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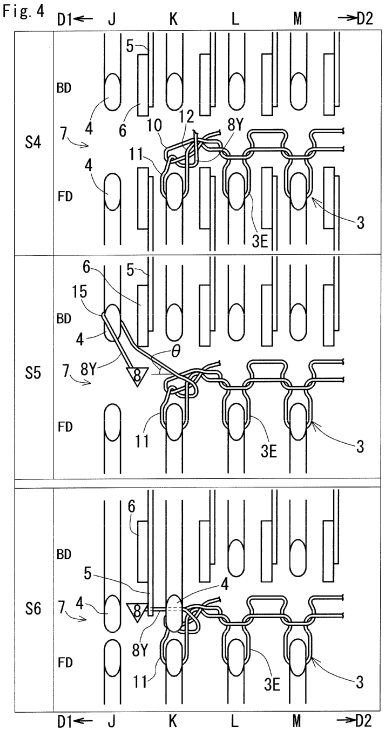
(54) METHOD FOR KNITTING TUBULAR KNITTED FABRIC

(57) A tubular knitted fabric knitting method, in which an intarsia portion is knitted within a knitting width of a first knitted fabric portion by moving a first yarn feeder, and thereafter, a second knitted fabric portion is knitted by moving a second yarn feeder so as to cross the first yarn feeder that is in a stopped state, includes: a step A of moving the first yarn feeder in a first direction after knitting a termination stitch of the intarsia portion, and forming a tuck stitch on a needle holding a stitch of the second knitted fabric portion; and a step B of placing the first yarn feeder in a second direction relative to the tuck stitch after the step A, so that, when knitting the second knitted fabric portion, the tuck stitch is removed as the needle moves toward a needle bed gap. The first direction is a direction outward of the intarsia portion, and the second direction is a direction inward of the intarsia portion.

FIG. 4
Fig. 4



EP 4 306 697 A1

Description

Technical Field

[0001] The present invention relates to a tubular knitted fabric knitting method using a flat knitting machine.

Background Art

[0002] A flat knitting machine includes a plurality of needle beds and a plurality of yarn feeders. Each yarn feeder feeds a knitting yarn to a plurality of needles provided on the needle beds. In the case of knitting using the flat knitting machine, when a knitted fabric portion is knitted using one yarn feeder X, this yarn feeder X may cross another yarn feeder Y that is stopped. At this time, the knitting yarn extending from the yarn feeder Y may be knitted into the aforementioned knitted fabric portion. One possible technology for solving this type of problem is a knitted fabric knitting method disclosed in Patent Literature 1.

[0003] Patent Literature 1 discloses a technology for solving the above problem that occurs in intarsia knitting. FIG. 2 of Patent Literature 1 shows that a first knitted fabric portion is knitted using a first yarn feeder (reference numeral 11) in step 1, and thereafter, a second knitted fabric portion is knitted using a second yarn feeder (reference numeral 13) in steps 2 to 4. At least a part of the first knitted fabric portion overlaps the second knitted fabric portion in the knitting width direction on the needle bed. As shown in step 3, both the second yarn feeder and the first yarn feeder are kicked back when the second yarn feeder crosses the first yarn feeder. "Being Kicked back" means that a yarn feeder moving in one direction temporarily moves in the opposite direction. Both yarn feeders being kicked back prevents the knitting yarn extending from the first yarn feeder to the first knitted fabric portion from being knitted into the second knitted fabric portion.

Citation List

Patent Literature

[0004] Patent Literature 1: JP H10-1852A

Summary of Invention

Technical Problem

[0005] In the technology of Patent Literature 1, the second yarn feeder is kicked back when the second knitted fabric portion is knitted. At this time, the second yarn feeder is temporarily stopped, and the tension of the knitting yarn extending from the second yarn feeder changes. As a result, the size of stitches may change before and after the second yarn feeder is kicked back. The difference in size between the stitches in the second knitted fabric portion may be noticeable depending on the material of the knitting yarn.

[0006] An object of the present invention is to provide a knitting method that does not require the second yarn feeder to be kicked back when knitting is performed while moving the second yarn feeder so as to cross the stopped first yarn feeder.

Solution to Problem

[0007] Item 1. An aspect of the present invention relates to a tubular knitted fabric knitting method in which, in a process of knitting, using a flat knitting machine including a first yarn feeder and a second yarn feeder, a tubular knitted fabric including a first knitted fabric portion held by a first needle bed and a second knitted fabric portion held by a second needle bed opposing the first needle bed, an intarsia portion is knitted within a knitting width of the first knitted fabric portion by moving the first yarn feeder, and thereafter, the second knitted fabric portion is knitted by moving the second yarn feeder so as to cross the first yarn feeder that is in a stopped state, the method including:

a step A of moving the first yarn feeder in a first direction after knitting a termination stitch of the intarsia portion, and forming a tuck stitch on a needle holding a stitch of the second knitted fabric portion; and

a step B of placing the first yarn feeder in a second direction relative to the tuck stitch after the step A, so that, when knitting the second knitted fabric portion, the tuck stitch is removed as the needle moves toward a needle bed gap,

wherein the first direction is a direction outward of the intarsia portion, and

the second direction is a direction inward of the intarsia portion.

[0008] Item 2. As one embodiment of the tubular knitted fabric knitting method of the present invention,

a position at which the tuck stitch is formed in the step A may be a position within three stitches in a knitting width direction as viewed from the termination stitch, and

a position at which the first yarn feeder is placed in the step B may be a position within two stitches in the knitting width direction as viewed from the tuck stitch.

[0009] Item 3. As one embodiment of the tubular knitted fabric knitting method of the present invention, the method may further include:

a step X of moving the first yarn feeder in the first direction, and knitting a first stitch on a needle not holding the first knitted fabric portion or the second

knitted fabric portion;
a step Y of intersecting a knitting yarn extending from the first yarn feeder to the first stitch with a cross-over yarn connecting the termination stitch to the first stitch, by placing the first yarn feeder in the second direction relative to the first stitch; and
a step Z of moving the first stitch the needle bed holding the first knitted fabric portion, and
the steps X, Y, and Z may be performed after the termination stitch has been knitted and before the step A.

[0010] Item 4. As one embodiment of the tubular knitted fabric knitting method of the present invention,
the first knitted fabric portion and the second knitted fabric portion are knitted in a full-gauge state.

Effects of the Invention

[0011] According to the knitting method of the present invention, the second yarn feeder need not be kicked back when the second knitted fabric portion is knitted that overlaps the intarsia section in the knitting width direction, as will be described in detail in a later-described embodiment. Thus, the second yarn feeder need not be stopped when the second knitted fabric portion is knitted. Knitting the second knitted fabric portion without stopping the second yarn feeder makes it unlikely to vary the size among a plurality of stitches arranged in the knitting width direction of the second knitted fabric portion.

[0012] Here, in the step A of the knitting method of the present invention, a tuck stitch is formed on the stitch of the second knitted fabric portion using the knitting yarn fed from the first yarn feeder. It might appear that the first knitted fabric portion and the second knitted fabric portion will be stitched together when the second knitted fabric portion is knitted. However, the first knitted fabric portion and the second knitted fabric portion will not be stitched together since the tuck stitch in the step A is removed from the needle when the second knitted fabric portion is formed, as will be described in more detail in the later-described embodiment.

[0013] When a tubular knitted fabric is knitted by a flat knitting machine that includes a knitting assist member such as a loop presser or a stitch presser, there is a concern that the knitting yarn extending from the first yarn feeder may be hooked to that knitting assist member. In this case, there is a possibility that the first knitted fabric portion and the second knitted fabric portion may be stitched together. According to the knitting method according to the above items 2 and 3, the knitting yarn extending from the first yarn feeder can be effectively prevented from being hooked to the knitting assist member, as will be described in detail in the later-described embodiment.

[0014] According to the knitting method according to the above item 4, a solid tubular knitted fabric with packed stitches can be knitted.

Brief Description of Drawings

[0015]

FIG. 1 is a schematic diagram of a knitted garment, which is a tubular knitted fabric according to Embodiment 1.
FIG. 2 is a conceptual diagram showing an example of a knitting method according to Embodiment 1.
FIG. 3 is a knitting step diagram showing some knitting steps of the knitting method according to Embodiment 1.
FIG. 4 is a schematic diagram of needle beds that illustrates some knitting steps of the knitting method according to Embodiment 1.

Description of Embodiments

Embodiment 1

[0016] In Embodiment 1, an example of knitting a knitted garment having an intarsia structure using the knitting method of the present invention will be described with reference to FIGS. 1 to 4. Of course, knitted fabrics knitted by the knitting method in this example are not limited to knitted garments, and may also be industrial materials such as seat covers, for example.

[0017] A tubular knitted fabric 100 shown in FIG. 1 is a sweater having a body 50, a right sleeve 60R, and a left sleeve 60L. The body 50 includes a front body 50F and a back body 50B. The left and right sides of the sweater are based on the left and right sides of the wearer, and the front and back sides of the sweater are based on the front and back sides of the wearer. The front body 50F includes an intarsia portion 3. The intarsia portion 3 is obtained by means of intarsia knitting. Thus, a knitting yarn that constitutes the intarsia portion 3 is different from a knitting yarn that constitutes sections other than the intarsia portion 3.

[0018] A procedure for knitting the intarsia portion 3 will be described with reference to the conceptual diagram in FIG. 2. In this example, a knitting example using a four-bed flat knitting machine will be described. Hereinafter, a lower front needle bed, a lower back needle bed, an upper front needle bed, and an upper back needle bed of the four-bed flat knitting machine will be referred to as an FD, a BD, an FU, and a BU, respectively. In this example, the FD and the FU correspond to "first needle bed", and the BD and the BU correspond to "second needle bed". Each needle provided on the FD, BD, FU, and BU may be a compound needle with a slider for opening and closing a hook, or a latch needle with a latch for opening and closing a hook. The four-bed flat knitting machine includes a plurality of yarn feeders. This example is an example of knitting using a first yarn feeder 8 that feeds a first knitting yarn 8Y and a second yarn feeder 9 that feeds a second knitting yarn 9Y. The yarn feeders 8 and 9 may be configured to be coupled to a carriage

or may be movable independently of the carriage. The yarn feeders 8 and 9 in this example are movable independently of the carriage. The first knitting yarn 8Y fed from the first yarn feeder 8 is used to knit the intarsia portion 3. The second knitting yarn 9Y fed from the second yarn feeder 9 is used to knit sections other than the intarsia portion 3. Of course, three or more yarn feeders may be used for knitting.

[0019] In FIG. 2, the yarn feeders 8 and 9 are denoted by inverted triangular marks. The first yarn feeder 8 is located on the proximal side relative to the second yarn feeder 9 as viewed from the FD. In other words, the second yarn feeder 9 is located on the proximal side relative to the first yarn feeder 8 as viewed from the BD. Lateral bars at both ends of the body 50 indicate boundaries between the front body 50F and the back body 50B. "T + number" in FIG. 2 indicates the knitting procedure. Bold arrows indicate movement of the yarn feeders 8 and 9.

[0020] At T0, the body 50 is shown that has been knitted up to a position immediately before the intarsia portion 3. The body 50 in this example is knitted by means of tubular knitting using the second yarn feeder 9. In this state, the front body 50F having the intarsia portion 3 and the back body 50B opposing the front body 50F are knitted. From T1 onward, the front body 50F having the intarsia portion 3 is referred to as a first knitted fabric portion 1, and the back body 50B is referred to as a second knitted fabric portion 2.

[0021] At T1, the knitting yarn of the first yarn feeder 8 is introduced from outside the knitting width of the body 50 (T0), and reciprocating knitting is performed by moving the first yarn feeder 8 rightward and then moving the first yarn feeder 8 leftward. Through this reciprocating knitting, the intarsia portion 3 is knitted in the wale direction for two courses on the FD. After the intarsia portion 3 has been knitted, later-described knitting shown in the knitting step diagram in FIGS. 3 and 4 below is performed.

[0022] At T2, reciprocating knitting is performed by moving the second yarn feeder 9 rightward and then moving the second yarn feeder 9 leftward. Through this reciprocating knitting, a right portion 1R is knitted in the wale direction for two courses on the FD. The right portion 1R is a part of the first knitted fabric portion 1. The right portion 1R is adjacent to the right side (left side in the figure) of the intarsia portion 3 in the knitting width direction, and is joined to the intarsia portion 3 by knitting a tuck or the like.

[0023] At T3, the second yarn feeder 9 is moved rightward, and the second knitted fabric portion 2 is knitted on the BD. In this example, the knitting range of the intarsia portion 3 overlaps the knitting range of the second knitted fabric portion 2. Accordingly, the second yarn feeder 9 crosses the first yarn feeder 8 when the second knitted fabric portion 2 is knitted. In this example, the second knitted fabric portion 2 can be knitted without stopping the second yarn feeder 9 by performing the knitting shown in FIGS. 3 and 4 after T1. After the knitting at T3, the knitting shown in FIGS. 3 and 4 is performed again.

[0024] At T4, reciprocating knitting is performed by moving the second yarn feeder 9 leftward and then moving the second yarn feeder 9 rightward. Through this reciprocating knitting, a left portion 1L is knitted in the wale direction for two courses on the FD. The left portion 1L is a part of the first knitted fabric portion 1. The left portion 1L is adjacent to the left side (right side in the figure) of the intarsia portion 3 in the knitting width direction, and is joined to the intarsia portion 3 by knitting a tuck or the like.

[0025] At T5, the second yarn feeder 9 is moved leftward, and the second knitted fabric portion 2 is knitted on the back needle bed BD. At T5 as well, the second yarn feeder 9 crosses the first yarn feeder 8. Since the knitting shown in FIGS. 3 and 4 is performed after T3, the second knitted fabric portion 2 can be knitted without stopping the second yarn feeder 9. The locations of the yarn feeders 8 and 9 at the point when T5 ends are the same as those at T1. Accordingly, after T5, the knitting from T1 to T5 is repeated, thereby knitting the intarsia portion 3 in the body 50 as shown in FIG. 1.

[0026] Next, specific knitting steps for the section having the intarsia portion 3 will be described with reference to FIGS. 3 and 4. "S + number" in FIG. 3 indicates the knitting step number. The right column in FIG. 3 shows stitches in a held state on the FD, BD, and BU. FIG. 3 omits the FU. In the right column, a black point indicates a needle, a round mark indicates a stitch, a V-mark indicates a pick up stitch or a tuck stitch, and an inverted triangular mark indicates a yarn feeder 8 or 9. A capital letter outside the columns indicates the position of a needle. A section that is actually knitted in each step is indicated by a bold line, and a stitch that is newly knitted is painted.

[0027] In S0 in FIG. 3, stitches corresponding to the left half of those at T0 in FIG. 2 are shown. In this example, the first knitted fabric portion 1 and the second knitted fabric portion 2 are knitted in a full-gauge state where no empty needle is present between adjacent stitches.

[0028] In S1, the first yarn feeder 8 is moved rightward and a pick up stitch 10 at a needle K, which is an empty needle, on the BU, and thereafter, the intarsia portion 3 is knitted that is held by needles L to T on the FD. The knitting of the pick up stitch 10 is not essential. The knitting in S 1 corresponds to outward knitting at T1 in FIG. 2.

[0029] In S2, the first yarn feeder 8 is moved leftward, and the intarsia portion 3 is knitted that is held by the needles T to L on the FD. The knitting in S2 corresponds to return knitting at T1 in FIG. 2. Further, in S2, the first yarn feeder 8 is moved leftward after the knitting of the intarsia portion 3 has ended, and a first stitch 11 continuous in the wale direction with the pick up stitch 10 is knitted (step X). In this example, the leftward direction in FIG. 3 moving away from the intarsia portion 3 is referred to as a first direction D 1, and the rightward direction approaching the intarsia portion 3 is referred to as a second direction D2. The first direction D1 and the second

direction D2 are shown on the sides of the capital letters outside the columns. Here, if the pick up stitch 10 is not formed in S1, the first stitch 11 in S2 is formed as a pick up stitch. The first stitch 11 needs to be present on the needle bed opposing the first knitted fabric portion 1 at the point when the next S3 is implemented.

[0030] In S3, the first knitting yarn 8Y extending from the first yarn feeder 8 to the first stitch 11 is intersected with a cross-over yarn 12 by placing the first yarn feeder 8 in the second direction D2 relative to the first stitch 11 (step Y). In this example, the first knitting yarn 8Y is intersected with the cross-over yarn 12 by moving the first yarn feeder 8 in the second direction D2. The cross-over yarn 12 connects a termination stitch 3E held by the FD to the first stitch 11 held by the BU. The termination stitch 3E is a stitch that is knitted last, out of a plurality of stitches of the intarsia portion 3 that are knitted in S2. That is, the cross-over yarn 12 extends between the front and back needle beds. Unlike this example, the first knitting yarn 8Y may alternatively be intersected with the cross-over yarn 12 by subjecting the BD and BU to racking in the first direction D1.

[0031] In S4, the first stitch 11 is moved to the needle bed holding the first knitted fabric portion 1 (step Z). Specifically, the first stitch 11 is moved to the needle K on the FD. At this time, the first knitting yarn 8Y that intersects the cross-over yarn 12 is hooked to the cross-over yarn 12 and pulled to the FD side. The movement of the first stitch 11 in S4 causes the first stitch 11 to be stacked with a stitch 19 (see S3). The stitch 19 is a stitch of a section other than the intarsia portion 3 of the first knitted fabric portion 1. The stitch 19 being stacked with the first stitch 11 makes a stronger joint between the intarsia portion 3 and the right portion 1R when the right portion 1R is formed at T2 in FIG. 2.

[0032] A knitting procedure following S4 will be described with reference to FIG. 4. FIG. 4 schematically shows stitches held by needles on the FD and the BD. A capital letter outside the columns in FIG. 4 indicates the position of a needle. The capital letters in FIG. 4 correspond to the capital letters in FIG. 3. FIG. 4 omit stitches other than those of the intarsia portion 3. In practice, stitches of the first knitted fabric portion 1 are held by the needles J and K on the FD, and stitches of the second knitted fabric portion 2 are held by needles J, K, L, and M on the BD. A sinker 6 and a loop presser 5 are disposed between every two adjacent needles. The sinker 6 is a component for adjusting the shape of a sinker loop connecting two stitches adjacent in the knitting width direction. The loop presser 5 is a component for pressing stitches and knitting yarns to the lower side of a needle bed gap 7 (e.g. see JP 2013-64205A). The loop presser 5 is not an essential component. Here, in S5 and S6, the sinkers 6 and loop pressers 5 on the FD are not shown.

[0033] In S4 in FIG. 4, a held state of stitches after step S4 in FIG. 3 has ended is shown. As shown in S4, the first knitting yarn 8Y extending from the first stitch 11 to the first yarn feeder 8 is hooked to the cross-over yarn 12 and pulled to the FD side. This makes it unlikely for the first knitting yarn 8Y to be caught by a needle on the BD even if needles on the BD are moved. For example, even when a flat knitting machine equipped with a stitch presser (JP H3-8841A), the stitch presser is unlikely to catch the first knitting yarn 8Y. The stitch presser is a member that presses existing stitches held by the needle beds to the lower side of the needle bed gap 7 when a new stitch is knitted. The needle bed gap 7 is a gap formed between the FD and the BD. The lower side of the needle bed gap 7 corresponds to the distal side in the direction perpendicular to the paper plane. The stitch presser is mounted in the carriage and moves together with the carriage.

[0034] In S5, the first yarn feeder 8 is moved in the first direction D1 to form a tuck stitch 15 as a stitch of the second knitted fabric portion 2 (see FIG. 3) (step A). Specifically, the tuck stitch 15 is formed on a hook 4 of the needle J on the BD. It is favorable that the position at which the tuck stitch 15 is formed is a position within three stitches in the knitting width direction as viewed from the termination stitch 3E. In this example, the position at which the tuck stitch 15 is formed is a position separated by two stitches from the termination stitch 3E in the knitting width direction.

[0035] Further, in S5, the first yarn feeder 8 is placed in the second direction D2 relative to the tuck stitch 15 (step B). In this example, the first yarn feeder 8 is moved in the second direction, D2, and the first yarn feeder 8 is stopped at a position beyond the tuck stitch 15. It is favorable that the position at which the first yarn feeder 8 is stopped is a position within two stitches in the knitting width direction as viewed from the tuck stitch 15. In this example, the position at which the first yarn feeder 8 is stopped is between the needle J and the needle K. This stop position is separated by 0.5 stitches from the tuck stitch 15 in the knitting width direction. As shown in S5, the first yarn feeder 8 is moved in the second direction D2 after the tuck stitch 15 has been formed. As a result, a section of the first knitting yarn 8Y that extends from the first yarn feeder 8 to the tuck stitch 15 and a section extending from the tuck stitch 15 to the first stitch 11 are stretched without slack. Thus, the tuck stitch 15 is hooked to the end of the hook 4. Unlike this example, the first yarn feeder 8 may alternatively be placed in the second direction D2 relative to the tuck stitch 15 by subjecting the BD to racking in the first direction D1.

[0036] After S5 has been implemented, T2 and T3 in FIG. 2 are implemented. At the point of S5, the first knitting yarn 8Y extending from the termination stitch 3E to the first yarn feeder 8 is turned back at the hook 4 and stretched without slack. The first knitting yarn 8Y being stretched without slack allows the tuck stitch 15 to be hooked to the end of the hook 4 of the needle J. Accordingly, as shown in S6, the tuck stitch 15 (S5) is removed from the hook 4 upon the needles J and K on the BD moving to the needle bed gap 7 to form the second knitted fabric portion 2. Here, the stitch of the second knitted

fabric portion 2 (FIG. 2) is placed on the distal side of the hook 4 of the needle J and is pulled to the lower side of the needle bed gap 7 by the existing second knitted fabric portion 2, and is therefore not removed from the needle J.

[0037] In S6, the knitting yarn (part of the first knitting yarn 8Y) extending from the first yarn feeder 8 to the first stitch 11 is placed below the needle K during knitting. This is due to the state in S5 where the section extending from the tuck stitch 15 to the first stitch 11 is stretched without slack. The knitting yarn extending from the first yarn feeder 8 to the first stitch 11 will not be caught by the hook 4 of the needle K, nor caught by the stitch presser. Thus, by performing the knitting shown in S5, the first knitting yarn 8Y will not be knitted into the second knitted fabric portion 2 even if the needles on the BD are moved to knit the second knitted fabric portion 2 (T3 in FIG. 2). Moreover, the second yarn feeder 9 need not be stopped when the second knitted fabric portion 2 is knitted.

[0038] In S6, the loop presser 5 moves toward the needle bed gap 7. In this example, even if the loop presser 5 moves toward the needle bed gap 7, the first knitting yarn 8Y will not be knitted into the second knitted fabric portion 2. This is because, as shown in S5, the first yarn feeder 8 is placed between the needle J and the needle K, and the section extending from the first yarn feeder 8 to the tuck stitch 15 is placed below the operating area of the loop presser 5. In the case of knitting using a flat knitting machine that is not equipped with the loop presser 5, the stop position of the first yarn feeder 8 may alternatively be in the second direction D2 relative to the position in S5.

[0039] Here, in S5, it is favorable that the angle θ between the knitting yarn (part of the first knitting yarn 8Y) extending from the first stitch 11 to the tuck stitch 15 and the lengthwise direction of the needle beds is smaller. In S6, the smaller the angle θ is, the easier it is for the knitting yarn extending from the first yarn feeder 8 to be placed below the needle K. This also makes it more unlikely for the knitting yarn to be caught by the stitch presser (not shown in the figure). In this example, the knitting yarn extending from the first stitch 11 to the tuck stitch 15 is drawn from the side of the needle K in the second direction D2 by performing the knitting in FIG. 3. Therefore, the angle θ in this example is smaller than in the case where the knitting yarn extending from the first stitch 11 to the tuck stitch 15 is drawn from the side of the needle K in the first direction D 1. One possible means for reducing the angle θ is to use a needle located in the first direction D 1 relative to the needle J as a needle for forming the tuck stitch 15.

[0040] As mentioned above, performing the knitting shown in FIGS. 3 and 4 prevents the first knitted fabric portion 1 and the second knitted fabric portion 2 to be stitched together even if the second knitted fabric portion 2 is knitted without kicking back the second yarn feeder 9 at T3 and T5 in FIG. 2. Accordingly, the second yarn feeder 9 need not be stopped when the second knitted fabric portion 2 is knitted. The second knitted fabric portion 2 can be knitted while maintaining a constant tension of the second knitting yarn 9Y extending from the second yarn feeder 9 by knitting the second knitted fabric portion 2 without stopping the second yarn feeder 9. As a result, the size of the plurality of stitches constituting the second knitted fabric portion 2 is unlikely to vary, and a tubular knitted fabric 100 with excellent appearance is knitted.

Others

[0041] The knitting shown in FIG. 3 is not essential. For example, after the intarsia portion 3 has been knitted by means of reciprocating knitting shown at T1 in FIG. 2, the knitting shown in S5 in FIG. 4 may be performed without performing the knitting shown in FIG. 3. In this case, the termination stitch 3E and the tuck stitch 15 are directly connected. In the case of not performing the knitting in FIG. 3, it is favorable that the termination stitch 3E of the intarsia portion 3 is knitted by moving the first yarn feeder 8 in the second direction D2. This makes the termination stitch 3E a twisted stitch. The knitting yarn extending from the termination stitch 3E to the tuck stitch 15 is drawn from the side of the needle L in the second direction D2. This results in a smaller angle between the knitting yarn extending from the termination stitch 3E to the tuck stitch 15 and the lengthwise direction of the needle beds.

[0042] The first knitted fabric portion 1 and the second knitted fabric portion 2 may be knitted in a half-gauge state where an empty needle is placed between every two adjacent stitches. If the first knitted fabric portion 1 and the second knitted fabric portion 2 are knitted in a half-gauge state, the flat knitting machine used for the knitting method of the present invention may alternatively be a two-bed flat knitting machine.

[0043] The front body 50F may have more than one intarsia portion 3. In addition to the front body 50F, the back body 50B may also have at least one intarsia portion 3. Knitting is performed using four or more yarn feeders if the front body 50F and the back body 50B each have the intarsia portion 3. In this case, when the intarsia portion 3 of the front body 50F is knitted, the knitting method of the present invention is implemented while regarding the front body 50F as the first knitted fabric portion 1 and the back body 50B as the second knitted fabric portion 2. When the intarsia portion 3 of the back body 50B is knitted, the knitting method of the present invention is implemented while regarding the back body 50B as the first knitted fabric portion 1 and the front body 50F as the second knitted fabric portion 2.

List of Reference Numerals

[0044]

1: First knitted fabric portion, 1L: Left portion, 1R: Right portion
2: Second knitted fabric portion

3: Intarsia portion, 3E: Termination stitch
4: Hook
5: Loop presser
6: Sinker
7: Needle bed gap
8: First yarn feeder, 8Y: First knitting yarn
9: Second yarn feeder, 9Y: Second knitting yarn
10: Pick up stitch, 11: First stitch, 12: Cross-over yarn, 15: Tuck stitch
50: Body, 50F: Front body, 50B: Back body
60L: Left sleeve, 60R: Right sleeve
100: Tubular knitted fabric
D1: First direction, D2: Second direction

Claims

1. A tubular knitted fabric knitting method in which, in a process of knitting, using a flat knitting machine including a first yarn feeder and a second yarn feeder, a tubular knitted fabric including a first knitted fabric portion held by a first needle bed and a second knitted fabric portion held by a second needle bed opposing the first needle bed, an intarsia portion is knitted within a knitting width of the first knitted fabric portion by moving the first yarn feeder, and thereafter, the second knitted fabric portion is knitted by moving the second yarn feeder so as to cross the first yarn feeder that is in a stopped state, the method **characterized by**:

   a step A of moving the first yarn feeder in a first direction after knitting a termination stitch of the intarsia portion, and forming a tuck stitch on a needle holding a stitch of the second knitted fabric portion; and
   a step B of placing the first yarn feeder in a second direction relative to the tuck stitch after the step A, so that, when knitting the second knitted fabric portion, the tuck stitch is removed as the needle moves toward a needle bed gap,
   wherein the first direction is a direction outward of the intarsia portion, and
   the second direction is a direction inward of the intarsia portion.

2. The tubular knitted fabric knitting method according to claim 1,

   wherein a position at which the tuck stitch is formed in the step A is a position within three stitches in a knitting width direction as viewed from the termination stitch, and
   a position at which the first yarn feeder is placed in the step B is a position within two stitches in the knitting width direction as viewed from the tuck stitch.

3. The tubular knitted fabric knitting method according to claim 1 or 2, further including:

   a step X of moving the first yarn feeder in the first direction, and knitting a first stitch on a needle not holding the first knitted fabric portion or the second knitted fabric portion;
   a step Y of intersecting a knitting yarn extending from the first yarn feeder to the first stitch with a cross-over yarn connecting the termination stitch to the first stitch, by placing the first yarn feeder in the second direction relative to the first stitch; and
   a step Z of moving the first stitch to a needle bed holding the first knitted fabric portion,
   wherein the steps X, Y, and Z are performed after the termination stitch has been knitted and before the step A.

4. The tubular knitted fabric knitting method according to any one of claims 1 to 3, wherein the first knitted fabric portion and the second knitted fabric portion are knitted in a full-gauge state.

FIG. 1

Fig. 1

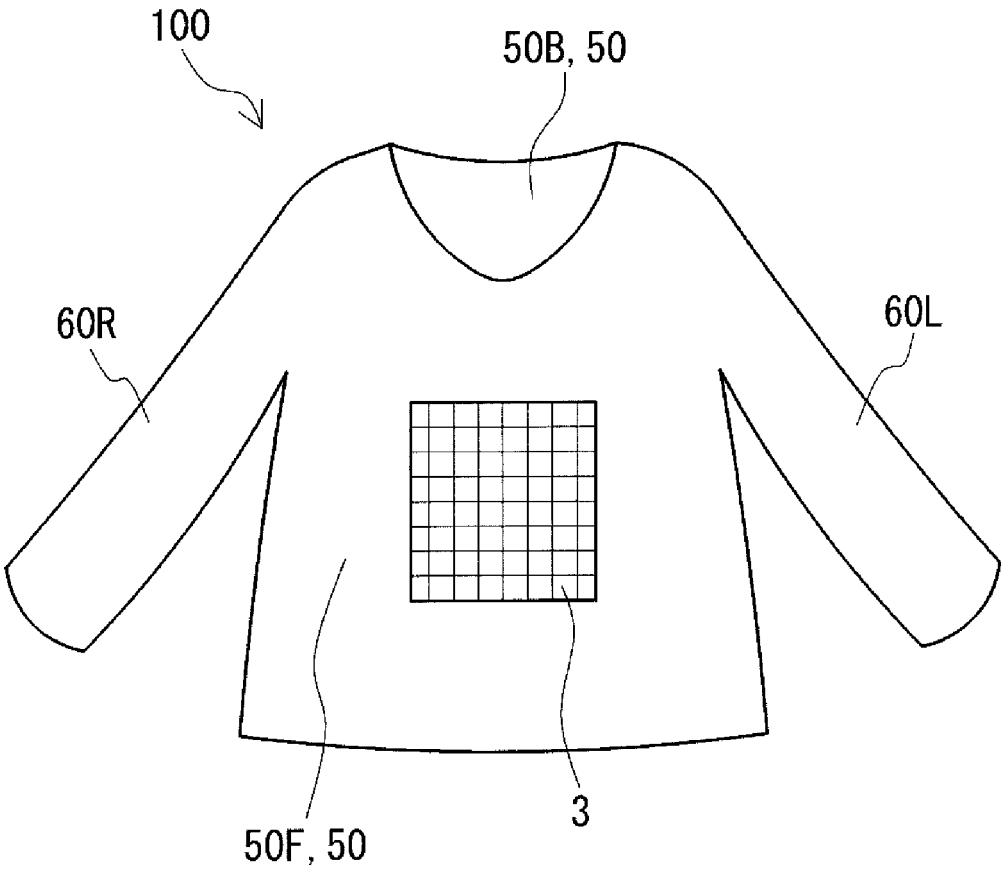


FIG. 2

Fig. 2

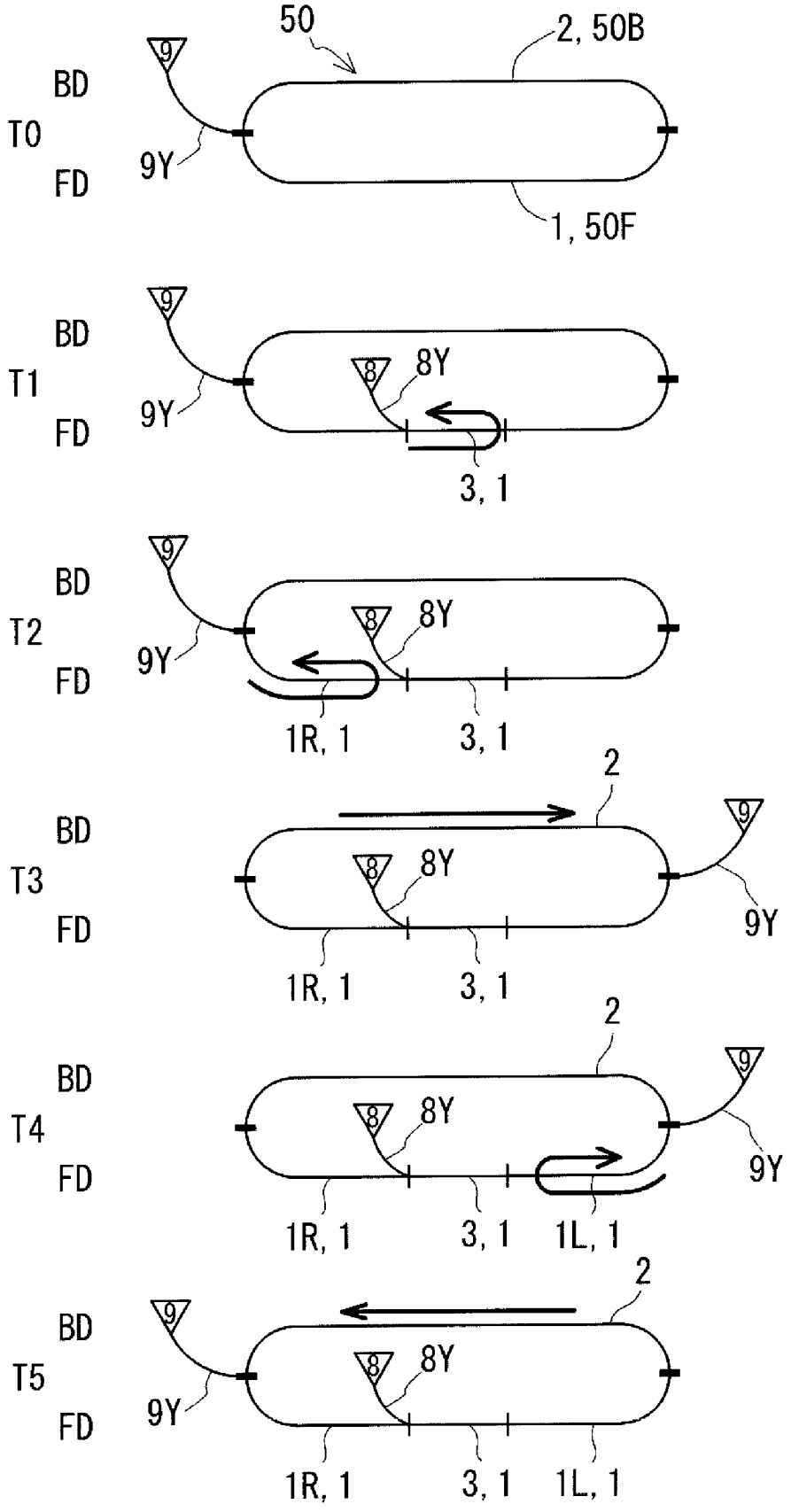


FIG. 3

Fig. 3

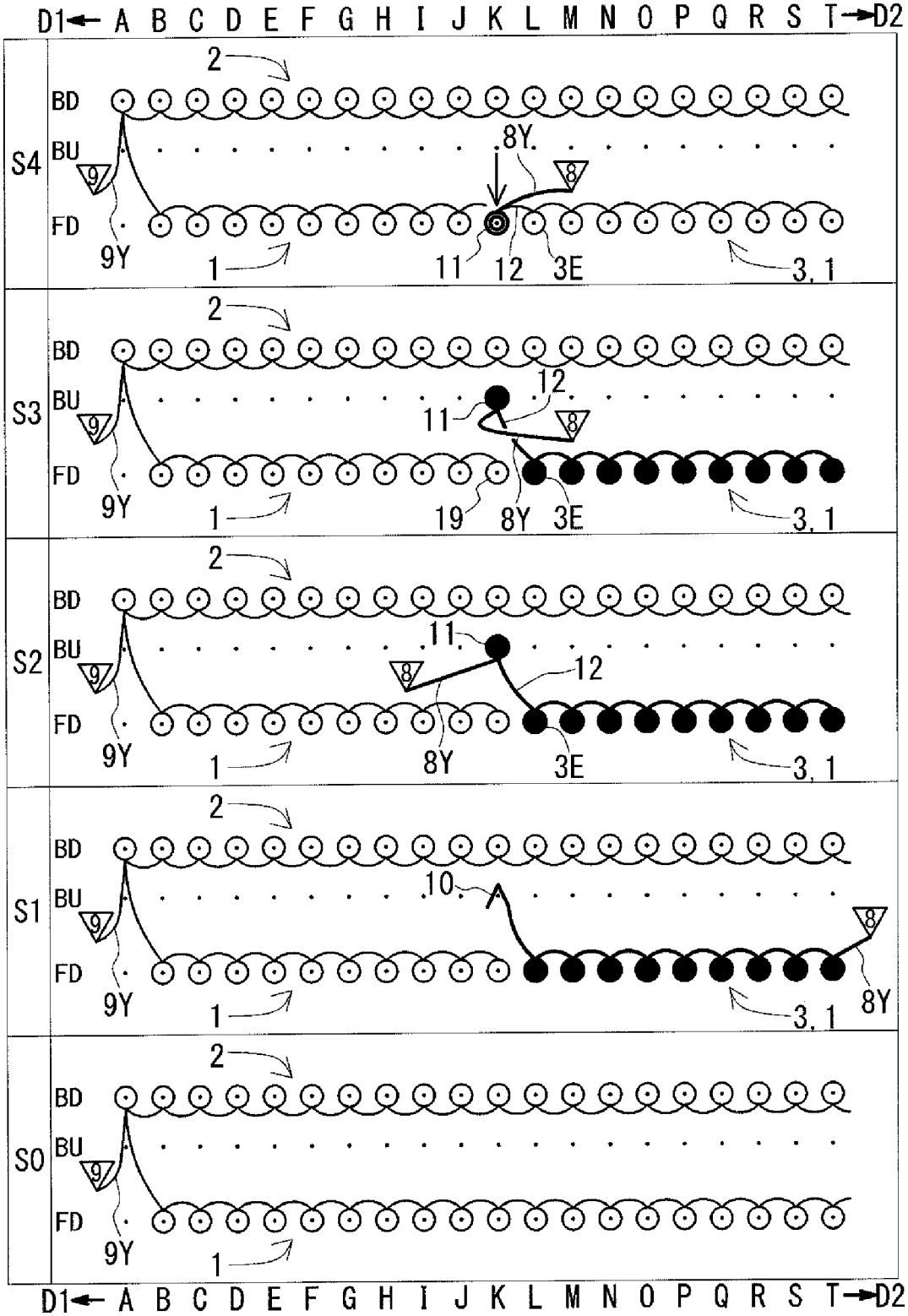
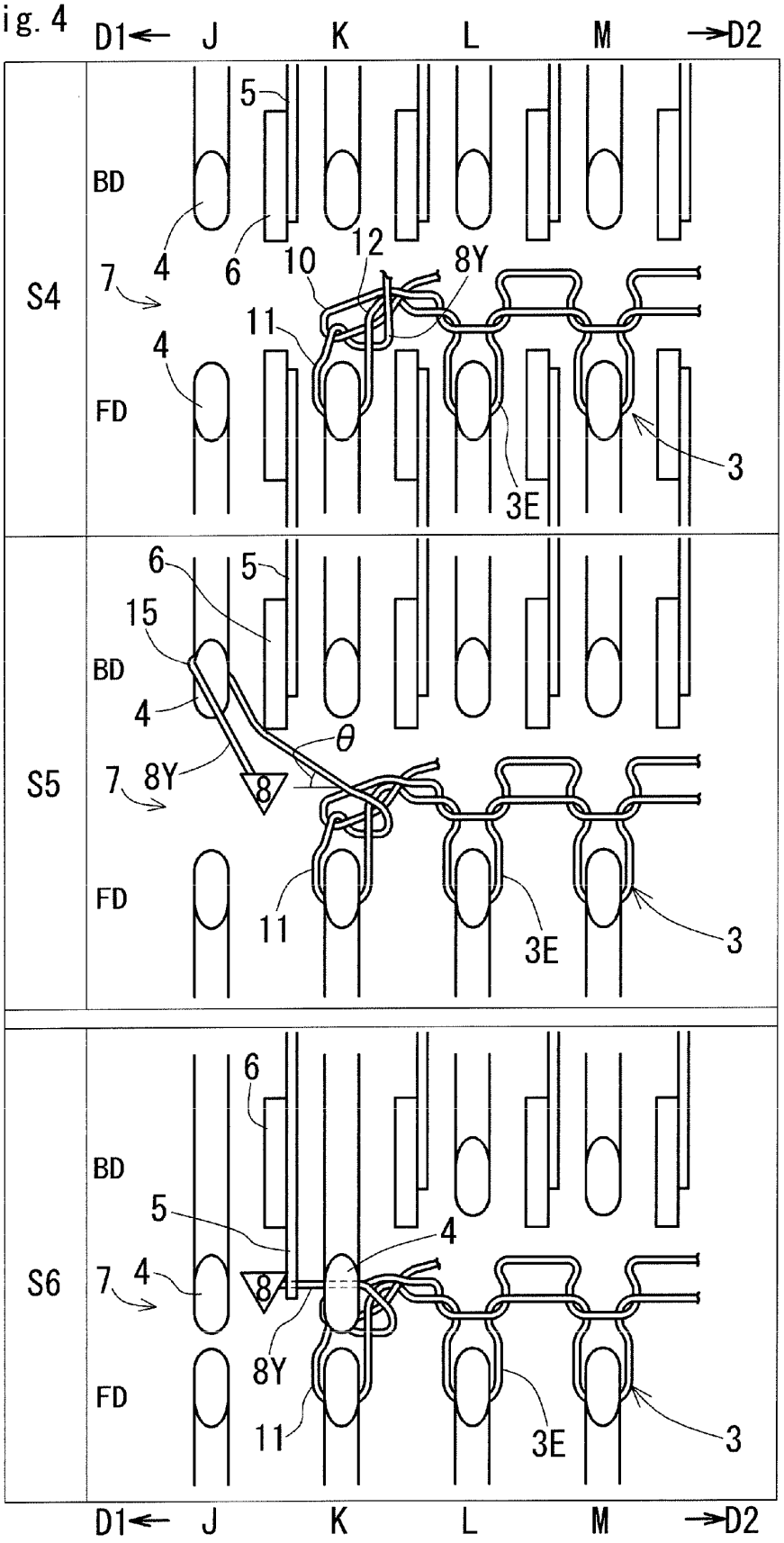

D1 A B C D E F G H I J K L M N O P Q R S T D2
S4
S3
S2
S1
S0
BD
BU
FD
2
1
9
9Y
8
8Y
10
11
12
19
3E
3, 1

FIG. 4

Fig. 4



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2022/009260

A. CLASSIFICATION OF SUBJECT MATTER

D04B 1/10(2006.01)i; ***A41D 1/04***(2006.01)i; ***D04B 1/00***(2006.01)i
FI: D04B1/10; D04B1/00 Z; A41D1/04 S

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A41D1/02-1/04, A41D3/00-3/08, A41D29/00, D04B1/00-39/08

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Published examined utility model applications of Japan 1922-1996
Published unexamined utility model applications of Japan 1971-2022
Registered utility model specifications of Japan 1996-2022
Published registered utility model applications of Japan 1994-2022

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

JSTPlus/JMEDPlus/JST7580 (JDreamIII)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 10-001852 A (SHIMA SEIKI MFG LTD) 06 January 1998 (1998-01-06)	1-4
A	JP 2012-092469 A (SHIMA SEIKI MFG LTD) 17 May 2012 (2012-05-17)	1-4
A	JP 2005-232603 A (SHIMA SEIKI MFG LTD) 02 September 2005 (2005-09-02)	1-4

☐ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
02 June 2022	**21 June 2022**

Name and mailing address of the ISA/JP	Authorized officer
Japan Patent Office (ISA/JP) **3-4-3 Kasumigaseki, Chiyoda-ku, Tokyo 100-8915** **Japan**	Telephone No.

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/JP2022/009260

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
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		CN 102534980 A	
JP 2005-232603 A	02 September 2005	US 2007/0168076 A1	
		EP 1717362 A1	
		CN 1922351 A	
		KR 10-2006-0132662 A	

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REFERENCES CITED IN THE DESCRIPTION

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- JP 2013064205 A **[0032]**
- JP H38841 A **[0033]**