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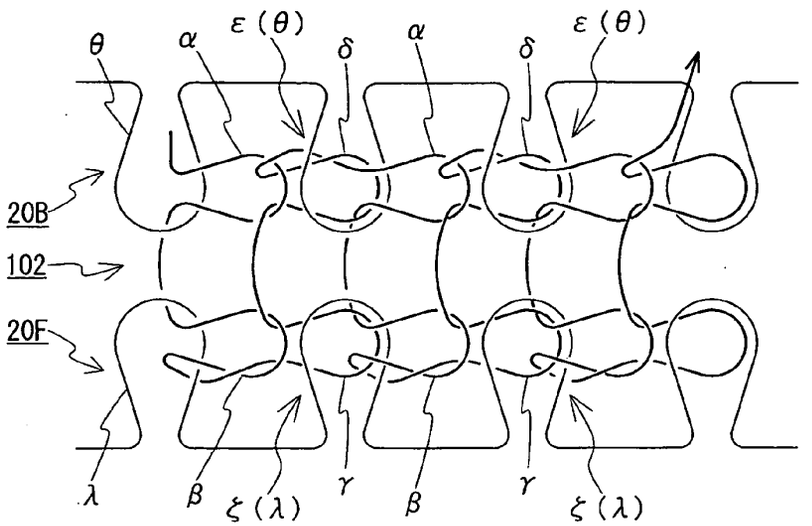
(54) Knitting method of knitted fabric, and knitted fabric

(57) To provide a knitting method of a knitted fabric capable of making a stretchability of a bind-off processed portion greater than in the prior art when connecting stitches at an end in a wale direction of front and back knitted fabric portions through a bind-off process. The following steps A to F are repeated. Step A of forming a new stitch α following an end stitch θ in a starting end direction LS of one side knitted fabric portion 20B. Step B of forming a new stitch P following an end stitch λ in the starting end direction LS of the other side knitted fabric portion 20F. Step C of forming a new stitch γ following the stitch β. Step D of forming a new stitch δ following the stitch α. Step E of forming a double stitch s in which the stitch δ and a stitch next to the stitch δ in a bind-off direction RS are overlapped. Step F of forming a double stitch ζ in which the stitch γ and a stitch next to the stitch γ in the bind-off direction RS are overlapped.

Here, one of the stitch α and the stitch δ is a front stitch and the other is a back stitch, and one of the stitch β and the stitch γ is a front stitch and the other is a back stitch.

Fig. 2



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Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a knitting method of a knitted fabric for joining stitches at an end in a wale direction of knitted fabric portions respectively held on front and back needle beds through a bind-off process using a flat knitting machine, and a knitted fabric obtained by the knitting method.

Description of the Related Art

[0002] When knitting a knitted fabric using a flat knitting machine, a bind-off process may be used as a method of processing so that the stitches of a final course of the knitted fabric (stitches at the end in a wale direction) do not ravel. In the bind-off process, adjoining stitches are overlapped in the final course of the knitted fabric, and a stitch of next course is newly formed following the overlapped stitches (double stitch). The knitting of further overlapping such a newly formed stitch with a stitch next thereto and forming a stitch of next course is repeated from one end towards the other end in a knitting width direction of the knitted fabric.

[0003] Such a bind-off process can also be used in joining knitted fabric portions respectively formed on front and back needle beds. For example, Patent Documents 1 and 2 each disclose a knitting method of a knitted fabric for joining the front and back knitted fabric portions at a shoulder position.

PRIOR ART DOCUMENT

PATENT DOCUMENT

[0004]

[Patent Document 1] Japanese Patent No. 3044368
[Patent Document 2] Japanese Patent No. 3798062

SUMMARY OF THE INVENTION

[0005] However, since the double stitches are formed in the bind-off process, such double stitches restrain the stretching of the knitted fabric, whereby the stretchability of the bind-off processed portion becomes lower than that of other portions. Such lowness in stretchability may become a problem depending on the shape of the knitted fabric to knit. For example, consider a skirt 100 in which knitting is started from one side end of the skirt 100 and finished at the other side end for the sake of design, as in the skirt (knitted fabric) 100 shown in Fig. 3. In order to knit the skirt 100, a set-up portion 101 is first formed, and then a front knitted fabric portion 20F and a back knitted fabric portion 20B diverged from the set-up portion 101 are knitted. The front knitted fabric portion 20F and the back knitted fabric portion 20B are joined by the bind-off process at a position to become the other side end of the skirt 100, which becomes a knitting-finish portion 102 of the skirt 100. In this case, the stretchability of the bind-off processed knitting-finish portion 102 is inferior to the stretchability of the set-up portion 101, and hence the stretching of the knitting-finish portion 102 is small compared to the stretching of the set-up portion 101 and the skirt 100 may lose shape if the skirt 100 is repeatedly worn.

[0006] The present invention has been devised in view of the above problem, and an object thereof is to provide a knitting method of a knitted fabric capable of making stretchability of bind-off processed portion greater than in the prior art when joining stitches at an end in a wale direction of front and back knitted fabric portions through a bind-off process, and a knitted fabric knitted by applying such a method.

[0007] A knitting method of a knitted fabric according to the present invention is a knitting method of a knitted fabric for joining stitches at an end in a wale direction of knitted fabric portions respectively held on front and back needle beds through a bind-off process, using a flat knitting machine including at least one front needle bed and one back needle bed, at least one of the front and back needle beds capable of being racked in a transverse direction, and in which stitches are transferrable between the front and back needle beds. Assuming a direction in which a bind-off stitch is sequentially formed in a longitudinal direction of the needle beds is a bind-off direction, and a direction opposite to the bind-off direction is a starting end direction, the knitting method of the knitted fabric of the present invention repeats the following steps A to F to join one side knitted fabric portion and the other side knitted fabric portion.

[Step A] forming a new stitch α following in the wale direction of an end stitch θ in the starting end direction of one side knitted fabric portion held on one of the front and back needle beds.
[Step B] forming a new stitch β following in the wale direction of an end stitch λ in the starting end direction of the other side knitted fabric portion held on the other of the front and back needle beds.
[Step C] forming a new stitch γ following in the wale direction of the stitch β.
[Step D] forming a new stitch δ following in the wale direction of the stitch α.
[Step E] overlapping the stitch δ and a stitch of the one side knitted fabric portion next to the stitch δ in the bind-off direction to form a double stitch ε to become a new end stitch θ of the one side knitted fabric portion.
[Step F] overlapping the stitch γ and a stitch of the other side knitted fabric portion next to the stitch γ in the bind-off direction to form a double stitch ζ to become a new end stitch λ of the other side knitted

fabric portion.

[0008] Furthermore, in the knitting method of the knitted fabric of the present invention, when forming the stitch δ following in the wale direction of the stitch α in the step D, the stitch δ is formed as a back stitch if the stitch α is a front stitch, and the stitch δ is formed as a front stitch if the stitch α is a back stitch; and when forming the stitch γ following in the wale direction of the stitch β in the step C, the stitch γ is formed as a back stitch if the stitch β is a front stitch, and the stitch γ is formed as a front stitch if the stitch β is a back stitch. The specific patterns of the stitches α to δ are as follows. [1] and [2] are particularly preferable in terms of appearance and texture of the finished knitted fabric (see effects of the embodiment to be described later).

[1] stitch α = front stitch, stitch β = front stitch, stitch γ = back stitch, stitch δ = back stitch
[2] stitch α = back stitch, stitch β = back stitch, stitch γ = front stitch, stitch δ = front stitch
[3] stitch α = front stitch, stitch β = back stitch, stitch γ = front stitch, stitch δ = back stitch
[4] stitch α = back stitch, stitch β = front stitch, stitch γ = back stitch, stitch δ = front stitch

[0009] The "front stitch" and the "back stitch" in the knitting method of the knitted fabric of the present invention refer to the state of the stitches in the case where the knitted fabric portion is seen from the side of the needle bed on which the knitted fabric portion is knitted before performing the bind-off process. For example, if the knitted fabric portion is mainly knitted with the front needle bed, whether the stitch is the "front stitch" or the "back stitch" is determined from the state of the stitch when the relevant knitted fabric portion is seen from the front needle bed. The "back side of the knitted fabric portion", to be described later, means the side opposite to the needle bed on which the knitted fabric portion is held before the bind-off process. For example, if the knitted fabric portion is mainly knitted with the front needle bed, the back needle bed side of the knitted fabric portion is the "back side of the knitted fabric portion".

[0010] Among the steps of the knitting method of the present invention, the steps A to D need to be performed in alphabetical order. On the contrary, the step E may be performed at any time after the step D, in which the stitch δ to be transferred in the step E is formed, and may be performed after the step F. The step F may be performed at any time after the step C, in which the stitch γ to be transferred in the step F is formed, and may be performed immediately after the step C. The specific execution order is as follows. The execution order of [3] shown in the embodiment described later is particularly preferable in terms of knitting efficiency.

[1] step A - step B - step C - step D - step E - step F
[2] step A - step B - step C - step D - step F - step E
[3] step A - step B - step C - step F - step D - step E

[0011] In one aspect of the knitting method of the knitted fabric of the present invention, in the step E, the double stitch ε is preferably formed by overlapping the stitch δ on a back side of the one side knitted fabric portion; and in the step F, the double stitch ζ is preferably formed by overlapping the stitch γ on a back side of the other side knitted fabric portion.

[0012] In another aspect of the knitting method of the knitted fabric of the present invention, the one side knitted fabric portion and the other side knitted fabric portion can be set up divergingly from one set-up portion.

[0013] A knitted fabric of the present invention is a knitted fabric obtained by joining stitches at an end in a wale direction of one side knitted fabric portion and the other side knitted fabric portion through a bind-off process using a flat knitting machine including at least one front needle bed and one back needle bed, at least one of the front and back needle beds capable of being racked in a transverse direction, and in which stitches are transferrable between the front and back needle beds, the knitted fabric including stitches α to δ. The stitch α is a stitch formed following in the wale direction of the one side knitted fabric portion. The stitch β is a stitch formed following in the wale direction of the other side knitted fabric portion and directly connecting to the stitch α through a knitting yarn. The stitch γ is a stitch formed following in the wale direction of the stitch β and directly connecting to the stitch β through a knitting yarn. The stitch δ is a stitch formed following in the wale direction of the stitch α and directly connecting to the stitch γ through a knitting yarn. The stitch δ is overlapped with a stitch of the one side knitted fabric portion as a bind-off stitch, and the stitch γ is overlapped with a stitch of the other side knitted fabric portion as a bind-off stitch. One of the stitch α and the stitch δ is a front stitch and the other is a back stitch; and one of the stitch β and the stitch γ is a front stitch and the other is a back stitch.

[0014] According to the knitting method of the knitted fabric of the present invention, the knitted fabric of the present invention in which the one side knitted fabric portion and the other side knitted fabric portion are joined by the bind-off process can be knitted. In the knitted fabric of the present invention, the bind-off stitch in the one side knitted fabric portion comprises the stitch α and the stitch δ lined in the wale direction, and the bind-off stitch in the other side knitted fabric portion comprises the stitch β and the stitch γ lined in the wale direction. That is, the stretch margin worth two stitches can be provided to the bind-off processed portion of the knitted fabric of the present invention while the stretch margin worth only one stitch is provided to the conventional bind-off processed portion. As a result, the bind-off processed portion can possess stretchability greater than in the prior art.

[0015] In the knitted fabric of the present invention, one of the two stitches configuring the bind-off stitch is a front stitch and the other is a back stitch, so that the

two stitches are in a folded state and do not project out in the thickness direction of the knitted fabric. As a result, the bind-off processed portion becomes flat and an appearance close to the set-up portion can be achieved. If the two stitches are both front stitches or back stitches, the stitches project out in the thickness direction of the knitted fabric without being folded, and thus may affect the appearance of the knitted fabric.

[0016] In the knitting method of the knitted fabric of the present invention, the stitch δ and the stitch γ are respectively overlapped on the back side of the one side knitted fabric portion and the other side knitted fabric portion when forming the double stitches ε, ζ, so that the double stitches ε, ζ at the bind-off processed portion in the knitted fabric are less likely to stand out. As a result, the visual quality of the knitted fabric can be enhanced.

[0017] In the knitting method of the knitted fabric of the present invention, the stretchability of the entire knitted fabric can be made about the same extent by setting up the one side knitted fabric portion and the other side knitted fabric portion from one set-up portion. This is because the set-up portion generally has a high stretchability, while the bind-off processed portion knitted with the knitting method of the knitted fabric of the present invention also has high stretchability equivalent to that of the set-up portion.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018]

Fig. 1 is a knitting step diagram related to a knitting method of a knitted fabric described in an embodiment;

Fig. 2 is a loop diagram of a knitted fabric knitted with the knitting method of the knitted fabric described in the embodiment; and

Fig. 3 is a schematic configuration diagram of a skirt (knitted fabric) set up from a side.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0019] A description will be given below of an example in which a knitting method of a knitted fabric of the present invention is applied to the knitting of a skirt (knitted fabric) 100 set up from a side described with reference to Fig. 3 in the section explaining the object of the present invention. A flat knitting machine used in the embodiment is a two-bed flat knitting machine having one front needle bed and one back needle bed extending in a transverse direction and disposed opposite to each other in a cross direction, the back needle bed capable of being racked in the transverse direction and stitches being transferrable between the front and back needle beds. The flat knitting machine includes a plurality of cam systems on a carriage, where the transfer and the knitting can be carried out by one movement of the carriage. The knitting is carried out with every other knitting needle, allowing for empty needles for transfer, in the two-bed flat knitting machine. The flat knitting machine to use may be a four-bed flat knitting machine.

[0020] In order to knit the skirt (knitted fabric) 100 shown in Fig. 3, a set-up portion 101 to become the side end on the left side in the plane of drawing is first formed. A front knitted fabric portion 20F and a back knitted fabric portion 20B diverged from the set-up portion 101 are then knitted. A knitting-finish portion 102 in which the knitted fabric portions 20F, 20B are joined by the bind-off process is then formed to complete the skirt 100. The knitting method of the knitted fabric of the present invention is applied to forming the knitting-finish portion 102.

[0021] Fig. 1 is a knitting step diagram showing specific knitting steps for forming the knitting-finish portion 102. "S + number" written in the left column in Fig. 1 indicates the number of the knitting step, the arrow in the transverse direction and "K" written in the right column indicate performing knit knitting by moving a yarn feeder in the direction of the arrow, and the arrow in up and down or diagonal direction indicates the direction of transfer. Moreover, ○ (single circle) in the middle column where the actual knitting state is shown indicates the stitch held on the needle bed, • indicates the stitch knitted in each knitting step, ⊙ (double circle) indicates a double stitch, and V indicates the yarn feeder. Furthermore, in Fig. 1, a bind-off stitch starts to be formed from the left side in the plane of drawing and the bind-off process is sequentially carried out towards the right side, and hence the rightward direction in the plane of drawing is referred to as "bind-off direction RS" and the leftward direction in the plane of drawing is referred to as "starting end direction LS". In S3, S5, S6 of Fig. 1, the transfer and the knit knitting are carried out by one movement of the carriage, but the transfer and the knit knitting are individually shown only in S6, in particular.

[0022] S0 of Fig. 1 shows a state in which the front knitted fabric portion (other side knitted fabric portion in the present invention) 20F is held on the knitting needles 2, 4, 6, 8, 10 of the front needle bed (hereinafter, FB), and the back knitted fabric portion (one side knitted fabric portion in the present invention) 20B is held on the knitting needles 3, 5, 7, 9, 11 of the back needle bed (hereinafter, BB).

[0023] From the state of S0, the yarn feeder is moved towards the starting end direction LS in S1. In this case, a new stitch α following in a wale direction of an end stitch θ held on a knitting needle 3 of the BB at an end in the starting end direction LS of the back knitted fabric portion 20B is formed (step A of the present invention). The stitch α is a front stitch when seen from the back knitted fabric portion 20B.

[0024] In S2, the yarn feeder is moved towards the bind-off direction RS. In this case, a new stitch β following in the wale direction of an end stitch λ held on a knitting needle 2 of the FB at an end in the starting end direction LS of the front knitted fabric portion 20F is formed (step

B of the present invention). The stitch β is a front stitch when seen from the front knitted fabric portion 20F.

[0025] In S3, the stitch β formed on the knitting needle 2 of the FB in S2 is first transferred to the knitting needle 2 of the opposing BB. While moving the yarn feeder towards the starting end direction LS, a new stitch γ following in the wale direction of the stitch β transferred to the knitting needle 2 of the BB is formed (step C of the present invention). The stitch γ is a back stitch when seen from the front knitted fabric portion 20F.

[0026] In S4, the stitch γ formed in S3 is overlapped with the stitch of the front knitted fabric portion 20F held on a knitting needle 4 of the FB to form a double stitch ζ (step F of the present invention). The stitch γ is thus arranged on the back side of the front knitted fabric portion 20F. The double stitch ζ formed in S4 becomes a new end stitch λ of the front knitted fabric portion 20F.

[0027] In S5, the stitch α formed on the knitting needle 3 of the BB in S1 is first transferred to the knitting needle 3 of the opposing FB. While moving the yarn feeder towards the bind-off direction RS, a new stitch δ following in the wale direction of the stitch α transferred to the knitting needle 3 of the FB is formed (step D of the present invention). The stitch δ is a back stitch when seen from the back knitted fabric portion 20B.

[0028] In S6, as shown on the upper stage of S6, the stitch δ formed in S5 is first overlapped with the stitch of the back knitted fabric portion 20B held on a knitting needle 5 of the BB to form a double stitch ε (step E of the present invention). The stitch δ is thus arranged on the back side of the back knitted fabric portion 20B. The double stitch ε formed in the first half of S6 becomes a new end stitch θ of the back knitted fabric portion 20B.

[0029] Referring to the arrangement state of the stitches and the position of the yarn feeder in the upper stage of S6, they are the same as those in S0 other than that the end stitches θ, λ on the starting end direction LS side are the double stitches ε, ζ. The next bind-off process is thus started assuming the double stitches ε, ζ are the end stitches θ, λ on the starting end direction LS side. Specifically, as shown on the lower stage of S6, a new stitch α following in the wale direction of the double stitch ε is formed while moving the yarn feeder towards the starting end direction LS (knitting similar to S1; step A of the present invention).

[0030] The knitting described in S2 to S6 is repeated after S6, so that the front knitted fabric portion (other side knitted fabric portion) 20F and the back knitted fabric portion (one side knitted fabric portion) 20B can be joined by the bind-off process.

[0031] The loop diagram of the skirt 100 obtained through the above knitting steps is shown in Fig. 2. The stitches shown using reference numerals in Fig. 2 correspond to the stitches shown using reference numerals in Fig. 1. In Fig. 2, the front knitted fabric portion 20F and the back knitted fabric portion 20B are represented with a thin line, and the knitting-finish portion 102 in which the knitted fabric portions 20F, 20B are joined by the bind-off process is shown with a thick line.

[0032] As apparent from the loop diagram shown in Fig. 2, the bind-off stitch of the back knitted fabric portion 20B comprises two stitches, that is, the stitch α and the stitch δ, continuing in the wale direction, and the bind-off stitch of the front knitted fabric portion 20F comprises two stitches, that is, the stitch β and the stitch γ, continuing in the wale direction, so that the stretch margin worth two stitches can be ensured for each bind-off stitch. As a result, the knitting-finish portion 102 being greater than when formed by the conventional bind-off process and having stretchability equivalent to that of the set-up portion 101 can be obtained. In the skirt 100, the difference in stretching is less likely to be made between the left and right side ends and thus loss of shape is less likely to occur even if it is repeatedly worn.

[0033] Since one of the stitches α, δ (stitches β, γ) lined in the wale direction to configure the bind-off stitch is the front stitch and the other is the back stitch, such stitches are in a state folded into the knitting-finish portion 102, and thus do not project out in the thickness direction of the skirt 100. As a result, slackening of the knitting-finish portion 102 that occurs when configuring the bind-off stitch with two stitches can be prevented, and the flat knitting-finish portion 102 having an appearance close to the set-up portion 101 can be realized.

[0034] Furthermore, since the stitches α, β are the front stitches and the stitches γ, δ are the back stitches in the knitting-finish portion 102, a knitting yarn (cross-over yarn) connecting the stitch α and the stitch β is arranged on the back side of the skirt 100, and a knitting yarn (cross-over yarn) connecting the stitch γ and the stitch δ is arranged on the front side of the skirt 100. As a result, a hole of the knitting-finish portion 102 does not stand out since two cross-over yarns are arranged substantially in parallel, and moreover, the cross-over yarn arranged on the back side of the skirt 100 does not stand out (the same thing is true for a case where the stitches α, β are the back stitches and the stitches γ, δ are the front stitches). On the contrary, if knitted in the order of stitch α → stitch β → stitch δ → stitch γ different from the regulation of the invention of the present application, three cross-over yarns will exist and the cross-over yarn connecting the stitch β and the stitch δ will cross diagonally, and hence the cross-over yarns will stand out greatly.

[0035] Note that, the knitted fabric to be applied with the knitting method of the knitted fabric of the present invention is not limited to the skirt set up from the side, and for example, front and back knitted fabric portions may be joined at a shoulder position of a sweater using the knitting method of the knitted fabric of the present invention. In addition, the front and back knitted fabric portions 20F, 20B to be subjected to the bind-off process are not limited to plain stitch structure, and may be a rib structure.

Claims

1. A knitting method of a knitted fabric for joining stitches at an end in a wale direction of knitted fabric portions (20B, 20F) held on front and back needle beds through a bind-off process, using a flat knitting machine including at least one front needle bed and one back needle bed, at least one of the front and back needle beds capable of being racked in a transverse direction, and in which stitches are transferrable between the front and back needle beds, the knitting method **characterized in that**,
assuming a direction in which a bind-off stitch is sequentially formed in a longitudinal direction of the needle beds as a bind-off direction (RS), and a direction opposite to the bind-off direction (RS) is a starting end direction (LS),

a step A of forming a new stitch α following in the wale direction of an end stitch θ in the starting end direction (LS) of one side knitted fabric portion (20B) held on one (BB) of the front and back needle beds,
a step B of forming a new stitch β following in the wale direction of an end stitch λ in the starting end direction (LS) of the other side knitted fabric portion (20F) held on the other (FB) of front and back needle beds,
a step C of forming a new stitch γ following in the wale direction of the stitch β,
a step D of forming a new stitch δ following in the wale direction of the stitch α,
a step E of overlapping the stitch δ and a stitch of the one side knitted fabric portion (20B) next to the stitch δ in the bind-off direction (RS) to form a double stitch ε to become a new end stitch θ of the one side knitted fabric portion (20B), and
a step F of overlapping the stitch γ and a stitch of the other side knitted fabric portion (20F) next to the stitch γ in the bind-off direction (RS) to form a double stitch ζ to become a new end stitch λ of the other side knitted fabric portion (20F),

are repeated to join the one side knitted fabric portion (20B) and the other side knitted fabric portion (20F); wherein
when forming the stitch δ following in the wale direction of the stitch α in the step D, the stitch δ is a back stitch if the stitch α is a front stitch, and the stitch δ is a front stitch if the stitch α is a back stitch; and
when forming the stitch γ following in the wale direction of the stitch β in the step C, the stitch γ is a back stitch if the stitch β is a front stitch, and the stitch γ is a front stitch if the stitch β is a back stitch.

2. The knitting method of the knitted fabric according to claim 1, **characterized in that**
in the step E, the double stitch ε is formed by overlapping the stitch δ on a back side of the one side knitted fabric portion (20B); and
in the step F, the double stitch ζ is formed by overlapping the stitch γ on a back side of the other side knitted fabric portion (20F).

3. The knitting method of the knitted fabric according to claim 1 or 2, **characterized in that** the one side knitted fabric portion (20B) and the other side knitted fabric portion (20F) are set up divergingly from one set-up portion (101).

4. A knitted fabric (100) obtained by joining stitches at an end in a wale direction of one side knitted fabric portion (20B) and the other side knitted fabric portion (20F) through a bind-off process using a flat knitting machine including at least one front needle bed and one back needle bed, at least one of the front and back needle beds capable of being racked in a transverse direction, and in which stitches are transferrable between the front and back needle beds, the knitted fabric **characterized by**:

a stitch α following in the wale direction of a stitch of the one side knitted fabric portion (20B);
a stitch β following in the wale direction of a stitch of the other side knitted fabric portion (20F) and directly connecting to the stitch α through a knitting yarn;
a stitch γ following in the wale direction of the stitch β and directly connecting to the stitch β through a knitting yarn; and
a stitch δ following in the wale direction of the stitch α and directly connecting to the stitch γ through a knitting yarn; wherein
the stitch δ is overlapped with a stitch of the one side knitted fabric portion (20B) as a bind-off stitch, and the stitch γ is overlapped with a stitch of the other side knitted fabric portion (20F) as a bind-off stitch;
one of the stitch α and the stitch δ is a front stitch and the other is a back stitch; and
one of the stitch β and the stitch γ is a front stitch and the other is a back stitch.

Fig. 1

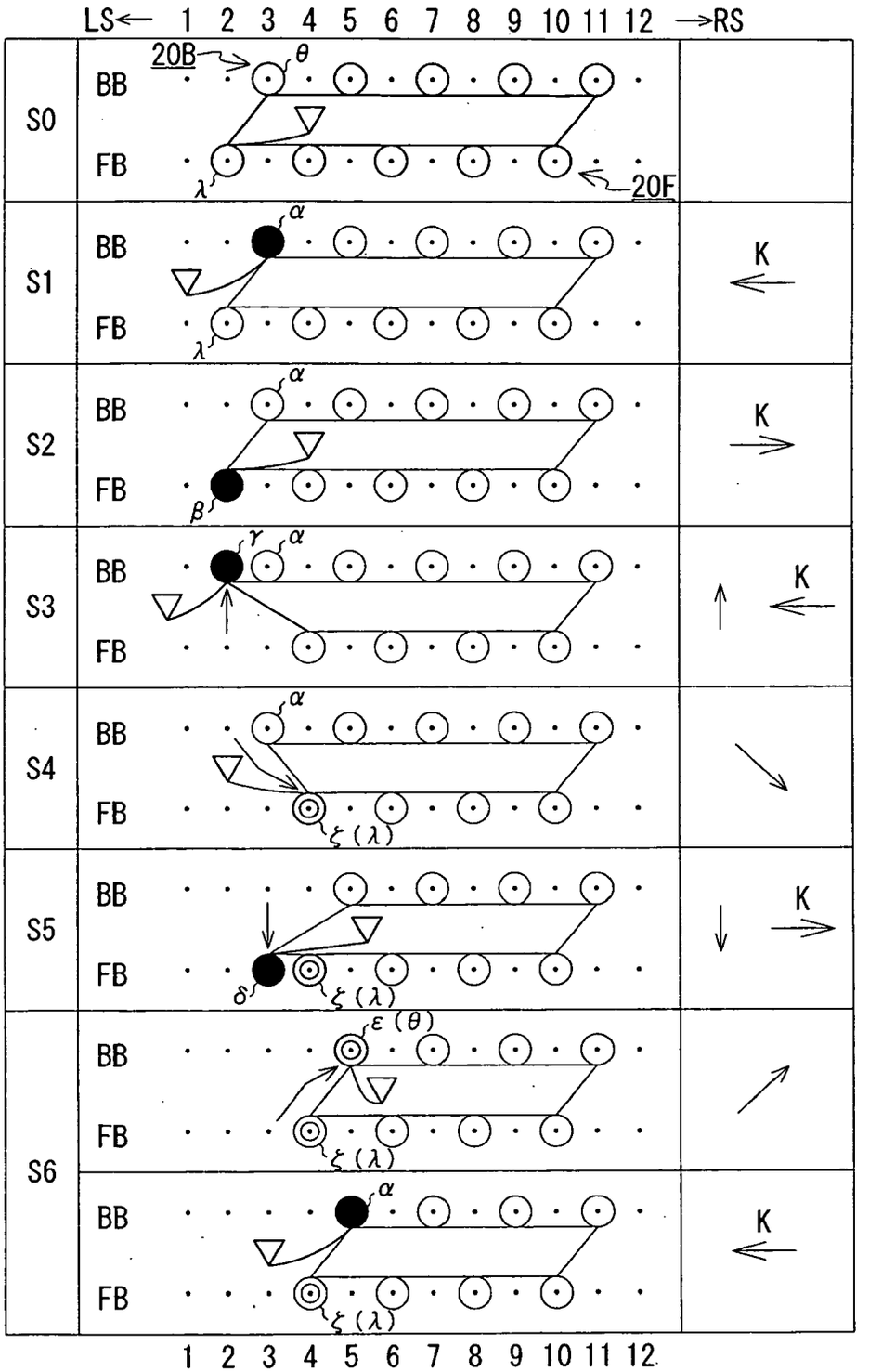

LS← 1 2 3 4 5 6 7 8 9 10 11 12 →RS
S0
S1
S2
S3
S4
S5
S6
BB
FB
20B
20F
K
1 2 3 4 5 6 7 8 9 10 11 12

Fig. 2

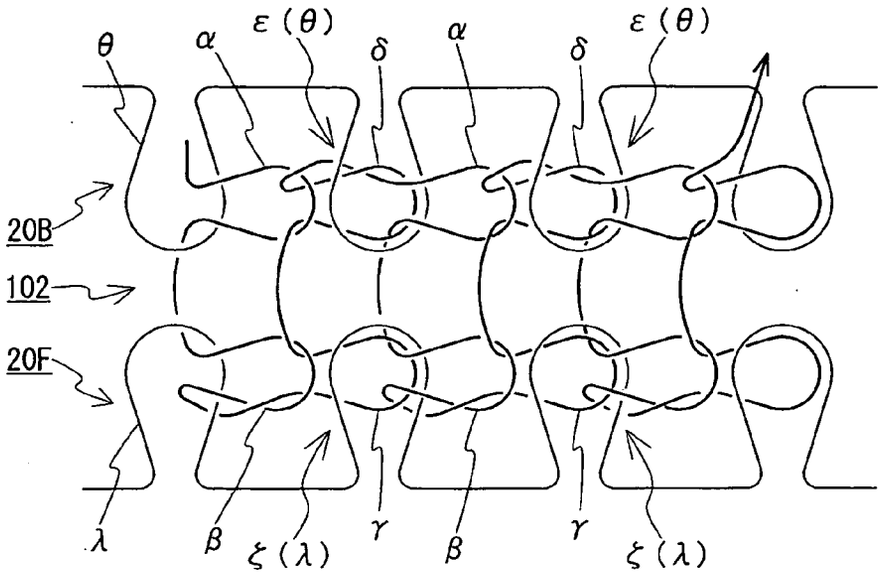
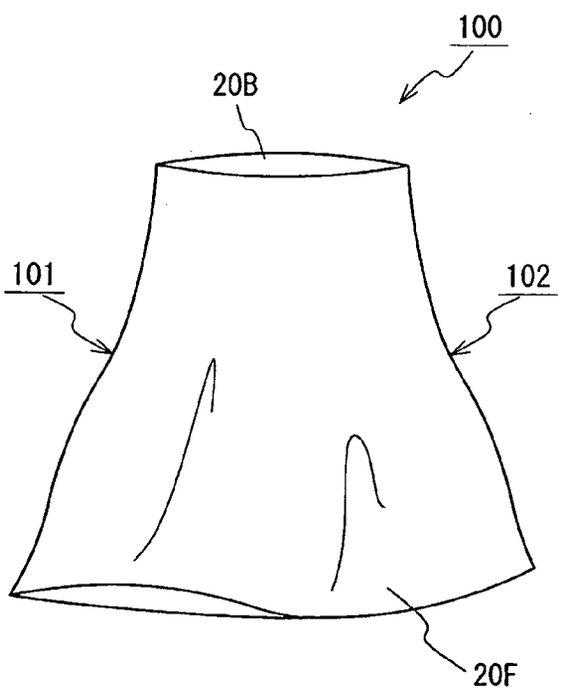


Fig. 3



REFERENCES CITED IN THE DESCRIPTION

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