



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
27.05.2020 Bulletin 2020/22

(51) Int Cl.:
B41J 11/00 (2006.01)

(21) Application number: **19210241.6**

(22) Date of filing: **20.11.2019**

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

(72) Inventors:
• **ROBUSTELLI, Sandro**
22079 Villa Guardia (Como) (IT)
• **CAZZANIGA, Rodolfo**
23893 Cassago Brianza (LC) (IT)
• **KOJIMA, Kenji**
20092 Cinisello Milan (MI) (IT)
• **JINGUSHI, Masaru**
20092 Cinisello Milan (MI) (IT)

(30) Priority: **20.11.2018 JP 2018217349**

(71) Applicant: **Seiko Epson Corporation**
Tokyo 160-8801 (JP)

(74) Representative: **Miller Sturt Kenyon**
9 John Street
London WC1N 2ES (GB)

(54) **INKJET PRINTER**

(57) A printer includes a transporting belt configured to support a medium and rotate to transport the medium in a transport direction, a head configured to discharge a liquid onto the medium supported by the transporting belt, a medium support portion that supports the transporting belt, and a suction unit configured to suction the transporting belt toward the medium support portion, in which provided that a direction intersecting the transport direction is a width direction, no through-hole is provided

through the transporting belt in a thickness direction at a first end portion region being a region including an end portion on a first side of the transporting belt in the width direction and a second end portion region being a region including an end portion on a second side in the width direction, in which the suction unit is disposed at a position where the suction unit suctions the transporting belt at the first end portion region and the second end portion region toward the medium support portion.

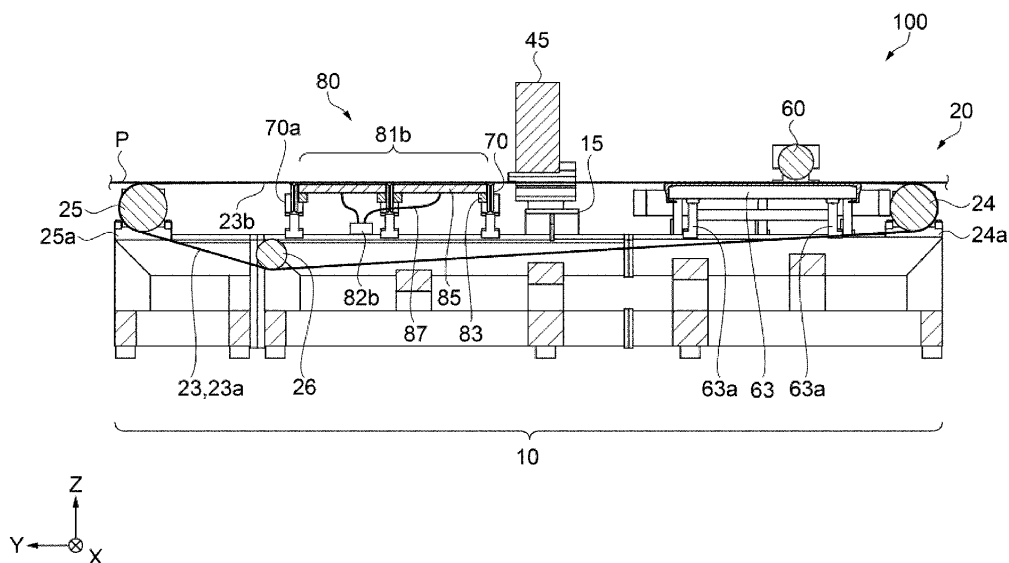


FIG. 2

Description

[0001] The present application is based on, and claims priority from JP Application Serial Number 2018-217349, filed November 20, 2018, the disclosure of which is hereby incorporated by reference herein in its entirety.

BACKGROUND

1. Technical Field

[0002] The present disclosure relates to an inkjet printer.

2. Related Art

[0003] There have been known an inkjet printer configured to print images or characters on a medium such as paper or cloth, along with causing a discharge unit that discharges ink to be moved relative to the medium. For example, JP 2004-136533 A discloses an image forming device being an inkjet printer that discharges ink onto a recording medium held and transported by a transporting belt to form an image.

[0004] The inkjet printer, described in JP 2004-136533 A and configured to cause a transporting belt to support and transport a medium, occasionally allow the transporting belt to float up at both end portions of the transporting belt in the width direction. An occurrence of float-up of the transporting belt at the both end portions may cause non-uniform distances between the medium and the discharge unit, to thus deteriorate the image quality of the image formed on the medium.

SUMMARY

[0005] An inkjet printer of the present disclosure includes a transporting belt configured to support a medium and rotate to transport the medium in a transport direction, a discharge unit configured to discharge a liquid onto the medium supported by the transporting belt, a support portion that supports the transporting belt, and a suction unit configured to suction the transporting belt toward the support portion, in which provided that a direction intersecting the transport direction is a width direction, no through-hole is provided through the transporting belt in a thickness direction at a first end portion region being a region including an end portion on a first side of the transporting belt in the width direction and a second end portion region being a region including an end portion on a second side in the width direction, in which the suction unit is disposed at a position where the suction unit suctions the transporting belt at the first end portion region and the second end portion region toward the support portion.

[0006] In the inkjet printer described above, the suction unit may be disposed at a position where the suction unit does not suction the transporting belt at a center region

located between the first end portion region and the second end portion region toward the support portion.

[0007] The inkjet printer described above may include a controller configured to perform a control of execution of an image forming operation of causing the discharge unit to discharge a liquid, to form an image on the medium, a transport operation of rotating the transporting belt to transport the medium, and a suction operation of causing the suction unit to suction the transporting belt toward the support portion, in which the controller may be configured to execute the suction operation during execution of the image forming operation and during execution of the transport operation.

[0008] The inkjet printer described above may include a controller configured to perform a control of execution of an image forming operation of causing the discharge unit to discharge a liquid, to form an image on the medium, a transport operation of rotating the transporting belt to transport the medium, and a suction operation of causing the suction unit to suction the transporting belt toward the support portion, in which the controller is configured to execute the suction operation during execution of the image forming operation and to cause the suction operation to be not executed during execution of the transport operation.

[0009] In the inkjet printer described above, the suction unit may include a first suction section configured to suction the transporting belt at the first end portion region, and a second suction section configured to suction the transporting belt at the second end portion region, in which the first suction section and the second suction section may be configured to individually vary a suction force exerted on the transporting belt.

[0010] In the inkjet printer described above, the support portion may include a first support section and a second support section provided spaced apart from the first support section in the transport direction, and the suction unit may be provided between the first support section and the second support section.

[0011] In the inkjet printer described above, the support portion may be provided with a suction hole at a surface that supports the transporting belt, the suction unit may be configured to suction, toward the support portion, a portion of the transporting belt being not supported by the support portion, and the support portion may be configured to suction the transporting belt through the suction hole.

[0012] In the inkjet printer described above, the support portion may be provided with a suction hole passing through a surface that supports the transporting belt, and the suction unit may be configured integrally with the support portion, and configured to suction the transporting belt through the suction hole.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013]

FIG. 1 is a perspective view of a printer according to Embodiment 1.

FIG. 2 is a cross-sectional-side view of an inkjet printer, viewed from the - side, along the X-axis.

FIG. 3 is a perspective view illustrating an enlargement of a periphery of a medium support portion.

FIG. 4 is a perspective view illustrating an enlargement of a back surface of the suction table.

FIG. 5 is a block diagram schematically illustrating a configuration of an inkjet printer.

FIG. 6 is a cross-sectional view schematically illustrating a cross-sectional shape of a transporting belt.

FIG. 7 is a cross-sectional view schematically illustrating a cross-sectional shape of a transporting belt.

FIG. 8 is a cross-sectional view schematically illustrating a cross-sectional shape of a transporting belt.

FIG. 9 is a cross-sectional view schematically illustrating a cross-sectional shape of the transporting belt and a positional relationship of the suction unit.

FIG. 10 is an enlarged perspective view illustrating a periphery of a medium support portion according to Embodiment 2.

FIG. 11 is an enlarged perspective view illustrating a periphery of a medium support portion according to Embodiment 3.

FIG. 12 is a cross-sectional view schematically illustrating a cross-sectional shape of a transporting belt according to Embodiment 4.

FIG. 13 is a cross-sectional view schematically illustrating a cross-sectional shape of a transporting belt regulated by a belt regulating portion.

DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0014] Embodiments will be described below with reference to the accompanying figures. Note that, in each of the figures below, to illustrate each of layers or each of members at a recognizable size, a scale of each of the layers or each of the members is different from an actual scale.

[0015] In addition, FIG. 1 to FIG. 4 and FIG. 6 to FIG. 13 illustrate, for convenience of explanation, X axis, Y axis, and Z axis as three axes orthogonal to one another, where the tip end side of the arrow indicating the axial direction is defined as "+ side" and the base end side as "- side".

Embodiment 1

Schematic configuration of Inkjet printer

[0016] FIG. 1 is a perspective view of a printer according to Embodiment 1. FIG. 2 is a cross-sectional-side view of an inkjet printer, viewed from the - side, along the X axis. First, an inkjet printer according to Embodiment 1 will be described below with reference to FIGS. 1 and 2. Note that, in Embodiment 1, descriptions will be given exemplifying an inkjet printer of a serial head type. In the

following descriptions, the inkjet printer is referred to as printer 100. The printer 100 is configured to perform printing onto a medium P, along with causing a head 42 being a discharge unit to move, discharging a liquid onto the medium P.

[0017] As illustrated in FIG. 1, the printer 100 includes a transport unit 20, a printing unit 40, a pressing unit 60, and a medium support portion 70 being a support portion. The components of the printer 100 are attached to a frame 10 that constitutes the transport unit 20. Note that, in Embodiment 1, the vertical axis along the gravity direction is defined as the Z axis, the axis along a transport direction in which the medium P that will be described below is transported as the Y axis, and the axis along a width direction of the medium P as the X axis. In addition, the positional relationship along the transport direction of the medium P is also referred to as "upstream" or "downstream".

[0018] First, a configuration of the transport unit 20 will be described below.

[0019] The transport unit 20 includes the frame 10, a transporting belt 23, a first roller 24, a second roller 25, and a third roller 26. The transport unit 20 is configured to transport the medium P in the transport direction (direction from the - side to the + side of the Y axis). As the medium P, there can be used, for example, natural fiber, cotton, silk, hemp, mohair, wool, cashmere, regenerated fiber, synthetic fiber, nylon, polyurethane, polyester, and woven cloth or non-woven cloth fabricated by mixed spinning of these fibers. To the woven cloth or non-woven cloth, a pretreatment agent for promoting a color developing property and a fixing property may be applied.

[0020] The frame 10 forms a rectangular parallelepiped having the Y axis in which the plurality of frame members are combined with each other as the longitudinal direction of the frame 10. The first roller 24 is disposed upstream of the frame 10 in the transport direction. The both ends of the first roller 24 are supported rotatably on a support stage 24a, where the support stage 24a is attached to the upper face of the frame 10. Further, the second roller 25 is disposed downstream of the frame 10 in the transport direction. The second roller 25 is supported rotatably on a support stage 25a, where the support stage 25a is attached to the upper face of the frame 10.

[0021] The transporting belt 23, which is stretched over the first roller 24 and the second roller 25, rotates supporting the medium P to transport the medium P in the transport direction. More specifically, the transporting belt 23, which is endlessly formed with both end portions of a band-shaped belt being coupled to each other, is hung between two rollers of the first roller 24 and the second roller 25. The transporting belt 23 is held in a state where a predetermined tension is applied thereto. The transporting belt 23 is divided into three regions consisting of a first end portion region 23c, a second end portion region 23d, and a center region 23e in a width direction intersecting the transport direction. The first end

portion region 23c is a region including an end portion on one side (the - side of the X axis) in the width direction of the transporting belt 23. The second end portion region 23d is a region including an end portion on the other side (the + side of the X axis) in the width direction of the transporting belt 23. The center region 23e is a region located between the first end portion region 23c and the second end portion region 23d.

[0022] A front surface 23a of the transporting belt 23 is provided with an adhesive layer 29 onto which the medium P adheres. The transporting belt 23 supports the medium P affixed to the adhesive layer by the pressing unit 60 that will be described below. This allows stretchable clothes and the like to be handled as the medium P. For example, when using a transporting belt on which no adhesive layer is provided, a through-hole may be provided through the transporting belt in the thickness direction to cause the medium to come into close contact with the transporting belt. In this scheme, the medium is brought into the close contact with the transporting belt by suctioning the medium through the through hole. However, in the printer 100 of Embodiment 1 employing a scheme in which the medium P is caused to come in close contact with the transporting belt 23 via the adhesive layer, the transporting belt 23 including the first end portion region 23c and the second end portion region 23d is not formed with a through-hole passing through the transporting belt 23 in the thickness direction (Z axis direction) Such a configuration in which the transporting belt 23 is not provided with a through-hole can suppress unevenness from occurring on a face (that is, the front surface 23a) by which the transporting belt 23 supports the medium P.

[0023] The first roller 24 and the second roller 25 are provided at the inner side of the transporting belt 23, and support a back surface 23b of the transporting belt 23. The transport unit 20 of Embodiment 1 includes the third roller 26 that supports the transporting belt 23 between the first roller 24 and the second roller 25. The third roller 26 is a member that assists in supporting the transporting belt 23, with an aim to adjust the tension and the like of the transporting belt 23. Note that the transport unit 20 may also be configured not to include a member such as the third roller 26, which assists in supporting the transporting belt 23.

[0024] The second roller 25 rotates the transporting belt 23 to transport the medium P in the transport direction. The second roller 25 includes a non-illustrated rotation driver for rotationally driving the second roller 25. The second roller 25 is provided downstream of the printing unit 40 in the transport direction, while the first roller 24 is provided upstream of the printing unit 40 in the transport direction. The rotation drive of the second roller 25 causes the transporting belt 23 to rotate in association with the rotation of the second roller 25, and then the first roller 24 is driven to rotate due to the rotation of the transporting belt 23. In association with the rotation of the transporting belt 23, the medium P supported by the

transporting belt 23 is transported in the transport direction, and an image and the like are formed on the medium P at a position opposing to the printing unit 40 that will be described below. Note that descriptions have been given that the transporting belt 23 includes, but not limited to, the adhesive layer onto which the medium P adheres. For example, the transporting belt may be of an electrostatic attraction type belt for attracting the medium onto the belt with static electricity.

[0025] The transport unit 20 may also be configured to be connectable to a medium supply unit that supplies the medium P at the upstream of the transporting belt 23 in the transport direction. For example, the medium supply unit rotatably supports the medium P of a band-shape wound in a rolled shape, rolls out the medium P of a rolled shape by rotating the medium P, and then supplies the medium P to the transporting belt 23.

[0026] Further, the transport unit 20 may also be configured to be connectable to a medium winding unit that winds up the medium P at the downstream of the transporting belt 23 in the transport direction. For example, the medium winding unit includes a winding shaft that rotatably supports the medium P, and rotates the winding shaft to wind up the medium P of a band-shape into a rolled shape.

[0027] Next, components of the pressing unit 60, the printing unit 40, a carriage moving unit 45, the medium support portion 70 being a support portion, and a suction unit 80, which are provided in the printer 100, will be described below.

[0028] The pressing unit 60 is provided between the first roller 24 and the printing unit 40, and presses the medium P against the transporting belt 23. The pressing unit 60 is constituted in a cylindrical shape or a columnar shape, and is provided rotatably in a circumferential direction to rotate along the transport direction of the medium P. The pressing unit 60 is supported, between the first roller 24 and the printing unit 40, to be movable reciprocally along the transport direction. The pressing unit 60, while pressing the medium P from the vertical above (the + side of the Z axis) to the vertical below (the - side of the Z axis), is moved by a pressing unit driver 62 in the transport direction (direction from the - side to the + side of the Y axis) and in the direction opposite to the transport direction (direction from the + side to the - side of the Y axis).

[0029] A pressing unit support portion 63 is provided at the inner side of the transporting belt 23 and between the first roller 24 and the second roller 25. The pressing unit support portion 63 is plate-like shaped and is configured to be able to support the pressing unit 60 via the transporting belt 23. The range in which the pressing unit support portion 63 is constituted corresponds to the movement range of the pressing unit 60. Specifically, the length in the X direction of the range in which the pressing unit support portion 63 is formed corresponds to the length of the pressing unit 60 in the X direction. Further, the length in the Y direction of the range in which the

pressing unit support portion 63 is formed corresponds to the movement range of the pressing unit 60 in the Y direction. The pressing unit support portion 63 is supported by four support stages 63a, where the support stages 63a are attached to the upper face of the frame 10. The medium P supplied onto the transporting belt 23 is pressed against the transporting belt 23 between the pressing unit 60 and the pressing unit support portion 63. This allows the medium P to be reliably affixed to the adhesive layer provided on the front surface 23a of the transporting belt 23, and to prevent the medium P from floating up over the transporting belt 23.

[0030] FIG. 3 is a perspective view illustrating an enlargement of a periphery of the medium support portion 70. In FIG. 3, the transporting belt 23 is omitted to be illustrated for convenience of explanation.

[0031] The medium support portion 70 is provided at the inner side of the transporting belt 23 and between the first roller 24 and the second roller 25. In Embodiment 1, the medium support portion 70 is configured such that a plurality of beam members, which have the width direction of the medium P being a direction intersecting the transport direction as the longitudinal direction of the beam members, are provided along the transport direction. The beam members correspond to a first medium support portion, a second medium support portion, and a third medium support portion, in the order from the upstream in the transport direction. Accordingly, the medium support portion 70 is configured to include the first medium support portion, the second medium support portion provided spaced apart from the first medium support portion in the transport direction, and the third medium support portion provided spaced apart from the second medium support portion in the transport direction. That is, the medium support portion 70 supports the transporting belt 23 by the three beam members. The printer 100 includes the head 42 that is moved along the X axis. In a plan view viewed along the Z axis, the range of the transporting belt 23 that can overlap with the head 42 due to the movement of the head 42 is a print region PA illustrated in FIG. 1. The medium support portion 70 in the X direction is longer in length than the transporting belt 23 in the width direction. The three beam members constituting the medium support portion 70 are arranged, in the print region PA, in a manner equally spaced apart from each other along the transport direction. The both ends of each of the medium support portions 70 are supported by support stages 70a, where the support stages 70a are attached onto the frame 10.

[0032] The printer 100 also includes the suction unit 80 that suctions the transporting belt 23 toward the medium support portion 70. The suction unit 80 includes a first suction section 81a provided at a position where the first suction section 81a suctions the transporting belt 23 at the first end portion region 23c toward the medium support portion 70, and a second suction section 81b provided at a position where the second suction section 81b suctions the transporting belt 23 at the second end

portion region 23d toward the medium support portion 70. In other words, the suction unit 80 is provided at a position where the suction unit 80 does not suction the transporting belt 23 at the center region 23e toward the medium support portion 70.

[0033] The first suction section 81a is located, in the print region PA, facing the back surface 23b of the first end portion region 23c of the transporting belt 23. In Embodiment 1, the first suction section 81a is constituted by two suction tables 85 provided between two of the three beam members that constitute the medium support portion 70. More specifically, the first suction section 81a is constituted by two suction tables 85 consisting of the suction table 85 provided between the first medium support portion and the second medium support portion, and the suction table 85 provided between the second medium support portion and the third medium support portion. This allows the suction tables 85 to be arranged in the vicinity of the transporting belt 23, and to thus cause the first suction section 81a to efficiently suction the transporting belt 23 at the first end portion region 23c from the + side to the - side of the Z axis.

[0034] The second suction section 81b is located, in the print region PA, facing the back surface 23b of the second end portion region 23d of the transporting belt 23. In Embodiment 1, the second suction section 81b is constituted by two suction tables 85 provided between two of the three beam members that constitute the medium support portion 70. More specifically, the second suction section 81b is constituted by two suction tables consisting of the suction table 85 provided between the first medium support portion and the second medium support portion, and the suction table 85 provided between the second medium support portion and the third medium support portion. This allows the suction tables 85 to be arranged in the vicinity of the transporting belt 23, and to thus cause the second suction section 81b to efficiently suction the transporting belt 23 at the second end portion region 23d from the + side to the - side of the Z axis.

[0035] The suction tables 85 are plate-like shaped. A suction groove 85a for suctioning of the transporting belt 23 is provided at a surface of the suction table 85, which faces the back surface 23b of the transporting belt 23. A stainless steel having excellent wear resistance and slidability may be used for the surface of the suction table 85, which is in contact with the transporting belt 23. The center of the suction table 85 is provided with a through hole 85b passing through the suction table 85 in the thickness direction (Z axis direction), where the through hole 85b is in communication with the suction groove 85a.

[0036] Note that the number of beam members constituting the medium support portion 70 and the number of the suction tables 85 provided between the beam members are given as an example. The number of the beam members constituting the medium support portion 70 may be two, or four or more. The number of the suction tables 85 constituting the first suction section 81a or the

second suction section 81b may be one, or three or more. For example, a configuration may also be employed in which the medium support portion 70 is constituted by two beam members consisting of a first medium support portion and a second medium support portion, and the suction unit 80 is provided between the first medium support portion and the second medium support portion. Further, the suction unit 80 may not be provided between any two beam members adjacent to each other. For example, a configuration may also be employed in which the medium support portion 70 is constituted by three beam members consisting of the first medium support portion, the second medium support portion, and the third medium support portion, the suction unit 80 is provided between the first medium support portion and the second medium support portion, and the suction unit 80 is not provided between the second medium support portion and the third medium support portion.

[0037] In addition, in Embodiment 1, the configuration is presented in which the suction table 85 includes the suction groove 85a for suctioning the transporting belt 23, however, the suction table may also be configured to include a plurality of suction holes for suctioning the transporting belt 23.

[0038] FIG. 4 is a perspective view illustrating an enlargement of a back surface of the suction table 85. In FIG. 4, the support stage 70a is illustrated as being transparent for convenience of explanation,

[0039] The suction table 85 has two sides along the medium support portion 70, which are supported by support members 83. The support member 83 is a rod-shaped rectangular parallelepiped having the X axis direction as the longitudinal direction of the support member 83. Two pieces of the support members 83 that support one suction table 85 are each disposed along two beam members facing each other of the medium support portion 70. The suction table 85 is provided with four screw holes for coupling with the support members 83, where the suction table 85 and the support members 83 are coupled by adjustment bolts 88. The adjustment bolt 88 is a bolt that can adjust the height of the suction table 85 while maintaining the coupling between the suction table 85 and the support members 83. The suction table 85 can be varied in its height, that is, the distance between the suction table 85 and the transporting belt 23, by the adjustment bolts 88 at four locations.

[0040] Further, the first suction section 81a and the second suction section 81b are configured to individually vary the suction forces exerted on the transporting belt 23 at the first end portion region 23c and the second end portion region 23d. Specifically, the first suction section 81a includes a first suction section drive unit 82a, and the second suction section 81b includes a second suction section drive unit 82b. The first suction section drive unit 82a and the second suction section drive unit 82b are attached to the frame 10. The through hole 85b of the suction table 85 constituting the first suction section 81a is in communication with the first suction section drive

unit 82a through a suction tube 87. The through hole 85b of the suction table 85 constituting the second suction section 81b is in communication with the second suction section drive unit 82b through the suction tube 87.

[0041] As the first suction section drive unit 82a and the second suction section drive unit 82b, there can be employed, for example, an ejector that reduces pressure by ejecting fluid from the nozzle at a high rate of speed, a vacuum pump, a vacuum blower, or the like. The first suction section drive unit 82a is driven to cause, in the print region PA, the transporting belt 23 to be suctioned at the first end portion region 23c to the suction table 85 that constitutes the first suction section 81a. The second suction section drive unit 82b is driven to cause, in the print region PA, the transporting belt 23 to be suctioned at the second end portion region 23d to the suction table 85 that constitutes the second suction section 81b. The driving force of the first suction section drive unit 82a and the driving force of the second suction section drive unit 82b are individually controlled to make it possible to individually vary the suction force of the first suction section 81a and the suction force of the second suction section 81b.

[0042] The printing unit 40 is disposed at the upper side (the + side of the Z axis) of the transport unit 20. The printing unit 40 includes the head 42, a carriage 43 on which the head 42 is mounted, and the like. The head 42 discharges a liquid onto the medium P supported by the transporting belt 23 to print an image and the like on the medium P. A plurality of the heads 42 are mounted on the carriage 43 in a replaceable manner. The head 42 mounted on the carriage 43 is moved, by the carriage moving unit 45, in the width direction (X axis direction) of the medium P, which intersects the transport direction (Y axis direction) of the medium P. Each of the heads 42 is supplied with, as the liquid, a color ink such as cyan (C), magenta (m), yellow (Y), black (K), and the like. The head 42 is configured to discharge liquids from non-illustrated nozzles corresponding to the respective colors onto the medium P.

[0043] The carriage moving unit 45 is attached to a support frame 15 extending from the frame 10 to the + side of the Z axis, and is located at the upper side (the + side of the Z axis) of the transporting belt 23. The carriage moving unit 45 includes a guide rail 46 extending along the X axis direction. The head 42 is supported by the guide rail 46 in a state reciprocally movable together with the carriage 43 along the X axis.

[0044] The carriage moving unit 45 includes a non-illustrated moving mechanism and power source for causing the carriage 43 to be moved along the guide rail 46. As the moving mechanism, there can be employed, for example, a mechanism combined of a ball screw and a ball nut, a linear guide mechanism, or the like. As the power source, there can be employed, for example, a variety of motors such as a stepping motor, a servomotor, and a linear motor. The motor is driven to cause the moving mechanism to move the head 42 together with the

carriage 43 along the X axis direction.

[0045] Note that the printer 100 of Embodiment 1 is a printer of a serial head type as an example in which the head 42, mounted on the carriage 43 reciprocally moved, discharges a liquid while being moved in the width direction (X axis direction) of the medium P, however, the printer 100 may also be a printer of a line-head type in which a head extending in the width direction of the medium P discharges a liquid in a state of being fixed.

[0046] Next, an electrical configuration of the printer 100 will be described below with reference to FIG. 5. FIG. 5 is a block diagram schematically illustrating a configuration of an inkjet printer.

[0047] The printer 100 includes a controller 1 that controls the respective units included in the printer 100. The controller 1 is configured to include an interface unit (I/F) 2, a Central Processing Unit (CPU) 3, a control circuit 4, a storage unit 5, and the like. The CPU 3 is coupled to the respective units via a bus.

[0048] The interface unit 2, which is configured to transmit/receive data between an input device 6 that handles input signals or images and the controller 1, receives print data and the like generated in the input device 6. The input device 6 is constituted by a computer and the like. In Embodiment 1, a block diagram is presented in which the input device 6 is configured integrally with the printer 100, however, the input device 6 may be configured separately from the printer 100.

[0049] The CPU 3 is an arithmetic processing device for performing various input signal processings, and an overall control of the printer 100 in accordance with programs stored in the storage unit 5 and print data received from the input device 6.

[0050] The storage unit 5, which serves as a storage medium that ensures an area for storing the programs, a work area, and the like of the CPU 3, includes a storage device such as a Random Access Memory (RAM), an Electrically Erasable Programmable Read Only Memory (EEPROM), or the like. The control circuit 4 is a circuit that generates control signals for controlling the head 42, the carriage moving unit 45, the transport unit 20, the first suction section drive unit 82a, the second suction section drive unit 82b, and the like based on the print data, and calculation results of the CPU 3.

[0051] The controller 1 perform a control of execution of an image forming operation of causing a head control signal for driving the head 42 and a carriage control signal for driving the carriage moving unit 45 to be generated, to cause the head 42 that is moved by the carriage 43 to discharge a liquid, and to form an image on the medium P.

[0052] The controller 1 performs a control of causing a transport operation to be executed, in which a transport control signal for driving the rotation driver of the transport unit 20 is generated to rotate the transporting belt 23, to transport the medium P.

[0053] The controller 1 causes the transport operation and the image forming operation to be alternately executed, to print a desired image based on image data on

the medium P.

[0054] The controller 1 generates a suction control signal for driving the first suction section drive unit 82a and the second suction section drive unit 82b, to perform a control of causing the suction unit 80 to execute a suction operation of suctioning the transporting belt 23 toward the medium support portion 70.

[0055] Next, a suction method 1 and a suction method 2 for the transporting belt 23 will be described below with reference to FIGS. 6 and 7. FIGS. 6 and 7 are cross-sectional views schematically illustrating a cross-sectional shape of the transporting belt 23.

[0056] The transporting belt 23 in FIG. 6 indicates a schematic cross-sectional shape before execution of the suction operation by the suction unit 80. The transporting belt 23 is curled to the back surface 23b side at its both end portions in the width direction, which are cut planes. The transporting belt 23 is stretched between the first roller 24 and the second roller 25 and is further tensioned. The both end portions of the transporting belt 23 that are curled may then be supported by the medium support portion 70 to make the both end portions serve as fulcrums, to thus cause the transporting belt 23 included in the first end portion region 23c and the second end portion region 23d to float up in an arc shape being convex upward (toward the + side of the Z axis) in the respective regions. FIG. 6 schematically illustrates a cross-sectional view of the transporting belt 23 in this state. For example, in case of the transporting belt 23 having width of 64 inches wide, there may occur, from the medium support portion 70, a floating-up of about 0.2mm within a range of approximately 200mm from the both end portions. Accordingly, the widths of the first end portion region 23c and the second end portion region 23d are set to be 200mm or greater and 300mm or less. An occurrence of floating-up of the transporting belt 23 may cause non-uniform distances between the medium P being in close contact with the transporting belt 23 and the head 42, to deteriorate the quality of the image formed on the medium P.

Suction method 1

[0057] In the suction method 1, the controller 1 performs a control of causing the suction operation to be executed during execution of the image forming operation and during execution of the transport operation. Specifically, the controller 1 drives the first suction section drive unit 82a and the second suction section drive unit 82b when causing the image forming operation and the transport operation to be executed. That is, the suction operation is constantly executed while the image forming operation and the transport operation are repeatedly executed. Because no through hole is formed at the first end portion region 23c and the second end portion region 23d of the transporting belt 23, the first end portion region 23c is suctioned, by the first suction section 81a, from the + side to the - side of the Z axis, and the second end

portion region 23d is suctioned, by the second suction section 81b, from the + side to the - side of the Z axis. As illustrated in FIG. 7, this suppresses the floating-up of the transporting belt 23, rendering the transporting belt 23 substantially parallel to the medium support portion 70. Further, the suction unit 80 is not provided in the center region 23e where the transporting belt 23 hardly floats up, thus making it possible to reduce members and a consumption of energy required for the suctioning. However, in case when the transporting belt 23 floats up at the center region 23e, a configuration may be employed, in which the suction unit 80 is provided at a position corresponding to the center region 23e, to cause the transporting belt 23 to be suctioned at the center region 23e toward the medium support portion 70. For example, a configuration may be employed in which the suction table 85 is also provided at a position corresponding to the center region 23e.

[0058] The controller 1 repeatedly causes the image forming operation and the transport operation to be executed, to form an image on the medium P. The image forming operation and the transport operation are executed concurrently with the suction operation, to cause the transporting belt 23 to be supported substantially parallel to the medium support portion 70. This results in substantially uniform distances between the medium P and the head 42, and an enhancement of the quality of the image formed on the medium P.

Suction method 2

[0059] In the suction method 2, the controller 1 causes the suction operation to be executed during execution of the image forming operation, and causes the suction operation to be not executed during execution of the transport operation. Specifically, the controller 1 drives the first suction section drive unit 82a and the second suction section drive unit 82b when causing the image forming operation to be executed, and ceases driving the first suction section drive unit 82a and the second suction section drive unit 82b when causing the transport operation to be executed. This allows, during execution of the image forming operation, the first suction section 81a to suction the transporting belt 23 at the first end portion region 23c from the + side to the - side of the Z-axis, and the second suction section 81b to suction the transporting belt 23 at the second end portion region 23d from the + side to the - side of the Z axis. As illustrated in FIG. 7, this suppresses the floating-up of the transporting belt 23 during the image formation process, rendering the transporting belt 23 substantially parallel to the medium support portion 70.

[0060] The controller 1 repeatedly causes the image forming operation accompanying the suction operation and the transport operation without accompanying the suction operation to be executed, to form an image on the medium P. During the image forming operation, a suction operation is executed to cause the transporting

belt 23 to be supported substantially parallel to the medium support portion 70. This results in substantially uniform distances between the medium P and the head 42, and an enhancement of the quality of the image formed on the medium P. Because the suction operation is not executed during execution of the transport operation, the frictional resistance between the medium support portion 70 and the transporting belt 23 is reduced. This reduces the transport load of the transporting belt 23. Note that, in the suction method 1 and the suction method 2, a configuration may also be employed in which the first suction section 81a and the second suction section 81b are driven by an identical suction drive unit.

[0061] Next, a suction method 3 and a suction method 4 that the controller 1 causes to be executed will be described below with reference to FIGS. 8 and 9. FIG. 8 is a cross-sectional view schematically illustrating a cross-sectional shape of the transporting belt 23. FIG. 9 is a cross-sectional view schematically illustrating a cross-sectional shape of the transporting belt 23 and a positional relationship of the suction unit 80.

[0062] The transporting belt 23 illustrated in FIG. 8 indicates a schematic cross-sectional shape before execution of the suction operation by the suction unit 80. In the transporting belt 23, the amount of floating-up at the first end portion region 23c may occasionally be different from the amount of floating-up at the second end portion region 23d. FIG. 8 schematically illustrates a cross-section of the transporting belt 23 in a state where the amount of floating-up of the first end portion region 23c is greater than the amount of floating-up of the second end portion region 23d.

Suction method 3

[0063] In the suction method 3, the controller 1 individually controls the first suction section drive unit 82a and the second suction section drive unit 82b to execute the suction operation, to make the suction force of the first suction section 81a greater than the suction force of the second suction section 81b. That is, the first end portion region 23c having a large amount of floating-up of the transporting belt 23 is exerted with a suction force that is greater than the suction force exerted on the second end portion region 23d having a small amount of the floating-up. This suppresses the floating-up of the transporting belt 23 having different amounts of floating-up between the first end portion region 23c and the second end portion region 23d, rendering the transporting belt 23 substantially parallel to the medium support portion 70. The controller 1 causes the suction operation to be executed during execution of the image forming operation, resulting in substantially uniform distances between the medium P and the head 42, and an enhancement of the quality of the image formed on the medium P.

Suction method 4

[0064] In the suction method 4, the suction table 85 constituting the first suction section 81a and the second suction section 81b can cause the adjustment bolts 88 to vary the distance between the suction table 85 and the transporting belt 23. As illustrated in FIG. 9, the second suction section 81b corresponding to the second end portion region 23d is altered, by adjustment of the adjustment bolts 88, to a position that is lower than the first suction section 81a corresponding to the first end portion region 23c. That is, the spacing between the second suction section 81b and the transporting belt 23 is set to be wider than the spacing between the first suction section 81a and the transporting belt 23. The controller 1 controls the first suction section drive unit 82a and the second suction section drive unit 82b to cause the suction operation to be executed. Even when the first suction section drive unit 82a and the second suction section drive unit 82b are driven to generate an equivalent magnitude of suction force, the suction forces, which are exerted on the transporting belt 23 at the first end portion region 23c and the second end portion region 23d, can be individually varied by adjusting of the heights of the first suction section 81a and the second suction section 81b.

[0065] In FIG. 9, the first end portion region 23c having a large amount of floating-up of the transporting belt 23 is exerted with a suction force that is greater than the suction force exerted on the second end portion region 23d having a small amount of the floating-up. This suppresses the floating-up of the transporting belt 23 having different amounts of floating-up between the first end portion region 23c and the second end portion region 23d, rendering the transporting belt 23 substantially parallel to the medium support portion 70. The controller 1 causes the suction operation to be executed during execution of the image forming operation, resulting in substantially uniform distances between the medium P and the head 42, and an enhancement of the quality of the image formed on the medium P. Note that the suction method 3 described above may be applied to the suction method 4 to individually vary the suction forces exerted on the transporting belt 23 at the first end portion region 23c and the second end portion region 23d.

[0066] As described above, according to the printer 100 according to Embodiment 1, the following advantages can be achieved.

[0067] The printer 100 includes the transporting belt 23 that transports the medium P, the first suction section 81a that suctions the transporting belt 23 at the first end portion region 23c toward the medium support portion 70, and the second suction section 81b that suctions the transporting belt 23 at the second end portion region 23d toward the medium support portion 70. Because no through hole is formed at the first end portion region 23c and the second end portion region 23d of the transporting belt 23, the transporting belt 23 is suctioned at the first end portion region 23c by the first suction section 81a

from the + side to the - side of the Z axis and the second end portion region 23d is suctioned by the second suction section 81b from the + side to the - side of the Z axis. This suppresses the transporting belt 23 from floating up from the medium support portion 70. Accordingly, the quality of the image formed on the medium P is enhanced.

[0068] None of the suction unit 80 is provided in the center region 23e where the transporting belt 23 hardly floats up, thus making it possible to reduce members and a consumption of energy required for the suctioning. However, in case when the transporting belt 23 floats up at the center region 23e, a configuration may be employed, in which the suction unit 80 is provided at a position corresponding to the center region 23e, to cause the transporting belt 23 to be suctioned at the center region 23e toward the medium support portion 70. For example, a configuration may be employed in which the suction table 85 is also provided at a position corresponding to the center region 23e.

[0069] The controller 1 can perform a control of causing the suction operation to be executed during execution of the image forming operation and during execution of the transport operation. The image forming operation and the transport operation are executed concurrently with the suction operation, to cause the transporting belt 23 to be supported substantially parallel to the medium support portion 70. This results in substantially uniform distances between the medium P and the head 42, and an enhancement of the quality of the image formed on the medium P.

[0070] The controller 1 can perform a control of causing the suction operation to be executed during execution of the image forming operation, and causes the suction operation to be not executed during execution of the transport operation. During the image forming operation, a suction operation is executed to cause the transporting belt 23 to be supported substantially parallel to the medium support portion 70. This results in substantially uniform distances between the medium P and the head 42, and an enhancement of the quality of the image formed on the medium P. Because the suction operation is not executed during execution of the transport operation, the frictional resistance between the medium support portion 70 and the transporting belt 23 is reduced, thus reducing the transport load of the transporting belt 23.

[0071] The printer 100 can individually vary the suction forces exerted by the first suction section 81a and the second suction section 81b in accordance with the amounts of floating-up of the transporting belt 23 at the first end portion region 23c and the second end portion region 23d. Specifically, the controller 1 can individually control the first suction section drive unit 82a and the second suction section drive unit 82b to vary the suction force of the first suction section 81a and the suction force of the second suction section 81b. This suppresses the floating-up of the transporting belt 23 having different amounts of floating-up between the first end portion re-

gion 23c and the second end portion region 23d, rendering the transporting belt 23 substantially parallel to the medium support portion 70.

[0072] Further, according to another method as well, the printer 100 can individually vary the suction forces exerted by the first suction section 81a and the second suction section 81b in accordance with the amounts of floating-up of the transporting belt 23 at the first end portion region 23c and the second end portion region 23d. Specifically, the suction table 85 constituting the first suction section 81a and the second suction section 81b is configured to cause the adjustment bolts 88 to vary the heights of the suction table 85. That is, the distance between the first suction section 81a and the first end portion region 23c, and the distance between the second suction section 81b and the second end portion region 23d are individually varied, to thus individually vary the suction forces exerted on the first end portion region 23c and the second end portion region 23d. This suppresses the floating-up of the transporting belt 23 having different amounts of floating-up between the first end portion region 23c and the second end portion region 23d, rendering the transporting belt 23 substantially parallel to the medium support portion 70.

[0073] The first suction section 81a and the second suction section 81b are each constituted by two suction tables 85 provided between two of the three beam members that constitute the medium support portion 70. This allows the suction tables 85 to be disposed in the vicinity of the transporting belt 23, to thus cause the first suction section 81a to efficiently suction the transporting belt 23 at the first end portion region 23c from the + side to the - side of the Z axis, and to thus cause the second suction section 81b to efficiently suction the transporting belt 23 at the second end portion region 23d from the + side to the - side of the Z axis.

Embodiment 2

[0074] FIG. 10 is an enlarged perspective view illustrating a periphery of a medium support portion 170 according to Embodiment 2. A suction unit 180 of Embodiment 2 will be described below with reference to FIG. 10. Note that, in FIG. 10, the transporting belt 23 is omitted to be illustrated for convenience of explanation. In addition, the same components as in Embodiment 1 are given the same reference signs, and redundant descriptions of these components will be omitted.

[0075] The medium support portion 170 being a support portion is configured such that a plurality of hollow beam members, which have the width direction of the medium P intersecting the transport direction as the longitudinal direction, are provided along the transport direction. The beam members correspond, in the order from the upstream of the transport direction, to the first medium support portion, the second medium support portion, and the third medium support portion. Accordingly, the medium support portion 170 is configured to in-

clude a first medium support portion, a second medium support portion provided spaced apart from the first medium support portion in the transport direction, and a third medium support portion provided spaced apart from the second medium support portion in the transport direction. That is, the medium support portion 170 supports the transporting belt 23 by the three beam members. The medium support portion 170 is provided with suction holes 175 at a surface that supports the transporting belt 23. The suction holes 175 are then provided in a region overlapping with the first end portion region 23c and the second end portion region 23d at the medium support portion 170. The suction unit 180 includes a first suction section 181a provided at a position at which the first suction section 181a suctions the transporting belt 23 at the first end portion region 23c toward the medium support portion 170, and a second suction section 181b provided at a position at which the second suction section 181b suctions the transporting belt 23 at the second end portion region 23d toward the medium support portion 170.

[0076] The first suction section 181a is located, in the print region PA, facing the back surface 23b of the first end portion region 23c of the transporting belt 23. The first suction section 181a is constituted by two suction tables 85 provided between two of the three beam members that constitute the medium support portion 170. More specifically, the first suction section 181a is constituted by two suction tables 85 consisting of the suction table 85 provided between the first medium support portion and the second medium support portion, and the suction table 85 provided between the second medium support portion and the third medium support portion. The first suction section 181a includes a first suction section drive unit 82a, and the through hole 85b of the suction table 85 constituting the first suction section 181a is in communication with the first suction section drive unit 82a through the suction tube 87. Further, the suction hole 175 provided at a position corresponding to the first end portion region 23c is in communication with the first suction section drive unit 82a through the suction tube 87. The first suction section 181a causes the suction table 85 to suction a portion of the transporting belt 23, which is not supported by the medium support portion 170, from the + side to the - side of the Z axis. Concurrently therewith, the medium support portion 170 suctions the transporting belt 23 through the suction holes 175 provided at a position corresponding to the first end portion region 23c.

[0077] The second suction section 181b is located, in the print region PA, facing the back surface 23b of the second end portion region 23d of the transporting belt 23. The second suction section 181b is constituted by two suction tables 85 provided between two of the three beam members that constitute the medium support portion 170. More specifically, the second suction section 181b is constituted by two suction tables 85 consisting of the suction table 85 provided between the first medium support portion and the second medium support portion,

and the suction table 85 provided between the second medium support portion and the third medium support portion. The second suction section 181b includes the second suction section drive unit 82b, and the through hole 85b of the suction table 85 constituting the second suction section 181b is in communication with the second suction section drive unit 82b through the suction tube 87. The second suction section 181b causes the suction table 85 to suction a portion of the transporting belt 23, which is not supported by the medium support portion 170, from the + side to the - side of the Z axis. Concurrently therewith, the medium support portion 170 suctions the transporting belt 23 through the suction holes 175 provided at a position corresponding to the second end portion region 23d.

[0078] Such a configuration allows, in the transporting belt 23, the portion supported by the medium support portion 170 and the portion being not supported by the medium support portion 170 to be suctioned together. This further suppresses the floating-up of the transporting belt 23, rendering the transporting belt 23 parallel to the medium support portion 170. The controller 1 causes the suction operation to be executed during execution of the image forming operation, resulting in substantially uniform distances between the medium P and the head 42, and an enhancement of the quality of the image formed on the medium P. Note that in Embodiment 2, a configuration may also be employed in which the first suction section 181a and the second suction section 181b are driven by an identical suction drive unit. In addition, in Embodiment 2, the suction drive unit that drives the suction hole 175 is shared with the suction drive unit that drives the suction unit 180, however, a configuration may be employed in which the suction drive unit that drives the suction hole 175 is provided separately from the suction drive unit that drives the suction unit 180.

[0079] In addition, in Embodiment 2, neither the suction unit 180 nor the suction hole 175 are provided in the center region 23e where the transporting belt 23 hardly floats up, thus making it possible to reduce members and a consumption of energy required for the suctioning. However, in case when the transporting belt 23 floats up at the center region 23e, a configuration may be employed, in which the suction unit 180 and the suction hole 175 are provided at positions corresponding to the center region 23e, to cause the transporting belt 23 to be suctioned at the center region 23e toward the medium support portion 170. Then, a configuration may also be employed in which one of the suction unit 180 or the suction hole 175 is provided at a position corresponding to the center region 23e.

Embodiment 3

[0080] FIG. 11 is an enlarged perspective view illustrating a periphery of a medium support portion 270 according to Embodiment 3. A suction unit 280 of Embodiment 3 will be described below with reference to FIG.

11. Note that in FIG. 11, the transporting belt 23 is omitted to be illustrated for convenience of explanation. In addition, the same components as in Embodiment 1 are given the same reference signs, and redundant descriptions of these components will be omitted.

[0081] The medium support portion 270 being a support portion forms a hollow rectangular parallelepiped and supports the transporting belt 23. The medium support portion 270 is supported by a support stage 270a attached onto the frame 10, and is provided in a region overlapping with the print region PA. The suction unit 280, which includes a first suction section 281a that suctions the transporting belt 23 at the first end portion region 23c, and a second suction section 281b that suctions the transporting belt 23 at the second end portion region 23d, is configured integrally with the medium support portion 270. Specifically, at the medium support portion 270, a suction hole 275 passing through a surface supporting the transporting belt 23 is provided in a region overlapping with the first end portion region 23c and the second end portion region 23d. A non-illustrated suction unit drive unit is provided inside the medium support portion 270.

[0082] The transporting belt 23 is suctioned through the suction holes 275 provided at the medium support portion 270. This further suppresses the floating-up of the transporting belt 23, rendering the transporting belt 23 parallel to the medium support portion 270. The controller 1 causes the suction operation to be executed during execution of the image forming operation, resulting in substantially uniform distances between the medium P and the head 42, and an enhancement of the quality of the image formed on the medium P. Further, the suction unit 280 is configured integrally with the medium support portion 270, thus making it possible to reduce the component count and required spaces when providing of the suction unit 280.

[0083] Moreover, in the suction unit 280, the suction holes 275 is not provided in the center region 23e where the transporting belt 23 hardly floats up, thus making it possible to reduce a burden required to process the suction hole and a consumption of energy required for the suctioning. However, in case when the transporting belt 23 floats up at the center region 23e, a configuration may be employed, in which the suction holes 275 are provided at a position corresponding to the center region 23e, to cause the transporting belt 23 to be suctioned at the center region 23e toward the medium support portion 270. Note that in Embodiment 3, the configuration is presented in which the medium support portion 270 includes a plurality of suction holes 275 for suctioning the transporting belt 23, however, a configuration may also be employed in which the medium support portion 270 is configured to include a suction groove and a through hole for suctioning the transporting belt 23.

Embodiment 4

[0084] FIG. 12 is a cross-sectional view schematically illustrating a cross-sectional shape of the transporting belt 23 according to Embodiment 4. FIG. 13 is a cross-sectional view schematically illustrating a cross-sectional shape of the transporting belt 23 regulated by a belt regulating portion 385. In Embodiment 1, the method is described in which, when the transporting belt 23 floats up in an arc shape being convex upward (toward the + side of the Z axis), the floating up is suppressed by the suctioning of the suction unit 80, however, in Embodiment 4, a method of suppressing floating-up when the transporting belt 23 floats up in a different shape will be described.

[0085] The transporting belt 23 in FIG. 12 indicates a schematic cross-sectional shape before the floating-up is suppressed. The transporting belt 23 may be curled to the front surface 23a side at its both end portions being cut planes in the width direction, depending on the cutting direction of the both end portions or the like. The transporting belt 23 is stretched between the first roller 24 and the second roller 25 and is further tensioned. The transporting belt 23 is then supported at the center region 23e by the medium support portion 70, and thus the both end portions of the transporting belt 23 may warp upward (toward the + side of the Z axis) at the first end portion region 23c and the second end portion region 23d.

[0086] Hence, the medium support portion 70 is provided with the belt regulating portion 385 for regulating the warping-up of the both end portions of the transporting belt 23. The belt regulating portion 385 is an L-shaped metal fitting covering the both end portions of the transporting belt 23 from above, where the metal fitting is coupled to the medium support portion 70 at the outer side from the both end portions of the transporting belt 23. The belt regulating portion 385 covers, in the print region PA, the both end portions of the transporting belt 23. The height of a portion of the belt regulating portion 385, which covers the transporting belt 23, is set to be lower than a print gap being the distance between the head 42 and the transporting belt 23. For the belt regulating portion 385, a stainless steel having excellent wear resistance and slidability may be used.

[0087] As illustrated in FIG. 13, the belt regulating portion 385 suppresses the transporting belt 23 from warping, rendering the transporting belt 23 substantially parallel to the medium support portion 70. This results in substantially uniform distances between the medium P and the head 42, and an enhancement of the quality of the image formed on the medium P. Note that descriptions have been given that the transporting belt 23 that warps in the shape illustrated in FIG. 12 is suppressed from warping by the belt regulating portion 385, however, the transporting belt 23 that warps in the shape illustrated in FIG. 12 may be suppressed from warping by the suctioning of the suction units 80, 180, and 280 presented in Embodiments 1 to 3.

[0088] Contents derived from the Embodiments will be described below.

[0089] An inkjet printer of the present disclosure includes a transporting belt configured to support a medium and rotate to transport the medium in a transport direction, a discharge unit configured to discharge a liquid onto the medium supported by the transporting belt, a support portion that supports the transporting belt, and a suction unit configured to suction the transporting belt toward the support portion, in which provided that a direction intersecting the transport direction is a width direction, no through-hole is provided through the transporting belt in a thickness direction at a first end portion region being a region including an end portion on a first side of the transporting belt in the width direction and a second end portion region being a region including an end portion on a second side in the width direction, in which the suction unit is disposed at a position where the suction unit suctions the transporting belt at the first end portion region and the second end portion region toward the support portion.

[0090] According to the above configuration, the inkjet printer includes a transporting belt that supports the medium and transports the medium in the transport direction. The transporting belt is supported by the support portion. The suction unit suctions the first end portion region and the second end portion region, which are the both end portions of the transporting belt in the width direction, toward the support portion. No through hole is formed at the first end portion region and the second end portion region. This allows the transporting belt are suitably suctioned at the first end portion region and the second end portion region toward the support portion, thus suppressing the floating-up of the transporting belt from the support portion. Accordingly, the quality of the image formed on the medium is enhanced.

[0091] In the inkjet printer described above, the suction unit may be configured to be disposed at a position where the suction unit does not suction the transporting belt at a center region located between the first end portion region and the second end portion region toward the support portion.

[0092] According to the above configuration, the suction unit does not suction the transporting belt at the center region in the width direction. Non-suctioning of the transporting belt at the center region that hardly floats up from the support portion makes it possible to reduce members and a consumption of energy required for the suctioning.

[0093] The inkjet printer described above may include a controller configured to perform a control of execution of an image forming operation of causing the discharge unit to discharge a liquid, to form an image on the medium, a transport operation of rotating the transporting belt to transport the medium, and a suction operation of causing the suction unit to suction the transporting belt toward the support portion, in which the controller may be configured to execute the suction operation during execution

of the image forming operation and during execution of the transport operation.

[0094] According to the above configuration, the controller causes the suction operation to be executed during execution of the transport operation in addition to during execution of the image forming operation, thus constantly suppressing the transporting belt from floating up. This enhances the quality of the image formed on the medium.

[0095] The inkjet printer described above may include a controller configured to perform a control of execution of an image forming operation of causing the discharge unit to discharge a liquid, to form an image on the medium, a transport operation of rotating the transporting belt to transport the medium, and a suction operation of causing the suction unit to suction the transporting belt toward the support portion, in which the controller may be configured to execute the suction operation during execution of the image forming operation and to cause the suction operation to be not executed during execution of the transport operation.

[0096] According to the above configuration, the controller causes the suction operation to be executed during execution of the image forming operation, thus suppressing the transporting belt 23 from floating up during the image forming operation, and enhancing the quality of the image formed on the medium. Further, the controller, which causes the suction operation to be not executed during the transport operation, thus reducing the transport load of the transporting belt.

[0097] In the inkjet printer described above, the suction unit may include a first suction section configured to suction the transporting belt at the first end portion region, and a second suction section configured to suction the transporting belt at the second end portion region, in which the first suction section and the second suction section may be configured to individually vary a suction force exerted on the transporting belt.

[0098] According to the above configuration, the suction forces exerted by the first suction section and the second suction section are individually varied in accordance with the amounts of floating-up of the transporting belt at the first end portion region and the second end portion region, to thus suppress the transporting belt from floating up in a further suitable manner.

[0099] In the inkjet printer described above, the support portion may be configured to include a first support section and a second support section provided spaced apart from the first support section in the transport direction, and the suction unit may be configured to be provided between the first support section and the second support section.

[0100] According to the above configuration, the suction unit is provided between the first support section and the second support section provided spaced apart from each other along the transport direction. This allows the suction unit to be disposed in the vicinity of the transporting belt, thus making it possible to efficiently suction the transporting belt toward the support portion.

[0101] In the inkjet printer described above, the support portion may be configured to be provided with a suction hole at a surface that supports the transporting belt, the suction unit may be configured to suction, toward the support portion a portion of the transporting belt being not supported by the support portion, and the support portion may be configured to suction the transporting belt through the suction hole.

[0102] According to the above configuration, the suction unit suctions a portion that is not supported by the support portion, and the support portion suctions the transporting belt through the suction hole provided in the support portion, thus suppressing the transporting belt from floating up in a suitable manner.

[0103] In the inkjet printer described above, the support portion may be configured to be provided with a suction hole passing through a surface that supports the transporting belt, and the suction unit may be configured integrally with the support portion, and configured to suction the transporting belt through the suction hole.

[0104] According to this configuration, According to the above configuration, the suction unit is configured integrally with the support portion and is disposed to suction the transporting belt through the suction unit provided in the support portion, thus making it possible to reduce the component count and required spaces when providing of the suction unit.

Claims

1. An inkjet printer comprising:

a transporting belt configured to support a medium and rotate to transport the medium in a transport direction;
 a discharge unit configured to discharge a liquid onto the medium supported by the transporting belt;
 a support portion that supports the transporting belt; and
 a suction unit configured to suction the transporting belt toward the support portion, wherein provided that a direction intersecting the transport direction is a width direction,
 no through-hole is provided through the transporting belt in a thickness direction at a first end portion region being a region including an end portion on a first side of the transporting belt in the width direction and a second end portion region being a region including an end portion on a second side in the width direction, wherein the suction unit is disposed at a position where the suction unit suctions the transporting belt at the first end portion region and the second end portion region toward the support portion.

2. The inkjet printer according to claim 1, wherein

the suction unit is disposed at a position where the suction unit does not suction the transporting belt at a center region located between the first end portion region and the second end portion region toward the support portion.

3. The inkjet printer according to claim 1 or 2, comprising
a controller configured to perform a control of execution of
an image forming operation of causing the discharge unit to discharge a liquid, to form an image on the medium,
a transport operation of rotating the transporting belt to transport the medium, and
a suction operation of causing the suction unit to suction the transporting belt toward the support portion, wherein
the controller is configured to execute the suction operation during execution of the image forming operation and during execution of the transport operation.

5
10
15
20
4. The inkjet printer according to claim 1 or 2, comprising
a controller configured to perform a control of execution of
an image forming operation of causing the discharge unit to discharge a liquid, to form an image on the medium,
a transport operation of rotating the transporting belt to transport the medium, and
a suction operation of causing the suction unit to suction the transporting belt toward the support portion, wherein
the controller is configured to execute the suction operation during execution of the image forming operation and to cause the suction operation to be not executed during execution of the transport operation.

25
30
35
40
5. The inkjet printer according to any one of claims 1 to 4, wherein
the suction unit includes a first suction section configured to suction the transporting belt at the first end portion region, and a second suction section configured to suction the transporting belt at the second end portion region, wherein
the first suction section and the second suction section are configured to individually vary a suction force exerted on the transporting belt.

45
50
6. The inkjet printer according to any one of claims 1 to 5, wherein
the support portion includes a first support section and a second support section provided spaced apart from the first support section in the transport direction, and

55

the suction unit is provided between the first support section and the second support section.

7. The inkjet printer according to any one of claims 1 to 6, wherein
the support portion is provided with a suction hole at a surface that supports the transporting belt, the suction unit is configured to suction, toward the support portion, a portion of the transporting belt being not supported by the support portion, and the support portion is configured to suction the transporting belt through the suction hole.

5
10
15
20
8. The inkjet printer according to any one of claims 1 to 6, wherein
the support portion is provided with a suction hole passing through a surface that supports the transporting belt, and
the suction unit is configured integrally with the support portion, and configured to suction the transporting belt through the suction hole.

25
30
35
40

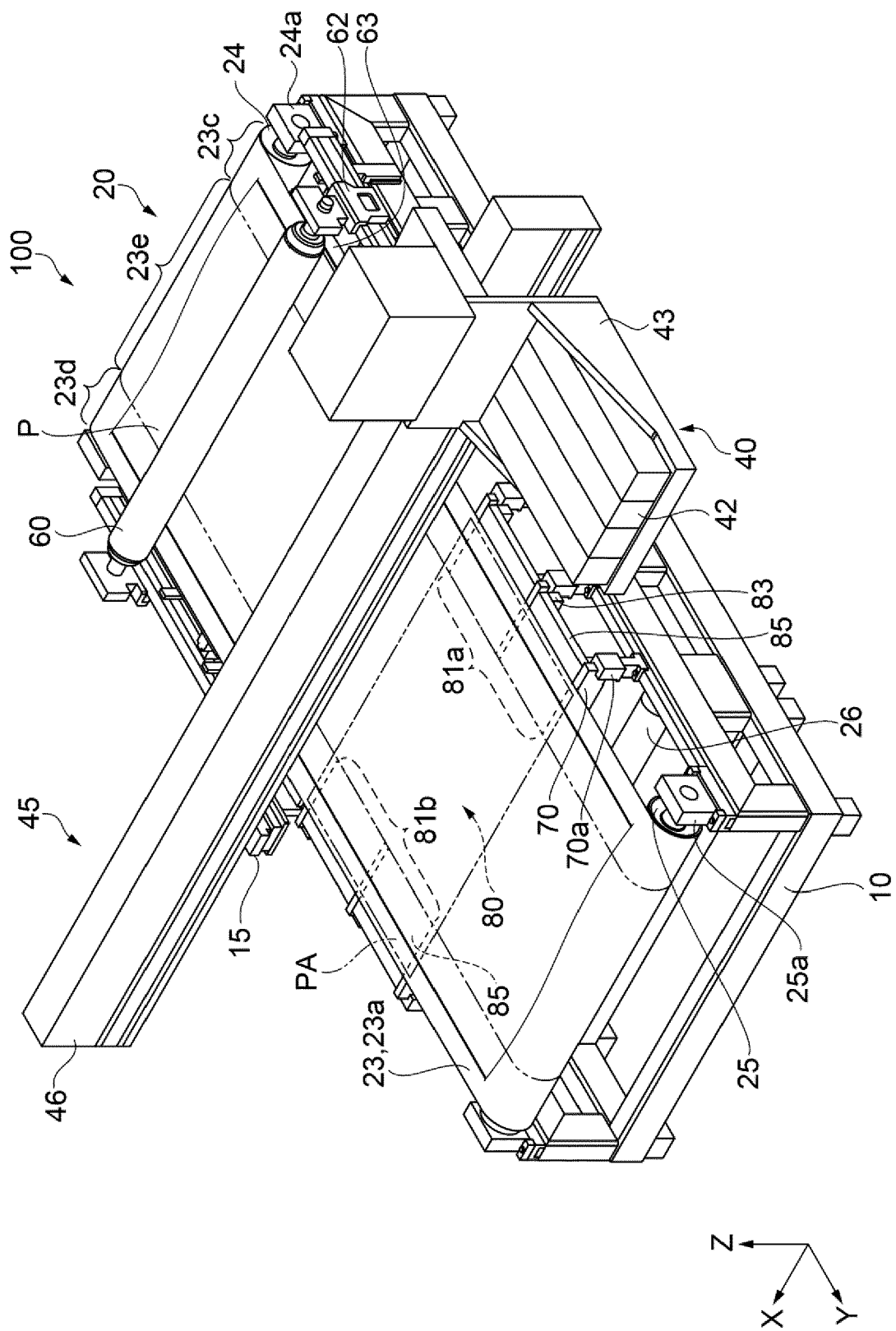


FIG. 1

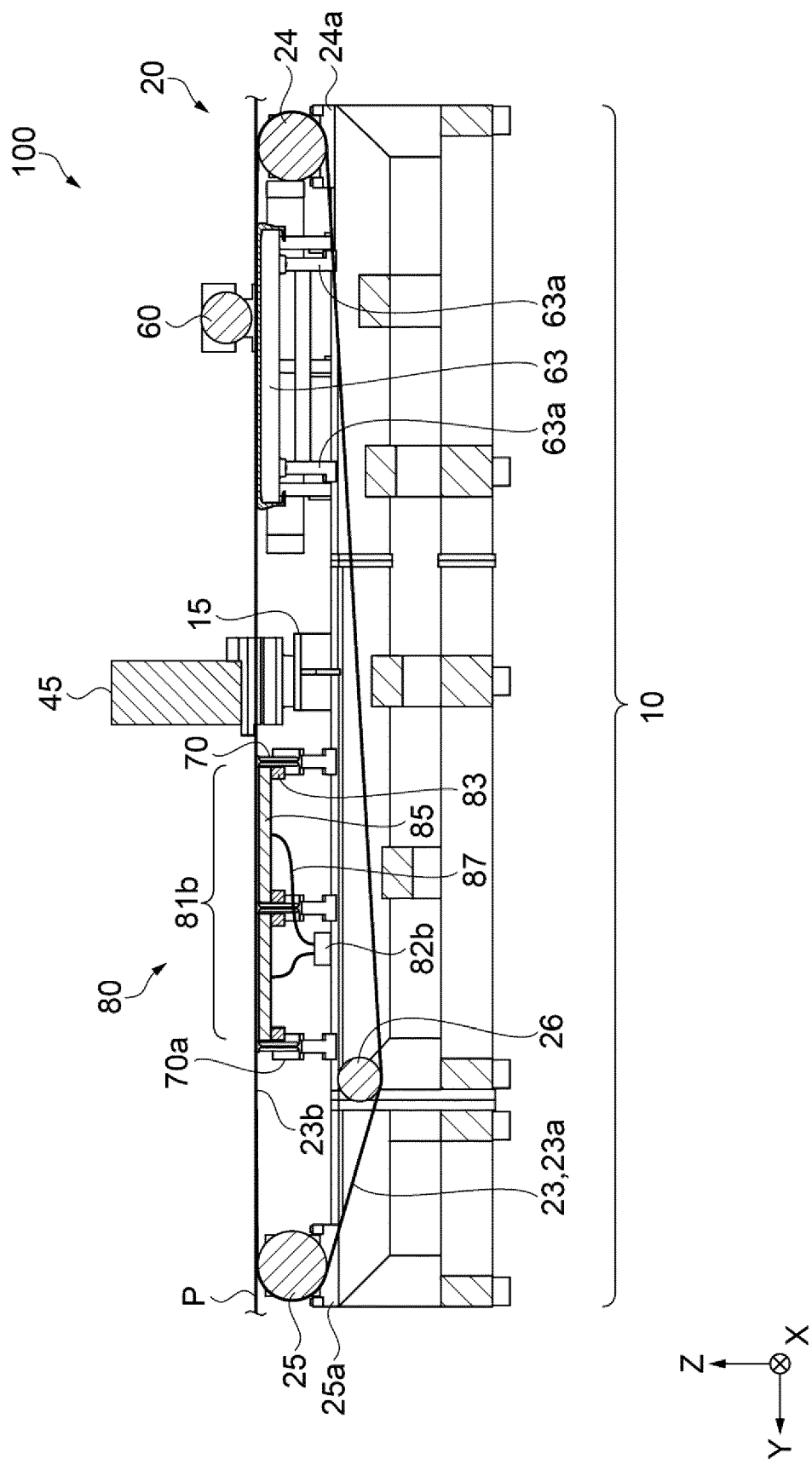


FIG. 2

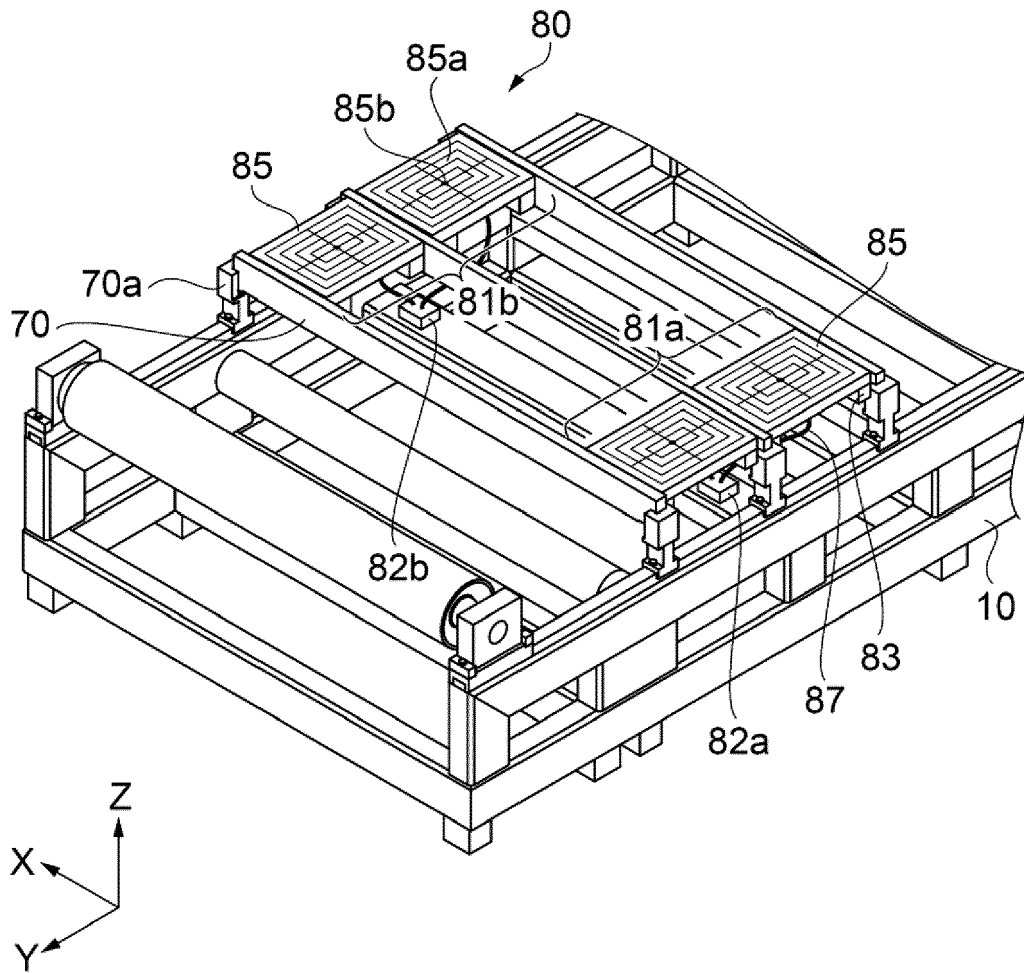


FIG. 3

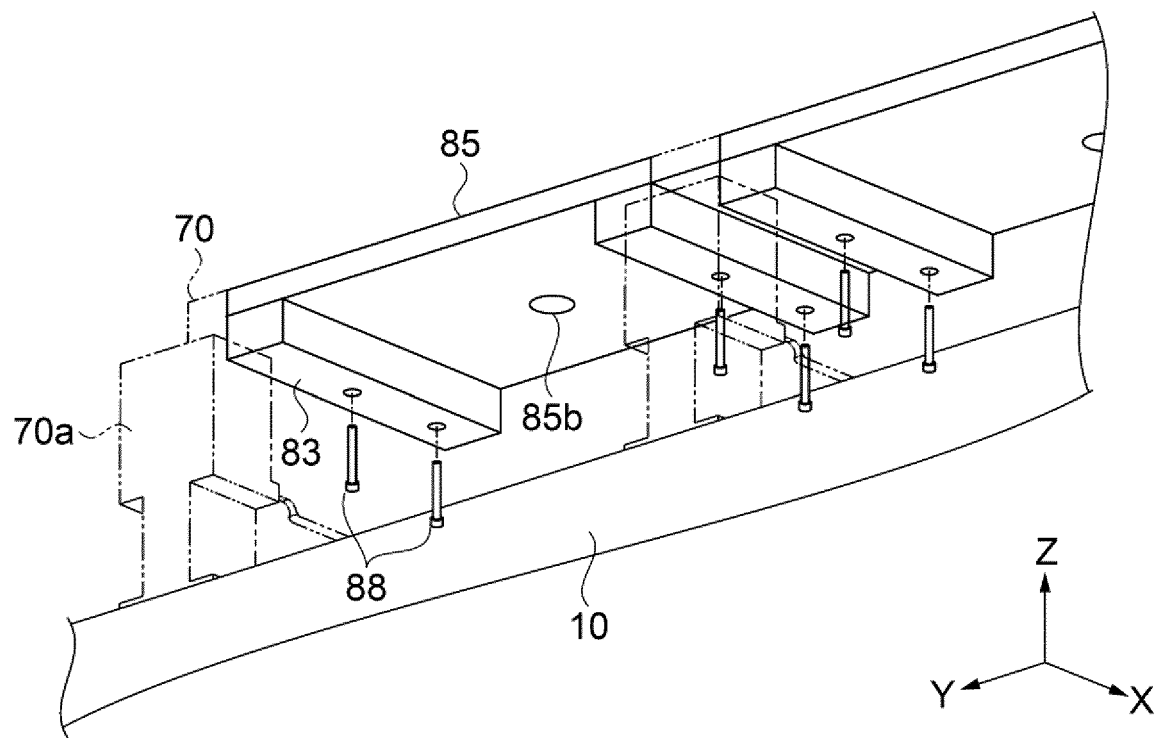


FIG. 4

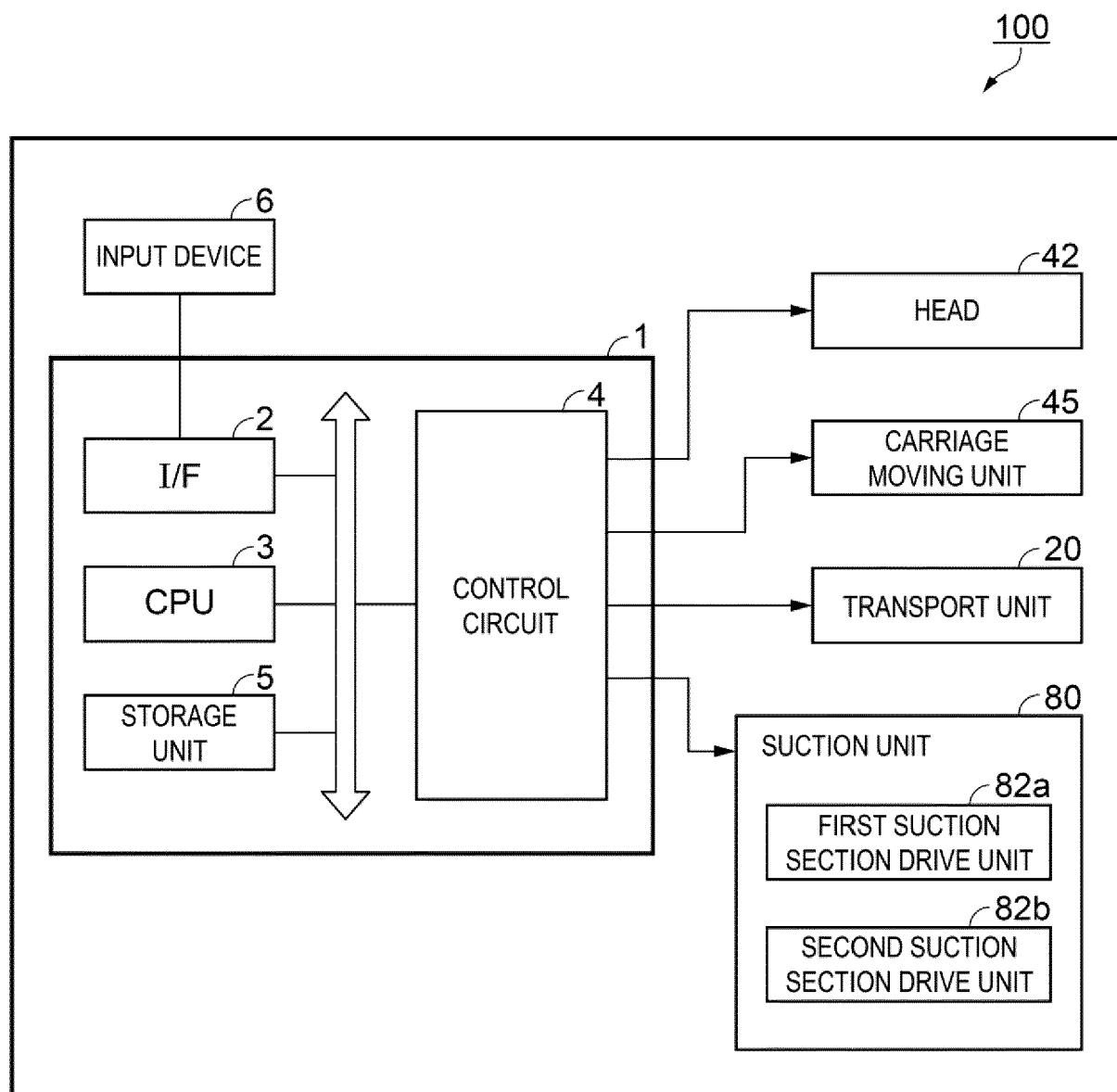


FIG. 5

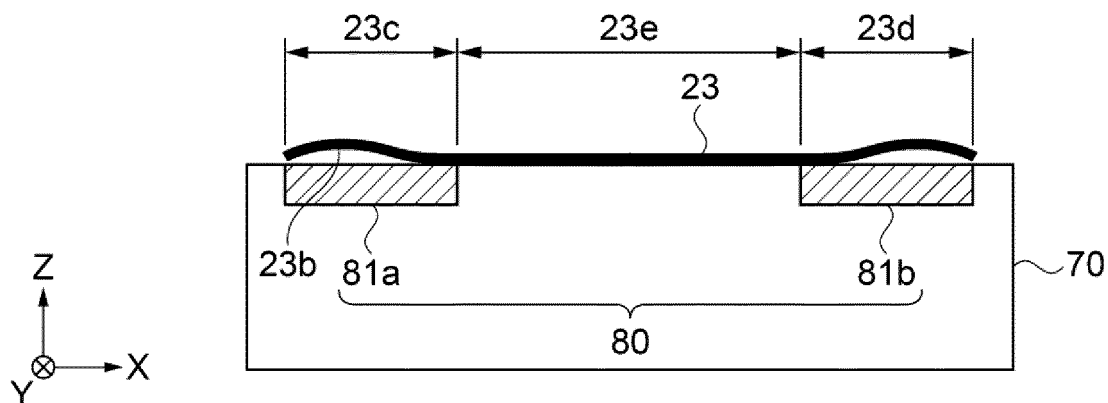


FIG. 6

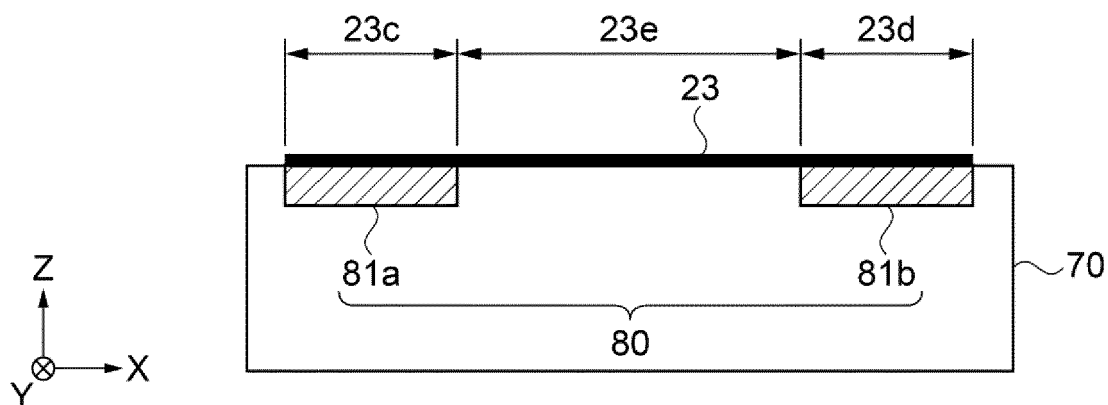


FIG. 7

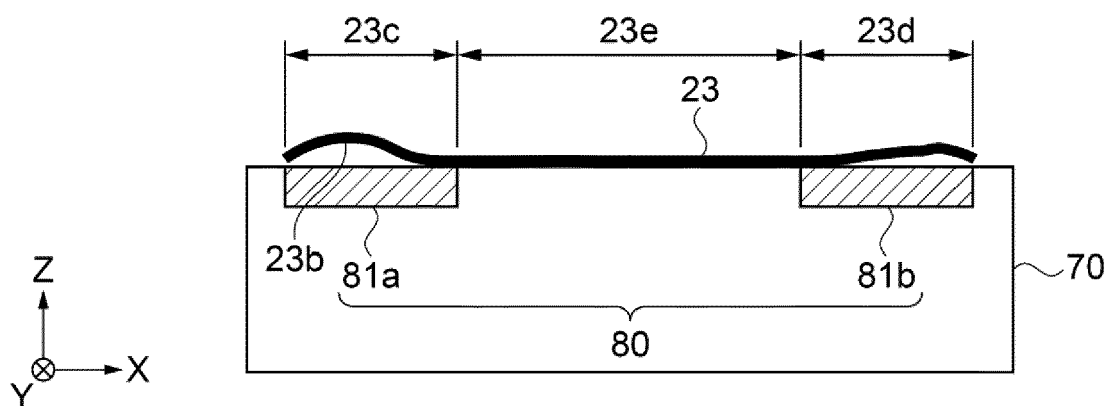


FIG. 8

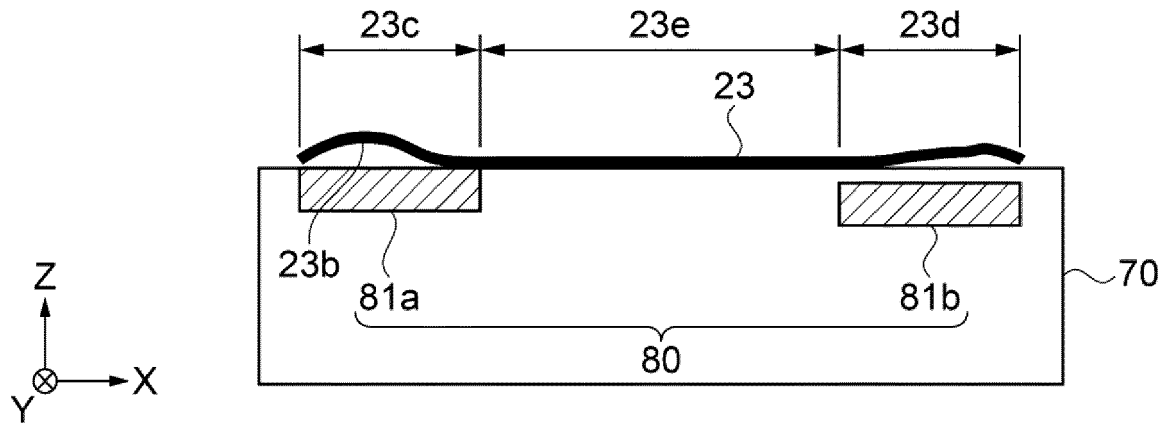


FIG. 9

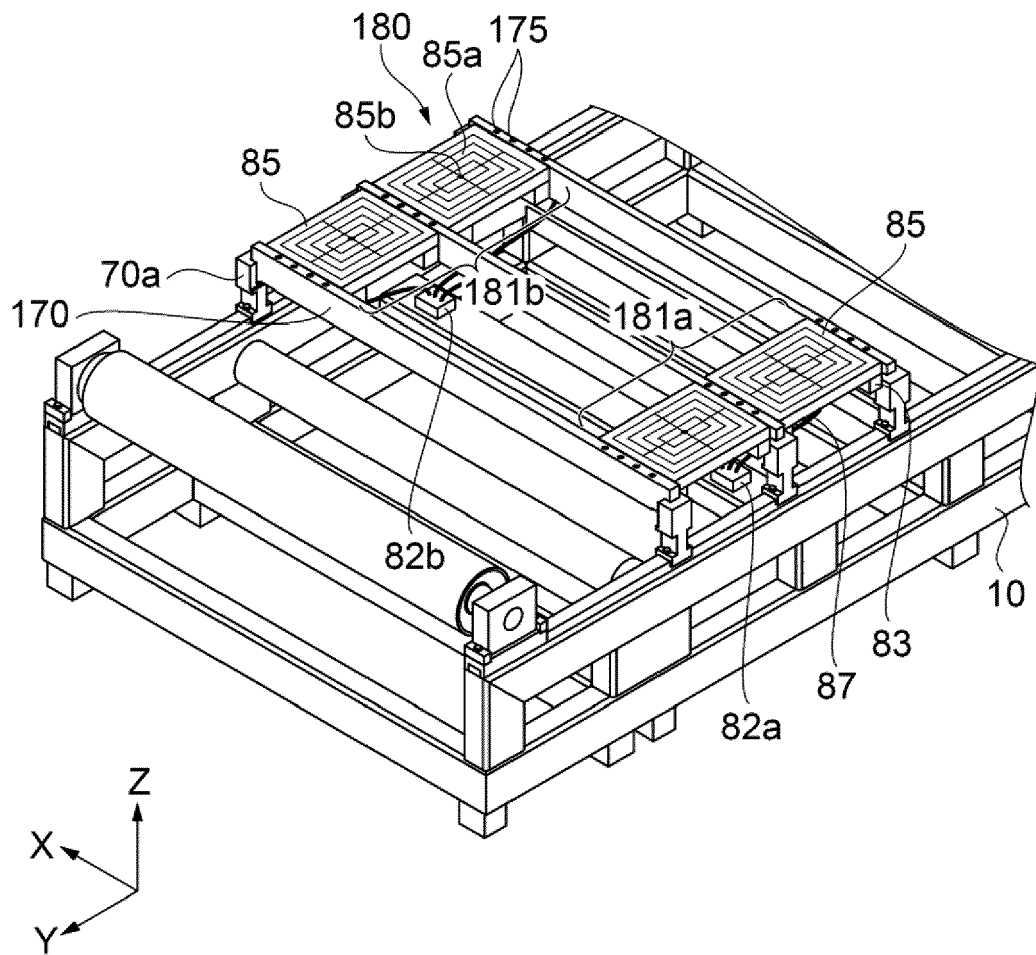


FIG. 10

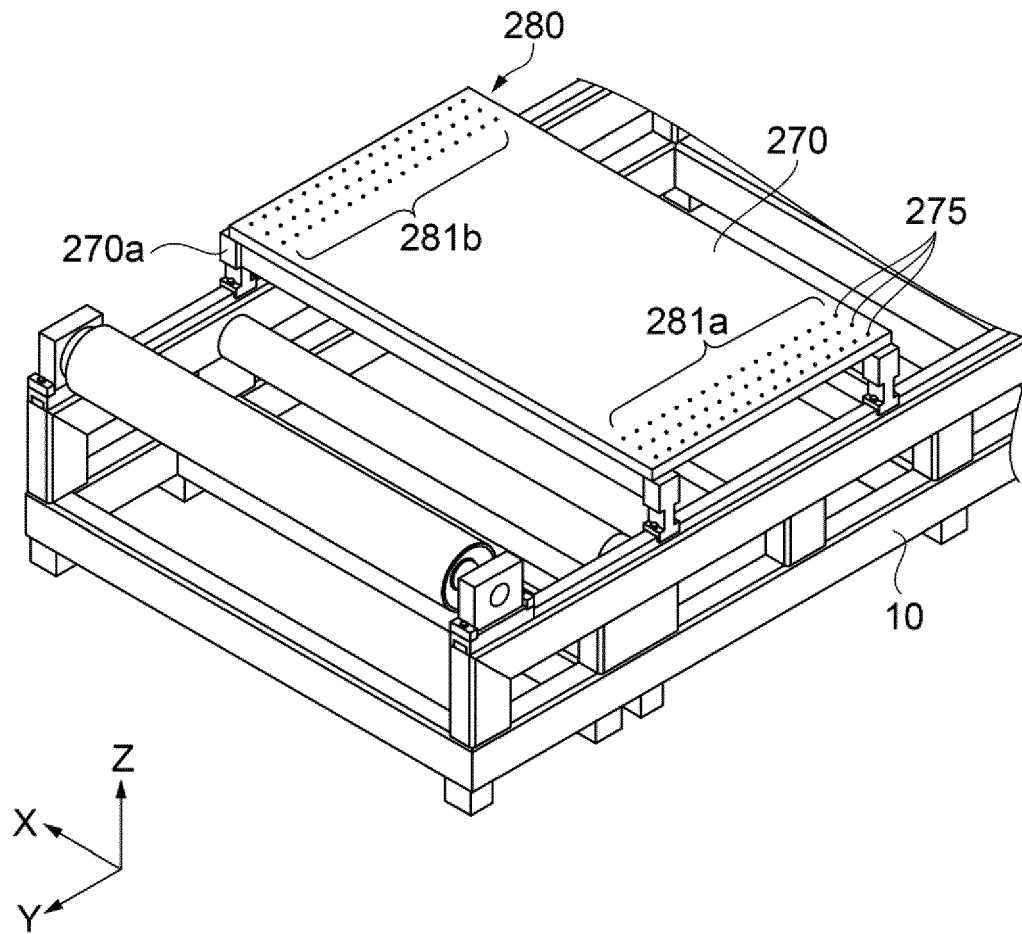


FIG. 11

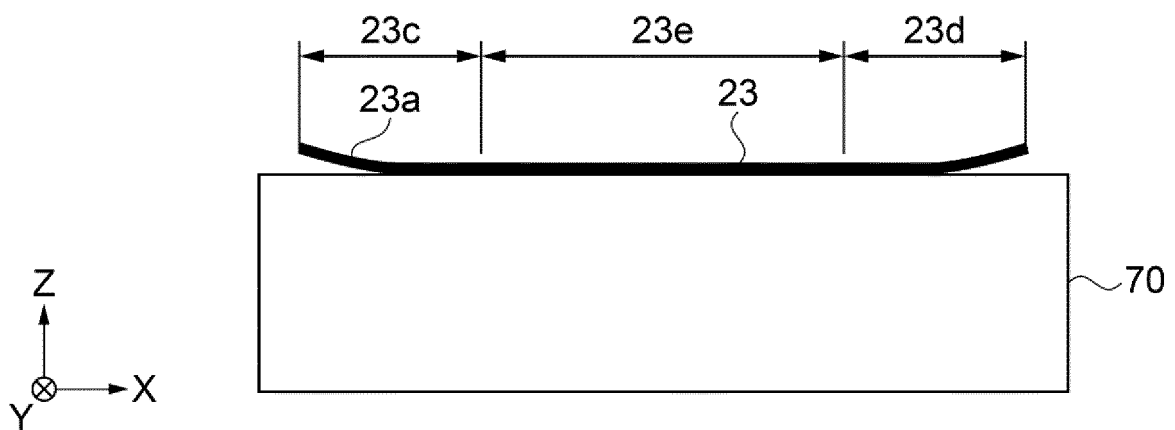


FIG. 12

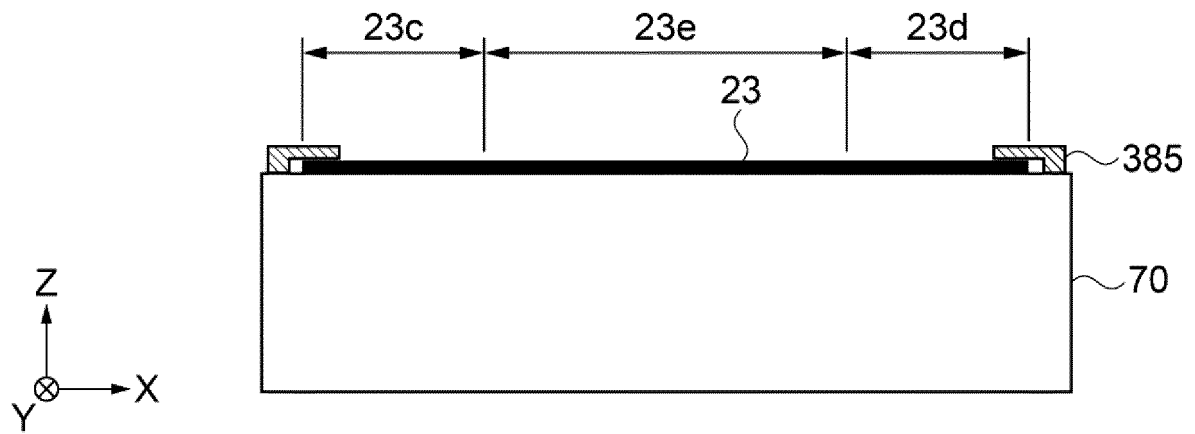


FIG. 13



EUROPEAN SEARCH REPORT

 Application Number
 EP 19 21 0241

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X A	US 6 406 017 B1 (YANEDA TAKESHI [JP]) 18 June 2002 (2002-06-18) * column 1, lines 6-14 * * column 6, line 47 - column 10, line 14 * * claims 1-14; figures 1-11 *	1,3,4,7, 8 2,5,6	INV. B41J11/00
X A	US 2011/227980 A1 (SAITOH ATSUSHI [JP] ET AL) 22 September 2011 (2011-09-22) * paragraphs [0045] - [0050]; figures 1, 2, 9, 14 *	1,3,4,7, 8 2,5,6	
X A	JP 2014 237258 A (CANON FINETECH INC.) 18 December 2014 (2014-12-18) * abstract; figures 2, 11-13 *	1,3,4,7, 8 2,5,6	
			TECHNICAL FIELDS SEARCHED (IPC)
			B41J B65H
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 12 March 2020	Examiner Bacon, Alan
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

 1
 EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 19 21 0241

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

12-03-2020

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6406017 B1	18-06-2002	DE 60014262 T2	06-10-2005
		EP 1069060 A2	17-01-2001
		JP 3469824 B2	25-11-2003
		JP 2001031286 A	06-02-2001
		US 6406017 B1	18-06-2002

US 2011227980 A1	22-09-2011	JP 5724406 B2	27-05-2015
		JP 2011213095 A	27-10-2011
		US 2011227980 A1	22-09-2011

JP 2014237258 A	18-12-2014	NONE	

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- JP 2018217349 A [0001]
- JP 2004136533 A [0003] [0004]