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LIQUID EJECTING DEVICE

Abstract

A liquid ejecting device includes a liquid ejecting unit, a maintenance unit, and a raising and lowering mechanism. The liquid ejecting unit is capable of ejecting liquid. The maintenance unit performs maintenance of the liquid ejecting unit. The raising and lowering mechanism raises and lowers the maintenance unit between a first position and a second position lowered than the first position. The raising and lowering mechanism includes a counterweight and a coupling portion. Both ends of the coupling portion are coupled to coupling destinations so as to raise and lower the counterweight and the maintenance unit in opposite directions to each other via a pulley.

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Background/Summary

[0001] The present application is based on, and claims priority from JP Application Serial Number 2024-024525, filed Feb. 21, 2024, the disclosure of which is hereby incorporated by reference herein in its entirety.

BACKGROUND

1. Technical Field

[0002] The present disclosure relates to a liquid ejecting device including a maintenance unit that performs maintenance of a liquid ejecting unit that ejects liquid.

2. Related Art

[0003] For example, JP-A-2022-12259 discloses a liquid ejecting device (for example, a recording device) that performs printing on a medium such as paper by ejecting liquid from a liquid ejecting unit (for example, a recording head) capable of ejecting liquid such as ink. The liquid ejecting device includes a maintenance unit that performs maintenance of the liquid ejecting unit. The maintenance unit includes a wiping device that performs maintenance (for example, wiping) on the nozzle surface of the liquid ejecting unit using a cleaning cloth (for example, a wiping member) fed from a roll-shaped cloth roll. This type of the wiping device includes a feeding unit and a winding unit. When the winding unit winds the cleaning cloth, a new cloth region is fed out from the cloth roll.

[0004] However, in the liquid ejecting device described in JP-A-2022-12259, when all of the cloth rolls in the feeding unit are fed, it is necessary to perform a replacement operation of removing the used cloth roll wound around the winding unit and setting a new cloth roll in the feeding unit. Alternatively, the maintenance unit itself needs to be replaced with a new maintenance unit. However, in the liquid ejecting device described in JP-A-2022-12259, there is room for improvement in terms of replaceability of consumables used for maintenance. Maintenance using consumables such as cloth is not limited to wiping, and includes cleaning and the like. In addition, there is also a case where a person such as a user or a service person needs to access the maintenance unit in order to perform a component replacement operation, a cleaning operation, or the like without being limited to the replacement operation of the consumables. As described above, there is room for improvement in accessibility when a person or the like performs a predetermined operation on the maintenance unit. Therefore, it is desired to improve usability for a person or the like who accesses the maintenance unit.

SUMMARY

[0005] According to an aspect of the disclosure, there is provided a liquid ejecting device including a liquid ejecting unit configured to eject liquid, a maintenance unit configured to perform maintenance of the liquid ejecting unit, and a raising and lowering mechanism configured to raise and lower the maintenance unit between a first position and a second position lowered than the first position, wherein the raising and lowering mechanism includes a counterweight, and a coupling portion having both ends coupled to a coupling destination to raise and lower the counterweight and the maintenance unit in opposite directions to each other via a pulley.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. **1** is a schematic side view illustrating a liquid ejecting device according to an embodiment.

[0007] FIG. **2** is a partial side view illustrating the liquid ejecting device.

[0008] FIG. **3** is a schematic view illustrating a maintenance unit and a raising and

[0009] lowering mechanism.
[0010] FIG. **4** is a schematic view illustrating the maintenance unit and the raising and lowering mechanism.
[0011] FIG. **5** is a side view illustrating the maintenance unit and the raising and
[0012] lowering mechanism.
[0013] FIG. **6** is a rear view illustrating the maintenance unit raised to a first position and the raising and lowering mechanism.
[0014] FIG. **7** is a rear view illustrating the maintenance unit lowered to a second position and the raising and lowering mechanism.
[0015] FIG. **8** is a perspective view illustrating the maintenance unit slid to a working position and the raising and lowering mechanism.
[0016] FIG. **9** is a front view illustrating the maintenance unit raised to the first position and the raising and lowering mechanism.
[0017] FIG. **10** is a partial rear view of the maintenance unit regulated to the first position by a second regulating unit.
[0018] FIG. **11** is a front view for explaining the operation of a positioning assist mechanism.
[0019] FIG. **12** is a front view for explaining the operation of the positioning assist mechanism.
[0020] FIG. **13** is a rear view for explaining the operation of a holding unit.
[0021] FIG. **14** is a rear view for explaining the operation of the holding unit.
[0022] FIG. **15** is a partial perspective view illustrating the maintenance unit sliding to the working position and the raising and lowering mechanism.
[0023] FIG. **16** is a side view illustrating a wiping unit, which is an example of the maintenance unit, and the raising and lowering mechanism.
[0024] FIG. **17** is a schematic view illustrating a maintenance unit and a raising and lowering mechanism in a modification example.
[0025] FIG. **18** is a schematic view illustrating a maintenance unit and a raising and lowering mechanism in a modification example different from that of FIG. **17**.
[0026] FIG. **19** is a schematic view illustrating a maintenance unit and a raising and lowering mechanism in a modification example different from that of FIG. **18**.
[0027] FIG. **20** is a schematic view illustrating a maintenance unit and a raising and lowering mechanism in a modification example different from that of FIG. **19**.

DESCRIPTION OF EMBODIMENTS

[0028] Below, an embodiment of a liquid ejecting device will be described with reference to the drawings. A liquid ejecting device **11** illustrated in FIG. **1** in the present embodiment is, for example, an ink jet type printer that prints an image such as a character or a photograph by ejecting ink, which is an example of a liquid, onto a medium such as paper or fabric.

Liquid Ejecting Device **11**

[0029] In the liquid ejecting device **11** illustrated in FIG. **1**, three directions intersecting with each other (for example, orthogonal to each other) are indicated by an XYZ coordinate system, and are respectively referred to as an X direction, a Y direction, and a Z direction. The X direction and the Y direction intersect (for example, are orthogonal to) each other in, for example, a horizontal plane. The X direction is a scanning direction in which a liquid ejecting unit **22** moves in the liquid ejecting device **11**, and thus is also referred to as a scanning direction X. The X direction is also a direction in which a portion of a medium **99** on which printing is performed by the liquid ejecting unit **22** ejecting liquid is transported. The Y direction is a direction that intersects (for example, is orthogonal to) the scanning direction X on the horizontal plane. The Z direction is a direction parallel to a vertical direction, and is therefore also referred to as a vertical direction Z. The vertical direction Z includes an upward direction+Z and a downward direction-Z.
[0030] As illustrated in FIG. **1**, the liquid ejecting device **11** includes a housing **12**. The liquid ejecting device **11** includes a medium feeding unit **13**. The medium feeding unit **13** is configured to

feed the medium **99**. The medium feeding unit **13** is accommodated in, for example, the housing **12**. The medium feeding unit **13** includes a feeding shaft **14**. The feeding shaft **14** rotatably holds a roll body **90** around which the medium **99** is wound. The feeding shaft **14** holds the medium **99** before printing. As the feeding shaft **14** rotates, the medium **99** is fed from the medium feeding unit **13**. The feeding shaft **14** may be driven to rotate by a motor, or may be rotated in a driven manner by the medium **99** being pulled.

[0031] The liquid ejecting device **11** includes a medium winding unit **15**. The medium winding unit **15** is configured to wind the medium **99**. The medium winding unit **15** is accommodated, for example, in the housing **12**. The medium winding unit **15** includes a winding shaft **16**. Similarly to the feeding shaft **14**, the winding shaft **16** rotatably holds the roll body **90**. The winding shaft **16** holds the medium **99** after printing. As the winding shaft **16** rotates, the medium winding unit **15** winds the medium **99**. The winding shaft **16** is driven to rotate, for example, by a motor.

[0032] The liquid ejecting device **11** includes a medium support unit **17**. The medium support unit **17** supports the medium **99**. The medium support unit **17** is accommodated in the housing **12**, for example. The medium support unit **17** supports, for example, the medium **99** from below. The medium support unit **17** supports the medium **99** in the course from when the medium **99** is fed from the medium feeding unit **13** to when the medium **99** is wound around the medium winding unit **15**. Printing is performed on a region of the medium **99** supported by the medium support unit **17**.

[0033] The medium support unit **17** may be, for example, a platen having a rectangular plate shape extending in the scanning direction X. The platen may have a plurality of ribs that support the medium **99**. The platen may have an absorbing member capable of absorbing liquid such as ink ejected from the liquid ejecting head **23** to a place other than the medium **99**.

[0034] The liquid ejecting device **11** includes a transport unit **18**. The transport unit **18** is configured to transport the medium **99**. The transport unit **18** is accommodated in, for example, the housing **12**. The transport unit **18** transports the medium **99** from the medium feeding unit **13** toward the medium winding unit **15**. For example, the transport unit **18** transports the medium **99** on the medium support unit **17** toward a first direction A**1**. The transport unit **18** transports the medium **99** intermittently, for example. Specifically, the transport unit **18** stops while the liquid is ejected to the region of the medium **99** supported by the medium support unit **17**. The transport unit **18** transports the medium **99** after the liquid is ejected to the region of the medium **99** supported by the medium support unit **17**. The transport unit **18** is not limited to a long medium **99** that is continuous from the roll body **90**, and may transport single sheets of the medium **99**.

[0035] The transport unit **18** includes one or more transport rollers **19**. For example, the transport roller **19** is located in the housing **12**, for example. The transport roller **19** rotates to transport the medium **99**. The medium **99** is wound over the transport roller **19**. The transport rollers **19** may sandwich the medium **99**. The transport roller **19** rotates to transport the medium **99**. The transport roller **19** includes, for example, a roller that is driven to rotate by a motor. A transport path of the medium **99** is formed in the housing **12** by the transport roller **19**.

[0036] The liquid ejecting device **11** includes a drying unit **21**. The drying unit **21** is configured to dry the medium **99** after printing. The drying unit **21** dries the medium **99** in the course in which the medium **99** is transported from the medium support unit **17** to the medium winding unit **15**. The drying unit **21** is located, for example, inside the housing **12**. The drying unit **21** is located, for example, immediately below the medium support unit **17**. The drying unit **21** may include a heater that heats the medium **99**. The drying unit **21** may include a blower that blows a gas onto the medium **99**.

[0037] The liquid ejecting device **11** includes the liquid ejecting unit **22**. The liquid ejecting unit **22** is configured to be capable of ejecting liquid. The liquid ejecting unit **22** ejects liquid onto the medium **99**. The liquid ejecting unit **22** includes a liquid ejecting head **23**. The liquid ejecting head **23** has a plurality of nozzles **24**. The liquid ejecting head **23** has a nozzle surface **25** capable of

facing a support surface (for example, an upper surface) of the medium support unit **17**. The plurality of nozzles **24** are open in the nozzle surface **25**.

[0038] The liquid ejecting unit **22** of the present embodiment reciprocates in the scanning direction X. The liquid ejecting unit **22** includes a carriage **26** configured to reciprocate in the scanning direction X. The liquid ejecting head **23** is mounted on the carriage **26**. The liquid ejecting unit **22** passes through a position facing the medium support unit **17** by reciprocating in the scanning direction X. The liquid ejecting unit **22** is located, for example, above the medium support unit **17**.

[0039] The scanning direction X includes the first direction A**1** and the second direction A**2**. The second direction A**2** is the opposite direction to the first direction A**1**. In the liquid ejecting device **11**, a direction in which the carriage **26** moves coincides with a direction in which the medium **99** moves on the medium support unit **17**. Thus, the liquid ejecting device **11** is a lateral printer. In the case of the lateral printer, the carriage **26** may also be movable in a sub-scanning direction Y orthogonal to the scanning direction X (main scanning direction X). The liquid ejecting device **11** may be a serial printer in which the medium **99** is transported in a direction different from the scanning direction X. In addition, the liquid ejecting device **11** may be a serial printer in which a direction different from the X direction which is a direction in which the medium **99** is transported is a scanning direction in which the carriage **26** moves.

[0040] As illustrated in FIG. **2**, the liquid ejecting unit **22** performs printing on the medium **99** by ejecting liquid onto the medium **99**. The liquid ejecting unit **22** has the nozzle surface **25** in which one or more nozzles **24** are open. The liquid ejecting unit **22** ejects liquid from the nozzle **24**.

[0041] The liquid ejecting unit **22** includes one or more piezoelectric elements **27**. The liquid ejecting unit **22** has the same number of piezoelectric elements **27** as that of the nozzles **24**. The piezoelectric element **27** changes the pressure in the nozzle **24** when a voltage is applied thereto. When the piezoelectric element **27** changes the pressure in the nozzle **24**, the liquid is ejected from the nozzle **24**.

[0042] The piezoelectric element **27** can change the pressure in the nozzle **24** so that liquid is not ejected from the nozzle **24**. In other words, the piezoelectric element **27** can vibrate the liquid in the nozzle **24** so that liquid is not ejected from the nozzle **24** by changing the pressure in the nozzle **24**. In this manner, the liquid ejecting unit **22** can perform micro-vibration for vibrating the liquid in the nozzle **24**. The liquid in the nozzle **24** is stirred by the micro-vibration. As a result, thickening of the liquid in the nozzle **24** is eliminated. The liquid ejecting unit **22** appropriately performs the micro-vibration, for example, before printing, during printing, or the like. The micro-vibration is performed in a state where the liquid ejecting unit **22** is stopped.

[0043] The liquid ejecting unit **22** ejects the liquid onto a region of the medium **99** supported by the medium support unit **17**. The liquid ejecting unit **22** is, for example, a line head capable of ejecting liquid all at once across the width of the medium **99**. The liquid ejecting unit **22** reciprocates in the scanning direction X together with the carriage **26**. Accordingly, the liquid ejecting unit **22** can eject the liquid over the entire region of the medium **99** supported by the medium support unit **17**.

[0044] The liquid ejecting unit **22** is displaced to a plurality of positions by moving in the scanning direction X. The liquid ejecting unit **22** is displaced not only to a position facing the medium support unit **17** but also to a position not facing the medium support unit **17**. The liquid ejecting unit **22** may reciprocate between positions facing the medium support unit **17** during printing, or may also reciprocate between positions not facing the medium support unit **17** in an operation different from printing.

[0045] As illustrated in FIG. **1**, the liquid ejecting device **11** includes a pressurizing unit **28**. The pressurizing unit **28** is configured to pressurize the inside of the liquid ejecting unit **22**. The pressurizing unit **28** is coupled to the liquid ejecting unit **22**. The pressurizing unit **28** is, for example, a pump. The pressurizing unit **28** supplies the liquid to a flow path (not illustrated) communicating with the nozzle **24** by pressurization. The liquid ejecting unit **22** is coupled to a liquid supply source (not illustrated) such as an ink cartridge or an ink tank through a flow path.

The pressurizing unit **28** supplies, from a liquid supply source, an amount of liquid corresponding to an amount of liquid consumed by the liquid ejecting unit **22** ejecting the liquid from the nozzle **24**, to a flow path (not illustrated) communicating with the nozzle **24** by pressurization.

[0046] The flow path pressurized by the pressurizing unit **28** may be a circulation flow path passing through the liquid ejecting unit **22**. In this case, the pressurizing unit **28** may perform a circulation operation of circulating the liquid in the circulation flow path. The liquid such as ink contains a coloring matter. The coloring matter is, for example, pigment or dye. Depending on a type of liquid, the coloring matter (for example, pigment) may be prone to settling over time. When liquid in which the coloring matter is prone to settling is used as described above, a circulation operation of circulating the liquid through the circulation flow path may be performed. The circulation operation stirs the coloring matter in the liquid, thereby curbing the settling of the coloring matter.

[0047] The liquid ejecting device **11** includes a maintenance unit **30**. The maintenance unit **30** performs maintenance on the liquid ejecting unit **22**. The maintenance performed on the liquid ejecting unit **22** by the maintenance unit **30** is, for example, cleaning. The maintenance unit **30** of the present embodiment is a cleaning unit **31** that performs cleaning as maintenance. The cleaning unit **31** receives the liquid ejected or discharged from the nozzles **24** by the liquid ejecting unit **22** performing cleaning. The cleaning in the present embodiment is an operation in which the liquid ejecting unit **22** ejects or discharges the liquid from the nozzle **24** in order to prevent or eliminate an ejection failure (clogging or the like) of the nozzle **24**. In addition, the reception of the liquid in which the liquid ejected or discharged from the nozzle **24** by the cleaning is received by a receiving member **32** (refer to FIG. **2**) which will be described below is also included in a part of the cleaning.

[0048] The liquid ejecting unit **22** may perform a liquid discharge operation of forcibly discharging the liquid from the nozzle **24** as an example of the cleaning. The liquid ejecting unit **22** may perform flushing as an example of the cleaning. The flushing is a process of ejecting liquid droplets that are not related to printing from all the nozzles **24**. That is, the cleaning includes at least one of the liquid discharge processing and the flushing. The cleaning of the present embodiment includes, for example, both the liquid discharge processing and the flushing. Note that the cleaning may be only the liquid discharge processing or only the flushing. In addition, in the present specification, a period in which the liquid discharge operation is performed is referred to as a cleaning period, and a period in which the flushing is performed is referred to as a flushing period. The control unit **100** manages a cleaning time and a flushing time.

[0049] When the cleaning time is reached, the liquid ejecting unit **22** moves to a discharge position EP. The discharge position EP is, for example, a position shifted in a second direction A**2** from the position facing the medium support unit **17**. The liquid ejecting unit **22** forcibly discharges the liquid from the nozzle **24** toward the maintenance unit **30** at the discharge position EP. The maintenance unit **30** receives the liquid discharged from the nozzle **24**. In addition, the liquid ejecting unit **22** moves to the discharge position EP at the flushing time. The liquid ejecting unit **22** ejects the liquid from the nozzle **24** toward the maintenance unit **30** at the discharge position EP. In a case where the cleaning is the liquid discharge operation, for example, air bubbles, foreign substances, and the like present in the liquid in the nozzle **24** are discharged together with the liquid (ink). In a case where the cleaning is flushing, for example, the thickened liquid (thickened ink) present in the liquid in the nozzle **24** is ejected from the nozzle **24** by the discharge. In this manner, the nozzle **24** is cleaned by the liquid discharge operation or the flushing, and thus the ejection failure of the nozzle **24** is prevented or eliminated.

[0050] The liquid ejecting device **11** includes a wiping unit **40**. The wiping unit **40** wipes the nozzle surface **25** by coming into contact with the nozzle surface **25**. When the wiping unit **40** wipes the nozzle surface **25**, the liquid adhering to the nozzle surface **25** is removed. That is, the wiping unit **40** performs wiping on the liquid ejecting unit **22**. The wiping unit **40** wipes the nozzle surface **25** after cleaning, for example. When the cleaning operation is performed, the liquid adheres to the

nozzle surface **25** as a result of the liquid being discharged from the nozzle **24**. Therefore, it is preferable that the wiping unit **40** wipes the nozzle surface **25** after cleaning. Accordingly, the liquid adhering to the nozzle surface **25** is removed.

[0051] The liquid ejecting unit **22** is displaced to a removal position RP facing the wiping unit **40**. The removal position RP is a position at which the liquid adhering to the nozzle surface **25** is removed. The removal position RP is, for example, a position where the liquid ejecting unit **22** is shifted in the second direction A**2** from a position facing the medium support unit **17**.

[0052] The wiping unit **40** is arranged with the maintenance unit **30** in the scanning direction X, for example. In one example, the wiping unit **40** is disposed at a position shifted in the second direction A**2** from the maintenance unit **30**. For the wiping unit **40**, for example, when the liquid ejecting unit **22** is located at the removal position RP, the liquid ejecting unit **22** faces the wiping unit **40**. The wiping unit **40** comes into contact with the nozzle surface **25**, for example, by approaching the liquid ejecting unit **22** at the removal position RP. The wiping unit **40** may come into contact with the nozzle surface **25** by the liquid ejecting unit **22** at the removal position RP approaching the wiping unit **40**. The wiping unit **40** wipes the nozzle surface **25** by relatively moving in a direction along the nozzle surface **25** with respect to the liquid ejecting unit **22** in a state of being in contact with the nozzle surface **25**.

[0053] The liquid ejecting device **11** includes a contact portion **45**. The contact portion **45** moisturizes the nozzle **24** by coming into contact with the nozzle surface **25**. The contact portion **45** is, for example, a cap **45**C. The contact portion **45** forms a space communicating with the nozzle **24** by coming into contact with the nozzle surface **25**. That is, the contact portion **45** caps the liquid ejecting unit **22**. The nozzle **24** is moisturized by the capping. As a result, concern that clogging occurs in the nozzle **24** is reduced.

[0054] The liquid ejecting unit **22** may stand by at a retreat position CP facing the contact portion **45** until printing is started. During the standby, the liquid ejecting unit **22** is displaced to the retreat position CP facing the contact portion **45**. The retreat position CP is a position at which the liquid ejecting unit **22** stops in a case where printing is not performed, for example, in a case of waiting for an input of a start signal of a print job. The liquid ejecting unit **22** waits at the retreat position CP when printing is not performed. That is, the retreat position CP is a home position of the liquid ejecting unit **22**. The retreat position CP is, for example, a position shifted in the second direction A**2** from the position facing the medium support unit **17**. When printing is started, for example, when a start signal of a print job is input, the liquid ejecting unit **22** is displaced from the retreat position CP toward the first direction A**1** toward the position of the medium support unit **17**.

[0055] The liquid ejecting unit **22** reciprocates in the scanning direction X. The position of the medium support unit **17** is disposed at a position shifted in the first direction A**1** from the maintenance unit **30**, the wiping unit **40**, and the contact portion **45**. At the time of printing, the liquid ejecting unit **22** moves from the retreat position CP to the first direction A**1**. The liquid ejecting unit **22** moves in the first direction A**1** and in the second direction A**2** within a range of a position facing the medium support unit **17**. For example, the liquid ejecting unit **22** performs printing on a portion of the medium **99** supported by the medium support unit **17** by ejecting droplets of ink or the like from the nozzle **24** in the course of reciprocating within a range facing the medium support unit **17**.

[0056] In addition, the pressurizing unit **28** forcibly discharges the liquid from the nozzle **24**. That is, the pressurizing unit **28** pressurizes the inside of the liquid ejecting unit **22** to perform cleaning in which the liquid is forcibly discharged from the nozzle **24** of the liquid ejecting unit **22**. The cleaning is a maintenance for forcibly discharging the liquid from the nozzle **24** to discharge air bubbles, foreign matter, and the like from the nozzle **24** together with the liquid. Therefore, the pressurizing unit **28** causes the liquid ejecting unit **22** to perform cleaning as maintenance.

[0057] As illustrated in FIG. **1**, the liquid ejecting device **11** includes a control unit **100**. The control unit **100** controls the liquid ejecting device **11**. The control unit **100** controls, for example, the

medium feeding unit **13**, the medium winding unit **15**, the transport unit **18**, the drying unit **21**, the liquid ejecting unit **22**, the pressurizing unit **28**, the maintenance unit **30**, the wiping unit **40**, the contact portion **45**, and the like.

[0058] The control unit **100** may execute the circulation operation of circulating the liquid in the circulation flow path passing through the inside of the liquid ejecting unit **22** every predetermined time by controlling the pressurizing unit **28**. Through the circulation operation, a settling of coloring matter (for example, pigment) in the liquid is effectively prevented. The control unit **100** may execute the circulation operation after the printing is finished. Accordingly, the next printing is executed smoothly. The control unit **100** may execute the circulation operation when the power supply of the liquid ejecting device **11** is turned on from off. When the power is switched from off to on, the liquid has often remained stagnant for a long time. Therefore, the circulation operation can be used to stir the coloring matter that has settled in the liquid. The control unit **100** may change the length of time for which the circulation operation is continued, or may change the circulation intensity.

[0059] The control unit **100** may receive a print job from a host device (not illustrated), which is an example of an external device. The host device may be, for example, a personal computer. The liquid ejecting device **11** may include an operation panel. A print job may be sent to the control unit **100** by a user operating the operation unit of the operation panel. The control unit **100** executes the received print job.

[0060] In addition, a linear encoder (not illustrated) for detecting the position of the liquid ejecting unit **22** (carriage **26**) in the scanning direction X is provided in the housing **12**. The linear encoder outputs a detection signal including a number of pulses proportional to the amount of movement of the liquid ejecting unit **22** in the scanning direction X. The control unit **100** counts the number of pulse edges of the detection signal input from the linear encoder by a counter (not illustrated). The counter is reset when the liquid ejecting unit **22** is at the origin position in the scanning direction X. The control unit **100** acquires the position of the liquid ejecting unit **22** from a count value of the counter. The control unit **100** performs position control and speed control of the liquid ejecting unit **22** based on the detection signal from the linear encoder and the count value of the counter. The control unit **100** performs printing on the medium **99**, maintenance of the liquid ejecting unit **22** at a maintenance position MP, and the like by performing position control and speed control of the liquid ejecting unit **22**.

Configuration of Maintenance Unit **30**, Wiping Unit **40**, and Contact Portion **45**

[0061] Next, configurations of the maintenance unit **30**, the wiping unit **40**, and the contact portion **45** will be described in detail with reference to FIG. **2**.

[0062] The maintenance unit **30** includes a receiving member **32**. The receiving member **32** is a member that absorbs liquid. The receiving member **32** is, for example, a cloth. The receiving member **32** receives the liquid ejected or discharged from the nozzle **24** and absorbs the received liquid.

[0063] The maintenance unit **30** receives, for example, the liquid ejected from the nozzles **24** by flushing. The flushing is a maintenance process in which liquid is ejected from the nozzle **24** to suppress clogging of the nozzle **24**. By the flushing, for example, the thickened liquid (for example, thickened ink) is discharged from the nozzle **24**. The flushing is performed by applying a voltage to the piezoelectric element **27**. Therefore, the maintenance unit **30** receives the liquid discharged by the flushing as the maintenance. The amount of liquid discharged to the maintenance unit **30** by flushing is smaller than the amount of liquid discharged to the maintenance unit **30** by cleaning.

[0064] The maintenance unit **30** is arranged with the medium support unit **17** in the scanning direction X, for example. In one example, the maintenance unit **30** is located in the second direction A**2** with respect to the medium support unit **17**. In a case where the liquid ejecting unit **22** is located at a position facing the maintenance unit **30**, the maintenance unit **30** receives the liquid discharged from the liquid ejecting unit **22**. Specifically, when the liquid ejecting unit **22** is located

at the discharge position EP, the maintenance unit **30** receives the liquid discharged from the liquid ejecting unit **22**. The discharge position EP is a position at which the liquid ejecting unit **22** faces the maintenance unit **30**.

[0065] The flushing may be performed in a state where the liquid ejecting unit **22** is stopped at the discharge position EP. The flushing may be performed in a state in which the liquid ejecting unit **22** moves in the first direction A**1** during printing. That is, the flushing may be performed while the liquid ejecting unit **22** passes through the discharge position EP during printing.

[0066] The maintenance unit **30** includes, for example, a pair of holding rollers **33** and one or more guide rollers **34**. The receiving member **32** is wound around the pair of holding rollers **33**. The pair of holding rollers **33** holds the receiving member **32**. A region of the receiving member **32** held between the pair of holding rollers **33** faces the nozzle surface **25**. The receiving member **32** receives the liquid ejected or discharged to this region. Further, the guide roller **34** guides the receiving member **32** together with the pair of holding rollers **33**. Accordingly, the receiving member **32** is guided along a predetermined feeding path.

[0067] The maintenance unit **30** includes a feeding unit **35** and a winding unit **36**. The feeding unit **35** feeds and supplies the unused receiving member **32**. The winding unit **36** collects the used receiving member **32** by winding the used receiving member **32**. For example, each time the receiving member **32** receives a certain amount of liquid by flushing, the feeding unit **35** and the winding unit **36** rotate. Specifically, the control unit **100** controls the feeding amount per unit of the receiving member **32** by controlling the maintenance unit **30**. The liquid ejecting unit **22** moves to the discharge position EP when flushing is necessary. The liquid ejecting unit **22** ejects the liquid from all the nozzles **24** toward the receiving member **32** at the discharge position EP.

[0068] The control unit **100** performs feeding control of the receiving member **32** in the maintenance unit **30**. The control unit **100** manages the amount of liquid ejected or discharged from the liquid ejecting unit **22** in the cleaning by the liquid ejecting unit **22**. Accordingly, the control unit **100** manages the amount of the liquid received in the receiving region horizontally held between the pair of holding rollers **33** in the receiving member **32**. When the amount of liquid received in the receiving region of the receiving member **32** exceeds a predetermined threshold value, the control unit **100** controls the winding unit **36**. Accordingly, the winding unit **36** winds the receiving member **32** by a predetermined feeding amount. By the winding force of the receiving member **32**, the receiving member **32** corresponding to the same feeding amount is fed from the feeding unit **35**. In this manner, the receiving member **32** is intermittently fed at each predetermined timing when the amount of liquid received in the receiving region exceeds the threshold value. Accordingly, a used region of the receiving member **32** is switched to an unused region at each predetermined timing.

[0069] The time interval of the cleaning period is considerably longer than the time interval of the flushing period. The thickening of the liquid in the nozzle **24** progresses according to the printing length or the printing time. Therefore, the control unit **100** causes the liquid ejecting unit **22** to perform flushing every time the printing length reaches a predetermined unit length during printing or every time the printing time reaches a predetermined unit time. For example, in a period in which there is no liquid discharge operation during printing, the control unit **100** causes the liquid ejecting unit **22** to perform flushing once per unit printing length. The control unit **100** performs a feeding operation of feeding the receiving member **32** once every time the number of times of flushing reaches a predetermined threshold number of times. In addition, the control unit **100** manages, for example, the print length and the elapsed time with the end time point of the previous liquid discharge operation as a start point. The control unit **100** causes the liquid ejecting unit **22** to perform the liquid discharge operation each time one of the print length and the elapsed time reaches each threshold value. When the liquid receiving amount obtained by adding the liquid receiving amount received in the receiving region of the receiving member **32** and the liquid receiving amount by the current liquid discharge operation is equal to or less than the threshold

value, the control unit **100** causes the liquid ejecting unit **22** to perform the liquid discharge operation as it is. On the other hand, in a case where the total liquid receiving amount exceeds the threshold value, the control unit **100** causes the winding unit **36** to perform the feeding operation of the receiving member **32** and then causes the liquid ejecting unit **22** to perform the liquid discharge operation. The control unit **100** may manage only one of the print length and the elapsed time. In addition, in a case where the medium **99** is a cut sheet such as cut paper, the control unit **100** may manage the number of printed sheets instead of the print length. In this case, the control unit **100** may cause the liquid ejecting unit **22** to perform the liquid discharge operation with the time when the number of printed sheets reaches a predetermined threshold value as the cleaning time.

[0070] During the capping, the nozzle **24** communicate with a substantially closed space surrounded by the nozzle surface **25** and the cap **45**C. During capping, the nozzle **24** is moisturized by the vapor of the liquid remaining in the cap **45**C. Therefore, the thickening of the liquid in the nozzle **24** is suppressed. During printing, since the liquid ejecting unit **22** is in the non-capping state, the liquid in the nozzle **24** is exposed to the atmosphere. The liquid in the nozzles **24** thickens as a solvent evaporates or volatilizes. During printing, droplets may be ejected from some of the nozzles **24** selected based on the image data among all the nozzles **24**. The liquid in the nozzle **24** is refreshed by the ejection of droplets. Meanwhile, the liquid in the non-ejecting nozzle **24** continues to thicken. The liquid in the non-ejecting nozzle **24** is thickened with the printing length or the elapsed time during printing.

[0071] Therefore, the control unit **100** manages the flushing timing based on the print length or the elapsed time during printing. The control unit **100** causes the liquid ejecting unit **22** to perform flushing each time the flushing time is reached. For example, in a case where the flushing timing is managed by time, as an example, the flushing timing is set every time a predetermined time (for example, 20 seconds) within a range of 5 to 30 seconds elapses. Flushing may also be performed before and after printing. In this case, the timings before and after the printing are the flushing timings.

[0072] The wiping unit **40** includes a wiping member **41**. The wiping member **41** is a member that comes into contact with the nozzle surface **25**. The wiping member **41** is, for example, cloth. When the wiping member **41** absorbs the liquid adhering to the nozzle surface **25**, the liquid is removed from the nozzle surface **25**. The wiping unit **40** includes, for example, one or more pressing rollers **42**. The pressing roller **42** is a roller that presses the wiping member **41** against the nozzle surface **25**. Accordingly, the wiping member **41** can be brought into close contact with the nozzle surface **25**. The wiping unit **40** includes, for example, a feeding unit **43** and a winding unit **44**. The feeding unit **43** feeds an unused wiping member **41** before being used for wiping. The winding unit **44** collects the used wiping member **41** used for wiping by winding the used wiping member **41**. For example, each time the wiping member **41** wipes the nozzle surface **25** a predetermined number of times, the feeding unit **43** and the winding unit **44** rotate.

[0073] For example, the contact portion **45** is arranged with the wiping unit **40** in the scanning direction X. In one example, the contact portion **45** is disposed at a position shifted in the second direction A**2** from the wiping unit **40**. For example, the contact portion **45** faces the nozzle surface **25** when the liquid ejecting unit **22** is located at the retreat position CP. In this state, when the contact portion **45** approaches the liquid ejecting unit **22**, the contact portion **45** comes into contact with the nozzle surface **25**. The contact portion **45** may come into contact with the nozzle surface **25** by the liquid ejecting unit **22** approaching the contact portion **45**.

[0074] The contact portion **45** is, for example, the cap **45**C that can contact the nozzle surface **25**. The cap **45**C receives the liquid forcibly discharged from the nozzle **24** of the liquid ejecting unit **22** by the cleaning. The cap **45**C is in contact with the nozzle surface **25** to form a substantially closed space communicating with the nozzle **24** between the nozzle surface **25** and the cap **45**C. By capping the liquid ejecting unit **22** with the cap **45**C, the nozzle **24** communicating with a substantially closed space surrounded by the nozzle surface **25** and the cap **45**C is moisturized. Due

to this moisturizing action, thickening or drying of the liquid in the nozzle **24** is suppressed. For example, an absorbing member (not illustrated) in which the moisturizing liquid is absorbed may be accommodated in the cap **45**C. The moisturizing liquid may be a dedicated moisturizing liquid, or may be liquid such as ink ejected or discharged from the nozzle **24** by the liquid ejecting unit **22**.

[0075] Further, one of the liquid discharge operation and the flushing may be performed toward the cap **45**C. For example, the liquid discharge operation may be performed toward the cap **45**C. In this case, the liquid discharge operation may be, for example, pressurization cleaning in which the liquid is forcibly discharged from the nozzle **24** by the pressurizing unit **28** pressurizing the liquid ejecting unit **22**. The cap **45**C is coupled to a waste liquid accommodating unit (not illustrated) through a discharge tube (not illustrated). By driving a suction pump (not illustrated) provided in the middle of the discharge tube, the liquid (waste liquid) received by the cap **45**C is collected in the waste liquid accommodating unit through the discharge tube. The liquid discharge operation may be suction cleaning performed by driving the suction pump in the capping state instead of the pressurization cleaning performed by the pressurizing unit **28**. In the suctioning cleaning, a substantially closed space surrounded and formed by the nozzle surface **25** and the cap **45**C is set to have a negative pressure by driving the suction pump, and thus the liquid is forcibly discharged from the nozzle **24**.

[0076] As described above, when the liquid discharge operation is performed toward the cap **45**C, the maintenance unit **30** receives only the liquid by the flushing. When the liquid discharge operation is not performed toward the cap **45**C, the maintenance unit **30** also receives the liquid by the liquid discharge operation. In the latter case, when the cleaning time comes, the liquid ejecting unit **22** moves to the discharge position EP. In this state, the pressurizing unit **28** pressurizes the liquid ejecting unit **22**, and thus the liquid is forcibly discharged from the nozzle **24**. The maintenance unit **30** receives the discharged liquid. In FIG. **2**, only a part of main components of the maintenance unit **30** is illustrated, and a detailed configuration of the entire maintenance unit **30** will be described below.

Configuration of Maintenance Unit **30**

[0077] Next, the configuration of a maintenance system **30**S including the maintenance unit **30** will be described in detail with reference to FIGS. **3** and **4**. The liquid ejecting device **11** includes the maintenance system **30**S illustrated in FIGS. **3** and **4**. The maintenance system **30**S includes the maintenance unit **30** and a raising and lowering mechanism **50**. That is, the liquid ejecting device **11** includes the raising and lowering mechanism **50**. In FIGS. **3** and **4**, the maintenance unit **30** and the raising and lowering mechanism **50** are schematically illustrated. An arrangement position and a detailed configuration of the raising and lowering mechanism **50** will be described below together with the maintenance unit **30**. Here, a schematic configuration of the raising and lowering mechanism **50** will be described, and a point that the maintenance unit **30** is configured to be raised and lowered in the raising and lowering region LA by the raising and lowering mechanism **50** will be described.

[0078] As illustrated in FIG. **3**, the raising and lowering mechanism **50** raises and lowers the maintenance unit **30**. Specifically, the raising and lowering mechanism **50** raises and lowers the maintenance unit **30** between a first position P**1** and a second position P**2** lowered than the first position P**1**. The Z direction in which the maintenance unit **30** is raised and lowered is also referred to as a raising and lowering direction Z.

[0079] In FIG. **3**, the maintenance unit **30** is located at the first position P**1** raised by the raising and lowering mechanism **50**. In FIG. **4**, the maintenance unit **30** is located at the second position P**2** lowered than the first position P**1** by the raising and lowering mechanism **50**.

[0080] The raising and lowering mechanism **50** includes a counterweight **51** (weight) and a coupling portion **53** having both ends coupled to a coupling destination so as to raise and lower the counterweight **51** and the maintenance unit **30** in opposite directions via a pulley **52**. The pulley **52** may be a fixed pulley as illustrated in FIGS. **3** and **4**. In this case, the coupling portion **53** couples

the counterweight **51** and the maintenance unit **30** via the pulley **52**. That is, both ends of the coupling portion **53** are coupled to the counterweight **51** and the maintenance unit **30**. The present embodiment is an example in which coupling destinations of both ends of the coupling portion **53** are the counterweight **51** and the maintenance unit **30**. The raising and lowering mechanism **50** of the present embodiment includes the counterweight **51**, the pulley **52**, and the coupling portion **53** configured as described above.

[0081] As illustrated in FIGS. **3** and **4**, a plurality of pulleys **52** may be provided. As an example, the number of the pulleys **52** is two. One of the two pulleys **52** is located above a coupling portion where the coupling portion **53** suspending the maintenance unit **30** is coupled to the maintenance unit **30**. The other of the two pulleys **52** is located above a coupling portion where the coupling portion **53** suspending the counterweight **51** is coupled to the counterweight **51**. In this manner, the maintenance unit **30** and the counterweight **51** are fixed to both end portions of the coupling portion **53** passing through the two pulleys **52** in a suspended state. The number of the pulleys **52** is not limited to two, and may be three or more.

[0082] In the present embodiment, the weight of the counterweight **51** is large enough to raise the maintenance unit **30** against the weight of the maintenance unit **30**. The weight of the counterweight **51** may be greater than the weight of the maintenance unit **30**. The counterweight **51** may include a member made of metal.

[0083] The coupling portion **53** is a linear member having a predetermined length and flexibility. In the example illustrated in FIG. **3**, the coupling portion **53** is a wire. That is, the coupling portion **53** is a wire as an example of a linear member having flexibility. The coupling portion **53** passes through the plurality of pulleys **52**, and both end portions thereof are coupled to the maintenance unit **30** and the counterweight **51**, respectively. The coupling portion **53** has a strength that can sufficiently withstand even when the coupling portion **53** is pulled from both end portions by gravity due to the weight of each of the maintenance unit **30** and the counterweight **51**.

[0084] As illustrated in FIG. **3**, the maintenance unit **30** includes a support unit **37** and a maintenance portion **38**. The maintenance portion **38** is supported by the support unit **37**. In the present embodiment, the maintenance unit **30** includes the support unit **37** and the maintenance portion **38** supported by the support unit **37**. The support unit **37** is coupled to one end portion of the coupling portion **53**. The support unit **37** has, for example, a shape of a support table. The maintenance portion **38** is placed at the support unit **37**.

[0085] The counterweight **51** is coupled to a first end portion of both end portions of the coupling portion **53**, and the support unit **37** is coupled to a second end portion which is an end portion on a side opposite to the first end portion. The support unit **37** is configured to be raised and lowered by raising and lowering of the counterweight **51**. The maintenance portion **38** is supported by the support unit **37**. The support unit **37** is, for example, a support table. The maintenance portion **38** is placed at the support unit **37** formed of a support base.

[0086] The weight of the maintenance unit **30** including the support unit **37** and the maintenance portion **38** is applied to the second end portion side of the coupling portion **53**. When the counterweight **51** is raised, the maintenance unit **30** is lowered. When the counterweight **51** is lowered, the maintenance unit **30** is raised.

[0087] As illustrated in FIGS. **3** and **4**, the maintenance unit **30** of the present embodiment includes the support unit **37** that is raised and lowered by the raising and lowering mechanism **50**, and the maintenance portion **38** that is supported by the support unit **37**. The maintenance unit **30** of the present embodiment includes the support unit **37** on which the maintenance portion **38** is supported. The weight of the maintenance unit **30** is indicated by the sum of the weight of the maintenance portion **38** and the weight of the support unit **37**. The maintenance portion **38** includes the receiving member **32** that is intermittently fed along a predetermined path from the feeding unit **35** toward the winding unit **36**. Therefore, the weight of the maintenance portion **38** includes the weight of the receiving member **32**. When the weight of the counterweight **51** fixed to both end

portions of the coupling portion **53** via the pulley **52** is compared with the weight of the maintenance unit **30**, the weight of the counterweight **51** is greater than the weight of the maintenance unit **30**.

[0088] That is, in the present embodiment, the counterweight **51** has a weight greater than the weight indicated by the sum of the weight of the support unit **37** and the weight of the maintenance portion **38**. In addition, the weight of the maintenance portion **38** includes the weight of the liquid received by the receiving member **32** as a result of the maintenance (cleaning). Therefore, the weight of the counterweight **51** may be greater than the total weight of the maintenance unit **30** and the liquid added as a part of the weight of the maintenance unit **30** as a result of the maintenance.

[0089] Further, the weight of the maintenance unit **30** includes the weight of various components assembled to the support unit **37**. From the above point, the weight of the maintenance unit **30** is defined as all the units in which the weight is applied to the end portion on the side opposite to the coupling side of the counterweight **51** in the coupling portion **53**. All of the units include the weights of various components attached to the maintenance portion **38** and the weights of various components attached to the support unit **37**.

[0090] Therefore, the maintenance unit **30** can be raised from the second position P**2** to the first position P**1** only by the weight of the counterweight **51**. That is, it is possible to automatically raise the maintenance unit **30** from the second position P**2** to the first position P**1** in a state where there is no operation force of a person. The maintenance unit **30** may be constituted only by the maintenance portion **38** by eliminating the support unit **37**. In this case, the counterweight **51** has a weight greater than the weight of the maintenance unit **30** including the maintenance portion **38**.

[0091] Therefore, a person such as a user or a service person can lower the maintenance unit **30** from the first position P**1** to the second position P**2** with a small force. The small force is a force against the own weight based on a difference obtained by subtracting the weight of the maintenance unit **30** from the weight of the counterweight **51**. In other words, the small force is a force capable of lowering the maintenance unit **30** against its own weight based on a difference obtained by subtracting the weight of the maintenance unit **30** from the weight of the counterweight **51**.

[0092] When the maintenance unit **30** is lowered in order to perform a predetermined operation on the maintenance unit **30**, the maintenance unit **30** can be lowered with a small force due to the weight of the counterweight **51**. Further, when the maintenance unit **30** is raised, the maintenance unit **30** can be raised by the weight of the counterweight **51** without applying a force. In addition, since a drive source is not used for raising and lowering the maintenance unit **30**, power is not used and control is not required. Therefore, the maintenance system **30**S is realized with a simple configuration.

[0093] In this manner, the maintenance unit **30** can be raised and lowered in the raising and lowering region LA by the raising and lowering mechanism **50**. That is, the maintenance unit **30** is configured to be raised and lowered between the first position P**1** and the second position P**2** in the raising and lowering region LA. The raising and lowering region LA is a region in which the maintenance unit **30** can be raised and lowered.

[0094] The first position P**1** illustrated in FIG. **3** is the maintenance position MP at which the maintenance unit **30** performs maintenance. The maintenance position MP is a position at which the maintenance unit **30** performs maintenance on the liquid ejecting unit **22**. The maintenance unit **30** performs maintenance on the liquid ejecting unit **22** at the first position P**1**, which is the raised position. The maintenance unit **30** is disposed at the first position P**1** (raised position) which is the maintenance position MP during printing or the like.

[0095] As illustrated in FIG. **4**, at least a part of the maintenance unit **30** is slidable along the horizontal direction from the raising and lowering region LA in which the maintenance unit **30** is raised and lowered. In the example illustrated in FIG. **4**, at least a part of the maintenance unit **30** is horizontally slidable from the second position P**2**. At least a part of the maintenance unit **30** is

moved to a working position WP by the sliding. The working position WP is a position where, for example, a person such as a user or a service person performs a predetermined operation on at least a part of the maintenance unit **30**. The working position WP is, for example, a position where a person performs a predetermined operation such as replacement or replenishment of consumables of the maintenance unit **30**. In the present embodiment, the user performs, for example, an operation of replacing the receiving member **32** (see FIGS. **2** and **5**) as the predetermined operation.

[0096] In FIG. **4**, the maintenance portion **38** is supported by the support unit **37**. Therefore, the maintenance portion **38** is slidable in the horizontal direction with respect to the support unit **37**. That is, the maintenance portion **38**, which is a part of the maintenance unit **30**, is slidable in the horizontal direction with respect to the support unit **37**. The maintenance portion **38** can be pulled out from the support unit **37** to the working position WP by horizontally sliding from the second position P**2** with respect to the support unit **37**. Since this pull-out direction is parallel to the Y direction, it is also referred to as a pull-out direction Y. The Y direction is also referred to as an intersecting direction Y because the Y direction is also an intersecting direction that intersects the raising and lowering direction Z.

Configuration of Maintenance System **30**S

[0097] Next, a detailed configuration of the maintenance system **30**S will be described with reference to FIGS. **5** to **9**. FIG. **5** illustrates a side view from the pull-out side when the maintenance system **30**S is pulled out horizontally. FIG. **6** illustrates a state in which the maintenance unit **30** is raised to the first position P**1**. FIG. **7** illustrates a state in which the maintenance unit **30** is lowered to the second position P**2**. FIG. **8** illustrates a state in which the maintenance portion **38** is pulled out to the working position WP by sliding the maintenance portion **38** from the support unit **37** in the horizontal direction.

[0098] As illustrated in FIG. **5**, the maintenance unit **30** includes the feeding unit **35** in which the receiving member **32** that receives liquid is set, and the winding unit **36** that winds the receiving member **32**.

[0099] The receiving member **32** receives the liquid ejected or discharged from the liquid ejecting unit **22**. The liquid ejected from the liquid ejecting unit **22** is liquid ejected from the liquid ejecting unit **22** by flushing. The receiving member **32** receives the liquid ejected from the liquid ejecting unit **22** by flushing. The liquid ejected from the liquid ejecting unit **22** is liquid discharged from the liquid ejecting unit **22** by cleaning. The receiving member **32** receives the liquid discharged from the liquid ejecting unit **22** by cleaning.

[0100] The maintenance portion **38** includes a frame **38**A. The feeding unit **35** and the winding unit **36** are assembled to the frame **38**A. The feeding unit **35** and the winding unit **36** may be disposed vertically. In this case, the winding unit **36** may be disposed above the feeding unit **35**. Conversely, the feeding unit **35** may be disposed above the winding unit **36**. Since the feeding unit **35** and the winding unit **36** are vertically disposed, the maintenance unit **30** is integrated in a vertically long shape. For example, it is possible to contribute to miniaturization of the liquid ejecting device **11** in the scanning direction X.

[0101] A roll body R**1** (refer to FIG. **9**) of the receiving member **32** is set in the feeding unit **35**. The receiving member **32** is fed from the feeding unit **35** to the winding unit **36**. The winding unit **36** winds the receiving member **32** fed from the feeding unit **35** through a predetermined feeding path. The receiving member **32** is guided by the pair of holding rollers **33** and the plurality of guide rollers **34** supported on the frame **38**A so as to form a predetermined feeding path. The receiving member **32** forms a receiving region **32**A formed of a horizontal surface by a portion guided by the pair of holding rollers **33**. The liquid ejecting unit **22** ejects or discharges liquid to the receiving region **32**A of the receiving member **32**. When the amount of liquid received in the receiving region **32**A exceeds the predetermined value, the receiving member **32** is fed by a predetermined feeding amount by driving the winding unit **36**. By the feeding operation of the receiving member

32, the receiving region **32**A is changed to a new surface.

[0102] The winding unit **36** winds the receiving member **32**, which has been used by receiving the liquid ejected or discharged from the liquid ejecting unit **22**, in a roll shape. The winding unit **36** forms a used roll body R**2** (refer to FIG. **9**) by winding the used receiving member **32**.

Detailed Configuration of Raising and Lowering Mechanism **50**

[0103] Next, a detailed configuration of the raising and lowering mechanism **50** will be described with reference to FIGS. **5** to **7**. As illustrated in FIGS. **5** to **7**, the raising and lowering mechanism **50** is disposed on the back surface side of the maintenance portion **38**, which is opposite to the work surface side on which the user performs the replacement operation. As described above, the raising and lowering mechanism **50** includes the counterweight **51**, the pulley **52**, and the coupling portion **53**. The pulley **52** is located at a level that is lower than the level of the surface of the receiving region **32**A. Therefore, interference with the liquid ejecting unit **22** can be avoided. Since the coupling portion **53** of the maintenance unit **30** is coupled to the support unit **37**, the pulley **52** is disposed at a position lower than the surface of the receiving region **32**A.

[0104] As illustrated in FIGS. **6** and **7**, for example, the two pulleys **52** may be disposed at positions horizontally aligned in the Y direction. The pulley **52** is supported at a predetermined position by a support member (not illustrated). In this manner, the pulley **52** may be a fixed pulley.

[0105] The counterweight **51** includes an accommodating unit **51**A, a weight **51**W, and a first connector **51**B. The accommodating unit **51**A is configured to accommodate a plurality of the weights **51**W. The weight **51**W is, for example, a weight plate made of a metallic substance having a large specific weight. The weight of the counterweight **51** can be adjusted by selecting the number of weights **51**W accommodated in the accommodating unit **51**A. The first connector **51**B may be, for example, a U-shaped fitting fixed to the upper surface of the accommodating unit **51**A. A first end of the coupling portion **53** is coupled to the first connector **51**B of the counterweight **51**.

[0106] As illustrated in FIGS. **6** and **7**, the support unit **37** is supported by a raising and lowering rail **55** in a state in which the support unit **37** can be raised and lowered. The support unit **37** is an elongated member extending in the Y direction. The support unit **37** may be supported by the pair of raising and lowering rails **55** at two positions on both sides in the Y direction.

[0107] As illustrated in FIGS. **6** and **7**, a coupling member **56** is fixed to the back surface of the support unit **37**. The coupling member **56** is fixed to a central portion of the support unit **37** in the Y direction. The coupling member **56** has a second connector **56**A. The second connector **56**A may be, for example, a U-shaped fitting. A second end portion of the coupling portion **53** is coupled to the second connector **56**A of the coupling member **56** fixed to the support unit **37**.

[0108] One side portion of the counterweight **51** is engaged with a guide rail **54** extending in the vertical direction Z. The counterweight **51** is raised and lowered along the vertical direction Z by being guided by the guide rail **54**.

[0109] The weight of the counterweight **51** is greater than the weight of the maintenance unit **30**. Even if the user does not apply a force to the maintenance unit **30**, the maintenance unit **30** is raised to the first position P**1** by the weight of the counterweight **51**. In other words, the first position P**1** is a stable position of the maintenance unit **30**. The first position P**1** is set as the maintenance position MP. For this reason, it is possible to stably perform maintenance on the liquid ejecting unit **22** by the maintenance unit **30**.

[0110] When the receiving member **32** of the roll body R**1** set in the feeding unit **35** runs out, the user performs a replacement operation of the roll body R**1** and the R**2** which are consumables. The maintenance unit **30** includes an operation unit **39**. The operation unit **39** is provided, for example, on a side surface of a frame **38**A of the maintenance portion **38** on the pull-out direction Y side. For example, the user operates the operation unit **39** to apply a downward force to the maintenance unit **30**. When a downward force greater than a force corresponding to a difference between the weight of the maintenance unit **30** and the weight of the counterweight **51** is applied, the maintenance unit **30** descends. Here, the weight of the counterweight **51** is denoted by W**1**, and the weight of the

maintenance unit **30** is denoted by W**2**. The differential AW (W**1**-W**2**) is, for example, a predetermined value within a range of 0.1 to 5 kgf. The differential AW may be, for example, a 1 kgf.

[0111] The user lowers the maintenance unit **30** from the first position P**1**, which is the maintenance position MP, to the second position P**2**. The maintenance unit **30** is lowered than the first position P**1** illustrated in FIG. **6** to the second position P**2**. At this time, the counterweight **51** is raised due to the weight of the maintenance unit **30** and the downward force applied by the user.

[0112] As illustrated in FIG. **8**, the user slides the maintenance unit **30** at the second position P**2** in the pull-out direction Y to move the maintenance unit **30** to the working position WP. As illustrated in FIG. **8**, the support unit **37** has a support plate **37**A at the bottom. In addition, the maintenance portion **38** has a bottom plate **38**B at the bottom. The support unit **37** has a pair of first rails **91** on both sides in the X direction of the support plate **37**A. The maintenance portion **38** has a pair of second rails **92** on both sides in the X direction of the bottom plate **38**B. The first rail **91** and the second rail **92** are slidably engaged with each other in the Y direction. The maintenance portion **38** at the working position WP is in a state in which the feeding unit **35** and the winding unit **36** are vertically arranged. It is easy for a user to perform a replacement operation of consumables in which the roll body R**2** is removed from the winding unit **36** and a new roll body R**1** is set in the feeding unit **35**.

Positioning of Maintenance Unit **30** at First Position P**1**

[0113] As illustrated in FIGS. **6** and **7**, the liquid ejecting device **11** includes a regulating unit **60** that regulates the maintenance unit **30** from rising from the first position P**1**.

[0114] As illustrated in FIGS. **6** and **7**, the maintenance system **30**S of the present embodiment includes two types of regulating units **60**. The two types of regulating units **60** are a first regulating unit **61** and a second regulating unit **62**. The first regulating unit **61** regulates the maintenance unit **30** from being raised from the first position P**1**. The first regulating unit **61** includes a positioning pin **63** fixed at a predetermined height and a stopper **64** extending horizontally from both side surfaces of the maintenance unit **30** in the Y direction. In the course of raising the maintenance unit **30** to the first position P**1**, the stopper **64** abuts against the positioning pin **63** when the maintenance unit **30** reaches the first position P**1**. As a result, the maintenance unit **30** is regulated from further rising from the first position P**1**. The positioning pin **63** is supported by a distal end portion of a support member **67** (see FIG. **9**) fixed to a frame (not illustrated).

[0115] At least three first regulating units **61** are provided. In the present embodiment, two first regulating units **61** are provided at each of positions corresponding to both ends of the maintenance unit **30** in the intersecting direction Y intersecting the raising and lowering direction Z. In other words, four first regulating units **61** are provided. As a result, positioning can be reliably performed.

[0116] The first regulating units **61** are provided in at least three positions including two positions corresponding to both ends of the maintenance unit **30** in the intersecting direction Y intersecting the raising and lowering direction Z. The at least three positions are defined, for example, as follows. Here, a virtual plane intersecting (for example, orthogonal to) the raising and lowering direction Z is assumed. The virtual plane may be a plane parallel to the nozzle surface **25** of the liquid ejecting unit **22**. The at least three positions are positions at which at least three projection positions when projected on a virtual plane intersecting the raising and lowering direction Z are positions corresponding to vertices of a polygon on the virtual plane. That is, the first regulating unit **61** regulates the maintenance unit **30** in at least three positions where a polygon having the respective projection points as vertices can be formed when projected on the virtual plane. If the first regulating unit **61** can regulate the maintenance unit **30** from further rising from the first position P**1** in at least three positions, the maintenance unit **30** can be positioned at the first position P**1** without being inclined with respect to the horizontal plane.

[0117] In the example illustrated in FIGS. **6** and **7**, the first regulating units **61** are provided at two

positions corresponding to both ends of the maintenance unit **30** in the intersecting direction Y intersecting the raising and lowering direction Z, that is, two positions different in the X direction, that is, four positions in total. The four positions are positions at which the four projection positions when projected onto a virtual plane intersecting the raising and lowering direction Z are positions corresponding to the vertices of a quadrangle on the virtual plane. The first regulating unit **61** regulates the maintenance unit **30** at four positions that can form a quadrangle having the respective projection points as vertices when projected on a virtual plane. Therefore, it is possible to accurately position the maintenance unit **30** with respect to the nozzle surface **25** of the liquid ejecting unit **22**. For example, it is possible to position the maintenance unit **30** in a posture in which the surface of the receiving region **32**A is parallel to the nozzle surface **25**.

[0118] The second regulating unit **62** positions the maintenance unit **30** at the first position P**1** while absorbing an impact. The second regulating unit **62** includes, for example, a shock absorber **65**. Specifically, the second regulating unit **62** includes the shock absorber **65** and a regulating plate **66** formed at the support unit **37**. The support unit **37** includes a regulating plate **66** at a position corresponding to the shock absorber **65**. At least one second regulating unit **62** is provided. In the present embodiment, two second regulating units **62** are provided at positions corresponding to both ends of the maintenance unit **30** in the intersecting direction Y intersecting the raising and lowering direction Z. Accordingly, it is possible to regulate the lifting of the maintenance unit **30** while reliably absorbing the impact.

[0119] One of the two types of regulating units **61**, **62** performs main positioning, and the other performs sub-positioning. That is, the second regulating unit **62** absorbs an impact when the maintenance unit **30** is positioned at the first position P**1** and is regulated from rising further. On the other hand, the first regulating unit **61** regulates the maintenance unit **30**, which is in the course of deceleration in which the impact is absorbed by the second regulating unit **62**, to the first position P**1**.

[0120] Further, as illustrated in FIGS. **6** and **7**, the maintenance system **30**S includes a positioning assist mechanism **70** that assists the maintenance unit **30** to rise until the maintenance unit **30** reaches the first position P**1**. The positioning assist mechanism **70** assists in raising the maintenance unit **30** to the first position P**1** where the raising of the maintenance unit **30** is regulated by the first regulating unit **61**. The maintenance unit **30** of the present embodiment rises due to the gravity of the counterweight **51** even if the user does not apply a force. On the other hand, the difference AW is set to be small in order to relatively reduce the operation force applied downward when the user lowers the maintenance unit **30**. Therefore, the force for raising the maintenance unit **30** only by the gravity of the counterweight **51** is relatively small according to the difference AW. In addition, in the course of raising the maintenance unit **30**, a force that prevents the maintenance unit **30** from rising, such as sliding friction, is generated. As a result, the maintenance unit **30** may not be completely raised to the first position P**1**. Therefore, in the present embodiment, the positioning assist mechanism **70** assists in raising the maintenance unit **30** to the first position P**1**. Details of the positioning assist mechanism **70** will be described below.

Holding of Maintenance Unit **30** at Second Position P**2**

[0121] The liquid ejecting device **11** includes a holding unit **80** that holds the maintenance unit **30** at the second position P**2** so that the maintenance unit **30** does not rise from the second position P**2**. The holding unit **80** includes two types of holding units, namely, a first holding unit and a second holding unit. The first holding unit is, for example, a roll catch **81**. The second holding unit is, for example, an uplift prevention member **82**.

[0122] As illustrated in FIGS. **6** and **7**, when the maintenance unit **30** is slid and pulled out with respect to the support unit **37**, it is necessary to lock the support unit **37** at the second position P**2** so that the support unit **37** does not rise due to the weight of the counterweight **51**. The roll catch **81** holds (locks) the support unit **37** at the second position P**2**. The roll catch **81** includes a first member **83** and a second member **84** that are engageable with each other. The first member **83** is

fixed at a predetermined height by a support member (not illustrated). The second member **84** is fixed to the support unit **37** at a predetermined position corresponding to the first member **83**.

[0123] The uplift prevention member **82** prevents uplift of the maintenance portion **38** in the course of sliding the maintenance portion **38** at the second position P**2** to the working position WP or when the maintenance portion **38** is at the working position WP. The detailed configurations of the roll catch **81** and the uplift prevention member **82** will be described below.

Configuration of Maintenance Portion **38**

[0124] Next, a configuration of the maintenance portion **38** will be described with reference to FIG. **9**. The feeding unit **35** includes a frictional mechanism **35**F at an end portion located outside a rotating portion in which the roll body R**1** is set. The frictional mechanism **35**F generates rotational frictions when the feeding unit **35** rotates. The winding unit **36** includes a motor **36**M as a driving source. The winding unit **36** is rotated in the winding direction by the driving force of the motor **36**M. The receiving member **32** is wound as the roll body R**2** by a winding force of the winding unit **36**. The receiving member **32** is fed out from the roll body R**1** set in the feeding unit **35** by the winding force of the winding unit **36**. At this time, a tensile force is applied to the receiving member **32** by a rotational frictional force generated by the frictional mechanism **35**F. By the winding force of the winding unit **36**, the receiving member **32** is intermittently fed by a predetermined amount in the feeding direction in a state where tension is applied to the receiving member **32**.

Configuration of Second Regulating Unit **62**

[0125] Next, the configuration of the second regulating unit **62** will be described with reference to FIG. **10**. As illustrated in FIG. **10**, the second regulating unit **62** includes the shock absorber **65** and the regulating plate **66** as described above. The shock absorber **65** includes a cylinder **65**A and an abutting portion **65**B fixed to a distal end portion of a rod biased in a protruding direction in which the rod protrudes from the cylinder **65**A. The shock absorber **65** elastically biases the abutting portion **65**B in the protruding direction by a biasing force of a spring (not illustrated) in the cylinder **65**A, compression air, or the like. When the abutting portion **65**B of the shock absorber **65** abuts against the regulating plate **66**, the rod of the cylinder **65**A elastically contracts against the biasing force in the protruding direction. For this reason, when the abutting portion **65**B abuts against the regulation plate **66**, the maintenance unit **30** is regulated from rising from the first position P**1** while a shock at the time of abutting is alleviated.

Configuration of First Regulating Unit **61** and Positioning Assist Mechanism **70**

[0126] Next, the configurations of the first regulating unit **61** and the positioning assist mechanism **70** will be described with reference to FIGS. **11** and **12**. The liquid ejecting device **11** includes the positioning assist mechanism **70** including the positioning member **72** that pushes the maintenance unit **30** to the regulation position where the maintenance unit **30** is regulated by the regulating unit **60**. The present embodiment is an example in which the regulation position is the first position P**1**. This is because the first position P**1** is the maintenance position MP. The maintenance position MP is a position at which maintenance is performed on the liquid ejecting unit **22**. When the height of the maintenance position MP is shifted in the vertical direction Z, there is a case where the maintenance on the liquid ejecting unit **22** cannot be appropriately performed. For example, when the gap between the nozzle surface **25** of the liquid ejecting unit **22** and the receiving member **32** is large, there is a possibility that the ratio of the liquid that is scattered as mist and cannot be received in the liquid ejected or discharged from the nozzle **24** increases. The scattered liquid contaminates the inside of the housing **12**. On the other hand, when the height position of the liquid ejecting unit **22** at the first position P**1** is shifted in the upward direction+Z in which the gap is reduced, there is a possibility that the liquid ejecting unit **22** and the receiving member **32** come into contact with each other. In a case where the liquid is color ink, the contact may cause color mixing or damage to the liquid ejecting head **23**. Therefore, it is necessary to accurately position the maintenance unit **30** at the first position P**1**.

[0127] As illustrated in FIGS. **11** and **12**, the positioning assist mechanism **70** includes an arm **71**, a positioning member **72**, and a motor **73** as a drive source. The arm **71** is coupled to an output shaft of the motor **73**. The positioning member **72** is supported by a distal end portion of the arm **71**. When the motor **73** is driven, the arm **71** rotates about a rotation axis **71**A within a predetermined angle range. The positioning member **72** may be, for example, a roller rotatably supported by the distal end portion of the arm **71**. The arm **71** and the positioning member **72** are located at least at the retracted position illustrated in FIG. **11** during a predetermined period in which the maintenance unit **30** is located within a predetermined range immediately before the maintenance unit **30** reaches the first position P**1** in the course of rising.

[0128] For example, as illustrated in FIG. **11**, the maintenance unit **30** may stop at a position before reaching the first position P**1** at which the stopper **64** abuts on the positioning pin **63** due to a force that prevents the maintenance unit **30** from rising, such as sliding friction. When a position sensor (not illustrated) detects that the maintenance unit **30** is positioned within a predetermined range in the course of rising, the control unit **100** drives the motor **73** of the positioning assist mechanism **70**. When the motor **73** is driven, the arm **71** and the positioning member **72** are rotated in a pushing direction indicated by an arrow in FIG. **11**. As a result, the positioning member **72** performs a pushing operation of pushing the stopper **64** upward.

[0129] As illustrated in FIG. **12**, when the positioning member **72** performs the pushing operation from the retracted position indicated by the two dot chain line, the stopper **64** is pushed up to the regulation position where the stopper **64** abuts on the positioning pin **63**. Therefore, the maintenance unit **30** is reliably positioned at the first position P**1**.

Configuration and Operation of Roll Catch **81**

[0130] Next, the configuration and operation of the roll catch **81** will be described with reference to FIGS. **13** and **14**. FIG. **13** illustrates a separated state in which the first member **83** and the second member **84** constituting the roll catch **81** are not engaged with each other. FIG. **14** illustrates a holding state in which the first member **83** and the second member **84** constituting the roll catch **81** are engaged with each other.

[0131] As illustrated in FIG. **13**, the second member **84** has a main body **84**A and a protruding portion **84**B protruding from the main body **84**A. A distal end portion of the protruding portion **84**B protrudes in a bulging shape, and the bulging portion is formed in a tapered shape that becomes narrower toward a distal end on the first member **83** side.

[0132] The first member **83** includes a main body **83**A, a pair of swing members **831**, a pair of rollers **832**, a pair of support shafts **833**, and a spring **834**. The pair of swing members **831** are rotatably assembled to the main body **83**A. The pair of rollers **832** are rotatably attached to distal end portions of the pair of swing members **831**. The pair of rollers **832** are rotatable about support shafts **833** respectively fixed to distal end portions of the pair of swing members **831**. The spring **834** biases the pair of swing members **831** in a closing direction in which the pair of swing members **831** approach each other. The spring **834** is, for example, a torsion coil spring. Therefore, when the roll catch **81** is in the separated state illustrated in FIG. **13**, the pair of rollers **832** is in a closed state. Note that the spring **834** may be a leaf spring or the like. Instead of the support shaft **833**, a rotation shaft that is rotatable together with the roller **832** may be used, and the rotation shaft may be rotatably supported by the swing member **831**.

[0133] When the maintenance unit **30** is at the first position P**1**, the roll catch **81** is in the separated state illustrated in FIG. **13**. When the user lowers the maintenance unit **30** from the first position P**1** to the second position P**2**, as illustrated in FIG. **14**, the roll catch **81** enters the holding state. That is, the protruding portion **84**B of the second member **84** is inserted between the pair of rollers **832** in the closed state illustrated in FIG. **13** while pushing and expanding the pair of rollers **822**. The pair of rollers **832** pinch a thin portion of the protruding portion **84**B closer to the base portion than the bulging portion by the biasing force of the spring **834**. In this manner, the first member **83** and the second member **84** are engaged with each other as illustrated in FIG. **14**. In order to release this

engagement, it is necessary to apply a force to spread the pair of rollers **832** to a position wider than the bulging portion of the protruding portion **84**B. This force is sufficiently greater than a force f(=ΔW*g) by which the maintenance unit **30** rises due to the weight of the counterweight **51**. Here, g is the gravitational acceleration. Therefore, when the roll catch **81** is in the holding state illustrated in FIG. **14**, the maintenance unit **30** is held at the second position P**2** even if the user does not apply a force.

[0134] In the holding state of the roll catch **81** illustrated in FIG. **14**, when the user applies a force in the upward direction +Z to the maintenance unit **30**, the protruding portion **84**B of the second member **84** is detached from the pair of rollers **832**. That is, the roll catch **81** is changed from the holding state illustrated in FIG. **14** to the separated state illustrated in FIG. **13**. In the separated state of the roll catch **81**, the maintenance unit **30** can rise from the second position P**2** toward the first position P**1**.

Configuration and Operation of Uplift Prevention Member **82**

[0135] Next, the configuration and operation of the uplift prevention member **82** will be described with reference to FIG. **15**. As illustrated in FIG. **15**, the uplift prevention member **82** holds the support unit **37** at the second position P**2**. The uplift prevention member **82** prevents the support unit **37** from uplifting in the upward direction+Z when the user slides the maintenance unit **30** in the intersecting direction Y intersecting the raising and lowering direction Z at the second position P**2**. The uplift prevention member **82** is disposed at a position deviated in the horizontal direction from a raising and lowering region LA (see FIG. **3**) in which the maintenance unit **30** is raised and lowered. Therefore, the uplift prevention member **82** does not prevent the maintenance unit **30** from being raised and lowered. In addition, the uplift prevention member **82** is disposed at a position on the pull-out direction Y side with respect to the support unit **37**.

[0136] The uplift prevention member **82** has a holding plate **85** at its lower end portion. The lower surface of the holding plate **85** may be formed as, for example, a horizontal holding surface. The holding plate **85** is located at a position slightly higher than the height of a part of the maintenance portion **38** when the holding plate **85** is located at the second position P**2**. When the maintenance portion **38** is about to float, the holding plate **85** abuts against a part of the maintenance portion **38** to prevent the maintenance portion **38** from uplifting. A part of the maintenance portion **38** that abuts against the holding plate **85** may be a member that is located at a height at which the part can abut against the holding plate **85** and extends in the pull-out direction Y. In the present embodiment, the part of the maintenance portion **38** is, for example, a rail **92** that is fixed to both ends in the X direction of the bottom plate **38**B of the maintenance portion **38** and extends in the pull-out direction Y. The uplift prevention member **82** prevents the uplift of the maintenance portion **38** by bringing the rail **92** into contact with the holding plate **85** regardless of the position of the maintenance portion **38** within the sliding range. Therefore, the uplift prevention member **82** prevents the uplift of the maintenance portion **38** in the entire slidable range from the position at which the maintenance portion **38** horizontally deviates from the second position P**2** to the working position WP.

[0137] For example, when performing a predetermined operation such as an operation of replacing the receiving member **32**, the user horizontally slides the maintenance portion **38** located at the second position P**2** with respect to the support unit **37**. When the maintenance portion **38** is in the middle of sliding or at the working position WP, even if the holding of the roll catch **81** is released for some reason, the uplift of the maintenance portion **38** is regulated by the uplift prevention member **82**. Accordingly, the maintenance unit **30** is prevented from uplifting.

[0138] A sliding amount by which the maintenance portion **38** is slidable with respect to the support unit **37** is limited to a value at which a state in which a part of the maintenance portion **38** is supported by the support unit **37** is maintained. That is, even when the maintenance portion **38** is located at the working position WP, a part of the maintenance portion **38** is placed at the support unit **37**. For this reason, when the maintenance portion **38** is at the working position WP, even if the

roll catch **81** is detached, the support unit **37** abuts against the maintenance portion **38** whose upward movement is regulated by the uplift prevention member **82**, so that the support unit **37** is prevented from uplifting from the second position P**2**. That is, when the maintenance portion **38** is at the working position WP, even if the roll catch **81** is disengaged, the maintenance unit **30** is prevented from uplifting from the second position P**2**.

Operation and Effects of Embodiment

[0139] According to the present embodiment, the following operations and effects are obtained.

[0140] (1) The liquid ejecting device **11** includes the liquid ejecting unit **22**, the maintenance unit **30**, and the raising and lowering mechanism **50**. The liquid ejecting unit **22** can eject liquid. The maintenance unit **30** performs maintenance of the liquid ejecting unit **22**. The raising and lowering mechanism **50** raises and lowers the maintenance unit **30** between a first position P**1** and a second position P**2** lowered than the first position P**1**. The raising and lowering mechanism **50** includes the counterweight **51** and the coupling portion **53**. Both ends of the coupling portion **53** are coupled to coupling destinations so as to raise and lower the counterweight **51** and the maintenance unit **30** in opposite directions via the pulley **52**. According to this configuration, when the maintenance unit **30** is lowered, the maintenance unit **30** can be lowered by the weight of the counterweight **51** with a small force or without applying a force. Further, when the maintenance unit **30** is raised, the maintenance unit **30** can be raised by the weight of the counterweight **51** without applying a force or with a small force. Therefore, it is possible to improve usability for a person or the like who accesses the maintenance unit **30**. For example, in a case where the maintenance unit **30** is moved from the maintenance position MP at which the maintenance of the liquid ejecting unit **22** is performed to the working position WP at which the user performs the work while being lowered or raised, the usability of the user can be improved. In addition, for example, in a case where a driving source is not used, power is not used, and control is not required, and thus, it is possible to realize a simple configuration.

[0141] (2) Both ends of the coupling portion **53** are coupled to the counterweight **51** and the maintenance unit **30**. According to this configuration, the pulley **52** is a fixed pulley, and the raising and lowering mechanism **50** can be easily realized with a simple configuration. Further, for example, the raising and lowering stroke of the counterweight **51** and the raising and lowering stroke of the maintenance unit **30** can be made equal to each other. For example, in a case where the pulley **52** includes a movable pulley, one of the counterweight **51** and the maintenance unit **30** is coupled to the movable pulley. In this case, the raising and lowering stroke of one of the counterweight **51** and the maintenance unit **30** becomes long, or the weight of the counterweight **51** becomes large. However, the liquid ejecting device **11** can avoid these problems.

[0142] (3) The weight of the counterweight **51** is large enough to raise the maintenance unit **30** against the weight of the maintenance unit **30**. According to this configuration, the user can lower the maintenance unit **30** located at the first position P**1** with a small force. Further, when the maintenance unit **30** is raised from the second position P**2**, the maintenance unit **30** is raised by the weight of the counterweight **51** without applying a force. Therefore, the usability for the user can be improved.

[0143] (4) The weight of the counterweight **51** is greater than the weight of the maintenance unit **30**. According to this configuration, since the weight of the counterweight **51** is greater than the weight of the maintenance unit **30**, the user can lower the maintenance unit **30** with a small force. Further, the maintenance unit **30** located at the second position P**2** is raised by the weight of the counterweight **51** without applying a force. Therefore, the usability for the user can be improved.

[0144] (5) The liquid ejecting device **11** includes the regulating unit **60** that regulates the maintenance unit **30** from rising from the first position P**1**. According to this configuration, the maintenance unit **30** raised by the weight of the counterweight **51** can be positioned at a correct position.

[0145] (6) The first regulating unit **61**, which is an example of the regulating unit **60**, is provided in

at least three positions including two positions corresponding to both ends of the maintenance unit **30** in the intersecting direction Y intersecting the raising and lowering direction Z. The at least three positions are positions at which at least three projection positions when projected on a virtual plane intersecting the raising and lowering direction Z are positions corresponding to vertices of a polygon on the virtual plane. According to this configuration, the maintenance unit **30** can be reliably positioned. In particular, it is possible to accurately position the maintenance unit **30** with respect to the nozzle surface **25** which is a surface of the liquid ejecting unit **22** on which maintenance is performed. For example, the maintenance unit **30** can be positioned at the first position P**1** (maintenance position MP) in a posture in which the surface of the receiving region **32**A is parallel to the nozzle surface **25**. That is, it is possible to suppress the surface of the receiving region **32**A from being inclined with respect to the nozzle surface **25**. Therefore, it is possible to avoid inconvenience in maintenance such as the receiving region **32**A coming into contact with the nozzle surface **25** due to the surface of the receiving region **32**A being inclined with respect to the nozzle surface **25**.

[0146] (7) The positioning assist mechanism **70** including the positioning member **72** that pushes the maintenance unit **30** to the regulation position where the maintenance unit **30** is regulated by the first regulating unit **61**, which is an example of the regulating unit **60**, is provided. According to this configuration, the maintenance unit **30** can be reliably pushed by the positioning member **72** to a position where the maintenance unit **30** comes into contact with the first regulating unit **61**. Therefore, the maintenance unit **30** can be more reliably positioned at the first position P**1**.

[0147] (8) The liquid ejecting device **11** includes the holding unit **80** that holds the maintenance unit **30** so that the maintenance unit **30** does not rise from the second position P**2**. According to this configuration, when the maintenance unit **30** is lowered, the maintenance unit **30** can be held at the second position P**2**. That is, it is possible to improve the positioning accuracy when the maintenance unit **30** is lowered.

[0148] (9) The maintenance unit **30** includes the operation unit **39**. According to this configuration, since raising and lowering can be performed by operating the operation unit **39**, the usability of the user is improved.

[0149] (10) The maintenance unit **30** includes the feeding unit **35** and the winding unit **36**. The receiving member **32** that receives the liquid is set in the feeding unit **35**. The winding unit **36** winds the receiving member **32**. According to this configuration, since the roll of the receiving member **32** can be set in the feeding unit **35**, the length of the receiving member **32** set in the feeding unit **35** can be increased. Therefore, it is possible to reduce the replacement frequency or the replenishment frequency of the receiving member **32**. In addition, with the roll configuration, since the length of the receiving member **32** can be increased, the maintenance unit **30** is likely to be increased in size and weight. Nevertheless, the above configuration can improve the usability for the user.

[0150] (11) The receiving member **32** receives the liquid ejected from the liquid ejecting unit **22**. According to this configuration, since it is necessary to replace the receiving member **32** that receives the liquid ejected from the liquid ejecting unit **22**, it is possible to improve the usability of the user by adopting the above-described configuration.

[0151] (12) The first position P**1** is the maintenance position MP at which the maintenance unit **30** performs maintenance. According to this configuration, it is easy to access the maintenance unit **30** by lowering the maintenance unit **30** to a position lowered than the maintenance position MP.

[0152] (13) At least a part of the maintenance unit **30** is slidable along the horizontal direction from the raising and lowering region LA in which the maintenance unit **30** is raised and lowered. According to this configuration, at least a part of the maintenance unit **30** can be pulled out in the horizontal direction by sliding. For example, it becomes easier for the user to work on at least a part of the maintenance unit **30**.

[0153] (14) At least a part of the maintenance unit **30** moves to the working position WP by

horizontally sliding from the second position P**2**. According to this configuration, at least a part of the maintenance unit **30** can be pulled out by sliding. For example, the user can easily perform work on at least a part of the maintenance unit **30**.

[0154] (15) The maintenance unit **30** includes the support unit **37** and the maintenance portion **38**. The support unit **37** is raised and lowered by the raising and lowering mechanism **50**. The maintenance portion **38** is supported by the support unit **37**. The maintenance portion **38** is slidable in the horizontal direction with respect to the support unit **37**. According to this configuration, it is possible to smoothly move the maintenance portion **38**, which is a work target of the user, in the horizontal direction when the maintenance portion **38**, which is a part of the maintenance unit **30**, slides with respect to the support unit **37**, rather than when the maintenance unit **30** including the support unit **37** is raised and lowered and slides.

Modification Examples

[0155] The above embodiment may be modified as follows. Furthermore, the above-described embodiment and the following modification examples can be implemented in combination with each other as long as there is no technical contradiction. Further, the following modification examples can be implemented in combination as appropriate. [0156] The maintenance unit **30** is not limited to the cleaning unit **31**. The maintenance unit **30** may be a wiping unit **40**U (wiping unit) including the wiping unit **40** illustrated in FIG. **16**. That is, the maintenance unit **30** is not limited to the cleaning unit **31**, and may be the wiping unit **40**U. In this case, as illustrated in FIG. **16**, the liquid ejecting device **11** includes the liquid ejecting unit **22** and the maintenance system **30**S. The maintenance system **30**S includes the wiping unit **40**U and the raising and lowering mechanism **50**. The wiping unit **40**U may include the wiping unit **40** as an example of the maintenance portion **38**, and the support unit **37**. The support unit **37** supports the wiping unit **40**. The receiving member **32** is the wiping member **41** that wipes the liquid adhering to the liquid ejecting unit **22**. The wiping unit **40**U performs wiping for wiping the nozzle surface **25** of the liquid ejecting unit **22** as maintenance by the wiping unit **40**. The wiping unit **40** includes the feeding unit **43** and the winding unit **44**. The feeding unit **43**, the winding unit **44**, the pressing roller **42**, and the like are rotatably supported on the frame **40**A of the wiping unit **40**. The wiping member **41** is pressed upward by the pressing roller **42** at an intermediate portion of the path from the feeding unit **43** to the winding unit **44**, and thus a wiping unit capable of wiping the nozzle surface **25** is formed. The wiping unit **40**U wipes the nozzle surface **25** with the wiping member **41**. The wiping unit **40** may include a raising and lowering unit **40**B. The raising and lowering unit **40**B raises and lowers the wiping member **41**. Accordingly, the wiping member **41** may be configured to be able to come into contact with the nozzle surface **25** of the liquid ejecting unit **22**. Alternatively, a configuration may be adopted in which the nozzle surface **25** and the wiping member **41** are brought into contact with each other by lowering the liquid ejecting unit **22** at the discharge position EP.

[0157] Further, in FIG. **16**, the configuration of the raising and lowering mechanism **50** is the same as that of the above-described embodiment. The raising and lowering mechanism **50** raises and lowers the wiping unit **40**U between the first position P**1** and the second position P**2** lowered than the first position P**1**. That is, the wiping unit **40**U is raised and lowered in the raising and lowering region LA (see FIG. **3**). The raising and lowering mechanism **50** has the counterweight **51**, and the coupling portion **53** whose both ends are coupled to a coupling destination so as to raise and lower the counterweight **51** and the wiping unit **40**U in the opposite directions to each other via pulleys **52**. Both ends of the coupling portion **53** are coupled to the counterweight **51** and the wiping unit **40**U via the pulleys **52**. The pulley **52** may be, for example, a fixed pulley. In a case where the wiping unit **40**U includes the support unit **37** that supports the wiping unit **40**, the second end portion of the coupling portion **53** may be coupled to the support unit **37**. The weight of the counterweight **51** may be greater than, smaller than, or the same as the weight of the wiping unit **40**U. As an example, the weight of the counterweight **51** may be greater than the weight of the

wiping unit **40**U. According to this configuration, the wiping unit **40**U can be raised to the first position P**1** without the user applying a force to the wiping unit **40**U. The first position P**1** is the maintenance position MP at which the wiping unit **40**U wipes the nozzle surface **25** of the liquid ejecting unit **22**. In the maintenance system **30**S, the configuration other than the configuration in which the maintenance portion **38** is the wiping unit **40** may be the same as that of the above-described embodiment. That is, the maintenance system **30**S may include the regulating unit **60**, the positioning assist mechanism **70**, the holding unit **80**, and the operation unit **39** as in the above-described embodiment. In this case, the regulating unit **60** may include two types of regulating units, namely, the first regulating unit **61** and the second regulating unit **62**. In addition, the holding unit **80** may include two types of the roll catch **81** and the uplift prevention member **82**. Further, the maintenance unit **30** may be slidable along the horizontal direction from the raising and lowering region LA in which the maintenance unit **30** is raised and lowered. That is, the wiping unit **40** may be slidably supported by the rails **91**, **92** with respect to the support unit **37**. According to the configuration of the modification example, since it is necessary to replace the wiping member **41** that wipes the liquid adhering to the liquid ejecting unit **22**, it is possible to improve the usability of the user by employing the above-described configuration. [0158] The maintenance position MP is not limited to the first position P**1**. For example, as illustrated in FIG. **17**, a position outside the raising and lowering region LA may be the maintenance position MP. In this example, the maintenance position MP is located at the same height position as the first position P**1** outside the raising and lowering region LA. The maintenance unit **30** is configured to be slidable in the horizontal direction with respect to the raising and lowering region LA. The user may place the maintenance unit **30** at the first position P**1** by horizontally sliding the maintenance unit **30** from the maintenance position MP. Further, the position to which the maintenance unit **30** is lowered than the first position P**1** to the second position P**2** may be the working position WP. For example, the weight of the counterweight **51** may be greater than the weight of the maintenance unit **30**. In this case, the user can lower the maintenance unit **30** to the second position P**2**, which is the working position, with a relatively small downward operating force. In addition, since the maintenance unit **30** is raised without applying a force, it is easy to position the maintenance unit **30** at the first position P**1** and the maintenance position MP. [0159] As illustrated in FIG. **18**, the maintenance position MP may be the second position P**2**. That is, in the course of moving the maintenance unit **30** from the maintenance position MP to the working position WP, the maintenance unit **30** may be raised from the second position P**2** to the first position P**1**. In this case, the weight of the counterweight **51** may be smaller than the weight of the maintenance unit **30**. The user raises the maintenance unit **30** from the second position P**2**, which is the maintenance position MP, to the first position P**1** by applying an upward force. Further, the user horizontally slides the maintenance unit **30** from the first position P**1**. Accordingly, the maintenance unit **30** is disposed at the working position WP. In this manner, the working position WP at which the maintenance unit **30** is slid with respect to the raising and lowering region LA may be the same height as the first position P**1**. [0160] As illustrated in FIG. **19**, the maintenance position MP may be a position outside the raising and lowering region LA and at the same height as the second position P**2**. That is, similarly to FIG. **18**, in the course of moving the maintenance unit **30** from the maintenance position MP to the working position WP, the maintenance unit **30** may be raised from the second position P**2** to the first position P**1**. In FIG. **19**, the maintenance unit **30** rises from the second position P**2** to the first position P**1**, and then slides horizontally from the first position P**1** to be disposed at the working position WP. The weight of the counterweight **51** may be smaller than the weight of the maintenance unit **30**. In this manner, the user can raise the maintenance unit **30** with a relatively small operation force. [0161] In the above-described embodiment and the modification examples illustrated in FIGS. **18** and **19**, the maintenance portion **38** may not slide in the horizontal direction with respect to the raising and lowering region LA. In this case, for example, in the above embodiment, the second position P**2** may be the working position WP. In the modification example

illustrated in FIG. **18**, the first position P**1** may be the working position WP. In the modification example illustrated in FIG. **19**, the second position P**2** may be the working position WP. [0162] At least one of the pulleys **52** may be a movable pulley. For example, as illustrated in FIG. **20**, the maintenance system **30**S includes a plurality of pulleys **5257**. At least one (for example, one) of them is a movable pulley **57**. For example, the movable pulley **57** is coupled to the maintenance unit **30**. The coupling portion **53** is provided so as to raise and lower the counterweight **51** and the maintenance unit **30** in opposite directions via the pulleys **52**, **57**. In the example illustrated in FIG. **20**, a first end portion of the coupling portion **53** via the pulleys **52**, **57** is coupled to the counterweight **51**, and a second end portion which is an end portion on the opposite side of the first end portion via the pulleys **52**, **57** is fixed to a predetermined fixing target. The fixing target is, for example, a frame, a support member, or the like in the housing **12**. In the example illustrated in FIG. **20**, the second end portion of the coupling portion **53** is fixed to the fixing target at a position higher than the highest position of the movable pulley **57** (for example, the position in FIG. **20**). The weight of the counterweight **51** may be greater than half of the weight of the maintenance unit **30**. In this case, the weight of the moving pulley **57** may be included in the weight of the maintenance unit **30**. In short, the weight of the counterweight **51** may be greater than the weight of the counterweight **51** when the counterweight **51** and the maintenance unit **30** are balanced via the pulleys **52**, **57** and the coupling portion **53**. According to this configuration, the maintenance unit **30** can be raised to the first position P**1** by the weight of the counterweight **51** without applying a force. In addition, a force to be applied to the maintenance unit **30** located at the first position P**1** when the maintenance unit **30** is lowered is small. Moreover, the weight of the counterweight **51** can be reduced to about a half of the weight of the counterweight **51** in the above embodiment. For example, the total weight of the maintenance system **30**S can be reduced. As a result, the total weight of the liquid ejecting device **11** can be reduced. Although the raising and lowering stroke of the counterweight **51** is longer than that in the above-described embodiment, since the maintenance unit **30** has a vertically long shape in which the feeding unit **35** and the winding unit **36** are disposed vertically, it is easy to secure a raising and lowering space. [0163] In the modification example illustrated in FIG. **20**, the movable pulley **57** may be fixed to the counterweight **51**. According to this configuration, although the weight of the counterweight **51** increases, the raising and lowering stroke thereof can be made smaller than that of the above embodiment. The raising and lowering mechanism **50** may include two movable pulleys **57** to which both the counterweight **51** and the maintenance unit **30** are fixed. [0164] In the modification example illustrated in FIG. **20**, the maintenance position MP and the working position WP may be changed as in the modification examples illustrated in FIGS. **16** to **19**. [0165] The wiping unit **40** illustrated in FIG. **16** is not limited to a cloth wiper that wipes the nozzle surface **25** with the wiping member **41** made of cloth as an example of the receiving member **32**, and may be configured to wipe the nozzle surface **25** with a wiper blade. In this case, adjustment, repair, or replacement of the wiper blade may be performed as the predetermined operation at the working position WP. [0166] The maintenance system **30**S in the above-described embodiment and each of the above-described modification examples illustrated in FIGS. **16** to **20** and the like may include at least one of the regulating unit **60**, the positioning assist mechanism **70**, the holding unit **80**, and the operation unit **39**. For example, only one of them may be provided, or a plurality of them such as two, three, or four may be provided. Further, the regulating unit **60** may include at least one of the first regulating unit **61** and the second regulating unit **62**. Further, the holding unit **80** may include at least one of the roll catch **81** and the uplift prevention member **82**. [0167] In the above-described embodiment and the above-described modification examples illustrated in FIGS. **16** to **20** and the like, at least three first regulating units **61** are provided. The number of the first regulating units **61** may be three or five or more. In any case, a polygon having at least three projection points obtained by projecting at least three positions on a virtual plane as vertices is a polygon having three or more vertices. The polygon may be a triangle or a pentagon. Even in these configurations, the maintenance unit **30** can

be positioned with high accuracy with little inclination with respect to the nozzle surface **25**. [0168] In the above-described embodiment and each of the above-described modification examples illustrated in FIGS. **16** to **20** and the like, only one regulating unit **60** may be provided. In this case, one regulating unit **60** may be provided at a position corresponding to the central portion of the maintenance unit **30** in the intersecting direction Y. Further, three regulating units **60** may be provided at positions corresponding to both sides of the maintenance unit **30** in the intersecting direction Y and a position corresponding to the central portion in the intersecting direction Y. In a case where the maintenance unit **30** is a strong rigid body or is configured to perform maintenance of a type in which positioning accuracy of the liquid ejecting unit **22** with respect to the nozzle surface **25** is not required so much, the number of the first regulating units **61** may be one or two. Further, the number of the second regulating units **62** may be one or three. [0169] In the above-described embodiment and each of the above-described modification examples illustrated in FIGS. **16** to **20** and the like, two holding units **80** may be provided. In this case, the two holding units **80** may be provided at positions corresponding to both sides of the maintenance unit **30** in the intersecting direction Y. For example, two or three roll catches **81** may be provided at different positions in the intersecting direction Y of the maintenance unit **30**. In addition, two or three uplift prevention members **82** may be provided at different positions in the intersecting direction Y of the maintenance unit **30**. [0170] The positioning assist mechanism **70** may be configured to assist the positioning of the maintenance unit **30** at the second position P**2**. In this case, the positioning assist mechanism **70** may assist in positioning the maintenance unit **30** at the second position P**2** by pushing down the stopper **64** as the pushing operation. This configuration is particularly effective when the second position P**2** is the maintenance position MP. In this manner, the pushing by the positioning assist mechanism **70** is not limited to pushing up, and may be pushing down. [0171] In the above-described embodiment and modification examples, the present disclosure is not limited to the configuration in which the maintenance unit **30** is slid in the horizontal direction with respect to the raising and lowering region LA, and the slide mechanism may not be provided in a configuration in which the maintenance unit **30** is not slid. [0172] In the embodiment described above, the receiving member **32**, which is an example of a consumable item, is replaced at the working position WP, but the entire maintenance portion **38** may be replaced. In particular, in the small-sized or medium-sized liquid ejecting device **11**, since the maintenance portion **38** is small, the maintenance portion **38** may be disposable and replaceable. In this case, since the replacement operation such as roll replacement is not required, the replacement operation is simple. [0173] The maintenance unit **30** may be configured to be slidable in the horizontal direction with respect to the raising and lowering region LA. For example, the pulley **52** may be configured to be movable in the pull-out direction Y in conjunction with the sliding of the maintenance unit **30**. [0174] The first position P**1** is not limited to the maintenance position MP. The second position P**2** may be the maintenance position MP. Further, the working position WP may be a position to which a person or the like raises or lowers the maintenance unit **30** from the maintenance position MP. The working position WP may be a working position to which the maintenance unit **30** is moved from the maintenance position MP along a predetermined path, or the maintenance position MP itself may be the working position. [0175] A subject that performs the predetermined operation at the working position WP is not limited to a person such as a user or a service person, and may be a work robot. In this case, the force required for the work robot can be reduced. For example, the work robot can be reduced in size, weight, and power consumption. [0176] The pulley is not limited to a fixed pulley, and may include a movable pulley. A combined pulley in which a fixed pulley and a movable pulley are combined may be used. [0177] The coupling portion **53** is not limited to a wire. The coupling portion **53** may be a rope, a chain, a chain, or the like. In the case of a chain, the pulley **52** may be a sprocket engageable with the chain. [0178] The receiving member **32** included in the maintenance unit **30** as a consumable item is not limited to cloth. For example, the receiving member **32** may be a liquid absorbing member made of paper or synthetic resin fiber. [0179] The

maintenance unit **30** may be configured not to include a consumable such as the receiving member **32**. In this case, at the maintenance position MP, a predetermined operation such as maintenance, inspection, or component replacement of the maintenance unit **30** may be performed. [0180] The counterweight **51** may be replaced with a liquid supply source. That is, the counterweight **51** may include a liquid supply source. The liquid supply source may be a liquid supply source for replacement or replenishment, which is prepared in advance for a case where the liquid of the liquid supply source in use that supplies the liquid to the liquid ejecting unit **22** runs out. Examples of the replacement liquid supply source include an ink cartridge. Examples of the liquid supply source for replenishment include an ink bottle. In a configuration in which the liquid ejecting device **11** includes an ink tank as a liquid supply source, a user replenishes the ink tank with liquid (ink) from an ink bottle, for example, when the amount of ink in the ink tank reaches an amount less than the end. The ink cartridge or the ink bottle as a part of the counterweight **51** may be, for example, a new product. However, even if the counterweight **51** is not new, the weight of the counterweight **51** is within a necessary range. The necessary range in the present embodiment is, for example, a range satisfying that the weight of the counterweight **51** is greater than the weight of the maintenance unit **30**. As described above, in the configuration in which the spare liquid supply source is stored as a part of the counterweight **51**, a storage space for storing the spare liquid supply source can be saved. In addition, the object stored as a part of the counterweight **51** may be a spare consumable necessary for the liquid ejecting device **11** to perform printing. An example of the consumable includes a spare medium **99**. In this manner, when the counterweight **51** is substituted with a liquid supply source such as an ink cartridge, an empty space can be effectively used. [0181] The intersecting direction intersecting the raising and lowering direction Z of the maintenance unit **30** may be the X direction instead of the Y direction. In this case, at least three first regulating units **61** may be provided in at least three positions including two positions corresponding to both ends of the maintenance unit **30** in the X direction. Two second regulating units **62** may be provided at positions corresponding to both ends of the maintenance unit **30** in the X direction. [0182] In the above-described embodiment, instead of the maintenance portion **38**, the maintenance unit **30** may be configured to be slidable in the horizontal direction with respect to the raising and lowering region LA. For example, a slider on which the lowered maintenance unit **30** can be placed may be disposed at the second position P**2**, and the slider on which the maintenance unit **30** is placed may move horizontally. In this case, one of the pulleys **52** corresponding to the maintenance unit **30** may move in the horizontal direction together with the maintenance unit **30**. Furthermore, the raising and lowering mechanism **50** may also slide in the horizontal direction together with the slider. [0183] The pull-out direction Y of the maintenance portion **38** may be the −Y direction which is a direction opposite to the Y direction, or may be the A**1** direction or the A**2** direction. [0184] The feeding units **35**, **43** constituting the maintenance unit **30** may be driven or active. That is, the feeding units **35**, **43** may actively feed the receiving member **32** by being driven by a driving source such as a motor, or may passively feed the receiving member **32** by the winding force of the winding units **36**, **44**. [0185] The liquid ejecting device **11** may include a drive source that raises and lowers the maintenance unit **30**. Even with this configuration, the power required for the drive source is small. Therefore, only a small driving source is required, so that it is possible to reduce the size and cost of the maintenance system **30**S. In addition, since the user can raise and lower the maintenance unit **30** without applying an operation force, it is possible to improve usability for the user. According to this configuration, for example, since the user can slide at least a part of the maintenance unit **30** in the horizontal direction without applying an operation force, it is possible to improve usability for the user. [0186] The liquid ejecting device **11** may include a drive source that slides at least a part (for example, the maintenance portion **38**) of the maintenance unit **30** along the horizontal direction with respect to the raising and lowering region LA. [0187] The liquid ejecting device **11** may include a nozzle inspection unit that detects an ejection failure of the nozzle **24**. The time when the nozzle inspection unit detects the ejection failure of the nozzle **24** may be one of the

cleaning times. For example, the nozzle inspection unit drives the piezoelectric element **27** to such an extent that a liquid droplet is not ejected from the nozzle **24**, and detects an ejection failure of the nozzle **24** based on residual vibration remaining in the liquid in the liquid chamber communicating with the nozzle **24**. The nozzle inspection unit detects a foreign substance, an air bubble, a thickened liquid (for example, thickened ink), or the like in the liquid in the nozzle **24** as the ejection failure of the nozzle **24**. The driving element that causes the nozzle **24** to eject liquid droplet is not limited to the piezoelectric element **27**, and may be an electrostatic element or a heater element. [0188] The medium **99** is not limited to paper or the like, and may be an envelope, board paper, cloth, a synthetic resin film, a laminate medium, clothing, or the like. [0189] In a case where the liquid ejecting device **11** is a printer, the liquid ejecting device **11** is not limited to the lateral type or the serial type described in the above embodiment, and may be a line type. In the case of the line type, the liquid ejecting unit **22** includes a liquid ejecting head **23** extending in the width direction of the medium **99**. Printing is performed on the medium **99** by ejecting the liquid all at once from the nozzles **24** of the long liquid ejecting head **23** toward the medium **99** transported at a constant speed. [0190] The liquid ejecting device **11** is not limited to an ink jet printer that ejects liquid such as ink. The liquid ejecting device **11** may be a device that ejects liquid other than ink. The state of the liquid ejected from the liquid ejecting unit **22** of the liquid ejecting device **11** includes a granular shape, a teardrop shape, and a thread-like shape with a tail. In addition, the liquid referred to here is a material that can be ejected from the liquid ejecting device **11**. For example, it is assumed that the liquid may be any matter in a state in which the matter is in a liquid phase, and includes a liquid body having high or low viscosity, and a fluid body such as sol, gel water, other inorganic solvents, an organic solvent, a solution, a liquid resin, and a liquid metal (metal molten liquid). Further, the matter may include one in which particles of a functional material made of a solid such as pigments or metal particles have been dissolved, dispersed, or mixed in a solvent, in addition to a liquid as one state of matter. The ink here includes various liquid compositions such as general aqueous ink and solvent ink, gel ink, and hot-melt ink. Specific examples of the liquid ejecting device **11** include a liquid ejecting device that ejects a liquid containing a material such as an electrode material or a color material used for manufacturing a liquid crystal display, an electroluminescence (EL) display, a surface emitting display, a color filter, or the like in a dispersed or dissolved form. Further, the liquid ejecting device may be a liquid ejecting device that ejects bioorganic substances used for biochip manufacturing, a liquid ejecting device used as a precision pipette and ejecting liquid to be a sample, a dye-printing device, a micro dispenser, or the like. Furthermore, the liquid ejecting device may be a liquid ejecting device that ejects lubricating oil in a pinpoint manner to a precision machine such as a watch or a camera, or a liquid ejecting device that ejects a transparent resin liquid such as an ultraviolet curable resin onto a substrate in order to form a micro hemispherical lens (optical lens) or the like used for an optical communication element or the like. Further, the liquid ejecting device may be a liquid ejecting device that ejects an etching liquid such as an acid or an alkali in order to etch a substrate or the like.

Supplementary Note

[0191] Hereinafter, technical spirits ascertained from the embodiments and the modification examples will be described together with the effects.

[0192] (A) A liquid ejecting device includes a liquid ejecting unit configured to eject liquid, a maintenance unit configured to perform maintenance of the liquid ejecting unit, and a raising and lowering mechanism configured to raise and lower the maintenance unit between a first position and a second position lowered than the first position, wherein the raising and lowering mechanism includes a counterweight, and a coupling portion having both ends coupled to a coupling destination to raise and lower the counterweight and the maintenance unit in opposite directions to each other via a pulley. According to this configuration, when the maintenance unit is lowered, the maintenance unit can be lowered by the weight of the counterweight with a small force or without

applying a force. Further, when the maintenance unit is raised, the maintenance unit can be raised by the weight of the counterweight without applying a force or with a small force. Therefore, it is possible to improve usability for a person or the like who accesses the maintenance unit. For example, in a case where the maintenance unit is moved from the maintenance position at which the maintenance of the liquid ejecting unit is performed to the working position at which the user performs the work while being lowered or raised, the usability of the user can be improved. In addition, for example, in a case where a driving source is not used, power is not used, and control is not required, and thus, it is possible to realize a simple configuration.

[0193] (B) In the liquid ejecting device according to (A), the both ends of the coupling portion may be coupled to the counterweight and the maintenance unit. According to this configuration, since the pulley may be a fixed pulley, it is easy to realize the raising and lowering mechanism with a simple configuration. Further, for example, the raising and lowering stroke of the counterweight and the raising and lowering stroke of the maintenance unit can be made equal to each other. For example, in a case where the pulley includes a movable pulley, one of the counterweight and the maintenance unit is coupled to the movable pulley. In this case, the raising and lowering stroke of one of the counterweight and the maintenance unit becomes long, or the weight of the counterweight becomes large. However, the liquid ejecting device can avoid these problems.

[0194] (C) In the liquid ejecting device according to (A), a weight of the counterweight may be large enough to raise the maintenance unit against a weight of the maintenance unit. According to this configuration, the user can lower the maintenance unit located at the first position with a small force. Further, when the maintenance unit is raised from the second position, the maintenance unit is raised by the weight of the counterweight without applying a force. Therefore, the usability for the user can be improved.

[0195] (D) In the liquid ejecting device according to (B), a weight of the counterweight may be greater than a weight of the maintenance unit. According to this configuration, since the weight of the counterweight is greater than the weight of the maintenance unit, the user can lower the maintenance unit with a small force. Further, the maintenance unit located at the second position is raised by the weight of the counterweight without applying a force. Therefore, the usability for the user can be improved.

[0196] (E) The liquid ejecting device according to any one of (A) to (D) may include a regulating unit configured to regulate rising of the maintenance unit from the first position. According to this configuration, the maintenance unit raised by the weight of the counterweight can be positioned at a correct position.

[0197] (F) In the liquid ejecting device according to (E), the regulating unit may be provided in at least three positions including two positions corresponding to both ends of the maintenance unit in an intersecting direction intersecting with a raising and lowering direction, the at least three positions may be positions such that at least three projection positions when projected on a virtual plane intersecting the raising and lowering direction are positions corresponding to vertices of a polygon on the virtual plane. According to this configuration, the maintenance unit can be reliably positioned. For example, it is possible to accurately position the maintenance unit with respect to the surface to be maintained of the liquid ejecting unit.

[0198] (G) The liquid ejecting device according to (E) or (F) may include a positioning assist mechanism including a positioning member configured to push the maintenance unit to a regulation position where the maintenance unit is regulated by the regulating unit. According to this configuration, the maintenance unit can be reliably pushed by the positioning member to a position where the maintenance unit comes into contact with the regulating unit. Therefore, the maintenance unit can be more reliably positioned at the first position.

[0199] (H) The liquid ejecting device according to any one of (A) to (G) may include a holding unit configured to hold the maintenance unit without allowing the maintenance unit to rise from the second position. According to this configuration, when the maintenance unit is lowered, the

maintenance unit can be held at the second position. That is, it is possible to improve the positioning accuracy when the maintenance unit is lowered.
[0200] (I) In the liquid ejecting device according to any one of (A) to (H), the maintenance unit may include an operation unit. According to this configuration, since raising and lowering can be performed by operating the operation unit, the usability of the user is improved.
[0201] (J) In the liquid ejecting device according to any one of (A) to (I), the maintenance unit may include a feeding unit at which a receiving member configured to receive liquid is set, and a winding unit configured to wind the receiving member. According to this configuration, since the roll of the receiving member can be set in the feeding unit, the length of the receiving member set in the feeding unit can be increased. Therefore, it is possible to reduce the replacement frequency or the replenishment frequency of the receiving member. In addition, with the roll configuration, since the length of the receiving member can be increased, the maintenance unit is likely to be increased in size and weight. Nevertheless, the above configuration can improve the usability for the user.
[0202] (K) In the liquid ejecting device according to (J), the receiving member may be configured to receive the liquid ejected from the liquid ejecting unit. According to this configuration, since it is necessary to replace the receiving member that receives the liquid ejected from the liquid ejecting unit, it is possible to improve the usability of the user by adopting the above-described configuration.
[0203] (L) In the liquid ejecting device according to (J) or (K), the receiving member may be a wiping member configured to wipe off liquid adhering to the liquid ejecting unit. According to this configuration, since it is necessary to replace the wiping member that wipes the liquid adhering to the liquid ejecting unit, it is possible to improve the usability of the user by employing the above-described configuration.
[0204] (M) In the liquid ejecting device according to any one of (A) to (L), the first position may be a maintenance position at which the maintenance unit is configured to perform the maintenance. According to this configuration, it is easy to access the maintenance unit by lowering the maintenance unit from the maintenance position to the lowered position.
[0205] (N) In the liquid ejecting device according to any one of (A) to (M), at least a part of the maintenance unit may be configured to slide along a horizontal direction from a raising and lowering region in which the maintenance unit is raised and lowered. According to this configuration, at least a part of the maintenance unit can be pulled out in the horizontal direction by sliding. For example, it becomes easier for the user to work on at least a part of the maintenance unit.
[0206] (O) In the liquid ejecting device according to (N), at least a part of the maintenance unit may be configured to move to a working position by sliding from the second position along the horizontal direction. According to this configuration, at least a part of the maintenance unit can be pulled out by sliding. For example, the user can easily perform work on at least a part of the maintenance unit.
[0207] (P) In the liquid ejecting device according to (N) or (O), the maintenance unit may include a support unit that is raised and lowered by the raising and lowering mechanism, and a maintenance portion that is supported by the support unit, and the maintenance portion may be configured to slide in the horizontal direction with respect to the support unit. According to this configuration, it is possible to smoothly move the maintenance portion, which is a work target of the user, in the horizontal direction when the maintenance portion, which is a part of the maintenance unit, slides with respect to the support unit, rather than when the maintenance unit including the support unit is raised and lowered and slides.

Claims

1. A liquid ejecting device comprising: a liquid ejecting unit configured to eject liquid; a maintenance unit configured to perform maintenance of the liquid ejecting unit; and a raising and lowering mechanism configured to raise and lower the maintenance unit between a first position and a second position lowered than the first position, wherein the raising and lowering mechanism includes: a counterweight; and a coupling portion having both ends coupled to a coupling destination to raise and lower the counterweight and the maintenance unit in opposite directions via a pulley.

2. The liquid ejecting device according to claim 1, wherein the both ends of the coupling portion are coupled to the counterweight and the maintenance unit.

3. The liquid ejecting device according to claim 1, wherein a weight of the counterweight is large enough to raise the maintenance unit against a weight of the maintenance unit.

4. The liquid ejecting device according to claim 2, wherein a weight of the counterweight is greater than a weight of the maintenance unit.

5. The liquid ejecting device according to claim 1, comprising a regulating unit configured to regulate rising of the maintenance unit from the first position.

6. The liquid ejecting device according to claim 5, wherein the regulating unit is provided in at least three positions including two positions corresponding to both ends of the maintenance unit in an intersecting direction intersecting with a raising and lowering direction, and the at least three positions are positions such that at least three projection positions when projected on a virtual plane intersecting the raising and lowering direction are positions corresponding to vertices of a polygon on the virtual plane.

7. The liquid ejecting device according to claim 5, comprising a positioning assist mechanism including a positioning member configured to push the maintenance unit to a regulation position where the maintenance unit is regulated by the regulating unit.

8. The liquid ejecting device according to claim 1, comprising a holding unit configured to hold the maintenance unit without allowing the maintenance unit to rise from the second position.

9. The liquid ejecting device according to claim 1, wherein the maintenance unit includes an operation unit.

10. The liquid ejecting device according to claim 1, wherein the maintenance unit includes: a feeding unit at which a receiving member configured to receive liquid is set; and a winding unit configured to wind the receiving member.

11. The liquid ejecting device according to claim 10, wherein the receiving member is configured to receive the liquid ejected from the liquid ejecting unit.

12. The liquid ejecting device according to claim 10, wherein the receiving member is a wiping member configured to wipe off liquid adhering to the liquid ejecting unit.

13. The liquid ejecting device according to claim 1, wherein the first position is a maintenance position at which the maintenance unit is configured to perform the maintenance.

14. The liquid ejecting device according to claim 1, wherein at least a part of the maintenance unit is configured to slide along a horizontal direction from a raising and lowering region in which the maintenance unit is raised and lowered.

15. The liquid ejecting device according to claim 14, wherein at least a part of the maintenance unit is configured to move to a working position by sliding from the second position along the horizontal direction.

16. The liquid ejecting device according to claim 14, wherein the maintenance unit includes a support unit that is raised and lowered by the raising and lowering mechanism, and a maintenance portion that is supported by the support unit, and the maintenance portion is configured to slide in the horizontal direction with respect to the support unit.