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# LIQUID EJECTING HEAD AND LIQUID EJECTING APPARATUS

## Abstract

A liquid ejecting head includes: a head module that includes a flow path opening forming member and a chip; a supply flow path member that supplies a liquid to the head module; an elastic sealing member that liquid-tightly couples the flow path opening forming member and the supply flow path member to each other; and a fixing member that fixes the supply flow path member and the flow path opening forming member, in which a sealing region sandwiched between the flow path opening forming member and the supply flow path member in the sealing member overlaps the chip when viewed in an ejection direction, and a dimension of a portion of the flow path opening forming member that overlaps the sealing region in the ejection direction is larger than a distance between the sealing region and the fixing member when viewed in the ejection direction.

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## Background/Summary

[0001] The present application is based on, and claims priority from JP Application Serial Number 2024-022638, filed Feb. 19, 2024, the disclosure of which is hereby incorporated by reference herein in its entirety.

BACKGROUND

1. Technical Field

[0002] The present disclosure relates to a liquid ejecting head and a liquid ejecting apparatus.

2. Related Art

[0003] A liquid ejecting apparatus that includes a liquid ejecting head that ejects a liquid such as ink onto a medium such as printing paper has been proposed.

[0004] A liquid ejecting head described in JP-A-2015-226988 includes a recording element unit (head module) including an element recording substrate that includes an ejection port for ejecting a liquid and a support member that fixes the element recording substrate, and a flow path unit (supply flow path member) including a liquid supply path for supplying the liquid to the recording element unit, and the recording element unit and the flow path unit are liquid-tightly coupled to each other via an elastic member (sealing member).

[0005] When the sealing member is sandwiched between the head module and the supply flow path member to liquid-tightly couple a flow path, there is a possibility that reliability of the head module decreases due to a reaction force of the sealing member.

SUMMARY

[0006] According to an aspect of the present disclosure, a liquid ejecting head includes: a first head module that ejects a liquid in a first direction and includes a first flow path opening forming member in which a first flow path opening is formed, and a first chip disposed in the first direction with respect to the first flow path opening forming member; a supply flow path member that supplies the liquid to the first head module; an elastic first sealing member that is sandwiched between the first head module and the supply flow path member in the first direction to liquid-tightly couple the first flow path opening and a flow path opening of the supply flow path member to each other; and a first fixing member that fixes the supply flow path member and the first flow path opening forming member, in which a first sealing region sandwiched between the first flow path opening forming member and the supply flow path member in the first sealing member overlaps the first chip when viewed in the first direction, and a first dimension of a portion of the first flow path opening forming member that overlaps the first sealing region in the first direction is larger than a first distance between the first sealing region and the first fixing member when viewed in the first direction.

[0007] According to an aspect of the present disclosure, a liquid ejecting apparatus includes: a plurality of liquid ejecting heads; and a unit base to which the plurality of liquid ejecting heads are fixed.

## Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. **1** is a schematic view illustrating a configuration of a liquid ejecting apparatus according to a first embodiment.

[0009] FIG. **2** is a cross-sectional view of a liquid ejecting head illustrated in FIG. **1**.
[0010] FIG. **3** is a bottom view of the liquid ejecting head illustrated in FIG. **2**.
[0011] FIG. **4** is a cross-sectional view of a chip of a head module illustrated in FIG. **2**.
[0012] FIG. **5** is a view illustrating the head module, a supply flow path member, and a sealing member illustrated in FIG. **2**.
[0013] FIG. **6** is a plan view of the head module and the sealing member illustrated in FIG. **2**.
[0014] FIG. **7** is a plan view of a sealing member and a fixing member according to a first modified example.
[0015] FIG. **8** is a cross-sectional view of the sealing member and the fixing member according to the first modified example.
[0016] FIG. **9** is a plan view of a sealing member and a fixing member according to a second modified example.
[0017] FIG. **10** is a cross-sectional view of the sealing member and the fixing member according to the second modified example.
[0018] FIG. **11** is a plan view of a sealing member and a fixing member according to a third modified example.
[0019] FIG. **12** is a plan view of a sealing member and a fixing member according to a fourth modified example.
[0020] FIG. **13** is a plan view of a sealing member and a fixing member according to a fifth modified example.
[0021] FIG. **14** is a cross-sectional view of a sealing member and a fixing member according to a sixth modified example.
[0022] FIG. **15** is a plan view of a head module according to the sixth modified example.
[0023] FIG. **16** is a plan view of a sealing member and a fixing member according to a seventh modified example.
[0024] FIG. **17** is a cross-sectional view of the sealing member and the fixing member according to the seventh modified example.
[0025] FIG. **18** is a plan view of a head module according to an eighth modified example.
[0026] FIG. **19** is a cross-sectional view of the head module according to the eighth modified example.
[0027] FIG. **20** is a cross-sectional view of a head module according to a ninth modified example.
[0028] FIG. **21** is a cross-sectional view of a sealing member and the vicinity thereof according to a tenth modified example.
[0029] FIG. **22** is a cross-sectional view of a sealing member and the vicinity thereof according to an eleventh modified example.

## DESCRIPTION OF EMBODIMENTS

[0030] Hereinafter, exemplary embodiments according to the present disclosure will be described with reference to the accompanying drawings. Note that the dimensions or the scale of each component may differ appropriately from actual dimensions or scales, and some portions are schematically illustrated in the drawings to facilitate understanding. Further, the scope of the present disclosure is not limited to the embodiments unless otherwise specified in the following description. Furthermore, the phrase “an element β on an element γ” is not limited to a configuration in which the element γ and the element β are in direct contact with each other, but also includes a configuration in which the element γ and the element β are not in direct contact with each other. The phrase “the element γ and the element β are equal to each other” means that the element γ and the element β are only required to be substantially equal to each other, and includes measurement errors, manufacturing errors, and the like. The phrase “the element γ and the element β are the same as each other” means that the element γ and the element β are only required to be substantially the same as each other, and includes measurement errors, manufacturing errors, and the like.

1. First Embodiment
1-1. Overall Configuration of Liquid Ejecting Apparatus **100**
[0031] FIG. **1** is a schematic view illustrating a configuration of a liquid ejecting apparatus **100** according to a first embodiment. In the following, for convenience of explanation, an X axis, a Y axis, and a Z axis that are orthogonal to one another are used as appropriate. Further, a direction along the X axis is referred to as an X**1** direction, and a direction opposite to the X**1** direction is referred to as an X**2** direction. Similarly, a direction along the Y axis is referred to as a Y**1** direction, and a direction opposite to the Y**1** direction is referred to as a Y**2** direction. A direction along the Z axis is referred to as a Z**1** direction, and a direction opposite to the Z**1** direction is referred to as a Z**2** direction. The Z**1** direction corresponds to a “first direction”. Furthermore, the Z**1** direction with respect to a certain point is defined as a “downward direction”, and the Z**2** direction from the certain point is defined as an “upward” direction. Further, viewing in the Z**1** direction or the Z**2** direction is referred to as “plan view”.
[0032] As illustrated in FIG. **1**, the liquid ejecting apparatus **100** includes a liquid storage section **9**, a control unit **91**, a transport section **92**, a head unit **10**, and a movement mechanism **93**.
[0033] The liquid storage section **9** is a container that stores ink. Specific aspects of the liquid storage section **9** include, for example, a cartridge that is attachable to and detachable from the liquid ejecting apparatus **100**, a bag-shaped ink pack made of a flexible film, and an ink tank that can be refilled with the ink. The type of the ink stored in the liquid storage section **9** is not particularly limited but is arbitrary.
[0034] The control unit **91** controls an operation of each element of the liquid ejecting apparatus **100**. The control unit **91** includes, for example, a processing circuit such as a central processing unit (CPU) or a field programmable gate array (FPGA), and a storage circuit such as a semiconductor memory, and controls an operation of each element of the liquid ejecting apparatus **100**.
[0035] The transport section **92** transports a medium **90** in a direction DM under the control of the control unit **91**. The direction DM in the present embodiment is the Y**1** direction. In the example illustrated in FIG. **1**, the transport section **92** includes a transport roller that is elongated along the X axis and a motor that rotates the transport roller. The transport section **92** is not limited to a configuration using the transport roller, and may be configured to use, for example, a drum or an endless belt that transports the medium **90** while adsorbing the medium **90** to an outer circumferential surface thereof by an electrostatic force or the like.
[0036] The head unit **10** includes a unit base **11** and a liquid ejecting head **1**. The liquid ejecting head **1** ejects the ink from a nozzle N toward the medium **90**. The unit base **11** holds the liquid ejecting head **1**.
[0037] The movement mechanism **93** includes a transport belt to which the unit base **11** of the head unit **10** is fixed, and reciprocates the head unit **10** in the X**1** direction and the X**2** direction under the control of the control unit **91**. The head unit **10** ejects the ink supplied from the liquid storage section **9** onto the medium **90** through each of a plurality of nozzles N in the Z**1** direction under the control of the control unit **91**. The ejection of the ink from the head unit **10** is performed in parallel with the movement of the head unit **10** by the movement mechanism **93**, so that an image is formed with the ink on the surface of the medium **90**.
[0038] The number and arrangement of a plurality of liquid ejecting heads **1** included in the head unit **10** are not limited to those in the example illustrated in FIG. **1** but are arbitrary. In addition, when the head unit **10** is configured to be able to circulate the ink, the head unit **10** may be coupled to the liquid storage section **9** via a circulation mechanism for circulating the ink in the head unit **10**.
[0039] As described above, the liquid ejecting apparatus **100** includes the plurality of liquid ejecting heads **1** and the unit base **11** to which the plurality of liquid ejecting heads **1** are fixed. Such a liquid ejecting apparatus **100** includes the liquid ejecting head **1** as described below. As

described below, each of the plurality of liquid ejecting heads **1** is less susceptible to defects such as warping, and has excellent reliability in print quality. Therefore, with the liquid ejecting apparatus **100** including the plurality of liquid ejecting heads **1**, it is possible to improve the reliability in print quality.

1-2. Liquid Ejecting Head **1**

[0040] FIG. **2** is a cross-sectional view of the liquid ejecting head **1** illustrated in FIG. **1**. As illustrated in FIG. **2**, the liquid ejecting head **1** includes a plurality of head modules **2**, a plurality of sealing members **4**, a cover **5**, a flow path unit **6**, and a relay substrate **7**. The flow path unit **6** includes a supply flow path member **3**, a flow path member **60**, and a case **62**. The flow path unit **6** may be regarded as a "supply flow path member".

[0041] Each of the plurality of head modules **2** includes the plurality of nozzles N. Each of the plurality of head modules **2** ejects the ink in the Z**1** direction, which is the "first direction". The plurality of head modules **2** are arranged along the X axis. Each head module **2** is a member that is elongated along the Y axis. In the illustrated example, the number of head modules **2** is four, but the number of head modules **2** is not limited thereto and may be one to three, or five or more. Each head module **2** includes a chip **20** and a flow path opening forming member **25**. The chip **20** includes the plurality of nozzles N that eject the ink. The flow path opening forming member **25** is positioned in the Z**2** direction with respect to the chip **20** and supplies the ink to the chip **20**. The flow path opening forming member **25** and the chip **20** are fixed to each other with, for example, an adhesive or the like. For example, the flow path opening forming member **25** may be a member having a thickness of 3000 μm or more, a member having a thickness of 5000 μm or more, or a member having a thickness of 8000 μm or more. The flow path opening forming member **25** may be formed using one member or may be formed by stacking a plurality of members. The flow path opening forming member **25** may be made of a resin or may be made of a metal. Further, the flow path opening forming member **25** may contain a resin and a metal.

[0042] The supply flow path member **3** is positioned in the Z**2** direction with respect to the plurality of head modules **2**. The supply flow path member **3** is common to the plurality of head modules **2**. The supply flow path member **3** includes a supply flow path for supplying the ink to each head module **2**. The supply flow path is a flow path common to the plurality of head modules **2**. A material of the supply flow path member **3** is, for example, a resin or a metal such as stainless steel.

[0043] The plurality of sealing members **4** are disposed between each head module **2** and the supply flow path member **3**. The plurality of sealing members **4** are provided for each head module **2**. The sealing member **4** is sandwiched between the head module **2** and the supply flow path member **3** in the Z**1** direction and is compressed by the head module **2** and the supply flow path member **3**. The plurality of sealing members **4** are members that liquid-tightly couple flow paths between each head module **2** and the supply flow path member **3**. The sealing member **4** has elasticity. A material of the sealing member **4** is, for example, an elastic material such as an elastomer. In the present embodiment, a length of the sealing member **4** along the Z axis, that is, a thickness, is uniform. The thickness of the sealing member **4** is smaller than a thickness of the flow path opening forming member **25**.

[0044] The supply flow path member **3** houses and holds the plurality of head modules **2**. The supply flow path member **3** has a recess formed in the Z**2** direction on a bottom surface facing the Z**1** direction, and the plurality of head modules **2** are disposed in an internal space formed inside the recess.

[0045] The cover **5** is a flat-plate-shaped member provided in the Z**1** direction with respect to the plurality of head modules **2**, and holds the plurality of head modules **2** together with the supply flow path member **3**. A material of the cover **5** is, for example, a metal such as stainless steel. Further, the cover **5** has an opening **5**H, which is a through-hole formed for each head module **2**.

[0046] The relay substrate **7** is a substrate on which mounted components that electrically couple the above-described control unit **71** and a wiring substrate **209** (described below) provided on each head module **2** to each other are mounted. The relay substrate **7** has a flat plate shape along an X-Y plane and is disposed between the supply flow path member **3** and the case **62**. Although not illustrated, the relay substrate **7** has a through-hole communicating with the flow path of the supply flow path member **3**.

[0047] The flow path member **60** is disposed in the Z**2** direction with respect to the relay substrate **7**. The flow path member **60** includes a flow path for supplying the ink to the flow path of the supply flow path member **3** through the through-hole provided in the relay substrate **7**. A material of the flow path member **60** is, for example, a resin.

[0048] The case **62** is a member that houses the flow path member **60**. The case **62** has a hole that penetrates along the Z axis, and the flow path member **60** is disposed in an internal space formed inside the hole. Although not illustrated, the case **62** is coupled to the supply flow path member **3** and holds the supply flow path member **3**. A method of coupling the case **62** and the supply flow path member **3** to each other is not particularly limited. The case **62** and the supply flow path member **3** may be coupled to each other using any member such as an adhesive, a screw, or an engagement member. Although not illustrated, the case **62** has an opening through which a wiring member for electrically coupling the relay substrate **7** and the control unit **91** is inserted. Although not illustrated, the case **62** has a through-hole for supplying the ink to the flow path member **60** from the liquid storage section **9**. A material of the case **62** is, for example, a resin or a metal such as aluminum or stainless steel.

[0049] The liquid ejecting head **1** in FIG. **2** described above is an example. The liquid ejecting head **1** according to the present embodiment includes all the elements illustrated in FIG. **2**, but the components of the liquid ejecting head **1** do not need to include all the elements, and may further include additional elements.

[0050] FIG. **3** is a bottom view of the liquid ejecting head **1** illustrated in FIG. **2**. As illustrated in FIG. **3**, the plurality of nozzles N of the head module **2** are exposed through the opening **5**H of the cover **5**. The plurality of nozzles N of each head module **2** are arranged along the Y axis. The plurality of nozzles N are divided into nozzle rows La and Lb arranged in parallel at an interval along the X axis. Each of the nozzle rows La and Lb is a set of nozzles N arranged in a straight line along the Y axis. A surface of the head module **2** on which openings of the plurality of nozzles N are formed is referred to as a nozzle surface SN. The nozzle surface SN is a surface of the chip **20** of the head module **2** that faces the Z**1** direction. For example, the plurality of nozzles N may be arranged in a direction intersecting the X axis and the Y axis when viewed in the Z**1** direction.

1-3. Chip **20**

[0051] FIG. **4** is a cross-sectional view of the chip **20** of the head module **2** illustrated in FIG. **2**. As illustrated in FIG. **4**, the chip **20** is disposed in the Z**1** direction with respect to the flow path opening forming member **25**. The chip **20** has a structure in which elements related to each nozzle N of the nozzle row La and elements related to each nozzle N of the nozzle row Lb are arranged in approximate plane symmetry. Hereinafter, when there is no need to distinguish between the nozzle row La and the nozzle row Lb, the nozzle row La and the nozzle row Lb will be referred to as nozzle row L. In the following description, a configuration corresponding to the nozzles N of one nozzle row La or Lb will be mainly described.

[0052] As illustrated in FIG. **4**, the chip **20** of each head module **2** includes, for example, a communication plate **202**, a pressure chamber substrate **203**, a diaphragm **204**, a nozzle plate **201**, a vibration absorber **206**, a plurality of driving elements E, and a sealing substrate **205**.

[0053] Each of the communication plate **202**, the pressure chamber substrate **203**, the diaphragm **204**, the nozzle plate **201**, and the vibration absorber **206** is a plate-shaped member that is elongated along the Y axis. The pressure chamber substrate **203** is installed on a surface of the communication plate **202** in the Z**2** direction. The nozzle plate **201** and the vibration absorber **206** are installed on a surface of the communication plate **202** in the Z**1** direction. For example, the respective members are fixed to each other with an adhesive.

[0054] The nozzle plate **201** is a plate-shaped member in which the plurality of nozzles N are formed. The nozzle plate **201** is a member positioned furthest in the Z**1** direction in the head module **2**. A surface of the nozzle plate **201** that faces the Z**1** direction is the nozzle surface SN. Each of the plurality of nozzles N is a circular through-hole through which the ink is ejected. For example, the nozzle plate **201** is manufactured by processing a silicon (Si) single crystal substrate using semiconductor manufacturing techniques such as photolithography and etching.

[0055] The communication plate **202** includes a plurality of throttling portions R**1**, a plurality of communication flow paths R**2**, a communication space Ra, and a common flow path Rb. Each of the throttling portions R**1** and the communication flow paths R**2** extends in the Z**1** direction and is a through-hole formed for each nozzle N. The communication flow path R**2** overlaps the nozzle N in plan view. The communication space Ra is an opening formed so as to be elongated along the Y axis. The communication space Ra extends along the Y axis. The common flow path Rb communicates with the communication space Ra and overlaps the communication space Ra in plan view. The common flow path Rb extends along the Y axis. The common flow path Rb communicates with the plurality of throttling portions R**1**. The communication space Ra also communicates with a space Rc of the flow path opening forming member **25**.

[0056] The communication space Ra, the common flow path Rb, and the space Rc form a common space R common to the plurality of nozzles N. The common space R functions as an ink reservoir. The ink stored in the common space R branches into the throttling portions R**1** and is supplied to and filled in parallel into a plurality of pressure chambers C**0**.

[0057] The plurality of pressure chambers C**0** are formed in the pressure chamber substrate **203**. The pressure chamber C**0** is a space positioned between the communication plate **202** and the diaphragm **204** and formed by a wall surface of the pressure chamber substrate **203**. The pressure chamber C**0** is formed for each nozzle N. The pressure chamber C**0** is an elongated space extending in the X**1** direction. The plurality of pressure chambers C**0** are arranged along the Y axis.

[0058] The communication plate **202** and pressure chamber substrate **203** are manufactured by processing a semiconductor substrate such as a silicon single crystal substrate.

[0059] The elastically deformable diaphragm **204** is disposed on the pressure chamber C**0**. The diaphragm **204** is stacked on the pressure chamber substrate **203** and is in contact with a surface of the pressure chamber substrate **203** that is opposite to the communication plate **202**. The diaphragm **204** is a plate-shaped member having a rectangular shape that is elongated along the Y axis in plan view. The pressure chamber C**0** communicates with the communication flow path R**2** and the throttling portion R**1**. Therefore, the pressure chamber C**0** communicates with the nozzle N through the communication flow path R**2** and communicates with the communication space Ra through the throttling portion R**1**. The nozzle N, the communication flow path R**2**, the pressure chamber C**0**, and the throttling portion R**1** form an individual flow path for each nozzle N. For ease of explanation, the pressure chamber substrate **203** and the diaphragm **204** are illustrated as separate substrates in FIG. **4**, but in actual implementation, the pressure chamber substrate **203** and the diaphragm **204** are stacked as a single silicon substrate.

[0060] The driving element E is formed for each pressure chamber C**0** on a surface of the diaphragm **204** that is opposite to the pressure chamber C**0**. The driving element E is a piezoelectric element that is elongated along the X axis in plan view. The driving element E includes, for example, a pair of electrodes and a piezoelectric body sandwiched between the pair of electrodes. The driving element E may be an electrothermal conversion element that generates thermal energy.

[0061] The sealing substrate **205** is a structure that protects the plurality of driving elements E. The sealing substrate **205** is fixed to a surface of the diaphragm **204** with, for example, an adhesive. The plurality of driving elements E are housed inside a recess formed on a surface of the sealing substrate **205** that faces the diaphragm **204**. Further, the sealing substrate **205** also has a through-hole **21**H for inserting the wiring substrate **209**.

[0062] The wiring substrate **209** is bonded to the diaphragm **204**. The wiring substrate **209** protrudes from the diaphragm **204** in the Z**2** direction. The wiring substrate **209** is a mounted component on which a plurality of wirings for electrically coupling the chip **20** and the relay substrate **7** are formed. The wiring substrate **209** is, for example, a flexible substrate such as a flexible printed circuit (FPC) or a chip on film (COF), or a rigid substrate. A drive signal and a reference voltage for driving the driving element E are supplied from the wiring substrate **209** to each driving element E.

[0063] The vibration absorber **206** is a thin metal plate that forms a wall surface of the common flow path Rb. The vibration absorber **206** has a thickness similar to that of the nozzle plate **201**. A planar shape of the vibration absorber **206** is, for example, a frame shape that surrounds the nozzle plate **201**. A mold **207** made of a resin is provided between the vibration absorber **206** and the nozzle plate **201**. The vibration absorber **206** is a flexible film forming a wall surface of the communication space Ra, and absorbs variation in pressure of the ink in the common space R. As the vibration absorber **206** is provided, a natural frequency of a flow path from the nozzle N to the throttling portion R**1** through the pressure chamber C**0** is stabilized regardless of the driven nozzle N. In addition, a frame **501** is bonded between the vibration absorber **206** and the above-described cover **5** with an adhesive or the like. The frame **501** is a frame-shaped member formed around an outer periphery of the vibration absorber **206**. A material of the frame **501** is, for example, a metal.

[0064] In such a chip **20**, when the driving element E contracts due to energization, the diaphragm **204** is bent and deflected in such a way as to reduce a volume of the pressure chamber C**0**, and a force inside the pressure chamber C**0** increases, causing ink droplets to be ejected from the nozzle N. At this time, a pressure also propagates from the pressure chamber C**0** toward the throttling portion R**1**, and the ink also flows into the common flow path Rb through the throttling portion R**1**. After the ink is ejected, the driving element E is restored to an original position thereof. At this time, the ink in the common flow path Rb from the nozzle N also vibrates. Then, a meniscus of the nozzle Nis restored, and at the same time, the ink is supplied from the throttling portion R**1**. The ink is ejected from the nozzle N through the above-described series of operations.

[0065] The chip **20** according to the present embodiment includes all the elements illustrated in FIG. **3**, but the components of the chip **20** do not need to include all the elements, and may further include additional elements.

[0066] The chip **20** has, for example, a monolithic structure, is a member thinner than the flow path opening forming member **25**, and is, for example, a component having a thickness of less than 3000 μm. The chip **20** may be a component having a thickness of 1500 μm or less, or 1000 μm or less. The thickness of the chip **20** may be ⅕ or less of a length of a short side of the chip **20** when viewed in a direction along the Z axis, the direction being a thickness direction of the chip **20**. Furthermore, it is sufficient if the chip **20** includes at least one element among the nozzle plate **201**, the pressure chamber substrate **203**, the communication plate **202** or the driving element E, and the sealing substrate **205**. The chip **20** may include at least the nozzle plate **201**, may further include the pressure chamber substrate **203**, and may further include the communication plate **202**. At least one of the nozzle plate **201**, the pressure chamber substrate **203**, the communication plate **202** or the pressure chamber substrate **203** on which the driving element E is stacked, and the sealing substrate **205** may be regarded as the chip **20**. Further, the chip **20** may also be a stacked body of ceramic sheets or thin plates such as metal plates, or a stacked body in which thin plate-shaped members of the above-described materials are stacked, in addition to a stacked body of silicon substrates manufactured by micro-electromechanical systems (MEMS).

1-4. Flow Path Opening Forming Member **25**

[0067] As illustrated in FIG. **4**, the flow path opening forming member **25** is disposed in the Z**2** direction with respect to the chip **20**. The flow path opening forming member **25** has the through-hole **21**H. The through-hole **21**H overlaps a through-hole **20**H of the sealing substrate **205** in plan view. The wiring substrate **209** is inserted into the through-hole **21**H.

[0068] A flow path **25**R is formed inside the flow path opening forming member **25**. The flow path **25**R is provided to supply the ink to the chip **20**. The space Rc is provided on a chip **20** side of the flow path **25**R, that is, the space Rc is provided downstream of the flow path **25**R. The flow path **25**R and the space Rc communicate with each other.

[0069] FIG. **5** is a view illustrating the head module **2**, the supply flow path member **3**, and the sealing member **4** illustrated in FIG. **2**. As illustrated in FIG. **5**, the flow path **25**R of the flow path opening forming member **25** has a plurality of flow path openings **25**H on a side of the flow path **25**R that is opposite to the chip **20**, that is, the plurality of flow path openings **25**H are provided upstream of the flow path **25**R. Therefore, the flow path openings **25**H are formed in the flow path opening forming member **25**. Each flow path opening **25**H is an opening end of the flow path **25**R in the Z**2** direction. The flow path openings **25**H are openings for coupling the flow path **25**R of the flow path opening forming member **25** of the head module **2** and a flow path **3**R of the supply flow path member **3** described below.

[0070] The flow path opening forming member **25** also has a plurality of fixing holes **251**. The fixing holes **251** are bottomed holes provided on a surface of the flow path opening forming member **25** that faces the Z**2** direction, and can also be considered as recesses, that is, depressions. A fixing member **150** for fixing the head module **2** and the supply flow path member **3** is inserted into each fixing hole **251**.

[0071] Although not illustrated, a planar shape of the flow path opening forming member **25** is approximately equal to a planar shape of the chip **20**.

1-5. Supply Flow Path Member **3**

[0072] As illustrated in FIG. **5**, the supply flow path member **3** includes the flow path **3**R. The flow path **3**R supplies the ink to each head module **2** and distributes the ink to each head module **2**. The flow path **3**R is a common flow path that is common to the plurality of head modules **2**, and includes a common portion **3**RA extending along the X axis and a plurality of branch portions **3**RB branching from the common portion **3**RA and extending in the Z**1** direction. Although not illustrated, a flow path joint for communicating with the liquid storage section **9** via the flow path member **60** is provided on the supply flow path member **3**. The flow path joint is exposed to the outside of the liquid ejecting head **1**, for example, through an opening (not illustrated) formed in the supply flow path member **3**.

[0073] A flow path opening **3**H is provided on a head module **2** side of the flow path **3**R, that is, the flow path opening **3**H is provided downstream of the flow path **3**R. The flow path opening **3**H is an opening end of the flow path **3**R in the Z**1** direction. The flow path opening **3**H is provided corresponding to the flow path opening **25**H described above.

[0074] Further, the supply flow path member **3** also has a plurality of fixing holes **31**. Each fixing hole **31** is a hole that penetrates through the supply flow path member **3** in a direction along the Z axis, the direction being a thickness direction of the supply flow path member **3**. The fixing member **150** is inserted into each fixing hole **31**.

[0075] The fixing member **150** fixes the supply flow path member **3** and the flow path opening forming member **25**. The fixing member **150** is, for example, a screw. In this case, a female screw is formed on each inner peripheral wall surface on which the fixing hole **251** is formed. Since the fixing member **150** is a screw, the supply flow path member **3** and the flow path opening forming member **25** can be easily fixed and released by rotating and screwing the screw. Furthermore, since the fixing member **150** is a screw, the flow path opening forming member **25** can be detachably fixed to the supply flow path member **3** without using an adhesive.

[0076] The fixing member **150** may be a member other than a screw, and may include, for example, an L-shaped or T-shaped pin whose tip in the Z**1** direction is bent at a right angle and an elastic member such as a leaf spring or a coil spring, and may be configured to fix the supply flow path member **3** and the flow path opening forming member **25** by using an elastic force of the elastic member.

1-6. Sealing Member **4**

[0077] As illustrated in FIG. **5**, each sealing member **4** has a communication port **4**H. The communication port **4**H is provided corresponding to the flow path opening **25**H of the flow path opening forming member **25** and the flow path opening **3**H of the supply flow path member **3**. Although not illustrated in detail, the communication port **4**H overlaps each of the flow path opening **3**H and the flow path opening **25**H when viewed in the Z**1** direction. The communication port **4**H is coupled to the flow path **25**R via the flow path opening **25**H. The communication port **4**H is coupled to the flow path **3**R via the flow path opening **3**H. Therefore, the flow path **25**R and the flow path **3**R communicate with each other via the communication port **4**H.

[0078] The sealing member **4** is a member that is sandwiched between the head module **2** and the supply flow path member **3** in the Z**1** direction, thereby liquid-tightly coupling the flow path opening **25**H of the head module **2** and the flow path opening **3**H of the supply flow path member **3**. The sealing member **4** is compressed between the flow path opening forming member **25** and the supply flow path member **3**, so that the flow path **25**R and the flow path **3**R communicate with each other via the communication port **4**H. The ink flowing through the flow path **3**R of the supply flow path member **3** flows into the flow path **25**R of the flow path opening forming member **25** via the communication port **4**H, and is supplied to the individual flow path of the chip **20** via the common space R.

[0079] The sealing member **4** also has a sealing region **4**S. In the present embodiment, the entire region of the sealing member **4** corresponds to the sealing region **4**S. The sealing region **4**S is in contact with both the flow path opening forming member **25** and the supply flow path member **3** and is a region of the sealing member **4** that is sandwiched between the flow path opening forming member **25** and the supply flow path member **3**. The sealing region **4**S is a region that is compressed by a load from the flow path opening forming member **25** and the supply flow path member **3** in order to liquid-tightly couple the flow path opening **25**H and the flow path opening **3**H to each other. In other words, even when the sealing region **4**S is the region of the sealing member **4** that is sandwiched between the flow path opening forming member **25** and the supply flow path member **3**, a portion that is not compressed by the load from the flow path opening forming member **25** and the supply flow path member **3** and does not substantially contribute to liquid-tightly coupling the flow path opening **25**H and the flow path opening **3**H to each other is not included in the sealing region **4**S.

[0080] FIG. **6** is a plan view of the head module **2** and the sealing member **4** illustrated in FIG. **2**. As illustrated in FIG. **6**, four sealing members **4** are provided for each head module **2**. The four sealing members **4** are provided at both end portions of one head module **2** in a longitudinal direction. Each sealing member **4** is circular when viewed in the Z**1** direction, and may be polygonal or the like. The through-hole **21**H of the flow path opening forming member **25** described above is provided at the center of the flow path opening forming member **25** in plan view. Each sealing member **4** is positioned in the Y**1** direction or the Y**2** direction with respect to the through-hole **21**H when viewed in the Z**1** direction. In the illustrated example, each sealing member **4** is disposed at a corner of a quadrangular shape when viewed in the Z**1** direction.

[0081] The fixing member **150** is provided near the sealing member **4**. Four fixing members **150** are provided for each head module **2**. The four fixing members **150** are provided at both end portions of one head module **2** in the longitudinal direction. Each fixing member **150** is closer to the through-hole **21**H than the sealing member **4** positioned in the vicinity thereof when viewed in the Z**1** direction. In the illustrated example, each fixing member **150** is disposed at a corner of the quadrangular shape when viewed in the Z**1** direction.

[0082] As illustrated in FIG. **6**, the planar shape of the flow path opening forming member **25** is approximately equal to the planar shape of the chip **20** indicated by a broken line.

[0083] The sealing member **4** and the sealing region **4**S overlap the chip **20** when viewed in the Z**2** direction. Further, as illustrated in FIG. **5**, the dimension B of a portion of the flow path opening forming member **25** that overlaps the sealing region **4**S in the Z**1** direction is larger than a distance A, which is the shortest distance between the sealing region **4**S and the fixing member **150** when viewed in the Z**2** direction. Therefore, the liquid ejecting head **1** can be reduced in size as compared to a case where the sealing region **4**S does not overlap the chip **20**, and since the dimension B is larger than the distance A, an effect of a reaction force of the sealing member **4** is less likely to act on the chip **20** as compared to a case where the dimension B is smaller than the distance A. Therefore, warping or the like is less likely to occur in the chip **20**. Therefore, reliability of the head module **2** can be improved. The dimension B is a length of the portion of the flow path opening forming member **25** in the Z**1** direction, the portion overlapping the sealing region **4**S when viewed in the Z**1** direction.

[0084] Furthermore, the fixing member **150** overlaps the chip **20** when viewed in the Z**1** direction. Therefore, the liquid ejecting head **1** can be further reduced in size as compared to a case where the fixing member **150** does not overlap the chip **20**.

[0085] Furthermore, the sealing region **4**S and the fixing member **150** do not overlap each other when viewed in the Z**2** direction, but are spaced apart from each other. Therefore, it is easier to dispose the flow path, the sealing member **4**, and the fixing member **150** as compared to a case where the sealing region **4**S and the fixing member **150** overlap each other.

[0086] The dimension B may be larger than twice the distance A, and may be larger than three times the distance A. As a result, it is possible to significantly exert the above-described effects.

[0087] A dimension C of a portion of the flow path opening forming member **25** that overlaps the fixing member **150** in the Z**1** direction is larger than the distance A. As the dimension C is larger than the distance A, damage to the flow path opening forming member **25** at a fixing position of the fixing member **150** due to the reaction force of the sealing member **4** can be prevented as compared to a case where the dimension C is smaller than the distance A. The dimension C may be larger than twice the distance A, and may be larger than three times the distance A. Here, as illustrated in FIG. **5**, the dimension C is a dimension of the largest portion of the flow path opening forming member **25** in the Z**1** direction, the largest portion of the flow path opening forming member **25** overlapping the fixing member **150** when viewed in the Z**1** direction. However, the dimension C may also be a dimension of the smallest portion of the flow path opening forming member **25** in the Z**1** direction, the smallest portion of the flow path opening forming member **25** overlapping the fixing member **150** when viewed in the Z**1** direction. In this case, the dimension C corresponds to a distance from a bottom surface of the fixing hole **251** to a tip surface of the flow path opening forming member **25** in the Z**1** direction. The dimension C may be equal to or smaller than the distance A.

[0088] As described above, the liquid ejecting head **1** includes the plurality of head modules **2**. For example, the head module **2** positioned at the leftmost position in FIG. **6** is a “first head module **2***a*”. The head module **2** positioned to the right of the first head module **2***a* is a “second head module **2***b*”. In this case, the flow path opening forming member **25** of the first head module **2***a* is a “first flow path opening forming member **25***a*”, and the flow path opening forming member **25** of the second head module **2***b* is a “second flow path opening forming member **25***b*”. The flow path opening **25**H formed in the first flow path opening forming member **25***a* is a “first flow path opening **25**Ha”, and the flow path opening **25**H formed in the second flow path opening forming member **25***b* is a “second flow path opening **25**Hb”. The chip **20** of the first head module **2***a* is a “first chip **20***a*”, and the chip **20** of the second head module **2***b* is a “second chip **20***b*”. The sealing member **4** that liquid-tightly couples the first flow path opening **25**Ha and the flow path opening **3**H of the supply flow path member **3** to each other between the first head module **2***a* and the supply flow path member **3** in the Z**1** direction is a “first sealing member **4***a*”. The sealing member **4** that liquid-tightly couples the second flow path opening **25**Hb and the flow path opening **3**H of the supply flow path member **3** to each other between the second head module **2***b* and the supply flow path member **3** in the Z**1** direction is a "second sealing member **4***b*". The sealing region **4**S of the first sealing member **4***a* is a "first sealing region **4**Sa", and the sealing region **4**S of the second sealing member **4***b* is a "second sealing region **4**Sb". The fixing member **150** that fixes the supply flow path member **3** and the first flow path opening forming member **25***a* is a "first fixing member **150***a*", and the fixing member **150** that fixes the supply flow path member **3** and the second flow path opening forming member **25***b* is a "second fixing member **150***b*".

[0089] The dimension B of the portion of the first flow path opening forming member **25***a* sandwiched between the first chip **20***a* and the first sealing member **4***a* in the Z**1** direction is a "first dimension B**1**". The dimension B of the portion of the second flow path opening forming member **25***b* sandwiched between the second chip **20***b* and the second sealing member **4***b* in the Z**1** direction is a "second dimension B**2**". The distance A between the first sealing region **4**Sa and the first fixing member **150***a* when viewed in the Z**1** direction is a "first distance A**1**". The distance A between the second sealing region **4**Sb and the second fixing member **150***b* when viewed in the Z**1** direction is a "second distance A**2**".

[0090] The first dimension B**1** is larger than the first distance A**1**. The second dimension B**2** is larger than the second distance A**2**. As described above, in each of the plurality of head modules **2**, the dimension B is larger than the distance A, and thus, the effect of the reaction force of the sealing member **4** is less likely to act on the chip **20** as compared to a case where the dimension B is smaller than the distance A. Therefore, the reliability of the plurality of head modules **2** can be improved, and therefore the reliability of the liquid ejecting head **1** can be improved.

2. Modified Examples

[0091] The first embodiment exemplified above can be modified in various ways. Specific modified aspects that can be applied to the first embodiment described above are described below by way of example. Two or more aspects arbitrarily selected from the following examples can be appropriately and compatibly combined.

2-1. First Modified Example

[0092] FIG. **7** is a plan view of a sealing member **4** and a fixing member **150** according to a first modified example. FIG. **8** is a cross-sectional view of the sealing member **4** and the fixing member **150** according to the first modified example. In the first modified example illustrated in FIG. **7**, two sealing members **4** are provided for each head module **2**. Each sealing member **4** is disposed between two adjacent fixing members **150** when viewed in the Z**1** direction.

[0093] For example, in FIG. **7**, the fixing member **150** positioned in the X**1** direction with respect to one sealing member **4** is a "first fixing member **150***a*", and the fixing member **150** positioned in the X**2** direction with respect to the one sealing member **4** is a "third fixing member **150***c*".

[0094] As illustrated in FIG. **8**, the dimension B is larger than both a distance A (first distance A**1**) between a sealing region **4**S and the first fixing member **150***a* when viewed in the Z**2** direction and a distance A between the sealing region **4**S and the third fixing member **150***c* when viewed in the Z**2** direction. Therefore, it is possible to suppress the effect of the reaction force of the sealing member **4** acting on the chip **20**. In addition, as illustrated in FIG. **7**, the third fixing member **150***c* is not positioned on a half line L**1** extending from the sealing region **4**S toward the first fixing member **150***a* when viewed in the Z**2** direction. With the first fixing member **150***a* and the third fixing member **150***c*, the sealing member **4** can be held down at different positions in the sealing region **4**S, so that the effect of the reaction force of the sealing member **4** on the chip **20** can be effectively suppressed. The third fixing member **150***c* may be positioned on the half line L**1**.

[0095] In particular, the sealing region **4**S is disposed between the first fixing member **150***a* and the third fixing member **150***c* when viewed in the Z**1** direction. Therefore, it is possible to particularly effectively suppress the effect of the reaction force of the sealing member **4** acting on the chip **20**.

2-2. Second Modified Example

[0096] FIG. **9** is a plan view of a sealing member **4** and a fixing member **150** according to a second modified example. FIG. **10** is a cross-sectional view of the sealing member **4** and the fixing member **150** according to the second modified example. The second modified example will be mainly described with respect to the differences from the first modified example.

[0097] A planar shape of the sealing member **4** according to the second modified example illustrated in FIG. **9** is much larger than that of the first modified example. The sealing member **4** according to the second modified example has a through-hole **45** for inserting the fixing member **150**. The through-hole **45** is provided for each fixing member **150**. Specifically, the sealing member **4** has the through-hole **45** through which a first fixing member **150***a* is inserted and the through-hole **45** through which a third fixing member **150***c* is inserted.

[0098] Also in the present modified example, the dimension B is larger than both a distance A between a sealing region **4**S and the first fixing member **150***a* when viewed in the Z**2** direction and a distance A between the sealing region **4**S and the third fixing member **150***c* when viewed in the Z**2** direction. Therefore, it is possible to suppress the effect of the reaction force of the sealing member **4** acting on the chip **20**.

2-3. Third Modified Example

[0099] FIG. **11** is a plan view of a sealing member **4** and a fixing member **150** according to a third modified example. The third modified example will be mainly described with respect to the differences from the first modified example. In the modified example illustrated in FIG. **11**, four fixing members **150** are provided at both end portions of one head module **2** in a transverse direction. Also with such an arrangement, it is possible to suppress the effect of the reaction force of the sealing member **4** acting on the chip **20**.

2-4. Fourth Modified Example

[0100] FIG. **12** is a plan view of a sealing member **4** and a fixing member **150** according to a fourth modified example. In the fourth modified example illustrated in FIG. **12**, three or more adjacent fixing members **150** are provided for one sealing member **4**. Specifically, a first fixing member **150***a*, a third fixing member **150***c*, and a fourth fixing member **150***d* are provided. Each fixing member **150** fixes the supply flow path member **3** and the flow path opening forming member **25**.

[0101] Although some detailed illustrations are omitted, for each fixing member **150**, a distance A from a sealing region **4**S when viewed in the Z**2** direction is smaller than the dimension B. Therefore, it is possible to suppress the effect of the reaction force of the sealing member **4** acting on the chip **20**.

[0102] Furthermore, as illustrated in FIG. **12**, the sealing region **4**S is disposed inside the smallest protruding polygon K**0** that contains the plurality of fixing members **150** when viewed in the Z**2** direction. Therefore, it is possible to particularly effectively suppress the effect of the reaction force of the sealing member **4** acting on the chip **20**. The protruding polygon K**0** is a triangle in the illustrated example. The protruding polygon K**0** varies depending on the number of fixing members **150**. The protruding polygon K**0** circumscribes the respective fixing members **150**. In addition, the number of fixing members **150** for one sealing region **4**S is not particularly limited, and may be, for example, three to five.

2-5. Fifth Modified Example

[0103] FIG. **13** is a plan view of a sealing member **4** and a fixing member **150** according to a fifth modified example. In the fifth modified example illustrated in FIG. **13**, two sealing members **4** are provided between two adjacent fixing members **150**. A set of two adjacent fixing members **150** and two sealing members **4** disposed between the two adjacent fixing member **150** is provided at an end portion of the head module **2** in the longitudinal direction. In addition, a through-hole **21**H for inserting the wiring substrate **209** is provided at an end portion of the head module **2** in the longitudinal direction, not at the center of the head module **2**, when viewed in the Z**1** direction.

2-6. Sixth Modified Example

[0104] FIG. **14** is a cross-sectional view of a sealing member **4** and a fixing member **150** according to a sixth modified example. FIG. **15** is a plan view of a head module **2** according to the sixth modified example. In the sixth modified example illustrated in FIG. **14**, a stepped surface is provided on a surface of a flow path opening forming member **25** of the head module **2** that faces the Z**2** direction. For example, the flow path opening forming member **25** according to the sixth modified example includes a first member **255** and a second member **256**. The second member **256** is disposed in the Z**2** direction with respect to the first member **255**. Each of the first member **255** and the second member **256** is elongated along the Y axis. Further, as illustrated in FIG. **15**, a length of the first member **255** along the Y axis is larger than a length of the second member **256** along the Y axis. The first member **255** has a portion extending in the Y**1** and Y**2** directions with respect to the second member **256** when viewed in the Z**1** direction, and the portion does not overlap the second member **256** when viewed in the Z**1** direction.

[0105] A plurality of sealing members **4** are provided on a surface of the second member **256** in the Z**2** direction. The plurality of sealing members **4** are provided at both end portions of the second member **256** in a longitudinal direction. A plurality of fixing holes **251** are provided at a portion of the first member **255** that does not overlap the second member **256** when viewed in the Z**1** direction. Therefore, the portion of the first member **255** that does not overlap the second member **256** when viewed in the Z**1** direction has a fixing position of the flow path opening forming member **25** where a fixing member **150** is fixed. As illustrated in FIG. **14**, a gap equal to a length of the second member **256** along the Z axis is provided between the first member **255** and the supply flow path member **3**.

[0106] Although not illustrated in detail, the second member **256** has the same shape and area as the chip **20** when viewed in the Z**1** direction, and overlaps the chip **20** when viewed in the Z**1** direction. On the other hand, the portion of the first member **255** that does not overlap the second member **256** when viewed in the Z**1** direction does not overlap the chip **20** when viewed in the Z**1** direction. Therefore, the plurality of fixing holes **251** are provided at the portion of the first member **255** that does not overlap the second member **256** when viewed in the Z**1** direction, and a plurality of fixing members **150** do not overlap the chip **20** when viewed in the Z**1** direction.

[0107] As illustrated in FIG. **14**, in the sixth modified example, the dimension B is larger than the shortest distance D between a sealing region **4**S and the fixing position of the flow path opening forming member **25** where the fixing member **150** is fixed. Therefore, it is possible to prevent twisting in the rotation direction from the fixing position of the flow path opening forming member **25** as a base point as compared to a case where the dimension B is smaller than the shortest distance D.

[0108] For example, when the fixing member **150** is a screw, the fixing position is a location where a fixing force of the fixing member **150** acts directly on the flow path opening forming member **25**, such as a contact position between the fixing member **150** and an edge that forms an opening of the fixing hole **251** of the flow path opening forming member **25**. The dimension B may be equal to or smaller than the shortest distance D.

[0109] Also in the present modified example, the dimension B is larger than a distance A between the sealing region **4**S and the first fixing member **150***a* when viewed in the Z**2** direction. Therefore, it is possible to suppress the effect of the reaction force of the sealing member **4** acting on the chip **20**.

2-7. Seventh Modified Example

[0110] FIG. **16** is a plan view of a sealing member **4** and a fixing member **150** according to a seventh modified example. FIG. **17** is a cross-sectional view of the sealing member **4** and the fixing member **150** according to the seventh modified example. In the seventh modified example illustrated in FIGS. **16** and **17**, one fixing member **150** is provided between two sealing members **4** adjacent to each other when viewed in the Z**1** direction.

[0111] For example, one of the two sealing members **4** adjacent to each other when viewed in the Z**1** direction is a “first sealing member **4***a*”, and the other is a “third sealing member **4***c*”. In this case, a sealing region **4**S of the first sealing member **4***a* is a “first sealing region **4**Sa”, and a sealing region **4**S of the third sealing member **4***c* is a “third sealing region **4**Sc”. In addition, a communication port **4**H of the first sealing member **4***a* is a "first communication port **4**Ha", and a communication port **4**H of the third sealing member **4***c* is a "third communication port **4**Hc". The flow path opening **25**H of the flow path opening forming member **25** communicating with the first communication port **4**Ha is a "first flow path opening **25**Ha", and the flow path opening **25**H of the flow path opening forming member **25** communicating with the third communication port **4**Hc is a "third flow path opening **25**Hc". The first sealing member **4***a* and the third sealing member **4***c* are disposed between the first flow path opening forming member **25***a*, which is the same flow path opening forming member **25**, and the supply flow path member **3**. The first sealing region **4**Sa and the third sealing region **4**Sc overlap the chip **20** when viewed in the Z**1** direction.

[0112] In the seventh modified example, the first sealing member **4***a* and the third sealing member **4***c* are fixed in a state of being sandwiched between the flow path opening forming member **25** and the supply flow path member **3** by the fixing member **150** disposed between the first sealing member **4***a* and the third sealing member **4***c*. A dimension B of a portion of the flow path opening forming member **25** that overlaps the first sealing region **4**Sa in the Z**1** direction is larger than a distance A between the first sealing region **4**Sa and the first fixing member **150***a* when viewed in the Z**1** direction. Similarly, a dimension B of a portion of the flow path opening forming member **25** that overlaps the third sealing region **4**Sc in the Z**1** direction is larger than a distance A between the third sealing region **4**Sc and the first fixing member **150***a* when viewed in the Z**1** direction.

[0113] In this way, one fixing member **150** is used for fixing of both of the first sealing member **4***a* and the third sealing member **4***c*, and each dimension B is larger than the distance A. Therefore, the liquid ejecting head **1** can be reduced in size as compared to a case where the fixing member **150** and the sealing member **4** are provided in a one-to-one relationship.

2-8. Eighth Modified Example

[0114] FIG. **18** is a plan view of a head module **2** according to an eighth modified example. FIG. **19** is a cross-sectional view of the head module **2** according to the eighth modified example. The eighth modified example will be mainly described with respect to the differences from the seventh modified example.

[0115] Two flange portions **250** are coupled to a flow path opening forming member **25** of the head module **2** according to the eighth modified example illustrated in FIGS. **18** and **19**. The two flange portions **250** are provided at corner portions of the flow path opening forming member **25** that face each other when viewed in the Z**1** direction. Each flange portion **250** protrudes from the flow path opening forming member **25** in the X**1** direction or the X**2** direction. A surface of each flange portion **250** in the Z**2** direction and a surface of the flow path opening forming member **25** in the Z**2** direction are substantially flush with each other. A thickness of each flange portion **250**, which is a length of the each flange portion **250** along the Z axis, is smaller than a thickness of the flow path opening forming member **25**.

[0116] In the eighth modified example, one fixing member **150** is provided between two sealing members **4** adjacent to each other when viewed in the Z**1** direction. This fixing member **150** is a "first fixing member **150***a*". In addition, another fixing member **150** is provided on one flange portion **250**. The fixing member **150** is a "third fixing member **150***c*". The first fixing member **150***a*, the two sealing members **4**, and the third fixing member **150***c* are positioned on a line segment along the X axis.

[0117] Similarly, a dimension B of a portion of the flow path opening forming member **25** that overlaps the third sealing region **4**Sc in the Z**1** direction is larger than a distance A between the third sealing region **4**Sc and the third fixing member **150***c* when viewed in the Z**1** direction. Also with such an arrangement, it is possible to suppress the effect of the reaction force of the sealing member **4** acting on the chip **20**.

2-9. Ninth Modified Example

[0118] FIG. **20** is a cross-sectional view of a head module **2** according to a ninth modified example. The ninth modified example will be mainly described with respect to the differences from the eighth modified example. In the ninth modified example illustrated in FIG. **20**, two flange portions **250** positioned on the same line segment along the X axis are provided in a flow path opening forming member **25**. Each flange portion **250** is regarded as a part of the flow path opening forming member **25**. The fixing member **150** is provided on each flange portion **250**. In the ninth modified example, unlike the eighth modified example, the fixing member **150** is not provided between the two sealing members **4**. Even with such a configuration, the dimension B is larger than the distance A. Therefore, it is possible to suppress the effect of the reaction force of the sealing member **4** acting on the chip **20**.

2-10. Tenth Modified Example

[0119] FIG. **21** is a cross-sectional view of a sealing member **4** and the vicinity thereof according to a tenth modified example. A thickness of the sealing member **4** according to the tenth modified example illustrated in FIG. **21** is not uniform. The sealing member **4** according to the tenth modified example includes a thick portion **41** and a thin portion **42**. The thick portion **41** is positioned near an inner wall surface that forms a communication port **4**H, and is thicker than the thin portion **42**. The thin portion **42** is positioned on an outer side of the thick portion **41**.

[0120] In the tenth modified example, the thick portion **41** of the sealing member **4** has a sealing region **4**S. The thick portion **41** is in contact with the flow path opening forming member **25** and the supply flow path member **3**, and is sandwiched between the flow path opening forming member **25** and the supply flow path member **3**.

2-11. Eleventh Modified Example

[0121] FIG. **22** is a cross-sectional view of a sealing member **4** and the vicinity thereof according to an eleventh modified example. The sealing member **4** according to the eleventh modified example illustrated in FIG. **22** has a portion that is not in contact with both the supply flow path member **3** and the flow path opening forming member **25**. The sealing member **4** according to the eleventh modified example has a sealing region **4**S in the vicinity of a communication port **4**H. As described above, the sealing member **4** may have a portion that is not in contact with both the supply flow path member **3** and the flow path opening forming member **25** and is not sandwiched between the supply flow path member **3** and the flow path opening forming member **25** depending on the shapes of the supply flow path member **3** and the flow path opening forming member **25**. The portion of the sealing member **4** that is not sandwiched between the supply flow path member **3** and the flow path opening forming member **25** corresponds to the sealing region **4**S.

2-12. Twelfth Modified Example

[0122] In the first embodiment described above, the supply flow path member **3** in which the flow path **3**R is formed and the flow path opening forming member **25** are directly fixed by the fixing member **150**, but the present disclosure is not limited thereto. The supply flow path member **3** may be configured such that a portion in which the flow path **3**R is formed and a portion fixed to the flow path opening forming member **25** via the fixing member **150** are separate from each other.

2-13. Other Modified Examples

[0123] The “liquid ejecting apparatus” can be adopted in various devices such as a facsimile machine and a copy machine in addition to a device dedicated to printing. The use of the liquid ejecting apparatus is not limited to printing. For example, the liquid ejecting apparatus that ejects a solution of a coloring material is used as a producing apparatus that forms a color filter of a display apparatus such as a liquid crystal display panel. Further, the liquid ejecting apparatus that ejects a solution of a conductive material is used as a producing apparatus that forms a wiring or electrode of a relay substrate. Further, the liquid ejecting apparatus that ejects a solution of organic matter related to a living body is used as, for example, a producing apparatus that produces a biochip.

[0124] Although the present disclosure has been described above based on the exemplary embodiments, the present disclosure is not limited to the above-described embodiments. Further, a configuration of each portion according to the present disclosure can be substituted with an appropriate configuration that can implement the same functions as the above-described embodiments, and any appropriate configuration can also be added.

## Claims

**1**. A liquid ejecting head comprising: a first head module that is configure to eject a liquid in a first direction and includes a first flow path opening forming member in which a first flow path opening is formed, and a first chip disposed in the first direction with respect to the first flow path opening forming member; a supply flow path member that supplies the liquid to the first head module; an elastic first sealing member that is sandwiched between the first head module and the supply flow path member in the first direction to liquid-tightly couple the first flow path opening and a flow path opening of the supply flow path member to each other; and a first fixing member that fixes the supply flow path member and the first flow path opening forming member, wherein a first sealing region sandwiched between the first flow path opening forming member and the supply flow path member in the first sealing member overlaps the first chip when viewed in the first direction, and a first dimension of a portion of the first flow path opening forming member that overlaps the first sealing region in the first direction is larger than a first distance between the first sealing region and the first fixing member when viewed in the first direction.
**2**. The liquid ejecting head according to claim 1, wherein the first dimension is larger than twice the first distance.
**3**. The liquid ejecting head according to claim 2, wherein the first dimension is larger than three times the first distance.
**4**. The liquid ejecting head according to claim 1, wherein the first fixing member overlaps the first chip when viewed in the first direction.
**5**. The liquid ejecting head according to claim 1, wherein a dimension of a portion of the first flow path opening forming member that overlaps the first fixing member in the first direction is larger than the first distance.
**6**. The liquid ejecting head according to claim 1, further comprising a third fixing member that fixes the supply flow path member and the first flow path opening forming member, wherein the first dimension is larger than a distance between the first sealing region and the third fixing member when viewed in the first direction, and the third fixing member is not positioned on a half line extending from the first sealing region toward the first fixing member when viewed in the first direction.
**7**. The liquid ejecting head according to claim 6, wherein the first sealing region is disposed between the first fixing member and the third fixing member when viewed in the first direction.
**8**. The liquid ejecting head according to claim 6, further comprising a plurality of fixing members which include three or more fixing members including the first fixing member and the third fixing member, of which a distance to the first sealing region is smaller than the first dimension when viewed in the first direction, and which fix the supply flow path member and the first flow path opening forming member, wherein the first sealing region is disposed inside a smallest protruding polygon that contains the plurality of fixing members when viewed in the first direction.
**9**. The liquid ejecting head according to claim 1, further comprising an elastic third sealing member that is sandwiched between the first head module and the supply flow path member in the first direction to liquid-tightly couple the third flow path opening and the flow path opening of the supply flow path member to each other, wherein the third flow path opening is formed in the first flow path opening forming member, a third sealing region sandwiched between the first flow path opening forming member and the supply flow path member in the third sealing member overlaps the first chip when viewed in the first direction, and a dimension of a portion of the first flow path opening forming member that overlaps the third sealing region in the first direction is larger than a distance between the third sealing region and the first fixing member when viewed in the first

direction.

**10**. The liquid ejecting head according to claim 1, wherein the first sealing region and the first fixing member do not overlap each other when viewed in the first direction.

**11**. The liquid ejecting head according to claim 1, wherein the first dimension is larger than a shortest distance between the first sealing region and a fixing position of the first flow path opening forming member where the first fixing member is fixed.

**12**. The liquid ejecting head according to claim 1, further comprising: a second head module that includes a second flow path opening forming member in which a second flow path opening is formed, and a second chip disposed in the first direction with respect to the second flow path opening forming member; an elastic second sealing member that is sandwiched between the second head module and the supply flow path member in the first direction to liquid-tightly couple the second flow path opening and the flow path opening of the supply flow path member to each other; and a second fixing member that fixes the supply flow path member and the second flow path opening forming member, wherein a second sealing region sandwiched between the second flow path opening forming member and the supply flow path member in the second sealing member overlaps the second chip when viewed in the first direction, and a second dimension of a portion of the second flow path opening forming member that is sandwiched between the second chip and the second sealing member in the first direction is larger than a second distance between the second sealing region and the second fixing member when viewed in the first direction.

**13**. A liquid ejecting apparatus comprising: a plurality of the liquid ejecting heads according to claim 1; and a unit base to which the plurality of liquid ejecting heads are fixed.