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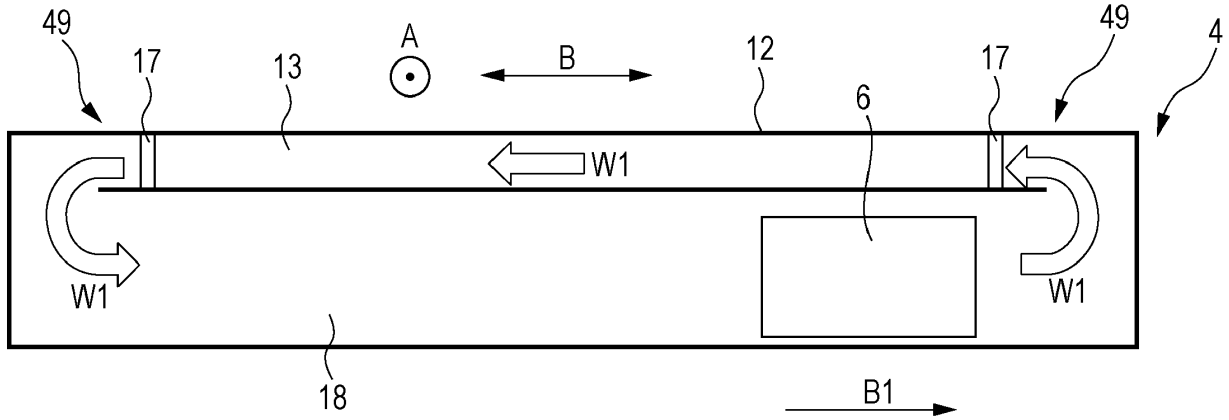
(54) LIQUID DISCHARGING APPARATUS

(57) A liquid discharging apparatus includes a carriage that includes a discharging portion discharging liquid onto a medium and is capable of being moved in a reciprocating direction, a case body that covers a moving region of the carriage, and an airflow receiving chamber that receives airflow generated by reciprocation of the carriage. With such a simple liquid discharging apparatus, mist can be moved from the moving region of the carriage.

FIG. 10A



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Description

BACKGROUND

1. Technical Field

[0001] The present invention relates to a liquid discharging apparatus.

2. Related Art

[0002] In the related art, a liquid discharging apparatus which discharges liquid such as ink onto a medium such as a recording medium is disclosed. In such a liquid discharging apparatus, there is a case in which mist of the liquid is attached to and remains in a discharging portion, or the like of the liquid and the medium is polluted by the mist dropping on the medium. For this reason, a technology in which attaching the mist to the discharging portion, or the like of the liquid is suppressed is disclosed. For example, in JP-A-2004-237691 and JP-A-2014-195887, it is disclosed that the liquid discharging apparatus includes a recovering portion which recovers the mist of ink generated when the ink is discharged from the discharging portion. Moreover, the liquid discharging apparatus, which is disclosed in JP-A-2004-237691 and JP-A-2014-195887, performs recording by reciprocating a carriage including the discharging portion in a reciprocating direction.

[0003] In the liquid discharging apparatus including the carriage that includes the discharging portion discharging the liquid onto the medium and that is capable of being moved in a reciprocating direction, if a large amount of the mist of the liquid is present in the moving region of the carriage, there is a case in which the mist is attached to the medium or a case in which an accuracy of discharging is deteriorated because the mist is attached to the discharging portion, and a quality (for example, recording quality) of the medium to which the liquid is discharged is deteriorated.

[0004] Here, the liquid discharging apparatus, which is disclosed in JP-A-2004-237691 and JP-A-2014-195887, is capable of appropriately moving (recovering) the mist of the ink generated when the ink is discharged from the discharging portion, from the moving region of the carriage; however, a configuration thereof is complicated.

SUMMARY

[0005] An advantage of some aspects of the invention is that mist generated when the liquid is discharged from the discharging portion is moved with a simple configuration from a moving region of a carriage, which includes a discharging portion discharging liquid onto a medium, and can be moved in the reciprocating direction.

[0006] According to a first aspect of the invention, a liquid discharging apparatus includes a carriage that includes a discharging portion discharging liquid onto a medium and that is capable of being moved in the reciprocating direction, a case body that covers a moving region of the carriage, and an airflow receiving chamber that receives airflow generated by reciprocation of the carriage.

[0007] In the recording device according to a second aspect of the invention, the airflow receiving chamber may extend in the reciprocating direction and includes receiving parts of the airflow at both ends of the reciprocating direction.

[0008] In the recording device according to a third aspect of the invention, the airflow receiving chamber may include a capturing portion which is capable of capturing mist generated when the liquid is discharged from the discharging portion.

[0009] In the recording device according to a fourth aspect of the invention, the capturing portion may be a filter in which a part thereof is fixed to an inside of the airflow receiving chamber and is capable of changing a posture thereof by the airflow.

[0010] In the recording device according to a fifth aspect of the invention, the airflow receiving chamber may be capable of exhausting the air.

[0011] In the recording device according to a sixth aspect of the invention, the airflow receiving chamber may include a back-flow preventing portion.

[0012] In the recording device according to a seventh aspect of the invention, an airflow inflow portion that is provided on the moving region in reciprocation of the carriage, and is capable of flowing-in the airflow through a path different from the airflow receiving chamber may be provided.

[0013] According to the invention, the mist generated when the liquid is discharged from the discharging portion can be moved with a simple configuration from the moving region of the carriage which includes the discharging portion discharging the liquid onto the medium and can be moved in the reciprocating direction.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] Embodiments of the invention will now be described by way of example only with reference to the accompanying drawings, wherein like numbers reference like elements.

Fig. 1 is a schematic perspective view illustrating a recording apparatus of Example 1 of the invention.

Fig. 2 is a schematic perspective view illustrating the recording apparatus of Example 1 of the invention.

Fig. 3 is a schematic side sectional view illustrating the recording apparatus of Example 1 of the invention.

Fig. 4 is a schematic perspective view illustrating a carriage of the recording apparatus of Example 1 of the invention.

Fig. 5 is a schematic plan view illustrating the car-

riage of the recording apparatus of Example 1 of the invention.

Fig. 6 is a schematic front view illustrating the carriage of the recording apparatus of Example 1 of the invention.

Fig. 7 is a schematic side view illustrating the carriage of the recording apparatus of Example 1 of the invention.

Fig. 8 is a block diagram illustrating the recording apparatus of Example 1 of the invention.

Fig. 9 is a schematic perspective view illustrating a recording mechanism of the recording apparatus of Example 1 of the invention.

Figs. 10A and 10B are schematic front views illustrating the recording mechanism of the recording apparatus of Example 1 of the invention.

Figs. 11A and 11B are schematic front views illustrating a recording mechanism of a recording apparatus of Example 2 of the invention.

Figs. 12A and 12B are schematic front views illustrating a recording mechanism of a recording apparatus of Example 3 of the invention.

Figs. 13A and 13B are schematic front views illustrating a recording mechanism of a recording apparatus of Example 4 of the invention.

DESCRIPTION OF EXEMPLARY EMBODIMENTS

Example 1 (Fig. 1 to Fig. 10B)

[0015] Hereinafter, a recording apparatus according to an example as a liquid discharging apparatus of the invention will be described in detail with reference to attached drawings.

[0016] First, an outline of a recording apparatus 1 according to Example 1 of the invention will be described.

[0017] Fig. 1 and Fig. 2 are schematic perspective views of the recording apparatus 1 of the example. In addition, Fig. 3 is a perspective side sectional view of the recording apparatus 1 of the example. Also, Fig. 2 illustrates a state in which a part of a configuration member, such as a case body 12 is removed so as to easily describe an inside of the recording apparatus 1.

[0018] The recording apparatus 1 of the example includes a transportation mechanism 3 which transports a recording medium in a transportation direction A by an adhesive belt 2 (endless belt) supporting the recording medium as a medium on a supporting surface attached with an adhesive. In addition, a feeding portion (not illustrated) is included therein which is capable of setting the recording medium of a roll type and feeding the recording medium to the transportation mechanism 3. In addition, a recording mechanism 4 is included therein which performs recording by reciprocating a carriage 6 including a recording head 7 (refer to Fig. 4) as a discharging portion to a transportation region of the recording medium by the transportation mechanism 3 in a reciprocating direction B intersecting with the transportation direction A of the recording medium. Further, a winding mechanism (not illustrated) is included therein, which is capable of winding the recording medium on which recording is performed in the recording mechanism 4.

[0019] The transportation mechanism 3 of the example includes the adhesive belt 2 which mounts and transports the recording medium fed from the feeding portion, a driving roller 8 which moves the adhesive belt 2, and a following roller 9. The recording medium is attached to and mounted on a supporting surface of the adhesive belt 2.

[0020] However, an endless belt as a transportation belt is not limited to the adhesive belt. For example, an electrostatically attracting endless belt may be used.

[0021] Moreover, the recording apparatus 1 of the example includes the transportation mechanism 3 having such a configuration; however, it is not limited to the transportation mechanism having such a configuration, and may have a configuration in which the recording medium is transported by being supported with a movable supporting tray, or the like, or a configuration in which the recording medium is transported by a pair of rollers, or the like. Also, a so called flatbed type recording apparatus may be used, which performs recording by fixing the recording medium to the supporting portion and moving the recording head 7 to a fixed recording medium.

[0022] The recording mechanism 4 includes a carriage motor 30 (refer to Fig. 8) which reciprocates the carriage 6 including the recording head 7 capable of discharging ink (liquid) in the reciprocating direction B.

[0023] The recording apparatus 1 of the example performs recording by reciprocally scanning the carriage 6 including the recording head 7 at the time of recording; however, during record-scanning (during moving of carriage 6), the transportation mechanism 3 allows transportation of the recording medium to stop. When expressed in a different manner, at the time of recording, reciprocal scanning of the carriage 6 and transportation of the recording medium are alternately performed. That is, at the time of recording, corresponding to reciprocal scanning of the carriage 6, the transportation mechanism 3 intermittently transports the recording medium (the adhesive belt 2 is intermittently moved).

[0024] Moreover, a rail 10a extending in the reciprocating direction B is provided on a pipe 11a constituting a frame portion of the recording apparatus 1 of the example, and a rail 10b extending in the reciprocating direction B is provided on a pipe 11b constituting the frame portion of the recording apparatus 1 of the example. In addition, bearing portions (not illustrated) are received in the rail 10a and the rail 10b, and thus, the carriage 6 of the example is guided to move in the reciprocating direction B by the rail 10a and the rail 10b.

[0025] In addition, as illustrated in Fig. 3, the recording mechanism 4 of the example is divided into a moving region 18 of the carriage 6, an airflow receiving chamber 13 to be described later, and a cable accommodating portion 36 which accommodates cables, or the like for transmitting data and signals to the carriage 6 by the case

body 12 and a wall portion 16. Also, by such a configuration, the mist, which is generated when the ink is discharged from the recording head 7 in the moving region 18 of the carriage 6, can be moved to the airflow receiving chamber 13, and an invasion of the mist into the cable accommodating portion 36 is suppressed.

[0026] Next, the carriage 6 of the recording apparatus 1 of the example will be described.

[0027] Fig. 4 to Fig. 7 illustrates schematic views of the carriage 6 of the example. Among these, Fig. 4 is a schematic perspective view of the carriage 6 of the example, Fig. 5 is a schematic plan view of the carriage 6 of the example, Fig. 6 is a schematic front view of the carriage 6 of the example, and Fig. 7 is a schematic side view of the carriage 6 of the example.

[0028] Moreover, in the carriage 6 of the example, sub-carriages 5 including a plurality of the recording heads 7 are provided in multiple (six), and Fig. 4 and Fig. 5 are perspective views illustrating an arrangement of the plurality of recording heads 7 provided in each of the sub-carriages 5.

[0029] As illustrated in Fig. 5 and Fig. 6, the plurality (six) of sub-carriages 5 can be detachable to the carriage 6 of the example. As illustrated in Fig. 4 and Fig. 5, in each of the sub-carriages 5, the plurality of recording heads 7 are alternately arranged from each other (staggered). Moreover, in addition to the plurality of recording heads 7, a substrate, and the like are provided in each of the sub-carriages 5, and as illustrated in Fig. 6, a sub-carriage fan 21 for cooling the substrate is provided therein.

[0030] Since the sub-carriage fan 21 suppresses an increase of a temperature inside the sub-carriage 5 by sending (blowing) the air to an inside of the sub-carriage 5, when there is mist of the ink in the vicinity of the sub-carriage fan 21, the mist is sent to the inside of the sub-carriage 5, and thus there is a concern that the mist is attached to the substrate, and the like.

[0031] For this reason, in the recording apparatus 1 of the example, in order to suppress attaching of the mist to the substrate, and the like, as described above, the mist can be moved from the moving region 18 of the carriage 6 to the airflow receiving chamber 13.

[0032] In addition, a frame type portion 37, which is for suppressing the mist of the ink discharged from the recording head 7 from flying up and the mist from becoming attached to the sub-carriage 5, is provided. The frame type portion 37 functions as a separator which suppresses flying-up of the mist with respect to a region where the mist near the recording head 7 is profuse and keeps a region above the sub-carriage 5 in a state where the mist is small.

[0033] Further, air current generation portions 38a and 38b in which a carriage fan 20 is respectively provided are provided in an outside of the frame type portion 37 in the reciprocating direction B. When expressed in a different manner, in the air current generation portions 38a and 38b provided on the outside of the frame type portion 37 in the reciprocating direction B, the carriage fan 20, which generates air current toward an opening portion 40 provided at an upstream side of the transportation direction A, is provided in the vicinity of an opening portion 39 which is provided at a downstream side of the transportation direction A.

[0034] Here, the carriage 6 of the example drives the carriage fan 20, thereby making it possible to move the mist to a position (upstream side of transportation direction A) which does not overlap with the recording head 7 in a moving region 18 of the carriage 6 when seen in the reciprocating direction B, by a control of the controller 23, during recording (during discharging the ink from the recording head 7 while moving the carriage 6 in the reciprocating direction B).

[0035] Such a carriage 6 of the example is provided with the frame type portion 37 and the air current generation portions 38a and 38b, and particularly, has a configuration hardly affected by the mist. However, the invention is not limited to the recording apparatus including the carriage which has such a configuration.

[0036] Next, an electrical configuration in the recording apparatus 1 of the example will be described.

[0037] Fig. 8 is a block diagram of the recording apparatus 1 of the example.

[0038] In the controller 23, a CPU 24 which controls the entire recording apparatus 1 is provided. The CPU 24 is connected to a ROM 26 which stores various programs, and the like executed by the CPU 24 and a RAM 27 which is capable of temporary storing data through a system bus 25.

[0039] In addition, the CPU 24 is connected to a head driving portion 28 for driving the recording head 7 through the system bus 25.

[0040] In addition, the CPU 24 is connected to a motor driving portion 29, which is for driving the carriage motor 30, a transportation motor 31, a feeding motor 32, a winding motor 33, a carriage fan motor 19, and a sub-carriage fan motor 22, through the system bus 25.

[0041] Here, the carriage motor 30 is a motor for moving the carriage 6 including the recording head 7. In addition, the transportation motor 31 is a motor for driving the driving roller 8. In addition, the feeding motor 32 is a driving motor of the feeding portion for feeding the recording medium which is set in a feeding portion (not illustrated) to the transportation mechanism 3. In addition, the winding motor 33 is a driving motor for driving a winding mechanism (not illustrated) which is for winding the recording medium on which recording is performed. In addition, the carriage fan motor 19 is a motor for driving the carriage fan 20. Also, the sub-carriage fan motor 22 is a motor for driving the sub-carriage fan 21.

[0042] Further, the CPU 24 is connected to an input and output portion 34 through the system bus 25, and the input and output portion 34 is connected to a PC 35 for performing transmitting and receiving of data such as recording data and a signal.

[0043] Next, the airflow receiving chamber 13 which is

a main part of the recording apparatus 1 of the example will be described.

[0044] Here, Fig. 9 is a schematic perspective view illustrating the moving region 18 and the airflow receiving chamber 13 of the carriage 6 which are parts of the recording mechanism 4 of the recording apparatus 1 of the example. In addition, Figs. 10A and 10B are schematic front views illustrating the moving region 18 and the airflow receiving chamber 13 of the carriage 6 which are parts of the recording mechanism 4 of the recording apparatus 1 of the example. Moreover, Fig. 10A is a view illustrating airflows W1 in the moving region 18 and the airflow receiving chamber 13 of the carriage 6 when the carriage 6 is moved in a direction B1 of the reciprocating direction B, and Fig. 10B is a view illustrating airflows W2 in the moving region 18 and the airflow receiving chamber 13 of the carriage 6 when the carriage 6 is moved in a direction B2 of the reciprocating direction B.

[0045] As illustrated in Fig. 9, in the moving region 18 of the carriage 6, the carriage 6 of the example is capable of moving the carriage 6 in a moving range R1 from the position P1 to the position P2 in the reciprocating direction B. Also, the recording apparatus 1 of the example includes a case body 12 which covers the moving region 18 of the carriage 6, and includes the airflow receiving chamber 13 which is capable of receiving the airflow W1 pushed from the moving region 18 of the carriage 6 by moving the carriage 6 in the direction B1 as illustrated in Fig. 10A. Moreover, the airflow receiving chamber 13 is also capable of receiving the airflow W2 pushed from the moving region 18 of the carriage 6 by moving the carriage 6 in the direction B2 as illustrated in Fig. 10B.

[0046] That is, the recording apparatus 1 of the example includes the carriage 6 which includes the recording head 7 discharging the ink onto a recording medium and can be moved in the reciprocating direction B and the airflow receiving chamber 13 which receives the airflow W1 and the airflow W2 generated by reciprocating the carriage 6.

[0047] For this reason, since the recording apparatus 1 of the example has such a configuration, that is, a simple configuration in which the airflow receiving chamber 13 is included, the mist generated when the ink is discharged from the recording head 7 can be moved from the moving region 18 of the carriage 6 using the airflow W1 and the airflow W2 generated due to reciprocation of the carriage 6.

[0048] Moreover, as in the recording apparatus 1 of the example, "covering the moving region 18 of the carriage 6" means that other parts may be covered when at least the moving region 18 of the carriage 6 is covered, but it does not need to be covered in a sealed state.

[0049] In addition, as illustrated in Figs. 10A and 10B, the airflow receiving chamber 13 of the example extends in the reciprocating direction B, and a receiving port 49 of the airflow W1 and the airflow W2 is provided on both ends of the reciprocating direction B. That is, with such a configuration, the airflow receiving chamber 13 of the example can receive the airflow W1 and the airflow W2 from the receiving ports 49 of both ends in the moving directions B1 and B2 of both sides in the reciprocating direction B. For this reason, the mist generated when the ink is discharged from the recording head 7 can be efficiently moved from the moving region 18 of the carriage 6.

[0050] In addition, as illustrated in Fig. 9 to Fig. 10B, the airflow receiving chamber 13 of the example includes a capturing portion 17, which is capable of capturing the mist generated when the ink is discharged from the recording head 7 in the vicinity of the receiving ports 49 of both ends in the reciprocating direction B. Therefore, the mist moved from the moving region 18 of the carriage 6 can be captured and recovered by the capturing portion 17.

[0051] Moreover, the capturing portion 17 of the example is a filter which is capable of capturing the mist by transmitting the airflow and is configured to have a filter type which is fixed to the airflow receiving chamber 13; however, if the mist can be captured, a configuration of the capturing portion 17 is not particularly limited. Moreover, the filter described above is an absorbing member which is capable of absorbing the attached liquid.

Example 2 (Figs. 11A and 11B)

[0052] Next, the recording apparatus according to Example 2 of the invention will be described.

[0053] Figs. 11A and 11B are schematic perspective views illustrating the recording mechanism 4 of the recording apparatus 1 according to Example 2 of the invention. Fig. 11A corresponds to Fig. 10A illustrating the recording mechanism 4 of the recording apparatus 1 according to Example 1, and Fig. 11B corresponds to Fig. 10B illustrating the recording mechanism 4 of the recording apparatus 1 according to Example 1.

[0054] Moreover, configuration members common to those of Example 1 are illustrated by the same numerals, and detailed descriptions thereof will not be repeated.

[0055] In the recording apparatus 1 of the example, only a configuration of the airflow receiving chamber 13 which is a main part of the recording apparatus 1 of the example is different from the recording apparatus 1 of Example 1.

[0056] As illustrated in Figs. 10A and 10B, the airflow receiving chamber 13 of Example 1 is configured to have the capturing portion 17 which is a filter type fixed to airflow receiving chamber 13.

[0057] Meanwhile, the airflow receiving chamber 13 of Example 2 is configured to have a plurality of flexible filters (absorbing members), in which a part (upper portion) thereof is fixed inside of the airflow receiving chamber 13 and is hanging inside of the airflow receiving chamber 13 as illustrated in Figs. 11A and 11B. For this reason, the capturing portion 17 of the example can change a posture thereof by the airflow W1 and the airflow W2, and does not shield the airflow W1 and the airflow W2 generated by reciprocation of the carriage 6 inside of the

airflow receiving chamber 13. That is, the recording apparatus 1 of the example efficiently receives the airflow W1 and the airflow W2 including the mist from the moving region 18 of the carriage 6 in the airflow receiving chamber 13, and the mist can be captured and recovered in the airflow receiving chamber 13.

[0058] Moreover, the airflow receiving chamber 13 of the example is configured to have the plurality of flexible filters in both end parts of the reciprocating direction B; however, it is not limited to such a configuration, and the flexible filters may be provided on the entirety of the inside of the airflow receiving chamber 13, for example, and flexible filters may be provided in which a center part in the reciprocating direction B has a density higher than that of both of the end parts thereof.

Example 3 (Figs. 12A and 12B)

[0059] Next, a recording apparatus according to Example 3 of the invention will be described.

[0060] Figs. 12A and 12B are schematic perspective views illustrating the recording mechanism 4 of the recording apparatus 1 according to Example 3 of the invention. Fig. 12A corresponds to Fig. 10A illustrating the recording mechanism 4 of the recording apparatus 1 of the Example 1, and Fig. 12B corresponds to Fig. 10B illustrating the recording mechanism 4 of the recording apparatus 1 of the Example 1.

[0061] Moreover, configuration members common to those of Example 1 and Example 2 are illustrated by the same numerals, and detailed descriptions thereof will not be repeated.

[0062] The recording apparatus 1 of the example has a configuration of the airflow receiving chamber 13, which is a main part of the recording apparatus 1 of the example, different from the recording apparatus 1 of Example 1 and Example 2.

[0063] As illustrated in Figs. 10A and 10B, in the airflow receiving chamber 13 of Example 1, it is possible that the airflow W1 and the airflow W2 flows-in from the end portions of one side of the reciprocating direction B and the airflow W1 and the airflow W2 flows-out from the end portions of the other side of the reciprocating direction B.

[0064] Meanwhile, as illustrated in Figs. 12A and 12B, the airflow receiving chamber 13 of the example is connected to a duct 41 connected to the outside of the recording apparatus 1, and the airflow W1 and the airflow W2 can be exhausted through the duct 41. Moreover, only that point described above is different from the recording apparatus 1 of Example 1. For this reason, the airflow W1 and the airflow W2 extruded from the moving region 18 of the carriage 6 by moving the carriage 6 is easily received, and the airflow W1 and the airflow W2 generated by reciprocation of the carriage 6 can be efficiently received in a airflow receiving chamber 13. Naturally, Example 2 can be modified in a similar way.

Example 4 (Figs. 13A and 13B)

[0065] Next, a recording apparatus according to Example 4 of the invention will be described.

[0066] Figs. 13A and 13B are schematic perspective views illustrating the recording mechanism 4 of the recording apparatus 1 according to Example 3 of the invention. Fig. 13A corresponds to Fig. 10A illustrating the recording mechanism 4 of the recording apparatus 1 of the Example 1, and Fig. 13B corresponds to Fig. 10B illustrating the recording mechanism 4 of the recording apparatus 1 of the Example 1.

[0067] Moreover, configuration members common to that of Example 1 to Example 3 are illustrated by the same numerals, and detailed descriptions thereof will not be repeated.

[0068] The recording apparatus 1 of Example 4 only has the configuration of the airflow receiving chamber 13 which is a main part of the recording apparatus 1 of the example, and a part of the configuration of the case body 12 are different from that the recording apparatus 1 of Example 1 to Example 3.

[0069] As illustrated in Figs. 10A and 10B, the airflow receiving chamber 13 of Example 1 to Example 3 includes the capturing portion 17 which is capable of capturing the mist generated when the ink is discharged from the recording head 7.

[0070] Meanwhile, as illustrated in Figs. 13A and 13B, the airflow receiving chamber 13 of the example includes a back-flow preventing portion 42 instead of the capturing portion 17. For this reason, back-flowing of the airflow W1 and the airflow W2 including the mist in the moving region 18 of the carriage 6 from the airflow receiving chamber 13 can be suppressed.

[0071] Moreover, the back-flow preventing portion 42 of the example includes a rotation shaft 43 of a direction along a transportation direction A, a lid portion 44 which can be rotated in a rotation direction C around the rotation shaft 43, and a regulating member 45 which regulates turning of the lid portion 44 in a direction from the inside toward the outside of the airflow receiving chamber 13. In addition, the airflow W1 and the airflow W2 flow inside the airflow receiving chamber 13 by turning the lid portion 44 inside of the airflow receiving chamber 13, and flowing-out of the airflow W1 and the airflow W2 to the outside of the airflow receiving chamber 13 is suppressed by regulating the lid portion 44 using the regulating member 45. However, a configuration of the back-flow preventing portion 42 is not particularly limited. In addition, of course, the capturing portion 17 may be provided inside of the airflow receiving chamber 13.

[0072] In addition, in the moving region 18 of the carriage 6 in the case body 12 of the recording apparatus 1 of the example, an airflow inflow portion 46 in which airflow W3 and airflow W4 can flow therein through a path different from the airflow receiving chamber 13 is provided. That is, the recording apparatus 1 of the example is capable of generating the airflow W3 from the airflow W1

in a direction in an order of the airflow inflow portion 46, the moving region 18 of the carriage 6, and the airflow receiving chamber 13. For this reason, the recording apparatus 1 of the example is capable of efficiently moving the mist generated when the ink is discharged from the recording head 7 from the moving region 18 of the carriage 6.

[0073] Moreover, the airflow inflow portion 46 of the example includes the rotation shaft 47 along the transportation direction A and the lid portion 48 capable of being rotated in the rotation direction C around the rotation shaft 47 as a reference Turning of the lid portion 48 from the inside of the airflow inflow portion 46 toward the outside is regulated by a part of the case body 12. In addition, the airflow W3 and the airflow W4 flows-in on the inside of the airflow inflow portion 46 by turning the lid portion 48 inside of the airflow inflow portion 46, and flowing-out of the airflow W3 and the airflow W4 to the outside of the airflow inflow portion 46 is suppressed by regulating the lid portion 48 using a part of the case body 12. However, a configuration of the airflow inflow portion 46 is not particularly limited.

[0074] Moreover, the invention is not limited to the above examples, and can be variously modified within a range of the invention disclosed in the claims. It is needless to say that these are also included in the range of the invention.

[0075] Hitherto, the invention has been described on the basis of the specific examples. Here, an outline of the invention will be described again.

[0076] The liquid discharging apparatus 1 of a first aspect of the invention includes the discharging portion 7 which discharges the liquid onto a medium, the carriage 6 which can be moved in the reciprocating direction B, the case body 12 which covers the moving region 18 of the carriage 6, and the airflow receiving chamber 13 which receives the airflow W1 and the airflow W2 generated by reciprocation of the carriage 6.

[0077] According to the aspect, the airflow receiving chamber 13 which receives the airflow W1 and the airflow W2 generated by reciprocation of the carriage 6 is provided. Therefore, with such a simple configuration with the airflow receiving chamber 13, the mist generated when the liquid is discharged from the discharging portion 7 can be moved from the moving region 18 of the carriage 6 using the airflow W1 and the airflow W2 generated by reciprocation of the carriage 6.

[0078] Moreover, "covering the moving region 18 of the carriage 6" means that other parts may be covered when at least the moving region 18 of the carriage 6 is covered, but it does not need to be covered in a sealed state.

[0079] In the liquid discharging apparatus 1 of a second aspect of the invention according to the first aspect, the airflow receiving chamber 13 extends in the reciprocating direction B and includes the receiving ports 49 of the airflow W1 and the airflow W2 in the both ends of the reciprocating direction B.

[0080] According to the aspect, the airflow receiving chamber 13 extends in the reciprocating direction B and includes the receiving ports 49 of the airflow W1 and the airflow W2 at the both ends of the reciprocating direction B. That is, in the moving directions B1 and B2 of both sides in the reciprocating direction B, the airflow W1 and the airflow W2 can be received from the receiving ports 49 of the both sides. Therefore, the mist generated when the liquid is discharged from the discharging portion 7 can be efficiently moved from the moving region 18 of the carriage 6.

[0081] In the liquid discharging apparatus 1 of a third aspect of the invention according to the first aspect or the second aspect, the airflow receiving chamber 13 includes the capturing portion 17 which is capable of capturing the mist generated when the liquid is discharged from the discharging portion 7.

[0082] According to the aspect, the airflow receiving chamber 13 includes a capturing portion 17 which is capable of capturing mist generated when the liquid is discharged from the discharging portion 7. Therefore, the mist moved from the moving region 18 of the carriage 6 can be captured and recovered by the capturing portion 17.

[0083] In the liquid discharging apparatus 1 of a fourth aspect of the invention according to the third aspect, the capturing portion 17 is a filter in which a part thereof is fixed to the inside of the airflow receiving chamber 13 and is capable of changing a posture thereof by the airflow W1 and the airflow W2.

[0084] According to the aspect, the capturing portion 17 is a filter in which a part thereof is fixed to an inside of the airflow receiving chamber 13 and is capable of changing a posture thereof by the airflow W1 and the airflow W2. Therefore, the airflow W1 and the airflow W2 generated by reciprocation of the carriage 6 inside of the airflow receiving chamber 13 are not shielded, that is, the airflow W1 and the airflow W2 including the mist from the moving region 18 of the carriage 6 are efficiently received in the airflow receiving chamber 13, and the mist can be captured and recovered in the airflow receiving chamber 13.

[0085] In the liquid discharging apparatus 1 of a fifth aspect of the invention according to any one of the first aspect to the fourth aspect, the airflow receiving chamber 13 is capable of exhausting the air.

[0086] According to the aspect, the airflow receiving chamber 13 is capable of exhausting the air. Therefore, the airflow W1 and the airflow W2 generated by reciprocation of the carriage 6 can be efficiently received in the airflow receiving chamber 13.

[0087] In the liquid discharging apparatus 1 of a sixth aspect of the invention according to any one of the first aspect to the fifth aspect, the airflow receiving chamber 13 includes the back-flow preventing portion 42.

[0088] According to the aspect, the airflow receiving chamber 13 includes the back-flow preventing portion 42. Therefore, back-flowing of the airflow W1 and the

airflow W2 including the mist from the airflow receiving chamber 13 to the moving region 18 of the carriage 6 can be suppressed.

[0089] In the liquid discharging apparatus 1 of a seventh aspect of the invention according to the sixth aspect, an airflow inflow portion 46 is further provided on the moving region 18 in reciprocation of the carriage 6, and is capable of allowing the airflow to flow therein through a path different from the airflow receiving chamber 13.

[0090] According to the aspect, an airflow inflow portion 46 is provided on the moving region 18 in reciprocation of the carriage 6, and is capable of flowing-in the airflow W3 and the airflow W4 through a path different from the airflow receiving chamber 13. That is, the airflow W4 can be generated from the airflow W1 in a direction in an order of the airflow inflow portion 46, the moving region 18 of the carriage, and the airflow receiving chamber 13. Therefore, the mist generated when the liquid is discharged from the discharging portion 7 can be efficiently moved from the moving region 18 of the carriage 6.

[0091] The foregoing description has been given by way of example only and it will be appreciated by a person skilled in the art that modifications can be made without departing from the scope of the present invention as defined by the claims.

Claims

1. A liquid discharging apparatus (1) comprising:

a carriage (6) that includes a discharging portion (7) for discharging liquid onto a medium and that is capable of being moved in a reciprocating direction (B);
a case body (12) that covers a moving region (18) of the carriage; and
an airflow receiving chamber (13) is arranged to receive an airflow generated by reciprocation of the carriage.

2. The liquid discharging apparatus according to claim 1,
wherein the airflow receiving chamber extends in the reciprocating direction and includes receiving ports (49) of the airflow in both ends of the reciprocating direction.

3. The liquid discharging apparatus according to claim 1 or claim 2,
wherein the airflow receiving chamber includes a capturing portion (17) which is capable of capturing mist generated when the liquid is discharged from the discharging portion.

4. The liquid discharging apparatus according to claim 3,
wherein the capturing portion is a filter (17) in which a part thereof is fixed to the inside of the airflow receiving chamber and is capable of changing a posture thereof by the airflow.

5. The liquid discharging apparatus according to any one of the preceding claims, wherein the airflow receiving chamber is capable of exhausting the air.

6. The liquid discharging apparatus according to any one of the preceding claims, wherein the airflow receiving chamber includes a back-flow preventing portion (42).

7. The liquid discharging apparatus according to claim 6, further comprising:

an airflow inflow portion (46) that is provided for the moving region by the reciprocation of the carriage, and is capable of allowing the airflow to flow therein through a path different from the airflow receiving chamber.

FIG. 1

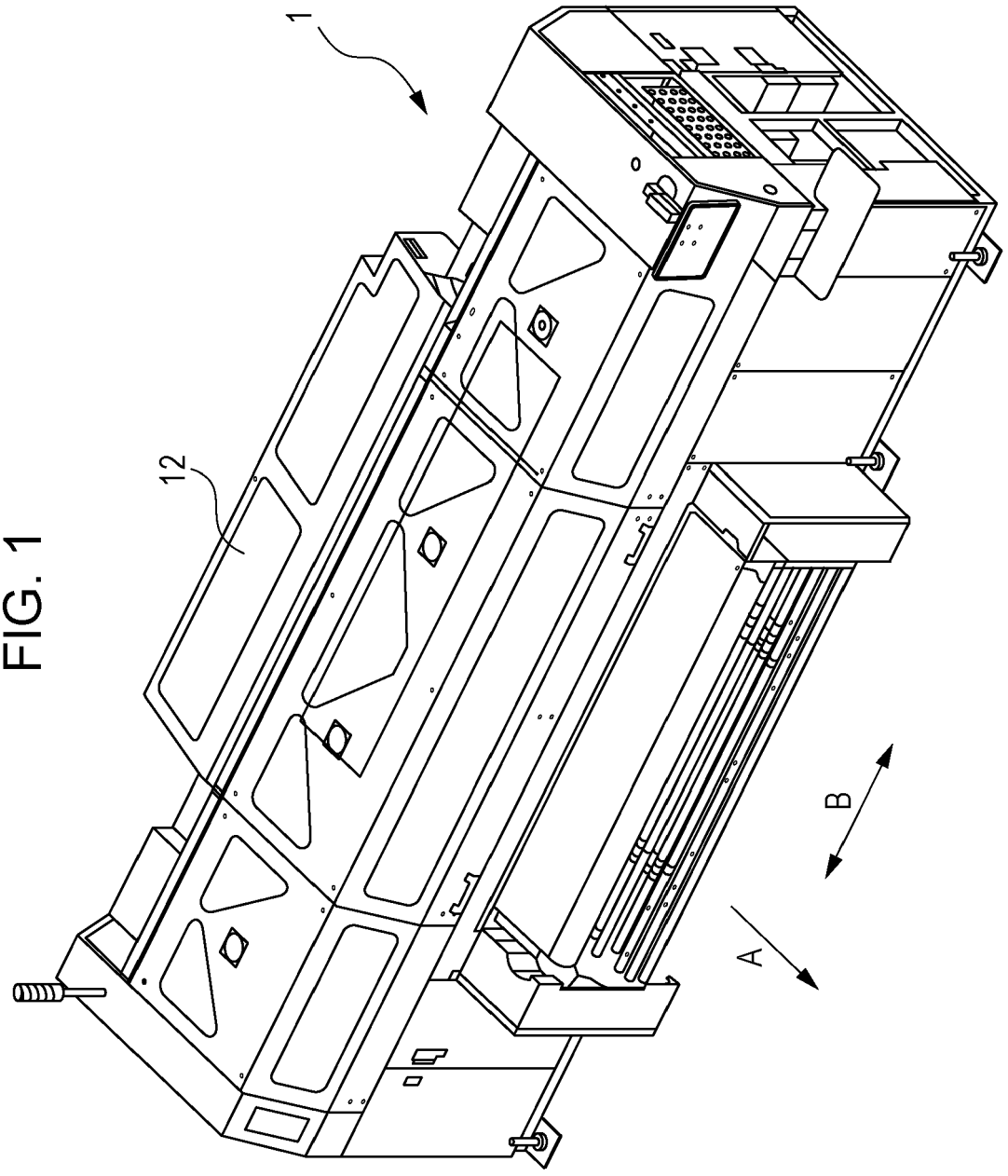


FIG. 2

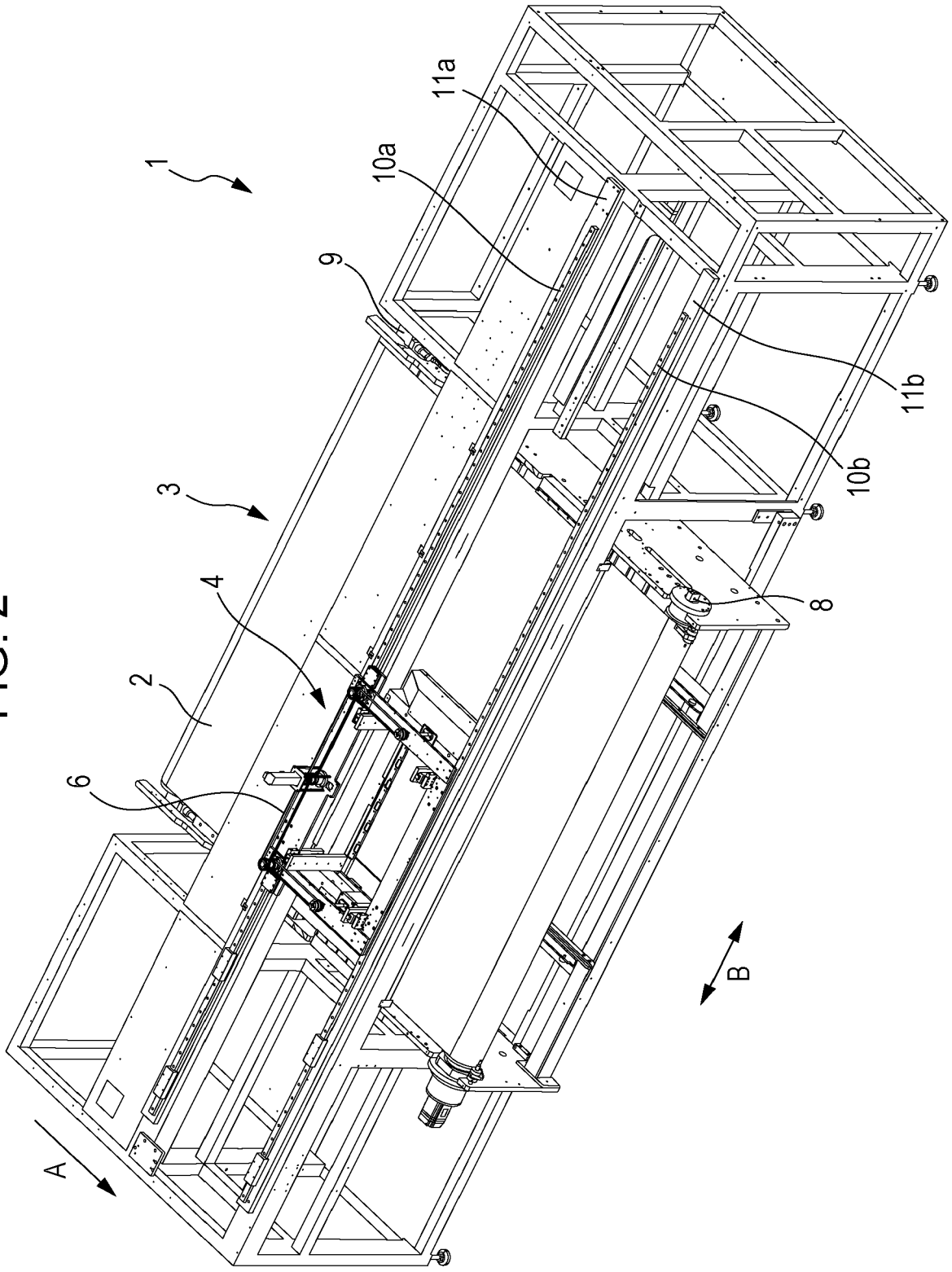


FIG. 3

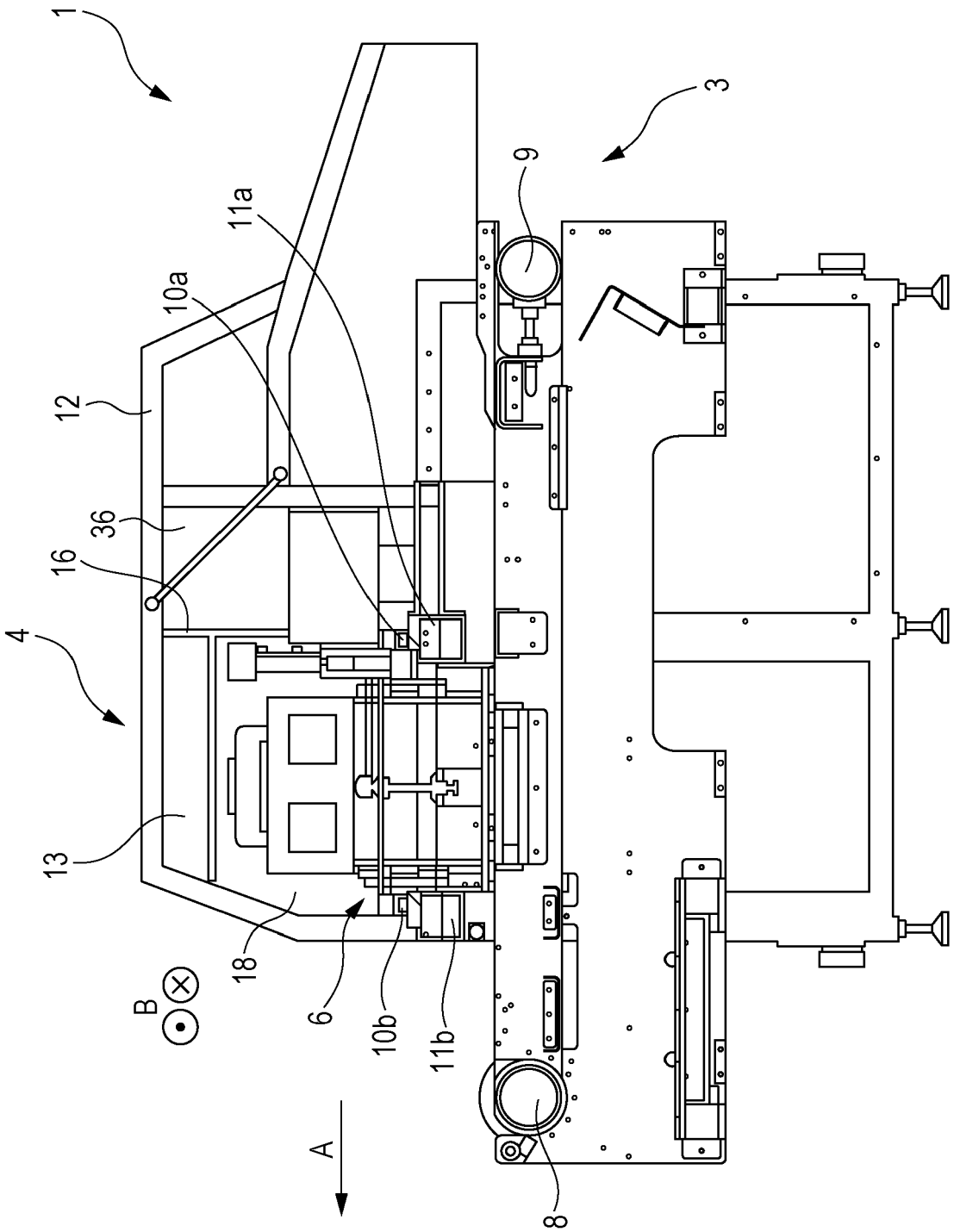


FIG. 4

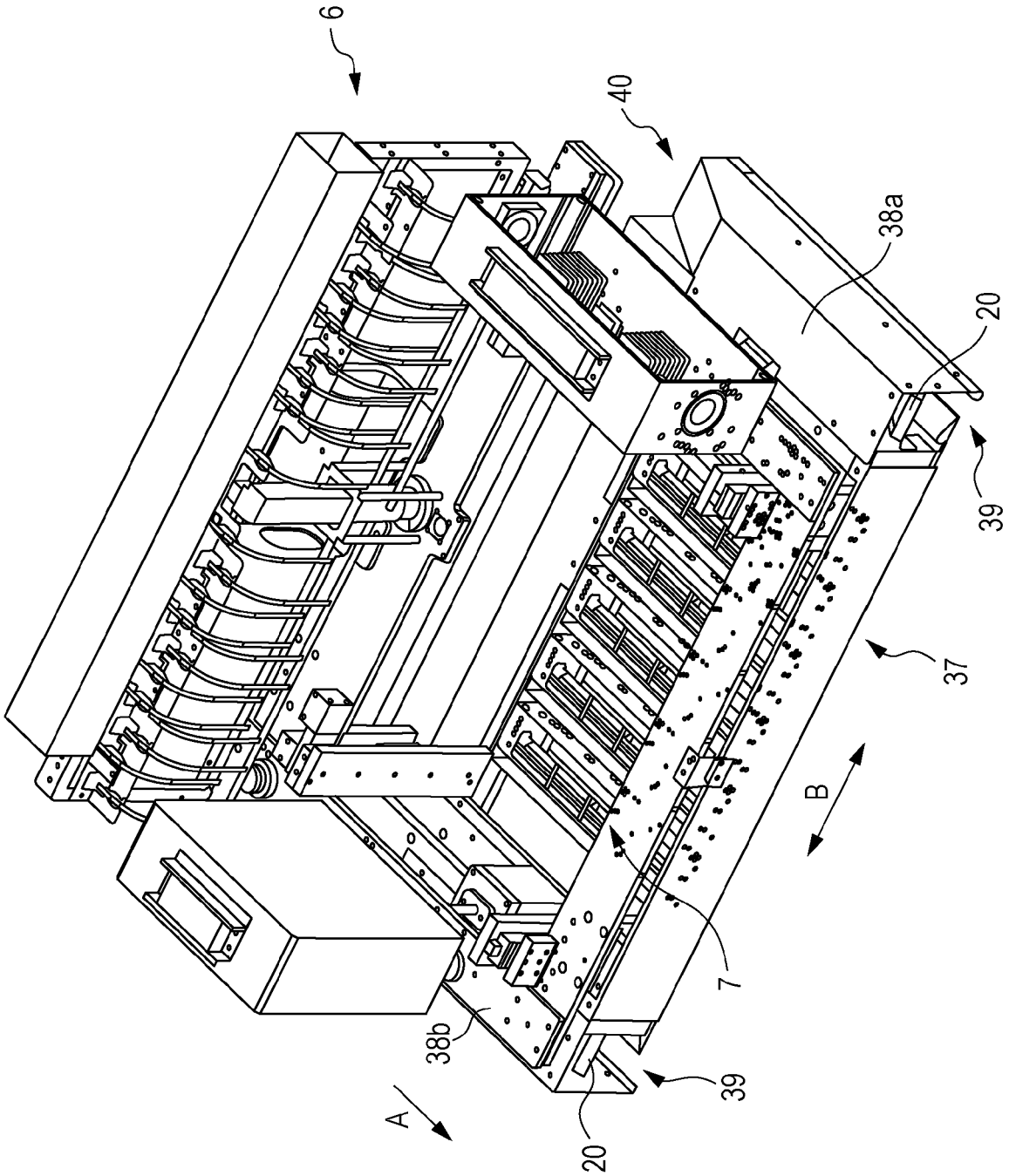


FIG. 5

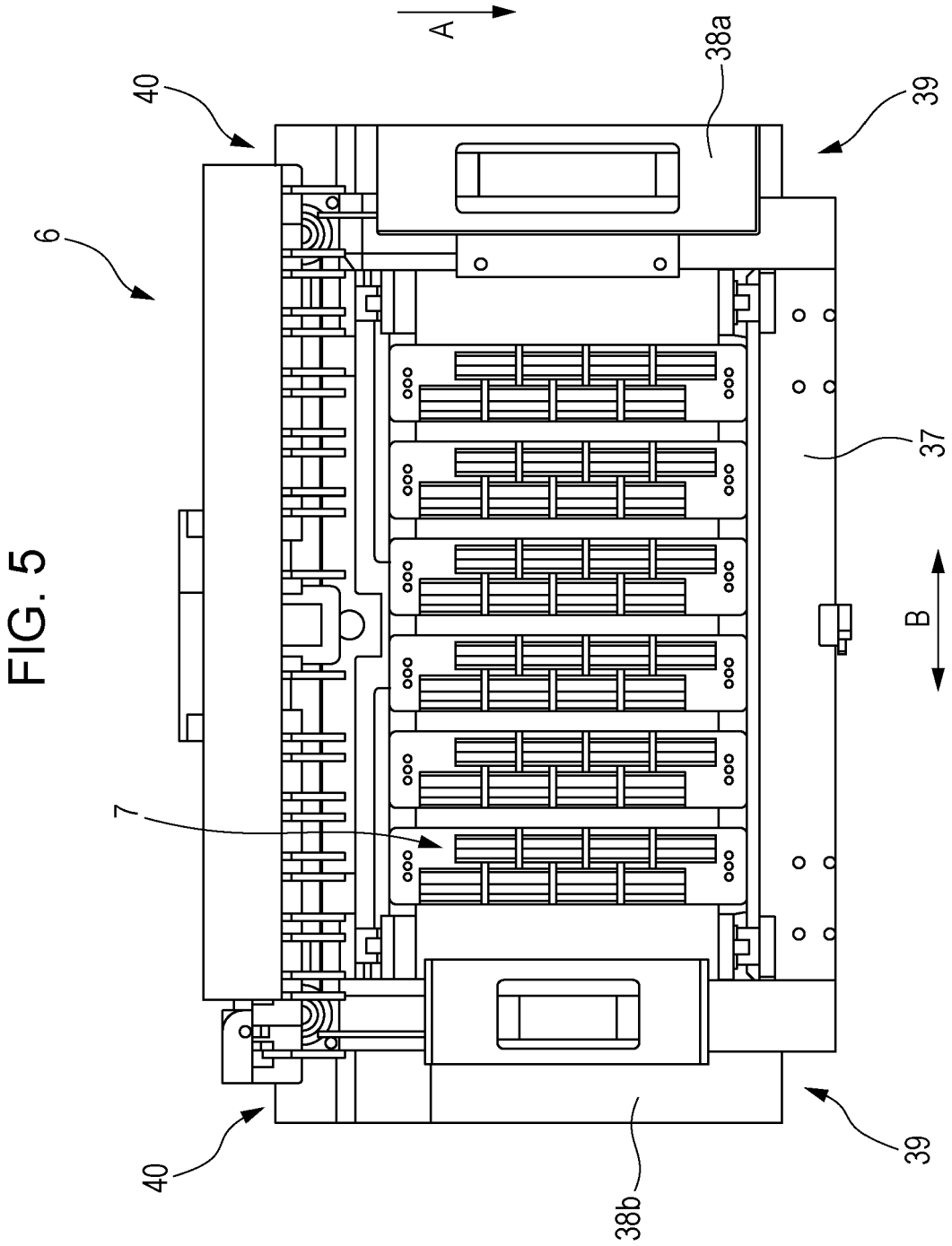


FIG. 6

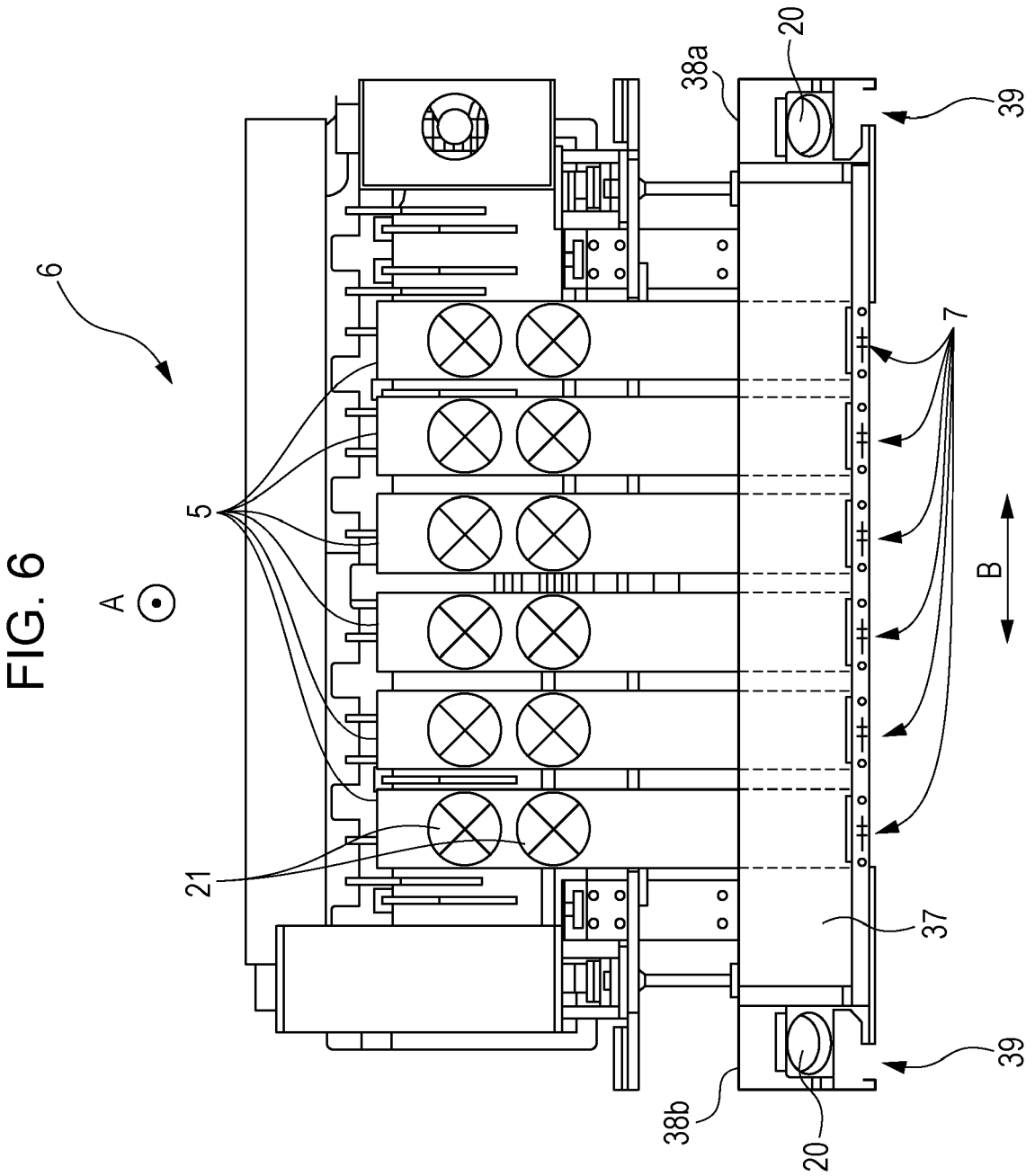


FIG. 7

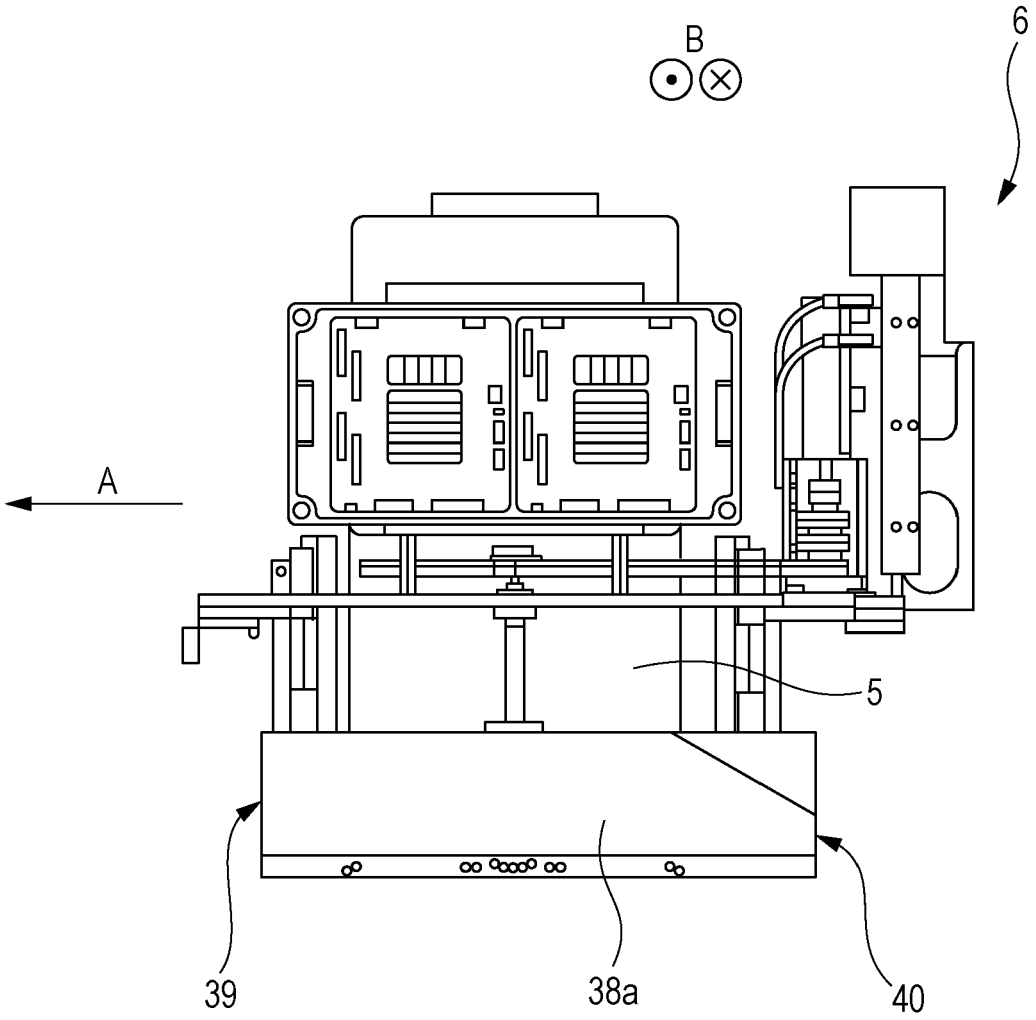


FIG. 8

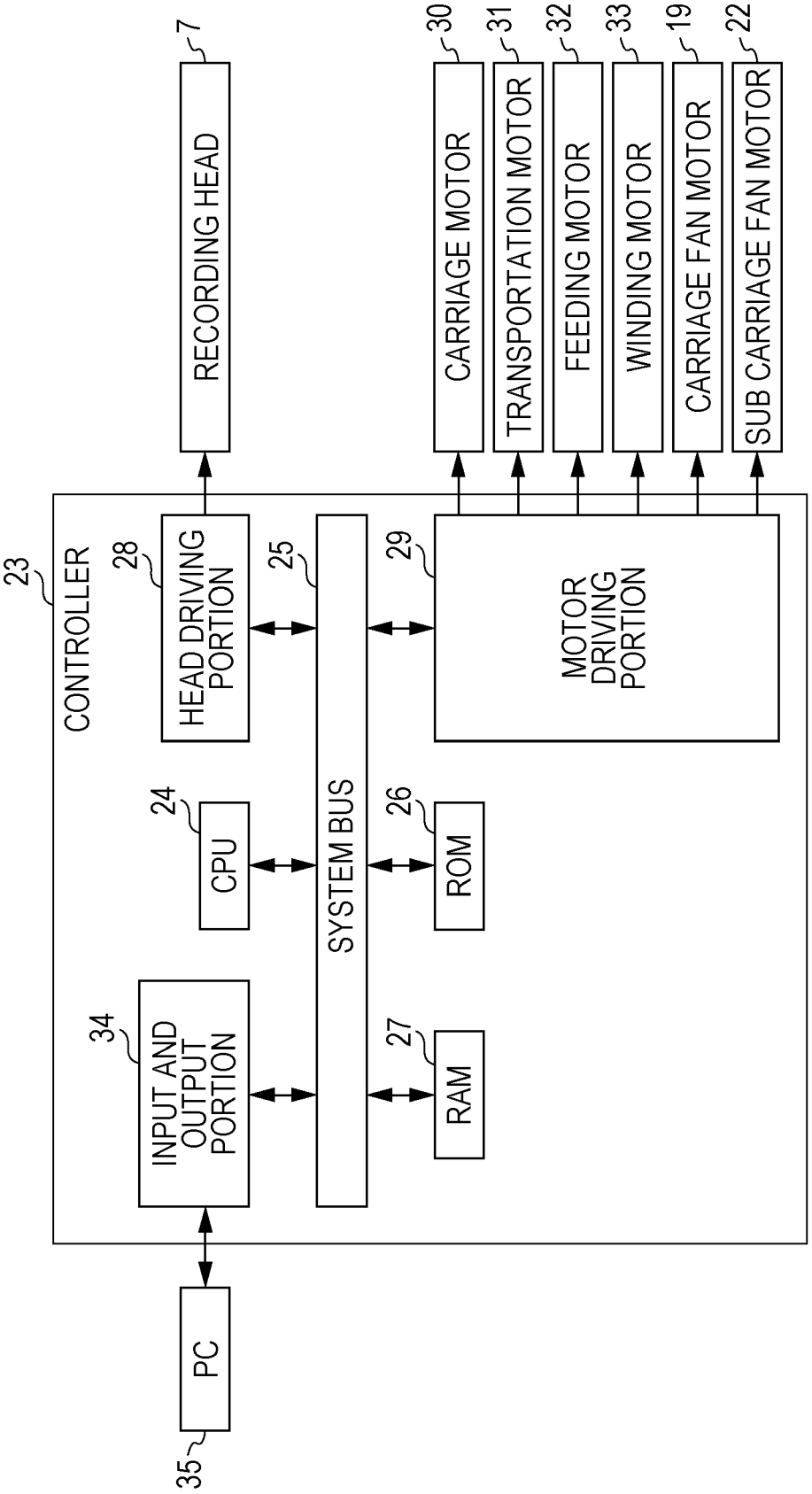

RECORDING HEAD
7
CARRIAGE MOTOR
30
TRANSPORTATION MOTOR
31
FEEDING MOTOR
32
WINDING MOTOR
33
CARRIAGE FAN MOTOR
19
SUB CARRIAGE FAN MOTOR
22
CONTROLLER
23
HEAD DRIVING PORTION
28
25
29
MOTOR DRIVING PORTION
SYSTEM BUS
CPU
24
26
ROM
INPUT AND OUTPUT PORTION
34
27
RAM
PC
35

FIG. 9

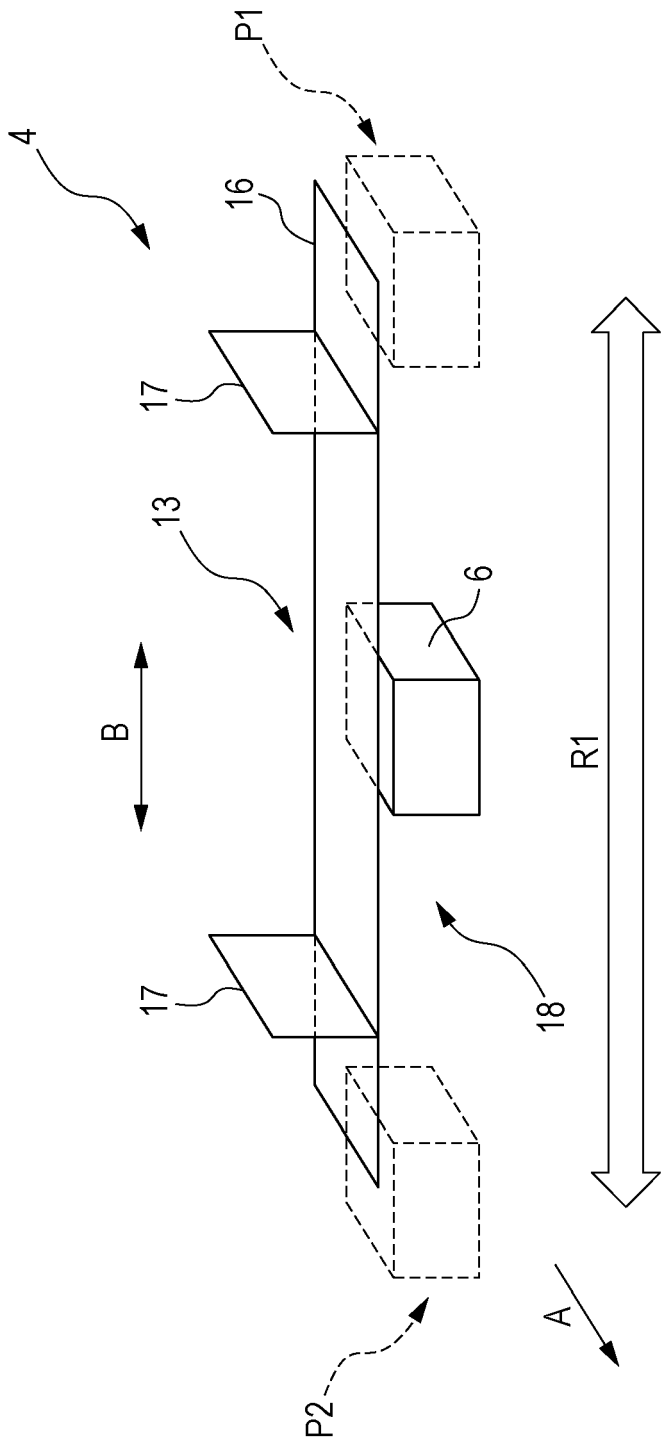


FIG. 10A

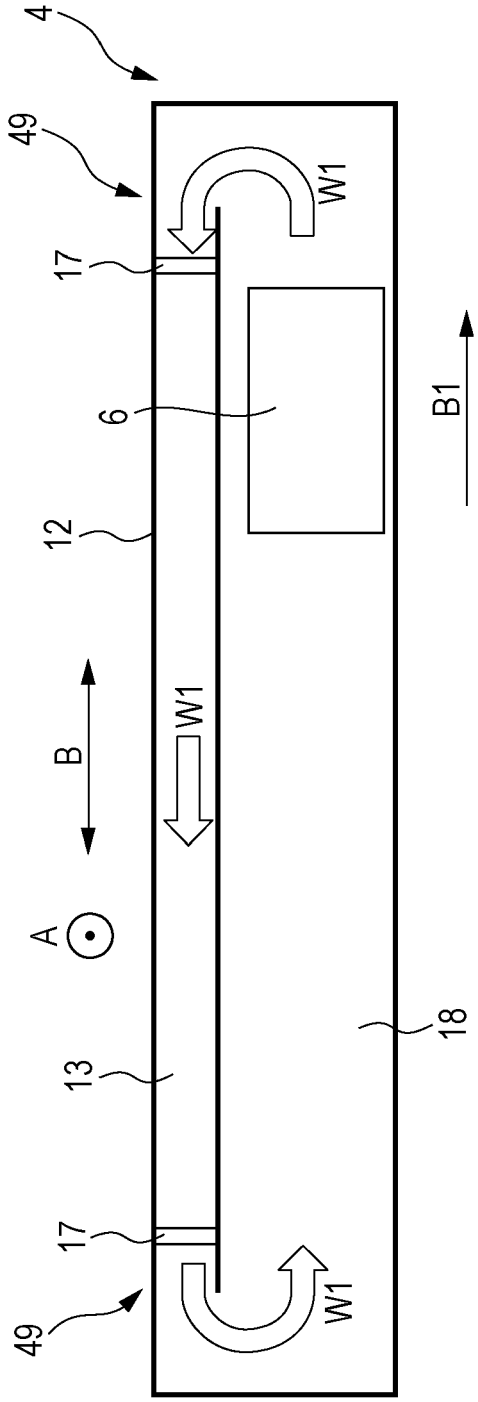


FIG. 10B

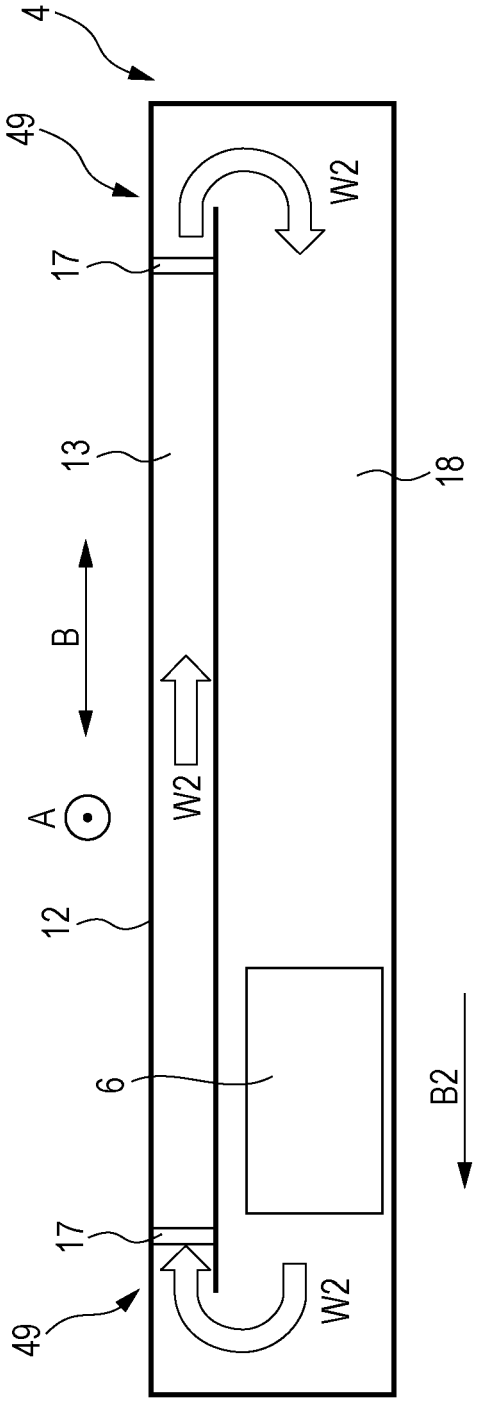


FIG. 11A

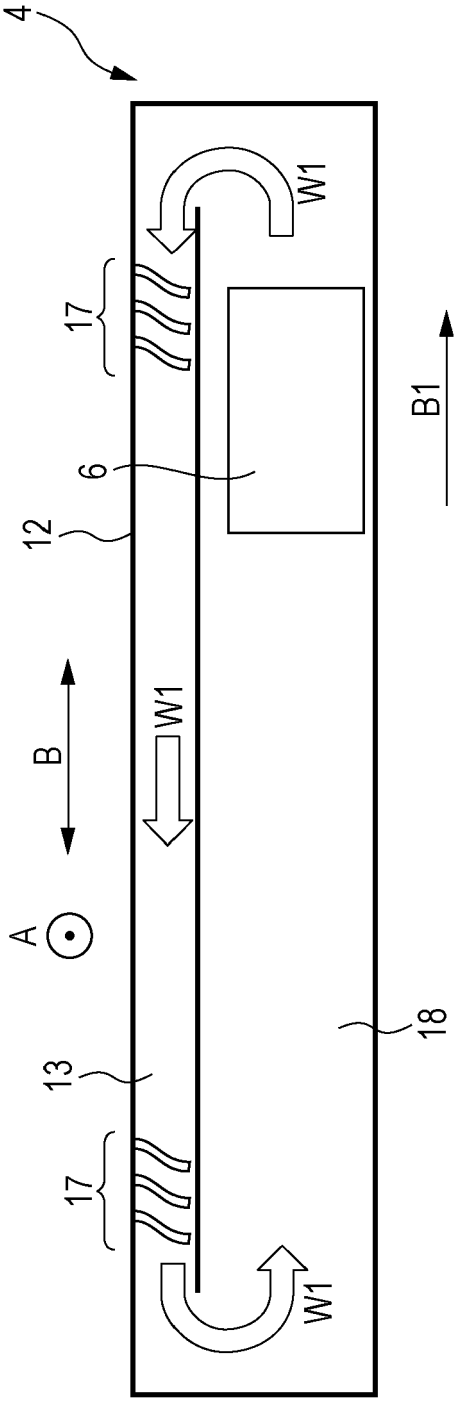


FIG. 11B

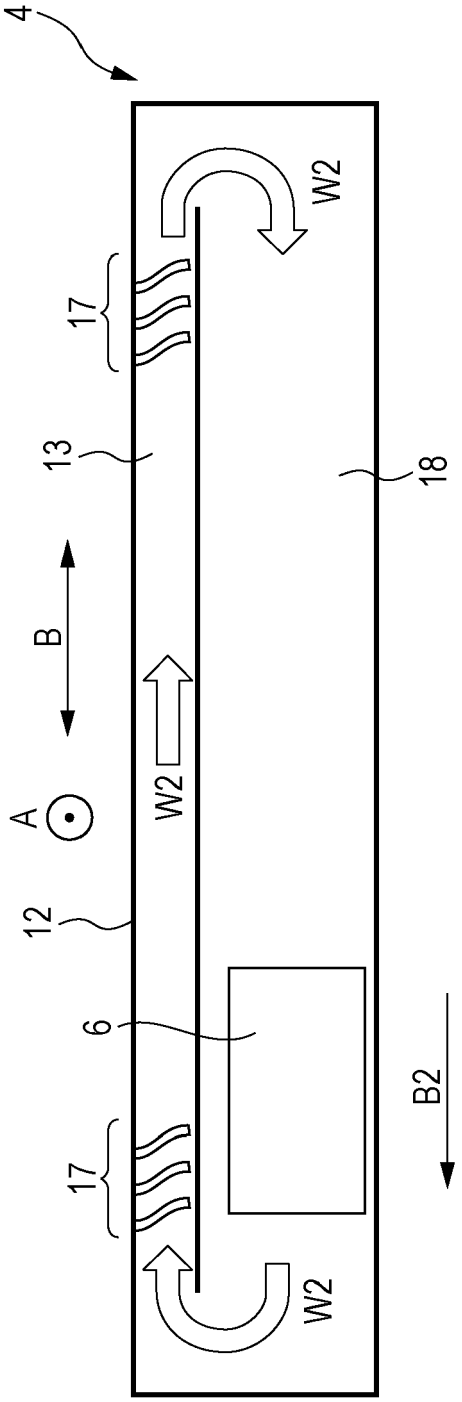


FIG. 12A

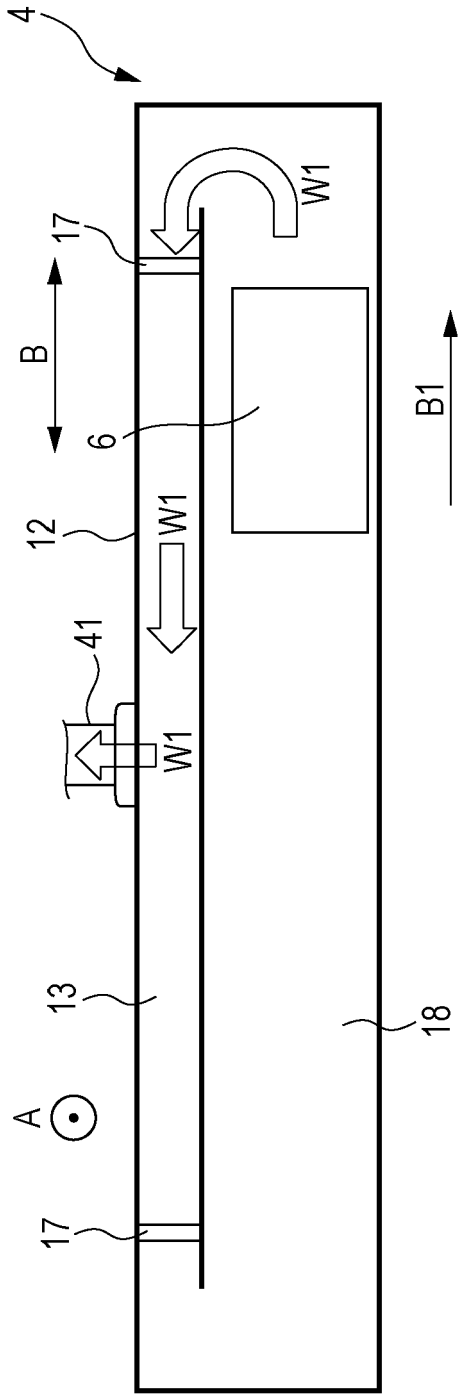


FIG. 12B

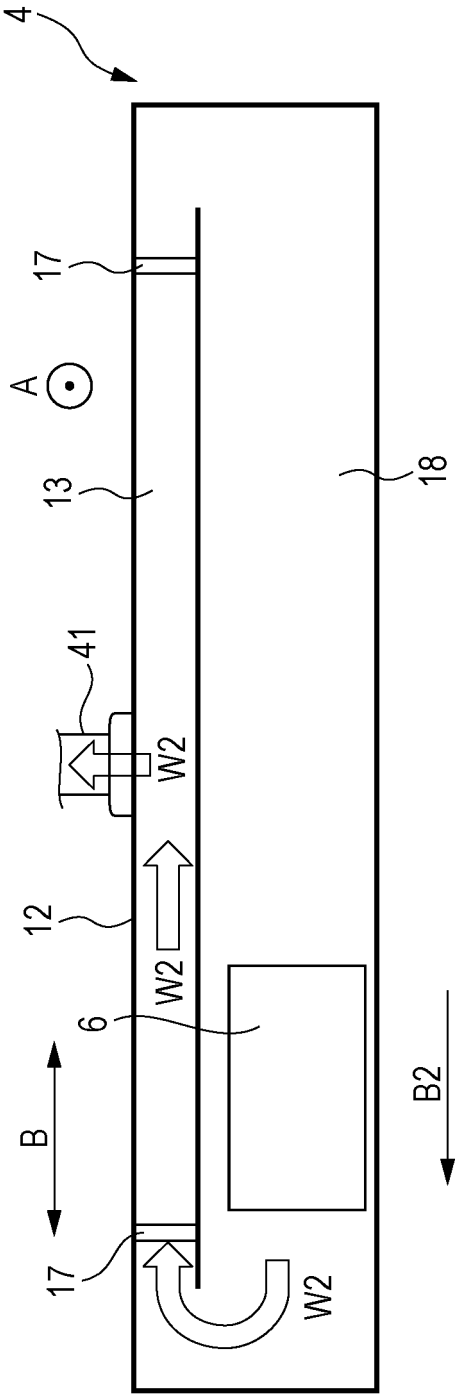


FIG. 13A

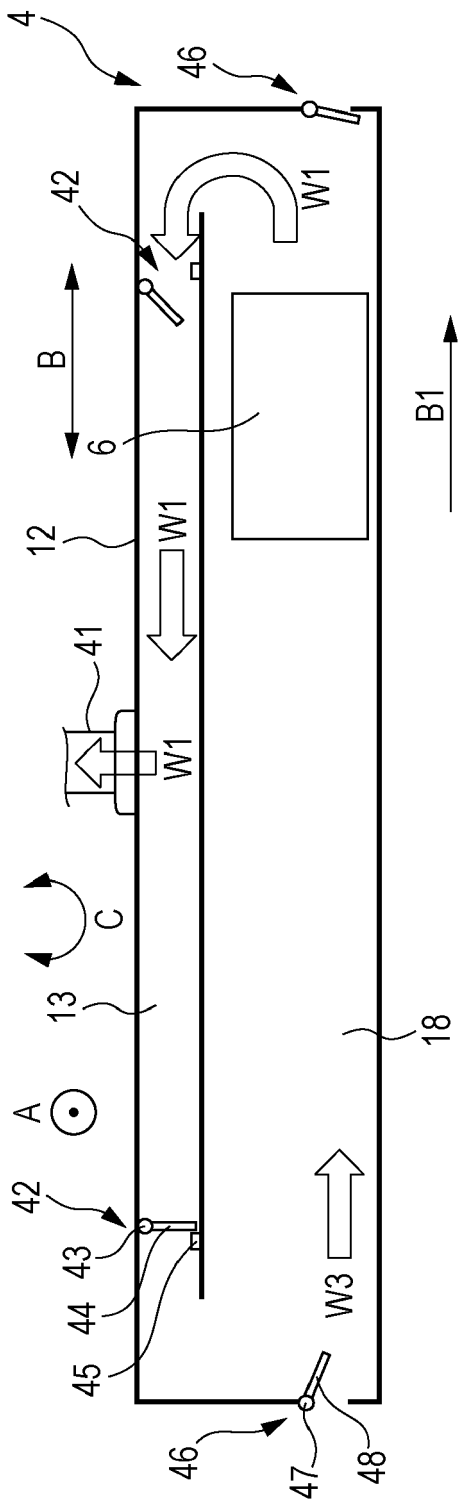
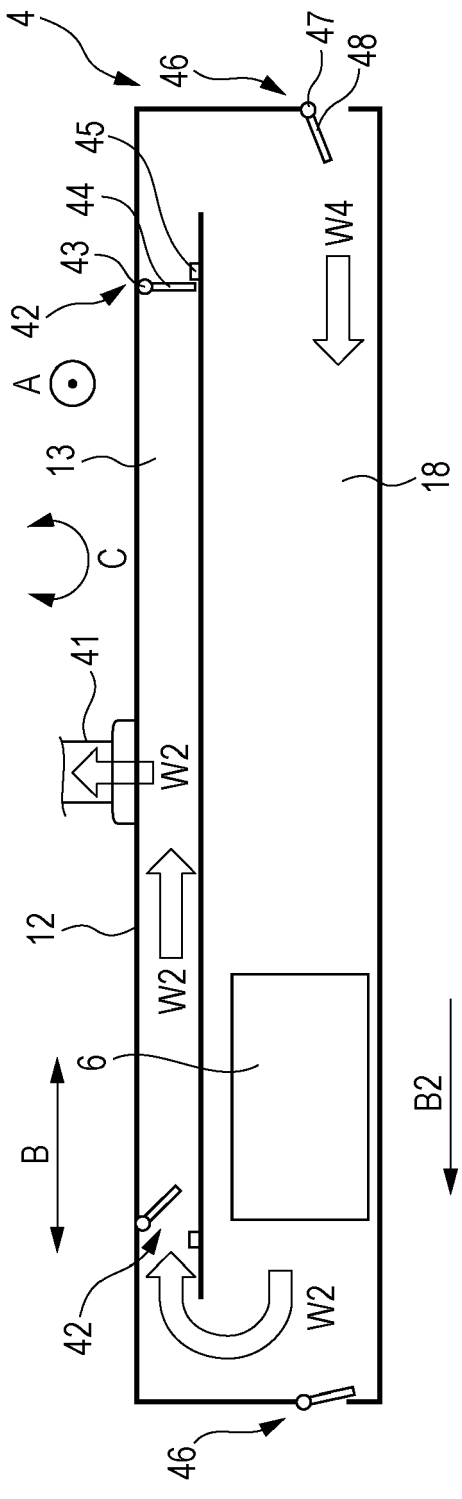


FIG. 13B



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EUROPEAN SEARCH REPORT

Application Number
EP 16 16 0812

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	JP 2004 130699 A (CANON KK) 30 April 2004 (2004-04-30)	1-3,5,7	INV. B41J2/17
A	* paragraph [0064]; figures 3, 4 *	4,6	
X	WO 2014/141688 A1 (SEIKO EPSON CORP [JP]) 18 September 2014 (2014-09-18)	1-3,5,7	
A	* abstract; figures *	4,6	
X	US 2011/285770 A1 (KOBAYASHI MASAHIRO [JP] ET AL) 24 November 2011 (2011-11-24)	1,2,5,7	
A	* paragraph [0049] - paragraph [0051] *	3,4,6	

TECHNICAL FIELDS SEARCHED (IPC)

B41J

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	9 September 2016	Gavaza, Bogdan

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09-09-2016

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