitch with respect to the back fabric, when the FU and the FD as well as the BD and the BU perform the racking, respectively, in the knitting courses 3 and 6, a bridging yarn w at the left end portion of the tubular fabric indicated by the broken line bridges the knitting needle b of the FU and the knitting needle a of the FD in the knitting course 3 and also bridges the B of the BD and a of the FD in the knitting course 6, and both can be a length of 1 pitch.

On the other hand, if the back fabric is retained by the knitting needles A to H of the BD in a state in which the front fabric and the back fabric are not displaced from each other in the knitting course 1, that is, when the front fabric is retained by the knitting needles a to h of the FD, a bridging yarn y indicated by a one-dot chain line bridges A of the BD and a of the FD both in the knitting courses 3 and 6, which becomes a length of 2 pitches.

Therefore, by knitting the rack pattern from the state in which the front fabric is displaced by 1 pitch in a direction opposite the inclination direction of the stitches with respect to the back fabric, the length of the bridging yarn can be reduced by 1 pitch as compared with the knitting from the non-displaced state, and cutting of the bridging yarn or stretching of the stitches of the portion hardly occurs.

[0030] Subsequently, in order to form the racked pattern in a state in which the stitch inclination direction R is changed to the inclination direction L in a transition from the lower stage J1 to the middle stage K of the fabric shown in Fig. 1, the knitting courses 1 to 11 are repeated for the predetermined number of times so as to knit the lower stage J1 and then, the direction of the first racking performed in the above-mentioned knitting courses 3 and 6 is reversed and then, knitting is performed.

[0031] At that time, in the knitting course 12 subsequent to the knitting course 11, since the inclination direction of the stitches from the vertical direction is changed from right to left, the stitches at the left end of the front fabric retained by the knitting needle a of the FD is transferred to the empty needle A of the BD and the stitches at the right end of the back fabric retained by the knitting needle I of the BD are transferred to the empty needle i of the FD.

Here, the stitches retained by the knitting needles a and I may be transferred to the knitting needles A and i as they are, but it may be so knitted that the stitches retained by the knitting needles a and I are twisted in advance and knitted and then, transferred to the knitting needles A and i opposing the knitting needles a and I and the twisting is unknitted.

By knitting through twisting the stitches retained by the knitting needles a and I and unknitting them, the stitches appearing on the front side of the fabric can be prevented from being twisted even after the stitch transfer, and a continuous pattern with a higher degree of completeness can be formed.

[0032] Then, after the stitch transfer similar to the knitting course 2, in the knitting course 13, the first racking is performed in a direction opposite that of the knitting course 3 so as to make the FU and the FD L2.0P, yarns are fed to the stitches retained by the knitting needles A, C, E, and G of the BD and the stitches retained by the knitting needles b, d, f, and h of the FU and knitting is performed, and at that time, the stitches retained by the knitting needles A, C, E, and G of the BD are given tucking.

After the knitting course 13, the second racking to move the FU and the FD to the right by 2 pitches is performed so that the relative positions of the stitches retained by the knitting needles A, C, E, and G and the b, d, f, and h of the BD and the FU, respectively, shown in the knitting course 4 become the relative positions before the first racking in the knitting course 13 so as to return to the positions of L0.0P and then, the stitches b, d, f, and h of the stitch row having been transferred to the knitting needles of the FU are transferred to the empty needles B, D, F, and H of the needle bed of the BD.

[0033] In knitting of the fabric retained by the knitting needles b to i of the FD, the stitch transfer is performed similarly to the knitting course 5 and the stitches retained by the knitting needles b, d, f, and h of the FD are transferred to the empty needles B, D, F, and H of the BU and then, in the knitting course 14, the first racking is performed to move the BU and the BD to the right by 2 pitches to have R1.5P and yarns are fed to the stitches retained by the knitting needles c, e, g, and i of the FD and the stitches having been transferred to the knitting needles B, D, F, and H of the BU and knitting is performed.

At that time, the stitches retained by the knitting needles c, e, g, and i of the FD are given tucking.

[0034] As shown in the knitting course 7, the second racking to move the BD and the BU to the left by 2 pitches to the relative positions before the first racking in the knitting course 14 is performed so as to return to the position of L0.5P, and the stitches of the stitch row having been transferred to the knitting needles B, D, F, and H of the BU are transferred to the empty needles b, d, f, and h of the needle bed of the FD.

[0035] Similarly to the knitting courses 8 to 11, knitting is performed without the first racking and the second racking after the stitch transfer and till the boundary between the middle stage K and the upper stage J2 shown in Fig. 1 is reached and the inclination direction of the stitches is changed, the knitting is repeated such that the knitting course 3 is replaced by the knitting course 13 and the knitting course 6 is replaced by the.knitting course 14 in the knitting courses 2 to 11.

[0036] When the racked pattern in the state in which the inclination direction R of the stitches is changed from right to left at a predetermined spot is to be formed in the knitting course 12 as above, since the stitches retained by the knitting needle a of the FD is transferred to the empty needle A of the BD and the stitches retained by the knitting needle I of the BD are transferred to the empty needle i of the FD, the continuous racked pattern can be

formed also for the fabric knitted after the inclination direction of the stitch is changed.

Then, when the stitch inclination direction L is to be changed from left to right at the transition from the middle stage K to the upper stage J1 shown in Fig. 1, contrarily to the knitting course 12, the stitches retained by the knitting needle A of the BD are transferred to the empty needle a of the FD and the stitches retained by the knitting needle i of the FD are transferred to the empty needle I of the BD so as to have the state in the knitting course I. As mentioned above, even if the inclination direction of the stitch is changed to right or left several times, the continuous racked pattern can be formed.

[0037] In the above embodiment, the one-side ridge knitting was performed in which the stitches appearing on the front side of the tubular fabric repeats tucking and knitting, but the tubular fabric having a racked pattern and a method of knitting the fabric according to the present invention are not limited to that, but it may be double-sided ridge knitting in which the both front and back side stitches of the tubular fabric repeat tucking and knitting or all the stitches may be knitted without tucking at all.

Also, in the above embodiment, the step shown in the knitting courses 2 to 6 in which the first and second racking are performed and the stitches appearing on the front side of the tubular fabric are tucked was performed prior to the step shown in the knitting courses 8 to 11 in which the stitches appearing on the front side of the tubular fabric are knitted without performing racking, but not limited to that, the step shown in the knitting courses 2 to 6 and the step shown in the knitting courses 8 to 11 may be in the reverse order.

In the stitches in the front and back fabrics of the tubular fabric, the stitches at the both ends are displaced in advance in a direction opposite the inclination direction of the racked pattern to be formed, but they may be the stitches only at one end side of the front and back fabrics.

Claims

1. A method of knitting a tubular fabric knitted using a weft knitting machine provided with at least a front and back pair of needle beds and the front, back needle beds being capable of relative racking, and halving a racked pattern with stitches transversely inclined, in which a front fabric retained by knitting needles of the front needle bed and a back fabric retained by the knitting needles of the back needle bed are connected to both right and left ends, **characterized by** including a step in which first racking is performed by transferring stitches of a fabric forming the racked pattern in the fabric retained by knitting needles of either one of the front and back needle beds from the knitting needles of the one needle bed to empty needles of the other needle bed so that relative positions of the stitches remaining on the knitting needles of the one needle bed and the stitches having been transferred to the knitting needles of the other needle bed are changed and then, second racking is performed by knitting the stitches retained by the knitting needles of the one needle bed and the stitches having been transferred to the knitting needles of the other needle bed so that the relative positions are returned to those before the first racking and transferring the stitches of a stitch row having been transferred to the knitting needle of the other needle bed to the empty needles of the one needle bed; and a step of performing knitting without racking after the stitches are transferred from the one needle bed to the empty needles of the other needle bed and of transferring the stitches of the transferred stitch row to the same positional relationship as the stitches on the one needle bed before the transfer, wherein when the inclination direction of the stitches is to be changed from left to right, the stitches on the right end of a front fabric retained by the knitting needles of the front needle bed are transferred to the empty needles of the back needle bed and the stitches on the left end of a back fabric retained by the knitting needles of the back needle bed are transferred to the empty needles of the front needle bed, while when the inclination direction of the stitches is to be changed from right to left, the stitches on the left end of the front fabric retained by the knitting needles of the front needle bed are transferred to the empty needles of the back needle bed and the stitches on the right end of the back fabric retained by the knitting needles of the back needle bed are transferred to the empty needles of the front needle bed.

2. The method of knitting a tubular fabric having a racked pattern according to claim 1, wherein when the racked pattern according to claim 1 is to be formed, the front fabric retained by the knitting needles of the front needle bed is knitted in a state displaced in advance by a predetermined amount in a direction opposite the inclination direction of the stitches with respect to the back fabric retained by the knitting needles of the back needle bed.

3. A tubular fabric having a racked pattern knitted using a weft knitting machine provided with at least a front and back pair of needle beds, the front and back needle beds being configured capable of relative racking, and having a racked pattern with stitches transversely inclined, **characterized in that** when the inclination direction of the stitches is to be changed from left to right, the stitches on the right end of a front fabric retained by the knitting needles of the front needle bed are transferred to the empty needles of the back needle bed and the stitches on the left end of a back fabric retained by the knitting needles of the back needle bed are transferred to

the empty needles of the front needle bed, while when the inclination direction of the stitches is to be changed from right to left, the stitches on the left end of the front fabric retained by the knitting needles of the front needle bed are transferred to the empty needles of the back needle bed and the stitches on the right end of the back fabric retained by the knitting needles of the back needle bed are transferred to the empty needles of the front needle bed so that the racked pattern is formed.

Fig. 1

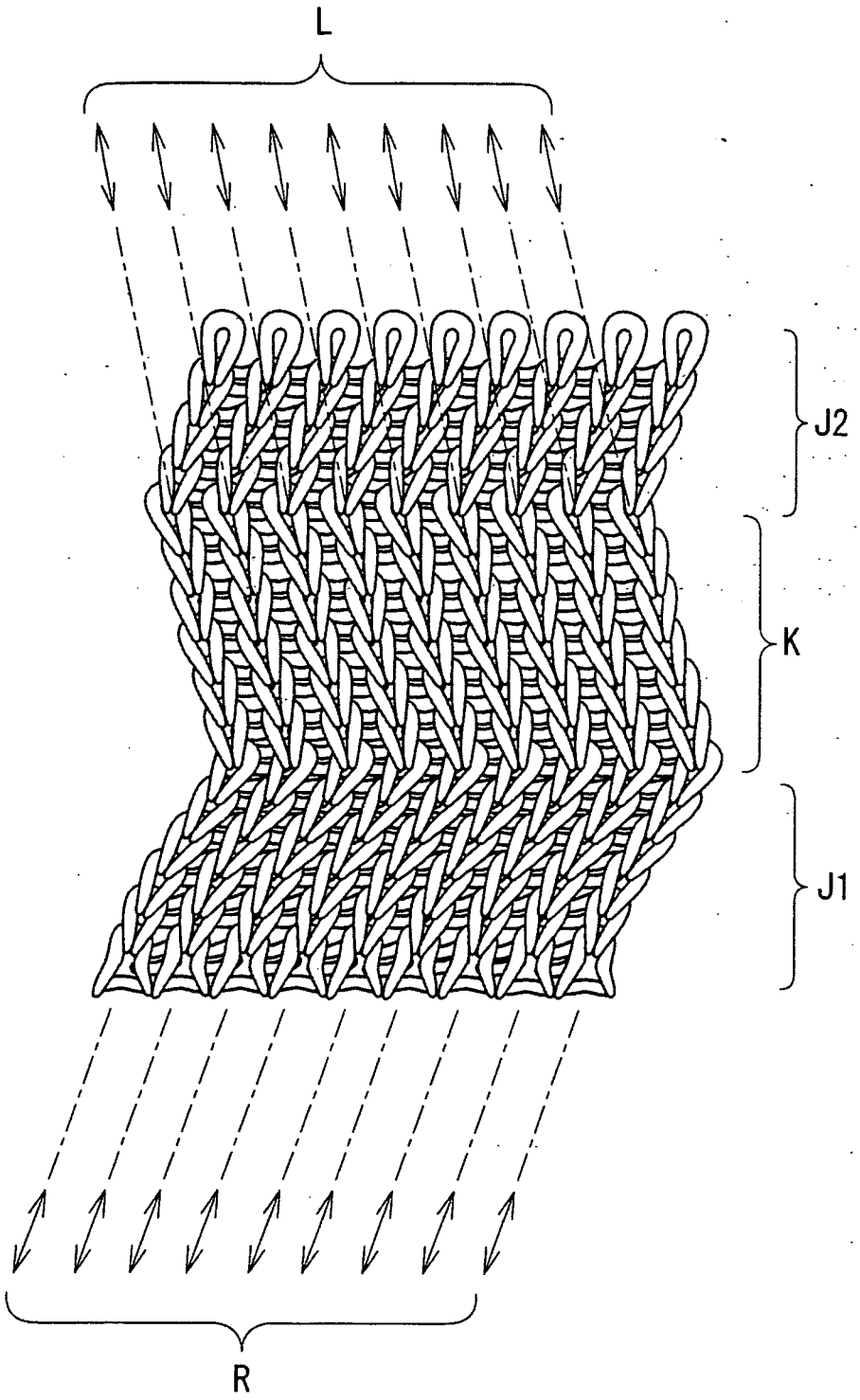


Fig. 2

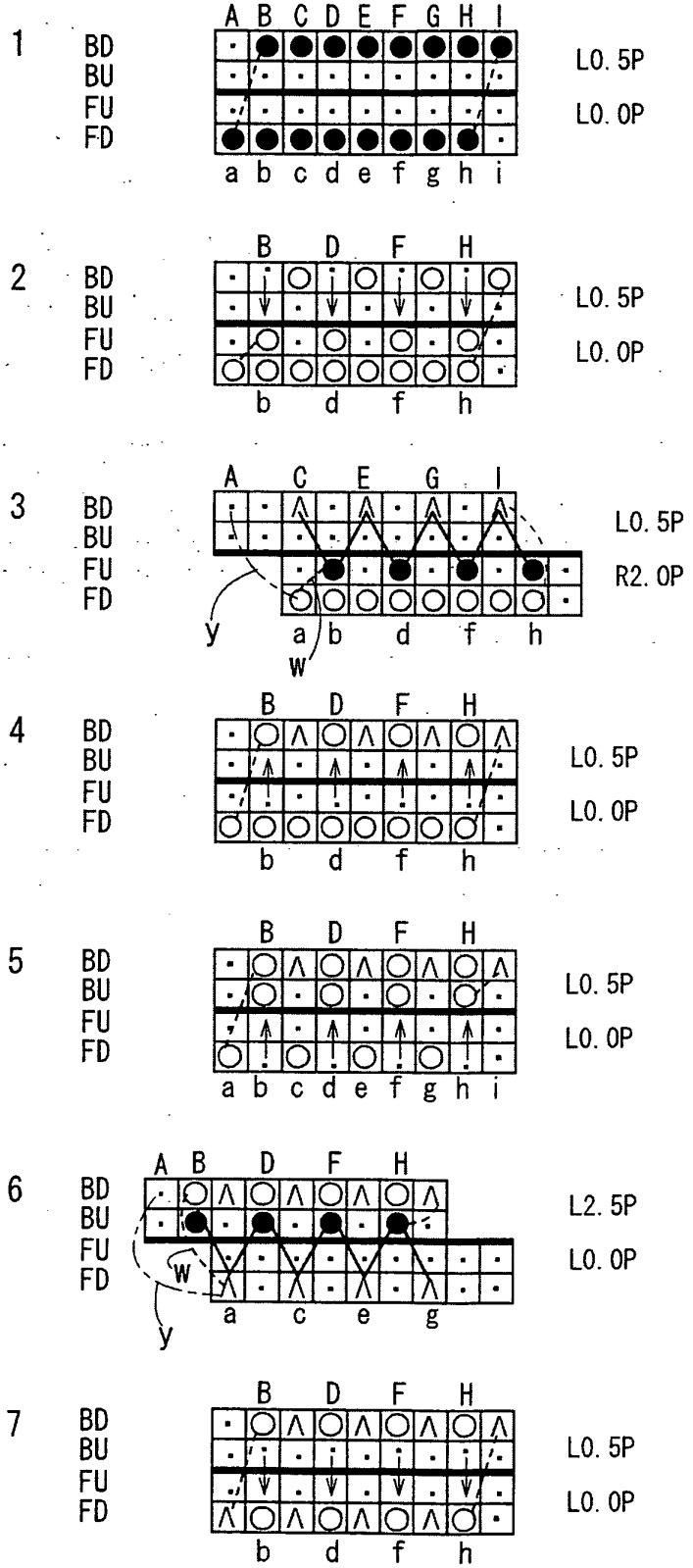

1
BD
BU
FU
FD
A B C D E F G H I
a b c d e f g h i
L0. 5P
L0. 0P
2
BD
BU
FU
FD
B D F H
b d f h
L0. 5P
L0. 0P
3
BD
BU
FU
FD
A C E G I
y
a b d f h
W
L0. 5P
R2. 0P
4
BD
BU
FU
FD
B D F H
b d f h
L0. 5P
L0. 0P
5
BD
BU
FU
FD
B D F H
a b c d e f g h i
L0. 5P
L0. 0P
6
BD
BU
FU
FD
A B D F H
W
a c e g
y
L2. 5P
L0. 0P
7
BD
BU
FU
FD
B D F H
b d f h
L0. 5P
L0. 0P

Fig. 3

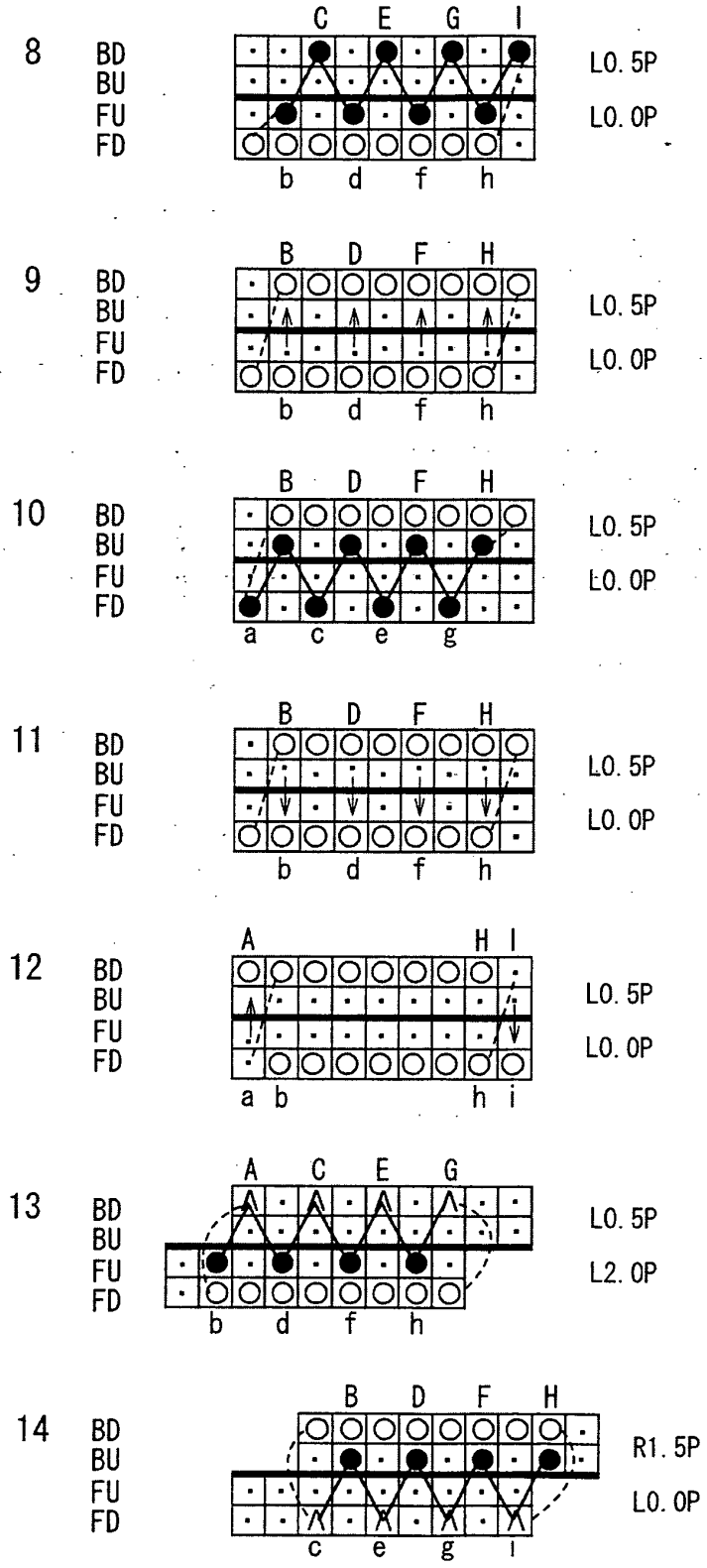
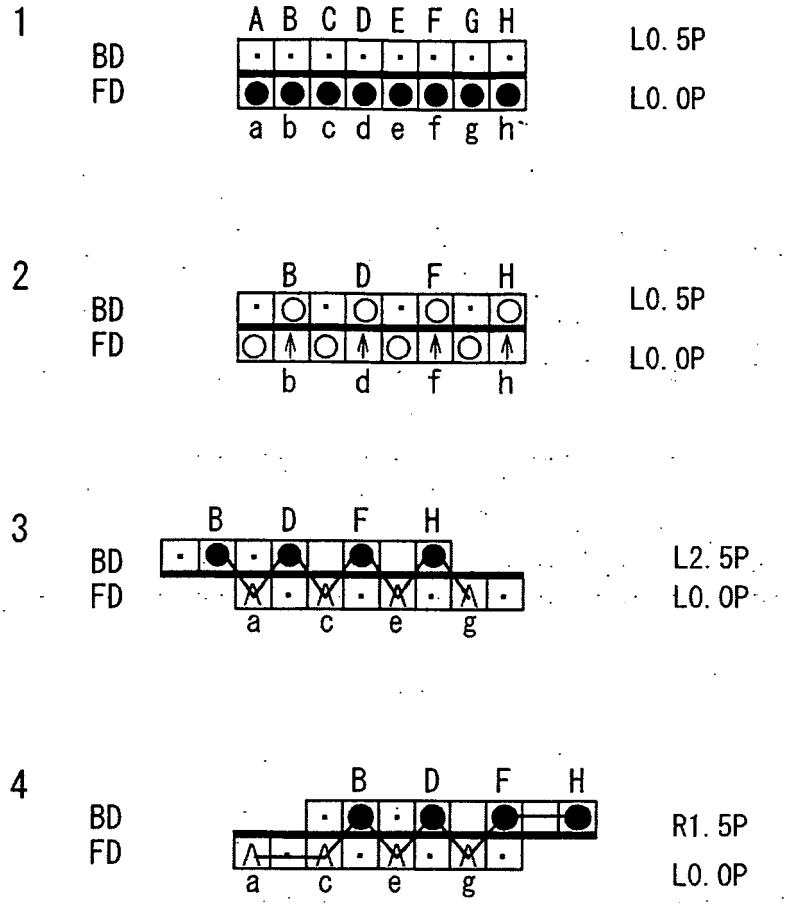

8
BD
BU
FU
FD
C E G I
b d f h
LO. 5P
LO. 0P
9
BD
BU
FU
FD
B D F H
b d f h
LO. 5P
LO. 0P
10
BD
BU
FU
FD
B D F H
a c e g
LO. 5P
LO. 0P
11
BD
BU
FU
FD
B D F H
b d f h
LO. 5P
LO. 0P
12
BD
BU
FU
FD
A H I
a b h i
LO. 5P
LO. 0P
13
BD
BU
FU
FD
A C E G
b d f h
LO. 5P
L2. 0P
14
BD
BU
FU
FD
B D F H
c e g i
R1. 5P
LO. 0P

Fig. 4


1
BD
FD
A B C D E F G H
a b c d e f g h
L0. 5P
L0. 0P
2
BD
FD
B D F H
b d f h
L0. 5P
L0. 0P
3
BD
FD
B D F H
a c e g
L2. 5P
L0. 0P
4
BD
FD
B D F H
a c e g
R1. 5P
L0. 0P

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2008/072177

A. CLASSIFICATION OF SUBJECT MATTER
D04B1/00(2006.01)i, *D04B7/26*(2006.01)i

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, D04B21/00-21/20, D04B3/00-19/00, D04B23/00-39/08

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 3-75656 B2 (Shima Seiki Mfg., Ltd.), 02 December, 1991 (02.12.91), Full text (Family: none)	1-3
A	WO 2004/79070 A1 (Shima Seiki Mfg., Ltd.), 16 September, 2004 (16.09.04), Full text & EP 1605082 A1 & US 2006/137405 A1 & CN 1751150 A & KR 2006/0013481 A	1-3
A	JP 2007-197856 A (Yasuo YAMAGUCHI), 09 August, 2007 (09.08.07), Claim 1 (Family: none)	1-3

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Date of the actual completion of the international search	Date of mailing of the international search report
05 February, 2009 (05.02.09)	17 February, 2009 (17.02.09)
Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer
Facsimile No.	Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2008/072177

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2000-45152 A (Kabushiki Kaisha Takatonitto), 15 February, 2000 (15.02.00), Par. No. [0025] (Family: none)	1-3

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 3075656 A **[0006]**