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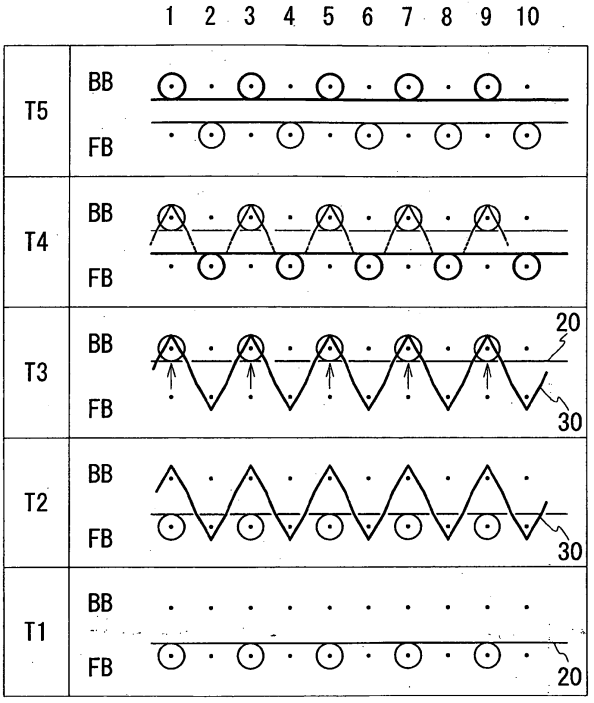
(54) Set up method of knitted fabric

(57) To provide a method of setting up a knitted fabric capable of preventing a set up portion of a knitted fabric from being stretched and loosened when knitting the set up portion of the knitted fabric. Stitches of a draw thread (20) following a final course of an existing knitted fabric held on a needle bed of a flat knitting machine in a wale direction are knitted (T1). Pick-up stitches are formed on a plurality of empty needles, on which the stitches of the draw thread (20) are not held, to knit a set up portion (30) of a knitted fabric (T2). Furthermore, the stitches of the draw thread (20) and the pick-up stitches of the set up portion (30) are overlapped (T3). The stitches following the set up portion (30) in the wale direction are knitted by front tubular knitting and back tubular knitting (T4,T5).

Fig. 1



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Description

TECHNICAL FIELD

[0001] The present invention relates to a set up method of a knitted fabric for setting up a new knitted fabric following an existing knitted fabric knitted using a flat knitting machine and held on a needle bed of the flat knitting machine.

BACKGROUND ART

[0002] A method of knitting a set up portion of a knitted fabric by entangling knitting yarns from two yarn feeders between front and back needle beds as described in Patent Document 1, for example, is conventionally known for the set up method of a knitted fabric using a flat knitting machine having at least a pair of front and back needle beds. Other than the technique of Patent Document 1, a new knitted fabric is set up following an existing knitted fabric already knitted with the needle beds of the flat knitting machine. For example, a waste knitted fabric (existing knitted fabric) is first knitted, and the new knitted fabric is set up through a draw thread formed following the stitch of the final course of the waste knitted fabric. Furthermore, knitting one collar (existing knitted fabric), and knitting a new collar through the draw thread to such collar may be repeated. In such a case, the existing knitted fabric is pulled down to the lower side of the needle bed with a take-down roller, or the like, so that the new knitted fabric can be knitted while applying an appropriate tension and thus the appearance of the new knitted fabric can be improved. The existing knitted fabric and the new knitted fabric can be separated by removing the draw thread after the knitting of the new knitted fabric is finished.

[0003] Fig. 3 is a knitting process diagram related to the set up method of a knitted fabric for setting up a new knitted fabric following an existing knitted fabric. The number of knitting process is shown in the left column in the figure, and the held state of the actual knitting yarn at the needle bed is shown in the right column. A circle in the right column indicates a stitch, and a V letter indicates a pick-up stitch, where the portion in which the knitting operation is actually carried out in the same column is shown with a thick line. The number at the upper end in the figure indicates the position of the knitting needle of the front needle bed (hereinafter referred to as FB) and the back needle bed (hereinafter referred to as BB). The described way of looking at the figure is similar in Figs. 1 and 2 of the embodiment to be described later.

[0004] In S1, a held state of a draw thread 20 including stitches knitted using a knitting yarn different from that of an existing knitted fabric with respect to the final course of the existing knitted fabric is shown. In S2, the knitting yarn is supplied in a zigzag manner to the knitting needle of the FB and the knitting needle of the BB from the above state to form a set up portion 30, which is the first portion of the new knitted fabric. Since the stitches of the draw thread 20 are formed on the knitting needles 1, 3, 5, 7, 9 of the BB at the stage of S1, the stitches of the set up portion 30 formed on the knitting needles 1, 3, 5, 7, 9 of the BB in S2 become stitches following the wale direction of the stitches of the draw thread 20. Front tubular knitting is carried out on a plurality of pick-up stitches of the set up portion 30 in S3 and back tubular knitting is carried out on a plurality of stitches of the set up portion 30 in S4 to knit a knitted fabric following the set up portion 30. Such front tubular knitting and back tubular knitting are knitting carried out to prevent the set up portion 30 from being unwound.

PRIOR ART DOCUMENT

PATENT DOCUMENT

[0005]

[Patent Document 1] WO2009/084167

DISCLOSURE OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0006] In the conventional set up method of a knitted fabric described with reference to Fig. 3, the stitches held on the knitting needles 1, 3, 5, 7, 9 of the BB in S2 of the stitches forming the set up portion of the knitted fabric are formed following the wale direction of the stitches of the draw thread pulled down to the lower side of a needle bed gap, and hence such stitches are also strongly pulled down to the lower side of the needle bed gap. As a result, the set up portion tends to be easily stretched and loosened, which may affect the appearance of the knitted fabric.

[0007] The present invention has been made in view of the above situations, and an object thereof is to provide a set up method of a knitted fabric capable of preventing the set up portion of the knitted fabric from being stretched and loosened when knitting the set up portion of the knitted fabric.

[0008] A set up method of a knitted fabric according to the present invention is a set up method of a knitted fabric for setting up a new knitted fabric following an existing knitted fabric held on a needle bed of a flat knitting machine using the flat knitting machine having at least a pair of front and back needle beds and in which stitches are transferable between the front and back needle beds, the set up method including the following steps.

(step A) Knitting stitches of a draw thread following a wale direction of a final course of the existing knitted fabric.

(step B) Knitting a set up portion of a knitted fabric by forming pick-up stitches on a plurality of empty needles on which the stitches of the draw thread are

not held.
(step C) Overlapping the stitches of the draw thread and the pick-up stitches of the set up portion.
(step D) Knitting a stitch row following the wale direction of the set up portion by front tubular knitting and back tubular knitting.

[0009] In one aspect of the set up method of a knitted fabric according to the present invention, the stitches may be overlapped on the pick-up stitches of the set up portion by transferring the stitches of the draw thread in the step C.

[0010] In another aspect of the set up method of a knitted fabric according to the present invention, the pick-up stitches of the set up portion may be formed only with either the front needle bed or the back needle bed in the step B, and the pick-up stitches may be overlapped on the stitches of the draw thread by transferring the pick-up stitches of the set up portion in the step C.

[0011] According to the set up method of a knitted fabric of the present invention, the set up portion is not stretched and loosened when knitting the set up portion of the knitted fabric. This is because, in the step B of the set up method of a knitted fabric of the present invention, the tension toward the lower side of the needle bed gap does not act on the set up portion until the set up portion is completed since the set up portion of the knitted fabric is knitted without directly connected to the draw thread on which the tension is applied to the lower side of the needle bed gap. Furthermore, since the set up portion and the draw thread are overlapped after the set up portion is completed, the knitted fabric can be knitted while applying an appropriate tension to the lower side of the needle bed gap with respect to the set up portion and the knitted fabric following the set up portion when knitting the knitted fabric following the set up portion.

[0012] According to the set up method of a knitted fabric of the present invention in which the stitches of the draw thread are transferred in the step C, the stitches of the draw thread and the pick-up stitches of the set up portion can be reliably overlapped. This is because it is easier to transfer the stitches rather than to transfer the pick-up stitches.

[0013] According to the set up method of a knitted fabric of the present invention in which the pick-up stitches of the set up portion are formed only with either the front needle bed or the back needle bed in the step B, a very tight set up portion can be knitted. This is because the knitting yarn of the set up portion does not bridge between the front and back needle beds, and the yarn length between each pick-up stitch of the set up portion does not become excessively long.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014]

Fig. 1 is a view showing knitting steps according to a set up method of a knitted fabric of a first embodiment.
Fig. 2 is a view showing knitting steps according to a set up method of a knitted fabric of a second embodiment.
Fig. 3 is a view showing knitting steps according to a set up method of a knitted fabric of the prior art.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0015] Embodiments of the present invention will be described below with reference to the drawings. A knitting example using a two-bed flat knitting machine having at least a pair of front and back needle beds and in which stitches can be transferred between the front and back needle beds will be described for the knitting in each embodiment. The flat knitting machine to use may be a two-bed flat knitting machine with a transfer jack bed or a four-bed flat knitting machine.

<First Embodiment>

[0016] In the first embodiment, with reference to Fig. 1, a description will be given of an example of the set up method of the present invention when knitting the waste knitted fabric (existing knitted fabric) with the FB, forming stitches with the knitting yarn, which is to become the draw thread, in the final course of such waste knitted fabric, and thereafter, setting up the knitted fabric following the stitches of the draw thread.

[0017] In T1 of Fig. 1, a state in which the stitches of a draw thread 20 formed following the final course of the waste knitted fabric are held on the knitting needles 1, 3, 5, 7, 9 of the FB is shown. From such state, pick-up stitches are formed in a zigzag manner on the empty needles of the FB and the BB avoiding the stitches of the draw thread 20 in T2. In T2, the pick-up stitches formed on the knitting needles 1, 3, 5, 7, 9 of the BB and the knitting needles 2, 4, 6, 8, 10 of the FB are a set up portion 30 of the knitted fabric. The pick-up stitches are allocated to the FB and the BB to perform front tubular knitting and back tubular knitting in T4, T5, to be described later.

[0018] The set up portion 30 knitted in T2 is knitted independently without directly connected to the draw thread 20, and thus the strong pull-down force to the lower side of the needle bed gap by the draw thread 20 does not act on the knitting yarn to knit the set up portion 30. As a result, the knitting yarn between the pick-up stitches of the set up portion 30 does not stretch and become loose, and the pick-up stitches are tightened.

[0019] Subsequently, in T3, the stitches of the draw thread 20 held on the knitting needles 1, 3, 5, 7, 9 of the FB in T1 are transferred to the knitting needles 1, 3, 5, 7, 9 of the opposing BB. The stitches of the draw thread 20 and the pick-up stitches of the set up portion 30 are thereby overlapped.

[0020] Lastly, the front tubular knitting and back tubular

knitting are carried out as shown in T4, T5, and new stitches are formed following the pick-up stitches of the set up portion 30 held on the knitting needles 2, 4, 6, 8, 10 of the FB and new stitches are formed following the double stitches held on the knitting needles 1, 3, 5, 7, 9 of the BB to connect the waste knitted fabric and the set up portion 30 through the draw thread 20. In this case, the stitches of the draw thread 20 on which the pull-down force to the lower side of the needle bed gap acts and some of the pick-up stitches of the set up portion 30 are overlapped, so that the pull-down force to the lower side of the needle bed gap acts on the stitch row knitted with the front tubular knitting and the back tubular knitting. As a result, the knitted fabric following the set up portion 30 can be knitted while applying an appropriate tension.

[0021] According to the knitting steps of the first embodiment described above, the set up portion 30 of the knitted fabric is not stretched and loosened. This is because the set up portion 30 is knitted independent from the draw thread on which a tension is applied toward the lower side of the needle bed gap in T2, and an excessive pull-down force toward the lower side of the needle bed gap does not act on the knitting yarn of the set up portion 30. The set up portion 30 formed without looseness is tight compared to the conventional set up portion, and thus has excellent appearance. The draw thread 20 can be easily detached since the entanglement of the draw thread 20 and the set up portion 30 is loose compared to the conventional set up method.

<Second Embodiment>

[0022] In the second embodiment, unlike the first embodiment, a set up method of a knitted fabric according to the present invention in which the pick-up stitches of the set up portion are overlapped on the stitches of the draw thread will be described with reference to Fig. 2.

[0023] In U1 of Fig. 2, a state in which the stitches of the draw thread 20 formed following the final course of the waste knitted fabric are held on the knitting needles 1, 3, 5, 7, 9 of the BB is shown. From such state, in U2, the pick-up stitches of the set up portion 30 are formed on the knitting needles 1 to 10 of the FB avoiding the BB on which the stitches of the draw thread 20 are held. The set up portion 30 formed in U2 is knitted independently from the draw thread 20, and thus the knitting yarn between the pick-up stitches of the set up portion 30 does not stretch and become loose by the draw thread 20, and the pick-up stitches are tightened. Furthermore, as the set up portion 30 is knitted only on the FB side, the knitting yarn of the set up portion 30 is not bridged between the FB and the BB, the yarn length between the pick-up stitches of the set up portion 30 is short, and the pick-up stitches are more tightened.

[0024] Subsequently, in U3, the pick-up stitches of the set up portion 30 formed on the knitting needles 1, 3, 5, 7, 9 of the FB in U2 are transferred to the knitting needles 1, 3, 5, 7, 9 of the opposing BB, and the pick-up stitches of the set up portion 30 are allocated to the FB and the BB. According to U3, the stitches of the draw thread 20 and the pick-up stitches of the set up portion 30 are overlapped. Thereafter, the front tubular knitting and back tubular knitting are carried out as shown in U4, U5, and new stitches are formed following the pick-up stitches of the set up portion 30 held on the knitting needles 2, 4, 6, 8, 10 of the FB, new stitches are formed following the double stitches held on the knitting needles 1, 3, 5, 7, 9 of the BB and the portion following the set up portion 30 in the knitted fabric is knitted to connect the waste knitted fabric and the set up portion 30 through the draw thread 20.

[0025] In the knitted fabric knitted by the knitting steps of the second embodiment described above as well, the appearance of the set up portion of the knitted fabric excels over the prior art due to similar reasons with respect to the knitted fabric knitted with the knitting steps of the first embodiment.

[0026] Embodiments of the present invention are not limited to the embodiments described above, and may be appropriately modified within a scope not deviating from the gist of the present invention. Regardless of the modifications to be made, the pick-up stitches of the set up portion are to be formed avoiding the stitches of the draw thread. For example, in the first embodiment, the knitting needles on which the stitches of the draw thread 20 are formed may not be the knitting needles at the positions facing the knitting needles on which the pick-up stitches of the set up portion 30 are held. Specifically, the stitches of the draw thread 20 may be held on the knitting needles 2, 4, 6, 8, 10 of the BB in T1 of the first embodiment. In this case, the relevant stitches are to be transferred to the knitting needles 1, 3, 5, 7, 9 of the FB after T2, and then T3 is to be carried out. In addition, the pick-up stitches do not need to be formed one at a time alternately on the FB and the BB when forming the pick-up stitches of the set up portion 30. For example, forming two pick-up stitches on the FB and forming one pick-up stitch on the BB may be repeated, or vice versa, or forming two pick-up stitches on each of the FB and the BB may be repeated.

DESCRIPTION OF REFERENCE NUMERALS

[0027]

1 to 10	knitting needle
20	draw thread
30	set up portion

Claims

1. A set up method of a knitted fabric for setting up a new knitted fabric following an existing knitted fabric

held on a needle bed of a flat knitting machine using the flat knitting machine having at least a pair of front and back needle beds and in which stitches are transferable between the front and back needle beds, wherein the set up method comprises:

a step A of knitting stitches of a draw thread (20) following a wale direction of a final course of the existing knitted fabric;
a step B of knitting a set up portion (30) of a knitted fabric by forming pick-up stitches on a plurality of empty needles on which the stitches of the draw thread (20) are not held,
a step C of overlapping the stitches of the draw thread (20) and the pick-up stitches of the set up portion (30), and
a step D of knitting a stitch row following the wale direction of the set up portion (30) by front tubular knitting and back tubular knitting.

2. The set up method of a knitted fabric according to claim 1, wherein the stitches are overlapped on the pick-up stitches of the set up portion (30) by transferring the stitches of the draw thread (20) in the step C.

3. The set up method of a knitted fabric according to claim 1, wherein the pick-up stitches of the set up portion (30) are formed only with either the front needle bed or the back needle bed in the step B, and the pick-up stitches are overlapped on the stitches of the draw thread (20) by transferring the pick-up stitches of the set up portion (30) in the step C.

Fig. 1

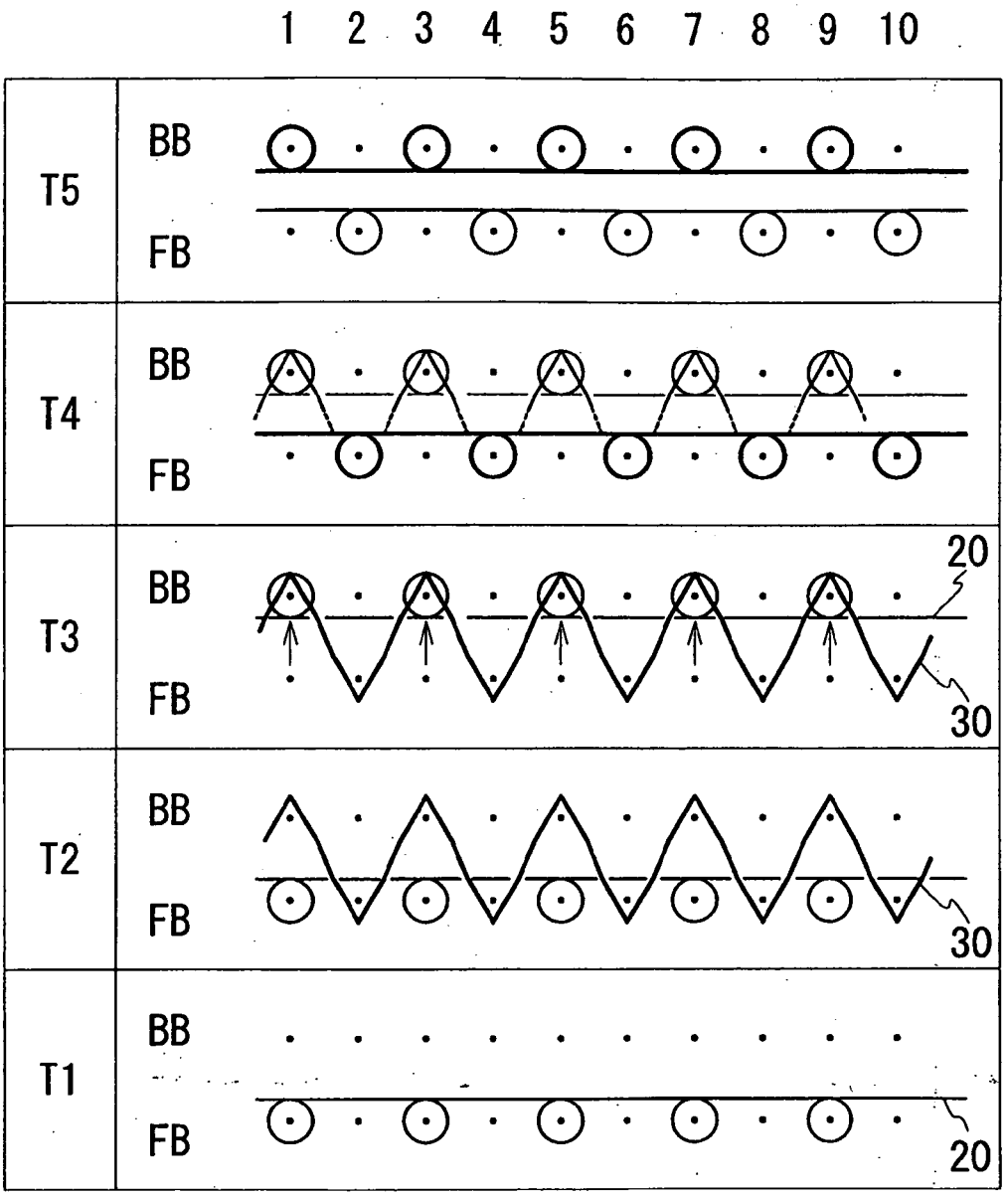


Fig. 2

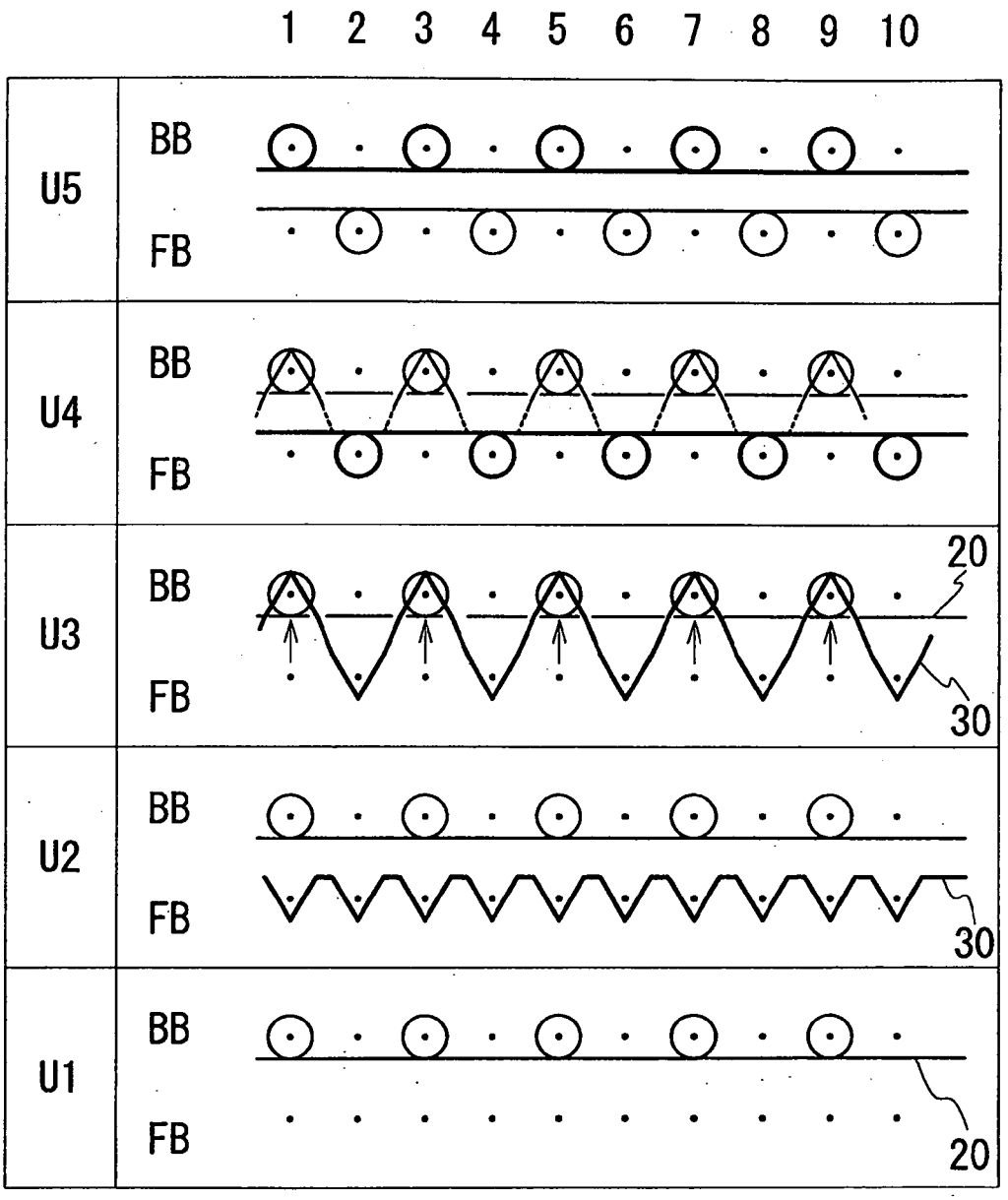
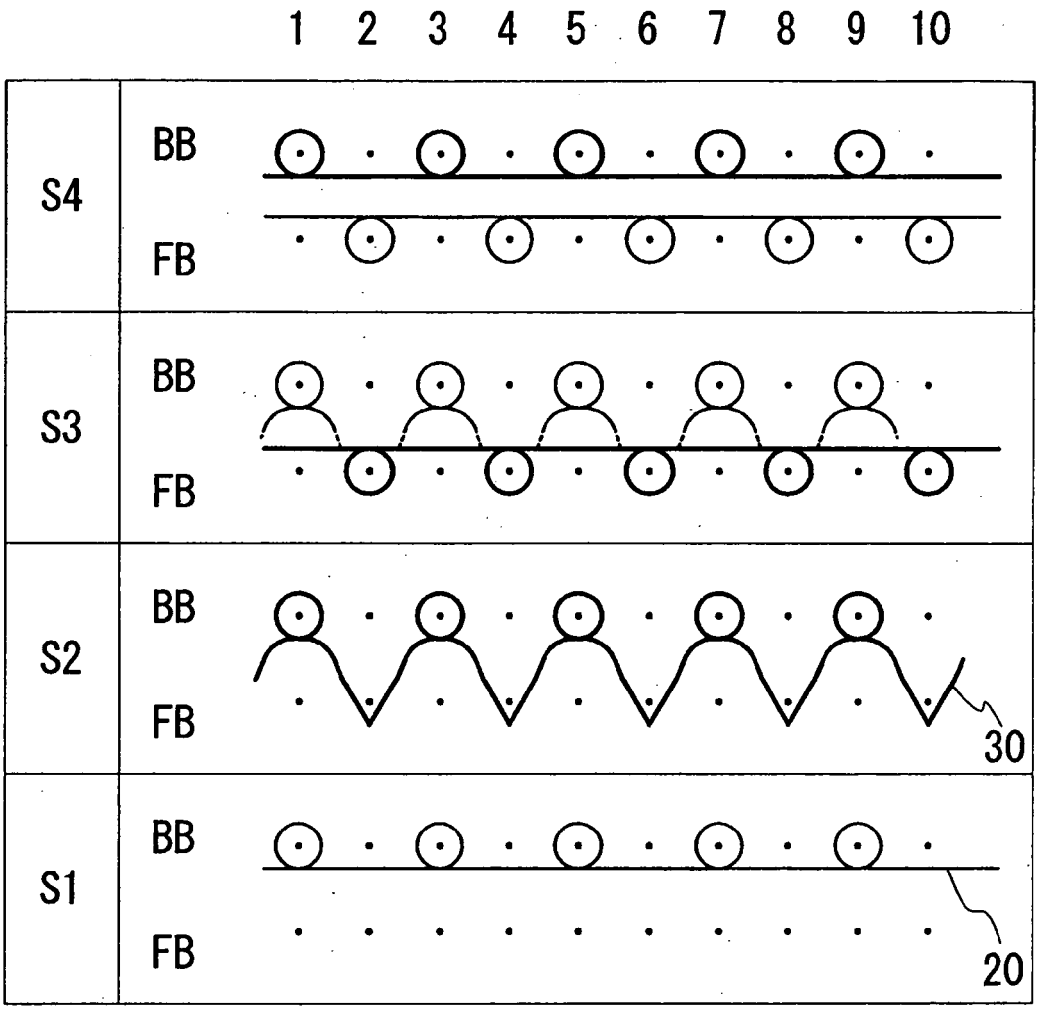


Fig. 3



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EUROPEAN SEARCH REPORT

Application Number
EP 11 00 6932

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	EP 0 839 940 A2 (SHIMA SEIKI MFG [JP]) 6 May 1998 (1998-05-06) * column 6, line 42 - column 7, line 27; figure 4 *	1-3	INV. D04B1/22
A	EP 1 408 145 A1 (SHIMA SEIKI MFG [JP]) 14 April 2004 (2004-04-14) * paragraph [0009] - paragraph [0015]; figures 2-4 *	1-3	

TECHNICAL FIELDS SEARCHED (IPC)

D04B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	13 January 2012	Zirkler, Stefanie

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

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REFERENCES CITED IN THE DESCRIPTION

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