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(54) **RECORDING DEVICE AND CONTROL METHOD FOR RECORDING DEVICE**

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(52) **U.S. Cl.**

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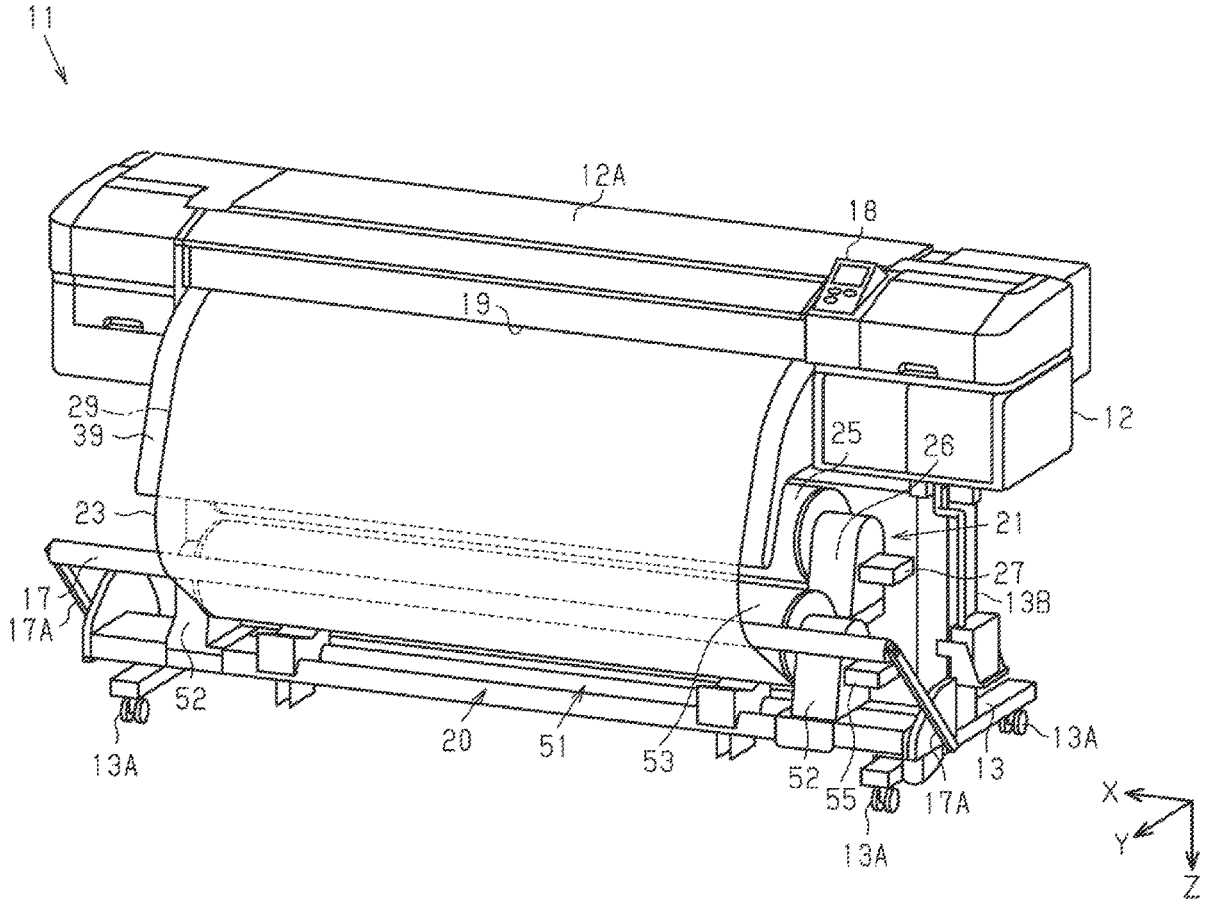
(57) **ABSTRACT**

A recording device includes a roll holding unit, a transport mechanism, a recording unit, a rear end detector, a cutting mechanism, and a control unit. The roll holding unit holds a roll in which a long medium is wound around a core body. The transport mechanism transports the medium supplied from the roll in a transport direction along a transport path. The recording unit performs recording on the transported medium. The rear end detector detects that all of the medium suppliable from the roll was supplied by the transport mechanism. The cutting mechanism cuts the medium in an intersecting direction intersecting the transport direction at a position between the roll holding unit and the recording unit. The control unit cuts the medium by the cutting mechanism based on rear end detection information from the rear end detector.



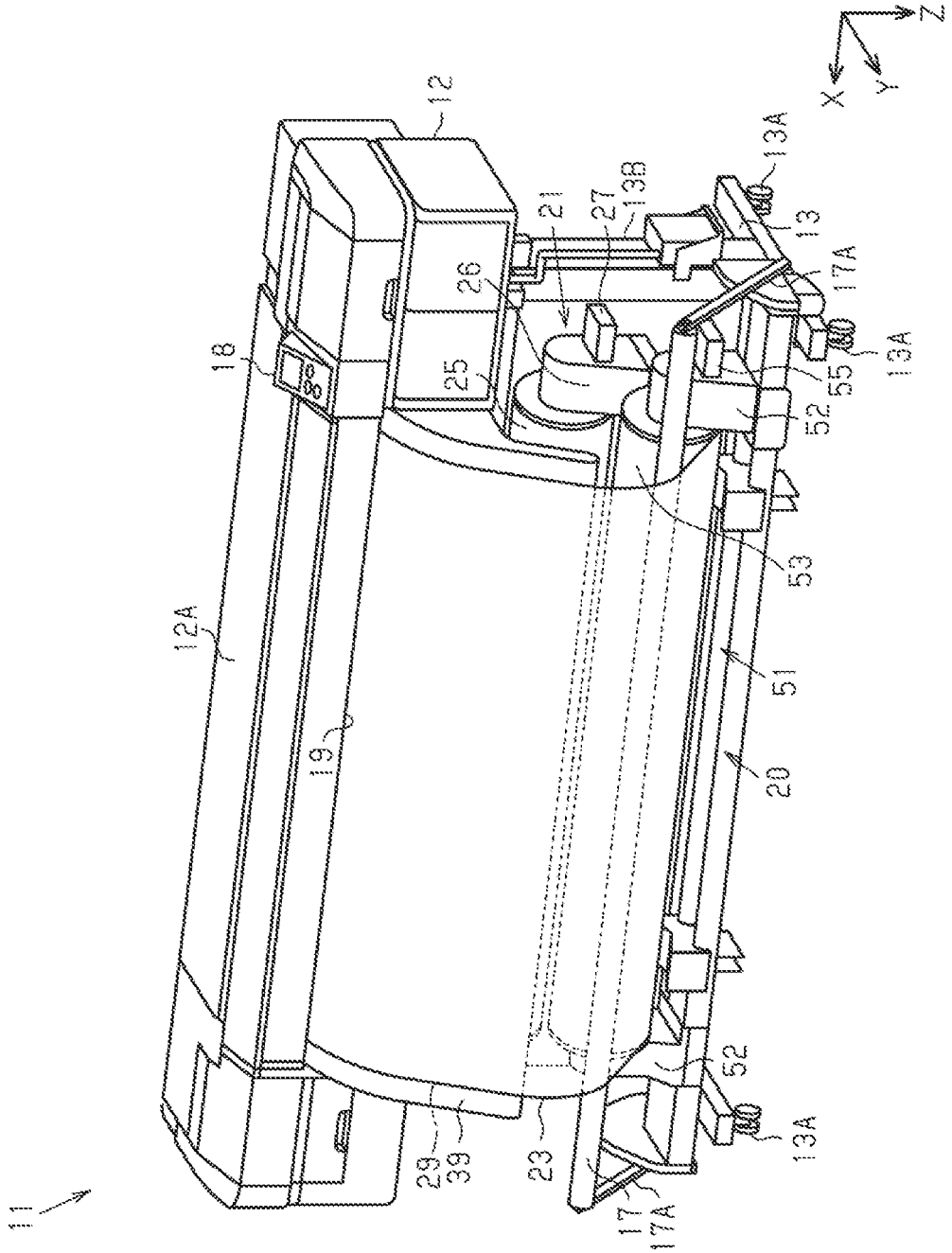
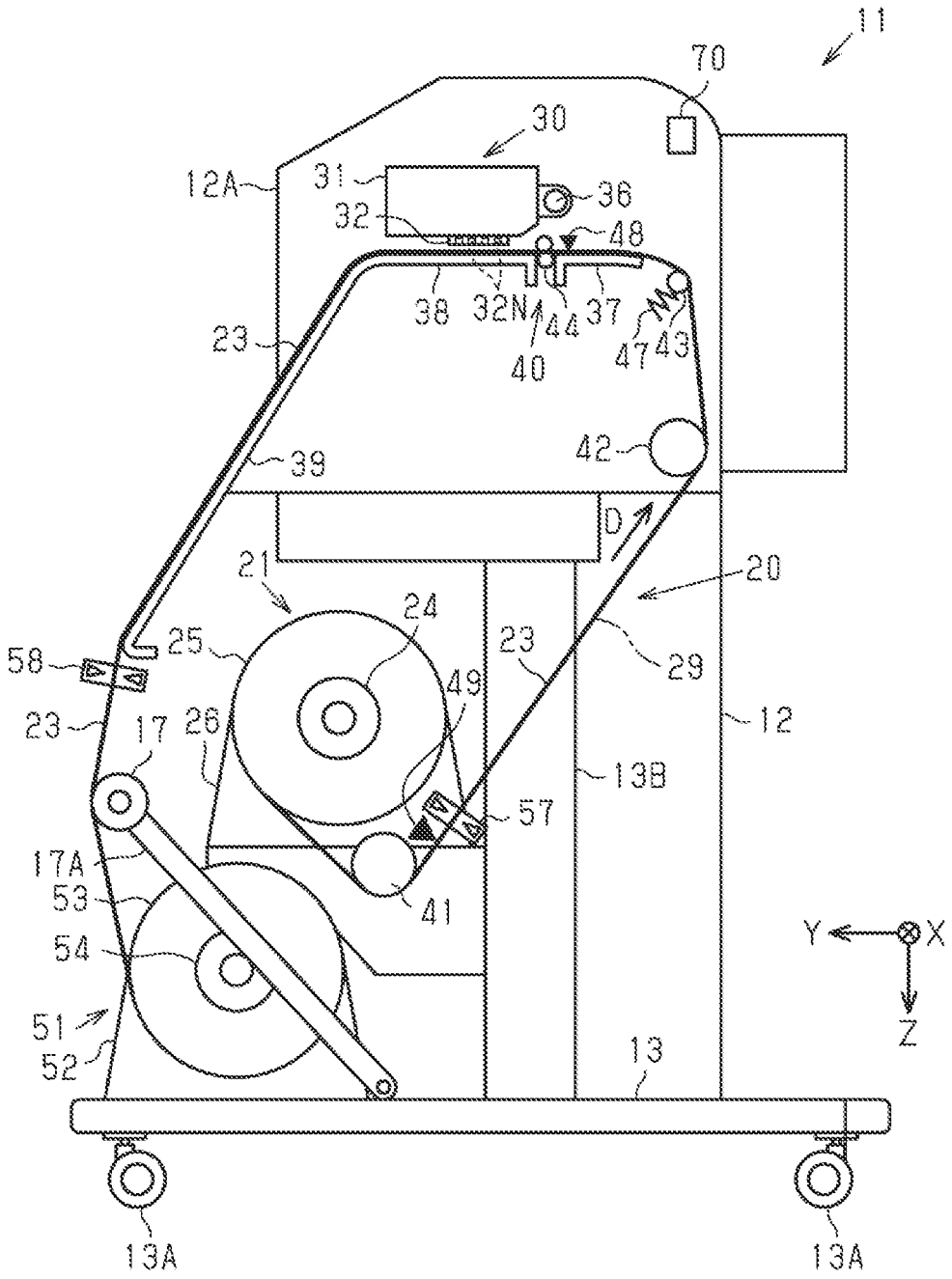

Z
X
Y
12
13A
13B
21
27
13
17A
26
18
25
55
52
53
12A
51
19
20
52
13A
29
39
23
17
17A
11

FIG. 1


11
70
30
12A
31
36
32
48
38
32N
44
37
47
43
40
23
42
39
D
21
20
24
25
23
29
58
49
23
17
26
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13B
57
17A
53
41
54
Y
X
Z
51
52
13
13A
13A

FIG. 2

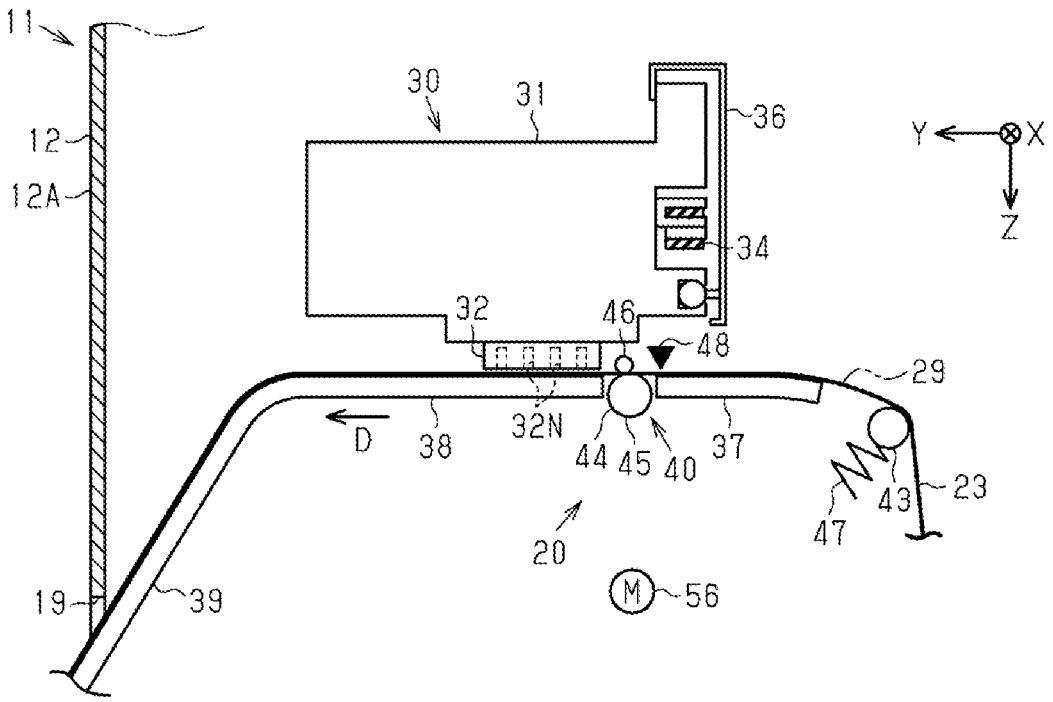

11
12
12A
30
31
36
34
Y
X
Z
32
46
48
29
D
38
32N
44
45
40
37
43
23
47
20
19
39
M
56

FIG. 3

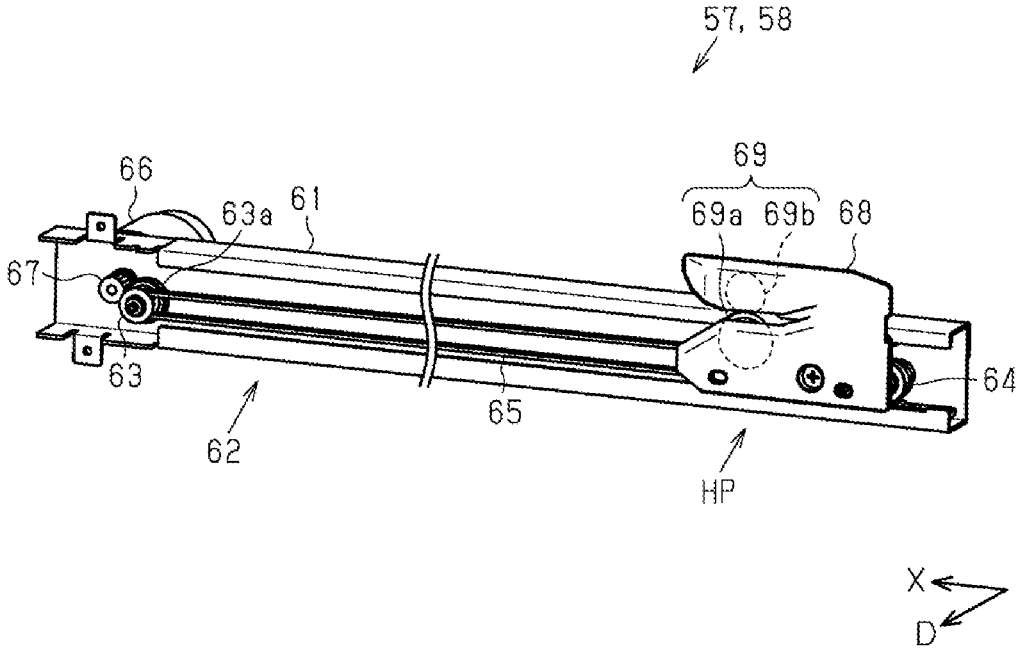

57, 58
66
63a
61
69
69a
69b
68
67
63
64
65
62
HP
X
D

FIG. 4

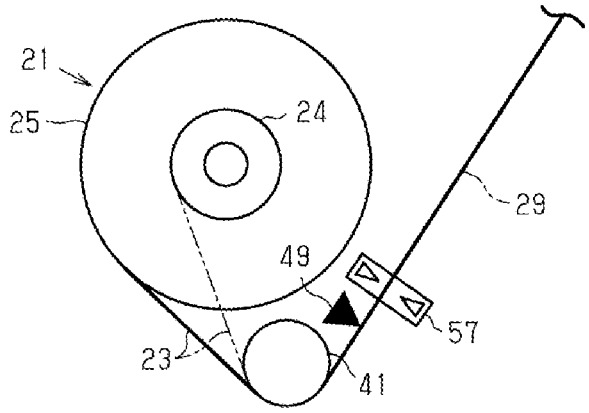


FIG. 5

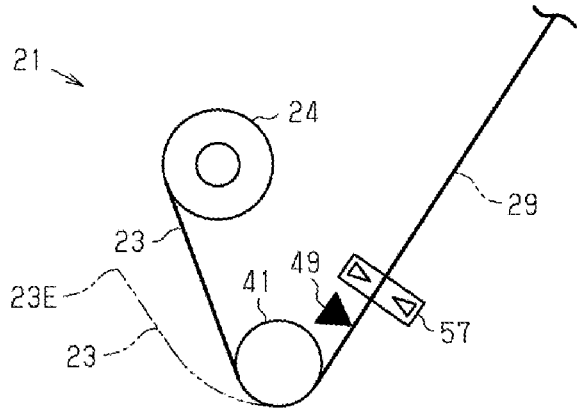


FIG. 6

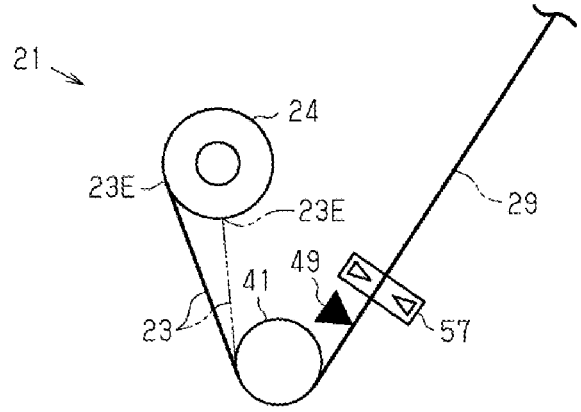


FIG. 7

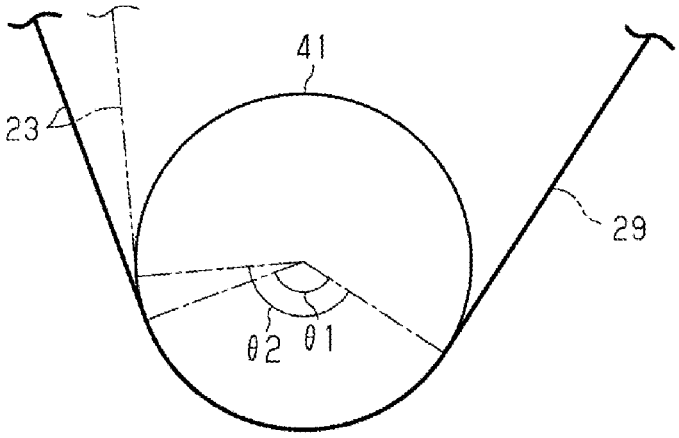

41
23
29
θ2
θ1

FIG. 8

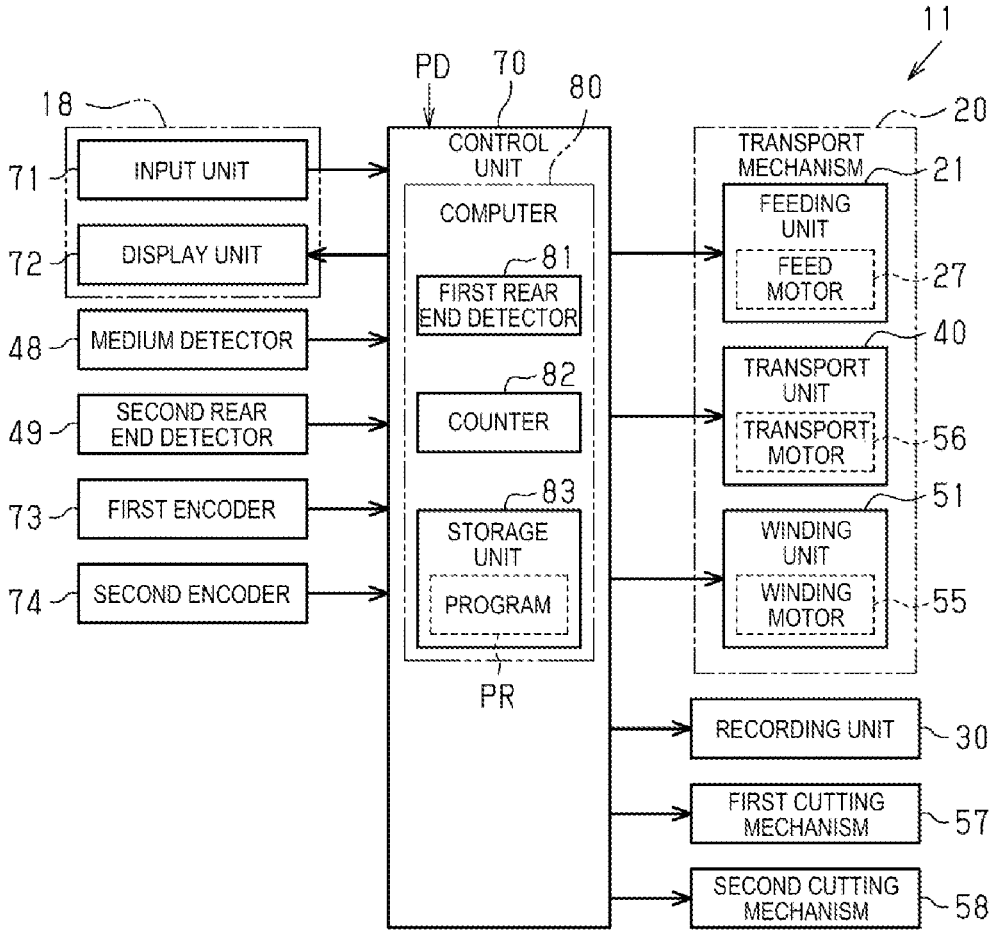

11
PD
70
80
18
20
71
INPUT UNIT
72
DISPLAY UNIT
48
MEDIUM DETECTOR
49
SECOND REAR END DETECTOR
73
FIRST ENCODER
74
SECOND ENCODER
CONTROL UNIT
COMPUTER
81
FIRST REAR END DETECTOR
82
COUNTER
83
STORAGE UNIT
PROGRAM
PR
TRANSPORT MECHANISM
21
FEEDING UNIT
FEED MOTOR
27
40
TRANSPORT UNIT
TRANSPORT MOTOR
56
51
WINDING UNIT
WINDING MOTOR
55
RECORDING UNIT
30
FIRST CUTTING MECHANISM
57
SECOND CUTTING MECHANISM
58

FIG. 9

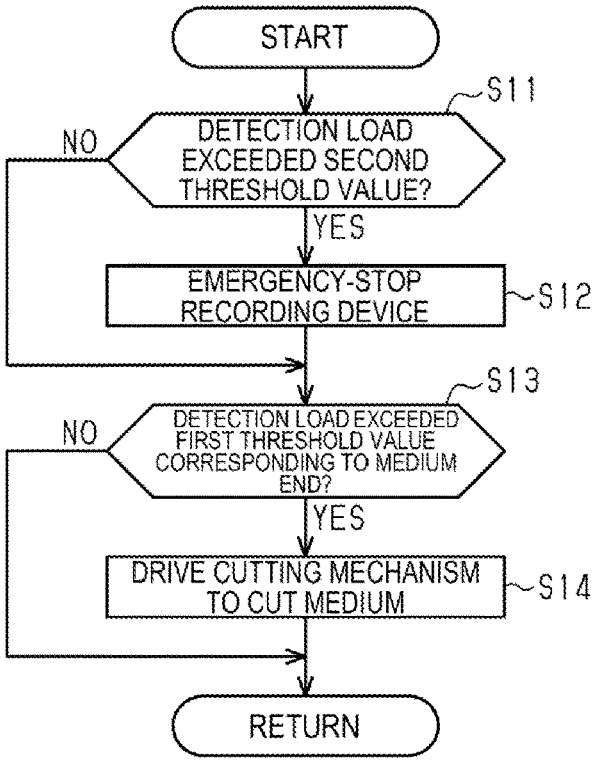
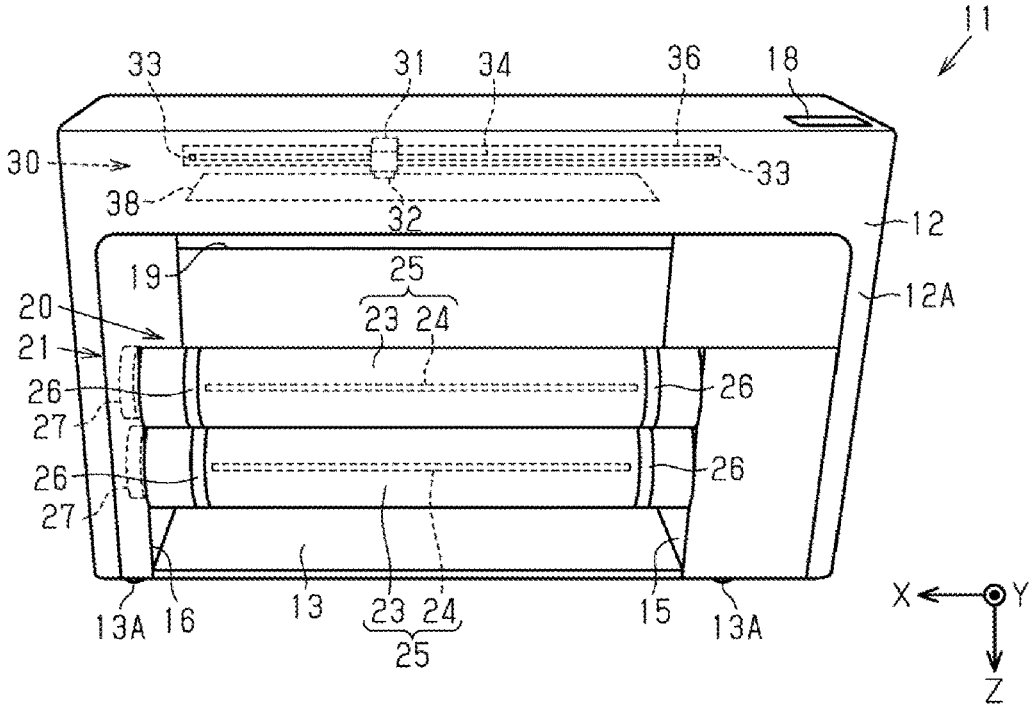

START
S11
DETECTION LOAD EXCEEDED SECOND THRESHOLD VALUE?
NO
YES
EMERGENCY-STOP RECORDING DEVICE
S12
S13
DETECTION LOAD EXCEEDED FIRST THRESHOLD VALUE CORRESPONDING TO MEDIUM END?
NO
YES
DRIVE CUTTING MECHANISM TO CUT MEDIUM
S14
RETURN

FIG. 10


11
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23 24
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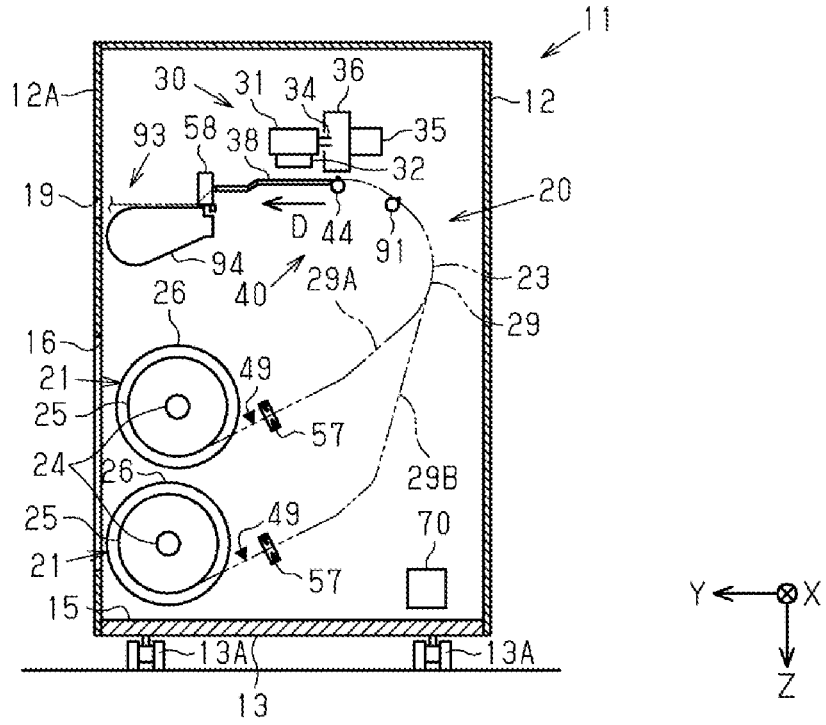
13A
X
Y
Z

FIG. 11


11
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13A
13A
13
Y
X
Z

FIG. 12

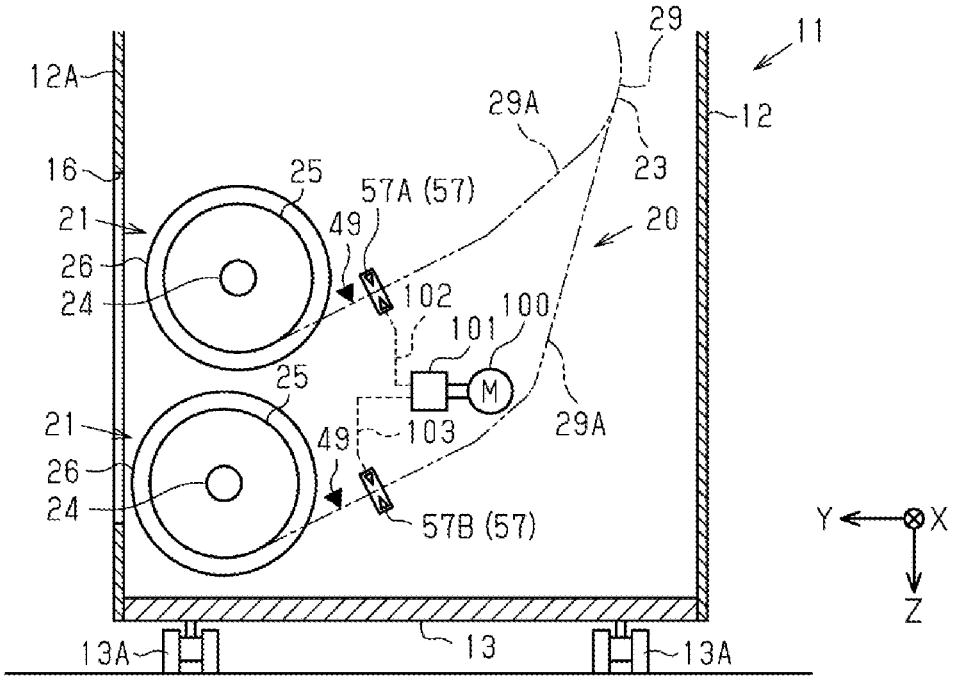
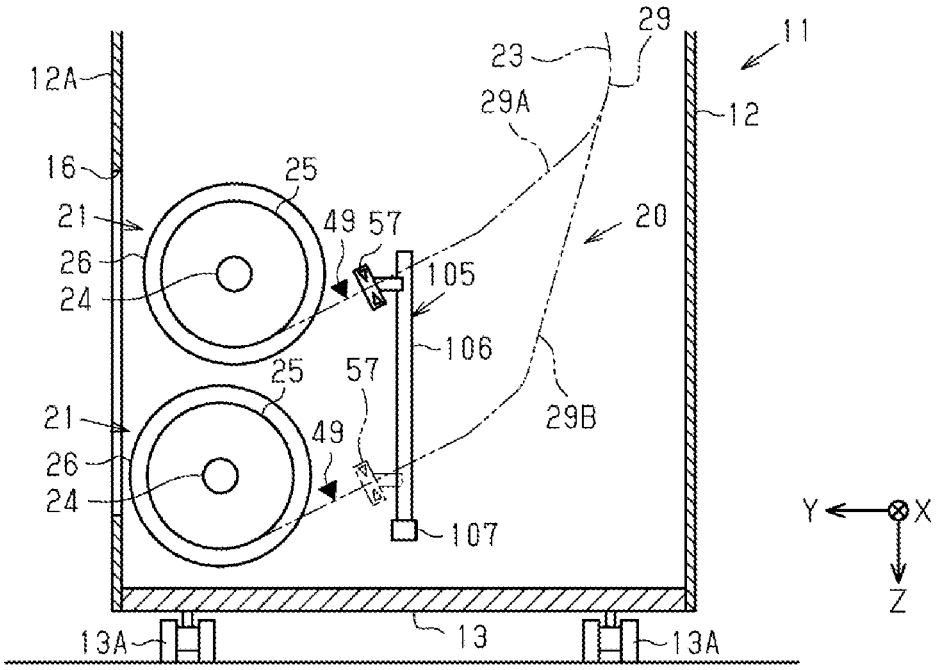

29
11
12A
29A
12
16
25
57A (57)
23
21
49
20
26
24
102
101
100
M
25
21
49
103
29A
26
24
57B (57)
13A
13
13A
Y
X
Z

FIG. 13


29
11
23
12A
29A
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57
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105
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106
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49
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Z
13A
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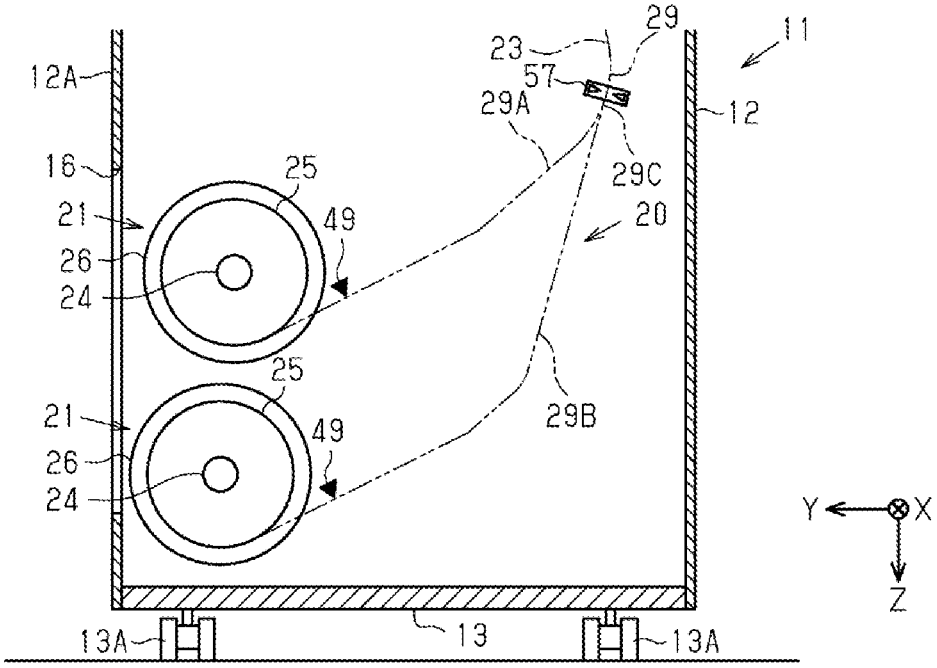
13A

FIG. 14


29
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12A
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Y
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Z
13A
13
13A

FIG. 15

RECORDING DEVICE AND CONTROL METHOD FOR RECORDING DEVICE

[0001] The present application is based on, and claims priority from JP Application Serial Number 2022-053047, filed Mar. 29, 2022, the disclosure of which is hereby incorporated by reference herein in its entirety.

BACKGROUND

1. Technical Field

[0002] The present disclosure relates to a recording device including a recording unit configured to perform recording on a medium and a control method for a recording device.

2. Related Art

[0003] JP-A-2021-183408 discloses a recording device including a record unit (an example of a recording unit) configured to perform recording on a medium such as a sheet. The recording device includes a first holding unit that holds a roll in which the sheet is wound around a core body, a transport unit that transports the sheet from the roll toward the record unit, and a first cutting unit capable of cutting the sheet fed from the first holding unit. The first cutting unit is provided between the record unit and the first holding unit. In addition, the recording device includes a second cutting unit that is provided between the record unit and the first cutting unit, and is capable of cutting the sheet fed from the first holding unit. A control unit included in the recording device switches whether the sheet fed from the first holding unit is cut by the first cutting unit or cut by the second cutting unit in accordance with a dimension in a transport direction of a deliverable. Both the two cutting units included in the recording device are configured to cut the sheet supplied from the roll into a sheet of a predetermined length, such as a cut sheet, and perform recording.

[0004] However, in the recording device described in JP-A-2021-183408, there is a problem in that, when a rear end of the medium wound around the roll is fixed to the core body, a rear end portion of the medium is not drawn out from the roll, recording cannot be performed on the rear end portion, and a waste medium such as loss paper is generated.

SUMMARY

[0005] A recording device that solves the problem described above includes a roll holding unit configured to hold a roll in which a long medium is wound around a core body, a transport mechanism configured to transport the medium supplied from the roll in a transport direction along a transport path, a recording unit configured to perform recording on the transported medium in the transport path, a rear end detector configured to detect that all of the medium suppliable from the roll was supplied by the transport mechanism, a cutting mechanism configured to cut the medium in an intersecting direction intersecting the transport direction at a position between the roll holding unit and the recording unit, and a control unit, wherein the control unit cuts the medium by the cutting mechanism based on rear end detection information from the rear end detector.

[0006] A control method for a recording device that solves the problem described above is a control method for a recording device, the recording device including a roll holding unit configured to hold a roll in which a long medium is wound around a core body, a transport mechanism configured to transport the medium supplied from the roll in a transport direction along a transport path, a recording unit configured to perform recording on the transported medium in the transport path, and a cutting mechanism configured to cut the medium in an intersecting direction intersecting the transport direction at a position between the roll holding unit and the recording unit, the control method including cutting the medium by the cutting mechanism when it is detected that all of the medium suppliable from the roll was supplied by the transport mechanism.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. **1** is a perspective view illustrating a recording device in a first exemplary embodiment.

[0008] FIG. **2** is a schematic side sectional view illustrating an internal configuration of the recording device.

[0009] FIG. **3** is a schematic side sectional view illustrating an internal configuration around a recording unit of the recording device.

[0010] FIG. **4** is a partially cutaway perspective view illustrating a configuration of a cutting mechanism.

[0011] FIG. **5** is a schematic side view for explaining when a medium **23** is supplied from a roll.

[0012] FIG. **6** is a schematic side view for explaining when a rear end of the medium is not fixed to a core body.

[0013] FIG. **7** is a schematic side view for explaining when the rear end of the medium is fixed to the core body.

[0014] FIG. **8** is a schematic side view illustrating the medium wound around a guide member.

[0015] FIG. **9** is a block diagram illustrating an electrical configuration of the recording device.

[0016] FIG. **10** is a flowchart illustrating a medium cutting control routine.

[0017] FIG. **11** is a perspective view seen from a front illustrating a recording device in a second exemplary embodiment.

[0018] FIG. **12** is a schematic side sectional view illustrating an internal configuration of the recording device.

[0019] FIG. **13** is a schematic side sectional side view illustrating a configuration including a first cutting mechanism of a first example.

[0020] FIG. **14** is a schematic side sectional side view illustrating a configuration including a first cutting mechanism of a second example.

[0021] FIG. **15** is a schematic side sectional side view illustrating a configuration including a first cutting mechanism of a third example.

DESCRIPTION OF EXEMPLARY EMBODIMENTS

First Exemplary Embodiment

[0022] Hereinafter, a first exemplary embodiment of a recording device will be described with reference to the drawings.

[0023] A Z-axis, which is a virtual axis parallel to a vertical direction is defined, assuming that a recording device **11** is placed on a horizontal surface. Two virtual axes along a plane orthogonal to the Z-axis are defined as an X-axis and Y-axis, respectively. The X-axis and the Y-axis are mutually orthogonal. Moreover, a direction parallel to the X-axis is defined as an X direction, a direction parallel to the Y-axis is defined as a Y direction, and a direction

parallel to the Z-axis is defined as a Z direction. Each of the X direction, the Y direction, and the Z direction includes both direction of a direction in which an arrow in the virtual axis faces (+direction), and an opposite direction thereof (−direction). The X direction is a direction parallel to a width direction of the medium **23** transported by the recording device **11**, and is also referred to as a width direction X. The Y direction is a direction parallel to a transport direction of the medium **23** at a recording position at which the recording device **11** performs recording on the medium **23** in a housing **12**A, and is also referred to as a transport direction Y. The vertical direction is a direction parallel to the Z-axis, and thus is also referred to as a vertical direction Z. Further, the width direction X is also a direction intersecting a transport direction D, and thus is also referred to as an intersecting direction X. The width direction X, the transport direction Y, and the vertical direction Z are orthogonal to each other.

[0024] As illustrated in FIG. **1**, the recording device **11** is, for example, an inkjet printer that records images such as characters and photographs on the medium **23** such as a sheet by discharging liquid such as ink. The recording device **11** includes a main body **12**, and a base **13** that supports the main body **12**. The main body includes column-and-beam structure **13**B made of a plurality of columns and beam members supported by the base **13**, and the housing **12**A described above supported by the column-and-beam structure **13**B. The base **13** is supported by a plurality of casters **13**A.

[0025] As illustrated in FIG. **1**, the recording device **11** includes a transport mechanism **20** (See FIG. **2**) that transports the medium **23**. The transport mechanism **20** includes a feeding unit **21** arranged at a front portion of the main body **12**. The feeding unit **21** includes a set of roll holding units **26** capable of holding a roll **25** for supply. The roll **25** for supply is detachably held by the roll holding units **26**. The roll **25** for supply is a roll in which the medium **23** before recording is wound in a roll shape around a core body **24** (see FIG. **2**). The roll holding units **26** rotatably hold both end portions of the core body **24** of the roll **25**. The feeding unit **21** includes a feed motor **27** that is a drive source for rotating the roll **25** held by the roll holding units **26** in a supply direction.

[0026] The medium **23** supplied from the roll **25** is transported along a transport path **29** as a path passing through inside the housing **12**A. A character, image, or the like is recorded on the medium **23** by a recording unit **30** (see FIG. **2**) in the housing **12**A. The recorded medium **23** is discharged from a discharge port **19** that opens in a front portion of the housing **12**A.

[0027] In the front portion of the housing **12**A, a downstream support portion **39** that supports the recorded medium **23** and discharged from the discharge port **19** extends obliquely downward. The recorded medium **23** is transported obliquely downward while being supported by a support face of the downstream support portion **39**. The downstream support portion **39** is heated by a heater (not illustrated). The recorded medium **23** transported along the downstream support portion **39** is heated from the support face, thereby promoting drying of ink.

[0028] The recording device **11** includes a winding unit **51** that winds the recorded medium **23**, below a front portion of a device main body **12**. The winding unit **51** includes a set of roll holding units **52** capable of holding a roll **53** for winding. The roll **53** is detachably mounted to the roll holding units **52**. The roll holding units **52** rotatably hold a core body **54** of the roll **53** (see FIG. **2**). The winding unit **51** includes a winding motor **55** (see FIG. **2**) that is a drive source. The winding motor **55** rotates the roll **53** held by the roll holding units **52** in a winding direction, and thus the recorded medium **23** is wound around the roll **53**.

[0029] As illustrated in FIG. **1**, the recording device **11** includes a tension bar **17** that imparts tension to the recorded medium **23** at a position in the middle of the transport path **29** between a downstream end portion of the downstream support portion **39** (downstream end portion) and the roll **53** mounted to the winding unit **51**. The tension bar **17** is held in horizontal posture extending in the width direction X by both end portions thereof being supported by a pair of arm portions **17**A. Base end portions of the pair of arm portions **17**A are supported rotatably with respect to a lower portion of the main body **12** or the base **13**. The tension bar **17** is configured to be displaceable. The tension bar **17** contacts a portion of the medium **23** between a leading end of the downstream support portion **39** and the roll **53** for winding, so that a load (self-weight) of the tension bar **17** is imparted to the medium **23**. The tension is imparted to the recorded medium **23** by the load of the tension bar **17**, in this manner. The winding unit **51** winds the recorded medium **23** to which the tension is imparted around the roll **53**. Note that, when the recorded medium **23** is discharged from the discharge port **19** in a state where the winding operation of the winding unit **51** is stopped, the tension bar **17** is displaced downward by the self-weight. When the recorded medium **23** is wound by the winding unit **51** around the roll **53**, the tension bar **17** is displaced upward by force received from the medium **23**.

[0030] Internal Configuration of Recording Device **11**

[0031] Next, a side cross-section of the recording device **11** is used to describe an internal configuration thereof in detail, with reference to FIG. **2**. Note that, the transport direction D in which the medium **23** is transported varies depending on a position on the transport path **29** of the medium **23**. The transport direction Y is identical to the transport direction D at a recording position where the recording unit **30** performs recording on the medium **23**.

[0032] As illustrated in FIG. **2**, the feeding unit **21** and the winding unit **51** are disposed, vertically below the recording unit **30**, aligned in the vertical direction Z. As a result, the roll **25** held by the roll holding units **26**, and the roll **53** held by the roll holding units **52** are disposed, vertically below the recording unit **30**, aligned in the vertical direction Z.

[0033] The transport mechanism **20** transports the medium **23** along the transport path. The feeding unit **21** that supplies the long medium **23** from the roll **25**, a transport unit **40** that transports the medium **23** supplied from the roll **25**, and the winding unit **51** that winds the recorded medium **23** are provided. The transport path **29** is a path that reaches a recording position of the recording unit **30** from the roll **25** through a rear portion in the device main body **12**, and further reaches the winding unit **51** disposed at a lower portion in the device main body **12** from the recording position through the front portion of the device main body **12**.

[0034] The transport unit **40** includes a guide member **41**, a roller **42**, a transport roller **43**, and a transport roller pair **44**, disposed along the transport path **29**. The guide member **41**, the roller **42**, the roller **43**, and the transport roller pair **44** are disposed in this order from the upstream in the transport path **29**.

[0035] The guide member **41** is disposed near the feeding unit **21**. The medium **23** supplied from the roll **25** is wound around an outer peripheral surface of the guide member **41**, and is transported above a rear portion of the device main body **12** via the guide member **41**. The guide member **41** is, for example, formed of a column or a cylinder. The guide member **41** is fixed to a frame constituting a portion of the column-and-structure **13**B in horizontal posture where an axial direction thereof coincides with the width direction X. Note that, the guide member **41** may be a rotatable roller.

[0036] The rollers **42** and **43** are disposed above a rear portion in the device main body **12**. The medium **23** via the guide member **41** is guided by the rollers **42** and **43**, and is sent forward from above the rear portion in the device main body **12**.

[0037] The roller **43** is disposed at a height position that is higher than the roller **42**. The plurality of rollers **42** and **43** are disposed to form a path for bending the transport path **29** from the vertical direction Z to the transport direction Y, above the rear portion of the device main body **12**. The medium **23** guided by the roller **43** is transported in the transport direction Y through a recording position where the recording unit **30** can perform recording. The transport roller pair **44** transports the medium **23** from the roller **43** in the transport direction Y.

[0038] The recording device **11** includes an upstream support portion **37**, a support **38**, and the downstream support portion **39**, that form a portion of the transport path **29** downstream of the roller **43** in the transport direction D. The support **38** is disposed at a position facing the recording unit **30**. The support **38** supports the medium **23** being recorded by the recording unit **30**. The recording device **11** may include a negative pressure generating unit (not illustrated) capable of adsorbing the medium **23** transported along a support face of the support **38** to the support face. Furthermore, at least one of the upstream support portion **37**, the support **38**, or the downstream support portion **39** may be heated by a heater (not illustrated). In the present example, the medium **23** is heated above the upstream support portion **37** before recording, heated above the support **38** during recording, and then heated above the downstream support portion **39** after recording. Note that, a drying device (not illustrated) may be arranged at a position facing the downstream support portion **39**. Alternatively, a configuration may be adopted in which the recorded medium **23** is guided by at least one discharge roller pair, instead of the configuration in which the recorded medium **23** is guided by the downstream support portion **39**. Furthermore, the path for transporting the recorded medium **23** may extend horizontally.

[0039] As illustrated in FIG. **2**, the recording device **11** includes the recording unit **30** that performs recording on the medium **23**. The recording unit **30** includes a recording head **32** that performs recording on the medium **23** transported by the transport mechanism **20**. The recording device **11** of the present example is a serial printer in which the recording head **32** scans the medium **23**. The recording unit **30** includes a carriage **31** that is scanned in the width direction X that intersects the transport direction Y at a position above the transported medium **23**, and the recording head **32** provided at a lower portion of the carriage **31**. The recording head **32** performs recording on the medium **23** by discharging liquid such as ink from a nozzle **32**N. The recording head **32** and the carriage **31** are disposed inside the housing **12**A.

[0040] As illustrated in FIG. **2**, the winding unit **51** winds the recorded medium **23** via the tension bar **17**. In accordance with a difference between a feeding amount by which the transport unit **40** feeds the medium **23**, and a winding amount by which the winding unit **51** winds the medium **23**, a length of the medium **23** between the transport unit **40** and the winding unit **51** changes. The tension bar **17** imparts appropriate tension to the medium **23** by being displaced, while contacting the medium **23** between the winding unit **51** and the transport unit **40** and imparting force due to self-weight to the medium **23**.

[0041] In addition, in the present exemplary embodiment, a first rear end detector **81** (see FIG. **9**) and a second rear end detector **49** are included as examples of a rear end detector that detects that all of the medium **23** was supplied from the roll **25** held by the roll holding units **26** of the feeding unit **21**, and that the medium **23** up to a rear end **23**E was supplied.

[0042] The first rear end detector **81** and the second rear end detector **49** detect, in different manners, that all of the medium **23** up to the rear end **23**E was supplied from the roll **25**.

[0043] As illustrated in FIG. **2**, the second rear end detector **49** can detect the rear end **23**E of the medium **23** at a position on the transport path **29** between the feeding unit **21** and the recording unit **30**. In the example illustrated in FIG. **2**, in order to be able to detect that all of the roll **25**, which is a medium supply source, up to the rear end **23**E of the medium **23** was supplied as earlier as possible, disposition is made at a position closer to the feeding unit **21** than the recording unit **30** on the transport path **29**. The second rear end detector **49** is configured to detect the rear end **23**E of the medium **23** separated from the core body **24**, when all of the medium **23** up to the rear end **23**E wound around the roll **25** held by the roll holding units **26** was supplied. The second rear end detector **49** includes an optical sensor or the like. The second rear end detector **49** may be a contact type sensor.

[0044] A type of the roll **25** used in the recording device **11** is present where the rear end **23**E of the medium **23** is bonded to the core body **24**. When this type of roll **25** is used, all of the medium **23** up to the rear end **23**E wound around the roll **25** is supplied, and the rear end **23**E is bonded to the core body **24**, the rear end **23**E is not separated from the core body **24**. Therefore, the rear end **23**E of the medium **23** cannot be detected by the second rear end detector **49** including the optical sensor or the like.

[0045] Therefore, the recording device **11** includes the first rear end detector **81** (see FIG. **9**) configured to detect that, even when the rear end of the medium **23** is bonded to the core body **24**, the medium **23** up to the rear end **23**E of the roll **25** was supplied. Details of the first rear end detector **81** will be described later.

[0046] Further, as illustrated in FIG. **2**, the recording device **11** includes a first cutting mechanism **57** as an example of a cutting mechanism for cutting the medium **23**, at a position on the transport path **29** between the feeding unit **21** and the recording unit **30**. The first cutting mechanism **57** cuts the medium **23** in the intersecting direction X intersecting the transport direction D, at a position between the roll holding units **26** and the recording unit **30**. In the example illustrated in FIG. **2**, the first cutting mechanism **57** cuts the medium **23** in which the rear end **23**E is bonded to the core body **24** when all of the medium **23** up to the rear

end **23**E of the roll **25** was supplied. The first cutting mechanism **57** is disposed at a position closer to the roll **25** held by the roll holding units **26** than the recording unit **30** in the transport path **29**.

[0047] Additionally, the recording device **11** includes a second cutting mechanism **58** different from the first cutting mechanism **57**, at a position downstream of the recording unit **30** in the transport direction D in the transport path **29**. The second cutting mechanism **58** cuts the medium **23** after recording in the intersecting direction X. The second cutting mechanism **58** of the present example cuts the recorded medium **23** to a predetermined length in a method of use where the recorded medium **23** is not wound by the winding unit **51**.

[0048] As illustrated in FIG. **2**, the recording device **11** includes a control unit **70** that controls the entire device. The control unit **70** controls the feeding unit **21**, the transport unit **40**, the winding unit **51**, the recording unit **30**, the first cutting mechanism **57**, and the second cutting mechanism **58**.

[0049] Internal Configuration of Recording Device **11**

[0050] Next, an internal configuration of the recording device **11** will be described with reference to FIG. **3**.

[0051] As illustrated in FIG. **3**, the transport roller pair **44** includes a driving roller **45** rotating by drive force from a transport motor **56**, and a driven roller **46** rotating in association with rotation of the driving roller **45**. The transport roller pair **44** transports the medium **23** by rotating in a state where the driving roller **45** and the driven roller **46** sandwich the medium **23**.

[0052] As illustrated in FIG. **3**, the roller **43** constituting the transport unit **40** guides the medium **23** at a curved portion of the transport path **29**. A medium guide member such as a roller or a support portion is not disposed near both sides along the transport path **29** with respect to the roller **43**. In other words, as illustrated in FIG. **3**, the roller **43** is positioned between a portion of the transport path extending upward from the roller **42**, and a portion of the transport path extending in the transport direction Y from the roller **43** toward the transport roller pair **44**, and has a function to change a path direction of the transport path **29**. The roller **43** is provided displaceably in a direction orthogonal to a portion of the transport path **29** that guides the medium **23** on an outer peripheral surface thereof.

[0053] The roller **43** is supported via a spring **47**. The spring **47** biases the roller **43** in a direction toward a guide position. Specifically, the roller **43** is disposed at a predetermined guide position, when the roller **43** is biased by biasing force of the spring **47** and displaced and a portion of a member that rotatably supports the roller **43** contacts a regulating member (not illustrated). When excessive tension is applied to a portion between the roll **25** and the transport roller pair **44** in the medium **23**, the roller **43** is displaced against the biasing force of the spring **47**.

[0054] The carriage **31** constituting the recording unit **30** is supported by a guide rail **36**. The carriage **31** is fixed to a portion of a timing belt **34**. By a carriage motor (not illustrated) rotating forward or backward, the carriage **31** fixed to the portion of the timing belt **34** can reciprocate along the guide rail **36** in a scanning direction X. The recording head **32** performs recording on the medium **23** by discharging liquid such as ink from the nozzle **32**N in a process of moving in the width direction X together with the carriage **31**.

[0055] The control unit **70** performs tension control for controlling tension of the medium **23** between the feeding unit **21** and the transport unit **40**. The tension control detects a load applied to the feed motor **27** and a load applied to the transport motor **56**, and controls motor torque of each of the feed motor **27** and the transport motor **56** so that each load falls within an appropriate range. This tension control stabilizes the tension of the medium **23** to be transported. Thus, the recording unit **30** can perform recording on the medium **23** with ink droplets discharged from a large number of the nozzles **32**N with high positional accuracy, and records recorded by the recording device **11** with higher recording accuracy can be obtained. The control unit **70** of the present exemplary embodiment is configured to detect the load acting on the feed motor **27**, and the load acting on the transport motor **56**. The first rear end detector **81** included in the control unit **70** detects that all of the medium **23** up to the rear end **23**E was supplied from the roll **25**, by using a detection load acquired by the function of detecting the load acting on the transport motor **56**.

[0056] Configuration of Cutting Mechanisms **57** and **58**

[0057] Next, a configuration of examples of the cutting mechanisms **57** and **58** will be described with reference to FIG. **4**.

[0058] As illustrated in FIG. **4**, each of **57** and **58** includes a rail **61** provided extending along the width direction X, and a cutter carriage **68** that is attached reciprocably in the width direction X along the rail **61**. A cutter blade **69** is held by the cutter carriage **68**. The cutter carriage **68** is configured to reciprocate with the width direction X of the medium **23** as a movement direction. The cutter blade **69** cuts the medium **23** by the cutter carriage **68** moving in one direction of the width direction X. In FIG. **4**, the medium **23** is cut when the cutter carriage **68** moves to the left from the right. The cutter blade **69** includes a driving blade **69***a* that is driven to rotate as the cutter carriage **68** moves, and a driven blade **69***b* that is driven to rotate in association with the rotation of the driving blade **69***a*.

[0059] As illustrated in FIG. **4**, the rail **61** is provided with a power transmission mechanism **62** that transmits power to reciprocate the cutter carriage **68** in the width direction X. The power transmission mechanism **62** includes pulleys **63** and **64** provided at both ends in the width direction X of the rail **61**, and an annular belt **65** wound around both the pulleys **63** and **64**. The cutter carriage **68** is fixed to a portion of the belt **65**.

[0060] In addition, in FIG. **4**, an electric motor **66** is provided at one end of the rail **61**. A pinion **67** attached to an output shaft of the electric motor **66** is meshed with a toothed gear **63***a* provided coaxially with the pulley **63**. When the electric motor **66** is driven, driving force thereof is transmitted to the cutter carriage **68** via the power transmission mechanism **62** that includes the belt **65**.

[0061] The cutter carriage **68** waits at a holding position HP illustrated in FIG. **4**. When the electric motor **66** is driven forward, the cutter carriage **68** moves forward in the width direction X along the rail **61** from the holding position HP illustrated in FIG. **4**. In this process, the medium **23** is cut at a position to be cut by the cutter blade **69**. After that, when the electric motor **66** is driven backward, the cutter carriage **68** moves backward in the width direction X to return to the holding position HP.

[0062] In the first cutting mechanism **57**, when the first rear end detector **81** detects the rear end **23**E of the medium

23, the electric motor **66** is driven forward. By the cutter carriage **68** moving forward from the holding position HP in the width direction X along the rail **61**, the medium **23** is cut by the cutter blade **69**.

[0063] In the second cutting mechanism **58**, the medium **23** stops at a position where the position to be cut of the medium **23** matches a cutting position of the cutting mechanisms **57** or **58**. In this state, when the electric motor **66** is driven forward, the cutter carriage **68** moves from the holding position HP in the width direction X along the rail **61**. In this process, the medium **23** is cut at the position to be cut by the cutter blade **69**.

[0064] Next, with reference to FIGS. **5** to **7**, the supply of the medium **23** from the roll **25** will be described. The medium **23** supplied from the roll **25** is supplied via the outer peripheral surface of the guide member **41** disposed on a lower side thereof.

[0065] As illustrated in FIG. **5**, the medium **23** is supplied through a path indicated by a solid line from the roll **25** at the start of the supply of the medium **23**. A roll diameter gradually decreases as the supply of the medium **23** from the roll **25** advances. Thus, the path of the medium **23** that reaches the guide member **41** from the roll **25** changes from the path indicated by the solid line in FIG. **5** at the start of the medium supply, to a path indicated by a two-dot chain line in FIG. **5** at the end of the medium supply.

[0066] As illustrated in FIG. **6**, when the rear end **23**E of the medium **23** is not fixed to the core body **24**, and all of the medium **23** is supplied from the roll **25**, the rear end **23**E is separated from the core body **24**, as indicated by a two-dot chain line in FIG. **6**. Therefore, the rear end **23**E is then detected by the second rear end detector **49**. In other words, the second rear end detector **49** detects the rear end **23**E by switching from a detecting state to detect the medium **23** to a non-detecting state not to detect the medium **23**. The control unit **70** detects that the roll **25** is emptied (ended), and that a remaining length of the medium **23** is shorter than a path length to the core body **24**, based on the detection of the rear end **23**E by the second rear end detector **49**.

[0067] On the other hand, as illustrated in FIG. **7**, when the rear end **23**E of the medium **23** is fixed to the core body **24**, and all of the medium **23** was supplied from the roll **25**, a path of the medium **23** indicated by a solid line in FIG. **7** is changed to a path where a center of the core body **24** is positioned on an extension line of the path of the medium **23**, as indicated by a two-dot chain line in FIG. **7**. In the process of changing the medium path, a load acting on the medium **23** gradually increases. The first rear end detector **81** detects this load acting on the medium **23**. Note that, since the rear end **23**E of the medium **23** remains fixed to the core body **24**, the second rear end detector **49** does not detect the rear end **23**E.

[0068] FIG. **8** is a schematic view in which a periphery of the guide member **41** illustrated in FIG. **7** is enlarged. As illustrated in FIG. **8**, the medium **23** is wound around the outer peripheral surface of the guide member **41**. A center angle, where a portion of the outer peripheral surface of the guide member **41** around which the medium **23** is wound is an arc, is referred to as a winding angle θ. That is, an angle formed by two lines linking two contacts of the medium **23** wound around the outer peripheral surface of the guide member **41** to a center of the guide member **41** is referred to as the winding angle θ.

[0069] A winding angle θ**2** when the medium **23** is on a path indicated by a two-dot chain line in FIG. **8** is larger than a winding angle θ**1** when the medium **23** is on a path indicated by a solid line in FIG. **8**. The greater the winding angle when the medium **23** is wound around the outer peripheral surface of the guide member **41**, the greater a contact area between the medium **23** and the outer peripheral surface of the guide member **41**. Thus, the greater the winding angle when the medium **23** is wound around the outer peripheral surface of the guide member **41**, the greater sliding resistance between the medium **23** and the outer peripheral surface of the guide member **41**.

[0070] Thus, a load acting on the transport motor **56** is larger for the winding angle θ**2** when the medium **23** is on the path indicated by the two-dot chain line in each of FIGS. **7** and **8**, as compared to the winding angle θ**1** when the medium **23** is on the path indicated by the solid line in each of FIGS. **7** and **8**.

[0071] The control unit **70** of the present exemplary embodiment controls the feed motor **27** that outputs power to supply the medium **23** from the roll **25**, and the transport motor **56** for the transport roller pair **44** to transport the medium **23**. Specifically, the control unit **70** controls the feed motor **27** and the transport motor **56** so that tension acting on the medium **23** of the portion between the roll **25** and the transport roller pair **44** falls within an appropriate predetermined range. That is, the control unit **70** controls the feed motor **27** and the transport motor **56** so that a difference between the load acting on the feed motor **27** and the load acting on the transport motor **56** falls within an acceptable range.

[0072] In the process of changing from the winding angle θ**1** to the winding angle θ**2** illustrated in FIG. **8**, as the winding angle θincreases, the sliding resistance between the medium **23** and the outer peripheral surface of the guide member **41** increases, and thus the load acting on the transport motor **56** increases. That is, the larger the winding angle θ, the greater the sliding resistance, thereby increasing the load acting on the transport motor **56**. As a result, the tension acting on the medium **23** of the portion between the roll **25** and the transport roller pair **44** increases. As a result, the control unit **70** performs control of increasing an amount by which the feed motor **27** feeds the medium **23** in order to reduce this increased tension, thereby performing tension control for optimizing the tension acting on the medium **23** of the portion between the roll **25** and the transport roller pair **44**. Thus, in the process of changing from the winding angle θ**1** to the winding angle θ**2**, even when the sliding resistance between the medium **23** and the guide member **41** is gradually increased, the tension acting on the medium **23** is optimized by the tension control. In the present example, the first rear end detector **81** detects a load when the rear end **23**E of the medium **23** is fixed to the core body **24**, and thus detects the rear end **23**E when the rear end **23**E is fixed to the core body **24**.

[0073] Electrical Configuration of Recording Device **11**

[0074] Next, an electrical configuration of the recording device **11** will be described with reference to FIG. **9**. The recording device **11** receives, for example, a print job PD from a host device (not illustrated). The print job PD includes a plurality of jobs including recording condition information and recording image data. The recording condition information includes, for example, information such as a medium length. The control unit **70** is electrically

coupled to an input unit **71** and a display unit **72** constituting an operating panel **18**. A user operates the input unit to input the recording condition information and the like, or instructs performance of recording. A menu screen, or the like is displayed on the display unit **72**. Note that, the display unit **72** may be configured by a touch panel, and at least a part of the input unit **71** may be configured by a touch operation mechanism thereof.

[0075] The recording device **11** includes a medium detector **48**, the first rear end detector **81**, and the second rear end detector **49**. The first rear end detector **81** outputs rear end detection information in accordance with a transport load when the transport mechanism **20** transports the medium **23**. The first rear end detector **81** of the present example detects a medium end that is a state when all of the medium **23** of the roll **25** was supplied and the rear end **23**E of the medium **23** is bonded to the core body **24**. The first rear end detector **81** detects that the medium **23** up to the rear end **23**E of the roll **25** was supplied, by detecting the transport load when the rear end is bonded to the core body **24** and the medium **23** is transported. In the present example, the first rear end detector **81** is included in the control unit **70**.

[0076] Additionally, the control unit **70** is electrically coupled to the medium detector **48** and the second rear end detector **49**.

[0077] The medium detector **48** detects the medium **23** at a position upstream of the recording unit **30** in the transport direction D. The medium detector **48** includes a sensor capable of detecting presence or absence of the medium **23**. The medium detector **48** detects, for example, a leading end or the rear end of the medium **23**.

[0078] The second rear end detector **49** detects the rear end **23**E of the medium **23** when all of the medium **23** wound around the roll **25** was supplied. The second rear end detector **49** detects the rear end **23**E of the medium **23**, thereby detecting that the roll **25** is emptied. Detection result information of the second rear end detector **49** is output to the control unit **70**. The control unit **70** recognizes that the roll **25** is emptied, when the second rear end detector **49** detects the rear end of the medium **23**.

[0079] The second rear end detector **49** detects the rear end **23**E of the medium **23**. The second rear end detector **49** is, for example, a non-contact type sensor capable of detecting presence or absence of the medium **23** in a non-contact manner such as an optical sensor or an ultrasonic sensor. Note that, the second rear end detector **49** may be a contact type sensor.

[0080] Additionally, the control unit **70** is electrically coupled to a first encoder **73** and a second encoder **74**.

[0081] The first encoder **73** detects rotation of the feed motor **27**. The first encoder **73** outputs a detection signal including the number of pulses proportional to an amount of the rotation of the feed motor **27**. The detection signal output by the first encoder **73** is input to the control unit **70**.

[0082] The second encoder **74** detects the rotation of the transport motor **56**. The second encoder **74** outputs a detection signal including the number of pulses proportional to an amount of the rotation of the transport motor **56**. The detection signal output by the second encoder **74** is input to the control unit **70**.

[0083] Also, the feeding unit **21**, the transport unit **40**, the winding unit **51**, the recording unit **30**, the first cutting mechanism **57**, and the second cutting mechanism **58** are electrically coupled to the control unit **70**, as an output system.

[0084] The print job PD is input to the control unit **70** from the host device (not illustrated) or the input unit **71**. The print job PD includes recording condition information and recording image data. The recording condition information includes selection information indicating selection by the user of whether to cause the winding unit **51** to wind the medium **23** on which recording is performed by the recording device **11** or to cause the second cutting mechanism **58** to cut the medium **23** to a predetermined size. When cutting to the predetermined length is selected, the recording condition information includes information of a predetermined length L**1**.

[0085] The control unit **70** controls the recording head **32** to perform recording control for discharging ink from the nozzle **32**N of the recording head **32**. In the present example, since the recording unit **30** is of a serial recording type, the control unit **70** controls the carriage motor **35** to move the carriage **31** in the scanning direction X, and causes the recording head **32** to perform recording on the medium **23** during the movement.

[0086] The control unit **70** controls the feed motor **27** constituting the feeding unit **21** to drive to rotate the roll **25** in a feeding direction (supply direction). Thus, the medium **23** is supplied from the feeding unit **21** toward a recording position of the recording unit **30**.

[0087] Additionally, the control unit **70** controls the transport motor **56** constituting the transport unit **40** to transport the medium **23** by the transport roller pair **44** (see FIG. **3**).

[0088] Further, the control unit **70** controls the winding motor **55** constituting the winding unit **51** to wind the recorded medium **23** around the core body **54** held by the roll holding units **52** of the winding unit **51**. The control unit **70** drives the winding motor **55** to rotate forward, to rotate the core body **54** held by the roll holding units **52** in the winding direction. Accordingly, the recorded medium **23** is wound by the winding unit **51** as the roll **53**.

[0089] The control unit **70** detects an actual speed of the feed motor **27** based on the detection signal input from the first encoder **73**. The control unit **70** controls the feed motor **27** to bring the actual speed of the feed motor **27** closer to a target speed.

[0090] The control unit **70** detects an actual speed of the transport motor **56** based on the detection signal input from the second encoder **74**. The control unit **70** controls the transport motor **56** to bring the actual speed of the transport motor **56** closer to a target speed.

[0091] The control unit **70** controls the load of the feed motor **27** and the load of the transport motor **56** so that tension acting on the medium **23** of the portion between the roll **25** and the transport roller pair **44** falls within an appropriate predetermined range. Specifically, the control unit **70** detects the load of the feed motor **27** and the load of the transport motor **56**. The control unit **70** performs control such that both the load of the feed motor **27** and the load of the transport motor **56** detected are balanced, to perform control such that tension acting on the medium **23** of the portion between the roll **25** and the transport roller pair **44** falls within an appropriate predetermined range. The control unit **70** detects the load of each of the feed motor **27** and the transport motor **56** for various types of control including this tension control.

[0092] The control unit **70** controls the electric motor **66** constituting the first cutting mechanism **57** to move the cutter blade in the width direction X, thereby cutting the medium **23** before recording. The control unit **70** cuts the medium **23** at a position near the supply source by the first cutting mechanism **57**, when the detection load detected by the first rear end detector **81** satisfies a predetermined cutting condition. Specifically, the control unit **70** performs medium rear end cutting control described later. Details of the medium rear end cutting control will be described later.

[0093] In addition, when the recorded medium **23** is not wound by the winding unit **51**, but cut by the predetermined length L**1** at a time, the recording device **11** controls the second cutting mechanism **58** as follows. The control unit **70** controls the electric motor **66** constituting the second cutting mechanism **58** to move the cutter blade **69** in the width direction X, to cut the recorded medium **23**.

[0094] Further, the control unit **70** includes a computer **80**. The computer **80** includes a central processing unit (CPU), a read only memory (ROM), a random access memory (RAM), and a storage, which are not illustrated. The control unit **70** controls the transport of the medium **23** in the recording device **11**, and the operation of recording the information to the medium **23** by the recording unit **30**. Specifically, the control unit **70** is not limited to performing software processing on all processing that the control unit **70** performs. For example, the control unit **70** may include a dedicated hardware circuit (for example, an application specific integrated circuit or ASIC) configured to perform hardware processing for at least a part of the processing that the control unit **70** performs. That is, the control unit **70** may be configured as a circuitry including one or more processors operating according to a computer program (software), one or more dedicated hardware circuits that perform at least some of various processes, or a combination thereof. The processor includes a CPU and a storage unit **83** such as a RAM and a ROM, and the storage unit **83** stores program codes or instructions configured to cause the CPU to perform processes. The storage unit **83**, that is, a computer-readable medium, includes any available medium that can be accessed by the general purpose or special purpose computer **80**.

[0095] The computer **80** includes the first rear end detector **81**, a counter **82**, and the storage unit **83**.

[0096] The counter **82** counts a count value corresponding to a transport position of the medium **23** with a position where the medium detector **48** detects the leading end of the medium **23** as an origin. The counter **82** is reset when the medium detector **48** detects the leading end of the medium **23**. The counter **82** counts the number of pulses or the number of pulse edges included in the detection signal input from the first encoder **73**. In this way, the count value of the counter **82** indicates a value corresponding to the transport position of the medium **23**, with the position of the medium **23** when the medium detector **48** detects the leading end of the medium **23** as the origin.

[0097] The control unit **70** controls the second cutting mechanism **58** as follows, when the medium **23** is cut without being wound around the winding unit **51**. The control unit **70** acquires information related to a predetermined length to which the recorded medium **23** is cut based on the recording condition information in the print job PD. When the medium **23** is cut to the predetermined length without being wound around the winding unit **51**, the computer **80** calculates a position to be cut where the recorded medium **23** is to be cut to the predetermined length, using the information related to the predetermined length included in the print job PD.

[0098] The count value of the counter **82** is used, for example, in addition to the transport control for transporting the medium **23** by the control unit **70**, for transport control for performing transport until the position to be cut where the second cutting mechanism **58** is caused to cut the medium **23** matches the cutting position. The control unit **70** stops the feed motor **27** and the transport motor **56**, when the position to be cut of the medium **23** reaches the cutting position of the second cutting mechanism **58**. Then, the control unit **70** drives the second cutting mechanism **58** while the medium **23** stops, and thus cuts the medium **23** to the predetermined length instructed by the print job PD.

[0099] When the second rear end detector **49** detects the rear end **23**E of the medium **23** during recording in which the medium **23** is cut, the control unit **70** may display, on the display unit **72**, information indicating that all of the medium **23** up to the rear end **23**E of the roll **25** was supplied and the roll **25** is emptied.

[0100] When the second rear end detector **49** detects the rear end **23**E of the medium **23** during the recording in which the medium **23** is cut, the control unit **70** calculates a position to be cut where the medium **23** of the remaining length is cut. The control unit **70** discharges the remaining medium **23** of a length less than the predetermined length without performing recording. However, when the length of the remaining medium **23** is less than a minimum length, the remaining medium **23** cannot be transported to a position where a last position to be cut reaches the cutting position of the second cutting mechanism **58**. Thus, the number of sheets for performing recording on the remaining medium **23** and cutting to the predetermined length is determined, so that the length of the remaining medium **23** is equal to or greater than a minimum length Lmin. For example, the computer **80** calculates a remaining length L**2** up to the rear end **23**E of the medium **23**. When a length obtained by subtracting the minimum length Lmin from the remaining length L**2** (L**2**−Lmin) is greater than N times the predetermined length L**1**, recording for the N sheets may continue. Here, N is a natural number. The minimum length Lmin that can be discharged is, for example, a length on the transport path **29** from a nip position of the transport roller pair **44** to the cutting position of the second cutting mechanism **58**.

[0101] About Medium Rear End Cutting Control

[0102] The first rear end detector **81** detects that all of the medium **23** up to the rear end **23**E was supplied from the roll **25** when the rear end **23**E is fixed to the core body **24**, using the function of detecting the transport loads of the motors **27** and **56** by the control unit **70**. The first rear end detector **81** of the present example detects the rear end **23**E of the medium **23** based on the transport load of the transport motor **56**. In the present example in which the tension control is performed, the first rear end detector **81** can also detect the rear end **23**E using a detection load of the feed motor **27**. Note that, in the following, a transport load detected by the first rear end detector **81** may be referred to as a detection load.

[0103] The first rear end detector **81** detects the rear end **23**E when all of the medium **23** up to the rear end **23**E of the roll **25** in which the rear end **23**E is bonded to the core body **24** was supplied, based on excess of the detection load over

a first threshold value SH1. The first threshold value SH1 is a threshold value for detecting a load when all of the medium **23** wound around the roll **25** was supplied and ended and the rear end **23**E is bonded to the core body **24**.

[0104] Furthermore, a second threshold value SH2 is set for the control unit **70**, as a threshold value for detecting that an abnormal load is applied in a transport system in which the medium **23** is transported by the transport mechanism **20**. The second threshold value SH2 is set to a value greater than the first threshold value SH1 (SH1<SH2). When the detection load exceeds the second threshold value SH2, the control unit **70** causes the recording device **11** to emergency-stop.

[0105] Thus, the first rear end detector **81** detects the rear end **23**E, when the detection load falls within a range greater than the first threshold value SH1 and equal to or less than the second threshold value SH2, the rear end **23**E of the medium **23** is bonded to the core body **24**, and all of the medium **23** of the roll **25** was supplied.

[0106] When the transport load exceeds a predetermined value, the first rear end detector **81** determines that all of the suppliable medium **23** was supplied with the rear end **23**E of the medium **23** fixed to the core body **24**, and outputs rear end detection information. The control unit **70** cuts the medium **23** by the first cutting mechanism **57** based on the rear end detection information. Here, the predetermined value is the first threshold value SH1. The control unit **70** of the present example drives the first cutting mechanism **57** to cut the medium **23** at a position near the roll **25**, when the first rear end detector **81** detects a detection load that is a value that falls within the range greater than the first threshold value SH1 and equal to or less than the second threshold value SH2. As a result of this cutting, it is possible to transport the remaining medium **23** when the first rear end detector **81** detects the rear end **23**E to the recording position of the recording unit **30**, and record an image or the like on the remaining medium **23**.

[0107] For example, when a configuration is adopted in which the first rear end detector **81** and the first cutting mechanism **57** are not present, and when the rear end of the medium **23** is bonded to the core body **24**, the remaining medium **23** is not supplied, and thus, the detection load exceeds the second threshold value S2 soon, and the recording device **11** is emergency-stopped. In this case, not only no recording is performed on the remaining medium **23**, but also recording in process at the time is interrupted. In this case, since a predetermined time elapses until the recording device **11** recovers and resumes recording, a recording failure may occur due to a dry unevenness or the like between a portion where the recording is ended until then and a portion where the recording is resumed. Furthermore, the user needs to cut the remaining medium **23** from the core body **24**, and perform setting to the recording device **11** again, which results in an extra task. In this way, when the rear end **23**E of the medium **23** is fixed to the core body **24** by the bonding or the like, the emergency stop of the recording device **11** is involved, and productivity of records decreases.

[0108] In the present exemplary embodiment, when the rear end **23**E is fixed to the core body **24** by bonding or the like when all of the medium **23** up to the rear end **23**E was supplied, and an excessive load is detected, then the control unit **70** drives the first cutting mechanism **57** to cut the medium **23** at a position near the roll **25**.

[0109] Further, the control unit **70** controls the second cutting mechanism **58** when cutting the recorded medium **23**. When cutting the medium **23** by the second cutting mechanism **58**, the control unit **70** stops the medium **23** at a position where the position to be cut on the medium **23** reaches the cutting position of the second cutting mechanism **58**. Then, the control unit **70** drives the second cutting mechanism **58** in this state.

[0110] A program PR is stored in the storage unit **83**. The program PR includes a program of a medium rear end cutting control routine illustrated in a flowchart of FIG. **10**. The control unit **70** executes the medium rear end cutting control routine during recording.

Operation of Exemplary Embodiment

[0111] Next, operation of the present exemplary embodiment will be described.

[0112] An operator operates the input unit **71** of the operation panel **18** to instruct the print job PD on the menu screen displayed on the display unit **72**. When accepting the instruction of the print job PD, the control unit **70** causes the recording device **11** to perform recording operation based on the print job PD. In the following, a case where the recorded medium **23** is wound as the roll **53** by the winding unit **51** will be described as an example.

[0113] The control unit **70** controls transport of the medium **23** by controlling the feeding unit **21**, the transport unit **40**, and the winding unit **51** based on the print job PD. The control unit **70** controls the recording unit **30** based on the print job PD, and causes recording to be performed on the medium **23**.

[0114] Hereinafter, the medium rear end cutting control performed by the control unit **70** during recording will be described. The computer **80** executes the medium rear end cutting control routine illustrated in FIG. **10**.

[0115] In step S11, the control unit **70** determines whether a detection load exceeds the second threshold value SH2 or not. When the detection load exceeds the second threshold value, the routine proceeds to step S12, and when the detection load does not exceed the second threshold value SH2, the routine proceeds to step S13.

[0116] In step S12, the control unit **70** causes the recording device **11** to emergency-stop.

[0117] In step S13, the control unit **70** determines whether the detection load exceeds the first threshold value SH1 corresponding to a medium end or not. Specifically, whether the rear end **23**E of the roll **25** is detected by the first rear end detector **81** or not is determined. That is, the control unit **70** determines whether the medium **23** in which the rear end **23**E is bonded to the core body **24** is pulled and a load of the transport motor **56** exceeds the first threshold value SH1 or not. In a case in which the roll **25** in which the rear end **23**E is bonded to the core body **24** is used, the rear end **23**E is detected by the first rear end detector **81** when all of the roll **25** was supplied (ended), based on excess of a load of the transport motor **56** applied from the medium **23** over the first threshold value SH1.

[0118] Note that, when tension acting on the medium **23** in the portion between the roll **25** and the transport roller pair **44** is excessively large, the excessive tension is mitigated by the roller **43** being displaced against biasing force of the spring **47**. Therefore, when the rear end **23**E is fixed to the core body **24**, a time from when the detection load of the first rear end detector **81** exceeds the first threshold value SH1 to

when the detection load further exceeds the second threshold value SH2 can be relatively lengthened. As a result, it is possible to avoid a situation where the detection load of the first rear end detector **81** exceeds the second threshold value SH2 at once, the medium **23** cannot be cut, and the recording device **11** emergency-stops.

[0119] In step S**14**, the control unit **70** drives the cutting mechanism **57** to cut the medium **23**. In other words, the control unit **70** drives the first cutting mechanism **57** to cut the medium **23** at a position near the feeding unit **21**.

[0120] Additionally, the roll holding units **26** are disposed on a front side vertically below the recording unit **30**. The transport path **29** extends from the roll holding units **26** to the recording unit **30** via the rear of the recording device **11**. The first cutting mechanism **57** is disposed, of the transport path **29**, at a position before the transport path **29** reaches the rearmost.

[0121] In FIG. **2**, when the rear end **23**E of the medium **23** is fixed to the core body **24**, the medium **23** is positioned in a substantially annular shape along the transport path **29** as illustrated in FIG. **2**. For example, in FIG. **2**, it is assumed that a configuration is adopted in which the user is accessible to the roll **25** only from a front of the main body **12** and the first cutting mechanism **57** is not present. In this case, the user needs to cut the medium **23** of the roll **25** for supply, by cutting the recorded medium **23** from a front side, or the like. In this case, the recorded and cut medium **23** is wasted. In contrast, even in such a situation, in the present exemplary embodiment, the medium **23** can be cut near the roll **25** for supply by the first cutting mechanism **57**. Thus, the recorded medium **23** need not be cut.

Effects of First Exemplary Embodiment

[0122] Effects of the first exemplary embodiment will be described.

[0123] (1) The recording device **11** includes the roll holding units **26**, the transport mechanism **20**, the recording unit **30**, the rear end detector **81**, the cutting mechanism **57**, and the control unit **70**. The roll holding units **26** hold the roll **25** in which the long medium **23** is wound around the core body **24**. The transport mechanism **20** transports the medium **23** supplied from the roll **25** in the transport direction along the transport path **29**. The recording unit **30** performs recording on the transported medium **23** in the transport path **29**. The rear end detector **81** detects that all of the medium **23** suppliable from the roll **25** was supplied by the transport mechanism **20**. The cutting mechanism **57** cuts the medium **23** in the intersecting direction X intersecting the transport direction at a position between the roll holding units **26** and the recording unit **30**. The control unit **70** cuts the medium **23** by the cutting mechanism **57** based on rear end detection information from the rear end detector **81**.

[0124] According to this configuration, even when the rear end **23**E of the medium **23** is fixed to the core body **24** of the roll **25**, the medium **23** is cut, and thus, after all of the medium **23** was supplied from the roll **25**, recording can be performed on the medium **23**. For example, when the rear end detector **81** detects that the rear end **23**E of the medium **23** is fixed to the core body **24** and all of the medium **23** suppliable from the roll **25** was supplied by the transport mechanism **20**, rear end detection information including contents indicating that the rear end **23**E of the medium **23** is fixed to the core body **24** is output to the control unit **70**. Based on the rear end detection information from the rear end detector **81**, when the information includes the contents indicating the rear end **23**E of the medium **23** is fixed to the core body **24**, the control unit **70** cuts the medium **23** by the cutting mechanism **57**. Thus, even when the rear end **23**E of the medium **23** is fixed to the core body **24** of the roll **25**, recording on the medium **23** can be performed after all of the medium **23** was supplied from the roll **25**.

[0125] (2) The rear end detector **81** outputs the rear end detection information in accordance with a transport load when the transport mechanism **20** transports the medium **23**. According to this configuration, the rear end detector **81** outputs the rear end detection information in accordance with the transport load when the transport mechanism **20** transports the medium **23**. For example, when all of the medium **23** was supplied from the roll **25**, and the rear end **23**E of the medium **23** is fixed to the core body **24**, a transport load when the transport mechanism **20** transports the medium **23** is increased. The rear end detector **81** outputs rear end detection information including contents indicating that this transport load is increased. Based on the rear end detection information from the rear end detector **81**, when the rear end detection information includes the contents indicating that the transport load is increased, the control unit **70** cuts the medium **23** by the cutting mechanism **57**. Thus, it is possible to precisely detect that the rear end **23**E of the medium **23** is fixed to the core body **24** of the roll **25**, and by cutting the medium **23** in which the rear end **23**E is fixed to the core body **24**, recording on the medium **23** can be performed after all the medium **23** was supplied from the roll **25**.

[0126] (3) When a transport load exceeds a predetermined value, the first rear end detector **81** determines that all of the suppliable medium **23** was supplied with the rear end **23**E of the medium **23** fixed to the core body **24**, and outputs rear end detection information. The control unit **70** cuts the medium **23** by the cutting mechanism **57** based on the rear end detection information. According to this configuration, when the transport load exceeds the predetermined value, the first rear end detector **81** determines that all of the suppliable medium **23** was supplied with the rear end **23**E of the medium **23** fixed to the core body **24**, and outputs the rear end detection information, and the control unit **70** cuts the medium **23** by the cutting mechanism **57** based on the rear end detection information. Thus, when the contents indicating that when all of the medium **23** was supplied from the roll **25** and the rear end **23**E of the medium **23** is fixed to the core body **24** of the roll **25** is acquired from the rear end detection information indicating that the transport load exceeds the predetermined value, the medium **23** in which the rear end **23**E is fixed to the core body **24** is cut. As a result, even after all of the medium **23** was supplied from the roll **25**, recording on the medium **23** can be performed.

[0127] (4) The recording device **11** includes the second cutting mechanism **58**, which is different from the cutting mechanism **57**, downstream of the recording unit **30** in the transport path **29**. The second cutting mechanism **58** cuts the medium **23** after recording in the intersecting direction X. According to this configuration, the medium **23** after recording is cut in the intersecting direction X, by the second cutting mechanism **58** positioned downstream of the recording unit **30** in the transport path **29**. With the cutting mechanism **57** different from the second cutting mechanism **58**, even when the rear end **23**E of the medium **23** is fixed

to the core body **24** and all of the medium **23** was supplied from the roll **25**, the medium **23** can be cut.

[0128] (5) The plurality of roll holding units **26** are disposed, vertically below the recording unit **30**, aligned in the vertical direction Z. According to this configuration, since the plurality of roll holding units **26** are present below the recording unit **30**, a distance along the transport path **29** from the roll **25** held by the roll holding units **26** to the recording unit **30** becomes longer, and in particular, when the roll **25** is disposed at a lower stage, it is possible to avoid a situation where, due to the fact that the rear end **23**E of the medium **23** is fixed to the core body **24** when all of the medium **23** was supplied from the roll **25**, recording is forcibly terminated at that time. In this way, as compared to a case where recording on the medium **23** is forcibly terminated at the time when all of the medium **23** was supplied from the roll **25** and the rear end **23**E of the medium **23** is detected to be fixed to the core body **24**, a length of the medium **23** that is wastefully discarded without being recorded can be reduced. For example, when the medium **23** is paper, it is possible to reduce a situation where a large amount of loss paper occurs.

[0129] (6) The roll holding units **26** are disposed on the front side vertically below the recording unit **30**, and the transport path **29** extends from the roll holding units **26** to the recording unit **30** via the rear of the recording device. The cutting mechanism **57** is disposed, of the transport path **29**, at the position before the transport path **29** reaches the rearmost. According to this configuration, since the cutting mechanism **57** is positioned, of the transport path **29** of the medium **23** supplied from the roll **25** held by the roll holding units **26**, at the position before the transport path **29** reaches the rearmost, a desirable position for cutting is the position on the front side vertically below the recording unit **30** of the recording device, which is a device center position and thus is difficult to access. Thus, although cutting of the medium **23** by the user is difficult, the control unit **70** can drive the cutting mechanism **57** to cut the medium **23**.

[0130] (7) A control method of the recording device **11**, the recording device **11** including the roll holding units **26**, the transport mechanism **20**, the recording unit **30**, and the cutting mechanism **57**, includes cutting the medium **23** by the cutting mechanism **57**, when it is detected that all of the medium **23** suppliable from the roll **25** was supplied by the transport mechanism **20**. According to this control method, even when the rear end **23**E of the medium **23** is fixed to the core body **24** of the roll **25**, the medium **23** is cut, and thus, after all of the medium **23** was supplied from the roll **25**, recording on the medium **23** can be performed.

Second Exemplary Embodiment

[0131] Next, the recording device **11** of a second exemplary example will be described. The recording device **11** of the present exemplary embodiment is different from the above-described first exemplary embodiment in that two sets of the roll holding units **26** that each hold the roll **25** for supply are provided. Note that, components common to those of the first exemplary embodiment, such as common members and common configurations, are given the same reference numerals and detailed descriptions thereof are omitted, and different configurations in particular will be described in detail.

[0132] As illustrated in FIG. **11**, the recording device **11** includes the two sets of roll holding units **26** in an accommodation portion **15** recessed in a front portion of the main body **12** in a substantially rectangular parallelepiped shape. The roll **25** in which the long medium **23** is wound around the core body **24** is held by each of the two sets of roll holding units **26**. The two rolls **25** are disposed vertically aligned in the vertical direction Z in the accommodation portion **15** of the main body **12**. Note that, the base **13** constituting a bottom of the main body **12** includes a plurality of casters **13**A at a lower portion thereof.

[0133] The feeding unit **21** having the set of roll holding units **26** includes the feed motor **27** as a drive source for driving one roll holding unit **26** of one set of the roll holding units **26**. By the feed motor **27** being driven, the roll **25** held by the one set of the roll holding units **26** rotates in a direction in which the medium **23** can be supplied. As illustrated in FIG. **1**, in the recording device **11**, the roll **25** can be attached to and detached from the roll holding units **26** from a front side via an opening **16** of the housing part **15**.

[0134] As illustrated in FIG. **11**, the recording device **11** includes the transport mechanism **20** that transports the medium **23** supplied from the roll **25**. Further, the recording device **11** includes the recording unit **30** that performs recording on the medium **23** transported by the transport mechanism **20**. The recording unit **30** includes the carriage **31** and the recording head **32**. The carriage **31** is provided reciprocably in the scanning direction X by being guided by the guide rail **36** extending along the width direction X. The carriage **31** is fixed to a portion of the timing belt **34** wound around a pair of pulleys **33** provided at both ends of the guide rail **36**. By the timing belt **34** being driven, the carriage **31** moves in the scanning direction X. In the process in which the carriage **31** moves in the scanning direction X, the recording head **32** performs recording on the medium **23** supported by the support **38**. The recorded medium **23** is discharged from the discharge port **19** that opens to the front portion of the main body **12**.

[0135] As illustrated in FIG. **12**, the recording device **11** includes the transport mechanism **20** that transports the medium **23** supplied from the roll **25** in the transport direction D along the transport path **29**. The transport mechanism **20** includes the feeding unit **21** that supplies the medium **23** from the roll **25** held by the roll holding units **26**, the transport unit **40** that transports the medium **23** supplied from the roll **25**, and a discharging unit **93** that discharges the recorded medium **23** that is transported. The transporting unit **40** includes a plurality of transport roller pairs **44** and **91** disposed along the transport path **29**. The transport roller pairs **44** and **91** transport the medium **23** along a path passing through a recording position of the recording unit **30**. The discharging unit **93** includes an output roller pair (not illustrated) for discharging the recorded medium **23** and a supporting member **94** that supports the medium **23** being discharged.

[0136] The recording unit **30** performs recording on the transported medium **23** in the transport path **29**.

[0137] The recording device **11** includes the first rear end detector **81** illustrated in FIG. **9** as an example of a rear end detector that detects that all of the medium **23** suppliable from the roll **25** was supplied by the transport mechanism **20**. Additionally, the recording device **11** includes the second rear end detector **49** that detects the rear end **23**E of the medium **23** separated from the core body **24**, at a position between the roll holding units **26** and the recording unit **30**

in the transport path **29**. The second rear end detector **49** detects the rear end **23**E of the medium **23** with the rear end **23**E separated from the core body **24**.

[0138] As illustrated in FIG. **12**, the recording device **11** includes the first cutting mechanism **57** as an example of a cutting mechanism that cuts the medium **23** in the intersecting direction X that intersects the transport direction D at a position between the roll holding units **26** and the recording unit **30**. The recording device **11** of the present example includes the first cutting mechanisms **57** each corresponding to a respective one of the plurality of roll holding units **26**.

[0139] Further, the recording device **11** includes the second cutting mechanism **58**, which is different from the first cutting mechanism **57**, downstream of the recording unit **30** in the transport path **29**. The second cutting mechanism **58** cuts the medium **23** after recording in the intersecting direction X that intersects the transport direction D. The second cutting mechanism **58** of the present example is provided in the main body **12**. A discharge unit **93** discharges the medium **23** cut by the second cutting mechanism **58** from the discharge port **19**.

[0140] A plurality (a plurality of sets) of the roll holding units **26** are disposed, vertically below the recording unit **30**, aligned in the vertical direction Z. In the recording device **11**, the medium **23** can be continuously supplied to the plurality of rolls **25** held by the plurality of roll holding units **26** to perform recording. By setting the roll **25** in each of the plurality of roll holding units **26**, when all of the medium **23** up to the rear end **23**E was supplied from one roll **25**, transport from a leading end of the medium **23** in a pre-set manner of another roll **25** is started. In this way, in the recording device **11** of the present example, switching of the roll **25** as a supply source is performed automatically between the plurality of rolls **25**.

[0141] The recording device **11** includes the control unit **70**. The control unit **70** controls the transport mechanism **20**, the recording unit **30**, the first cutting mechanism **57**, the second cutting mechanism **58**, and the like. The control unit **70** cuts the medium **23** by the first cutting mechanism **57** based on rear end detection information from the second rear end detector **49**.

[0142] Additionally, the roll holding units **26** are disposed on a front side vertically below the recording unit **30**. The transport path **29** extends from the roll holding units **26** to the recording unit **30** via the rear of the recording device **11**. The first cutting mechanism **57** is disposed, of the transport path **29**, at a position before the transport path **29** reaches the rearmost.

[0143] An electrical configuration of the recording device **11** is basically similar to that in FIG. **9**, except that a configuration associated with the winding unit **51** is not provided. The control unit **70** performs the medium rear end cutting control illustrated in FIG. **10** when the recording device **11** performs recording operation. However, the roll holding unit **26** disposed on a lower side of the two roll holding units **26** can be caused to function as the winding unit **51**.

[0144] Thus, when the first rear end detector **81** detects the rear end **23**E fixed to the core body **24**, based on excess of a detection load of the transport motor **56** over a first threshold value, the first cutting mechanism **57** is driven to cut the medium **23**. Thus, recording on the remaining medium **23** can be performed at the time of rear end detection when the first rear end detector **81** detects the rear end **23**E.

[0145] The roll holding units **26** are disposed below the recording unit **30**, and thus a transport distance along the transport path **29** from the roll **25** to the recording unit **30** is increased. In particular, when the roll is disposed at a lower stage, the transport distance along the transport path **29** from the roll **25** to the recording unit **30** is increased. In particular, when the roll is disposed at the lower stage, and the rear end **23**E of the medium **23** is fixed to the core body **24**, a large amount of loss paper occurs. However, in the present exemplary embodiment, the medium **23** is cut near the rear end **23**E by the second cutting mechanism **58**. Thus, an amount of this type of loss paper is suppressed to be small.

[0146] The configuration of the first cutting mechanism **57** in FIG. **12** may be changed to a configuration of each of examples illustrated in FIGS. **13** to **14** below.

First Example

[0147] As illustrated in FIG. **13**, the first cutting mechanisms **57** are provided as examples of cutting mechanisms each corresponding to a respective one of the plurality of roll holding units **26**. A drive source **100** is common to the plurality of first cutting mechanisms **57**. Driving of the drive source **100** is switched to operate the first cutting mechanisms **57**. The drive source **100** is, for example, an electric motor. A power transmission path of power of the drive source **100** is switched via a switching mechanism **101**. The drive source **100** and the switching mechanism **101** are controlled by the control unit **70**. When the control unit **70** switches the switching mechanism **101** to a first switching position, the power of the drive source **100** is transmitted to a first cutting mechanism **57**A on one side via a first power transmission path **102**. Further, when the control unit **70** switches the switching mechanism **101** to a second switching position, the power of the drive source **100** is transmitted to a first cutting mechanism **57**B on another side via a second power transmission path **103**. The control unit **70** recognizes one, which is a supply source, of the two rolls **25**.

[0148] In a case in which the roll **25** at an upper stage is used as the supply source, when all of the medium **23** was supplied from the roll **25** and the rear end **23**E is fixed to the core body **24**, then the first rear end detector **81** detects the rear end **23**E based on excess of a detection load over the first threshold value SH**1**. Then, the control unit **70** drives the first cutting mechanism **57**A on the one side to cut the medium **23** at a position near the roll **25** at the upper stage.

[0149] On the other hand, in a case in which the roll **25** at a lower stage is used as the supply source, when all of the medium **23** was supplied from the roll **25** and the rear end **23**E is fixed to the core body **24**, then the first rear end detector **81** detects the rear end **23**E based on excess of a detection load over the first threshold value SH**1**. Then, the control unit **70** drives the first cutting mechanism **57**B on the other side to cut the medium **23** at a position near the roll **25** at the lower stage.

[0150] According to this first exemplary example, the drive source **100** is common to the plurality of cutting mechanisms **57**A and **57**B used for cutting the medium **23**, when all of the medium **23** was supplied from one roll **25** of the plurality of rolls **25** held by the plurality of roll holding units **26**, and the rear end **23**E of the medium **23** is fixed to the core body **24**. Thus, the number of parts such as the drive

source **100** can be reduced, which makes it possible to simplify the cutting mechanisms **57**A and **57**B, and the configuration required for driving the cutting mechanisms.

Second Example

[0151] As illustrated in FIG. **14**, the plurality of roll holding units **26** may share the one first cutting mechanism **57** as an example of a cutting mechanism. The first cutting mechanism **57** moves between the plurality of roll holding units **26** to cut the medium **23**.

[0152] As illustrated in FIG. **14**, the recording device **11** includes a movement mechanism **105** that moves the first cutting mechanism **57** between the plurality of roll holding units **26**. The movement mechanism **105** includes a rail **106** that makes it possible for the one first cutting mechanism **57** to move, and a drive source **107** that outputs drive force for moving the first cutting mechanism **57** along the rail **106**. By being driven by the drive source **107**, the first cutting mechanism **57** moves between a first position indicated by solid lines in FIG. **14**, and a second position indicated by two-dot chain lines in the figure.

[0153] In a case in which the roll **25** at an upper stage is used as a supply source, when all of the medium **23** was supplied from the roll **25** and the rear end **23**E is fixed to the core body **24**, then the first rear end detector **81** detects the rear end **23**E. Then, the control unit **70** drives the first cutting mechanism **57** present at the first position to cut the medium **23** at a position near the roll **25** at the upper stage.

[0154] On the other hand, in a case in which the roll **25** at a lower stage is used as a supply source, when all of the medium **23** was supplied from the roll **25** and the rear end **23**E is fixed to the core body **24**, then the first rear end detector **81** detects the rear end **23**E. Then, the control unit **70** drives the first cutting mechanism **57** present at the second position to cut the medium **23** at a position near the roll **25** at the lower stage.

[0155] According to this second example, the first cutting mechanism **57** moves between transport paths **29**A and **29**B through which the media **23** are supplied from the rolls **25** held by the plurality of roll holding units **26** to cut the medium **23**. Thus, the number of installed first cutting mechanisms **57** can be reduced.

Third Example

[0156] As illustrated in FIG. **15**, the plurality of roll holding units **26** share the first cutting mechanism **57** as an example of a cutting mechanism. The first cutting mechanism **57** cuts the medium **23** at a position **29**C where the transport paths **29**A and **29**B from the respective roll holding units **26** are merged.

[0157] According to this third example, when all of the media **23** are supplied from the rolls **25** held by the plurality of roll holding units **26**, and the rear end **23**E of the medium **23** is fixed to the core body **24**, the one first cutting mechanism **57** is shared for cutting the medium **23**. By the one shared first cutting mechanism **57**, the medium **23** is cut at the position **29**C where the transport paths **29**A and **29**B from the respective roll holding units **26** are merged. Thus, in the recording device **11** including the plurality of roll holding units **26**, the first cutting mechanism **57** can be simply configured.

Modifications

[0158] The present exemplary embodiment can be modified and implemented as follows. The present exemplary embodiment and the following modifications can be combined and implemented within a technically consistent range.

[0159] The first cutting mechanism **57** may be a cutter driven by utilizing displacement of the roller **43** when the roller **43** is displaced against biasing force of the spring **47**. According to this configuration, the drive source of the first cutting mechanism **57** can be made unnecessary.

[0160] The rear end detector **49** may be eliminated, and the rear end **23**E of the medium **23** may be detected by the medium detector **48**.

[0161] The second cutting mechanism **58** may be eliminated, and instead, the medium **23** may be cut to a predetermined length by the first cutting mechanism **57**. In other words, the control unit **70** may cut the medium **23** to the predetermined length specified in a print job by the first cutting mechanism **57**.

[0162] In the above second exemplary embodiment, in the recording device **11**, the two rolls can be mounted, and when the medium **23** of the roll **25** on one side is used up, the medium **23** is automatically fed from another roll **25**, but instead, a configuration may be adopted in which, when the medium **23** of the roll **25** on the one side is used up, the user manually performs switching such that the medium **23** is fed from the roll **25** on another side. In this case, the number of rolls **25** that can be mounted at the recording device **11** may be two, or may be one.

[0163] The second cutting mechanism **58** may be disposed at approximately the same position as a most downstream roller pair, or may be disposed outside the housing.

[0164] The recording device **11** is not limited to a serial printer, and may be a line printer or a page printer. When the recording device **11** is a line printer, the recording unit **30** does not include the carriage **31**, but includes a recording head capable of simultaneously performing recording on a range that is longer than a maximum width of the medium **23**. The recording head **32** performs recording on the medium **23** transported at a predetermined speed by the transport mechanism **20**.

[0165] The recording device **11** is not limited to an inkjet printer, but may be an electrophotographic printer such as a laser printer. Further, the recording device **11** may also be a dot impact-type printer or a heat-transfer type printer.

[0166] The recording device **11** may be provided with an image reading unit (scanner), or may be a printer having only a recording function without including an image reading unit. The recording device **11** may be a multi-function device, when provided with an image reading unit.

[0167] The recording device **11** may be an inkjet printing apparatus that performs recording on fabric, when the medium **23** is fabric.

[0168] Technical ideas derived from the above exemplary embodiments and modifications and operations and advantages of the technical ideas will be described below.

[0169] (A) A recording device includes a roll holding unit configured to hold a roll in which a long medium is wound around a core body, a transport mechanism configured to transport the medium supplied from the roll in a transport direction along a transport path, a recording unit configured to perform recording on the transported medium in the transport path, a rear end detector configured to detect that

all of the medium suppliable from the roll was supplied by the transport mechanism, a cutting mechanism configured to cut the medium in an intersecting direction intersecting the transport direction at a position between the roll holding unit and the recording unit, and a control unit, wherein the control unit cuts the medium by the cutting mechanism based on rear end detection information from the rear end detector.

[0170] According to this configuration, even when the rear end of the medium is fixed to the core body of the roll, the medium is cut, and thus, after all of the medium was supplied from the roll, recording on the medium can be performed. For example, when the rear end detector detects that the rear end of the medium is fixed to the core body when all of the medium suppliable from the roll was supplied by the transport mechanism, the rear end detection information including contents that the rear end of the medium is fixed to the core body is output to the control unit. Based on the rear end detection information from the rear end detector, when the information includes the contents indicating the rear end of the medium is fixed to the core body, the control unit cuts the medium by the cutting mechanism. Thus, even when the rear end of the medium is fixed to the core body of the roll, recording on the medium can be performed after all of the medium was supplied from the roll.

[0171] (B) In the above recording device, the rear end detector may output the rear end detection information in accordance with a transport load when the transport mechanism transports the medium.

[0172] According to this configuration, the rear end detector outputs the rear end detection information in accordance with the transport load when the transport mechanism transports the medium. For example, when all of the medium was supplied from the roll, and the rear end of the medium is fixed to the core body, the transport load when the transport mechanism transports the medium is increased. The rear end detector outputs rear end detection information including contents indicating that this transport load is increased. Based on the rear end detection information from the rear end detector, when the rear end detection information includes the contents indicating that transport load is increased, the control unit cuts the medium by the cutting mechanism. Thus, it is possible to precisely detect that the rear end of the medium is fixed to the core body of the roll, and by cutting the medium in which the rear end is fixed to the core body, recording on the medium can be performed after all the medium was supplied from the roll.

[0173] (C) In the above recording device, when the transport load exceeds the predetermined value, the rear end detector may determine that all of the suppliable medium was supplied with the rear end of the medium fixed to the core body, and output the rear end detection information, and the control unit may cut the medium by the cutting mechanism based on the rear end detection information.

[0174] According to this configuration, when the transport load exceeds the predetermined value, the rear end detector determines that all of the suppliable medium was supplied with the rear end of the medium fixed to the core body, and outputs the rear end detection information, and the control unit cuts the medium by the cutting mechanism based on the rear end detection information. Thus, when the contents indicating that all of the medium was supplied from the roll and the rear end of the medium is fixed to the core body of the roll is acquired from the rear end detection information indicating that the transport load exceeds the predetermined value, the medium in which the rear end is fixed to the core body is cut. As a result, when the rear end is fixed to the core body, recording on the medium can be performed after all of the medium was supplied from the roll.

[0175] (D) The above recording device may further include a second cutting mechanism downstream of the recording unit in the transport path, the second cutting mechanism being different from the cutting unit, and the second cutting mechanism may cut the medium after recording in the intersecting direction.

[0176] According to this configuration, the medium after recording is cut in the intersecting direction, by the second cutting mechanism positioned downstream of the recording unit in the transport path. With the cutting mechanism different from the second cutting mechanism, even when all of the medium was supplied from the roll and the rear end of the medium is fixed to the core body, the medium can be cut.

[0177] (E) In the above recording device, a plurality of the roll holding units may be disposed, vertically below the recording unit, aligned in the vertical direction.

[0178] According to this configuration, since the plurality of roll holding units are present below the recording unit, a distance along the transport path from the roll held by the roll holding units to the recording unit becomes longer, and in particular, when the roll is disposed at a lower stage, it is possible to avoid a situation where, due to the fact that the rear end of the medium is fixed to the core body when all of the medium was supplied from the roll, recording is forcibly terminated at that time. In this way, as compared to a case where the recording on the medium is forcibly terminated at the time when the rear end of the medium is detected to be fixed to the core body and all of the medium was supplied from the roll, a length of the medium that is wastefully discarded without being recorded can be reduced. For example, when the medium is paper, it is possible to reduce a situation where a large amount of loss paper occurs.

[0179] (F) In the above recording device, the cutting mechanisms may be provided each corresponding to a respective one of the plurality of roll holding units, a drive source may be common to a plurality of the cutting mechanisms, and driving of the drive source may be switched to operate the plurality of cutting mechanisms.

[0180] According to this configuration, the drive source is common to the plurality of cutting mechanisms used for cutting the medium, when all of the medium was supplied from one roll of the plurality of rolls held by the plurality of roll holding units and the rear end of the medium is fixed to the core body. Thus, the number of parts such as the drive source can be reduced, which makes it possible to simplify the configuration required for driving the cutting mechanism.

[0181] (G) In the above recording device, the plurality of roll holding units may share the one cutting mechanism, and the one cutting mechanism may move between the plurality of roll holding units to cut the medium.

[0182] According to this configuration, the cutting mechanism moves between transport paths in which the media are supplied from the rolls held by the plurality of roll holding units to cut the medium, and thus the number of installed cutting mechanisms can be reduced.

[0183] (H) In the above recording device, the plurality of roll holding units may share the one cutting mechanism, and the one cutting mechanism may cut the medium at a position where the transport paths from the respective roll holding units are merged.

[0184] According to this example, one cutting mechanism is shared for cutting the medium by the cutting mechanism, when all of the media are supplied from the rolls held by the plurality of roll holding units and the rear end of the medium is fixed to the core body. By the one shared cutting mechanism, the medium is cut at the position where the transport paths from the respective roll holding units are merged. Thus, in the recording device including the plurality of roll holding units, the cutting mechanism can be simply configured.

[0185] (I) In the above recording device, the roll holding unit may be disposed on a front side vertically below the recording unit, the transport path may extend from the roll holding unit to the recording unit via a rear of the recording device, and the cutting mechanism may be disposed, of the transport path, at a position before the transport path reaches a rearmost.

[0186] According to this configuration, since the cutting mechanism is positioned, of the transport path of the medium supplied from the roll held by the roll holding units, at the position before reaching the rearmost side, a desirable position for cutting is the position on the front side vertically below the recording unit of the recording device, which is a device center position and thus is difficult to access. Thus, although cutting of the medium by the user is difficult, the control unit can drive the cutting mechanism to cut the medium.

[0187] (J) A control method for recording device is a control method for a recording device, the recording device including a roll holding unit configured to hold a roll in which a long medium is wound around a core body, a transport mechanism configured to transport the medium supplied from the roll in a transport direction along a transport path, a recording unit configured to perform recording on the transported medium in the transport path, and a cutting mechanism configured to cut the medium in an intersecting direction intersecting the transport direction at a position between the roll holding unit and the recording unit, the control method including cutting the medium by the cutting mechanism, when it is detected that all of the medium suppliable from the roll was supplied by the transport mechanism.

[0188] According to this method, even when the rear end of the medium is fixed to the core body of the roll, the medium is cut, and thus, after all of the medium was supplied from the roll, recording on the medium can be performed.

What is claimed is:

1. A recording device, comprising:
- a roll holding unit configured to hold a roll in which a long medium is wound around a core body;
- a transport mechanism configured to transport the medium supplied from the roll in a transport direction along a transport path;
- a recording unit configured to perform recording on the transported medium in the transport path;
- a rear end detector configured to detect that all of the medium suppliable from the roll was supplied by the transport mechanism;
- a cutting mechanism configured to cut the medium in an intersecting direction intersecting the transport direction at a position between the roll holding unit and the recording unit; and
- a control unit, wherein
- the control unit cuts the medium by the cutting mechanism based on rear end detection information from the rear end detector.

2. The recording device according to claim **1**, wherein
- the rear end detector outputs the rear end detection information in accordance with a transport load when the transport mechanism transports the medium.

3. The recording device according to claim **2**, wherein
- when the transport load exceeds a predetermined value, the rear end detector determines that all of the suppliable medium was supplied with a rear end of the medium fixed to the core body, and outputs the rear end detection information, and the control unit cuts the medium by the cutting mechanism based on the rear end detection information.

4. The recording device according to claim **1**, further comprising:
- a second cutting mechanism downstream of the recording unit in the transport path, the second cutting mechanism being different from the cutting unit, wherein
- the second cutting mechanism cuts the medium after recording in the intersecting direction.

5. The recording device according to claim **1**, wherein
- a plurality of the roll holding units are disposed, vertically below the recording unit, aligned in a vertical direction.

6. The recording device according to claim **5**, wherein
- the cutting mechanisms are provided each corresponding to a respective one of the plurality of roll holding units,
- a drive source is common to a plurality of the cutting mechanisms, and
- driving of the drive source is switched to operate the plurality of cutting mechanisms.

7. The recording device according to claim **5**, wherein
- the plurality of roll holding units share the one cutting mechanism and
- the one cutting mechanism moves between the plurality of roll holding units to cut the medium.

8. The recording device according to claim **5**, wherein
- the plurality of roll holding units share the one cutting mechanism and
- the one cutting mechanism cuts the medium at a position where the transport paths from the respective roll holding units are merged.

9. The recording device according to claim **1**, wherein
- the roll holding unit is disposed on a front side vertically below the recording unit,
- the transport path extends from the roll holding unit to the recording unit via a rear of the recording device, and
- the cutting mechanism is disposed, of the transport path, at a position before the transport path reaches a rearmost.

10. A control method for a recording device, the recording device including:
- a roll holding unit configured to hold a roll in which a long medium is wound around a core body,
- a transport mechanism configured to transport the medium supplied from the roll in a transport direction along a transport path,

a recording unit configured to perform recording on the transported medium in the transport path, and

a cutting mechanism configured to cut the medium in an intersecting direction intersecting the transport direction at a position between the roll holding unit and the recording unit,

the control method comprising

cutting the medium by the cutting mechanism when it is detected that all of the medium suppliable from the roll was supplied by the transport mechanism.

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