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WIPING DEVICE, LIQUID EJECTION DEVICE, AND METHOD FOR CONTROLLING A LIQUID EJECTION DEVICE

Abstract

The wiping device includes a wiping device **30** configured to wipe a nozzle surface **25** of a liquid ejection head **22** which ejects a liquid, an absorbing member **39** configured to absorb liquid, and a movement mechanism that moves the absorbing member **39** to a contact position Pc configured to contact the nozzle surface **25** and a separated position separate from the nozzle surface **25**, wherein the absorbing member **39** includes an impregnated section **56** configured to contact the nozzle surface **25** in a state in which the liquid is impregnated and a wiping section **55** configured to wipe the nozzle surface **25** by moving relative to the liquid ejection head **22.**

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Background/Summary

[0001] The present application is based on, and claims priority from JP Application Serial Number 2024-024354, 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 wiping device, a liquid ejection device, and a control method of a liquid ejection device.

2. Related Art

[0003] For example, as in JP-A-2018-103399, there is a liquid ejecting device as an example of a liquid ejection device. The liquid ejecting device performs printing by ejecting ink, which is an example of a liquid, from a liquid ejecting head, which is an example of a liquid ejection head. The liquid ejecting device includes a wiper unit, which is an example of a wiping device. The wiper unit wipes the liquid ejection head by moving with the first roller and the second roller pressing a cloth sheet against the liquid ejection head.

[0004] Mist or the like scattered during ejection of liquid may cling to the liquid ejection head that performs printing by ejecting the liquid. When the liquid such as mist that clings to the liquid ejection head solidifies, it might not be wiped off by the cloth sheet.

SUMMARY

[0005] To solve the above problem, a wiping device configured to wipe the nozzle surface of a liquid ejection head that ejects liquid includes a band-shaped absorbing member configured to absorb the liquid and a movement mechanism that moves the absorbing member to a contact position where the absorbing member is contactable with the nozzle surface and a separated position at which the absorbing member is separated from the nozzle surface, wherein the absorbing member includes an impregnated section configured to contact the nozzle surface in a state of being impregnated with liquid and a wiping section configured to wipe the nozzle surface by moving relative to the liquid ejection head.

[0006] To solve the above problem, a liquid ejection device includes a liquid ejection head that ejects a liquid from a nozzle formed in a nozzle surface and a wiping device with the above configuration.

[0007] To solve the above problem, a control method of a liquid ejection device, the liquid ejection device including a liquid ejection head that ejects a liquid from a nozzle formed in a nozzle surface and a wiping device configured to wipe the nozzle surface, wherein the wiping device includes a wiping section configured to wipe the nozzle surface by moving relative to the liquid ejection head, an absorbing member including an impregnated section configured to come into contact with the nozzle surface in a state of being impregnated with a liquid, and a movement mechanism that has a first movement mechanism configured to move the wiping section of the absorbing member to a position where the wiping section is contactable with the nozzle surface, and a second movement mechanism configured to move the impregnated section of the absorbing member to a position where the impregnated section contacts the nozzle surface, the control method including, using the

second movement mechanism to bring the impregnated section into contact with the nozzle surface, and maintaining a state in which the impregnated section contacts the nozzle surface for a predetermined time, using the second movement mechanism to separate the impregnated section from the nozzle surface, using the first movement mechanism to move the wiping section to a position where the wiping section is contactable with the nozzle surface, and wiping the nozzle surface with the wiping section.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. **1** is a schematic diagram of an embodiment of a liquid ejection device.

[0009] FIG. **2** is a perspective view of a wiping device.

[0010] FIG. **3** is a schematic cross-sectional view of the wiping device.

[0011] FIG. **4** is a perspective view of a pressing section and a support member.

[0012] FIG. **5** is a schematic cross-sectional view of the wiping device in which the wiping section is positioned at a wiping position.

[0013] FIG. **6** is a schematic cross-sectional view of the wiping device in which an impregnated section is positioned at an impregnation position.

[0014] FIG. **7** is a schematic cross-sectional view of the wiping device in which the impregnated section is positioned at a contact position.

DESCRIPTION OF EMBODIMENTS

Embodiments

[0015] Hereinafter, an embodiment of a wiping device, a liquid ejection device, and a control method of the liquid ejection device will be described with reference to the drawings. The liquid ejection device is an inkjet printer for printing images such as characters and photographs by ejecting ink, which is an example of a liquid, onto a medium such as paper or cloth.

[0016] In the drawings, a liquid ejection device **11** is placed on a horizontal surface, the direction of gravity is indicated by the Z-axis, and the directions along the horizontal surface are indicated by the X-axis and the Y-axis. The X-axis, the Y-axis, and the Z-axis are orthogonal to each other. In the following description, the directions parallel to the X-axis is referred to as scanning direction X1 and wiping direction X2, a direction parallel to the Y-axis is referred to as width direction Y, and a direction parallel to the Z-axis is referred to as vertical direction Z. The wiping direction X2 is a direction opposite to the scanning direction X1.

Liquid Ejection Device

[0017] As shown in FIG. **1**, the liquid ejection device **11** may include a control section **12**, a medium transport section **13**, a printing section **14**, and a maintenance section **15**.

[0018] The control section **12** integrally controls the driving of each mechanism in the liquid ejection device **11**, and controls various operations executed in the liquid ejection device **11**.

[0019] The control unit **12** can be configured as a circuit including a: one or more processors that execute various processes according to a computer program, β: one or more dedicated hardware circuits that execute at least a part of the various processes, or y: a combination thereof. The hardware circuit is, for example, an application-specific integrated circuit. The processor includes a CPU and memory, such as RAM and ROM, and the memory stores program code or instructions configured to cause the CPU to perform processes. Memory or computer-readable medium includes any readable medium that can be accessed by a general purpose or special purpose computer.

Medium Transport Section

[0020] The medium transport section **13** is configured to transport medium **17**. The medium transport section **13** may include a medium support section **18** and a transport roller **19**.

[0021] The medium support section **18** supports the medium **17**. The medium support section **18**, for example, supports the medium **17** from below. The medium support section **18** supports the medium **17** to be transported.
[0022] The medium transport section **13** may include a plurality of transport rollers **19**. The transport roller **19** transports the medium **17** by rotating.
[0023] The medium transport section **13**, for example, transports the medium **17** intermittently. Specifically, the medium transport section **13** stops transporting the medium **17** while the printing section **14** performs printing on the medium **17**. The medium transport section **13** transports the medium **17** after printing is performed on the medium **17**. The medium transport section **13** may transport not only an elongated medium **17** but also a single-sheet medium **17**.
Printing Section
[0024] The printing section **14** is configured to perform printing on the medium **17**. The printing section **14** performs printing on a region of the medium **17** that is supported by the medium support section **18**. The printing section **14** may include a carriage **21**, a liquid ejection head **22**, and a pressurizing section **23**.
[0025] The carriage **21** is configured to reciprocate in the scanning direction X1 and the wiping direction X2. The carriage **21** passes through a position facing the medium **17** by reciprocating in the scanning direction X1 and the wiping direction X2. The carriage **21**, for example, passes over the medium support section **18**.
[0026] In the liquid ejection device **11** of the present embodiment, the direction in which the carriage **21** moves coincides with the direction in which the medium **17** moves over the medium support section **18**. Therefore, the liquid ejection device **11** is a lateral printer. The liquid ejection device **11** may be a serial printer in which the medium **17** is transported in a direction different from the scanning direction X1.
[0027] The printing section **14** may include a plurality of liquid ejection heads **22**. The printing section **14** of the present embodiment includes five liquid ejection heads **22**. The plurality of liquid ejection heads **22** may be provided side by side in the scanning direction X1. The plurality of liquid ejection heads **22** each have a same configuration. Therefore, a single liquid ejection head **22** will be described below.
[0028] The liquid ejection head **22** is configured to eject liquid. The liquid ejection head **22** of the present embodiment ejects liquid in the vertical direction Z. The liquid ejection head **22** has a nozzle surface **25**. A nozzle **26** is formed on the nozzle surface **25**. The nozzle surface **25** is a surface on which one or more nozzles **26** are opened. The liquid ejection head **22** ejects liquid from the nozzle **26**. The liquid ejection head **22** is mounted on the carriage **21**. The liquid ejection head **22** prints an image on the medium **17** by ejecting liquid onto the medium **17**. The plurality of liquid ejection head **22** may eject the same type of liquid or different types of liquid. For example, four liquid ejection heads **22** may eject ink of different colors, and a single liquid ejection head **22** may eject a reaction liquid that aggregates the ink.
[0029] The liquid ejection head **22** is, for example, a line head configured to simultaneously eject liquid onto the medium **17** across the width direction Y. The liquid ejection head **22** is movable in the scanning direction X1. The liquid ejection head **22** is movable in the wiping direction X2. The liquid ejection head **22** reciprocates in the scanning direction X1 and the wiping direction X2 together with the carriage **21**. The liquid ejection head **22** can eject liquid over the entire area of the medium **17** supported by the medium support section **18**.
[0030] The pressurizing section **23** is connected to the liquid ejection head **22**. The pressurizing section **23**, for example, pressurizes the inside of the plurality of liquid ejection heads **22**. The printing section **14** may include a plurality of pressurizing sections **23**. For example, the printing section **14** may include a pressurizing section **23** for each of the liquid ejection heads **22**.
[0031] The pressurizing section **23** is, for example, a pump. The pressurizing section **23** pressurizes the inside of the liquid ejection head **22** to discharge liquid from the liquid ejection head **22**. That

is, the pressurizing section **23** pressurizes the inside of the liquid ejection head **22**, thereby pressurizing and discharging the liquid from the nozzle **26**. Discharging the liquid under pressure is also called pressure cleaning. Pressure cleaning is maintenance that involves forcibly discharging liquid from the nozzle **26** to discharge air bubbles, foreign matter, and the like from the nozzle **26**, together with the liquid in the liquid ejection head **22**.

Maintenance Section

[0032] The maintenance section **15** is configured to maintain the liquid ejection head **22**. The maintenance section **15** may include a moisturizing section **28**, a cleaning section **29**, a wiping device **30**, and a liquid receiving section **31**. The moisturizing section **28**, the cleaning section **29**, the wiping device **30**, the liquid receiving section **31**, and the medium support section **18** may be provided side by side in this order in the scanning direction X1. That is, in the scanning direction X1, the liquid receiving section **31** may be disposed adjacent to the wiping device **30** in the scanning direction X1.

[0033] The moisturizing section **28** may include one or more moisturizing caps **33**. The moisturizing section **28** may be provided with the same number of moisturizing caps **33** as the number of liquid ejection heads **22**. The moisturizing cap **33** forms a space communicating with the nozzle **26** by contacting the liquid ejection head **22**. The moisturizing cap **33** caps the liquid ejection head **22** located at a home position indicated by two-dot chain line in FIG. **1**. The moisturizing cap **33** moisturizes the nozzle **26** by capping the liquid ejection head **22**.

[0034] The cleaning section **29** performs suction cleaning of the liquid ejection head **22** by sucking the liquid from the liquid ejection head **22**. The cleaning section **29** may include one or more suction caps **35**. The cleaning section **29** may clean each of the liquid ejection heads **22** individually. The cleaning section **29** may clean multiple liquid ejection heads **22** simultaneously.

[0035] The suction cap **35** is in contact with the liquid ejection head **22**, thereby forming a space that communicates with the nozzle **26**. The suction cap **35** caps the liquid ejection head **22**. The cleaning section **29** performs suction cleaning by sucking the inside of the suction cap **35** to create a negative pressure. By performing suction cleaning on a liquid ejection head **22** that is not filled with liquid, the liquid ejection head **22** can be filled with liquid. By performing suction cleaning on the liquid ejection head **22** filled with liquid, air bubbles, foreign matter, and the like in the liquid ejection head **22** can be discharged. The suction cap **35** receives the liquid discharged during suction cleaning.

[0036] The liquid receiving section **31** is configured to receive liquid discharged from nozzle **26**. The liquid receiving section **31** may receive the liquid discharged from the liquid ejection head **22** by the pressurizing section **23**. That is, the liquid receiving section **31** may receive the liquid discharged during pressure cleaning. The liquid receiving section **31** may receive idly ejected liquid. The idle ejection is an operation of ejecting liquid from the nozzle **26** in order to suppress clogging of the nozzle **26**. Idle ejection is also called flushing. By idle ejection, for example, thickened liquid is discharged from nozzle **26**. The liquid receiving section **31** receives the liquid discharged from the liquid ejection head **22** facing the liquid receiving section **31**.

Wiping Device

[0037] As shown in FIG. **2**, the wiping device **30** may include a feed out section **37**, a winding section **38**, an absorbing member **39**, a guide roller **40**, and a movement mechanism **41**. The wiping device **30** may include a plurality of guide rollers **40**. The movement mechanism **41** may include a first movement mechanism **44** and a second movement mechanism **45**.

[0038] The feed out section **37** may include a braking section **47** and a feed out shaft **48**. The braking section **47** restricts rotation of the feed out shaft **48**. The braking section **47** applies a load to the rotating feed out shaft **48**. The feed out shaft **48** supports an unused absorbing member **39** wound in a roll shape. The feed out shaft **48** rotates to feed the unused absorbing member **39**.

[0039] The winding section **38** can wind up the absorbing member **39**. The winding section **38** may include a drive source **50** and a winding shaft **51**. The drive source **50** rotates the winding shaft **51**.

The winding shaft **51** winds up and supports the used absorbing member **39** in a roll shape.
[0040] As shown in FIG. **3**, the absorbing member **39** is strip-shaped. The absorbing member **39** is wound around a plurality of guide rollers **40**. The plurality of guide rollers **40** extend, for example, in the width direction Y. The absorbing member **39** fed from the feed out section **37** is sent to the winding section **38** via a plurality of guide rollers **40**.
[0041] The absorbing member **39** can absorb liquid. The absorbing member **39** is, for example, cloth. The absorbing member **39** has a contact surface **53** and a back surface **54**. The contact surface **53** is a surface that contacts the nozzle surface **25**. The back surface **54** is a surface opposite to the contact surface **53**. The absorbing member **39** has a wiping section **55** and an impregnated section **56**. The wiping section **55** may be positioned ahead of the impregnated section **56** in the wiping direction X2. The wiping section **55** may be disposed between the cleaning section **29** and the impregnated section **56** in the scanning direction X1.
[0042] As shown in FIG. **3**, when the absorbing member **39** is positioned at the separated position Ps, the wiping section **55** and the impregnated section **56** are positioned below the nozzle surface **25**. The separated position Ps is a position where the absorbing member **39** is separated from the nozzle surface **25**. The wiping section **55** and the impregnated section **56** located at the separated position Ps do not interfere with the liquid ejection head **22** that reciprocates in the scanning direction X1.
[0043] The first movement mechanism **44** may include a first lifting section **58**, a holder **59**, a frame **60**, and a pressing section **61**.
[0044] The holder **59** detachably attached to hold the frame **60**. The frame **60** rotatably supports the feed out shaft **48** and the winding shaft **51**. The user can replace the absorbing member **39** by removing the frame **60** from the holder **59** and removing the feed out shaft **48** and the winding shaft **51** from the frame **60**.
[0045] The first lifting section **58** is, for example, an air cylinder. The first lifting section **58** reciprocates the holder **59** in the vertical direction Z. The first lifting section **58** moves the holder **59** and the frame **60** supported by the holder **59**. That is, the first movement mechanism **44** reciprocates the entire absorbing member **39** in the vertical direction Z.
[0046] The pressing section **61** is configured to press the wiping section **55** against the nozzle surface **25**. The absorbing member **39** winds around the pressing section **61**. The pressing section **61** includes a holding member **63**, a cover member **64**, a mounting member **65**, a roller **66**, and an elastic member **67**. The pressing section **61** may include a plurality of mounting members **65**, rollers **66**, and elastic members **67**. The holding member **63** and the cover member **64** form a space for accommodating the mounting member **65**, the roller **66**, and the elastic member **67**.
[0047] As shown in FIGS. **3** and **4**, the cover member **64** has the same number of through holes **69** as the number of rollers **66**. A part of the roller **66** protrudes from the corresponding through hole **69**.
[0048] As shown in FIG. **3**, the roller **66** is mounted on the mounting member **65**. The roller **66** contacts the back surface **54** of the absorbing member **39**. The mounting member **65** rotatably holds the roller **66**. The roller **66** may be driven to rotate by the transported absorbing member **39**. The elastic member **67** pushes the mounting member **65**. The elastic member **67** pushes up the absorbing member **39** via the mounting member **65** and the roller **66**. The elastic member **67** is, for example, a spring.
[0049] The roller **66** has a cylindrical section **71** and a shaft section **72**. The cylindrical section **71** is a section around which the absorbing member **39** winds. The shaft section **72** is a portion to be inserted into the cylindrical section **71**. The shaft section **72** is mounted to the mounting member **65**. The shaft section **72** extends, for example, in the width direction Y. In the roller **66**, the cylindrical section **71** in contact with the wiping section **55** may have elasticity. The cylindrical section **71** may be formed of, for example, a member such as sponge or rubber. In this case, the absorbing member **39** more intimately contacts the nozzle surface **25**.

[0050] A plurality of shaft sections **72** are attached to different mounting members **65**. Therefore, the plurality of shaft sections **72** can be inclined at different angles. Therefore, the plurality of cylindrical sections **71** can be inclined in accordance with the nozzle surface **25** when wiping the nozzle surface **25**. By this, the absorbing member **39** easily comes into intimate contact with the nozzle surface **25**.
[0051] As shown in FIG. **5**, the first movement mechanism **44** can move the absorbing member **39** to the wiping position Pw. The first movement mechanism **44** moves the wiping section **55** to the separated position Ps shown in FIG. **3** and to the wiping position Pw shown in FIG. **5**. When the absorbing member **39** is located at the wiping position Pw, the wiping section **55** is located above the nozzle surface **25**. The wiping position Pw is a position at which the wiping section **55** can come into contact with the nozzle surface **25**. When the absorbing member **39** is located at the wiping position Pw, the impregnated section **56** is located below the nozzle surface **25**. The wiping position Pw is a position at which the impregnated section **56** is separated from the nozzle surface **25**. The wiping section **55** positioned at the wiping position Pw interferes with the liquid ejection head **22** reciprocating in the scanning direction X1.
[0052] The wiping device **30** is configured to wipe the nozzle surface **25**. The wiping section **55** is configured to wipe the nozzle surface **25** by moving relative to the liquid ejection head **22**. In the embodiment, wiping of the nozzle surface **25** is performed by moving the liquid ejection head **22** in the wiping direction X2 with respect to the wiping section **55**, which is stopped at the wiping position Pw. The wiping section **55** removes the liquid clinging to the nozzle surface **25**. The wiping device **30** wiping the nozzle surface **25** is also called wiping.
[0053] As shown in FIG. **2**, the movement mechanism **41** may include a plurality of second movement mechanisms **45**. The movement mechanism **41** of the present embodiment includes a pair of second movement mechanisms **45**. The pair of second movement mechanisms **45** are provided on both sides of the holder **59** at intervals in the width direction Y.
[0054] The second movement mechanism **45** may include a second lifting section **74** and a support member **75**.
The second lifting section **74** is, for example, an air cylinder. The second lifting section **74** pushes the support member **75** from below. The second lifting section **74** reciprocates the support member **75** in the vertical direction Z. The second movement mechanism **45** can move the support member **75**.
[0055] As shown in FIG. **4**, the support member **75** may include a support plate **76**, an elastic body **77**, and a porous body **78**.
The support plate **76** may have one or more guide sections **79**. The guide section **79** is, for example, a surface corresponding to the frame **60**. The guide section **79** of the present embodiment is an inner surface of a hole penetrating the support plate **76**. The guide section **79** guides the support plate **76** in the vertical direction Z. The guide section **79** allows the support plate **76** to move in the vertical direction Z and the direction opposite to the vertical direction Z, but restricts the support plate **76** from moving in the scanning direction X1 and the width direction Y. The support member **75** is provided so as to be capable of reciprocating in the vertical direction Z.
[0056] The elastic body **77** and the porous body **78** may be plate-shaped members. The elastic body **77** and the porous body **78** may be provided so as to be stacked on the support plate **76**. The elastic body **77** may be placed on the support plate **76**. The porous body **78** may be placed on the elastic body **77**. The porous body **78** is, for example, a sponge or a sea sponge. The porous body **78** may be elastic. The porous body **78** may have water absorption or moisture absorption properties. The elastic body **77** has elasticity. The elastic body **77** is, for example, rubber, a spring, or the like.
[0057] As shown in FIG. **3**, the support member **75** is positioned below the impregnated section **56**. The support member **75** may be on standby at a position separated from the absorbing member **39** positioned at the separated position Ps. The porous body **78** may face the back surface **54** of the impregnated section **56**. The support member **75** located at the standby position shown in FIG. **3**

comes into contact with the back surface **54** of the impregnated section **56** by moving upward. The second movement mechanism **45** is movable between a position at which the support member **75** is brought into contact with the impregnated section **56** and a position at which the support member **75** is separated from the impregnated section **56**. The support member **75** is movable so as to push up the impregnated section **56**. The support member **75** may pull out the absorbing member **39** from the feed out section **37** when pushing up the impregnated section **56**.

[0058] In the support member **75**, the portion in contact with the impregnated section **56** may be larger than the nozzle surface **25** in the scanning direction X1. In the support member **75**, the portion in contact with the impregnated section **56** may be larger than the nozzle surface **25** in the width direction Y. In the present embodiment, the porous body **78** is in contact with the impregnated section **56**. In the present embodiment, the impregnated section **56** is larger than the nozzle surface **25** in both the scanning direction X1 and the width direction Y.

[0059] As shown in FIG. **6**, the second movement mechanism **45** can move the impregnated section **56** to the impregnation position Pi. The impregnation position Pi is a position that is closer to the nozzle surface **25** than the separated position Ps and where the impregnated section **56** does not come into contact with the nozzle surface **25**. When the second movement mechanism **45** moves the impregnated section **56**, the wiping section **55** does not move. Therefore, at this time, the wiping section **55** is positioned below the nozzle surface **25**. The absorbing member **39** in a state in which the impregnated section **56** is positioned at the impregnation position Pi does not interfere with the liquid ejection head **22**.

[0060] The liquid ejection head **22** may eject the liquid from the nozzle **26** toward the impregnated section **56** located at the impregnation position Pi. The liquid ejection head **22** may impregnate the impregnated section **56** with the ejected liquid. Impregnation is the permeation of liquid into gaps such as fine holes. That is, the impregnated section **56** can absorb the liquid supplied to the contact surface **53**, bring it inside, and hold the absorbed liquid. The liquid ejection head **22** for supplying the liquid to the impregnated section **56** may be one or plural.

[0061] A single liquid ejection head **22** may eject the liquid while being stopped at a position facing the impregnated section **56**, for example. For example, a single liquid ejection head **22** may eject the liquid while reciprocating in the scanning direction X1 above the impregnated section **56**. For example, one or more liquid ejection heads **22** may supply the liquid to the impregnated section **56** at a timing when the liquid ejection heads **22** pass above the impregnated section **56** while moving in the scanning direction X1 or the wiping direction X2.

[0062] As shown in FIG. **7**, the second movement mechanism **45** can move the impregnated section **56** of the absorbing member **39** to the contact position Pc where the impregnated section **56** contacts the nozzle surface **25**. The second movement mechanism **45** can move the impregnated section **56** to the contact position Pc. The contact position Pc is a position closer to the nozzle surface **25** than the impregnation position Pi. The contact position Pc is a position where the impregnated section **56** contacts the nozzle surface **25**. The impregnated section **56** can come into contact with the nozzle surface **25** in a state of being impregnated with the liquid. The contact position Pc is a position at which the absorbing member **39** can contact the nozzle surface **25**. That is, the movement mechanism **41** moves the absorbing member **39** to the contact position Pc and the separated position Ps.

Pressure Cleaning

[0063] The control section **12** performs pressure cleaning, for example, when a predetermined time has elapsed from the start of printing or when a predetermined time has elapsed from the previous maintenance. The control section **12** may perform pressure cleaning on the plurality of liquid ejection heads **22** collectively or one by one. Hereinafter, a description will be given of maintenance in the case where pressure cleaning of a single liquid ejection head **22** is performed.

[0064] As shown in FIG. **3**, when performing maintenance, the control section **12** first moves the liquid ejection head **22** so that the nozzle surface **25** faces the impregnated section **56**. At this time,

the absorbing member **39** is positioned at the separated position Ps. The control section **12** drives the winding section **38** to position the unused portion in the impregnated section **56**. The control section **12** may simultaneously perform movement of the liquid ejection head **22** and winding of the absorbing member **39**.

[0065] As shown in FIG. **6**, when the winding of the absorbing member **39** is completed, the control section **12** drives the second movement mechanism **45** to move the impregnated section **56** to the impregnation position Pi. The control section **12** causes the impregnated section **56** positioned at the impregnation position Pi to be impregnated with liquid. The control section **12** causes the impregnated section **56** to be impregnated with liquid by ejecting the liquid from the nozzle **26** to the impregnated section **56**.

[0066] As shown in FIG. **7**, the control section **12** drives the second movement mechanism **45** to move the impregnated section **56** to the contact position Pc. That is, the control section **12** causes the second movement mechanism **45** to bring the impregnated section **56** into contact with the nozzle surface **25**. The control section **12** maintains a state in which the impregnated section **56** is brought into contact with the nozzle surface **25** for a predetermined time. The predetermined time may be several tens of seconds, one minute, or several minutes. The predetermined time may be set according to the amount of impregnating liquid, the type of impregnating liquid, the type of the absorbing member **39**, the air temperature, the humidity, and the like.

[0067] As shown in FIG. **3**, when a predetermined time elapses after the impregnated section **56** is brought into contact with the nozzle surface **25**, the control section **12** moves the impregnated section **56** to the separated position Ps. The control section **12** separates the impregnated section **56** from the nozzle surface **25** by the second movement mechanism **45**.

[0068] The control section **12** drives the winding section **38** in a state in which the absorbing member **39** is separated from the nozzle surface **25**. The control section **12** moves the portion of the absorbing member **39** impregnated with the liquid from the impregnated section **56** and positions the unused portion in the wiping section **55**.

[0069] The control section **12** moves the liquid ejection head **22** so that the nozzle surface **25** faces the liquid receiving section **31**. The control section **12** causes the pressurizing section **23** to discharge the liquid from the liquid ejection head **22**. That is, the control section **12** executes pressure cleaning. The liquid discharged from the liquid ejection head **22** is received by the liquid receiving section **31**. Subsequently, the control section **12** moves the liquid ejection head **22** so that the nozzle surface **25** faces the wiping section **55**.

[0070] In the state where the wiping section **55** faces the nozzle surface **25**, the control section **12** drives the first movement mechanism **44** to move the wiping section **55** to the wiping position Pw. The control section **12** causes the first movement mechanism **44** to move the wiping section **55** to a position where the wiping section **55** can come into contact with the nozzle surface **25**. The control section **12** uses the first movement mechanism **44** to bring the wiping section **55** into contact with the nozzle surface **25**.

[0071] After moving the wiping section **55** to the wiping position Pw, the control section **12** returns the wiping section **55** to the separated position Ps. That is, the control section **12** causes the wiping section **55** to temporarily come into contact with the nozzle surface **25**, and then causes the first movement mechanism **44** to separate the wiping section **55** from the nozzle surface **25**. The wiping section **55** in contact with the nozzle surface **25** absorbs the liquid from pressure cleaning that clings to the nozzle surface **25**.

[0072] The control section **12** drives the winding section **38** in a state in which the absorbing member **39** is separated from the nozzle surface **25**. The control section **12** positions a new portion of the absorbing member **39** at the wiping section **55** by using the winding section **38** to wind the absorbing member **39**.

[0073] As shown in FIG. **3**, the control section **12** moves the liquid ejection head **22** in the scanning direction X1. The control section **12** moves the liquid ejection head **22** to a position not facing the

wiping section **55**.
[0074] As shown in FIG. **5**, the control section **12** drives the first movement mechanism **44** to move the wiping section **55** to the wiping position Pw. The control section **12** causes the first movement mechanism **44** to move the wiping section **55** to a position where the wiping section **55** can come into contact with the nozzle surface **25**.
[0075] The control section **12** moves the liquid ejection head **22** in the wiping direction X2. The control section **12** moves the liquid ejection head **22** to pass by the wiping section **55**. The control section **12** causes the wiping section **55** to wipe the nozzle surface **25**. After wiping the nozzle surface **25**, the control section **12** moves the wiping section **55** to the separated position Ps.
[0076] The control section **12** moves the liquid ejection head **22** so that the nozzle surface **25** faces the liquid receiving section **31**. The control section **12** causes the liquid ejection head **22** to eject liquid toward the liquid receiving section **31**. That is, the control section **12** causes the wiping section **55** to wipe the nozzle surface **25**, and then idly ejects liquid from the liquid ejection head **22** toward the liquid receiving section **31**. By this, maintenance of a single liquid ejection head **22** is completed. The control section **12** performs maintenance on the plurality of liquid ejection heads **22** in order.
Suction Cleaning
[0077] The control section **12** may perform suction cleaning instead of the above-described pressure cleaning for maintenance. The control section **12** may perform suction cleaning, for example, when clogging of the nozzle **26** is not recovered by pressure cleaning. The control section **12** may perform suction cleaning on the plurality of liquid ejection head **22** collectively or one by one. Hereinafter, maintenance when suction cleaning of a single liquid ejection head **22** is performed will be described.
[0078] As shown in FIG. **7**, the control section **12** causes the impregnated section **56** that is impregnated with liquid to contact the nozzle surface **25** for a predetermined time in the same manner as in the case of pressure cleaning.
[0079] As shown in FIG. **3**, when a predetermined time elapses after the impregnated section **56** is brought into contact with the nozzle surface **25**, the control section **12** moves the impregnated section **56** to the separated position Ps and drives the winding section **38** to wind the absorbing member **39**.
[0080] The control section **12** moves the liquid ejection head **22** so that the nozzle surface **25** faces the cleaning section **29**. The control section **12** causes the cleaning section **29** to perform suction cleaning of the liquid ejection head **22**. That is, the control section **12** causes the suction cap **35** to cap the liquid ejection head **22**. The control section **12** causes the inside of the suction cap **35** to have a negative pressure to discharge the liquid from the nozzle **26**. By this, the liquid is discharged from the nozzle **26**. When suction cleaning is finished, control section **12** releases the capping.
[0081] Subsequently, the control section **12**, as in the case of pressure cleaning, sequentially executes the operation of bringing the wiping section **55** into temporary contact with the nozzle surface **25**, the operation of wiping the nozzle surface **25**, and the operation of causing the liquid ejection head **22** to perform idle ejection.
[0082] Specifically, the control section **12** moves the liquid ejection head **22** so that the nozzle surface **25** faces the wiping section **55**.
[0083] In the state where the wiping section **55** faces the nozzle surface **25**, the control section **12** drives the first movement mechanism **44** to move the wiping section **55** to the wiping position Pw. The control section **12** uses the first movement mechanism **44** to bring the wiping section **55** into contact with the nozzle surface **25**.
[0084] After moving the wiping section **55** to the wiping position Pw, the control section **12** returns the wiping section **55** to the separated position Ps. That is, the control section **12** causes the wiping section **55** to temporarily come into contact with the nozzle surface **25**, and then causes the first movement mechanism **44** to separate the wiping section **55** from the nozzle surface **25**. The wiping

section **55** in contact with the nozzle surface **25** absorbs the liquid from suction cleaning that clings to the nozzle surface **25**.

[0085] The control section **12** drives the winding section **38** in a state in which the absorbing member **39** is separated from the nozzle surface **25**. The control section **12** positions a new portion of the absorbing member **39** at the wiping section **55** by using the winding section **38** to wind the absorbing member **39**.

[0086] As shown in FIG. **3**, the control section **12** moves the liquid ejection head **22** in the scanning direction X1. The control section **12** moves the liquid ejection head **22** to a position not facing the wiping section **55**.

As shown in FIG. **5**, the control section **12** drives the first movement mechanism **44** to move the wiping section **55** to the wiping position Pw. The control section **12** causes the first movement mechanism **44** to move the wiping section **55** to a position where the wiping section **55** can come into contact with the nozzle surface **25**.

[0087] The control section **12** moves the liquid ejection head **22** in the wiping direction X2. The control section **12** moves the liquid ejection head **22** to pass by the wiping section **55**. The control section **12** causes the wiping section **55** to wipe the nozzle surface **25**. After wiping the nozzle surface **25**, the control section **12** moves the wiping section **55** to the separated position Ps.

[0088] The control section **12** moves the liquid ejection head **22** so that the nozzle surface **25** faces the liquid receiving section **31**. The control section **12** causes the liquid ejection head **22** to eject the liquid toward the liquid receiving section **31**. That is, the control section **12** causes the wiping section **55** to wipe the nozzle surface **25**, and then idly ejects liquid from the liquid ejection head **22** toward the liquid receiving section **31**. By this, maintenance of a single liquid ejection head **22** is completed. The control section **12** performs maintenance on the plurality of liquid ejection heads **22** in order.

Operation of the Present Embodiment

[0089] The operation of the present embodiment will be described.

The control section **12** causes the impregnated section **56**, which is impregnated with liquid, to come into contact with the nozzle surface **25** before wiping the nozzle surface **25**. The liquid clinging to the nozzle surface **25** absorbs the liquid contained in impregnated section **56**, and the viscosity decreases. Therefore, the nozzle surface **25** can be easily wiped off.

[0090] When pressure cleaning and suction cleaning are performed, a part of the discharged liquid clings to nozzle surface **25**. The control section **12** can reduce the liquid that clings to the nozzle surface **25** before wiping by temporarily bringing the wiping section **55** into contact with the nozzle surface **25** before wiping the nozzle surface **25**. This makes it possible to increase the speed at which the wiping section **55** and the liquid ejection head **22** are moved relative to each other during wiping. Since the amount of liquid mixed into the nozzle **26** can be reduced, the amount of the liquid to be idly ejected can be reduced.

Effects of the Present Embodiment

[0091] The effect of the present embodiment will be described.

[0092] (1-1) The absorbing member **39** includes the impregnated section **56** and the wiping section **55**. The impregnated section **56** can reduce the viscosity of the liquid clinging to the nozzle surface **25** by coming into contact with the nozzle surface **25** in a state of being impregnated with liquid. Therefore, since it is possible to cause the wiping section **55** to wipe with liquid having lower viscosity, it is possible to improve the wiping property of the solidified liquid.

[0093] (1-2) The movement mechanism **41** includes a first movement mechanism **44** and a second movement mechanism **45**. The first movement mechanism **44** moves the wiping section **55**. The second movement mechanism **45** moves the impregnated section **56**. Therefore, wiping of the nozzle surface **25** by the wiping section **55** and contact of impregnated section **56** against the nozzle surface **25** can be independently performed.

[0094] (1-3) The winding section **38** is configured to wind the absorbing member **39**. When the

winding section **38** winds the absorbing member **39**, an unused portion of the absorbing member **39** can be used as the impregnated section **56** and the wiping section **55**.
[0095] (1-4) The first movement mechanism **44** includes the roller **66**. The roller **66** has elasticity. Since the roller **66** comes into contact with the back surface **54** of the wiping section **55** to sandwich the wiping section **55** between the roller **66** and the nozzle surface **25**, it is possible to improve the followability of the wiping section **55** with respect to the nozzle surface **25**. Therefore, wiping performance can be improved.
[0096] (1-5) The second movement mechanism **45** has a support member **75**. Since the support member **75** contacts the back surface **54** of the impregnated section **56** to sandwich the contact portion between the support member **75** and the nozzle surface **25**, the impregnated section **56** can be pressed against the nozzle surface **25**.
[0097] (1-6) The support member **75** is movable to a position away from the impregnated section **56**. Since the winding section **38** can wind the absorbing member **39** in a state where the support member **75** is separated, the load of winding can be reduced.
[0098] (1-7) The support member **75** has a porous body **78**. Since the support member **75** contacts the back surface **54** of the impregnated section **56** to sandwich the impregnated section **56** between the nozzle surface **25** and the support member **75**, it is possible to improve the followability of the impregnated section **56** with respect to the nozzle surface **25**. Therefore, it is possible to easily reduce the viscosity of the liquid clinging to the nozzle surface **25**.
[0099] (1-8) The support member **75** has an elastic body **77**. Since the support member **75** contacts the back surface **54** of the impregnated section **56** to sandwich the impregnated section **56** between the nozzle surface **25** and the support member **75**, it is possible to improve the followability of the impregnated section **56** with respect to the nozzle surface **25**. Therefore, it is possible to easily reduce the viscosity of the liquid clinging to the nozzle surface **25**.
[0100] (1-9) The liquid ejection head **22** impregnates the impregnated section **56** with the liquid ejected from the nozzle **26**. Therefore, it is possible to reduce the size of the liquid ejection device **11** compared to a case where a configuration for impregnating the impregnated section **56** with the liquid is separately provided.
[0101] (1-10) After suction cleaning is performed by the cleaning section **29**, the nozzle surface **25** is wiped by the wiping section **55**. The distance between the wiping section **55** and the cleaning section **29** is shorter than the distance between the impregnated section **56** and the cleaning section **29**. Therefore, it is possible to shorten the time required for suction cleaning and wiping.
[0102] (1-11) After suction cleaning of the liquid ejection head **22** is performed, the wiping section **55** is brought into contact with the nozzle surface **25**. Therefore, it is possible to cause the wiping section **55** to absorb the liquid from suction cleaning that clings to the nozzle surface **25**. The winding section **38** winds the absorbing member **39** after the wiping section **55** comes into contact with the nozzle surface **25**. By winding up the absorbing member **39**, an unused portion of the absorbing member **39** can be used as the wiping section **55**. Therefore, the wiping section **55** can wipe the nozzle surface **25** with a new portion after reducing the liquid from suction cleaning that clings to the nozzle surface **25**.
[0103] (1-12) The liquid receiving section **31** is disposed adjacent to the wiping device **30** in the scanning direction X1. For this reason, after the nozzle surface **25** is wiped by the wiping device **30**, it is possible to rapidly perform idle ejection with respect to the liquid receiving section **31**.
[0104] (1-13) The liquid receiving section **31** receives the liquid discharged from the liquid ejection head **22** by the pressurizing section **23**. Therefore, the liquid idly ejected from the liquid ejection head **22** and the liquid discharged under pressure from the liquid ejection head **22** can be received by a single liquid receiving section **31**.
[0105] (1-14) After the liquid is discharged by pressurizing the inside of the liquid ejection head **22**, the wiping section **55** is brought into contact with the nozzle surface **25**. Therefore, it is possible to cause the wiping section **55** to absorb the liquid from pressurized discharge that clings

to the nozzle surface **25**. The winding section **38** winds the absorbing member **39** after the wiping section **55** comes into contact with the nozzle surface **25**. By winding up the absorbing member **39**, an unused portion of the absorbing member **39** can be used as the wiping section **55**. Therefore, the wiping section **55** can wipe the nozzle surface **25** with a new portion after reducing the liquid from pressurized discharge that clings to the nozzle surface **25**.

Modifications

[0106] The present embodiment can be implemented with the following modifications. The present embodiment and the following modifications can be implemented in combination with each other as long as there is no technical contradiction.

[0107] The wiping device **30** may wipe the nozzle surface **25** using the impregnated section **56**. When the nozzle surface **25** is wiped, the impregnated section **56** may not be impregnated with the liquid.

The size of the support member **75** and the impregnated section **56** may be smaller than that of the nozzle surface **25**. The support member **75** may press the impregnated section **56** against a part of the nozzle surface **25** multiple times while shifting position, thereby bringing the entire nozzle surface **25** into contact with the impregnated section **56**.

[0108] The wiping device **30** may not temporarily bring the absorbing member **39** into contact with the nozzle surface **25** after at least one of pressure cleaning and suction cleaning. The portion of the absorbing member **39** that is temporarily brought into contact with the nozzle surface **25** after the pressure cleaning and the suction cleaning may be the impregnated section **56**. The control section **12** may temporarily bring the absorbing member **39** into contact with the nozzle surface **25** after pressure cleaning and suction cleaning.

[0109] The liquid ejection device **11** may enable either pressure cleaning or suction cleaning. The liquid ejection device **11** may include either the pressurizing section **23** or the cleaning section **29**. The absorbing member **39** may receive the liquid idly ejected from the liquid ejection head **22**. The absorbing member **39** may receive the liquid discharged by pressure cleaning. In this case, the liquid ejection device **11** may be configured not to include the liquid receiving section **31**.

[0110] The wiping device **30** may include a transport unit that transports the strip-shaped absorbing member **39**. The transporting section may collect the used absorbing member **39** so as to fold it on itself.

The printing section **14** may supply the liquid from the nozzle **26** to the impregnated section **56** by the pressurizing section **23** pressurizing the inside of the liquid ejection head **22**. The pressurizing section **23** may pressurize the inside of the liquid ejection head **22** in a state in which the impregnated section **56** is in contact with the nozzle surface **25**. The liquid ejection device **11** may supply the liquid to the impregnated section **56** after the nozzle surface **25** is brought into contact with the impregnated section **56**.

[0111] The liquid supplied to the impregnated section **56** may be, for example, ink, a reaction liquid, water, a solvent, a moisturizing liquid, a cleaning liquid, or the like.

The wiping device **30** may include a supply section that supplies liquid to the impregnated section **56** separately from the liquid ejection head **22**.

[0112] The support member **75** may be formed by stacking the porous body **78** and the elastic body **77** in this order on the support plate **76**.

The support member **75** may be configured not to include at least one of the porous body **78** and the elastic body **77**.

[0113] The second movement mechanism **45** may be configured not to include the support member **75**. The first movement mechanism **44** may move the impregnated section **56**, for example, by moving the guide roller **40**.

The movement mechanism **41** may move the impregnated section **56** to the contact position Pc by the first movement mechanism **44**.

[0114] The roller **66** may be rigid.

The first movement mechanism **44** may be configured not to include the roller **66**. The first movement mechanism **44** may press the wiping section **55** against the nozzle surface **25** with, for example, a plate-shaped member.

[0115] The wiping device **30** may be provided separately from the liquid ejection device **11**.

The liquid ejection device **11** may be a liquid ejection device that sprays or ejects liquid other than ink. The state of the liquid which is ejected from the liquid ejection device in the form of a minute amount of liquid droplets includes granular, tear-shaped, and shapes with a thread-like tail. Here, the liquid may be a material that can be ejected from the liquid ejection device. For example, the liquid may be in a state where a substance is in a liquid phase and includes a fluid body such as a liquid body having high or low viscosity, sol, gel water, other inorganic solvents, an organic solvent, a solution, a liquid resin, and a liquid metal (metal melt). The liquid includes not only a liquid as one state of a substance but also a liquid in which particles of a functional material made of a solid material such as a pigment or metal particles are dissolved, dispersed, or mixed in a solvent. Typical examples of the liquid include liquid crystal and ink as described in the above embodiment. Here, the ink includes various liquid compositions such as general water-based ink, oil-based ink, gel ink, and hot-melt ink. As a specific example of the liquid ejection device, there is a device that ejects a liquid containing a material in a dispersed or dissolved form such as an electrode material or a color material used for manufacturing a liquid crystal display, an electroluminescence display, a surface emitting display, a color filter, or the like. The liquid ejection device may be a device for ejecting a bioorganic substance used for manufacturing a biochip, a device for ejecting a liquid to be a sample used as a precision pipette, a printing device, a microdispenser, or the like. The liquid ejection device may be a device that ejects lubricating oil in a pinpoint manner to precision machinery such as watches or cameras, or a device that ejects a transparent resin liquid such as an ultraviolet curable resin onto a substrate to form micro hemispherical lenses, optical lenses, or the like used in optical communication elements or similar applications. The liquid ejection device may be a device for ejecting an etching solution such as an acid or an alkali for etching a substrate or the like.

Definitions

[0116] As used herein, the expression “at least one” means “one or more” of the desired options. As an example, the expression “at least one” as used herein means “only one option” or “both of the two options” when the number of options is two. As another example, the expression “at least one” as used herein means “only one option”, “a combination of two optional options”, or “a combination of three or more optional options” when the number of options is three or more.

NOTES

[0117] Hereinafter, technical ideas grasped from the above-described embodiment and modifications, and operations and effects thereof will be described.

[0118] (A) A wiping device configured to wipe a nozzle surface of a liquid ejection head that ejects liquid, the wiping device including a band-shaped absorbing member configured to absorb the liquid and a movement mechanism that moves the absorbing member to a contact position where the absorbing member is contactable with the nozzle surface and a separated position at which the absorbing member is separated from the nozzle surface, wherein the absorbing member includes an impregnated section configured to contact the nozzle surface in a state of being impregnated with liquid and a wiping section configured to wipe the nozzle surface by moving relative to the liquid ejection head.

[0119] According to this configuration, the absorbing member includes an impregnated section and a wiping section. The impregnated section can reduce the viscosity of the liquid clinging to the nozzle surface by coming into contact with the nozzle surface in a state of being impregnated with the liquid.

[0120] Therefore, since it is possible to cause the wiping section to wipe using the liquid with reduced viscosity, it is possible to improve the wiping property against solidified liquid.

[0121] (B) The wiping device as according to (A), wherein [0122] the movement mechanism includes a first movement mechanism configured to move the wiping section of the absorbing member to a position where the wiping section is contactable with the nozzle surface and a second movement mechanism configured to move the impregnated section of the absorbing member to a position where the impregnated section contacts the nozzle surface.
[0123] According to this configuration, the movement mechanism is provided with a first movement mechanism and a second movement mechanism. The first movement mechanism moves the wiping section. The second movement mechanism moves the impregnated section. Therefore, the wiping of the nozzle surface by the wiping section and the contact of the impregnated section to the nozzle surface can be independently performed.
[0124] (C) The wiping device according to (A) or (B), wherein the wiping device further includes a winding section configured to wind the absorbing member.
According to this configuration, the winding section is configured to wind the absorbing member. When the winding section winds up the absorbing member, the unused portion of the absorbing member can be used as the impregnated section and the wiping section.
[0125] (D) The wiping device according to (B) or (C), wherein the first movement mechanism includes a roller that comes into contact with a back surface of the wiping section, the back surface being at an opposite side of a contact surface that comes into contact with the nozzle surface and the roller has an elastic portion that comes into contact with the wiping section.
[0126] According to this configuration, the first movement mechanism has a roller. The roller has elasticity. Since the roller comes into contact with the back surface of the wiping section to sandwich the wiping section between the roller and the nozzle surface, it is possible to improve the followability of the wiping section with respect to the nozzle surface. Therefore, wiping performance can be improved.
[0127] (E) The wiping device according to (B) to (D), wherein the second movement mechanism includes a support member that comes into contact with a back surface of the impregnated section, the back surface being at an opposite side of a contact surface that comes into contact with the nozzle surface.
According to this configuration, the second movement mechanism includes a support member. Since the support member contacts the back surface of the impregnated section to sandwich the contact portion between the support member and the nozzle surface, the impregnated section can be pressed against the nozzle surface.
[0128] (F) The wiping device according to (E) wherein the second movement mechanism is movable between a position at which the support member is brought into contact with the impregnated section and a position at which the support member is separated from the impregnated section.
[0129] According to this configuration, the support member is movable to a position away from the impregnated section. Since the winding section can wind up the absorbing member in a state where the support member is separated, the load of winding can be reduced.
[0130] (G) The wiping device according to (E) or (F), wherein the support member has a porous body.
[0131] According to this configuration, the support member has a porous body. Since the support member contacts the back surface of the impregnated section to sandwich the impregnated section between the nozzle surface and the support member, it is possible to improve the followability of the impregnated section with respect to the nozzle surface. Therefore, it is possible to easily reduce the viscosity of the liquid attached to the nozzle surface.
[0132] (H) The wiping device according to (E) to (G), wherein the support member has an elastic body.
According to this configuration, the support member has an elastic body. Since the support member contacts the back surface of the impregnated section to sandwich the impregnated section between

the nozzle surface and the support member, it is possible to improve the followability of the impregnated section with respect to the nozzle surface. Therefore, it is possible to easily reduce the viscosity of the liquid attached to the nozzle surface.

[0133] (I) The liquid ejection device includes a liquid ejection head for ejecting a liquid from a nozzle formed in the nozzle surface, and a wiping device described in (A) to (H). According to this configuration, the same effect as that of the wiping device can be obtained.

[0134] (J) The control method of the liquid ejection device including a liquid ejection head that ejects a liquid from a nozzle formed in a nozzle surface and a wiping device configured to wipe the nozzle surface, wherein the wiping device includes an absorbing member having a wiping section configured to wipe the nozzle surface by moving relative to the liquid ejection head, and an impregnated section configured to come into contact with the nozzle surface in a state of being impregnated with a liquid and a movement mechanism that has a first movement mechanism configured to move the wiping section of the absorbing member to a position where the wiping section is contactable with the nozzle surface, and a second movement mechanism configured to move the impregnated section of the absorbing member to a position where the impregnated section contacts the nozzle surface, the control method including using the second movement mechanism to bring the impregnated section into contact with the nozzle surface, and maintaining a state in which the impregnated section contacts the nozzle surface for a predetermined time, using the second movement mechanism to separate the impregnated section from the nozzle surface, using the first movement mechanism to move the wiping section to a position where the wiping section is contactable with the nozzle surface, and wiping the nozzle surface with the wiping section.

[0135] According to this method, the same effect as that of the wiping device can be obtained.

[0136] (K) The control method of a liquid ejection device according to (J) further including impregnating the impregnated section with a liquid by ejecting the liquid from the nozzle to the impregnated section.

[0137] According to this method, the liquid ejection head impregnates the impregnated section with the liquid ejected from the nozzle. Therefore, it is possible to reduce the size of the liquid ejection device compared to a case where a configuration for impregnating the impregnated section with the liquid is separately provided.

[0138] (L) The control method of a liquid ejection device according to (J), or (K), the liquid ejection device further including a cleaning section that suctions liquid from the liquid ejection head to perform suction cleaning of the liquid ejection head, wherein the liquid ejection head is movable in the scanning direction and the wiping section is disposed between the cleaning section and the impregnated section in the scanning direction, the control method further including performing suction cleaning of the liquid ejection head by the cleaning section, using the first movement mechanism to move the wiping section to a position where the wiping section is contactable with the nozzle surface, and wiping the nozzle surface with the wiping section.

[0139] According to this method, after suction cleaning is performed by the cleaning section, the nozzle surface is wiped by the wiping section. The distance between the wiping section and the cleaning section is shorter than the distance between the impregnated section and the cleaning section. Therefore, it is possible to shorten the time required for suction cleaning and wiping.

[0140] (M) The control method of the liquid ejection device according to (L), the wiping device further including a winding section configured to wind the absorbing member, the control method further including performing suction cleaning of the liquid ejection head by the cleaning section, using the first movement mechanism to bring the wiping section into contact with the nozzle surface, using the first movement mechanism to separate the wiping section from the nozzle surface, positioning a new portion of the absorbing member in the wiping section by using the winding section to wind the absorbing member, and using the first movement mechanism to move the wiping section to a position where the wiping section is contactable with the nozzle surface.

[0141] According to this method, after performing suction cleaning of the liquid ejection head, the wiping section is brought into contact with the nozzle surface. Therefore, it is possible for the wiping section to absorb the liquid from suction cleaning that clings to the nozzle surface. The winding section winds the absorbing member after the wiping section comes into contact with the nozzle surface. By winding the absorbing member, an unused portion of the absorbing member can be used as a wiping section. Therefore, the wiping section can wipe the nozzle surface with a new portion after reducing the liquid from suction cleaning that clings to the nozzle surface.
[0142] (N) The control method of the liquid ejection device according to (J) to (M), the liquid ejection device further including a liquid receiving section that receives liquid idly ejected from the liquid ejection head, wherein in the scanning direction, the liquid receiving section is disposed adjacent to the wiping device, the control method further including after wiping the nozzle surface by the wiping section, the liquid is idly ejected from the liquid ejection head toward the liquid receiving section.
[0143] According to this method, the liquid receiving section is disposed adjacent to the wiping device in the scanning direction. For this reason, after the nozzle surface is wiped by the wiping device, it is possible to rapidly perform idle ejection with respect to the liquid receiving section.
[0144] (O) The control method of the liquid ejection device according to (N), the liquid ejection device further including a pressurizing section configured to pressurize the inside of the liquid ejection head to discharge liquid from the liquid ejection head, the control method further including receiving in the liquid receiving section, the liquid that was discharged from the liquid ejection head by the pressurizing section, using the first movement mechanism to move the wiping section to a position where the wiping section is contactable with the nozzle surface, and wiping the nozzle surface with the wiping section.
[0145] According to this method, the liquid receiving section receives the liquid discharged from the liquid ejection head by the pressurizing section. Therefore, the liquid idly ejected from the liquid ejection head and the liquid ejected under pressure from the liquid ejection head can be received in a single liquid receiving section.
[0146] (P) The control method of a liquid ejection device according to (O), the wiping device further including a winding section configured to wind the absorbing member, the control method further including discharging liquid from the liquid ejection head by the pressurizing section, using the first movement mechanism to bring the wiping section into contact with the nozzle surface, using the first movement mechanism to separate the wiping section from the nozzle surface, positioning a new portion of the absorbing member in the wiping section by using the winding section to wind the absorbing member, and using the first movement mechanism to move the wiping section to a position where the wiping section is contactable with the nozzle surface.
[0147] According to this method, after pressurizing the inside of the liquid ejection head to discharge the liquid, the wiping section is brought into contact with the nozzle surface. Therefore, it is possible to cause the wiping section to absorb the liquid from pressurized discharge that clings to the nozzle surface. The winding section winds the absorbing member after the wiping section comes into contact with the nozzle surface. By winding the absorbing member, an unused portion of the absorbing member can be used as a wiping section. Therefore, the wiping section can wipe the nozzle surface with a new portion after reducing the liquid form pressurized discharge that clings to the nozzle surface.

Claims

1. A wiping device configured to wipe a nozzle surface of a liquid ejection head that ejects liquid, the wiping device comprising: a band-shaped absorbing member configured to absorb the liquid and a movement mechanism that moves the absorbing member to a contact position where the absorbing member is contactable with the nozzle surface and a separated position at which the

absorbing member is separated from the nozzle surface, wherein the absorbing member includes an impregnated section configured to contact the nozzle surface in a state of being impregnated with liquid and a wiping section configured to wipe the nozzle surface by moving relative to the liquid ejection head.

2. The wiping device according to claim 1, wherein the movement mechanism includes a first movement mechanism configured to move the wiping section of the absorbing member to a position where the wiping section is contactable with the nozzle surface and a second movement mechanism configured to move the impregnated section of the absorbing member to a position where the impregnated section contacts the nozzle surface.

3. The wiping device according to claim 2, further comprising: a winding section configured to wind the absorbing member.

4. The wiping device according to claim 3, wherein the first movement mechanism includes a roller that comes into contact with a back surface of the wiping section, the back surface being at an opposite side of a contact surface that comes into contact with the nozzle surface and the roller has an elastic portion that comes into contact with the wiping section.

5. The wiping device according to claim 3, wherein the second movement mechanism includes a support member that comes into contact with a back surface of the impregnated section, the back surface being at an opposite side of a contact surface that comes into contact with the nozzle surface.

6. The wiping device according to claim 5, wherein the second movement mechanism is movable between a position at which the support member is brought into contact with the impregnated section and a position at which the support member is separated from the impregnated section.

7. The wiping device according to claim 6, wherein the support member has a porous body.

8. The wiping device according to claim 6, wherein the support member has an elastic body.

9. A liquid ejection device comprising: a liquid ejection head that ejects a liquid from a nozzle formed in a nozzle surface and the wiping device according to claim 1.

10. A control method of a liquid ejection device, the liquid ejection device including a liquid ejection head that ejects a liquid from a nozzle formed in a nozzle surface and a wiping device configured to wipe the nozzle surface, wherein the wiping device includes a wiping section configured to wipe the nozzle surface by moving relative to the liquid ejection head, an absorbing member including an impregnated section configured to come into contact with the nozzle surface in a state of being impregnated with a liquid, and a movement mechanism that has a first movement mechanism configured to move the wiping section of the absorbing member to a position where the wiping section is contactable with the nozzle surface, and a second movement mechanism configured to move the impregnated section of the absorbing member to a position where the impregnated section contacts the nozzle surface, the control method comprising: using the second movement mechanism to bring the impregnated section into contact with the nozzle surface, and maintaining a state in which the impregnated section contacts the nozzle surface for a predetermined time; using the second movement mechanism to separate the impregnated section from the nozzle surface; using the first movement mechanism to move the wiping section to a position where the wiping section is contactable with the nozzle surface; and wiping the nozzle surface with the wiping section.

11. The control method of a liquid ejection device according to claim 10, further comprising: impregnating the impregnated section with a liquid by ejecting the liquid from the nozzle to the impregnated section.

12. The control method of a liquid ejection device according to claim 10, the liquid ejection device further including a cleaning section that suctions liquid from the liquid ejection head to perform suction cleaning of the liquid ejection head, wherein the liquid ejection head is movable in the scanning direction and the wiping section is disposed between the cleaning section and the impregnated section in the scanning direction, the control method further comprising: performing

suction cleaning of the liquid ejection head by the cleaning section; using the first movement mechanism to move the wiping section to a position where the wiping section is contactable with the nozzle surface; and wiping the nozzle surface with the wiping section.

13. The control method of a liquid ejection device according to claim 12, the wiping device further including a winding section configured to wind the absorbing member, the control method further comprising: performing suction cleaning of the liquid ejection head by the cleaning section; using the first movement mechanism to bring the wiping section into contact with the nozzle surface; using the first movement mechanism to separate the wiping section from the nozzle surface; positioning a new portion of the absorbing member in the wiping section by using the winding section to wind the absorbing member; and using the first movement mechanism to move the wiping section to a position where the wiping section is contactable with the nozzle surface.

14. The control method of a liquid ejection device according to claim 12, the liquid ejection device further including a liquid receiving section that receives liquid idly ejected from the liquid ejection head, wherein in the scanning direction, the liquid receiving section is disposed adjacent to the wiping device, the control method further comprising: after wiping the nozzle surface by the wiping section, the liquid is idly ejected from the liquid ejection head toward the liquid receiving section.

15. The control method of a liquid ejection device according to claim 14, the liquid ejection device further including a pressurizing section configured to pressurize the inside of the liquid ejection head to eject liquid from the liquid ejection head, the control method further comprising: receiving in the liquid receiving section, the liquid that was ejected from the liquid ejection head by the pressurizing section; using the first movement mechanism to move the wiping section to a position where the wiping section is contactable with the nozzle surface; and wiping the nozzle surface with the wiping section.

16. The control method of a liquid ejection device according to claim 15, the wiping device further including a winding section configured to wind the absorbing member, the control method further comprising: discharging liquid from the liquid ejection head by the pressurizing section; using the first movement mechanism to bring the wiping section into contact with the nozzle surface; using the first movement mechanism to separate the wiping section from the nozzle surface; positioning a new portion of the absorbing member in the wiping section by using the winding section to wind the absorbing member; and using the first movement mechanism to move the wiping section to a position where the wiping section is contactable with the nozzle surface.