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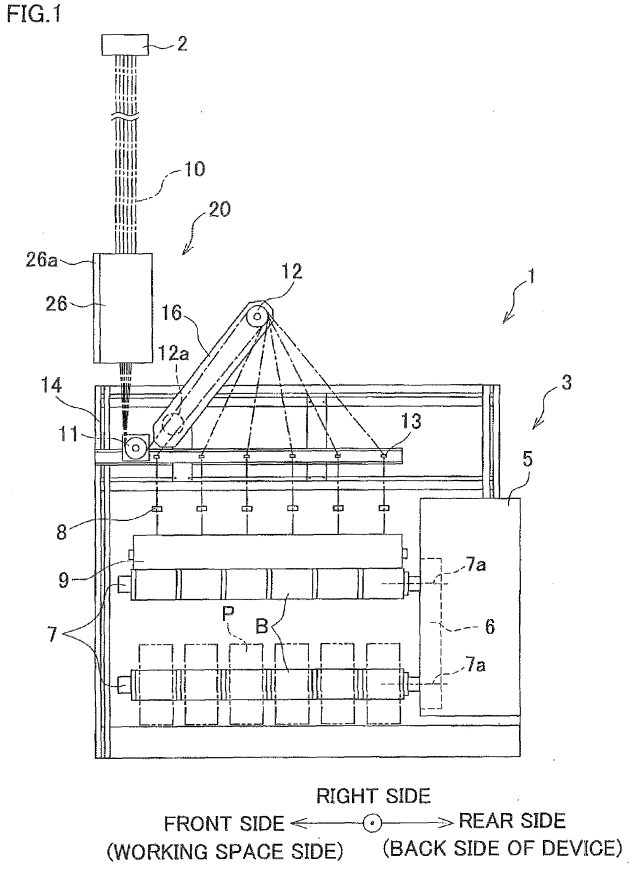
(54) Spinning winder

(57) The efficiency in yarn threading from the leading end side of a winding axis onto a plurality of heating rollers is improved. A spinning winder sends, to a winding unit below via a godet roller group 20 and two guide rollers 11 and 12, a plurality of yarns 10 spun out and serially supplied from a spinning machine above, and the winding unit winds the yarns 10. A godet roller group 20 is provided on the leading end side of a bobbin holder 7, and axes 21a to 24a of godet rollers 21 to 24 belonging to the godet roller group 20 are in parallel to the axis 7a of the bobbin holder 7.

FIG.1



EP 2 505 538 A2

Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a spinning winder which is arranged to wind yarns spun out from a spinning unit onto respective bobbins attached to a bobbin holder.

[0002] For example, a spinning winder recited in Patent Literature 1 (International Publication No. 2011/009498 (Fig. 1)) is arranged such that a plurality of bobbins are attached in series to a bobbin holder along the axial direction and a plurality of heating rollers are provided above the axial center of the bobbin holder to heat and draw the yarns. The axis of each heating roller is orthogonal to the axis of the bobbin holder. Yarns spun out from a spinning unit are serially wound onto the heating rollers below, and then wound onto corresponding bobbins.

[0003] In regard to the above, the number of heating rollers provided is more than one in order to sufficiently heat yarns to a desired temperature. When threading yarns onto these heating rollers, yarns are sucked through a suction port of a sucking unit (air sucker), the suction port of the hose of the sucking unit is inserted from the end face side into a gap between neighboring heating rollers, and the suction port is moved in gaps among the heating rollers. As a result, the yarns are threaded onto the heating rollers. In this arrangement, the sucking unit is large and heavy. Furthermore, the hose of the sucking unit is large in diameter in order to suck yarns without clogging, and is inflexible.

[0004] According to Patent Literature 1 above, the spinning winders are aligned in directions orthogonal to the axis of the bobbin holder, i.e., in directions in parallel to the axes of the heating rollers. For example, an operation to remove a package formed by winding a yarn onto a bobbin from the bobbin holder is performed such that an operator on the outside of the leading end of the bobbin holder performs the operation from the leading end side of the bobbin holder.

[0005] As described above, when the spinning winders are aligned in directions in parallel to the axes of the heating rollers, yarn threading onto the heating rollers is carried out such that a sucking unit having sucked yarns is taken to a narrow space between neighboring spinning winders, the suction port of the sucking unit having sucked the yarns is turned 90 degrees to face the end faces of the heating rollers and inserted into a space between heating rollers, and then the hose of the sucking unit is moved up and down and back and forth when viewed from the operator, along the circumferences of the heating rollers. As such, yarn threading is difficult in the arrangement above.

[0006] In particular, yarn threading onto a plurality of heating rollers is very difficult when there are a large number of heating rollers or heating rollers are provided at the back.

SUMMARY OF THE INVENTION

[0007] An object of the present invention is therefore to provide a spinning winder with improved operating efficiency in yarn threading onto a plurality of heating rollers from the leading end side of the winding axis.

[0008] A spinning winder of the present invention includes: a plurality of heating rollers which are aligned in directions along a yarn path of a plurality of yarns sent out from a spinning unit and on which the yarn are wound; and a winding axis to which a plurality of bobbins are attached in series along the winding axis and which winds the yarns supplied from the last one of the heating rollers onto the bobbins, respectively, the winding axis being rotatably supported by a winder main body, the heating rollers being provided on the leading end side of the winding axis, and the axis of each of the heating rollers being substantially in parallel to the winding axis.

[0009] In the spinning winder of the present invention, the bobbins attached to the winding axis are removed from the leading end side of the winding axis, and hence the working space for operations is provided in front of the winding axis. Furthermore, the heating rollers are provided on the leading end side of the winding axis and the end faces of the heating rollers face the working space. With this arrangement, when yarn threading onto the heating rollers is carried out from the working space, the yarns are sucked by, for example, a suction port of a sucking unit, the suction port of the sucking unit is inserted into gaps among the heating rollers from the front when viewed from the operator, and the suction port is moved up and down and left and right along the circumferences of the heating rollers. Because only these operations are required, it is possible to improve the efficiency in the yarn threading onto the heating rollers from the leading end side of the winding axis.

[0010] In addition to the above, preferably, the spinning winder and another spinning winder are aligned in directions orthogonal to the winding axis.

[0011] According to this arrangement, since it is difficult for an operator to enter a narrow space between neighboring spinning winders and to perform operations therein, it is advantageous for the operator to perform operations from the leading end side of the winding axis.

[0012] In addition to the above, preferably, the heating rollers are provided above the leading end of the winding axis.

[0013] According to this arrangement, the winding axis does not obstruct the yarn threading onto the heating rollers from the leading end side of the winding axis, and therefore the efficiency in the yarn threading is further improved.

[0014] In addition to the above, the heating rollers may be provided between the winder main body and an adjacent winder main body.

[0015] Also in this arrangement, the winding axis does not obstruct the yarn threading onto the heating rollers from the leading end side of the winding axis, and there-

fore the efficiency in the yarn threading is further improved.

[0016] In addition to the above, preferably, on a yarn path between the last one of the heating rollers and the winding axis are provided: a guide roller on which the yarns supplied from the last one of the heating rollers are wound; and a plurality of distribution guides which are aligned in directions along the winding axis to correspond to the respective bobbins and distribute the yarns supplied from the guide roller to the respective bobbins attached to the winding axis, and the axis of the guide roller is orthogonal to the winding axis.

[0017] The axial direction of the heating rollers is in parallel to the axial direction of the winding axis. Assuming that no guide roller is provided, the length of the winding axis increases as the number of bobbins increases, yarns remote from the heating rollers are distributed in a spread manner, and hence the bending angles of yarns wound onto the bobbins increase toward the edges of the winding axis. According to the arrangement above, the yarns wound onto the heating rollers are supplied to the guide roller arranged to be orthogonal to the winding axis, and therefore the yarns are aligned in the directions orthogonal to the alignment directions of the bobbins. Since the yarns leaving the guide roller are distributed in the tangential directions of the roller, the yarns immediately after leaving the guide roller runs toward the traversing fulcrum guides without being bended.

[0018] In addition to the above, preferably, the yarns are wound onto each of the heating rollers with a winding angle of less than 360 degrees, and the heating rollers are provided on a single vertical surface.

[0019] Provided that a yarn is heated while being wound onto a single godet roller many times in order to increase the effect of heating, it is necessary to deviate the heating rollers from one another in the axial directions to deviate the wound positions of the yarns from one another among the heating rollers in the axial directions of the winding axis. The yarn threading is difficult in this case. In this regard, when a single yarn is wound only once onto a single heating roller, the number of required heating rollers is increased. However, as in the present invention, the efficiency in the yarn threading is not significantly deteriorated even if the number of heating rollers is increased, when the heating rollers are provided on a single vertical surface on the leading end side of the winding axis and the end faces of the rollers face the same direction as the leading end of the bobbin holder.

[0020] A plurality of heating rollers are provided on the leading end side of a winding axis, and the end faces of the heating rollers face a working space. With this arrangement, when yarn threading onto the heating rollers is carried out from the working space, the yarns are sucked by, for example, a suction port of a sucking unit, the suction port of the sucking unit is inserted into gaps among the heating rollers from the front when viewed from the operator, and the suction port is moved up and down and left and right along the circumferences of the heating rollers. Because only these operations are required, it is possible to improve the efficiency in the yarn threading onto the heating rollers from the leading end side of the winding axis.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021]

Fig. 1 is a profile of a spinning winder according to an embodiment of the present invention.

Fig. 2 is a plan view for illustrating the arrangement of a plurality of spinning winders.

Fig. 3 is a perspective view of a godet roller group and guide rollers.

Fig. 4 is a front elevation of the godet roller group and the guide rollers.

Fig. 5 illustrates a process of yarn threading onto the godet roller group.

Fig. 6 is a front elevation of a spinning winder according to a modification.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0022] Now, an embodiment of the present invention will be described. Fig. 1 is a profile of a spinning winder according to the present embodiment. As shown in Fig. 1, the spinning winder 1 is arranged so that yarns 10 which are serially spun out from a spinning machine 2 at an upper part are fed to a winding unit 3 at a lower part via a godet roller group 20 and two guide rollers 11 and 12, and the yarns 10 are wound by the winding unit 3.

[0023] Fig. 2 is a plan view illustrating the arrangement of the spinning winders. As shown in Fig. 2, taking into account of, for example, the arrangement of spinnerets spinning out the yarns 10 of the spinning machine 2 upstream of (i.e., above) the spinning winder 1 in the yarn running direction and the removal of bobbins B from a cantilevered bobbin holder 7 (described later) from its leading end side, the spinning winders 1 are aligned in directions orthogonal to axes 7a of later-described bobbin holders 7 so that the spinning winders 1 are efficiently arranged within a limited space, and a working space 30 where an operator performs operations is provided on the leading end side or in front of the bobbin holders. In other words, when opposing face to face with the spinning winders 1, an operator performs an operation while watching the spinning winders 1 from the leading end side of the bobbin holders 7 along the axes 7a.

[0024] First, the winding unit 3 will be described. As shown in Fig. 1, the winding unit 3 is provided below the spinning machine 2. The winding unit 3 forms packages P by winding, onto bobbins B, yarns 10 supplied from the spinning machine 2 via the godet roller group 20 and the two guide rollers 11 and 12.

[0025] This winding unit 3 includes components such as a main body frame 5, a disc-shaped turret 6 rotatable with respect to the main body frame 5, two bobbin holders

7 (winding axes) each cantilevered at its rear end by the turret 6 and to each of which a plurality of bobbins B are attached in series to the axis 7a, and a contact roller 9 which is vertically movable with respect to the main body frame 5 and approaches and moves away from the bobbins B attached to the bobbin holder 7.

[0026] The winding unit 3 winds the yarns 10 onto the rotating bobbins B, as the bobbin holder 7 is rotated by an unillustrated motor and therefore the bobbins B attached to this bobbin holder 7 are rotated. At the same time, the yarns 10 wound onto the bobbins B are traversed in the axial directions of the bobbins B about later-described fulcrum guides 13, by a traverse guide 8 provided above each bobbin B.

[0027] The yarns 10 traversed about the fulcrum guides 13 by the traverse guide 8 are wound onto the bobbins B, with the result that packages P are formed. In so doing, the contact roller 9 contacts the outer circumference of a package P when a yarn is wound onto a bobbin B and rotates while applying a predetermined contact pressure to the package P, so as to shape the package P. When completely formed, the packages P attached to the bobbin holder 7 are pushed from the base end side to the leading end side of the bobbin holder 7 by an unillustrated pusher, and eventually removed from the bobbin holder 7 from the leading end side.

[0028] Fig. 3 is a perspective view of the godet roller group and the guide rollers. Fig. 4 is a front elevation of the godet roller group and the guide rollers. In Fig. 3 and Fig. 4, a thermal insulation box 26 is depicted by two-dot chain lines in order to clearly show the inside of the thermal insulation box 26.

[0029] As shown in Fig. 1, in addition to the winding unit 3, the spinning winder 1 includes components such as a frame 14 provided to be further from the viewer of Fig. 1 than the winding unit 3, a godet roller group 20 which receives the yarns 10 spun out from the spinning machine 2, two guide rollers 11 and 12 which receive the yarns 10 from the godet roller group 20, and fulcrum guides 13 (distribution guides) that distribute the yarns 10 wound on the downstream-side guide roller 12 to the bobbins B attached to the bobbin holder 7 of the winding unit 3 and each functions as a fulcrum of traversal by the traverse guide 8.

[0030] First, the godet roller group 20 will be described. As shown in Fig. 1 to Fig. 4, the godet roller group 20 is constituted by, for example, four godet rollers 21 to 24 which are provided below the spinning machine 2 and on the working space 30 side (leading end side) of the bobbin holder 7. The godet rollers 21 to 24 are arranged from the upstream to the downstream of the yarn running direction in this order. These godet rollers 21 to 24 are housed in the thermal insulation box 26 which is made of a heat insulating material and is substantially rectangular parallelepiped. The godet rollers 21 to 24 are staggered and the axes 21a to 24a thereof are arranged to be in parallel to the axis 7a of the bobbin holder 7.

[0031] The thermal insulation box 26 has an openable door 26a opposing the end faces 21b to 24b of the godet rollers 21 to 24. When this door 26a is open, the end faces 21b to 24b of the godet rollers 21 to 24 are exposed to the working space 30 from the thermal insulation box 26. This allows an operator in the working space 30 to easily perform operations inside the thermal insulation box 26, such as yarn threading on the godet rollers 21 to 24.

[0032] In addition to the above, the thermal insulation box 26 has two slits 28 and 29. Through the slit 28, the yarns 10 supplied to the most upstream godet roller 21 from the spinning machine 2 pass. Through the slit 29, the yarns 10 supplied from the most downstream godet roller 24 to the winding unit 3 pass.

[0033] In addition to the above, the godet rollers 21 to 24 are provided on the side opposite to the door 26a of the thermal insulation box 26 and are drive rollers cantilevered by an unillustrated frame. First, the yarns 10 supplied from the spinning machine 2 pass through the slit 28 of the thermal insulation box 26, enter the thermal insulation box 26, and are fed to the most upstream godet roller 21.

[0034] Thereafter, the yarns 10 fed to the godet roller 21 are wound onto the godet rollers 21 to 24 from the upstream, with winding angles of less than 360 degrees. As the godet rollers 21 to 24 are rotated by an unillustrated motor, the yarns are fed downstream, pass through the slit 29 of the thermal insulation box 26, and go out from the thermal insulation box 26. At this stage, the godet rollers 21 to 24 are rotated such that a roller on the downstream rotates at a higher speed, and therefore the yarns 10 are drawn by differences in the rotation speeds of the rollers.

[0035] In addition to the above, each of the godet rollers 21 to 24 is a heating roller provided with a heater 27 therein, and hence the yarns 10 wound on the godet rollers 21 to 24 are heated. Since the godet rollers 21 to 24 are provided in the thermal insulation box 26 and the door 26a is closed, the heat generated by the heaters 27 does not leak out from the thermal insulation box 26.

[0036] Now, the two guide rollers 11 and 12 will be described. As shown in Fig. 1, Fig. 3, and Fig. 4, the two guide rollers 11 and 12 are provided above the main body frame 5 of the winding unit 3 and have axes 11a and 12a extending in directions orthogonal to the axis 7a of the bobbin holder 7 (i.e., orthogonal to the axes 21a to 24a of the godet rollers 21 to 24). Furthermore, the guide rollers 11 and 12 are rotatably supported by the frame 14 and are drive rollers driven by an unillustrated motor. The guide roller 11 is provided immediately below the godet roller group 20 whereas the guide roller 12 is provided above the substantial center of the fulcrum guides 13 in the alignment directions. Since the guide roller 12 is moved to the yarn threading position 12a (indicated by a dotted line in Fig. 1) near the guide roller 11 at the time of yarn threading, the yarn threading can be easily done.

[0037] The fulcrum guides 13 are provided below the guide roller 12, above the traverse guides 8, and imme-

diately above the traverse guides 8 and the bobbins B attached to the bobbin holder 7. The fulcrum guides 13 are aligned along the axis 7a of the bobbin holder 7 with the same intervals as those of the bobbins B.

[0038] The yarns 10 supplied from the spinning machine 2 are sent out downward, and first of all wound on the most upstream godet roller 21 and then on the subsequent godet rollers, while being aligned in directions along the axes 21a to 24a.

[0039] The yarns 10 fed downstream in the yarn running direction from the most downstream godet roller 24 change the direction for 90 degrees and are then wound onto the guide roller 11 while being aligned in directions along the axis 11a of the guide roller 11. Thereafter, the yarns 10 wound onto the guide roller 11 are passed to the guide roller 12, and then threaded onto the respective fulcrum guides 13 and are fed to the winding unit 3 below.

[0040] Now, the yarn threading onto the godet rollers 21 to 24 of the godet roller group 20 will be described. Fig. 5 illustrates the yarn threading onto the godet roller group and is a perspective view of the godet roller group.

[0041] To conduct yarn threading onto the godet rollers 21 to 24, first, as shown in Fig. 5(a), the yarns 10 sent out from the spinning machine 2 are sucked and captured by an operator by using the suction port 40a of the air sucker 40 taken from the working space 30. The suction port 40a of the air sucker 40 sucking and capturing the yarns 10 is then inserted into the thermal insulation box 26 from the front side.

[0042] Thereafter, as shown in Fig. 5(b), the air sucker 40 is moved anticlockwise along the circumference from the left of the most upstream godet roller 21. The air sucker 40 passes through the gap between the godet rollers 21 and 23, then passes through the gap between the godet rollers 21 and 22, and eventually reach a position to the left of the godet roller 22. As a result, the yarns 10 are wound onto the most upstream godet roller 21.

[0043] Subsequently, as the air sucker 40 is moved in the same manner for the godet rollers 22 to 24, the yarns 10 are wound onto the godet rollers 21 to 24 as shown in Fig. 5(c).

[0044] In the spinning winder 1 of the present embodiment, the godet rollers 21 to 24 are provided in the vicinity of the working space 30 and above the leading ends of the bobbin holders 7, to be overlapped with one another in the vertical directions. The end faces 21b to 24b of the godet rollers 21 to 24 face the same direction as the leading ends of the bobbin holders 7. With this arrangement, when the yarns are threaded onto the godet rollers 21 to 24 from the working space 30 (i.e., from the leading end side of the bobbin holder 7), the yarns 10 are sucked by the suction port 40a of the air sucker 40 and the suction port 40a of the air sucker 40 is inserted into the gaps among the godet rollers 21 to 24 from the front side when viewed from the working space 30, and the air sucker 40 is moved up and down and left and right along the circumferences of the godet rollers 21 to 24 without being bended. The yarn threading is achieved only by these operations.

[0045] With the arrangement above, the bobbin holders 7 do not obstruct the operation, and hence the efficiency in the yarn threading from the working space 30 (i.e., from the leading end side of the bobbin holder 7) onto the godet rollers 21 to 24 is improved. Furthermore, trouble shooting such as removal of a yarn 10 wound onto the godet rollers 21 to 24 can be easily done.

[0046] In addition to the above, the yarns 10 wound onto the godet rollers 21 to 24 are supplied to the guide rollers 11 and 12 having the axes 11a and 12a orthogonal to the axis 7a of the bobbin holder 7, to be aligned in directions orthogonal to the alignment directions of the bobbins B. Since the yarns 10 leaving the guide roller 12 are distributed in the tangential directions of the roller 12, the yarns 10 immediately after leaving the guide roller 12 runs toward the traversing fulcrum guides 13 without being bended.

[0047] Provided that there are only few godet rollers, a yarn 10 is heated while being wound onto a single godet roller many times. For this reason, it is necessary to deviate the godet rollers from one another in the axial directions to deviate the wound positions of the yarns 10 from one another among the godet rollers in the axial directions of the bobbin holder 7. In the meanwhile, when the number of godet rollers is increased, it is possible to sufficiently heat a yarn 10 while winding the yarn 10 onto a single godet roller only once, i.e., without winding the yarn 10 onto a single godet roller many times. It is therefore possible to provide a plurality of godet rollers on the same vertical plane as described above. Although the number of godet rollers is increased in this case, when as in the present embodiment the godet rollers 21 to 24 are provided on the leading end side of the bobbin holder 7 and the end faces 21b to 24b face the same direction as the leading ends of the bobbin holders 7, the efficiency in the yarn threading is not significantly deteriorated even if the number of godet rollers is increased.

[0048] For example, in facilities for producing industrial yarns such as thick and high-strength yarns for tents and tire cords, the number of godet rollers (heating rollers) is large in order to obtain required properties of yarns. Also in such a case, as shown in Fig. 6, the efficiency in yarn threading is not significantly deteriorated even if the number of godet rollers 50 is large, when the godet rollers 50 are provided in the vicinity of the working space (on the leading end side of the bobbin holder 7) and between the winding units 3 (more specifically, between the main body frames 5) and furthermore the end faces of the rollers 50 face the same direction as the leading ends of the bobbin holders 7. As such, the arrangement above is very effective in this case, too. It is noted that a winder main body by which a winding axis is cantilevered in the present embodiment is equivalent to the main body frame 5 provided with the turret 6 by which the bobbin holders 7 are cantilevered in the present embodiment.

[0049] Now, various modifications of the present embodiment will now be described. It is noted that the same

components as in the embodiment are denoted by the same reference numerals as in the embodiment, respectively, and the description thereof will be omitted.

[0050] While in the present embodiment a single yarn 10 is wound once onto each godet roller with a winding angle of less than 360 degrees, a single yarn 10 may be wound onto a single godet roller more than once with a predetermined pitch. In this case, however, the godet rollers must be arranged to deviate from one another in the axial directions.

[0051] In addition to the above, while in the present embodiment two guide rollers are provided to be orthogonal to the axis 7a of the bobbin holder 7, the number and orientation of the guide rollers may be suitably changed on condition that the yarns 10 supplied from the godet roller group 20 are sent to the fulcrum guides 13 with small bending angles. For example, the most downstream guide roller may be provided to be in parallel to the axis 7a of the bobbin holder 7, on condition that this roller is disposed at a position much higher than the positions of the fulcrum guides 13.

[0052] In addition to the above, while in the present embodiment the two guide rollers 11 and 12 are provided between the godet roller group 20 and the fulcrum guides 13, the yarns 10 may be directly supplied from the godet roller group 20 to the fulcrum guides 13 without the intervention of the guide rollers 11 and 12.

[0053] In addition to the above, while in the present embodiment the fulcrum guides 13 function not only as guides about which the yarns are traversed but also as distribution guides for distributing the yarns 10 to the bobbins B, fulcrum guides for traversal and distribution guides may be independently provided.

[0054] In addition to the above, while in the present embodiment the axes 21a to 24a of the godet rollers 21 to 24 are arranged to be in parallel to the axis 7a of the bobbin holder 7, the axes 21a to 24a and the axis 7a may be slightly non-parallel on condition that an operator in the working space 30 is able to face the end faces 21b to 24b of the godet rollers 21 to 24.

[0055] In addition to the above, while in the present embodiment the bobbin holders 7 are cantilevered by the turret 6 of the winding unit 3, the spinning winder may be arranged so that the bobbin holders 7 are supported not only on the base end side but also on the leading end side by a supporting member, as recited in literatures such as Japanese Examined Patent Publication No. 5224/1995 (Tokukouhei 7-5224) and Japanese Patent No. 3440839.

Claims

1. A spinning winder comprising:

a plurality of heating rollers which are aligned in directions along a yarn path of a plurality of yarns spun out from a spinning unit and on which the yarn are wound; and

a winding axis to which a plurality of bobbins are attached in series along the winding axis and which winds the yarns supplied from the last one of the heating rollers onto the bobbins, respectively,

the winding axis being rotatably supported by a winder main body,

the heating rollers being provided on the leading end side of the winding axis, and

the axis of each of the heating rollers being substantially in parallel to the winding axis.

2. The spinning winder according to claim 1, wherein, the spinning winder and another spinning winder are aligned in directions orthogonal to the winding axis.

3. The spinning winder according to claim 1 or 2, wherein,

the heating rollers are provided above the leading end of the winding axis.

4. The spinning winder according to claim 2, wherein, the heating rollers are provided between the winder main body and an adjacent winder main body.

5. The spinning winder according to any one of claims 1 to 4, wherein,

on a yarn path between the last one of the heating rollers and the winding axis are provided:

a guide roller on which the yarns supplied from the last one of the heating rollers are wound; and

a plurality of distribution guides which are aligned in directions along the winding axis to correspond to the respective bobbins and distribute the yarns supplied from the guide roller to the respective bobbins attached to the winding axis, and

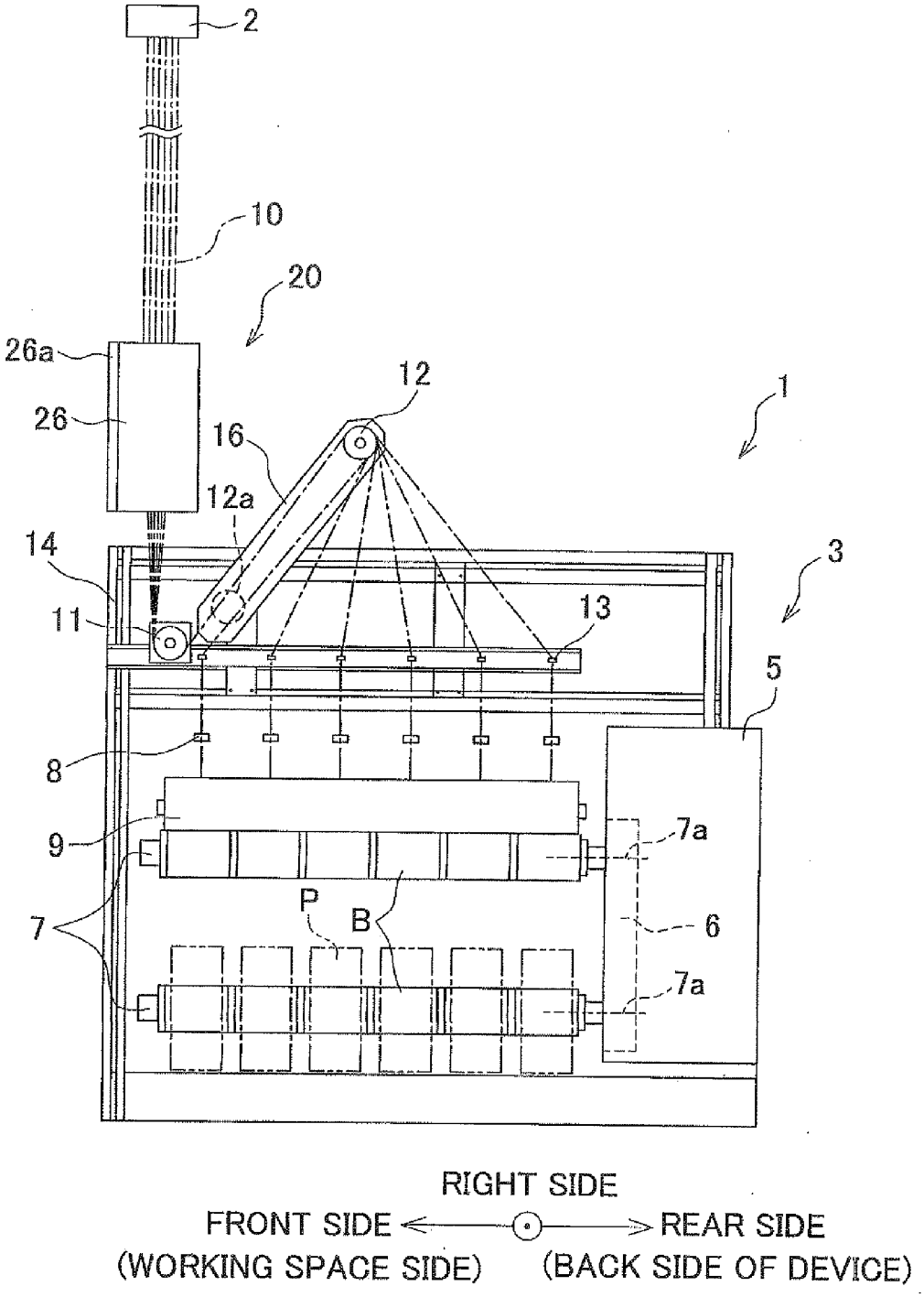
the axis of the guide roller is orthogonal to the winding axis.

6. The spinning winder according to any one of claims 1 to 5, wherein,

the yarns are wound onto each of the heating rollers with a winding angle of less than 360 degrees, and

the heating rollers are provided on a single vertical surface.

FIG.1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10
20
26a
26
12
16
12a
1
14
11
13
3
5
8
9
7
P
B
7a
6
7a
RIGHT SIDE
FRONT SIDE
REAR SIDE
(WORKING SPACE SIDE)
(BACK SIDE OF DEVICE)

FIG.2

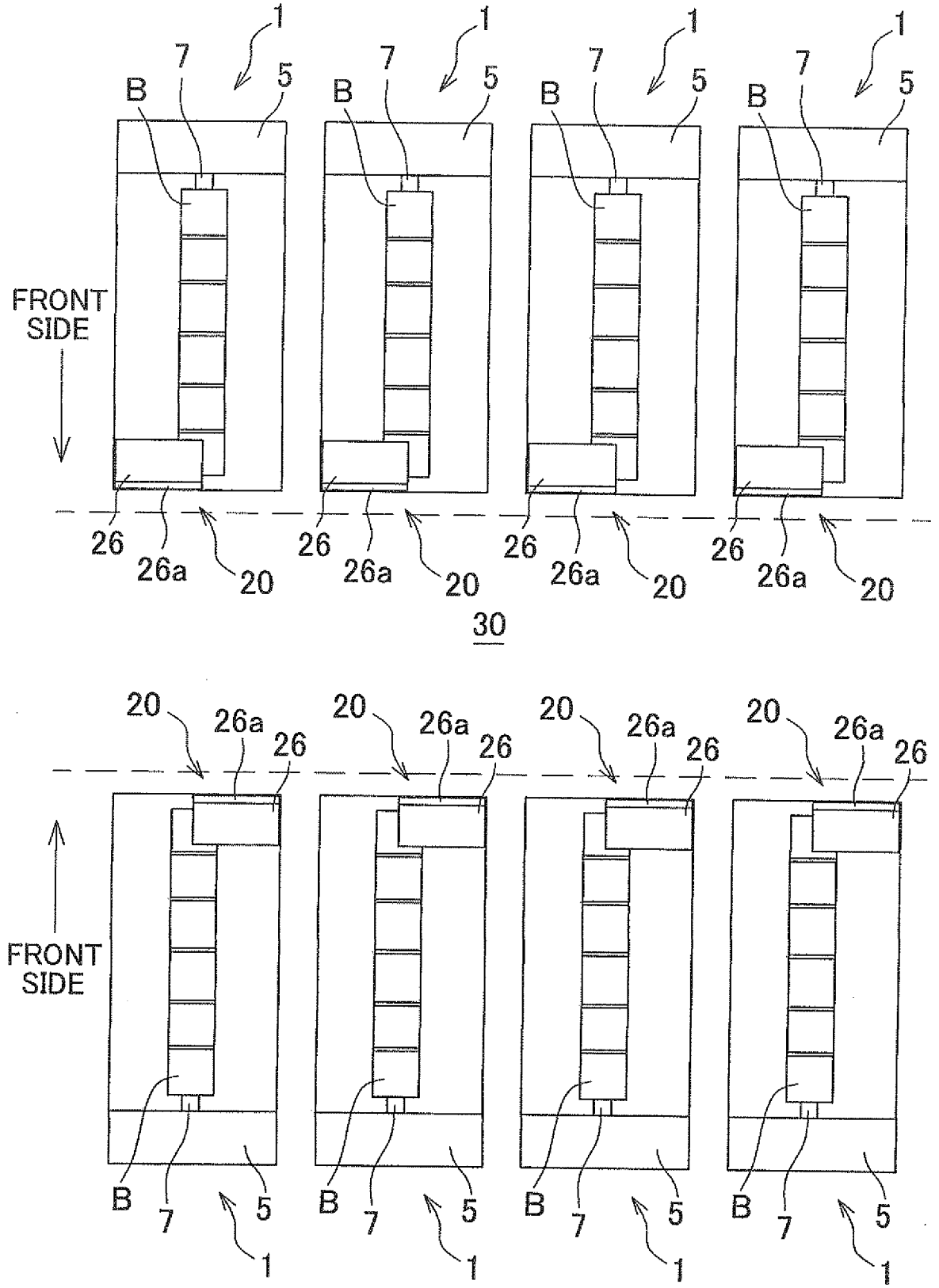
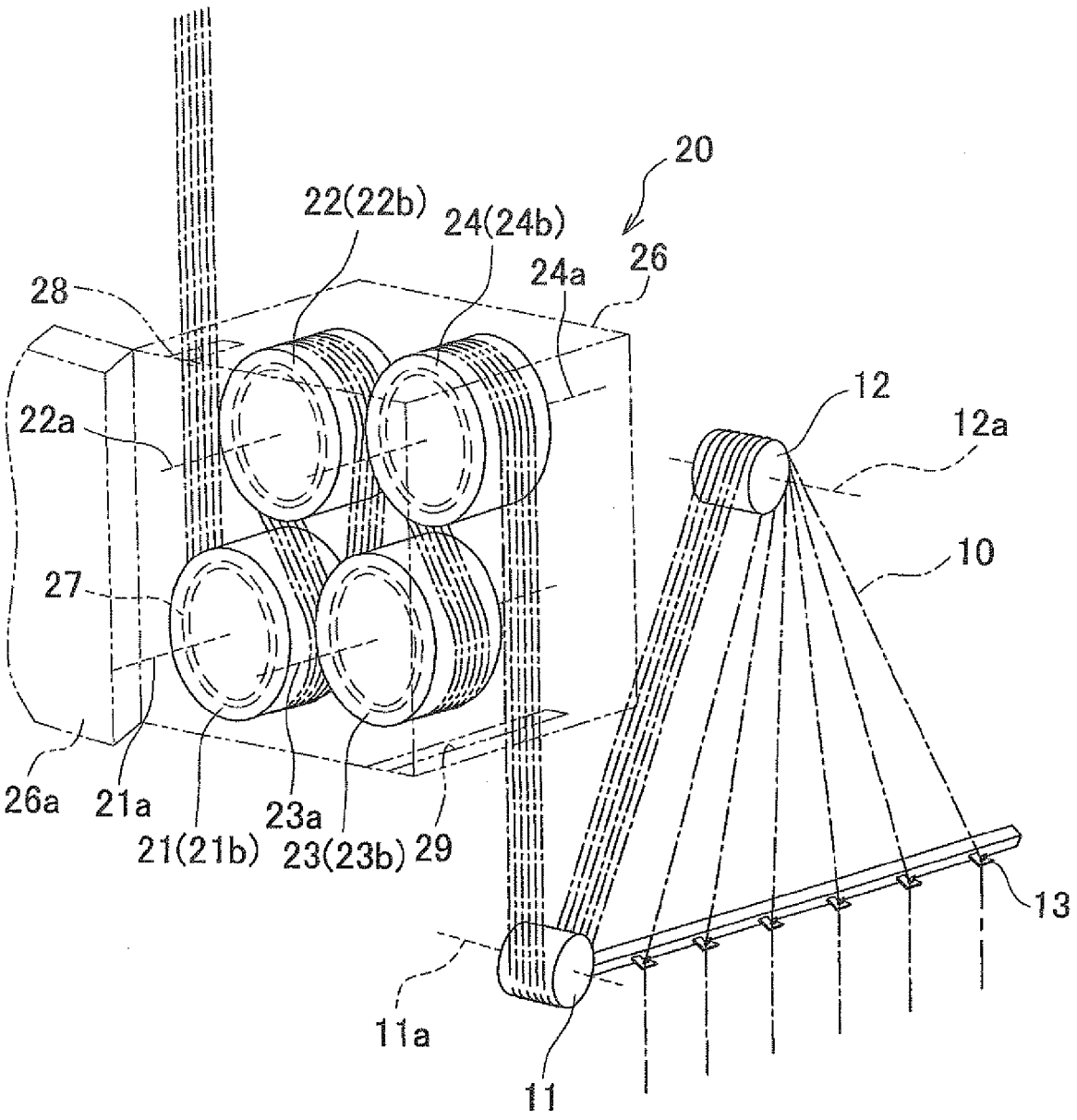


FIG.3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27
26a
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11a
11
LEFT SIDE
REAR SIDE
RIGHT SIDE
FRONT SIDE

FIG.4

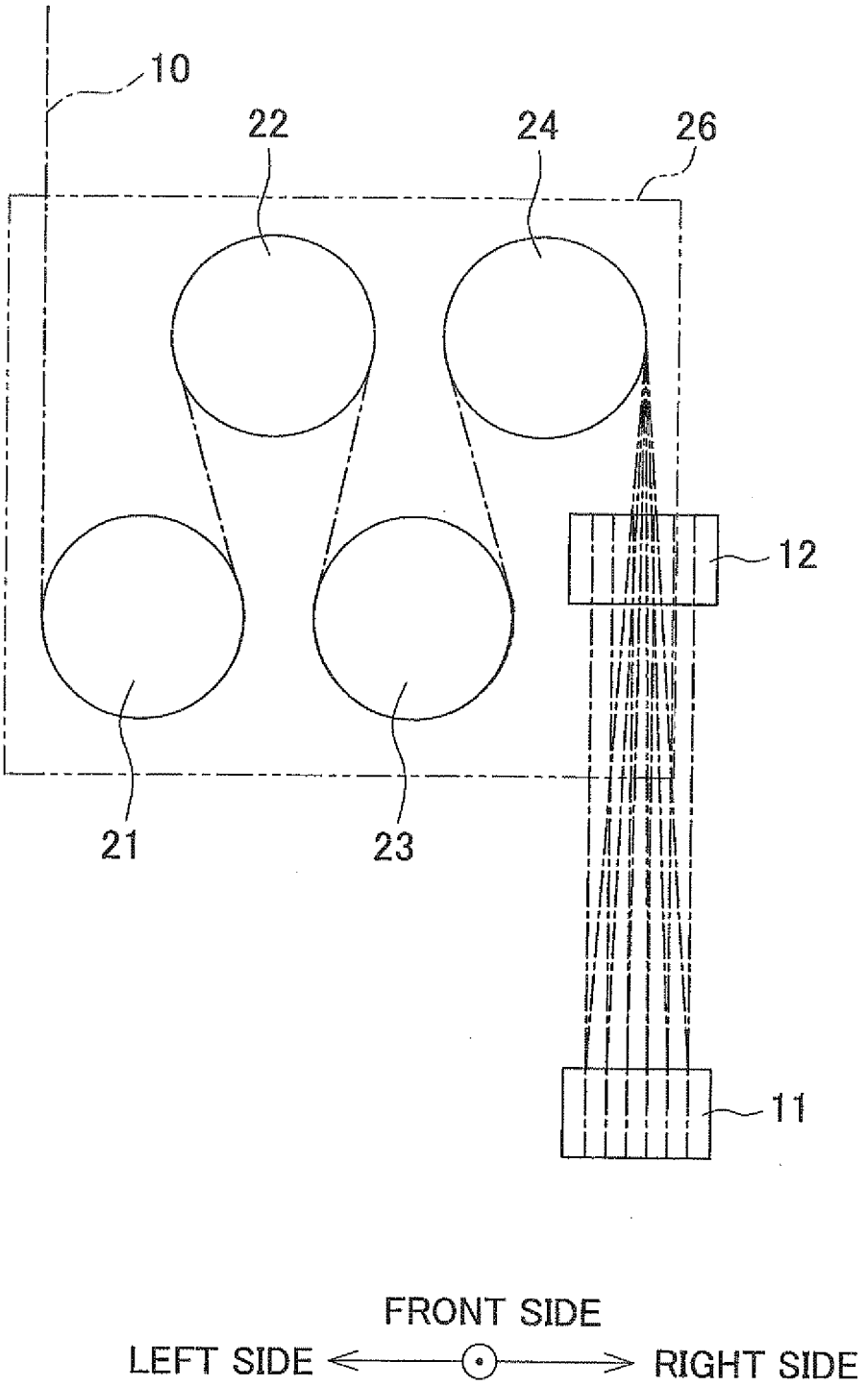


FIG.5

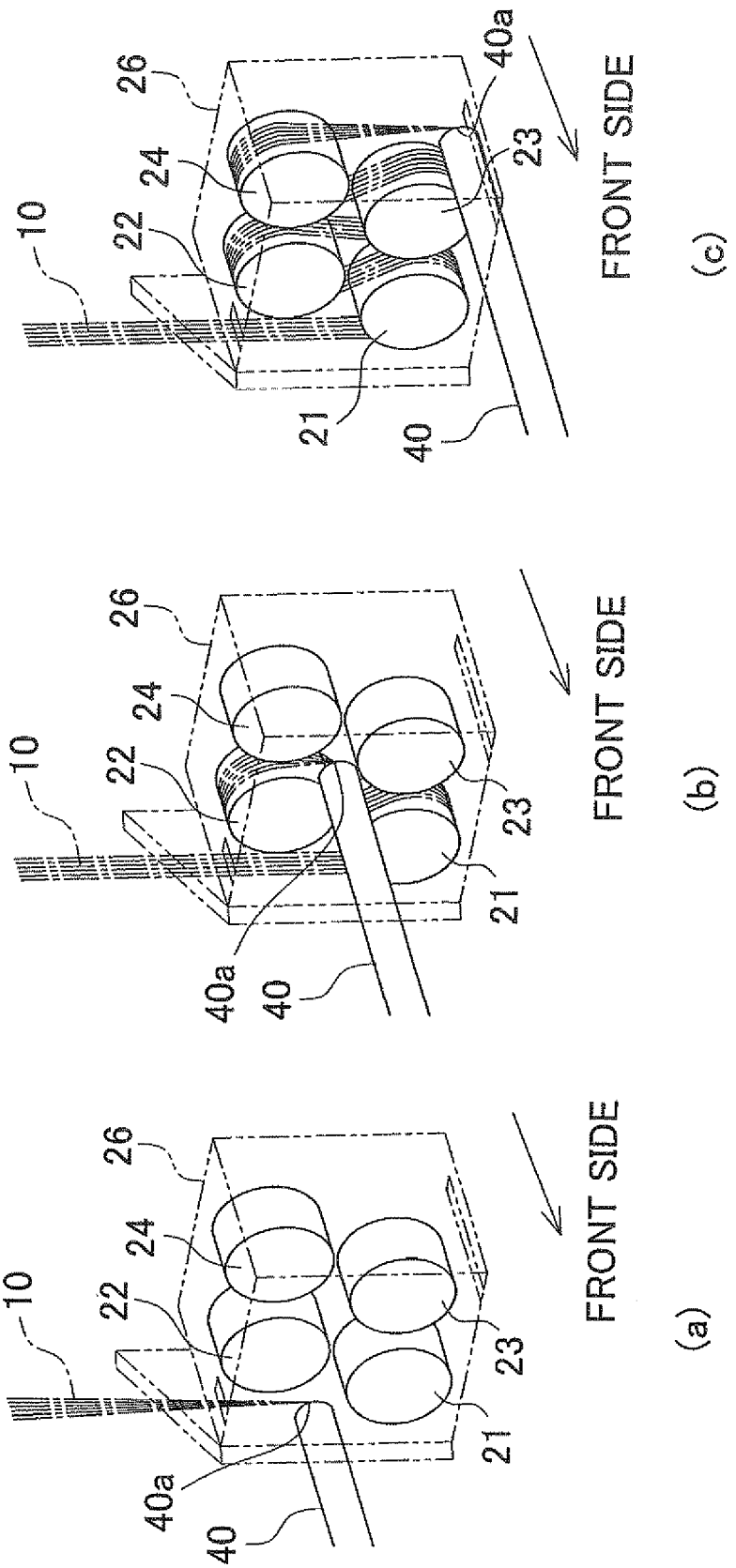
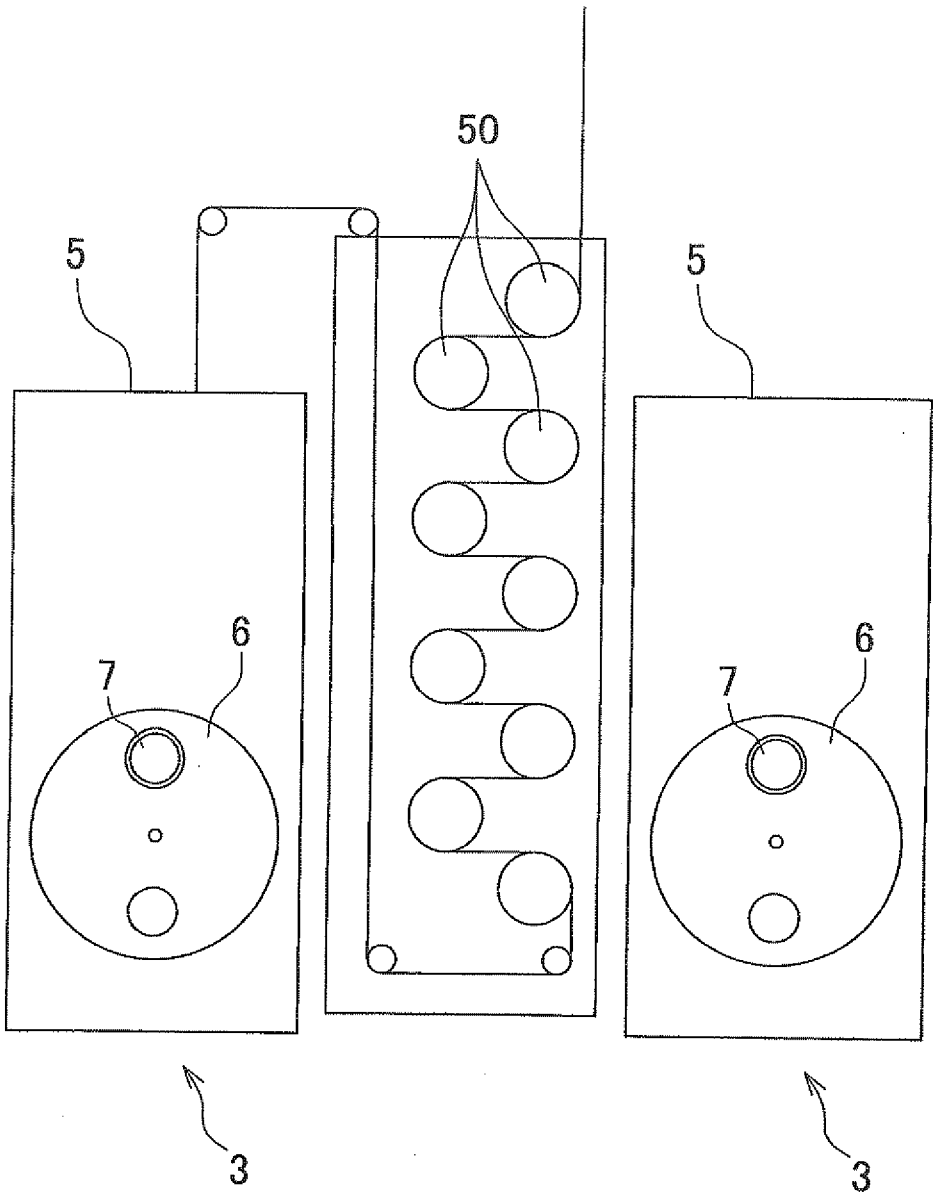


FIG.6



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