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MAINTENANCE DEVICE AND INKJET RECORDING APPARATUS

Abstract

A maintenance device includes a cap, a lifting device, a cleaning liquid supply device, an oscillating device, and a control part. The cap is attached to a nozzle surface of an inkjet head. The lifting device lifts and lowers at least one of the inkjet head or the cap. The cleaning liquid supply device supplies a cleaning liquid to the cap. The oscillating device oscillates the cap. The cap has a base portion, a wall portion which surrounds the nozzle surface, and an elastic body which has a liquid absorbency and is placed on a region inside the wall portion on the base portion. The control part controls the cleaning liquid supply device to supply the cleaning liquid to the cap, controls the lifting device such that the elastic body is pressed on the nozzle surface, and then controls the oscillating device to oscillate the cap.

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Background/Summary

INCORPORATION BY REFERENCE

[0001] This application is based on and claims the benefit of priority from Japanese patent application No. 2024-024023 filed on Feb. 20, 2024, which is incorporated by reference in its entirety.

BACKGROUND

[0002] The present disclosure relates to a maintenance device and an inkjet recording apparatus.

[0003] In the inkjet recording apparatus, there is a possibility that ink remains on or sticks to a nozzle surface of an inkjet head, causing ejection failure. Therefore, a technique for cleaning the nozzle surface has been studied. For example, there is a configuration in which a wiper scrapes a cleaning liquid from a cleaning liquid supply port adjacent to the nozzle surface, and the wiper holding the cleaning liquid slides along the nozzle surface. Further, a spray nozzle sprays the cleaning liquid onto the nozzle surface, and the wiper wipes the nozzle surface.

[0004] However, in the former configuration, since the wiper has a low capacity to hold the cleaning liquid, an amount of the cleaning liquid supplied to the nozzle surface is insufficient. In the latter configuration, there is a possibility that the cleaning liquid is scattered and the inside of the apparatus main body is contaminated.

SUMMARY

[0005] A maintenance device according to the present disclosure includes a cap, a lifting device, a cleaning liquid supply device, an oscillating device, and a control part. The cap is attached to a nozzle surface of an inkjet head. The lifting device lifts and lowers at least one of the inkjet head or the cap. The cleaning liquid supply device supplies a cleaning liquid to the cap. The oscillating device oscillates the cap. The control part controls the lifting device, the cleaning liquid supply device and the oscillating device. The cap has a base portion, a wall portion which protrudes upward from an upper surface of the base portion and surrounds the nozzle surface, and an elastic body which has a liquid absorbency and is placed on a region inside the wall portion on the base portion. The control part controls the cleaning liquid supply device to supply the cleaning liquid to the cap, controls the lifting device such that the elastic body is pressed on the nozzle surface, and then controls the oscillating device to oscillate the cap.

[0006] An inkjet recording apparatus according to the present disclosure includes the inkjet head, and the maintenance device.

[0007] The above and other objects, features, and advantages of the present disclosure will become more apparent from the following description when taken in conjunction with the accompanying drawings in which a preferred embodiment of the present disclosure is shown by way of illustrative example.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. **1** is a perspective view showing an external appearance of an inkjet recording apparatus according to one embodiment of the present disclosure.

[0009] FIG. **2** is a side view schematically showing an internal structure of the inkjet recording apparatus according to the embodiment of the present disclosure.

[0010] FIG. **3** is a perspective view schematically showing the internal structure of the inkjet

recording apparatus according to the embodiment of the present disclosure.
[0011] FIG. **4** is a perspective view showing an inkjet head according to the embodiment of the present disclosure.
[0012] FIG. **5** is a perspective view showing the inkjet head according to the embodiment of the present disclosure.
[0013] FIG. **6** is a right side view showing the inkjet head according to the embodiment of the present disclosure.
[0014] FIG. **7** is a bottom view showing the inkjet according to the embodiment of the present disclosure.
[0015] FIG. **8** is a rear view showing the inkjet head according to the embodiment of the present disclosure.
[0016] FIG. **9** is a perspective view showing a cap according to the embodiment of the present disclosure.
[0017] FIG. **10** is a perspective view showing the cap according to the embodiment of the present disclosure.
[0018] FIG. **11** is a plan view showing the cap according to the embodiment of the present disclosure.
[0019] FIG. **12** is a right side view showing the cap according to the embodiment of the present disclosure.
[0020] FIG. **13** is a cross-sectional view showing the cap according to the embodiment of the present disclosure.
[0021] FIG. **14** is a bottom view showing the cap according to the embodiment of the present disclosure.
[0022] FIG. **15** is a rear view showing the cap according to the embodiment of the present disclosure.
[0023] FIG. **16** is a cross-sectional view showing the inkjet head according to the embodiment of the present disclosure, to which the cap is attached.
[0024] FIG. **17** is an enlarged view showing the lower front side portion of FIG. **16**.
[0025] FIG. **18** is a plan view showing the cap according to a modified example of the embodiment of the present disclosure.
[0026] FIG. **19** is a right side view showing the cap according to the modified example of the embodiment of the present disclosure.
[0027] FIG. **20** is a cross-sectional view showing the cap according to the modified example of the embodiment of the present disclosure.
[0028] FIG. **21** is a cross-sectional view showing the inkjet head according to the modified example of the embodiment of the present disclosure, to which the cap is attached.

DETAILED DESCRIPTION

[0029] Hereinafter, with reference to the attached drawings, an inkjet recording apparatus **1** according to one embodiment of the present disclosure will be described below.
[0030] FIG. **1** is a perspective view showing an external appearance of the inkjet recording apparatus **1**. FIG. **2** is a side view schematically showing an internal structure of the inkjet recording apparatus **1**. FIG. **3** is a perspective view schematically showing the internal structure of the inkjet recording apparatus **1**. FIG. **4** and FIG. **5** are perspective views showing an inkjet head **12**. FIG. **6** is a right side view showing the inkjet head **12**. FIG. **7** is a bottom view showing the inkjet head **12**. FIG. **8** is a rear view showing the inkjet head **12**. Hereinafter, the left side of the paper plan on which FIG. **2** is drawn is defined as the front side of the inkjet recording apparatus **1**, and the right-and-left directions will be described with reference to the direction in which the inkjet recording apparatus **1** is viewed from the front side. In each figure, U, Lo, L, R, Fr, and Rr indicate the upper, lower, left, right, front, and rear, respectively.
[0031] The inkjet recording apparatus **1** (see FIG. **1** and FIG. **2**) includes a lower housing **3**A and

an upper housing **3**B provided above the lower housing **3**A. Inside the lower housing **3**A, a feed roll **4**, a rewind roll **9** provided in front of the feed roll **4**, a conveying unit **7** provided above the feed roll **4** and the rewind roll **9**, and a conveyance path **10** extending from the feed roll **4** to the rewind roll **9** via the conveying unit **7** are provided. One end of a sheet S is wound around the feed roll **4**, and the other end of the sheet S is wound around the rewind roll **9**. The sheet S is made of paper, resin film, cloth or the like. The conveying unit **7** includes a driving roller **25**, a driven roller **22** arranged on the rear side of the driving roller **25** parallel to the driving roller **25**, and an endless belt **21** wound around the driving roller **25** and the driven roller **22**.

[0032] Inside the upper housing **3**B, an image forming unit **6** and a maintenance device **30** are provided. The image forming unit **6** includes a plurality of (in this embodiment, four) inkjet heads **12** facing the conveying unit **7**. The image forming unit **6** ejects ink to the sheet S on the conveying unit **7** while reciprocating in the left-and-right directions by a driving device (not shown). The maintenance device **30** will be described later.

[0033] The inkjet head **12** (see FIG. **6**) includes a rectangular parallelepiped housing **12**H whose longitudinal direction is along the front-and-rear direction, nozzle plate **14** whose longitudinal direction is along the front-and-rear direction and provided at the bottom of the housing **12**H, and a socket **12**S to which a pipe for supplying the ink is connected. The nozzle plate **14** has a large number of nozzles **14**N arranged in the front-and-rear direction. The nozzle **14**N has a branch flow pass **14**B branched from the downstream side of the socket **12**S and a plurality of ejection ports **14**A provided on a nozzle surface **14**F which is a lower surface of the nozzle plate **14**. The ejection ports **14**A are provided in a rectangular region (referred to as an ejectable region **14**R) of the nozzle surface **14**F excluding the front and rear end portions and the left and right end portions. A diaphragm **14**V also serves as a part of the inner wall of the branch flow pass **14**B. The diaphragm **14**V is provided with a pressurizing element **14**Z. As the pressurizing element **14**Z, a piezoelectric element, an electrostatic actuator, a heater, and the like are used. A driving circuit **12**D for driving the pressurizing element **14**Z is connected to the pressurizing element **14**Z.

[0034] The control part **2** (see FIG. **2**) includes an arithmetic part and a storage part (not shown). The arithmetic part is, for example, a CPU (Central Processing Unit). The storage part includes a storage medium such as ROM (Read Only Memory), RAM (Random Access Memory), and EEPROM (Electrically Erasable Programmable Read Only Memory). The arithmetic part reads and executes control program stored in the storage part to perform various processes. The control part **2** may be implemented by an integrated circuit that does not use software.

[0035] The basic image forming operation of the inkjet recording apparatus **1** is as follows. When an image forming job is input to the inkjet recording apparatus **1** from an external computer or the like, the control part **2** drives the feed roll **4**, the conveying unit **7**, and the rewind roll **9** in the counterclockwise direction in FIG. **2**, and the sheet S is conveyed in the Y direction along the conveyance path **10**. When the control part **2** supplies a drive signal corresponding to the image data to the driving circuit **12**D in synchronization with the conveyance of the sheet S, the driving circuit **12**D supplies an ejection signal corresponding to the gradation of the image data to the pressurizing element **14**Z, and the ink is ejected from the nozzle **14**N.

[0036] [Maintenance Device] The maintenance device **30** (see FIG. **3**) includes a cap unit **31** and a wipe unit **32**. The maintenance device **30** is provided at the right end portion of the upper housing **3**B. Although only one wipe unit **32** is shown in FIG. **3**, actually, the same number of the wipe units **32** as the inkjet head **12** are arranged at the same interval as the inkjet head **12**.

[0037] [Wipe Unit] The wipe unit **32** includes a frame body **81** and a blade **82** provided on the upper surface of the frame body **81**. The maintenance device **30** is provided with a sliding device **83** for sliding the wipe unit **32** in the front-and-rear direction (the longitudinal direction of the nozzle surface **14**F).

[0038] [Cap Unit] The cap unit **31** includes a rectangular parallelepiped frame body **71**. A portion of the frame body **71** corresponding to the upper surface of the rectangular parallelepiped is open.

The frame body **71** is provided with the same number of caps **72** as the inkjet heads **12** in the same arrangement as the inkjet heads **12** in the image forming unit **6**. The maintenance device **30** is provided with a lifting device **77** for lifting and lowering the cap unit **31**. After the image forming unit **6** is moved above the cap unit **31**, the cap unit **31** is lifted so that the cap **72** is attached on the nozzle surface **14**F. The lifting device **77** may be provided in the image forming unit **6**.

[0039] [Cap] FIG. **9** and FIG. **10** are perspective views showing the cap **72**. FIG. **11** is a plan view showing the cap **72**. FIG. **12** is a right side view showing the cap **72**. FIG. **13** is a cross-sectional view showing the cap **72**. FIG. **14** is a bottom view showing the cap **72**. FIG. **15** is a rear view showing the cap **72**. FIG. **16** is a cross-sectional view showing the inkjet head **12** to which the cap **72** is attached. FIG. **17** is an enlarged view showing the lower front side portion of FIG. **16**.

[0040] The cap **72** has a base portion **72**B, a wall portion **72**W, and an elastic body **72**E. The base portion **72**B is formed in a flat plate shape whose longitudinal direction is along the front-and-rear direction. The wall portion **72**W projects upward from the upper surface of the base portion **72**B. The space inside the wall portion **72**W is a rectangle wider than the nozzle surface **14**F in the front-and-rear direction and the left-and right directions when viewed from the upper side. In other words, the wall portion **72**W has a size that can surround the entire circumference of the nozzle plate **14**. The base portion **72**B and the wall portion **72**W are integrally formed of resin, metal, or the like.

[0041] The elastic body **72**E is provided at the center portion in the front-and-rear direction and in the left-and-right direction on an upper surface of the base portion **72**B and inside the wall portion **72**W. The upper surface of the elastic body **72**E is positioned lower than the upper end of the wall portion **72**W and parallel to the nozzle surface **14**F. As the material of the elastic body **72**E, material having a low friction coefficient and a high liquid absorbency is desirable, and for example, sponge, cloth, urethane, pile fabric, and the like are used. A length L**2** of the elastic body **72**E in the front-and-rear direction (the longitudinal direction direction) is longer than a length L**1** of the ejectable region **14**R and shorter than a length L**3** of the nozzle surface **14**F. A width W**2** of the elastic body **72**E in the left-and-right direction (the direction crossing the longitudinal direction) is wider than a width W**1** of the ejectable region **14**R and narrower than a width W**3** of the nozzle surface **14**F. In other words, the elastic body **72**E is larger than the ejectable region **14**R and smaller than the nozzle surface **14**F.

[0042] The base portion **72**B has a supply hole **72**K on the rear side of the elastic body **72**E, and a discharge hole **72**H in front of the elastic body **72**E. A tank **13**T for storing a cleaning liquid and a pump **13**P for feeding the cleaning liquid to the cap **72** are connected to the supply hole **72**K via a supply pipe **73**K (see FIG. **3**). A pump **15**P for sucking a waste liquid containing the ink and the cleaning liquid from the cap **72** and a tank **15**T for storing the waste liquid are connected to the discharge hole **72**H via a discharge pipe **73**H. A cleaning liquid supply device **13** controls a liquid surface height of the cleaning liquid to be higher than a height H**1** of the bottom surface of the elastic body **72**E and lower than a height H**2** of the nozzle surface **14**F.

[0043] The cap **72** is attached to the frame body **71** via a support plate **74**. The support plate **74** is immovable with respect to the frame body **71**. The cap **72** is movable in the front-and-rear direction with respect to the support plate **74**. The support plate **74** is provided with an oscillating device **75**. The oscillating device **75** includes a biasing member **75**A (for example, a compression coil spring) and an eccentric cam **75**B whose axial direction is along the upper-and-lower direction. The biasing member **75**A is provided on the rear side of the base portion **72**B, and biases the base portion **72**B forward. The eccentric cam **75**B is provided in front of the base portion **72**B, and is in contact with the front end surface of the base portion **72**B. When the eccentric cam **75**B is rotationally driven by a motor or the like (not shown), the cap **72** oscillates in the front-and-rear direction. The oscillating device **75** may be a vibration motor or the like.

[0044] [Operation of Maintenance Device] Next, the operation of the maintenance device **30** will be described. Maintenance of the inkjet head **12** is performed at a predetermined timing. The

predetermined timing may be, for example, after the end of one image forming job, after performing of a predetermined amount of image forming, or periodically. Before the start of the maintenance, the cap unit **31** is retracted downward and the wipe unit **32** is retracted rearward.
[0045] First, the control part **2** moves the image forming unit **6** above the cap unit **31**. Next, the control part **2** controls the cleaning liquid supply device **13** to supply the cleaning liquid to the cap **72**, and controls the lifting device **77** to lift the cap unit **31**. Since the elastic body **72**E absorbs the cleaning liquid because of its high liquid absorbency. As the cap unit **31** is lifted, the nozzle plate **14** is accommodated in the space inside the wall portion **72**W, and the elastic body **72**E is pressed against the nozzle surface **14**F. The cleaning liquid is discharged from the elastic body **72**E by pressing the elastic body **72**E, and the cleaning liquid is supplied abundantly to the nozzle surface **14**F. Since the nozzle plate **14** is surrounded by the wall portion **72**W, scattering of the cleaning liquid is suppressed.
[0046] Next, the control part **2** drives the eccentric cam **75**B to oscillate the cap **72** in the front-and-rear direction for a predetermined time. Since a friction coefficient of the elastic body **72**E is low, it slides smoothly with respect to the nozzle surface **14**F, and the cleaning liquid penetrates into the high-viscosity ink remaining on the nozzle surface **14**F.
[0047] Next, the control part **2** lowers the cap unit **31**, positions the image forming unit **6** so that all the inkjet heads **12** are respectively positioned in front of the wipe unit **32**, slides the wipe units **32** by the sliding device **83**, and wipes the waste liquid containing the ink and the cleaning liquid from the nozzle surface **14**F.
[0048] Next, after retracting the wipe unit **32** rearward, the control part **2** moves the image forming unit **6** above the cap unit **31**, lifts the cap unit **31**, and waits until a new image forming job is input. Since the elastic body **72**E is pressed on the nozzle surface **14**F, the nozzle surface **14**F is moisturized, and increase in viscosity of the ink in the nozzle **14**N is suppressed.
[0049] The maintenance device **30** according to the present embodiment described above includes the inkjet heads **12**; the caps **72** which are attached to the nozzle surfaces **14**F of the inkjet heads **12**; the lifting device **77** which lifts and lower at least one of the inkjet head **12** or the cap **72**; the cleaning liquid supply device **13** which supplies the cleaning liquid to the caps **72**; the oscillating device **75** which oscillates the cap **72**; and the control part **2** which controls the lifting device **77**, the cleaning liquid supply device **13** and the oscillating device **75**. The cap **72** has the base portion **72**B, the wall portion **72**W which protrudes upward from the upper surface of the base portion **72**B and surrounds the nozzle surface **14**F, and the elastic body **72**E which has a liquid absorbency and is placed on the region inside the wall portion **72**W on the base portion **72**B. The control part **2** controls the cleaning liquid supply device **13** to supply the cleaning liquid to the cap **72**, controls the lifting device **77** such that the elastic body **72**E is pressed on the nozzle surface **14**F, and then controls the oscillating device **75** to oscillate the cap **72**. According to the present embodiment, it becomes possible to supply the cleaning liquid to the nozzle surface **14**F abundantly without scattering the cleaning liquid.
[0050] According to the maintenance device **30** according to the present embodiment, the elastic body **72**E is larger than the ejectable region **14**R where the ejection ports **14**A are formed on the nozzle surface **14**F and smaller than the nozzle surface **14**F. According to the present embodiment, the cleaning liquid can be supplied to the ejectable region **14**R without excess or deficiency. Further, abrasion of the elastic body **72**E due to friction with the edge of the nozzle surface **14**F can be prevented.
[0051] According to the maintenance device **30** according to the present embodiment, the control part **2** controls the cleaning liquid supply device **13** such that a liquid height of the cleaning liquid is higher than a height of the bottom surface of the elastic body **72**E and lower than a height of the nozzle surface **14**F. According to the present embodiment, the infiltration of the cleaning liquid into the inkjet head **12** can be suppressed.
[0052] According to the maintenance device according to the present embodiment, the wall portion

72W has a size capable of surrounding the entire circumference of the nozzle plate **14** having the nozzle surface **14**F. According to the present embodiment, deterioration of the nozzle surface **14**F due to friction with the wall portion **72**W can be prevented.

[0053] The inkjet recording apparatus **1** according to the present embodiment includes the inkjet heads **12** and the maintenance device **30**. According to the present embodiment, since ink ejection failure is suppressed, deterioration in image quality can be suppressed.

[0054] The above embodiments may be modified as follows.

[0055] FIG. **18** is a plan view showing the cap **72**. FIG. **19** is a right side view showing the cap **72**. FIG. **20** is a cross-sectional view showing the cap **72**. FIG. **21** is a cross-sectional view showing the inkjet head **12** to which the cap **72** is attached.

[0056] In this modified example, the structure of the wall portion **72**W is different from that of the above-described embodiment. The space inside the wall portion **72**W is a rectangle which is wider in the front and-rear direction and in the left-and-right direction than the ejectable region **14**R and narrower in the front-and-rear direction and in the left-and-right direction than the nozzle surface **14**F when viewed from the upper side. In other words, the wall portion **72**W has a size that can surround the entire circumference of the ejectable region **14**R of the nozzle surface **14**F. The upper end of the wall portion **72**W is positioned higher than the upper surface of the elastic body **72**E and parallel to the nozzle surface **14**F. As the material of the wall portion **72**W, a material having a high friction coefficient, a low liquid absorbency, and a flexibility is desirable, for example, rubber, silicone rubber, and the like are used.

[0057] First, the control part **2** moves the image forming unit **6** above the cap unit **31**. Next, the control part **2** supplies the cleaning liquid to the cap **72**, and lifts the cap unit **31**. The elastic body **72**E absorbs the cleaning liquid because of its high liquid absorbency. Due to the lifting of the cap unit **31**, the upper end of the wall portion **72**W comes into contact with the nozzle surface **14**F before the elastic body **72**E. Subsequently, the wall portion **72**W is bent, and the elastic body **72**E is pressed on the nozzle surface **14**F. The cleaning liquid is discharged from the elastic body **72**E by the pressing the elastic body **72**E, and the cleaning liquid is supplied abundantly to the nozzle surface **14**F. Since the wall portion **72**W is in contact with the nozzle surface **14**F, scattering of the cleaning liquid is suppressed.

[0058] Next, the control part **2** drives the eccentric cam **75**B to oscillate the cap **72** in the front-and-rear direction for a predetermined time. Since a friction coefficient of the elastic body **72**E is low, it slides smoothly with respect to the nozzle surface **14**F, and the cleaning liquid penetrates into the high-viscosity ink remaining on the nozzle surface **14**F. On the other hand, although a friction coefficient of the wall portion **72**W is high, since it has a flexibility, shear deformation is repeated in the front-and-rear direction.

[0059] Next, the control part **2** lowers the cap unit **31**, and moves the image forming unit **6** between the conveying unit **7** and the cap unit **31**. Next, the control part **2** moves the wipe unit **32** forward to wipe the waste liquid containing the ink and the cleaning liquid from the nozzle surface **14**F, and then retracts the wipe unit **32** rearward.

[0060] Next, the control part **2** moves the image forming unit **6** above the cap unit **31**, lifts the cap unit **31** to a height where the wall portion **72**W is in contact with the nozzle surface **14**F and the elastic body **72**E is not in contact with the nozzle surface **14**F, and waits until a new image forming job is input.

[0061] According to the present modified example, the upper surface of the elastic body **72**E is positioned to be lower than the upper end of the wall portion **72**W, the wall portion **72**W has a size that can surround the entire circumference of the ejectable region **14**R where the ejection sports **14**A are formed on the nozzle surface **14**F, and the control part **2** lifts or lowers at least one of the inkjet head **12** and the cap **72** at a height where the upper end of the wall portion **72**W is in contact with the nozzle surface **14**F and the elastic body **72**E is not in contact with the nozzle surface **14**F, and at a height where the upper end of the wall portion **72**W and the elastic body **72**E are in contact

with the nozzle surface **14**F. According to the present embodiment, since the ejectable region **14**R is surrounded by the wall portion **72**W, the nozzle surface **14**F is moisturized and the increase in viscosity of the ink in the nozzle **14**N is suppressed. Further, as compared with the above embodiment, an opportunity for the elastic body **72**E to come into contact with the nozzle surface **14**F is reduced, so that deterioration of the nozzle surface **14**F is suppressed. Further, it is possible to prevent the scattering of the waste liquid when the elastic body **72**E is pressed on the nozzle surface **14**F.

Claims

1. A maintenance device comprising: a cap which is attached to a nozzle surface of an inkjet head; a lifting device which lifts and lowers at least one of the inkjet head or the cap; a cleaning liquid supply device which supplies a cleaning liquid to the cap, an oscillating device which oscillates the cap; and a control part which controls the lifting device, the cleaning liquid supply device and the oscillating device, wherein the cap has: a base portion; a wall portion which protrudes upward from an upper surface of the base portion and surrounds the nozzle surface; and an elastic body which has a liquid absorbency and is placed on a region inside the wall portion on the base portion, and the control part controls the cleaning liquid supply device to supply the cleaning liquid to the cap, controls the lifting device such that the elastic body is pressed on the nozzle surface, and then controls the oscillating device to oscillate the cap.
2. The maintenance device according to claim 1, wherein the elastic body is larger than an ejectable region where an ejection port is formed on the nozzle surface and smaller than the nozzle surface.
3. The maintenance device according to claim 1, wherein the control part controls the cleaning liquid supply device such that a liquid height of the cleaning liquid is higher than a height of a bottom surface of the elastic body and lower than a height of the nozzle surface.
4. The maintenance device according to claim 1, wherein the wall portion has a size capable of surrounding an entire circumference of a nozzle plate having the nozzle surface.
5. The maintenance device according to claim 1, wherein an upper surface of the elastic body is lower than an upper end of the wall portion, the wall portion has a size capable of surrounding an entire circumference of an ejectable region where an ejection port is formed on the nozzle surface, the control part controls the lifting device to lift or lower at least one of the inkjet head or the cap to a height at which the upper end of the wall portion comes into contact with the nozzle surface and the elastic body does not come into contact with the nozzle surface and to a height at which the upper end of the wall portion and the elastic body come into contact with the nozzle surface.
6. An inkjet recording apparatus comprising: the inkjet head, and the maintenance device according to claim 1.