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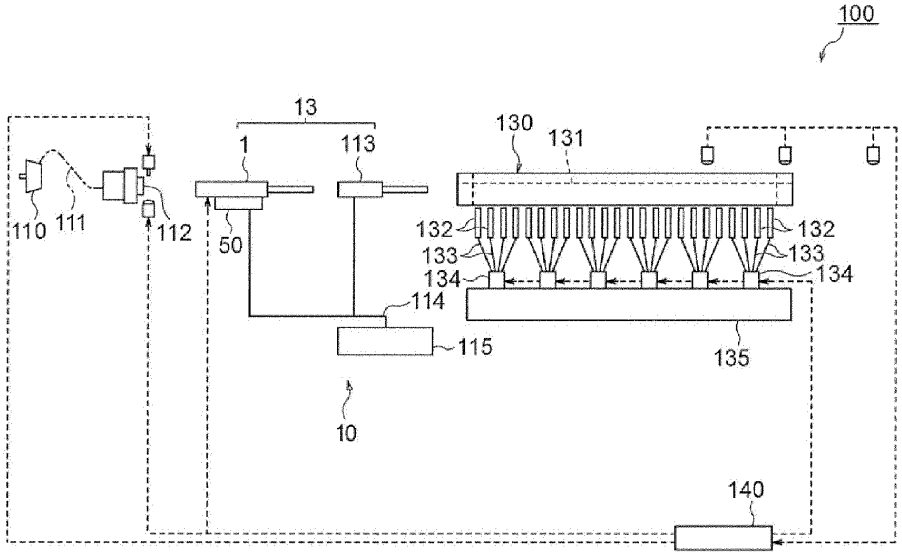
(54) **WEFT INSERTION DEVICE OF AIR JET LOOM**

(57) A weft insertion device (10) of an air jet loom (100) include a first air tank (115) configured to store air, a weft insertion nozzle (13) configured to inject a weft yarn by discharging air supplied from the first air tank (115), a second air tank (50, 52, 53) connected to the first air tank (115) through a pipe (114) and configured to store the air supplied from the first air tank (115), and an air valve (22, 32) directly connected to the weft insertion nozzle (13) and the second air tank (50, 52, 53), and controllable to supply air from the second air tank (50, 52, 53) to the weft insertion nozzle (13) and to stop supplying the air from the second air tank (50, 52, 53) to the weft insertion nozzle (13).

FIG. 1



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Description

BACKGROUND ART

[0001] The present invention relates to a weft insertion device of an air jet loom.

[0002] As a weft insertion device of an air jet loom that injects a weft yarn by discharging compressed air (air) from a weft insertion nozzle, devices disclosed in Japanese Patent Application Publications No.H04-257344 and No. H06-306738 have been known. The weft insertion devices disclosed in the above-cited Publications each include an air tank for storing air to be supplied to a weft insertion nozzle, and an air valve for controlling a supply of air from the air tank to the weft insertion nozzle, or stopping a supply of air to the weft insertion nozzle, and air is supplied to the air valve to be supplied to the weft insertion nozzle. The air tank and the air valve are connected through a pipe through which air flows in the weft insertion device disclosed in the Publications No. No.H04-257344, and the air valve and the weft insertion nozzle are connected through a pipe through which air flows in the weft insertion device disclosed in the Publication No. H06-306738.

[0003] However, hydraulic shock (water hammer) may occur in the weft insertion device of the air jet loom of the Publication No. No.H04-257344 due to acceleration of air supplied from the air tank to the air valve in a pipe having a small diameter and rapid deceleration of such air when flowing into the air valve having a larger space than the pipe. The occurrence of hydraulic shock causes a rapid change in the pressure of air discharged from the weft insertion nozzle, which makes injection of the weft yarn unstable. In the weft insertion device of the air jet loom of the Publication No. H06-306738, hydraulic shock may occur due to acceleration of air supplied from the air valve to the weft insertion nozzle in the pipe having a small diameter and rapid deceleration of such air when flowing into the weft insertion nozzle having a larger space than the pipe. The occurrence of hydraulic shock causes a rapid change in the pressure of air discharged from the weft insertion nozzle, which makes injection of the weft yarn unstable.

[0004] The present invention, which has been made to solve the above problem, is directed to providing a weft insertion device of an air jet loom that injects a weft yarn stably by making the pressure of air discharged from the weft insertion nozzle stable.

SUMMARY

[0005] In accordance with an aspect of the present disclosure, there is provided a weft insertion device of an air jet loom including a first air tank storing air, a weft insertion nozzle injecting a weft yarn by discharging air supplied from the first air tank, a second air tank connected to the first air tank through a pipe and storing the air supplied from the first air tank, and an air valve directly connected to the weft insertion nozzle and the second air tank, and controllable to supply air from the second air tank to the weft insertion nozzle and to stop supplying the air from the second air tank to the weft insertion nozzle.

[0006] Other aspects and advantages of the disclosure will become apparent from the following description, taken in conjunction with the accompanying drawings, illustrating by way of example the principles of the disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The disclosure, together with objects and advantages thereof, may best be understood by reference to the following description of the embodiments together with the accompanying drawings in which:

FIG. 1 is a schematic view of an air jet loom according to a first embodiment of the present invention;
FIG. 2 is a schematic view of a tandem nozzle illustrated in FIG. 1;
FIG. 3 is a plan view of the tandem nozzle illustrated in FIG. 2;
FIG. 4 is a front view of the tandem nozzle illustrated in FIG. 2;
FIG. 5 is a cross-sectional view of the tandem nozzle, taken along a line A-A' of FIG. 4;
FIG. 6 is a cross-sectional view of the tandem nozzle, taken along a line B-B' of FIG. 4; and
FIG. 7 is a schematic view of a tandem nozzle of an air jet loom according to a second embodiment of the present invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS

First embodiment

[0008] The following will describe a first embodiment of the present invention in details with reference to the accompanying drawings.

[0009] FIG. 1 is a schematic view of an air jet loom according to the first embodiment. An air jet loom 100 includes a yarn supply device 110, a storage drum 112 in which a weft yarn 111 drawn out from the yarn supply device 110 is stored, and a weft insertion device 10 executing weft insertion at which the weft yarn 111 is inserted into a modified reed 130 on a downstream side of the storage drum 112. The weft insertion device 10 includes a weft insertion nozzle 13 comprising a tandem nozzle 1 and a main nozzle 113. The tandem nozzle 1 is configured to discharge compressed air (air), which draws a weft yarn from the storage drum 112 and sends the weft yarn to the main nozzle 113 disposed on the downstream side. The tandem nozzle 1 is fixedly mounted to a bracket (not illustrated) provided on a floor surface on which the air jet loom 100 is placed or a frame (not illustrated) of the air jet loom 100.

[0010] The tandem nozzle 1 is connected to a second

air tank 50. The second air tank 50 is connected to a first air tank 115 through an air hose 114 (a pipe). The first air tank 115 stores air supplied from an air supply system (not illustrated) of a factory where the air jet loom 100 is installed. That is, the second air tank 50 is disposed in an air supply passage through which air stored in the first air tank 115 is supplied to the tandem nozzle 1. The second air tank 50 stores air supplied from the first air tank115. The tandem nozzle 1 is electrically connected to a control device 140 that comprehensively controls operations of the air jet loom 100.

[0011] A main nozzle 113 is disposed downstream of the tandem nozzle 1. The main nozzle 113 is connected to the first air tank 115 through the air hose 114, and injects the weft yarns 111 into a weft travel passage 131 of the modified reed 130 by discharging air supplied from the first air tank 115. The main nozzle 113 is provided with a main nozzle valve (not illustrated) of a solenoid valve connected to the control device 140, and the main nozzle valve is opened or closed by the control device 140 so that discharging air from the main nozzle 113 or not discharging air from the main nozzle 113 is switched.

[0012] A plurality of sub-nozzles 132 is disposed along the weft travel passage 131 of the modified reed 130. Air is discharged from the sub-nozzles 132 to transport weft yarns 111 along the weft travel passage 131 from the upstream side (from the main nozzle 113 side) to the downstream side of the weft travel passage 131, which corresponds to the left to the right in FIG. 1. Four sub-nozzles 132 form one group, and are connected through their associated air hoses 133 to one of sub-valves 134. Each of the sub-valves 134 is connected to a sub-nozzle air tank 135. The main nozzle 113, the modified reed 130, and the sub-nozzles 132 are mounted on a sley (not illustrated) of the air jet loom 100, and are reciprocally swung in a front-rear direction of the air jet loom 100.

[0013] FIG. 2 is a schematic view of the tandem nozzle 1 illustrated in FIG. 1. FIG. 3 is a plan view of the tandem nozzle 1 illustrated in FIG. 2, and FIG. 4 is a front view of the tandem nozzle 1 illustrated in FIG. 2. The tandem nozzle 1 includes a first nozzle 20 disposed on a downstream side of a passage of the weft yarns 111 (see FIG. 1), and a second nozzle 30 disposed upstream of the first nozzle 20. The second nozzle 30 is spaced from the first nozzle 20 so that a distal end of the second nozzle 30 is positioned on a base end side (upstream side) of the first nozzle 20. The first nozzle 20 and the second nozzle 30 are disposed so that the central axes thereof are positioned on the same straight line so as to form the passage of the weft yarns 111 (see FIG. 1). A known yarn tension correction device (ABS device) 40 is disposed between the first nozzle 20 and the second nozzle 30 so as to prevent breakage of weft yarns at peak tension.

[0014] The first nozzle 20 includes a first tandem valve 22 of a solenoid valve that is opened to supply air to the first nozzle 20 and closed to stop supplying air to the first nozzle 20, and a first tandem valve base portion 21 that supports the first nozzle 20 and the first tandem valve 22. The first tandem valve 22 corresponds to the air valve of the present invention. The second nozzle 30 includes a second tandem valve 32 of a solenoid valve that is opened to supply air to the second nozzle 30 and closed to stop supplying air to the second nozzle 30, and a second tandem valve base portion 31 that supports the second nozzle 30 and the second tandem valve 32. The second tandem valve 32 corresponds to the air valve of the present invention.

[0015] A second air tank 50 is disposed on the first tandem valve base portion 21 and the second tandem valve base portion 31. The second air tank 50 is an air tank having a rectangular parallelepiped shape and made of an aluminum material, and is disposed so that the longitudinal direction of the second air tank 50 extends in parallel with the axial directions of the first nozzle 20 and the second nozzle 30. The lower portion of the second air tank 50 supports the first nozzle 20, the first tandem valve 22, the second nozzle 30, and the second tandem valve 32. In other words, the second air tank 50 serves as a support member that supports the first nozzle 20, the first tandem valve 22, the second nozzle 30, and the second tandem valve 32. A first nozzle support member 23 having a hanging strap shape is provided below an end of the second air tank 50 on a side where the first tandem valve base portion 21 is provided, and supports the first nozzle 20 with the first nozzle 20 inserted through a ring-shaped end of the first nozzle support member 23. A second air tank joint 51 is provided at an end of the second air tank 50 on a side where the second tandem valve base portion 31 is provided, and is connected to an inside of the second air tank 50. The second air tank joint 51 is connected to the air hose 114 illustrated in FIG. 1. It is noted that the first air tank 115, the second air tank 50, the main nozzle 113, the tandem nozzle 1, the first tandem valve 22 (see FIG. 2), and the second tandem valve 32 form a weft insertion device of the air jet loom 100.

[0016] The following will describe the configuration of the second tandem valve base portion 31 and the second tandem valve 32 with reference to FIGS. 5 and 6. FIG. 5 is a cross-sectional view of the second tandem valve base portion 31, the second tandem valve 32, the second air tank 50 illustrated in FIG. 4, taken along a line A-A' extending perpendicularly to the axial direction of the first nozzle 20 and the second nozzle 30, as viewed from the right side. In addition, FIG. 6 is a cross-sectional view of the second tandem valve base portion 31 and the second tandem valve 32 illustrated in FIG. 4, taken along a line B-B' extending in the axial direction of the first nozzle 20 and the second nozzle 30. Since the first tandem valve base portion 21 and the first tandem valve 22 have the same configuration with the second tandem valve base portion 31 and the second tandem valve 32, the configuration of the first tandem valve base portion 21 and the first tandem valve 22 will be described with reference to FIGS. 5 and 6, similarly to the second tandem valve base

portion 31 and the second tandem valve 32.

[0017] Referring to FIG. 5, the second air tank 50 has therein a storage portion 50a that is a space in which air supplied from the first air tank 115 is stored. The second air tank 50 is formed large enough to store a greater amount of air in the storage portion 50a than the total amount of air to be discharged from the first nozzle 20 and the second nozzle 30 per weft insertion process.

[0018] Next, the second tandem valve 32 and the second tandem valve base portion 31 will be described. The second tandem valve base portion 31 has therein an air passage 37 through which air flows from the storage portion 50a to the second nozzle 30. The second tandem valve 32 is disposed in the air passage 37. The second tandem valve 32 includes a valve body 34 having a columnar shape, and a fixed member 35 having a columnar shape and disposed outward of the second tandem valve base portion 31, i.e., on the left in FIG. 5. The valve body 34 is disposed so that one end of the valve body 34 projects out in the air passage 37, and the other end thereof faces an end portion of the fixed member 35. The valve body 34 is movable in the longitudinal direction thereof. The movement of the valve body 34 is electrically controlled by the control device 140 (see FIG. 1), which causes the air passage 37 to be opened and to be closed. That is, the air passage 37 is closed with the movement of the valve body 34 to the right in FIG. 5, and the air passage 37 is opened with the movement of the valve body 34 to the left in FIG. 5.

[0019] Similarly, the first tandem valve 22 and the first tandem valve base portion 21 will be described. The first tandem valve base portion 21 has therein an air passage 27 through which air flows from the storage portion 50a to the first nozzle 20. The first tandem valve 22 is disposed in the air passage 27. The first tandem valve 22 includes a valve body 24 having a columnar shape, and a fixed member 25 having a columnar shape and disposed outward of the first tandem valve base portion 21, i.e., on the left in FIG. 5. The valve body 24 is disposed so that one end of the valve body 24 projects out in the air passage 27, and the other end thereof faces an end portion of the fixed member 25. The valve body 24 is movable in the longitudinal direction thereof. The movement of the valve body 24 is electrically controlled by the control device 140 (see FIG. 1), which causes the air passage 27 to be opened and to be closed. That is, the air passage 27 is closed with the movement of the valve body 24 to the right in FIG. 5, and the air passage 27 is opened with the movement of the valve body 24 to the left in FIG. 5.

[0020] Referring to FIG. 6, the second nozzle 30 has a nozzle opening 30a that is opened to the air passage 37 of the second tandem valve base portion 31, and the air passage 37 is connected to an inside of the second nozzle 30 through the nozzle opening 30a. Similarly, the first nozzle 20 has a nozzle opening 20a that is opened to the air passage 27 of the first tandem valve base portion 21, and the air passage 27 is connected to an inside of the first nozzle 20 through the nozzle opening 20a.

[0021] The following will describe an operation of the weft insertion device of the air jet loom according to the first embodiment. When weft insertion is performed in the air jet loom 100 illustrated in FIG. 1, a weft yarn 111 is drawn out from the storage drum 112 and injected towards the main nozzle 113 with air discharged from the tandem nozzle 1, and is inserted into the modified reed 130 with air discharged from the main nozzle 113. The control device 140 of the air jet loom 100 controls opening and closing of the first tandem valve 22, which executes air discharge from the first nozzle 20. The control device 140 of the air jet loom 100 controls opening and closing of the second tandem valve 32, which executes air discharge from the second nozzle 30. Air supplied from the first air tank 115 is stored in the storage portion 50a of the second air tank 50 illustrated in FIG. 2.

[0022] Next, an opening and closing operation of the first tandem valve 22 will be described with reference to FIG. 5. The valve body 24 of the first tandem valve 22 is electrically controlled by the control device 140 (see FIG. 1) and moves in the longitudinal direction thereof, so that opening and closing of the air passage 27 inside the first tandem valve base portion 21 is switched. When the valve body 24 moves to the first tandem valve base portion 21 side and closes the air passage 27, a communication between an valve upstream side air passage A and a valve downstream side air passage B is shut off and air stored in the storage portion 50a does not flows to the first nozzle 20, so that air is not discharged from the first nozzle 20.

[0023] When the valve body 24 of the first tandem valve 22 is electrically controlled by the control device 140 and is moved to the fixed member 25 side, the air passage 27 is opened. When the air passage 27 is opened, the valve upstream side air passage A and the valve downstream side air passage B are in communication, so that air stored in the storage portion 50a flows into the first nozzle 20 from the nozzle opening 20a illustrated in FIG. 6. Thus, air is discharged from the first nozzle 20.

[0024] The second air tank 50, the first tandem valve 22, the air passage 27 of the first tandem valve base portion 21, and the first nozzle 20 are directly connected. In this specification, "directly connected" means that the valve, the tank, and the nozzle are connected altogether without any pipe disposed therebetween. Unlike the weft insertion device of the conventional air jet loom, an air passage having a small diameter such as a pipe and an air hose is not provided between the second air tank 50 and the first tandem valve 22 and between the first tandem valve 22 and the first nozzle 20. Therefore, a rapid pressure change of air in the first tandem valve 22 and the first nozzle 20 does not occur, which can stabilize the pressure of air discharged from the first nozzle 20 by preventing hydraulic shock in the first tandem valve 22 and the first nozzle 20.

[0025] Next, an opening and closing operation of the second tandem valve 32 will be described. The valve

body 34 of the second tandem valve 32 is electrically controlled by the control device 140 and moves in the longitudinal direction thereof, so that opening and closing of the air passage 37 inside the second tandem valve base portion 31 is switched. When the valve body 34 of the second tandem valve 32 moves to the second tandem valve base portion 31 side and closes the air passage 37, a communication between the valve upstream side air passage A and the valve downstream side air passage B is shut off and air stored in the storage portion 50a does not flow into the second nozzle 30, so that air is not discharged from the second nozzle 30.

[0026] When the valve body 34 of the second tandem valve 32 is electrically controlled by the control device 140 and is moved to the fixed member 35 side, the air passage 37 is opened. When the air passage 37 is opened, the valve upstream side air passage A and the valve downstream side air passage B are in communication, so that air stored in the storage portion 50a flows into the second nozzle 30 from the nozzle opening 30a illustrated in FIG. 6. Thus, air is discharged from the second nozzle 30.

[0027] The second air tank 50, the second tandem valve 32, the air passage 37 of the second tandem valve base portion 31, and the second nozzle 30 are directly connected. Unlike the weft insertion device of the conventional air jet loom, an air passage having a small diameter such as a pipe and an air hose is not provided between the second air tank 50 and the second tandem valve 32 and between the second tandem valve 32 and the second nozzle 30. Therefore, a rapid pressure change of air in the second tandem valve 32 and the second nozzle 30 does not occur, which can stabilize the pressure of air discharged from the second nozzle 30, thereby preventing hydraulic shock from occurring in the second tandem valve 32 and the second nozzle 30.

[0028] As has been described, the weft insertion device 10 of the air jet loom 100 according to the first embodiment includes the first air tank 115 storing air, the weft insertion nozzle 13 injecting the weft yarns 111 by discharging air supplied from the first air tank 115, the second air tank 50 connected to the first air tank 115 through the air hose 114 and storing air supplied from the first air tank 115, and the first tandem valve 22 and the second tandem valve 32, which are directly connected to the second air tank 50, controllable to supply compressed air to the tandem nozzle 1 and to stop supplying compressed air to the tandem nozzle 1 from the second air tank 50. This configuration stabilizes the pressure of air discharged from the tandem nozzle 1, thereby injecting the weft yarns 111 stably.

[0029] The weft insertion nozzle 13 includes the main nozzle 113 that is disposed swingable and the tandem nozzle 1 that is disposed upstream of the main nozzle 113. The first tandem valve 22, which is controllable to supply air to the tandem nozzle 1 and to stop supplying air to the tandem nozzle 1, is directly connected to the first nozzle 20 and the second air tank 50, and the second tandem valve 32, which is controllable to supply air to the tandem nozzle 1 and to stop supplying air to the tandem nozzle 1, is directly connected to the second nozzle 30 and the second air tank 50. This configuration stabilizes the pressure of air discharged from both the first nozzle 20 and the second nozzle 30, thereby injecting the weft yarns 111 stably.

[0030] The weft insertion device includes the first nozzle 20 and the second nozzle 30, the first tandem valve 22 is directly connected to the first nozzle 20 and the second tandem valve 32 is directly connected to the second nozzle 30, and the first tandem valve 22 and the second tandem valve 32 are directly connected to the common second air tank 50. Thus, the first nozzle 20 and the second nozzle 30 are connected to each other by the common second air tank 50 without using a nozzle connecting member, which permits reducing the number of parts and arranging the first nozzle 20 and the second nozzle 30 in series easily.

[0031] According to the weft insertion device 10 of the first embodiment, the configuration in which the first tandem valve 22 and the second tandem valve 32 are directly connected to the common second air tank 50 permits integrating an air supply passage from the first air tank 115 to the first tandem valve 22 and an air supply passage from the first air tank 115 to the second tandem valve 32 into the air hose 114 connected to the first air tank 115, without providing the air supply passages separately.

[0032] The second air tank 50 of the weft insertion device 10 according to the first embodiment has a rectangular parallelepiped shape and has the storage portion 50a of a hollowed portion, which offers an advantage that the rigidity of the valve support member, i.e., the second air tank 50, is greater than that of the conventional valve support member.

[0033] Although the tandem nozzle 1 of the first embodiment includes two nozzles, namely, the first nozzle 20 and the second nozzle 30, the number of the nozzles is not limited thereto. Even in a case where the number of the nozzles is not two, each of tandem valves directly connected to their associated nozzle only need be directly connected to the second air tank 50.

[0034] Although the second air tank 50 has the rectangular parallelepiped shape and is made of aluminum in the first embodiment, the second air tank 50 may be made of a material other than aluminum or have a shape other than the parallelepiped shape. For example, the second air tank 50 may be made of a metal such as stainless steel or resin, and may have a cylindrical shape.

Second embodiment

[0035] The following will describe a weft insertion device of an air jet loom according to the second embodiment of the present invention. In the second embodiment, reference numerals the same as those of the first embodiment illustrated in FIGS. 1 through 6 represent the

same or similar parts, and the detailed description thereof will be omitted. The weft insertion device of the air jet loom of the second embodiment differs from the first embodiment in that the second air tank serves as a support member that supports the tandem nozzle.

[0036] FIG. 7 is a schematic view of the weft insertion device of the air jet loom according to the second embodiment. A tandem nozzle 1a of the air jet loom includes a first tandem valve base portion 21 and a second tandem valve base portion 31 that are spaced from each other in a horizontal direction and connected by a horizontal connecting member 11 having a bar shape. A second air tank 52 having a parallelepiped shape, the longitudinal direction of which extends in the vertical direction, is connected to the first tandem valve base portion 21. A second air tank 53 having a parallelepiped shape, the longitudinal direction of which extends in the vertical direction, is connected to the second tandem valve base portion 31. The second air tank 52 and the second air tank 53 each are a tank that stores air supplied from the first air tank 115 (see FIG. 1). The second air tank 52 and the second air tank 53 each are made of aluminum, have a rectangular parallelepiped shape, and have the same configuration. The second air tank 52 and the second air tank 53 are connected to a frame 12 of the air jet loom 100. The rest of the configuration of the weft insertion device of the second embodiment is the same as that of the first embodiment.

[0037] In the tandem nozzle 1a of the air jet loom 100 of the second embodiment, the second air tank 52 mounted to the frame 12 serves as a support member that supports the first nozzle 20, the first tandem valve base portion 21, and the first tandem valve 22, and the second air tank 53 mounted to the frame 12 serves as a support member that supports the second nozzle 30, the second tandem valve base portion 31, and the second tandem valve 32. That is, the second air tank 52 and the second air tank 53 each correspond to the support member that supports the tandem nozzle 1a against the frame 12.

[0038] In this way, the second air tank 52 and the second air tank 53 serve as the support members supporting the first nozzle 20, the first tandem valve base portion 21, the first tandem valve 22, the second nozzle 30, the second tandem valve base portion 31, and the second tandem valve 32, so that the air jet loom 100 can support the tandem nozzle 1a having the first nozzle 20 and the second nozzle 30 by fixing the tandem nozzle 1a to the frame 12 without providing a support member separately.

[0039] Further, since the second air tank 52 and the second air tank 53 of the second embodiment are disposed so that the longitudinal directions thereof extend in the vertical direction, the sizes of the second air tank 52 and the second air tank 53 may be increased easily, which offers an advantage that the volume of air stored in the second air tank 52 and the second air tank 53 may be increased easily. Further, since the second air tank 52 and the second air tank 53, which serve as the tandem nozzle support member, each have a rectangular parallelepiped shape having a hollow storage portion, the rigidity of the tandem nozzle support member may be increased while making the weight thereof relatively small, as compared with the conventional tandem nozzle support member. This configuration permits suppressing the vibration of the tandem nozzle while suppressing an increase of the weight of the tandem nozzle support member.

[0040] Although two second air tanks, namely, the second air tank 52 and the second air tank 53, are connected to the frame 12 to form the support member for the tandem nozzle 1a in the second embodiment, the support member may be formed by connecting only one of the second air tank 52 and the second air tank 53 to the frame 12.

[0041] Further, although the second air tank 52 and the second air tank 53 are connected to the frame 12 in the second embodiment, the second air tank 52 and the second air tank 53 may be connected to other parts as long as the first nozzle 20 and the second nozzle 30 can be supported. For example, the second air tank 52 and the second air tank 53 may be connected to a bracket for supporting the first nozzle 20 and the second nozzle 30 provided on the floor surface on which the air jet loom is installed.

[0042] Further, the present invention may be applied to nozzles of the weft insertion nozzle such as the main nozzle or the sub-nozzle, other than the tandem nozzle. However, since the main nozzle and the sub-nozzles swing during the weaving, the durability may be reduced if the weight of swinging parts is increased. In this respect, since the tandem nozzle does not swing, the present invention is preferably applied to the tandem nozzle without affecting the durability.

[0043] A weft insertion device (10) of an air jet loom (100) include a first air tank (115) configured to store air, a weft insertion nozzle (13) configured to inject a weft yarn by discharging air supplied from the first air tank (115), a second air tank (50, 52, 53) connected to the first air tank (115) through a pipe (114) and configured to store the air supplied from the first air tank (115), and an air valve (22, 32) directly connected to the weft insertion nozzle (13) and the second air tank (50, 52, 53), and controllable to supply air from the second air tank (50, 52, 53) to the weft insertion nozzle (13) and to stop supplying the air from the second air tank (50, 52, 53) to the weft insertion nozzle (13).

Claims

1. A weft insertion device (10) of an air jet loom (100), comprising:

   a first air tank (115) configured to store air; and a weft insertion nozzle (13) configured to inject a weft yarn by discharging air supplied from the first air tank (115); **characterized in that**

a second air tank (50, 52, 53) connected to the first air tank (115) through a pipe (114) and configured to store the air supplied from the first air tank (115),
an air valve (22, 32) directly connected to the weft insertion nozzle (13) and the second air tank (50, 52, 53), and controllable to supply air from the second air tank (50, 52, 53) to the weft insertion nozzle (13) and to stop supplying the air from the second air tank (50, 52, 53) to the weft insertion nozzle (13).

2. The weft insertion device (10) of the air jet loom (100) according to claim 1, **characterized in that**

the weft insertion nozzle (13) includes a main nozzle (113) that is disposed swingable, and a tandem nozzle (1, 1a) that is disposed upstream of the main nozzle (113), and
the air valve (22, 32) is directly connected to the tandem nozzle (1, 1a) and the second air tank (50, 52, 53).

3. The weft insertion device (10) of the air jet loom (100) according to claim 2, **characterized in that**
the tandem nozzle (1, 1a) includes a plurality of the tandem nozzles (20, 30), each of the plurality of the tandem nozzles(20, 30) is connected to its associated one of a plurality of the air valves (22, 32), and each of the air valves (22, 32) is connected to the second air tank (50) which is provided in common for the air valves (22, 32).

4. The weft insertion device (10) of the air jet loom (100) according to claim 2 or 3, **characterized in that**
the second air tank (52, 53) serves as a support member that support the weft insertion nozzle (13).

FIG. 1

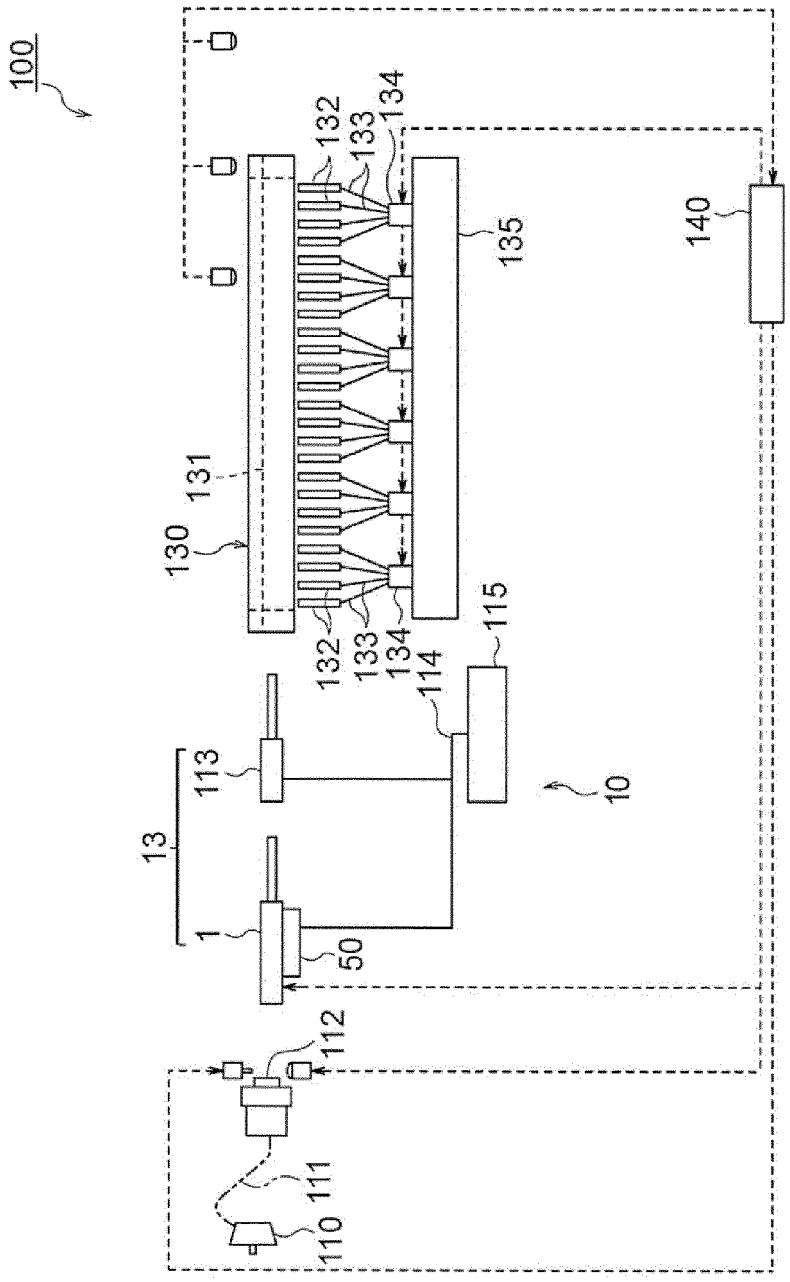
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FIG. 2

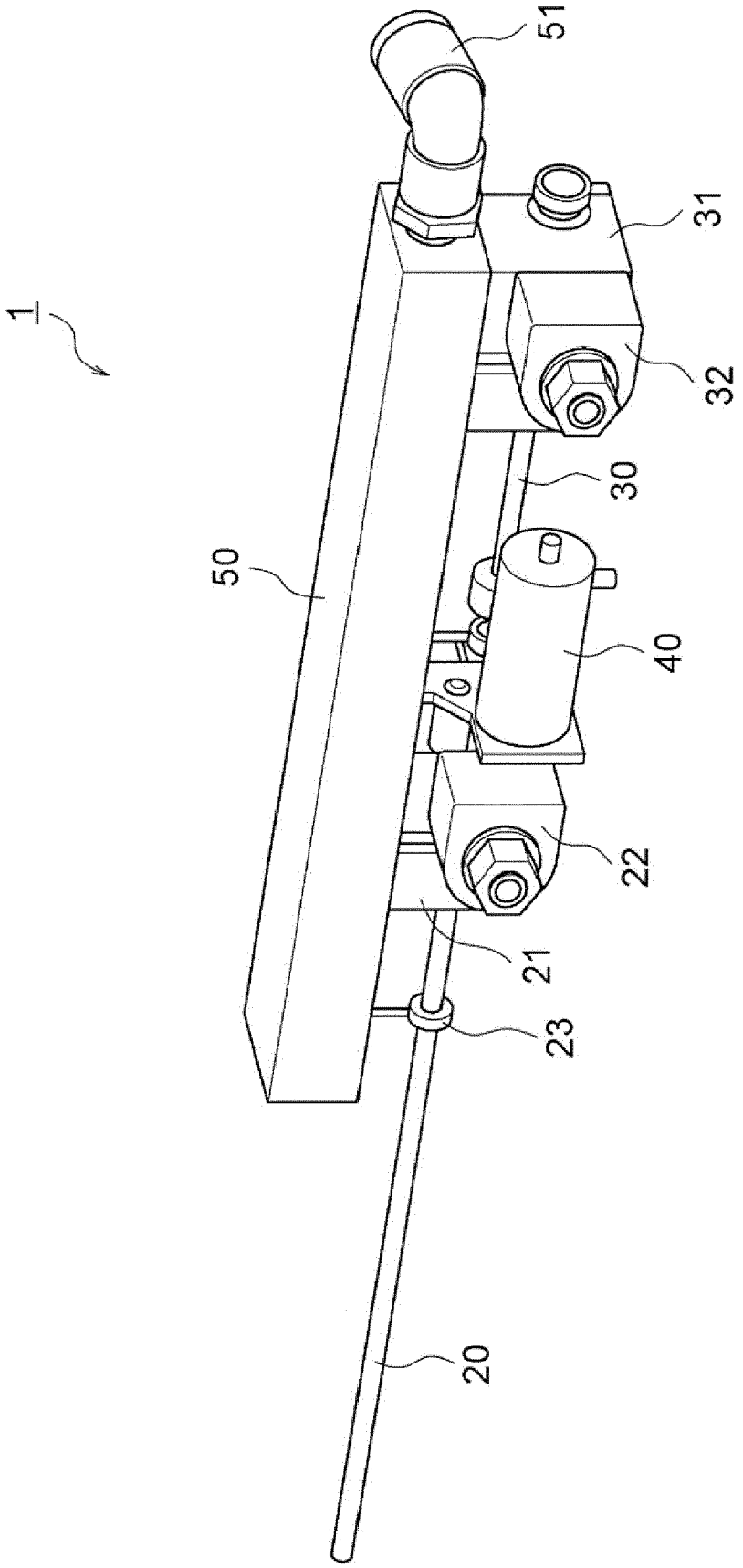


FIG. 3

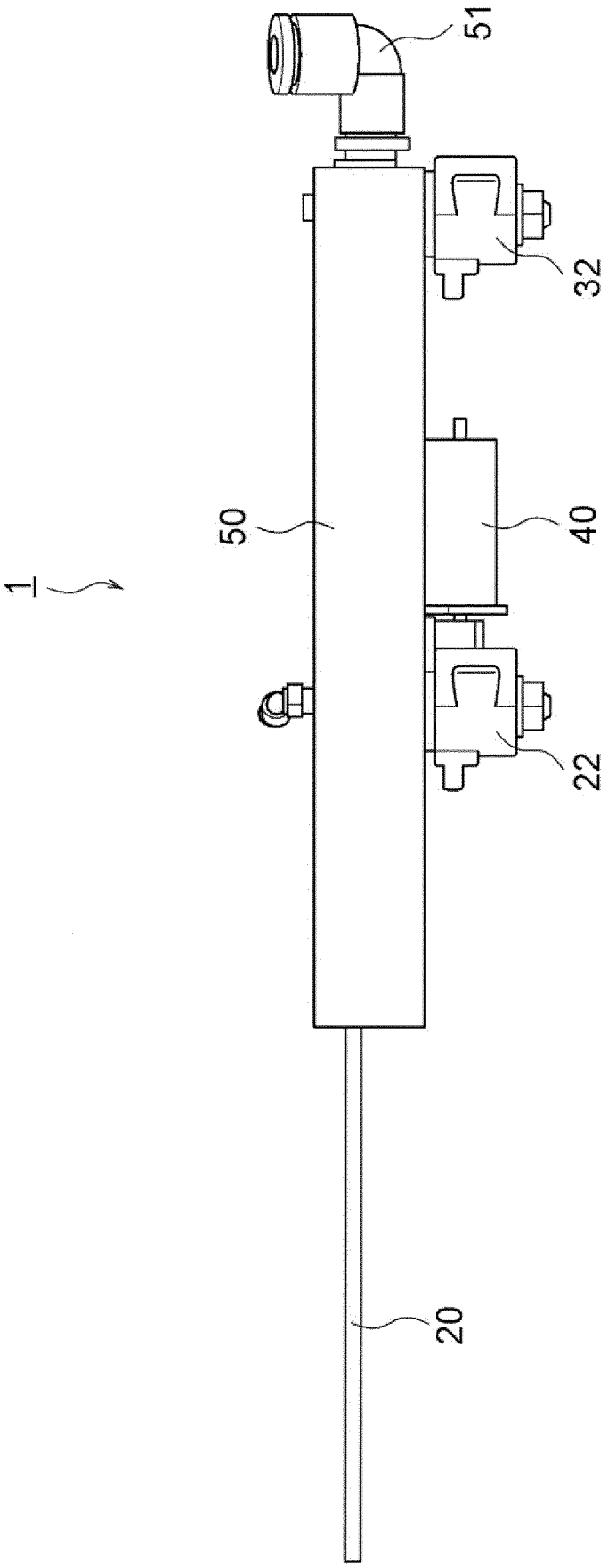


FIG. 4

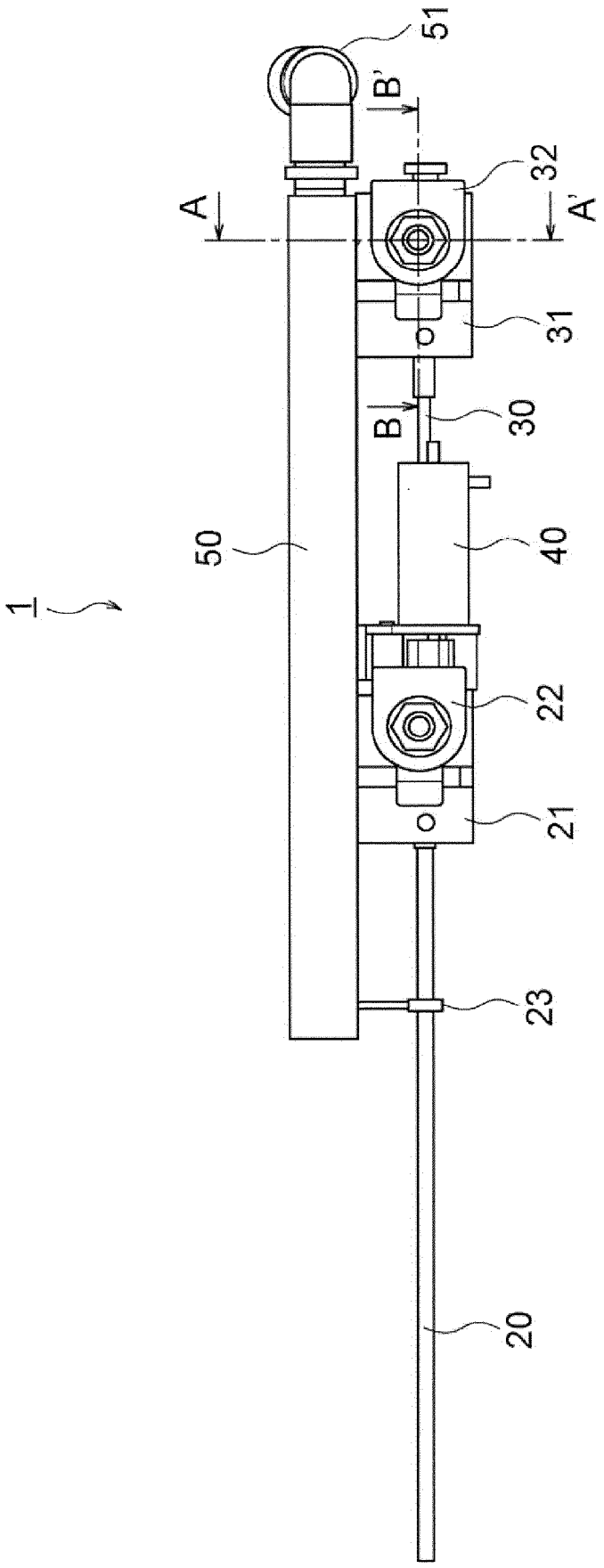


FIG. 5

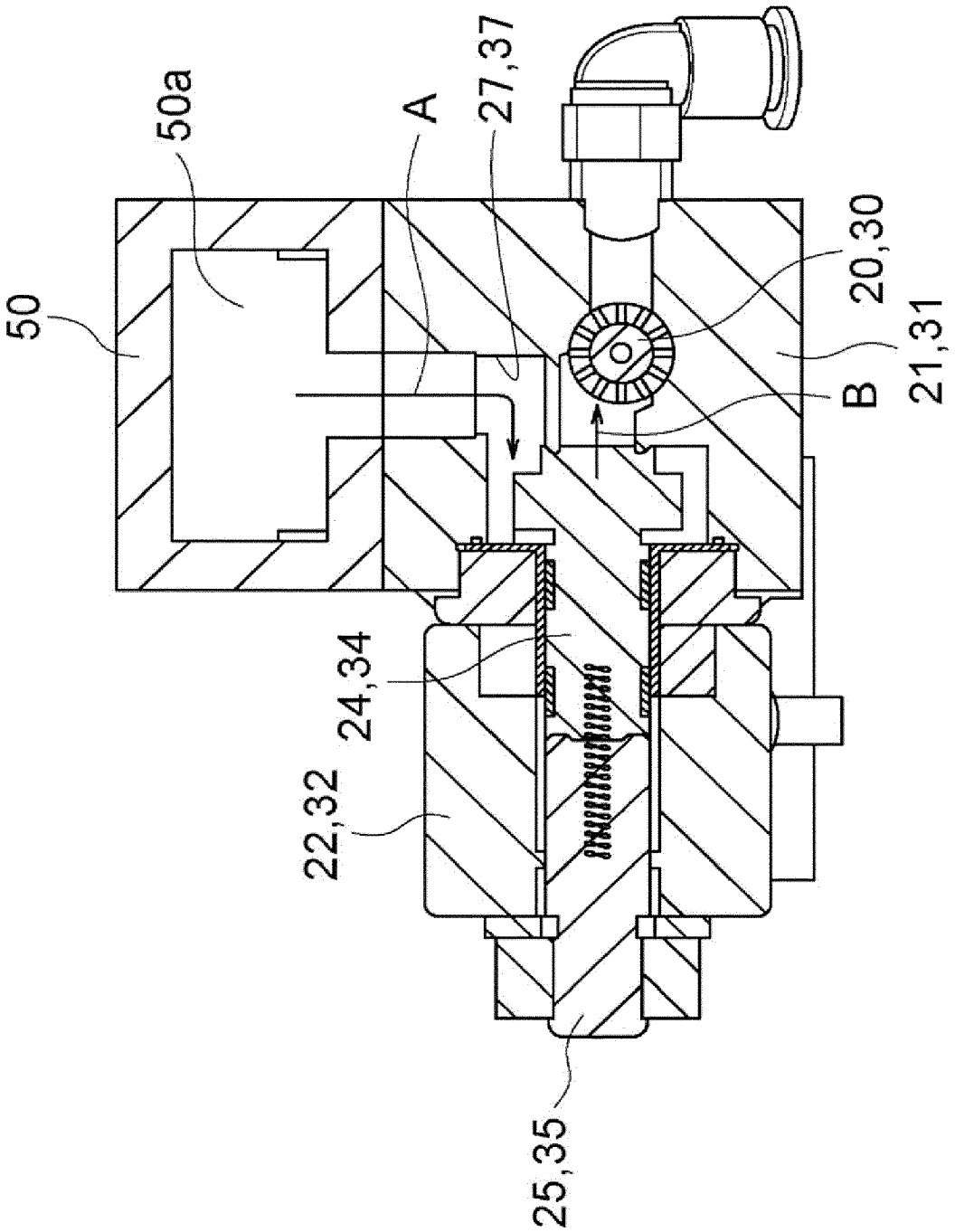


FIG. 6

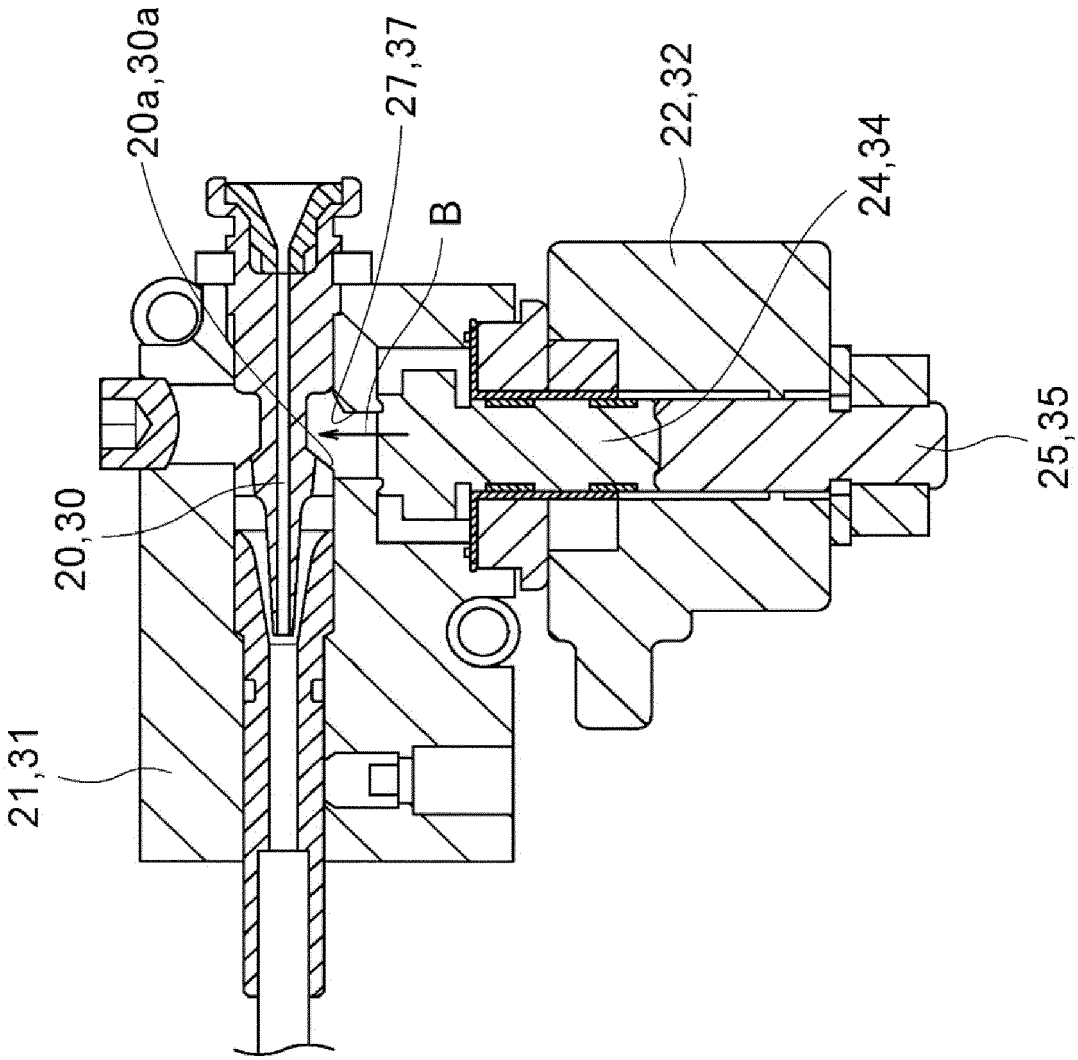
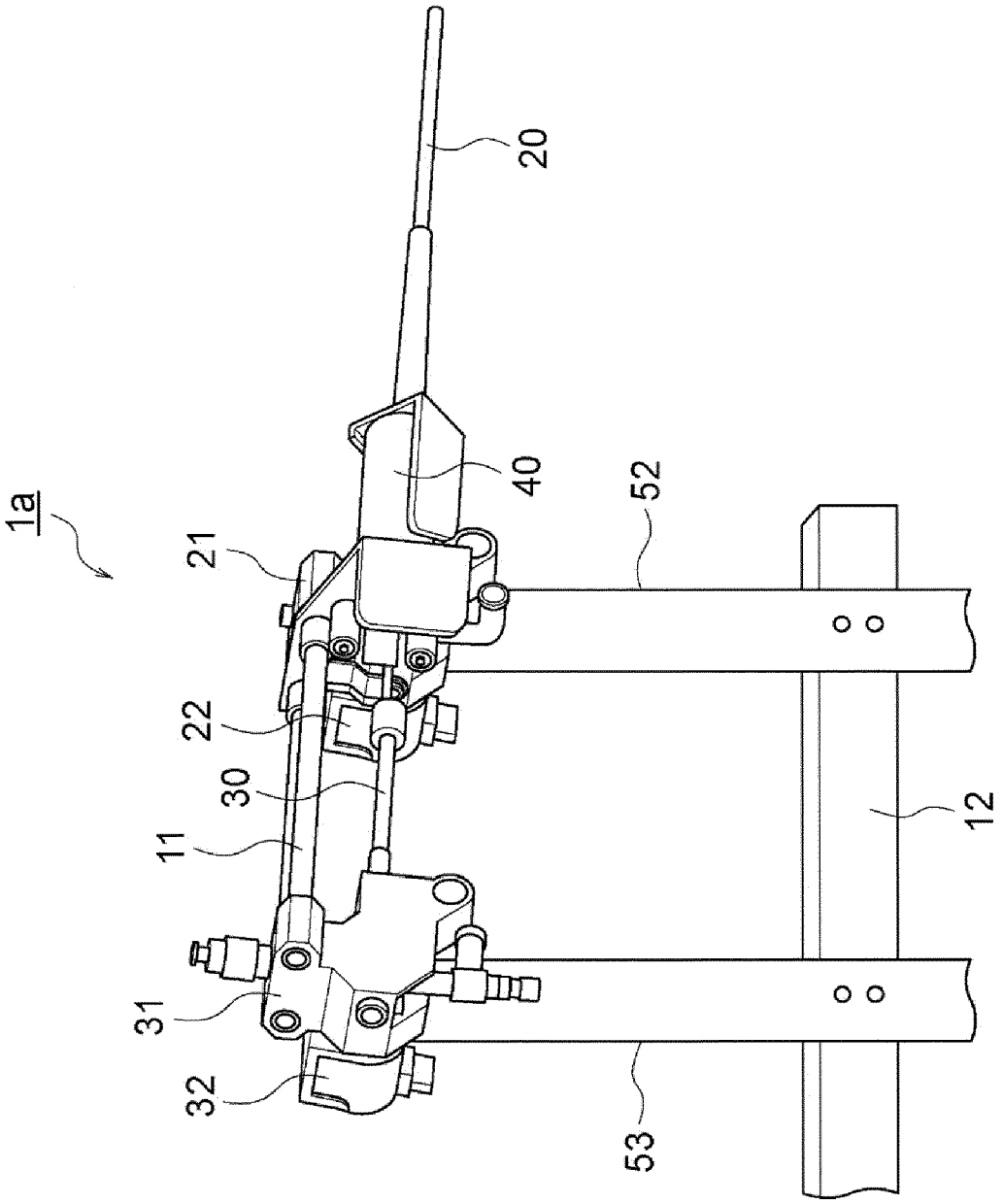


FIG. 7



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2 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	24 January 2022	Hausding, Jan

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