



(11)

EP 2 436 810 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
04.04.2012 Bulletin 2012/14

(51) Int Cl.:
D04B 1/22 (2006.01)

(21) Application number: **11008037.1**

(22) Date of filing: **04.10.2011**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA ME

(30) Priority: **04.10.2010 JP 2010225068**

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

(72) Inventor: **Okamoto, Kazuyoshi
Wakayama-shi
Wakayama, 641-8511 (JP)**

(74) Representative: **Emde, Eric
Wagner & Geyer
Gewürzmühlstrasse 5
80538 München (DE)**

(54) **Knitting method of three dimensionally shaped-knitted fabric, and three dimensionally shaped-knitted fabric**

(57) To provide a knitting method of a three dimensionally (3D) shaped-knitted fabric with which a 3D shaped-knitted fabric having a complex shape than the related art can be knitted. The knitting method includes a base knitting step in which a base knitted fabric portion including four sides is knitted such that at least three sides of the four sides are held on the needle beds; and a projection knitting step in which a projecting knitted fabric portion is knitted from at least one side of the base knitted fabric portion such that the projection knitted fabric portion has a smaller knitting width than the relevant one

side. In the projection knitting step, moving a part of a stitch row configuring one side of the base knitted fabric portion toward the outer side in a knitting width direction, knitting a pickup stitch on the knitting needle that became an empty needle by such movement, and forming a part of one side of the projecting knitted fabric portion; and knitting a new stitch row following a stitch row proximate to the empty needle to increase the knitting course of the projection knitted fabric portion are repeated.

EP 2 436 810 A2

Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a knitting method of a three dimensionally (3D) shaped-knitted fabric for knitting a 3D shaped-knitted fabric having a complex shape such as a sofa cover, and a 3D shaped-knitted fabric knitted with such knitting method.

Description of the Related Art

[0002] Patent document 1 discloses a knitting method of a 3D shaped-knitted fabric having a three-dimensional shape profile using a flat knitting machine. In the technique of patent document 1, when alternately forming stitches on front and back needle beds of the flat knitting machine, and knitting a rectangle knitted fabric using a stitch row comprising such stitches as a base, knitting is carried out such that all four sides of the rectangle knitted fabric are held on the needle beds. Circling knitting is then carried out on the four sides with the rectangle knitted fabric, in which all four sides are held on the needle beds, as a bottom surface of the 3D shaped-knitted fabric, thereby knitting four side surfaces of the 3D shaped-knitted fabric following the bottom surface.

[0003]

[Patent document 1] International Publication No. 2008/143172

SUMMARY OF THE INVENTION

[0004] According to the knitting method of patent document 1, 3D shaped-knitted fabric having a cubic shape or a quadrangular pyramid shape, and various 3D shaped-knitted fabrics such as slippers, bags, gloves and the like, can be knitted as described in the embodiment of the relevant document. However, it is difficult to have a shape other than a rectangle for the bottom surface in the method of patent document 1.

[0005] The present invention has been made in view of such situation, and an object thereof is to provide a knitting method of a 3D shaped-knitted fabric with which a 3D shaped-knitted fabric having a more complex shape than the related art can be knitted, and a 3D shaped-knitted fabric knitted by applying the knitting method.

[0006] A knitting method of a 3D shaped-knitted fabric of the present invention is a knitting method of a 3D shaped-knitted fabric in which a set-up surface to become one surface of the 3D shaped-knitted fabric is first knitted and remaining surfaces of the 3D shaped-knitted fabric are knitted with the set-up surface as a base when knitting the 3D shaped-knitted fabric using a 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. The knitting method of a 3D shaped-knitted fabric of the present invention includes a base knitting step in which a base knitted fabric portion, including four sides of a lower side, an upper side, a right side, and a left side, is knitted such that at least three sides of the four sides are held on the needle beds; and a projection knitting step in which a projecting knitted fabric portion is knitted from at least one side of the base knitted fabric portion such that the projecting knitted fabric portion has a smaller knitting width than the relevant one side to complete the set-up surface including the base knitted fabric portion and the projecting knitted fabric portion.

[0007] In the base knitting step, after forming a plurality of stitches (stitches referred to herein include pickup stitches) with at least one of the front and back needle beds, knitting a new stitch row following a set-up stitch row comprising such stitches to increase the knitting course of the base knitted fabric portion and moving the new stitch row to one side in the knitting width direction to form pickup stitches to become a part of the left side and the right side on the knitting needle that became an empty needle by the movement and on an empty needle substantially facing the end in the moving direction of the moved new stitch row are repeated.

[0008] The following is repeated in the projection knitting step.

Moving a part of a stitch row configuring one side of the base knitted fabric portion toward the outer side in a knitting width direction and knitting a pickup stitch on the knitting needle that became an empty needle by such movement to form a part of one side of the projecting knitted fabric portion.

Knitting a new stitch row following a stitch row proximate to the empty needle to increase the knitting course of the projection knitted fabric portion.

Knitting a pickup stitch on the empty needle proximate to the end on the opposite side of the empty needle obtained by the above movement in the proximate stitch row to form a part of the other side of the projection knitted fabric portion.

[0009] In one aspect of the knitting method of a 3D shaped-knitted fabric of the present invention, when knitting the projecting knitted fabric portion from an intermediate portion in the knitting width direction in one side of the base knitted fabric portion, such as when knitting the "convex" set-up surface as shown in the embodiment described with reference to Fig. 2(E) and Figs. 3 to 5, to be described later, the projection knitting step is particularly preferably carried out in the following manner. Specifically, in the projection knitting step, moving stitch rows on both sides of an intermediate stitch row at the intermediate portion in the knitting width direction, of the stitch rows configuring one side of the base knitted fabric portion, to positions spaced apart from the intermediate stitch row in the needle bed same as the intermediate stitch row, and knitting a new stitch row following the two empty needles sandwiching the intermediate stitch row

obtained by the movement and the intermediate stitch row are repeated.

[0010] In one aspect of the knitting method of a 3D shaped-knitted fabric of the present invention, when knitting the projecting knitted fabric portion from at least one end in the knitting width direction in one side of the base knitted fabric portion, that is, when knitting the "concave" set-up surface as shown in the embodiment described with reference to Fig. 2(F) and Figs. 6 to 8, to be described later, the projection knitting step is particularly preferably carried out in the following manner. Specifically, in the projection knitting step, moving an end stitch row including the end, of the stitch rows configuring one side of the base knitted fabric portion, to a position spaced apart from the remaining stitch row in the needle bed same as the remaining stitch row, and knitting a new stitch row following an empty needle formed by the movement, the moved end stitch row, and an empty needle substantially facing the end in the moving direction of the moved end stitch row are repeated.

[0011] If there is a stitch row of another side held on the needle bed same as the end stitch row in the moving direction of the end stitch row, the projection knitting step is preferably carried out after rotating the relevant stitch row to the needle bed facing the end stitch row. This is a process for smoothly carrying out the knitting of the end stitch row.

[0012] The 3D shaped-knitted fabric of the present invention is knitted using a 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. The 3D shaped-knitted fabric includes a set-up surface with a base knitted fabric portion having four sides, which is a surface knitted first of the surfaces configuring the 3D shaped-knitted fabric and a projection knitted fabric portion projecting out from at least one side of the four sides; and a plurality of coupling surfaces comprising stitches continuing in a wale direction of a stitch row configuring at least three sides of the set-up surface.

[0013] According to the knitting method of a 3D shaped-knitted fabric of the present invention, the 3D shaped-knitted fabric of the present invention having a more complex shape than the related art can be knitted. This is because the set-up surface knitted first in the 3D shaped-knitted fabric includes the base knitted fabric portion and the projecting knitted fabric portion projecting out from one side of the base knitted fabric portion, and has greater number of sides than the conventional rectangle set-up surface.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014]

Figs. 1(A) and 1(B) are photographs of a sofa cover knitted in an embodiment, where (A) is a photograph seen from a seating surface side and (B) is a photograph seen from a rear surface side.

Figs. 2(A) to (F) are views describing the knitting order of the sofa cover of Fig. 1, where (A) is a front view, (B) is a right side surface view, (C) is a rear view, (D) is a top view, (E) is a schematic view of a "convex" rear surface, and (F) is a schematic view of a "concave" front end face.

Fig. 3 is a knitting step diagram showing the first half of the knitting step for knitting the "convex" rear surface.

Fig. 4 is a knitting step diagram showing the last half of the knitting step following Fig. 3.

Fig. 5 is a schematic view showing a held state of the "convex" rear surface at a key point of the knitting step.

Fig. 6 is a knitting step diagram showing the first half of the knitting step for knitting the "concave" front end face.

Fig. 7 is a knitting step diagram showing the last half of the knitting step following Fig. 6.

Fig. 8 is a schematic view showing a held state of the "concave" front end face at a key point of the knitting step.

Fig. 9 is a schematic view of a base of the set-up surface shown in a modified embodiment, where (A) is a schematic view showing a dome shaped base knitted fabric portion, (B) is a schematic view showing a trapezoid shaped base knitted fabric portion, and (C) is a schematic view showing a cross-shaped set-up surface.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0015] An example of knitting a sofa cover shown in Fig. 1 using a two-bed flat knitting machine having a pair of front and back needle beds extending in a transverse direction and disposed opposite to each other in a cross direction, and in which stitches can be transferred between the front and back needle beds will be described below. The sofa cover may, of course, be knitted with a flat knitting machine including a transfer jack bed or a four-bed flat knitting machine other than the two-bed flat knitting machine.

[0016] There are roughly two methods for knitting the sofa cover shown in Fig. 1 in a seamless manner using the flat knitting machine. The first method is a method of knitting a "convex" rear surface 1 of a sofa cover as shown in Fig. 2(E), and carrying out knitting in the order of the number in the arrow shown in Figs. 2(A) to 2(D) toward the front end face of the sofa cover with the rear surface 1 as a set-up surface. The second method is a method of knitting a "concave" front end face 2 of a sofa cover as shown in Fig. 2(F), and carrying out knitting toward the rear surface of the sofa cover with the front end face 2 as a set-up surface.

<First embodiment>

[0017] When starting the knitting of the sofa cover from the "convex" rear surface of the sofa cover, each part of the sofa cover 100 is knitted according to the knitting procedure shown in Figs. 2(A) to 2(D). The "convex" rear surface 1 shown in Fig. 2(E) includes a rectangle base knitted fabric portion 10, and a rectangle projecting knitted fabric portion 11 projecting out from one side (side on upper side of sofa cover) of the base knitted fabric portion 10. In this case, all sides excluding the side (side a-b in the figure) on the lower side of the sofa cover, of the sides of the "convex" rear surface 1, are held on the needle beds. The knitting step for knitting the "convex" rear surface 1 will be described based on Figs. 3 to 5.

[0018] In Figs. 3, 4, "alphabet + number" indicates the number of the knitting step, A to Z, A' to E' indicate the position of the knitting needles of the front needle bed (FB) and the back needle bed (BB), and a to h indicate the positions on the needle bed corresponding to each vertex of the "convex" rear surface 1 shown in Fig. 2(E). O in the knitting step of Figs. 3, 4 is the stitch, V is the pickup stitch, and the portion where the knitting operation is actually carried out in each knitting step is shown with a thick line. A schematic view of the held state of the rear surface 1 at the key point of the knitting step of Figs. 3, 4 is shown in Fig. 5. The number of knitting needles shown in Figs. 3, 4 is less than in the actual knitting, and the number of the pickup stitches and stitches held in Figs. 3, 4 does not match with the number of the pickup stitches and stitches held in Fig. 5 for the sake of convenience of explanation.

[0019] In knitting the "convex" rear surface 1, a pickup stitch is alternately knitted on the knitting needles G, I, K, M, O, Q of the FB and the knitting needles H, J, L, N, P, R of the BB (S1). After knitting a pickup stitch on the knitting needle S of the FB, a new stitch row following a set-up stitch row comprising the pickup stitches of the BB is knitted (S2). The pickup stitch knitted in S2 is at a position substantially facing the stitch at an end in a moving direction of the stitch row knitted in S2 and to be moved in the next S3, and becomes a part of a side d-b (right side) shown in Fig. 2(E).

[0020] The stitches held on the BB are then moved toward the right direction in the plane of drawing by two needles (S3), and thereafter, a pickup stitch is knitted on the knitting needle H of the BB that became an empty needle by the movement in S3, and a new stitch row following in a wale direction of the stitch row moved in S3 is knitted (S4). The pickup stitch knitted in S4 becomes a part of a side c-a (left side) shown in Fig. 2(E).

[0021] After forming a pickup stitch on the knitting needle U of the FB, a new stitch row following the stitch row knitted in S2 and moved in S3 is knitted (S5), and the stitch row knitted in S5 is moved by two needles toward the right direction in the plane of drawing (S6). After forming a pickup stitch on the knitting needle J of the BB that became an empty needle by the movement in S6, a new

stitch row following the stitch row transferred in S6 is knitted (S7).

[0022] Hereinafter, knitting similar to S5 to S7 is repeated to complete the rectangle base knitted fabric portion 10 (c-d-b-a) shown in Fig. 2(E). The held state of each side of the base knitted fabric portion 10 is shown in S8 of Fig. 4 and Fig. 5(A). The sides c-a (left side) and a-b (lower side) of the base knitted fabric portion 10 are held on the BB, and the sides b-d (right side) and d-c (upper side) are held on the FB.

[0023] The projecting knitted fabric portion 11 that projects out from the side c-d, which is one side of the base knitted fabric portion 10, is knitted. In knitting the projecting knitted fabric portion 11, the side a-b is subjected to bind off process in the present embodiment. The bind off process is the process for forming the opening of the lower part of the sofa cover 100, and a known method can be used. The held state of the base knitted fabric portion 10 subjected to the bind off process is shown in S9 of Fig. 4 and Fig. 5(B).

[0024] The projecting knitted fabric portion 11 that projects out from the intermediate portion of the side c-d of the base knitted fabric portion 10 is knitted from the state of S9. In knitting, an intermediate stitch row of the side c-d comprising the pickup stitches held on the knitting needles K, M of the pickup stitches forming the side c-d and the side d-b of the base knitted fabric portion 10 held on the FB is held as is, and the remaining pickup stitches are transferred in the direction of moving away from the pickup stitches held on the knitting needles K, M (S10, Fig. 5(C)). In S10, the pickup stitches for forming the side c-a held on the BB are also moved by two needles toward the outer side in the knitting width direction. The pickup stitches held on the BB are moved to prevent the cross-over yarn between the FB and the BB near the vertex c from slacking. According to the transfer of S10, empty needles (knitting needles I, O of FB) are formed in the knitting width of the side c-d of the base knitted fabric portion 10, as shown in Fig. 5(C).

[0025] Then, pickup stitches are knitted on the knitting needles I, O of the FB that became empty needles by the transfer of S10 and a new stitch row following the stitch row held on the knitting needles K, M of the FB is formed while moving the yarn feeder in one direction (S11, Fig. 5(D)). The pickup stitch of the knitting needle I of the FB knitted in S11 becomes a part of the side e-g, and the pickup stitch of the knitting needle O becomes a part of the side f-h.

[0026] Assuming the stitch row held on the knitting needles K, M of the FB as the intermediate stitch row, the pickup stitches held on the FB and the BB are transferred by two needles in the direction of moving away from the relevant stitch row with only the intermediate stitch row remaining as is, similar to S10 (S12). Similar to S11, pickup stitches are formed on the knitting needles I, O of the FB that became empty needles by the transfer of S12, and a new stitch row following the stitch row held on the knitting needles K, M of the FB is knitted (S13).

Thereafter, knitting similar to S12, 13 is repeated, so that the rear surface 1 in which all the sides excluding the side a-b are held on the FB or the BB is knitted, as shown in S14.

[0027] After the knitting of the rear surface 1 described above is finished, the sofa cover 100 shown in Figs. 2(A) to 2(D) is knitted with the rear surface 1 as the set-up surface. Specifically, a C-shaped flechage knitting is carried out on the pickup stitches and the stitches held on the FB and the BB shown in S14 to knit the portions (continuing surfaces) corresponding to the upper surface and the side surface of the head rest of the sofa, as well as the side surface of the backrest, as shown in Figs. 2(B) and 2(D). Thereafter, the portions corresponding to the front surface of the head rest (Fig. 2(A)) → backrest (Fig. 2(A)) → main body including seating surface and arm rest (Figs. 2(B), 2(D)) → front end face (Fig. 2(A)) are knitted according to the order of the number shown in the arrow shown in Figs. 2(A) to 2(D), and lastly, the bind off process is performed on the lower end of the front end face to complete the sofa cover 100. The knitting order of the left and the right of the front end face may be interchanged.

<Second embodiment>

[0028] When knitting the "concave" front end face of the sofa cover and then knitting the sofa cover in a seamless manner in continuation to the front end face, the knitting of the portions corresponding to the front end face 2 (referencing Fig 2(F)) → main body including seating surface and arm rest → backrest → front surface of head rest → rear surface of main body are carried out in the procedure opposite to the procedure referencing Figs. 2(A) to 2(D) to complete the sofa cover 100. The knitting procedure of the "concave" front end face 2 will now be described while referencing Figs. 6 and 7, which are knitting step diagrams of the "concave" front end face 2, and Fig. 8, which is a schematic view showing a held state of the front end face 2 at the key point of the knitting step. The manner of looking at Figs. 6 and 7 is similar to Figs. 3 and 4, and the manner of looking at Fig. 8 is similar to Fig. 5.

[0029] When knitting the "concave" front end face 2, pickup stitches are knitted on the knitting needles B, D, F, H, J, L, N of the BB (T1). After knitting a pickup stitch on the knitting needle O of the FB, a new stitch row continuing to the pickup stitches of the BB is knitted (T2). The pickup stitch knitted in T2 is at a position substantially facing the stitch at an end in the moving direction of the stitch row to be moved in the next T3, and becomes a part of side i-o shown in Fig. 2(F).

[0030] The stitches held on the BB are moved toward the right direction in the plane of drawing by two needles (T3), and thereafter, a pickup stitch is knitted on the knitting needle B of the BB that became an empty needle by the movement of the T3 and a new stitch row following the stitch row transferred in T3 is knitted (T4). The pickup

stitch knitted in T4 becomes a part of the side j-1 shown in Fig. 2(F).

[0031] As shown in T5 and Fig. 8(A), the rectangle base knitted fabric portion 20 (Fig. 2(F)) is thereafter knitted by repeating the knitting similar to T2 to T4. The sides j-l, l-o of the base knitted fabric portion 20 are held on the BB and the side i-o is held on the FB.

[0032] After the base knitted fabric portion 20 is completed, the pickup stitches of the side j-l of the base knitted fabric portion 20 knitted on the knitting needles B, D, F of the BB are respectively transferred to the knitting needles K, I, G of the FB (T6, Fig. 8(B)). This transfer is carried out to make the knitting needles of the BB empty so that the stitch row of a projecting knitted fabric portion 21 can be knitted with them when knitting the projecting knitted fabric portion 21, as hereinafter described.

[0033] As shown in T7 of Fig. 7, the end stitch row at the left side in the plane of drawing held on the knitting needles H, J of the BB of the stitches configuring the side l-o of the base knitted fabric portion 20 are transferred to the left side in the plane of drawing by two needles, and the end stitch row at the right side in the plane of drawing held on the knitting needles T, R of the BB are transferred to the right side in the plane of drawing by two needles (Fig. 8(C)). A yarn is fed to the knitting needles J, H, F of the BB and the knitting needle E of the FB to knit the stitch row that becomes a part of the projecting knitted fabric portion 21, and a yarn is fed to the knitting needles R, T, V of the BB and the knitting needle U of the FB to knit the stitch row that becomes a part of the projecting knitted fabric portion 22 (T8, Fig. 8(D)). The pickup stitches knitted on the knitting needle E of the FB, the knitting needle J of the BB, the knitting needle R of the BB, and the knitting needle U of the FB in T8 respectively become a part of the sides 1-n, k-m, p-r, and o-q of Fig. 2(F).

[0034] Subsequently, the transfer shown in T9 and the knitting of the stitch rows shown in T10 are repeated to complete the front end face 2 shown in Fig. 2(F). The held state on the needle beds of the completed front end face 2 is shown in T11.

[0035] As shown in T11, the sides j-l, l-n, i-o, o-q of the front end face 2 are held on the FB and the sides n-m, m-k, k-p, p-r, r-q are held on the BB, and a stitch row following such sides can be knitted. The knitting is carried out in the knitting order opposite to the knitting order shown with the outlined arrows and numbers in Figs. 2(A) to 2(D) with the front end face 2 as the set-up surface to complete the sofa cover 100. However, with respect to the rear surface shown in Fig. 2(C), knitting is carried out from the upper end to the lower end, and the bind off process is performed at the position on the lower end.

[0036] In the knitting step referencing Figs. 6 and 7, two yarn feeders are used for the knitting of the projecting knitted fabric portions 21, 22, but both projecting knitted fabric portions 21, 22 may be knitted with one yarn feeder. In this case, knitting is carried out toward n → m → k → p of Fig. 2(F) to start the knitting of the projecting knitted fabric portion 22 once the projecting knitted fabric portion

21 is knitted to the upper end.

<Modified embodiment>

[0037] The present invention is not limited to the embodiments described above, and the embodiments described above may be appropriately changed and implemented within a scope not deviating from the gist of the present invention. For instance, the base knitted fabric portion 10 (20) of Figs. 2(E) and 2(F) described above is a rectangle, but the base knitted fabric portion 10(20) other than a rectangle may be knitted by carrying out flechage knitting of gradually reducing the knitting width of the side c-d (l-o). As shown in Fig. 9(A), a dome shaped base knitted fabric portion 30 can be knitted by carrying out flechage knitting of sequentially reducing the knitting width from both ends in the knitting width direction toward the middle in the knitting width direction of the base knitted fabric portion in the process of knitting the base knitted fabric portion. As shown in Fig. 9(B), a trapezoid shaped base knitted fabric portion 40 can be knitted by carrying out flechage knitting of sequentially reducing the knitting width with one end side in the knitting width direction of the base knitted fabric portion as a base point in the process of knitting the base knitted fabric portion.

[0038] Furthermore, in the base knitted fabric portion 10 shown in Fig. 2(E), the projecting knitted fabric portion 11 may also be formed on the side a-b facing the side c-d from which the projecting knitted fabric portion 11 is knitted as well as the side a-c and the side b-d. When forming the projecting knitted fabric portion 11 on the side c-d, the projecting knitted fabric portion projecting out from the base knitted fabric portion is also knitted on the side a-b without carrying out the bind off process in S10 of Fig. 4 and, thus a cross-shaped set-up surface shown in Fig. 9(C) can be knitted.

DESCRIPTION OF REFERENCE NUMERALS

[0039]

100	sofa cover (3D shaped-knitted fabric)
1	rear surface (set-up surface)
10	base knitted fabric portion
11	projecting knitted fabric portion
2	front end face (set-up surface)
20	base knitted fabric portion
21, 22	projecting knitted fabric portion
30	dome shaped base knitted fabric portion
40	trapezoid shaped base knitted fabric portion

Claims

1. A knitting method of a three dimensionally (3D) shaped-knitted fabric in which a set-up surface (1, (2)) to become one surface of the 3D shaped-knitted fabric (100) is first knitted and remaining surfaces of the 3D shaped-knitted fabric (100) are knitted with the set-up surface (1, (2)) as a base when knitting the 3D shaped-knitted fabric using a 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; the method **characterized by** the steps of:

a base knitting step in which a base knitted fabric portion (10, (20)), including four sides of a lower side, an upper side, a right side, and a left side, is knitted such that at least three sides of the four sides are held on the needle beds; and
a projection knitting step in which a projecting knitted fabric portion (11, (21, 22)) is knitted from at least one side of the base knitted fabric portion (10, (20)) such that the projecting knitted fabric portion has a smaller knitting width than the relevant one side to complete the set-up surface (1, (2)) including the base knitted fabric portion (10, (20)) and the projecting knitted fabric portion (11, (21, 22)); wherein

in the base knitting step,
after forming a plurality of stitches with at least one of the front and back needle beds,
knitting a new stitch row following a set-up stitch row comprising the stitches to increase the knitting course of the base knitted fabric portion (10, (20)) and moving the new stitch row to one side in the knitting width direction to form pickup stitches to become a part of the left side and the right side on the knitting needle that became an empty needle by the movement and an empty needle substantially facing the end in the moving direction of the moved new stitch row are repeated; and

in the projection knitting step,
moving a part of a stitch row configuring one side of the base knitted fabric portion (10, (20)) toward an outer side in a knitting width direction and knitting a pickup stitch on the knitting needle that became an empty needle by the movement, to form a part of one side of the projecting knitted fabric portion (11, (21, 22)),
knitting a new stitch row following a stitch row proximate to the empty needle to increase the knitting course of the projection knitted fabric portion (11, (21, 22)), and
knitting a pickup stitch on the empty needle proximate to the end on the opposite side of the empty needle obtained by the movement in the proximate stitch row to form a part of the other side

of the projection knitted fabric portion (11, (21, 22)) are repeated.

2. The knitting method of a three dimensionally shaped-knitted fabric according to claim 1, **characterized in that** when knitting the projecting knitted fabric portion (11) from an intermediate portion in the knitting width direction in one side of the base knitted fabric portion (10), moving the stitch rows on both sides of the intermediate stitch row at the intermediate portion in the knitting width direction, of the stitch rows configuring one side of the base knitted fabric portion (10), to positions spaced apart from the intermediate stitch row in the needle bed same as the intermediate stitch row, and knitting a new stitch row following the two empty needles sandwiching the intermediate stitch row obtained by the movement and the intermediate stitch row are repeated in the projection knitting step.

5
10
15
20
3. The knitting method of a three dimensionally shaped-knitted fabric according to claim 1, **characterized in that** when knitting the projecting knitted fabric portion (21, 22) from at least one end in the knitting width direction in one side of the base knitted fabric portion (20), moving an end stitch row including the end, of the stitch rows configuring one side of the base knitted fabric portion (20), to a position spaced apart from the remaining stitch row in the needle bed same as the remaining stitch row, and knitting a new stitch row following an empty needle formed by the movement, the moved end stitch row, and an empty needle substantially facing the end in the moving direction of the moved end stitch row are repeated in the projection knitting step.

25
30
35
4. The knitting method of a three dimensionally shaped-knitted fabric according to claim 3, **characterized in that** if there is a stitch of another side held on the needle bed same as the end stitch row in the moving direction of the end stitch row, the projection knitting step is carried out after rotating the relevant stitch row to the needle bed facing the end stitch row.

40
5. A three dimensionally (3D) shaped-knitted fabric (100) knitted using a 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, the 3D shaped-knitted fabric (100) comprising:

45
50

a set-up surface (1, (2)) with a base knitted fabric portion (10, (20)) having four sides, which is a surface knitted first of the surfaces configuring the 3D shaped-knitted fabric (100) and a projection knitted fabric portion (11, (21, 22) projecting out from at least one side of the four sides; and a plurality of coupling surfaces comprising

55

stitches continuing in a wale direction of a stitch row configuring at least three sides of the set-up surface (1, (2)).

Fig. 1

(A)



(B)



Fig. 2

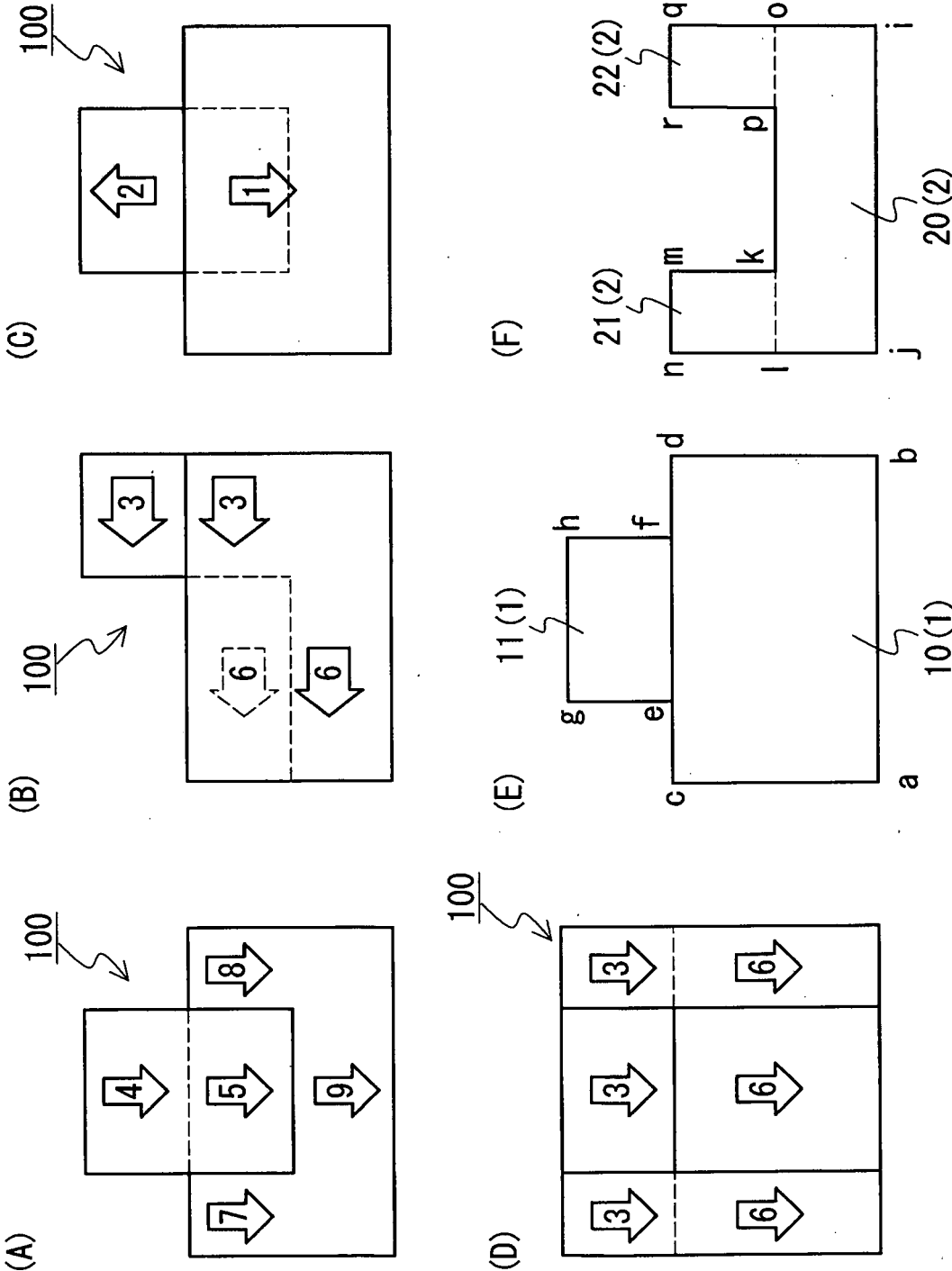


Fig. 3

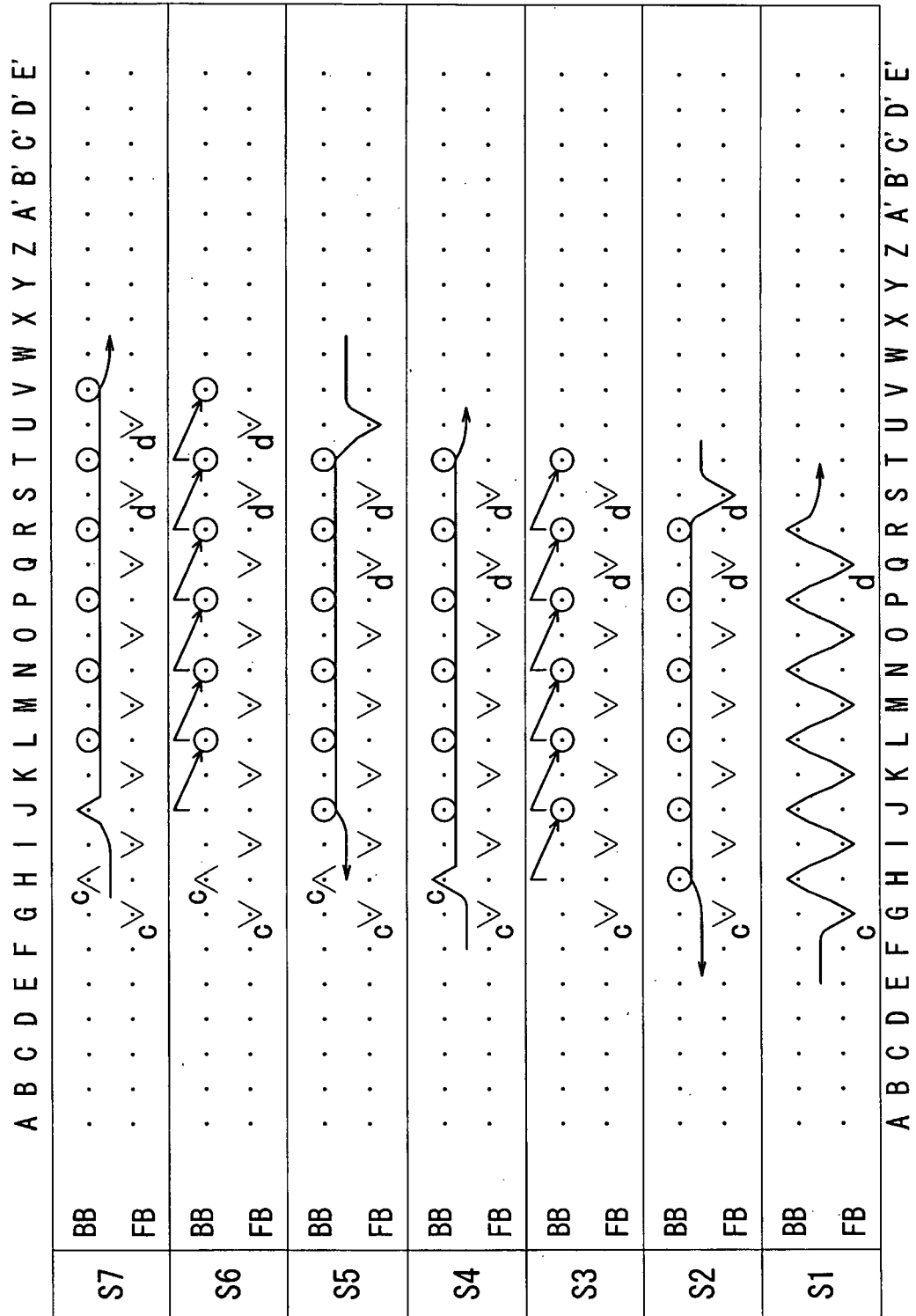
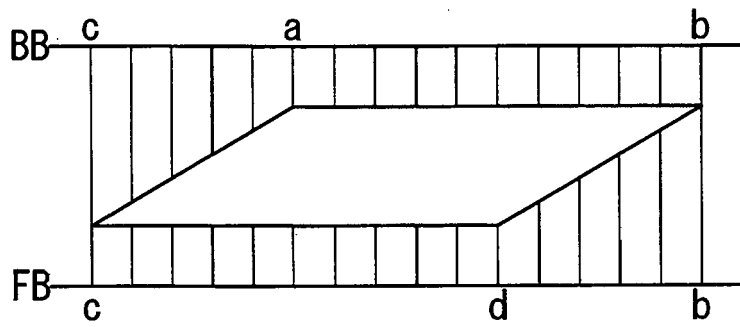
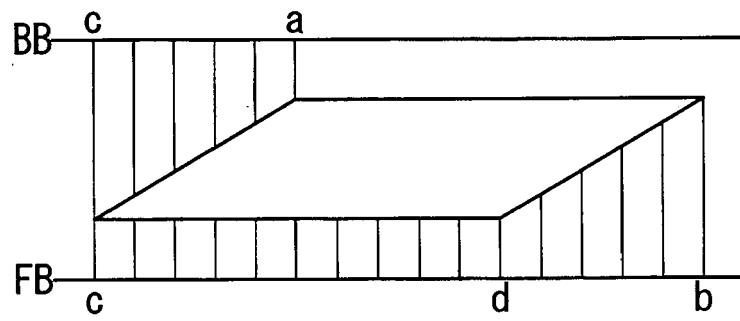


Fig. 5

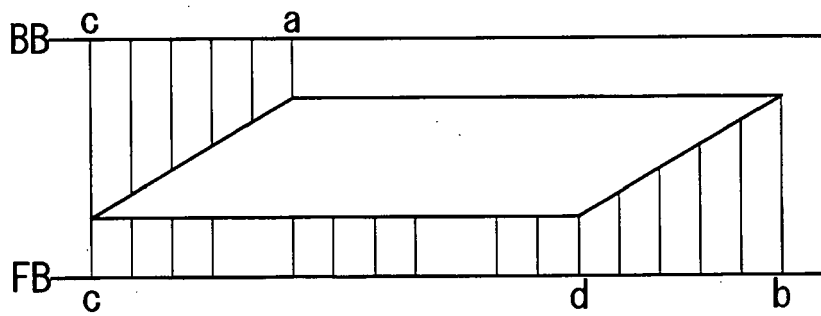
(A)



(B)



(C)



(D)

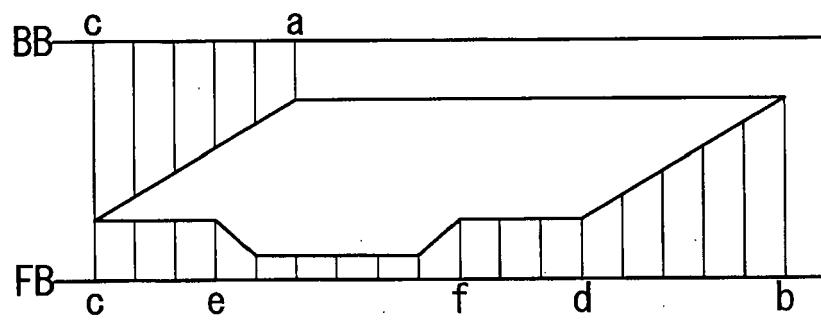


Fig. 6

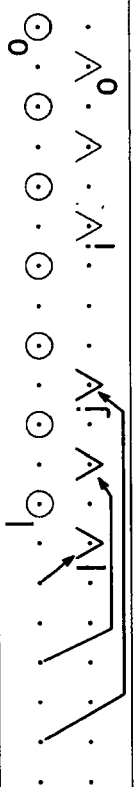
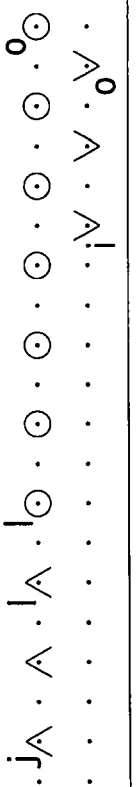
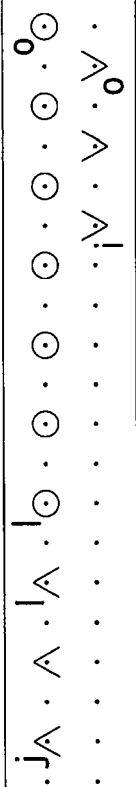
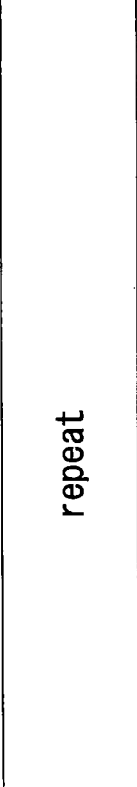
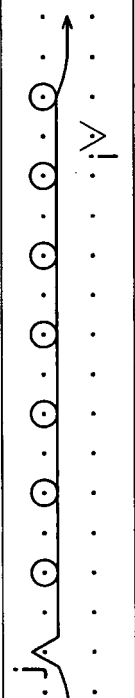
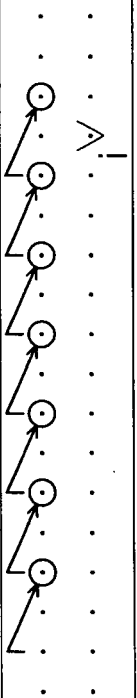
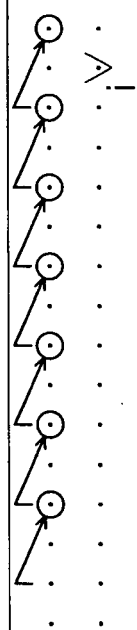
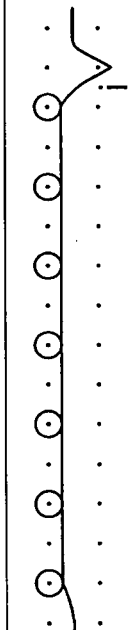
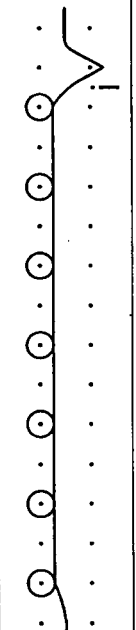
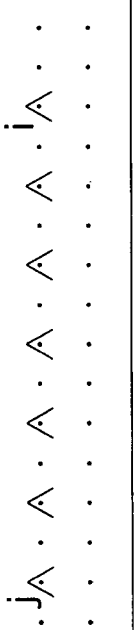
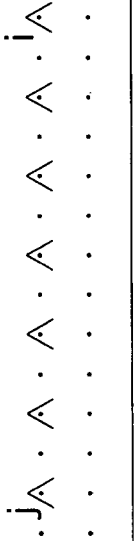
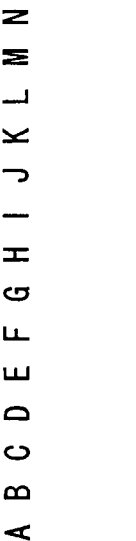
		A B C D E F G H I J K L M N O P Q R S T U V W X Y Z A' B' C' D' E'																									
T6	BB																										
	FB																										
T5	BB																										
	FB																										
		repeat																									
T4	BB																										
	FB																										
T3	BB																										
	FB																										
T2	BB																										
	FB																										
T1	BB																										
	FB																										
		A B C D E F G H I J K L M N O P Q R S T U V W X Y Z A' B' C' D' E'																									

Fig. 7

		A B C D E F G H I J K L M N O P Q R S T U V W X Y Z A' B' C' D' E'																									
T11	BB	n	m	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	FB	n	m	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
T10	BB	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	FB	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
T9	BB	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	FB	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
T8	BB	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	FB	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
T7	BB	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	FB	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Fig. 8

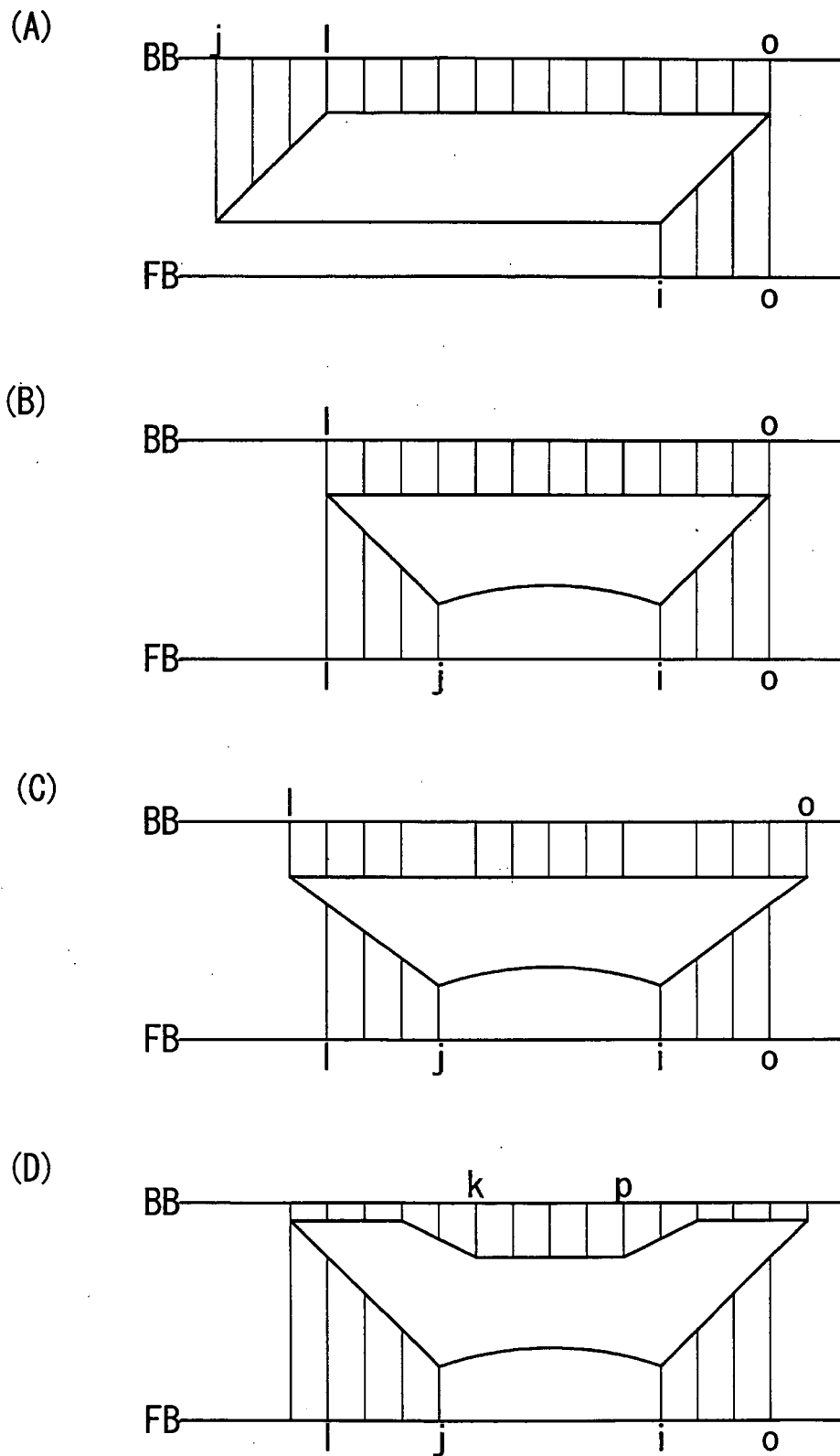
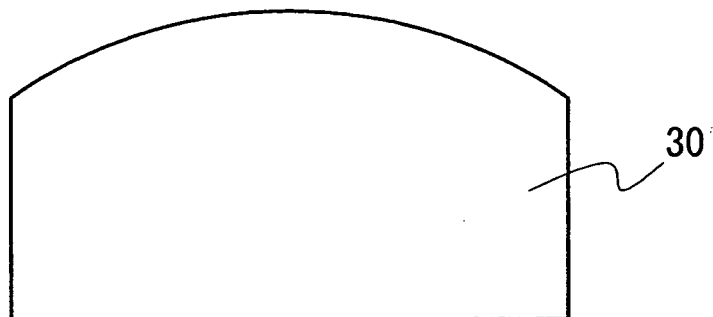
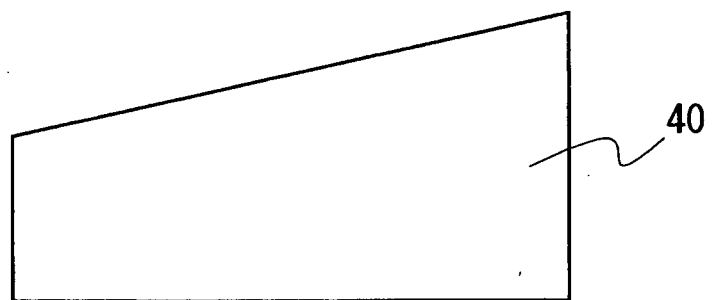


Fig. 9

(A)



(B)



(C)

