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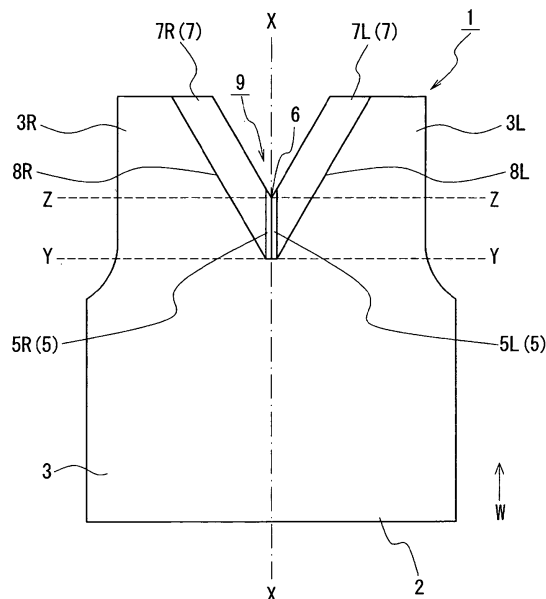
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80538 München (DE)****(54) Knitting method of V-neck peak and knitwear having V-neck**

(57) The present invention provides a knitting method of a V-neck peak for effectively preventing a hole from being formed in the V-neck peak. When knitting the V-neck peak using a flat knitting machine, one side collar portion 7L and one side central portion 5L, the other side collar portion 7R and the other side central portion 5R are knitted approximately from one side to the other side in a longitudinal direction of a needle bed on both sides

of a center line X-X which divides a V-neck in two in a knitting width direction of knitwear. At that time, one side widening stitch 4L and the other side widening stitch 4R are previously formed on one side and the other side of the center line X-X, the widening stitches 4L and 4R are inserted into empty needles made when collar portions 7L and 7R are transferred, respectively, thereby preventing a hole from being formed.

Fig. 9

Description

TECHNICAL FIELD

[0001] The present invention relates to a knitting method of a V-neck peak capable of preventing a hole from being formed near the V-neck peak when knitting knitwear having a V-neck, and to knitwear knitted by the knitting method.

BACKGROUND ART

[0002] When knitwear such as a sweater, a cardigan and a vest is knitted by a flat knitting machine, there is known a knitting method to obtain knitwear knitted in a seamless manner in which a front body and a back body are knitted into one tubular shape, left and right sleeves are also formed into tubular shapes and then, the body and both the sleeves are connected to each other through side parts and formed into one tubular shape.

[0003] The present applicant proposes a knitting method (see patent document 1) for integrally knitting a body and a collar portion while providing a neck opening, and a knitting method (see patent document 2) for enhancing strength of a branch portion of a V-neck.

[0004] Fig. 9 shows a front body 1 of a general V-neck vest. The front body 1 of the V-neck vest is bilaterally symmetric with respect to a center line X-X which divides a V-neck portion 9 in two in a knitting width direction, a torso portion 3 of the front body is knitted from a hem 2, it is divided into a left front body 3L and a right front body 3R from a branch portion 6 on line Z-Z, thereby forming the V-neck portion 9. The V-neck portion 9 includes a collar portion 7 (left collar portion (one side collar portion) 7L, a right collar portion (the other side collar portion) 7R) formed along a peripheral edge of a neck opening, and a central portion 5 (left central portion (one side central portion) 5L and a right central portion (the other side central portion) 5R) formed such as to astride the center line X-X.

[0005] Fig. 10 is a portion of a knitting step diagram for knitting a section Y-Z in the V-neck portion 9 shown in Fig. 9. A flat knitting machine used for knitting is a two-bed flat knitting machine having a pair of front and back needle beds, the back needle bed (BB, hereinafter) can rack with respect to the front needle bed (FB, hereinafter), and a movable yarn feeder is provided above a needle bed gap. In the knitting steps shown in Fig. 10, the alphabet + number shown on the left side in the drawing indicates a step number, left and right arrows show the knitting direction or a moving direction of the yarn feeder 10, and upper, lower and diagonal arrows show transfer directions. Symbols A to T in Fig. 10 indicate knitting needles of the FB, and symbols a to t indicate knitting needles of the BB. In the drawings, ○ indicates a stitch, ⊙ indicates double stitches, a symbol V indicates a pick up stitch, and actions actually carried out in each of the knitting steps are shown with thick lines. Here, in Fig. 10,

for the sake of convenience of explanation, the number of knitting needles is reduced as compared with the number of knitting needles used in the actual knitting operation, and it is assumed that all of the knitting operations are carried out by plain knitting. In Fig. 10, a racking action in a transfer of a stitch attended with racking is omitted. A viewing manner of the drawing is the same also in Figs. 1, 2, 5, 6 and 7 which are the drawings of later-described embodiment.

[0006] U1 shows a state where right front body 3R (knitting needles A to E), right collar portion 7R (knitting needles F to I), right central portion 5R (knitting needle J), left central portion 5L (knitting needle K), left collar portion 7L (knitting needles L to O), and left front body 3L (knitting needles P to T) are knitted. From this state, in U2 and U3, stitches held by knitting needles L to O of FD are respectively transferred in a direction separating from a center line X-X by one stitch. In subsequent U4 and U5, stitches held by the knitting needles F to I of FD are respectively transferred in the direction separating from the center line X-X by one stitch. By these U2 to U5, knitting needles I and L of FD become empty needles for forming widening stitches.

[0007] In U6 to U10, a front body of knitted fabric is knitted while forming widening stitches of pick up stitches on the empty needles made in U2 to U6. More specifically, in U6, a yarn feeder 10 is moved from right to left in the drawing, and a stitch is formed by the knitting needle T to M. In U7, the yarn feeder 10 is moved rightward, and a widening stitch of a pick up stitch is formed on the knitting needle L. In U8, the yarn feeder 10 is moved leftward, and stitches are formed on the knitting needles K and J. In U9, the yarn feeder 10 is moved rightward, and a widening stitch of a pick up stitch is formed on the knitting needle I. In U10, the yarn feeder 10 is moved leftward, and stitches are formed on the knitting needles H to A. Since the pick up stitches are formed by the knitting needles I and L while feeding a yarn from left to right in progress of the knitting of U6 to U10 generally operated from right to left, the pick up stitches become twisted stitches.

[0008] After U10, the same knitting operation as those in U2 to U9 is repeated while sequentially increasing the number of stitches of the central portion 5 (5L, 5R) and the collar portion 7 (7R, 7L) in a wale direction W (see Fig. 9), and a V-neck peak is formed. The double stitches formed by transfer appear on boundaries 8L and 8R between the left and right front bodies 3L and 3R and the left and right collar portions 7L and 7R in sections Y-Z in Fig. 9. Stitch rows of the collar portions 7L and 7R are transferred in a direction separating away from the center line X-X as shown in U2 to U5, the stitch rows are inclined with respect to a stitch row of the torso portion 3.

[0009] Since the widening stitch becomes the twisted stitch, a distance between two stitches which sandwich the twisted stitch is reduced, and a hole made at a location where the widening stitch is formed can be less noticeable.

PRIOR ART DOCUMENTS

PATENT DOCUMENTS

[0010]

[Patent Document 1] Japanese Patent No.3071147

[Patent Document 2] Japanese Patent No.3967922

DISCLOSURE OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0011] In the conventional knitting method shown in Fig. 10, after the collar portion 7 is transferred (U2 to U5), a widening stitch (pick up stitch) is formed when a stitch is formed in a next knitting course on a knitting needle which becomes an empty needle (U6 to U10). In this case, since the widening stitch (pick up stitch) is connected to a stitch formed in a further next knitting course (U11), this is insufficient, in some case, for preventing a hole from being formed in the knitting operation of the V-neck peak. In such a case, it is necessary to make effort for making a hole less noticeable by employing a mesh pattern for a knitting texture of the collar portion 7 for example.

[0012] The present invention has been accomplished in view of the above circumstances, and it is an object of the invention to provide a knitting method of a V-neck peak for effectively preventing a hole from being formed in a V-neck peak, and to provide knitwear having a V-neck knitted using this knitting method.

MEANS FOR SOLVING THE PROBLEMS

[0013] The present invention concerns a knitting method of a V-neck peak for knitting a V-neck central portion, one side collar portion and the other side collar portion in knitting knitwear having a V-neck, using a flat knitting machine having at least a pair of front and back needle beds and a yarn feeder which feeds a knitting yarn to a plurality of knitting needles disposed on each of the needle beds. The V-neck central portion has one side central portion and the other side central portion which are formed on both sides of a center line of the V-neck which divides the V-neck in two in a knitting width direction of the knitwear. These one side central portion and the other side central portion include stitch rows which are parallel to a knitting width direction of the knitwear. In contrast, the one side collar portion and the other side collar portion are formed on both sides of the V-neck central portion, and are inclined with respect to the knitting width direction of the knitwear. The knitting method of a V-neck peak of the present invention including the V-neck central portion, the one side collar portion and the other side collar portion includes such a process that after the one side collar portion and the one side central portion are knitted toward a center line, one side widening stitch of a twisted

stitch is formed on an empty needle in one of the front and back needle beds which is closer to the one side central portion than the center line and then, the other side widening stitch of a twisted stitch is formed on an empty needle of one of the front and back needle beds which is closer to the other side central portion than the center line and thereafter, the other side central portion and the other side collar portion are knitted in a direction separating away from the center line. The knitting method of a V-neck peak of the present invention comprises the following operation 1 and operation 2 carried out during or after the above process.

[Operation 1] The entire one side collar portion is moved in a direction separating away from the center line so that a portion of the one side collar portion is superposed on a stitch of a knitted fabric portion located on an outer side than the one side collar portion, the one side widening stitch is inserted in a space between the one side collar portion and the one side central portion made by the movement of the one side collar portion, and the one side widening stitch is regarded as a portion of the one side collar portion.

[Operation 2] The entire other side collar portion is moved in the direction separating away from the center line so that a portion of the other side collar portion is superposed on a stitch of a knitted fabric portion located on an outer side than the other side collar portion, the other side widening stitch is inserted in a space between the other side collar portion and the other side central portion made by the movement of the other side collar portion.

[0014] Various timing can be selected as timing for carrying out the operations 1 and 2. For example, as will be shown in a later-described first embodiment, the operation 1 and the operation 2 may be carried out after the above process is carried out.

Alternatively, the operation 1 may be carried out when the forming operation of the one side widening stitch in the above process is completed and then, the operation 2 may be carried out when all the process is completed. When the forming operation of the one side collar portion and the one side central portion in the above process is completed, a space is secured between the one side collar portion and the one side central portion, the one side widening stitch may be formed in the space, resulting the one side widening stitch to be formed and inserted at the same time.

[0015] As one aspect of the knitting method of a V-neck peak of the present invention, it is preferable that to eliminate the need for transferring the one side widening stitch during the process for knitting the V-neck peak, the one side collar portion which is already formed in the needle bed is transferred to an opposing needle bed before the one side widening stitch is formed, and the one side widening stitch is formed on the knitting needle which becomes an empty needle by the transfer. In this knitting method, the forming operation and the inserting operation of the one side widening stitch are carried out at the same time.

[0016] As one aspect of the knitting method of a V-neck peak of the present invention, it is preferable that, until the other side widening stitch is formed after the one side widening stitch is formed, a pick up stitch is formed on a knitting needle located on the other side in a longitudinal direction of the needle bed as compared with a position where the other side widening stitch is to be formed, and the pick up stitch is detached from the knitting needle after the other side widening stitch is formed and before the other side collar portion is formed.

[0017] Knitwear having a V-neck of the present invention has a V-neck knitted using a flat knitting machine which has at least a pair of front and back needle beds, and a yarn feeder which feeds a knitting yarn to a plurality of knitting needles disposed on each of the needle beds. The knitwear of the present invention comprises a V-neck central portion having one side central portion and the other side central portion which are formed on both sides of a center line of a V-neck which divides the V-neck in two in a knitting width direction of the knitwear and which are including stitch rows parallel to the knitting width direction of the knitwear, and one side collar portion and the other side collar portion which are formed on both sides of the V-neck central portion and which are inclined with respect to the knitting width direction of the knitwear. The knitwear of the present invention comprises a stitch at an end of the one side collar portion of the knitwear on the side of the center line as a twisted stitch which is directly connected to a stitch on an end of the one side central portion on the side of the center line, and a stitch on an end of the other side collar portion on the side of the center line as a twisted stitch which is directly connected to a stitch on an end of the other side central portion on the side of the center line.

EFFECTS OF THE INVENTION

[0018] According to the knitting method of the present invention, the widening stitch is formed in advance during the knitting course of the collar portion, and a hole is made less noticeable by using widening stitch when the collar portion is transferred. More specifically, the one side collar portion, the one side central portion and the one side widening stitch are knitted in this order, and the one side widening stitch is inserted between the one side collar portion and the one side central portion. According to this, since the knitting yarn which connects the one side collar portion and the one side central portion with each other runs across the one side widening stitch, a hole formed by the widening stitch can be less noticeable. Similarly, the other side widening stitch, the other side central portion and the other side collar portion are knitted in this order, and the other side widening stitch is inserted between the other side collar portion and the other side central portion. According to this, the knitting yarn which connects the other side collar portion and the other side central portion with each other runs across the other side widening stitch, and the widening stitch can be less no-

ticeable. As a result, it is possible to obtain the knitwear having the V-neck of the present invention with an excellent looking V-neck peak.

[0019] By forming and inserting the one side widening stitch at the same time, the knitting efficiency can be enhanced. This point will be described in detail in a later-described modified embodiment.

[0020] Further, the pick up stitch is once formed after the one side widening stitch is formed and before the other side widening stitch is formed, then, the pick up stitch is detached from the needle bed after the other side widening stitch is formed. According to this, it is possible to prevent an excessive tension from applying to the knitted yarn when the one side widening stitch is inserted between the one side collar portion and the one side central portion, and when the other side widening stitch is inserted between the other side collar portion and the other side central portion. Details thereof will be described in a later-described embodiment.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021]

Fig. 1 is a first knitting step diagram of a knitting method of a V-neck peak of a first embodiment;
 Fig. 2 is a second knitting step diagram of the knitting method of a V-neck peak of the first embodiment;
 Fig. 3 is a loop diagram showing a held state of one side widening stitch and the other side widening stitch during a knitting operation of the first embodiment;
 Fig. 4 is an enlarged photograph of a neckline and around the neckline of a V-neck vest knitted in accordance with the first embodiment;
 Fig. 5 is a knitting step diagram of a knitting method of a V-neck peak of a modified embodiment;
 Fig. 6 is a first knitting step diagram of a knitting method of a V-neck peak of a second embodiment;
 Fig. 7 is a second knitting step diagram of the knitting method of a V-neck peak of the second embodiment;
 Fig. 8 is a loop diagram showing a held state of the one side widening stitch and the other side widening stitch during a knitting operation of the second embodiment;
 Fig. 9 is a schematic diagram showing a front body of the V-neck vest; and
 Fig. 10 is a knitting step diagram of a conventional knitting method of a V-neck peak.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0022] An example in which a V-neck vest is knitted using a two-bed flat knitting machine will be described below. The flat knitting machine includes a pair of front and back needle beds, the back needle bed (BB) can rack with respect to the front needle bed (FB), and a

movable yarn feeder is provided above a needle bed gap. A general appearance of the V-neck vest to be knitted is the same as a general V-neck vest referring to Fig. 9, and description of each portion of the V-neck vest explained in the background art will be omitted. Obviously, the following knitting method can be carried out using a two-bed flat knitting machine having a transfer jack bed or using a four-bed flat knitting machine.

<First Embodiment>

[0023] Figs. 1 and 2 are knitting step diagrams of a V-neck peak (sections Y-Z) shown in Fig. 9. However only two cycles between Y-Y where the knitting operation of the V-neck peak starts and Z-Z will be described. A central portion 5 lying astride a center line X-X which divides a V-neck of the embodiment in two in the knitting width direction includes a left central portion (one side central portion) 5L and a right central portion (the other side central portion) 5R, and each of them includes one stitch. Besides, right side of the drawings is referred to as "one side of the needle bed", and left side as "the other side of the needle bed".

[0024] In S1, a knitting course immediately before Y-Y in which the knitting operation of the V-neck peak shown in Fig. 9 starts is shown, and a yarn feeder 10 is moved from left to right in the drawing (from the other side toward the one side of the needle bed), and a stitch of a torso portion 3 of a front body is formed by knitting needles A to T of the FB. In the knitting operation in S2 and thereafter, a V-neck peak in which a left front body 3L, a left collar portion 7L, a left central portion 5L, a right central portion 5R, a right collar portion 7R and a right front body 3R arranged from right in each knitting step in this order, is knitted.

[0025] In S2, the yarn feeder 10 is moved from right to left in the drawing (from the one side toward the other side of the needle bed), the left front body 3L is knitted by the knitting needles T to M of the FB, the left collar portion 7L is knitted by the knitting needle L of the FB, and the left central portion 5L is knitted by the knitting needle K of the FB sequentially.

[0026] In S3, a stitch of the left central portion 5L which is adjacent to the left collar portion 7L is transferred from the knitting needle K of the FB to the opposing knitting needle 1 of the BB so as to separate away from the center line X-X. By this transfer, the knitting needle K of the FB becomes an empty needle.

[0027] In S4, the yarn feeder 10 is moved from left to right in the drawing, a pick up stitch 4L is formed by the knitting needle K of the FB which is the empty needle, and in subsequent S5, the yarn feeder 10 is moved from right to left in the drawing. In these S4 and S5, the pick up stitch 4L formed by the knitting needle K is twisted, the twisted pick up stitch 4L becomes one side widening stitch 4L which becomes a portion of the left collar portion 7L as will be described later.

[0028] In S6, the one side widening stitch 4L formed

in S4 is transferred from the knitting needle K of the FB to the opposing knitting needle k of the BB, and in subsequent S7, a stitch of the left central portion 5L which is transferred in S3 is returned to the knitting needle K of the FB from the knitting needle 1 of the BB.

[0029] In S8, the yarn feeder 10 is moved from left to right in the drawing, a pick up stitch 4R is formed by the knitting needle j of the BB which is opposed to a stitch of the right central portion (the other side central portion) 5R knitted in next S9, in subsequent S9, the yarn feeder 10 is moved from right to left, and a stitch of the right central portion 5R is formed by the knitting needle J of the FB. Here, the pick up stitch 4R formed by the knitting needle j in S8 is twisted, the twisted pick up stitch 4R becomes the other side widening stitch 4R which becomes a portion of a later-described right collar portion (the other side collar portion) 7R.

[0030] In S10, the yarn feeder 10 is moved from left to right in the drawing. In subsequent S11, the yarn feeder 10 is moved from right to left in the drawing, a knit knitting is carried out to form a new stitch on the pick up stitch which is held by the knitting needle j of the BB and thereafter, a stitch of the right collar portion 7R is knitted by the knitting needle I of the FB, and a stitch of the right front body 3R is knitted by the knitting needles H to A of the FB. In S11, since the pick up stitch held by the knitting needle j of the BB is the other side widening stitch 4R, a new stitch formed on this pick up stitch can also be regarded as the other side widening stitch 4R.

[0031] The knit knitting carried out on the pick up stitch of the knitting needle j in S11 facilitates the transfer of a stitch in subsequent S13 and S14 (see Fig. 2), the knit knitting also prevents the knitting yarn between widening stitches after the transfer from stretching excessively, and it is possible to select whether the knit knitting should be carried out as needed basis. The knit knitting which facilitates the transfer may be carried out for a pick up stitch (one side widening stitch 4L) held by the knitting needle k of the BB, or may be carried out for both pick up stitch (widening stitches 4L and 4R). Also by increasing a pulling amount of the knitting yarn using a knitting needle to increase a loop length of the pick up stitch, instead of carrying out the knit knitting on the pick up stitch, it is possible to facilitate the transfer in S13 and S14. By doing so, it is possible to eliminate a gap and a distortion especially between the left central portion 7L and the right central portion 7L to enhance the visual quality of the V-neck peak.

[0032] Fig. 3 is a loop diagram showing a held state on a knitting needle when the knitting operation in S9 shown in Fig. 1 is completed. Stitches held by the knitting needles k and j of the BB are one side widening stitch (pick up stitch) 4L and the other side widening stitch (pick up stitch) 4R, respectively. As shown in the drawing, a knitting yarn fed from the yarn feeder 10 is connected to the knitting needles L, K, k, j and J in this order, and the knitting yarn is bilaterally symmetric with respect to the center line X-X of the V-neck. Also, the widening stitches

4L and 4R held by the knitting needles k and j are respectively twisted, and a knitting yarn which connects the widening stitches 4L and 4R with each other is arranged below the widening stitches 4L and 4R.

[0033] Next, in S12 shown in Fig. 2 after S11, the right collar portion 7R is transferred from the knitting needle l of the FB to the opposing knitting needle i of the BB, and the left collar portion 7L is transferred from the knitting needle L of the FB to the knitting needle 1 of the BB. In S13, the one side widening stitch 4L held by the knitting needle k of the BB is transferred to the knitting needle L of the FB, and the left collar portion 7L held by the knitting needle 1 of the BB is transferred to the knitting needle M of the FB. The one side widening stitch 4L is transferred and inserted such as to fill the knitting needle L of the FB which becomes an empty needle, thereby preventing a hole from being made and the one side widening stitch 4L becomes a stitch of the left collar portion 7L at the same time. Double stitches are formed on the knitting needle M of the FB, and the double stitches appear on a boundary 8L between the left front body 3L and the left collar portion 7L in the sections Y to Z shown in Fig. 9.

[0034] In S14, knitting which is symmetric of S13 with respect to the center line X-X is performed. The other side widening stitch 4R held by the knitting needle j of the BB is transferred to the knitting needle l of the FB, and the right collar portion 7R held by the knitting needle i of the BB is transferred to the knitting needle H of the FB. The other side widening stitch 4R is transferred and inserted to fill the knitting needle l of the FB which becomes an empty needle, thereby preventing a hole from being formed, and the other side widening stitch 4R becomes a stitch of the right collar portion 7R at the same time. Double stitches are formed on the knitting needle H of the FB, and the double stitches appear on a boundary 8R between the right front body 3R and the right collar portion 7R in the sections Y-Z shown in Fig. 9.

[0035] In S15, the yarn feeder 10 is moved from left to right, the right front body 3R is knitted by the knitting needles A to H of the FB, the right collar portion 7R is knitted by the knitting needle l of the FB, the right central portion 5R is knitted by the knitting needle J of the FB, the left central portion 5L is knitted by the knitting needle K of the FB, the left collar portion 7L is knitted by the knitting needle L of the FB, and the left front body 3L is knitted by the knitting needles M to T of the FB in this order.

[0036] Thereafter, when a neck hole whose collar is gradually widened is to be knitted as shown in Fig. 9, the number of stitches of the collar portion 7 is increased one by one on the left and right sides, respectively, and the same knitting operation as that shown in S1 to S15 should be carried out. A knitting operation of one cycle after S15 is shown in Fig. 2 for reference.

[0037] In S16 to S25, the same knitting operations as those in S2 to S11 are carried out though not shown in the drawing, and widening stitches 4L and 4R are formed for filling an empty needle which is present at the time of

transfer in next S26 to S28. However, the number of stitch of the collar portions 7L and 7R is increased by one, a stitch held by the knitting needles H and I of the FB corresponds to the right collar portion 7R, and a stitch held by the knitting needles L and M of the FB corresponds to the left collar portion 7L.

[0038] In S26, the right collar portion 7R is transferred from the knitting needles H and I of the FB to the opposing knitting needles h and i of the BB, and the left collar portion 7L is transferred from the knitting needles L and M of the FB to the opposing knitting needles 1 and m of the BB.

[0039] In S27, the one side widening stitch 4L held by the knitting needle k of the BB is transferred to the knitting needle L of the FB, and the left collar portion 7L held by the knitting needles 1 and m of the BB is transferred to the knitting needles M and N of the FB. The one side widening stitch 4L is transferred and inserted to fill the knitting needle L of the FB which becomes an empty needle, thereby preventing a hole from being formed, and the one side widening stitch 4L becomes a stitch of the left collar portion 7L at the same time. Double stitches are formed on the knitting needle N of the FB, and the double stitches appear on the boundary 8L between the left front body 3L and the left collar portion 7L in the sections Y-Z shown in Fig. 9.

[0040] In S28, knitting which is symmetric of S27 with respect to the center line X-X is performed. The other side widening stitch 4R held by the knitting needle j of the BB is transferred to the knitting needle l of the FB, and the right collar portion 7R held by the knitting needles h and i of the BB is transferred to the knitting needles G and H of the FB. The other side widening stitch 4R is transferred and inserted to fill the knitting needle l of the FB which becomes an empty needle, thereby preventing a hole from being formed, and the other side widening stitch 4R becomes a stitch of the right collar portion 7R at the same time. Double stitches are formed on the knitting needle G of the FB, and the double stitches appear on a boundary 8R between the right front body 3R and the right collar portion 7R in the sections Y-Z shown in Fig. 9.

[0041] The above knitting steps are repeated, and when the process reaches Z-Z at which the knitting operation of the V-neck peak is completed, the knitting method described in the patent document 2 should be applied at the branch portion 6. After the branch, the yarn feeder used for the knitting operation is increased, and when the right front body 3R and the right collar portion 7R, the left front body 3L and the left collar portion 7L are knitted to a shoulder portion, the front body 1 of the V-neck vest can be completed.

[0042] According to the above-described knitting method of a V-neck peak, the widening stitches 4L and 4R are formed on both sides of the center line X-X before the transfer in S13 and S14, and S27 and S28, respectively. At the time of each of the transfer steps in S13 and S14, and S27 and S28, the widening stitches 4L and 4R

which are formed in advance, are transferred to the knitting needles which become empty needles, thereby preventing a hole from being formed. More specifically, the collar portions 7L (7R), the central portions 5L (5R) and the widening stitches 4L (4R) are knitted in this order, and the widening stitches 4L (4R) are inserted between the collar portions 7L (7R) and the central portions 5L (5R). By doing so, since a knitting yarn which connects the collar portions 7L (7R) and the central portions 5L (5R) runs across the widening stitches 4L (4R), holes formed by the widening stitches 4L (4R) becomes less noticeable, and an excellent looking V-neck peak can be knitted.

[0043] Fig. 4 is an enlarged photograph of a neckline of the V-neck vest knitted in accordance with the above-described knitting steps (note that in the V-neck vest shown in Fig. 4, a portion of the collar portion is formed by back stitch so that texture pattern is formed on the collar portion). As shown in Fig. 4, a central portion is formed in parallel to the knitting width direction of the body of the V-necked vest, and the collar portion is formed inclined with respect to the knitting width direction of the body. Also, in this V-neck vest, almost no hole is formed at a position between the central portion and the collar portion where a hole is prone to be formed by conventional technique, and it can be found that the V-neck vest has excellent looking.

[0044] In this embodiment, the number of each of the right central portion 5R and the left central portion 5L is described as one stitch, respectively, but they may be two or more. The order of the steps shown in Figs. 1 and 2 may appropriately be changed within a range not departing from the subject matter of the invention. For an example, the order of S13 and S14 may be reversed. Besides, in one knitting unit of S2 to S14, S2 to S7, S12 (only the transfer from the knitting needle L to the knitting needle 1), S13, S8 to S11, S12 (only the transfer from the knitting needle l to the knitting needle i), and S14 may be carried out in this order. The invention is not limited to the illustrated example, and by changing the order of the steps appropriately, the knitting efficiency can be enhanced.

<Modified Embodiment>

[0045] In a modified embodiment, a knitting method of a V-neck peak having enhanced knitting efficiency by rearranging the knitting steps so that it is unnecessary to transfer the one side widening stitch over the knitting steps, will be described based on the knitting steps shown in Fig. 5.

[0046] In this modified embodiment, a knitting method of a V-neck peak for completely equalizing left and right collar portions is also described at the same time. In the above-described first embodiment, the knitting operation is carried out on the pick up stitch which becomes the other side widening stitch 4R in S11 of Fig.1, thereby forming a new stitch so that the transfer in S13 and S14

can easily be carried out. In this case, while the other side widening stitch 4R is a new stitch which is subsequent with the pick up stitch, the one side widening stitch 4L remains a pick up stitch. Therefore, formed states of the left and right collar portions 7L and 7R are slightly different from each other (especially see S12 in Fig. 2). According to the knitting method shown in this modified embodiment, this difference can completely be eliminated. An operation carried out for enhancing the knitting efficiency and an operation for equalizing the formed states of the left and right collar portions are independent from each other.

[0047] Knitting operations in S2' to S11' in Fig. 5 substantially correspond to those in S2 to S14 in Fig. 1. Only different points will be described below.

[0048] In S3', unlike S3 in Fig. 1, a stitch of the collar portion 7L held by the knitting needle L of the FB is transferred to the knitting needle m of the BB. As shown in S13 in Fig. 2 of the first embodiment, the knitting needle L of the FB is located at a position where the one side widening stitch 4L will be inserted later. Hence, in S4' of the modified embodiment, a pick up stitch which becomes the one side widening stitch 4L is formed on the knitting needle L of the FB while the yarn feeder 10 is moved rightward on the sheet of the drawing. By doing so, the one side widening stitch 4L is formed and inserted at the same time, and it becomes unnecessary to move the one side widening stitch 4L over the knitting steps thereafter. That is to say, in the modified embodiment, the moving step of the one side widening stitch 4L which is carried out in the first embodiment can be omitted, and the left collar portion 7L can be completed only by superposing, in S10', a stitch transferred in S3' on a stitch held by the opposing knitting needle L of the FB.

[0049] On the other hand, to equalize the formed states of the left and right collar portions 7L and 7R, in S5' of the modified embodiment, the yarn feeder 10 is not merely moved leftward unlike S5 in Fig. 1, a pick up stitch is formed on the knitting needle h of the BB. The pick up stitch is for increasing the yarn length of the knitting yarn which connects the one side widening stitch 4L formed on the knitting needle L in S4' and the other side widening stitch 4R formed on the knitting needle j in S6' with each other. Therefore, the pick up stitch formed in S5' is detached from the knitting needle h of the BB in S8' after the other side widening stitch 4R is formed in S6' and before the other side collar portion is formed in S9'.

[0050] By forming the pick up stitch on the knitting needle h and by increasing the yarn length of the knitting yarn which connects the one side widening stitch 4L and the other side widening stitch 4R with each other, it becomes unnecessary to carry out the knit knitting on the other side widening stitch 4R which is held by the knitting needle j of the BB as shown in S9'. As a result, remaining knitting operation can be carried out while leaving both the one side widening stitch 4L and the other side widening stitch 4R as the pick up stitches as it is. Therefore, in a completed V-neck vest, appearances of the left and

right collar portions 7L and 7R can completely be symmetric with respect to the center line X-X.

[0051] A position where the pick up stitch is formed should be a position where the yarn length between the widening stitches 4L and 4R can be increased, and this position is not limited to the position of the knitting needle h. Since the pick up stitch is detached from the knitting needle later, it is only necessary that the knitting needle which forms the pick up stitch is an empty needle, and such a knitting needle may be the knitting needle of the FB.

<Second Embodiment>

[0052] In the first embodiment, the one side widening stitch is knitted by a knitting needle of the FB and the other side widening stitch is knitted by a knitting needle of the BB, but in a second embodiment, an example in which the one side widening stitch is knitted by a knitting needle of the BB and the other side widening stitch is knitted by a knitting needle of the FB will be described based on Figs. 6 and 7.

[0053] In T1, like the first embodiment, stitches are formed on the knitting needles A to T of the FB while moving the yarn feeder 10 from left to right. Next, in T2, the yarn feeder 10 is reversed, stitches are formed on the knitting needles T to K of the FB and in subsequent T3, a pick up stitch is formed on the knitting needle k of the BB while moving the yarn feeder 10 from left to right. This pick up stitch is the one side widening stitch 4L.

[0054] In T4, the yarn feeder 10 is once moved leftward with respect to the knitting needle i of the BB, and in T5, a stitch held by the knitting needle J of the FB is transferred to the opposing knitting needle i of the BB. In T6, a pick up stitch is formed on the knitting needle J of the FB which becomes an empty needle by the transfer in T5 while moving the yarn feeder 10 rightward. This pick up stitch is the other side widening stitch 4R. In T4, as shown in the modified embodiment, the pick up stitch for increasing the yarn length of the knitting yarn which connects the one side widening stitch 4L formed in T3 and the other side widening stitch 4R formed in T6 with each other may be formed by the knitting needle h of the BB, for an example.

[0055] In T7, the yarn feeder 10 is moved leftward with respect to the knitting needle j of the BB once. In T8, the other side widening stitch 4R held by the knitting needle J of the FB is transferred to the opposing knitting needle j of the BB.

[0056] Next, in T9 in Fig. 7, the stitch transferred in T5 is returned to the knitting needle J of the FB which becomes an empty needle by the transfer in T8. In T10, the yarn feeder 10 is moved rightward once, and then, in T11, the yarn feeder 10 is again moved leftward. During this movement to the left of the yarn feeder 10, a stitch of the other side central portion 5R is knitted by the knitting needle J of the FB.

[0057] Fig. 8 is a loop diagram showing a held state

on a knitting needle when the knitting operation in T9 in Fig. 7 is completed. The stitches held by the knitting needles k and j of the BB are the one side widening stitch (pick up stitch) 4L and the other side widening stitch (pick up stitch) 4R, respectively. As shown in the drawing, a knitting yarn fed from the yarn feeder 10 is connected to the knitting needles L, K, k, j and J in this order, and the knitting yarn is bilaterally symmetric with respect to the V-neck center line X-X. Moreover, the widening stitches 4L and 4R held by the knitting needles k and j are respectively twisted, and the knitting yarn which connects the widening stitches 4L and 4R with each other is disposed on upper sides of the widening stitches 4L and 4R.

[0058] In subsequent T12 to T16, the same knitting operations as those shown in S10 to S15 in the first embodiment shown in Fig. 2 are carried out. Here, as described above, when a pick up stitch for increasing the yarn length of the knitting yarn which connects the widening stitches 4L and 4R is formed in T4, if the pick up stitch is detached from the knitting needle in T12, the knitting operation of the other side widening stitch 4R in T13 can be omitted.

[0059] Thereafter, in order to gradually increase the width of the collar portion 7, the same knitting operations as those shown in T1 to T16 should be repeated while increasing the number of stitches of the collar portion 7.

[0060] The V-neck vest obtained by the knitting method of a V-neck peak described above is slightly different from the V-neck vest of the first embodiment shown in Fig. 4 in the formed state of a stitch near a boundary between the central portion and the collar portion, and a hole near the boundary is suppressed as compared with the conventional technique, and an appearance is excellent. A reason why the formed states of the stitch near the boundary of the central portion and the collar portion are different between the second embodiment and the first embodiment is that the formed states of the widening stitches 4L and 4R during the knitting operation are different between the first embodiment shown in Fig. 3 and the second embodiment shown in Fig. 8.

[0061] In the above-described embodiments, the collar portion 7, the torso portion 3 and the bodies 3L and 3R are knitted by plain knitting for the sake of convenience of explanation, but these portions may be texture pattern. Knitwear to be knitted is not limited to the V-neck vest, and the knitwear may be a sweater or a cardigan knitted in a seamless manner in which the body and both sleeves are respectively knitted and connected into tubular shapes.

DESCRIPTION OF SYMBOLS

[0062]

- 1 front body of a V-neck best
- 2 hem
- 3 torso portion 3L left front body 3R right front body
- 4L one side widening stitch (pick up stitch) 4R the

other side widening stitch (pick up stitch)
 5 central portion 5L left central portion (one side central portion) 5R right central portion (the other side central portion)
 6 branch portion
 7 collar portion 7L left collar portion (one side collar portion) 7R right collar portion (the other side collar portion) 8L, 8R boundary
 9 V-neck portion
 10 yarn feeder

Claims

1. A knitting method of a V-neck peak in knitting knitwear having a V-neck, using a flat knitting machine having at least a pair of front and back needle beds and a yarn feeder which feeds a knitting yarn to a plurality of knitting needles disposed on each of the needle beds, the method is for knitting
 a V-neck central portion having one side central portion and the other side central portion which are formed on both sides of a center line of the V-neck which divides the V-neck in two in a knitting width direction of the knitwear and which are including stitch rows parallel to a knitting width direction of the knitwear, and one side collar portion and the other side collar portion which are formed on both sides of the V-neck central portion and which are formed inclined with respect to the knitting width direction of the knitwear, wherein
 the method includes a process in which after the one side collar portion and the one side central portion are knitted toward the center line, one side widening stitch of a twisted stitch is formed on an empty needle of one of the front and back needle beds which is closer to the one side central portion than the center line, and after the other side widening stitch of a twisted stitch is formed on an empty needle of one of the front and back needle beds which is closer to the other side central portion than the center line, the other side central portion and the other side collar portion are knitted in a direction separating away from the center line, and
 during or after the above process,
 the entire one side collar portion is moved in the direction separating away from the center line, a portion of the one side collar portion is superposed on a stitch of a knitted fabric located on an outer side with respect to the one side collar portion, the one side widening stitch is inserted in a space between the one side collar portion and the one side central portion made by this movement of the one side collar portion, thereby making the one side widening stitch as a portion of the one side collar portion, and
 the entire other side collar portion is moved in the direction separating away from the center line, a portion of the other side collar portion is superposed on

a stitch of a knitted fabric located on an outer side with respect to the other side collar portion, the other side widening stitch is inserted in a space between the other side collar portion and the other side central portion made by this movement of the other side collar portion, thereby making the other side widening stitch as a portion of the other side collar portion.

2. The knitting method of a V-neck peak according to claim 1,
 wherein
 to eliminate a need for transferring the one side widening stitch in a process of knitting the V-neck peak, the one side collar portion which is already formed on the needle bed is transferred to the opposing needle bed before the one side widening stitch is formed, the one side widening stitch is formed on the knitting needle which becomes an empty needle by the transfer, thereby forming and inserting the one side widening stitch at the same time.
3. The knitting method of a V-neck peak according to claim 1 or 2, wherein
 until the other side widening stitch is formed after the one side widening stitch is formed, a pick up stitch is formed on a knitting needle located on the other side in a longitudinal direction of the needle bed than a position where the other side widening stitch is to be formed, and
 the pick up stitch is detached from the knitting needle after the other side widening stitch is formed and before the other side collar portion is formed.
4. Knitwear having a V-neck knitted using a flat knitting machine having at least a pair of front and back needle beds and a yarn feeder which feeds a knitting yarn to a plurality of knitting needles disposed on each of the needle beds, the knitwear comprising:
 a V-neck central portion having one side central portion and the other side central portion which are formed on both sides of a center line of the V-neck which divides the V-neck in two in a knitting width direction of the knitwear and which are respectively including stitch rows parallel to the knitting width direction of the knitwear, and one side collar portion and the other side collar portion which are formed on both sides of the V-neck central portion and which are formed inclined with respect to the knitting width direction of the knitwear,
 a stitch on an end of the one side collar portion on the side of the center line is a twisted stitch which is directly connected to a stitch on an end of the one side central portion on the side of the center line, and
 a stitch on an end of the other side collar portion on the side of the center line is a twisted stitch

which is directly connected to a stitch on an end of the other side central portion on the side of the center line.

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Fig. 1

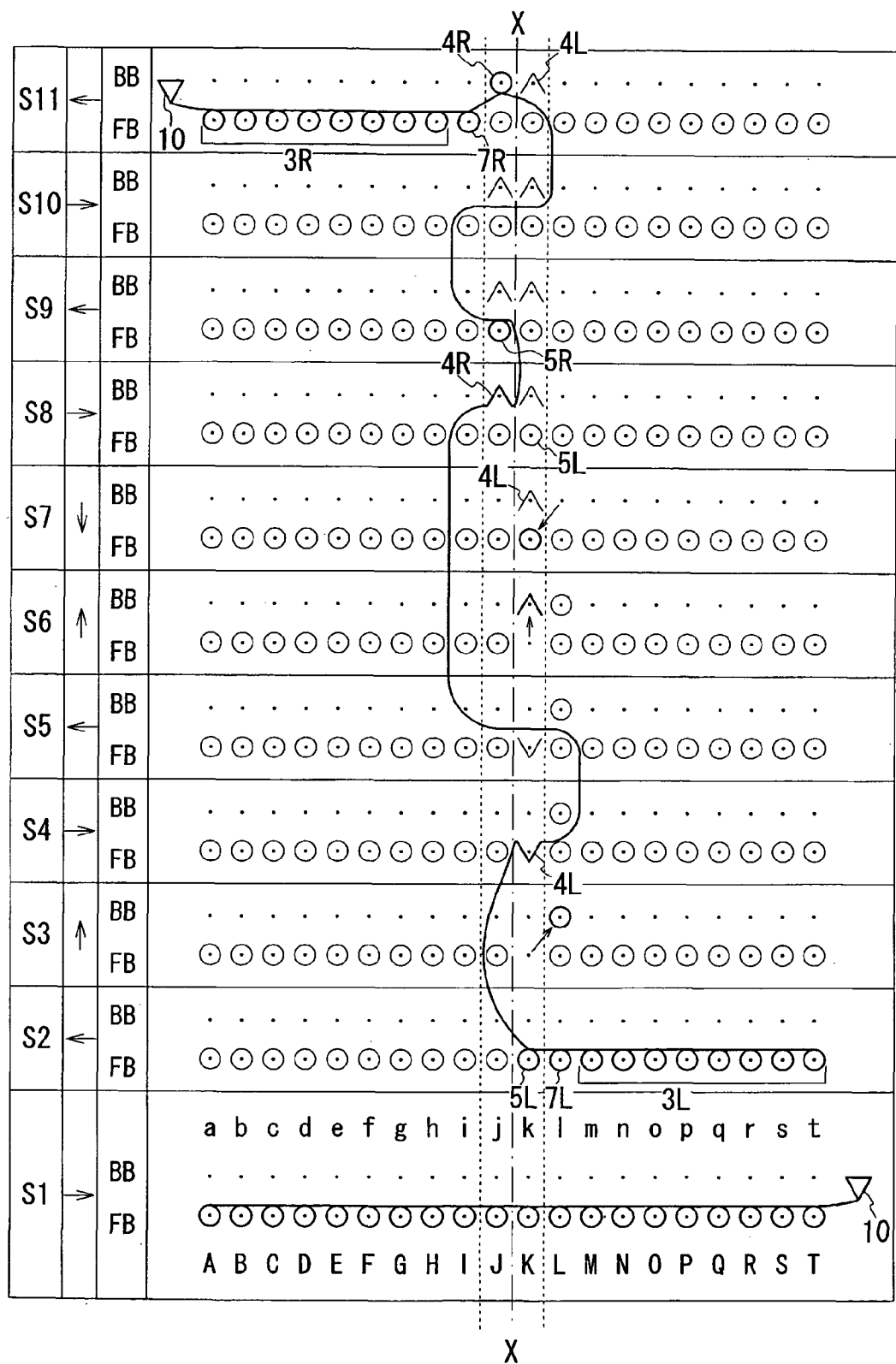


Fig. 2

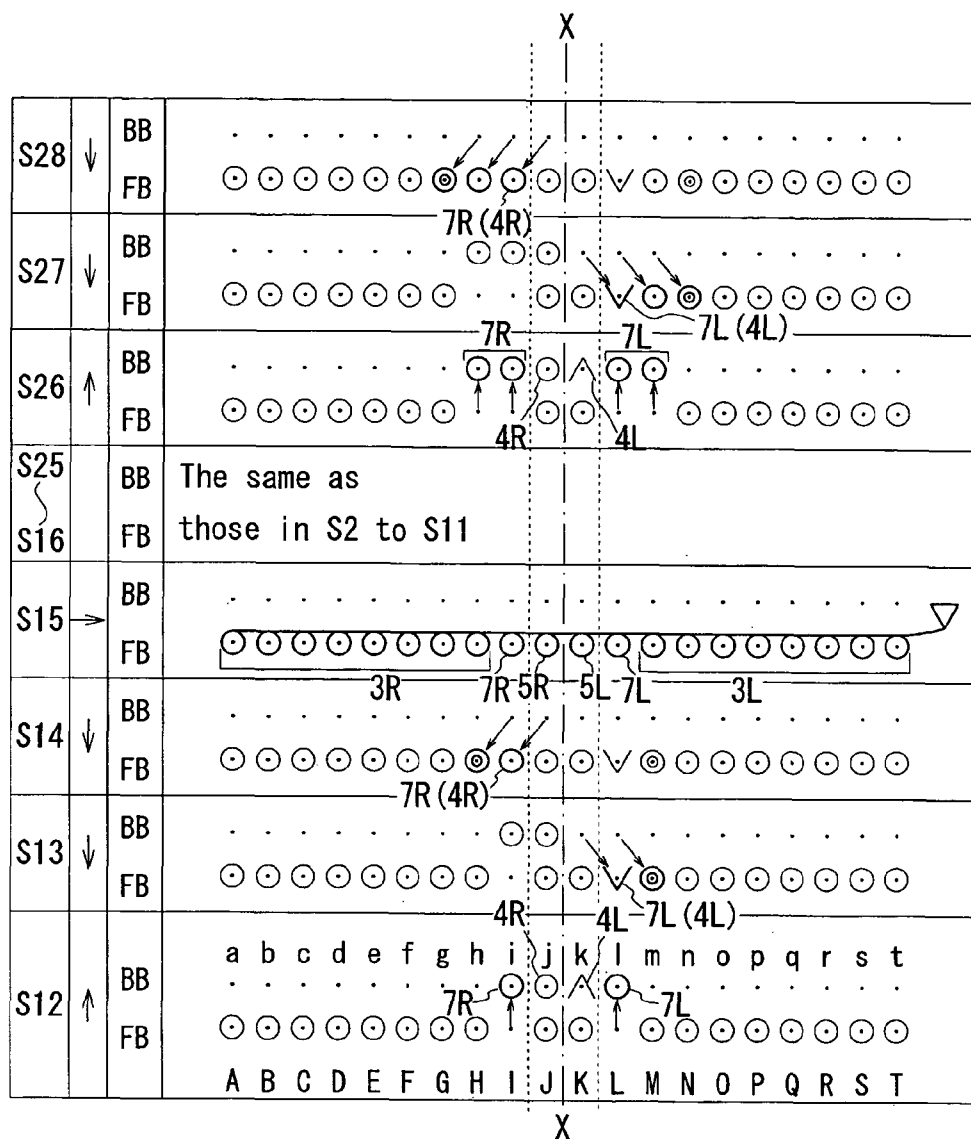


Fig. 3

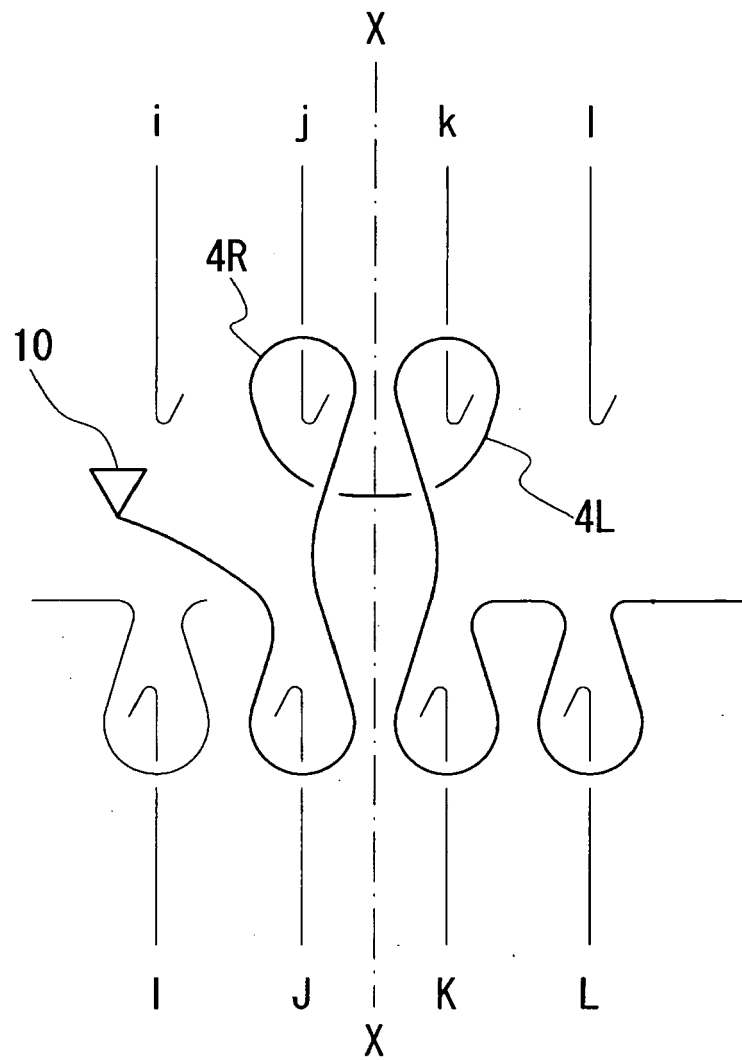


Fig. 4

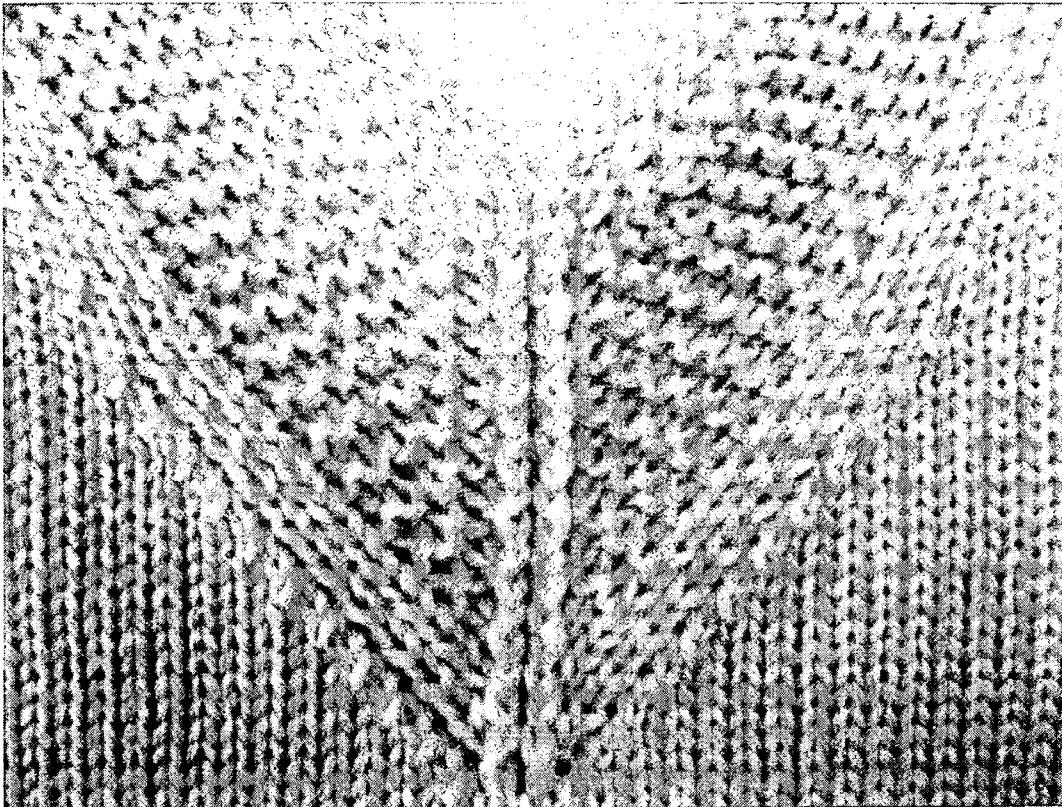


Fig. 5

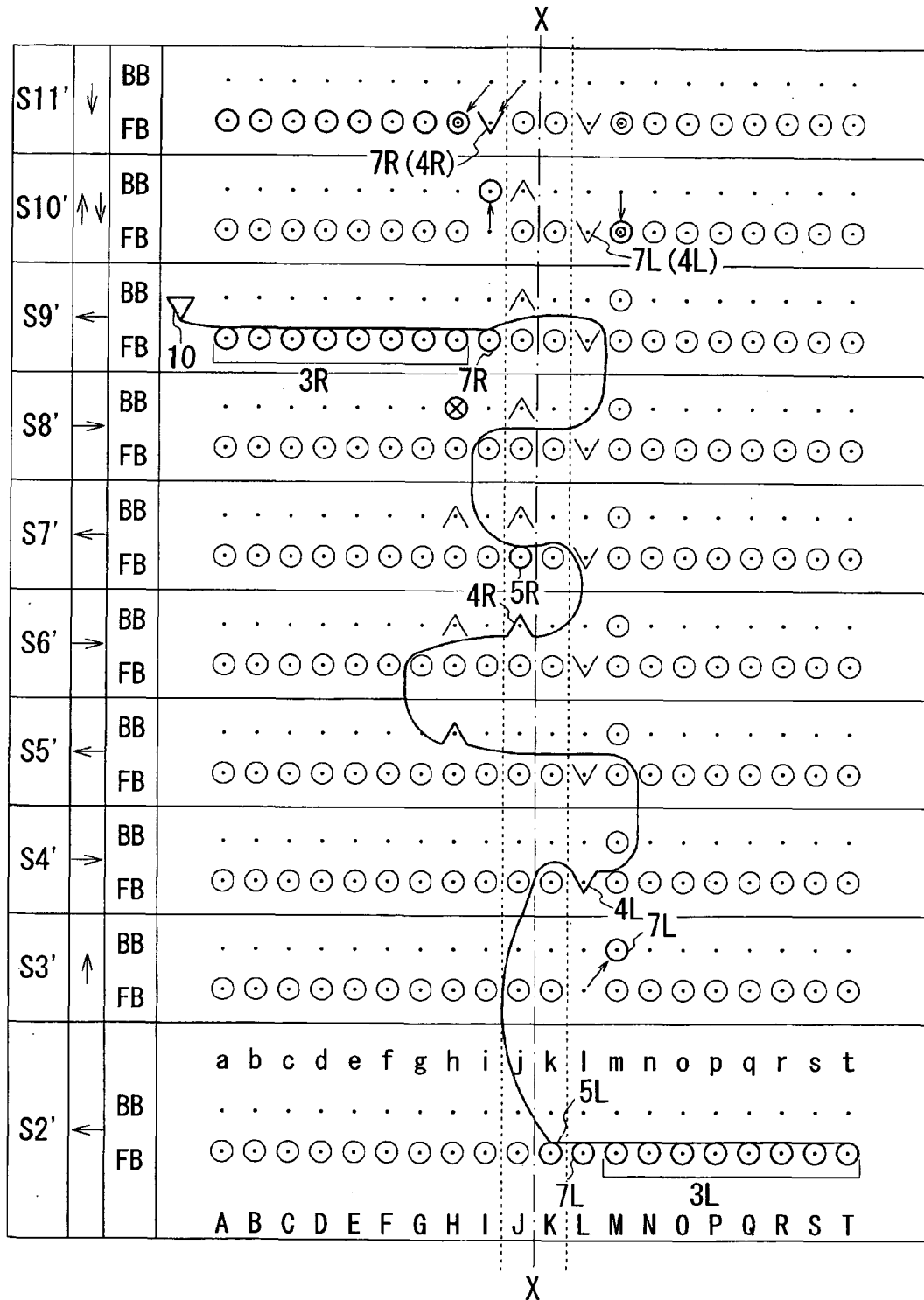


Fig. 6

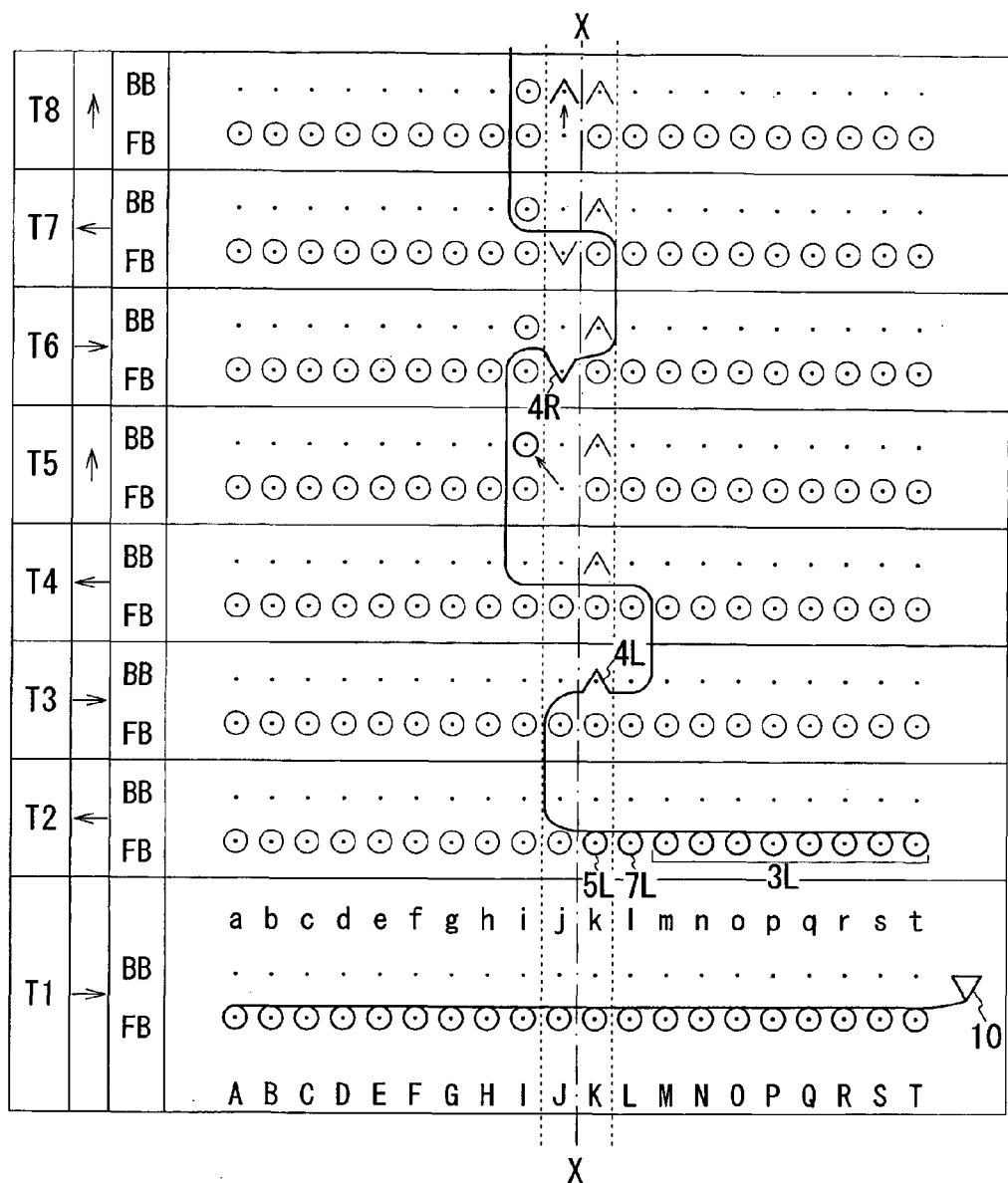


Fig. 7

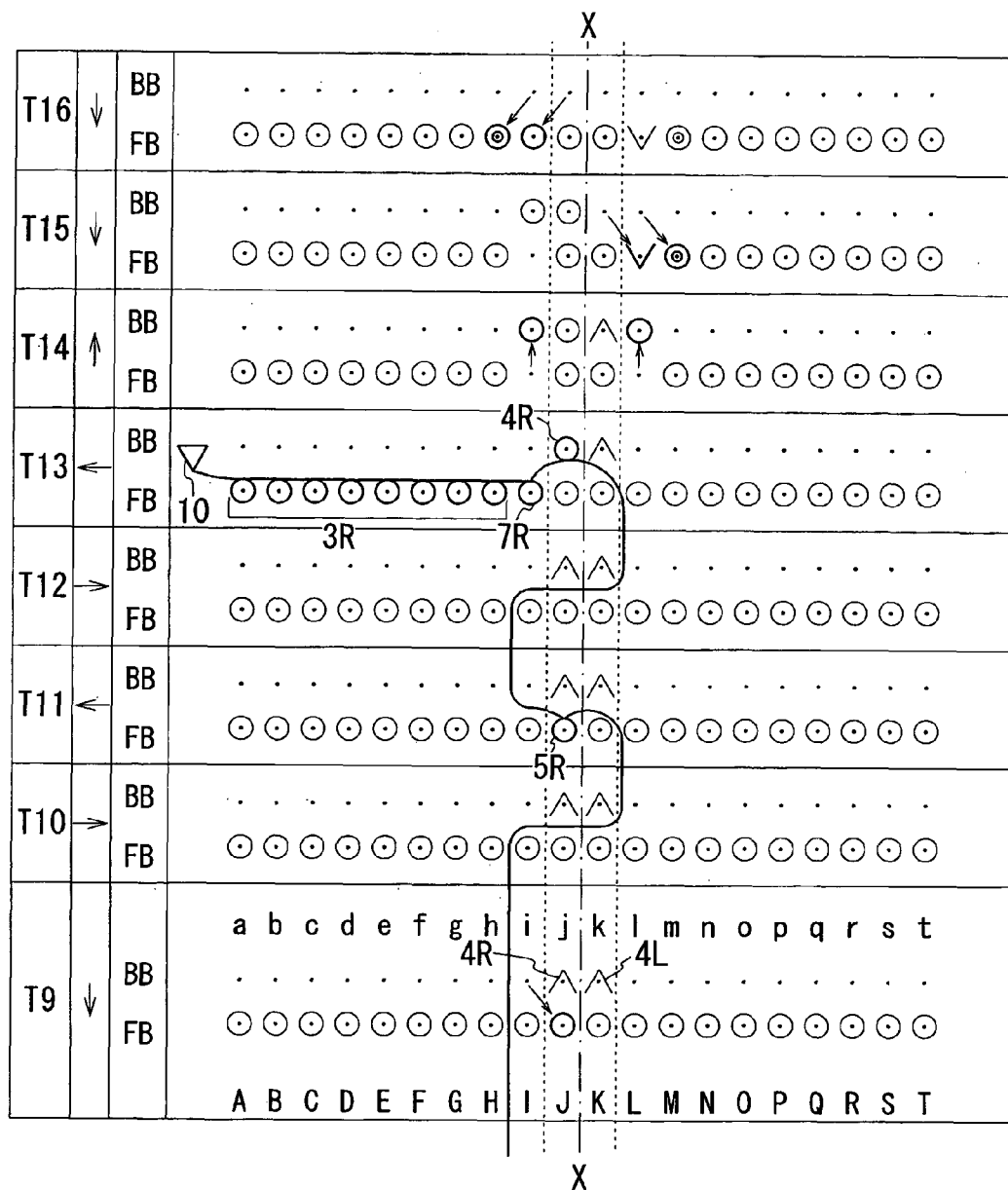


Fig. 8

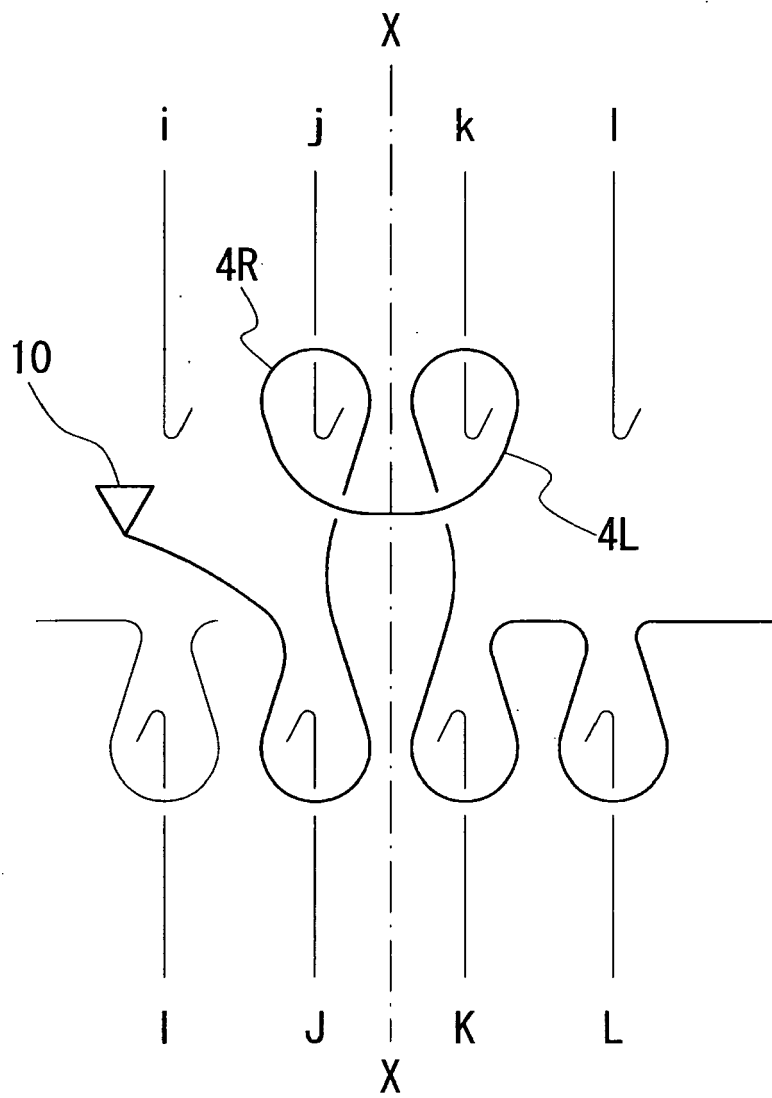


Fig. 9

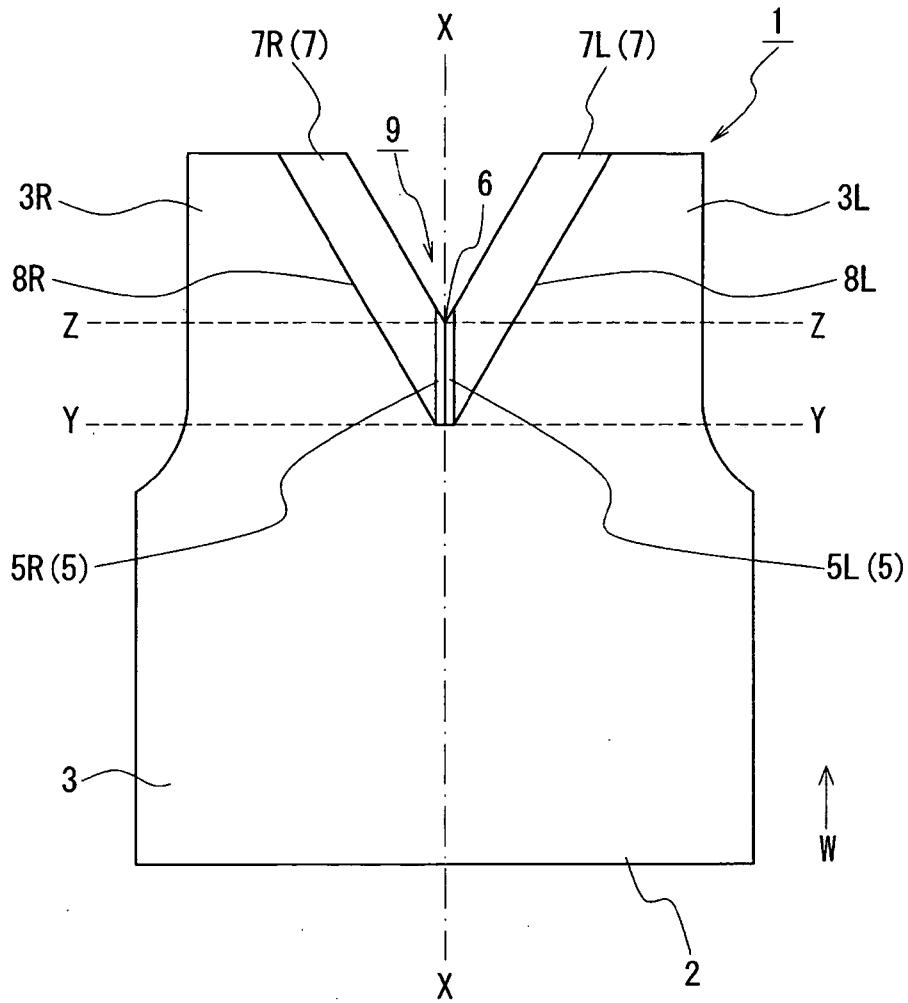
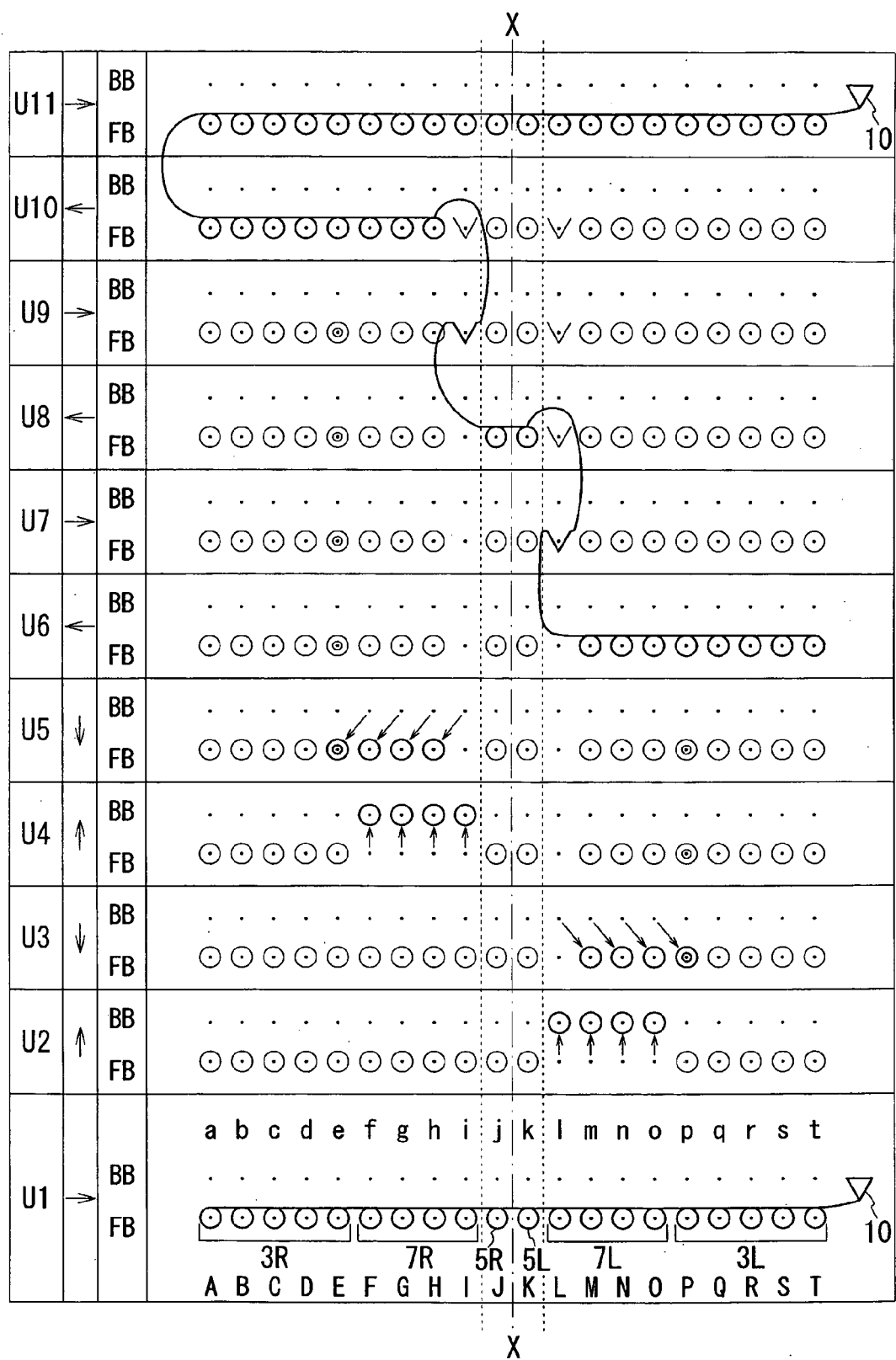


Fig. 10





EUROPEAN SEARCH REPORT

Application Number
EP 11 00 2181

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	EP 1 253 229 A1 (SHIMA SEIKI MFG [JP]) 30 October 2002 (2002-10-30) * paragraph [0020] - paragraph [0054]; figures 1-10 *	1-4	INV. D04B1/24
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			D04B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 15 June 2011	Examiner Zirkler, Stefanie
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 11 00 2181

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15-06-2011

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