



(11)

EP 4 571 204 A1

(12)

EUROPEAN PATENT APPLICATION
published in accordance with Art. 153(4) EPC

(43) Date of publication:

18.06.2025 Bulletin 2025/25

(21) Application number: **23882878.4**

(22) Date of filing: **01.09.2023**

(51) International Patent Classification (IPC):

F24F 1/027 ^(2019.01) **F24F 13/24** ^(2006.01)
F24F 13/20 ^(2006.01) **F24F 1/0326** ^(2019.01)

(52) Cooperative Patent Classification (CPC):

F24F 1/027; F24F 1/0326; F24F 13/24;
F24F 2130/20

(86) International application number:

PCT/KR2023/013106

(87) International publication number:

WO 2024/090771 (02.05.2024 Gazette 2024/18)

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL
NO PL PT RO RS SE SI SK SM TR**

Designated Extension States:

BA

Designated Validation States:

KH MA MD TN

(30) Priority: **25.10.2022 KR 20220138623**

(71) Applicant: **Samsung Electronics Co., Ltd.**
Suwon-si, Gyeonggi-do 16677 (KR)

(72) Inventors:

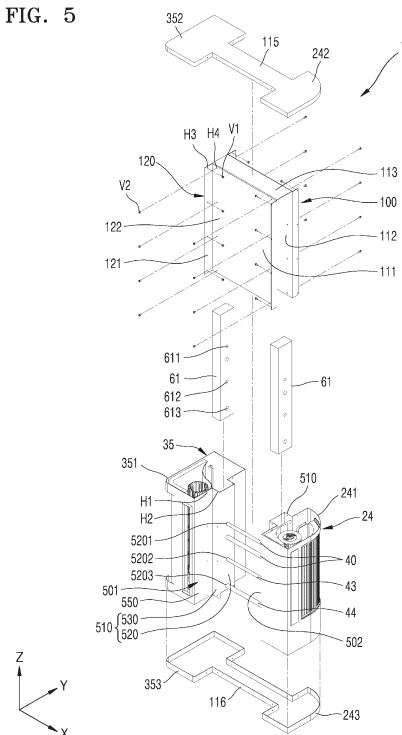
- **KIM, Munsub**
Suwon-si, Gyeonggi-do 16677 (KR)
- **JUNG, Duhan**
Suwon-si, Gyeonggi-do 16677 (KR)

(74) Representative: **Walaski, Jan Filip et al**
Venner Shipley LLP
200 Aldersgate
London EC1A 4HD (GB)

(54) **WINDOW-TYPE AIR CONDITIONER**

(57) A window-type air conditioner according to an embodiment of the disclosure includes: an outdoor module including a compressor; an indoor module separated from the outdoor module; a refrigerant pipe providing a flow path through which a refrigerant moves between the indoor module and the outdoor module; and a connection support module connecting the indoor module and the outdoor module and supporting the indoor module and the outdoor module, wherein at least one soundproof member surrounding the refrigerant pipe may be arranged in the connection support module.

FIG. 5



Description**Technical Field**

[0001] One or more embodiments provide a window-type air conditioner and a method of manufacturing a window-type air conditioner.

Background Art

[0002] An air conditioner may include a compressor for compressing a refrigerant, a heat exchanger (condenser and evaporator) for inducing heat exchange with the refrigerant, an expansion valve, and a blower for accelerating heat exchange with the refrigerant.

[0003] Air conditioners may be classified as separation-type air conditioners in which an indoor unit and an outdoor unit are separated, and window-type air conditioners that may be installed in a window frame with an indoor unit and an outdoor unit being formed in one device.

[0004] A window-type air conditioner may be installed in a window frame, and thus is easy to install. However, due to the installation of a window-type air conditioner, there may be a gap between a window and the window frame, and accordingly, external noise, e.g., noise from a compressor, may flow into an indoor space. This may cause discomfort for a user of the window-type air conditioner.

Disclosure of Invention**Solution to Problem**

[0005] According to an embodiment, a window-type air conditioner which is installable in a window frame, includes:

an outdoor module including a compressor for compressing a refrigerant, an outdoor heat exchanger in which heat exchange between an outdoor air and the refrigerant occurs, and an outdoor housing accommodating the compressor and the outdoor heat exchanger;

an indoor module including an indoor housing spaced apart from the outdoor housing, and an indoor heat exchanger which is arranged in the indoor housing and in which a heat exchange between an indoor air and the refrigerant occurs;

a refrigerant pipe providing a flow path in which the refrigerant moves between the indoor module and the outdoor module; and

a connection support module that connects the indoor module and the outdoor module, and is configured so that opposite end portions thereof support the indoor housing and the outdoor housing.

[0006] At least one soundproof member surrounding

the refrigerant pipe may be arranged in the connection support module.

Brief Description of Drawings

[0007]

FIG. 1 is a perspective view showing a window-type air conditioner according to an embodiment, installed in a window frame.

FIG. 2 is a diagram showing conceptually showing a structure of a window-type air conditioner according to an embodiment.

FIG. 3 is a perspective view of a structure of a window-type air conditioner according to an embodiment.

FIG. 4 is an assembly perspective view of a window-type air conditioner according to an embodiment.

FIG. 5 is an exploded perspective view of a window-type air conditioner according to an embodiment.

FIG. 6 is an enlarged view showing a state in which a connection support module of a window-type air conditioner according to an embodiment is fixed to an outdoor housing.

FIG. 7 is a diagram for illustrating a state in which a connection support module of a window-type air conditioner according to an embodiment is fixed to an indoor housing and an outdoor housing.

FIG. 8 is an enlarged view showing a state in which a connection support module of a window-type air conditioner according to an embodiment is fixed to an outdoor housing.

FIG. 9 is an exploded perspective view of a window-type air conditioner according to an embodiment.

FIG. 10 is a perspective view showing an example in which an upper plate is omitted from a connection support module in a window-type air conditioner according to an embodiment.

FIG. 11 is an assembly perspective view of a window-type air conditioner according to an embodiment.

FIG. 12 is an exploded perspective view of the window-type air conditioner of FIG. 11.

FIG. 13 is a cross-sectional view illustrating a first soundproof member in the window-type air conditioner of FIG. 5.

FIG. 14 is a perspective view of a window-type air conditioner according to an embodiment.

FIG. 15 is an exploded perspective view of a window-type air conditioner according to an embodiment.

FIG. 16 is a perspective view showing an installation state of a window-type air conditioner according to an embodiment.

FIG. 17 is a perspective view showing an installation state of a window-type air conditioner according to an embodiment.

Mode for the Invention

[0008] Hereinafter, one or more embodiments of the present disclosure will be described in detail with reference to accompanying drawings. In the drawings, like reference numerals or symbols may denote like parts or components that perform substantially the same function.

[0009] It will be understood that although the terms "first" and "second" are used herein to describe various elements, these elements should not be limited by these terms. Terms are only used to distinguish one element from other elements. For example, a first element may be referred to as a second element while not departing from the scope of the present disclosure, and likewise, a second element may also be referred to as a first element. The term "and/or" includes a combination of a plurality of related described items or any one item among the plurality of related described items.

[0010] Also, the terms used in the present application are merely used to describe particular embodiments, and are not intended to limit the present disclosure. An expression used in the singular encompasses the expression of the plural, unless it has a clearly different meaning in the context. In the present application, it is to be understood that the terms such as "including," "having," and "comprising" are intended to indicate the existence of the features, numbers, steps, actions, components, parts, or combinations thereof disclosed in the specification, and are not intended to preclude the possibility that one or more other features, numbers, steps, actions, components, parts, or combinations thereof may exist or may be added. In the drawings, like reference numerals may denote like members that perform substantially the same function.

[0011] FIG. 1 is a perspective view showing a window-type air conditioner 1 according to an embodiment, installed in a window frame 1010, and FIG. 2 is a diagram conceptually showing a structure of the window-type air conditioner 1 according to an embodiment. FIG. 3 is a perspective view of a structure of the window-type air conditioner 1 according to an embodiment.

[0012] Referring to FIG. 1, the window-type air conditioner 1 according to the embodiment is a device that may be installed in the window frame 1010, and may perform a function of cooling an indoor space. The window frame 1010 in which the window-type air conditioner 1 is installed may be a frame supporting a window 1000 to be slidably movable.

[0013] Referring to FIG. 2, the window-type air conditioner 1 according to the embodiment may include a compressor 31, an outdoor heat exchanger 32, an expansion device 33, and an indoor heat exchanger 21.

[0014] The compressor 31 may compress a refrigerant. The compressor 31 may compress the refrigerant of a gas phase. The refrigerant of a gas phase may be converted from a low-temperature and low-pressure state to a high-temperature and high-pressure state while

being compressed by the compressor 31.

[0015] In the outdoor heat exchanger 32, heat exchange between the refrigerant and outdoor air may occur. The outdoor heat exchanger 32 and the compressor 31 may be connected to each other so that the refrigerant is movable. The outdoor heat exchanger 32 condenses the high-temperature and high-pressure refrigerant transferred from the compressor 31, and the refrigerant may dissipate heat to the outdoor air while being condensed.

[0016] An outdoor fan 34 may be provided in the vicinity of the outdoor heat exchanger 32. The outdoor fan 34 may blow the outdoor air to the outdoor heat exchanger 32 so as to accelerate the heat exchange between the refrigerant and the outdoor air.

[0017] The expansion device 33 may reduce the pressure and temperature of the refrigerant condensed in the outdoor heat exchanger 32. The expansion device 33 and the outdoor heat exchanger 32 are connected to each other so that the refrigerant is movable. For example, the expansion device 33 may reduce the pressure and temperature of the refrigerant by using a throttling effect. For example, the expansion device 33 may reduce the pressure and temperature of the refrigerant by using an orifice.

[0018] In the indoor heat exchanger 21, heat exchange between the refrigerant and the indoor air may occur. The indoor heat exchanger 21 and the expansion device 33 are connected to each other so that the refrigerant is movable. The refrigerant of low-temperature and low-pressure may evaporate from the indoor heat exchanger 21. While the refrigerant evaporates, the refrigerant may absorb heat from the indoor air.

[0019] An indoor fan 22 may be provided in the vicinity of the indoor heat exchanger 21. The indoor fan 22 may blow the indoor air to the indoor heat exchanger 21 so as to accelerate the heat exchange between the refrigerant and the indoor air.

[0020] A drain pan 23 may be provided under the indoor heat exchanger 21. As such, during the operation of the indoor heat exchanger 21, condensate water generating on a surface of the indoor heat exchanger 21 may be stored in the drain pan 23.

[0021] The refrigerant after passing through the indoor heat exchanger 21 may be in the low-temperature and low-pressure state. The low-temperature and low-pressure refrigerant may be transferred to the compressor 31. Accordingly, the above-described processes may be repeatedly performed.

[0022] As described above, while the window-type air conditioner 1 operates, the refrigerant moves along a refrigerant pipe 40, the indoor air is cooled down while the refrigerant evaporates from the indoor heat exchanger 21, and the heat is dissipated while the refrigerant is condensed in the outdoor heat exchanger 32. The refrigerant pipe 40 may include a first refrigerant pipe 41 connecting the compressor 31 to the indoor heat exchanger 21, and a second refrigerant pipe 42 connecting the

outdoor heat exchanger 32 to the indoor heat exchanger 21.

[0023] However, while the window-type air conditioner 1 operates, noise may occur from some components, and the noise may cause discomfort for a user when the noise reaches the user. For example, while the window-type air conditioner 1 operates, a lot of noise may occur during the process in which the compressor 31 compresses the refrigerant to a high-pressure state. When the noise generated from the compressor 31 is transferred to the user, the user may experience uncomfortable feeling.

[0024] The window-type air conditioner 1 according to the embodiment may have a structure in which an outdoor module 3 including the compressor 31 is separated from an indoor module 2, in order to prevent the noise generated from the compressor 31 from infiltrating into the indoor space.

[0025] FIG. 4 is an assembly perspective view of the window-type air conditioner 1 according to the embodiment, and FIG. 5 is an exploded perspective view of the window-type air conditioner according to the embodiment.

[0026] Referring to FIG. 3 to FIG. 5, the window-type air conditioner 1 according to the embodiment may include the indoor module 2, the outdoor module 3 separated from the indoor module 2, and a connection support module 100 connecting the indoor module 2 to the outdoor module 3.

[0027] The outdoor module 3 may include the compressor 31, the outdoor heat exchanger 32, and an outdoor housing 35 accommodating them. The outdoor module 3 may further include the outdoor fan 34 arranged in the outdoor housing 35. FIG. 4 does not indicate the expansion device 33, but the expansion device 33 may be arranged in the outdoor module 3 or the indoor module 2.

[0028] The indoor module 2 may include an indoor housing 24 spaced apart from the outdoor housing 35, and the indoor heat exchanger 21 arranged in the indoor housing 24. The indoor module 2 further includes the indoor fan 22 arranged in the indoor housing 24.

[0029] The connection support module 100 supports the indoor module 2 and the outdoor module 3. The connection support module 100 may connect the indoor housing 24 to the outdoor housing 35. One end portion of the connection support module 100 is fixed to the indoor housing 24, and the other end portion may be fixed to the outdoor housing 35.

[0030] The connection support module 100 has a width less than that of each of the indoor module 2 and the outdoor module 3. For example, the width of the connection support module 100 may be half the width of the outdoor module 3 or less. For example, the width of the connection support module 100 may be 1/3 of the width of the outdoor module 3 or less. Because the width of the connection support module 100 is less than the width of each of the indoor module 2 and the outdoor module 3, a

width occupied by the window-type air conditioner 1 in the window frame 1010 (see FIG. 1) may be reduced, which may be advantageous for blocking noise and heat.

[0031] The connection support module 100 may include first and second support plates 111 and 112 that are spaced apart from each other. At least some of the first and second support plates 111 and 112 may have a flat plate shape and the first and second support plates may be arranged parallel to each other.

[0032] The first and second support plates 111 and 112 may have roughly square shapes. However, the first and second support plates 111 and 112 are not limited to the above shape, and may have various shapes. For example, although not shown in the drawings, the first and second support plates 111 and 112 may each have a roughly trapezoidal shape, parallelogram shape, or elliptical shape.

[0033] The connection support module 100 may have a material having a certain strength. For example, the connection support module 100 may include steel. For example, the connection support module 100 may include galvanized steel. For example, the first and second support plates 111 and 112 may include steel. For example, the first and second support plates 111 and 112 may include galvanized steel. However, the material of the connection support module 100 is not limited thereto, and may be various provided that the material has a certain strength. Because the connection support module 100 has a certain strength, a positional relationship between the indoor module 2 and the outdoor module 3 may be fixed due to the connection support module 100.

[0034] The refrigerant pipe 40 providing a flow path through which the refrigerant moves between the indoor module 2 and the outdoor module 3 may be arranged in the connection support module 100. The refrigerant pipe 40 may include a first refrigerant pipe 41 connecting the compressor 31 to the indoor heat exchanger 21, and a second refrigerant pipe 42 connecting the outdoor heat exchanger 32 to the indoor heat exchanger 21. For example, the refrigerant pipe 40 may be arranged between the first and second support plates 111 and 112. For example, the first and second refrigerant pipes 41 and 42 may be arranged between the first and second support plates 111 and 112. The first and second support plates 111 and 112 may be spaced apart from the refrigerant pipe 40 so as not to come into contact with the refrigerant pipe 40. For example, a distance between the first and second support plates 111 and 112 may be greater than an outer diameter of the refrigerant pipe 40. Accordingly, corrosion generated due to the contact between the refrigerant pipe 40 and the first and second support plates 111 and 112 may be prevented.

[0035] A wire 43 for electrically connecting between the indoor module 2 and the outdoor module 3 may be arranged in the connection support module 100. A drain hose 44 may be arranged in the connection module. The drain hose 44 may transfer the condensate water generated from the indoor heat exchanger 21 to the outdoor

module 3.

[0036] In addition, external forces may be applied during transport, installation, and use from various directions to the window-type air conditioner 1 of which the indoor module 2 and the outdoor module 3 are supported by the connection support module 100.

[0037] The window-type air conditioner 1 according to the embodiment may have a structure capable of increasing a connection strength between the connection support module 100 and the indoor module 2 and the connection strength between the connection support module 100 and the outdoor module 3, in consideration that the external force is applied from various directions.

[0038] For example, in the window-type air conditioner 1 according to the embodiment, the connection support module 100 may be fixed to at least one of the outdoor housing 35 and the indoor housing 24 to be restricted from moving in at least two directions.

[0039] For example, at least one of the outdoor housing 35 and the indoor housing 24 may have a protruding portion 510 that protrudes from a part of one of opposite surfaces 501 and 502 facing each other, to be inserted into the connection support module 100. For example, each of the outdoor housing 35 and the indoor housing 24 may include the protruding portion 510 that protrudes from a part of the opposite surface 501 and 502 facing each other, so as to be inserted into the connection support module 100.

[0040] For example, the outdoor housing 35 may include the protruding portion 510 that is a protruding part of the opposite surface 501 facing the indoor housing 24. The indoor housing 24 includes the protruding portion 510 that is a protruding part of the opposite surface 502 facing the outdoor housing 35.

[0041] A width of the protruding portion 510 of the outdoor housing 35 may be equal to that of the protruding portion 510 of the indoor housing 24. However, the relationship between the width of the protruding portion 510 of the outdoor housing 35 and the width of the protruding portion 510 of the indoor housing 24 is not limited to the above example, and as necessary, the width of the protruding portion 510 of the outdoor housing 35 may be modified to be less than or greater than the width of the protruding portion 510 of the indoor housing 24.

[0042] The width of the protruding portion 510 is less than the widths of the opposite surfaces 501 and 502 of the outdoor housing 35 and the indoor housing 24. The width of the protruding portion 510 is greater than the diameter of the refrigerant pipe 40. The protruding portion 510 may include a protruding surface 520 and connecting surfaces 530 connecting the protruding surface 520 to remaining portions 550 of the opposite surfaces 501 and 502.

[0043] A height of the protruding portion 510 in a vertical direction (Z) may be equal to a height of the opposite surfaces 501 and 502 in the vertical direction (Z). However, the relationship between the height of the protruding portion 510 and the heights of the opposite surface

501 and 502 is not limited to the above example, and the height of the protruding portion 510 may be less than the heights of the opposite surfaces 501 and 502.

[0044] The connecting surface 530 is bent from the protruding surface 520, and may have a different orientation from that of the remaining portions 550. For example, the remaining portions 550 of the opposite surfaces 501 and 502 have a plane (YZ plane) perpendicular to a back-and-forth direction (X), but the connecting surface 530 of the protruding portion 510 may have a plane (XZ plane) that is parallel to the back-and-forth direction (X).

[0045] Via the protruding portion 510, portions of the outdoor housing 35 and the indoor housing 24 fixed to the connection support module 100 may expand, and moreover, directions fixed to the connection support module 100 are increased. Thus, connection strengths between the connection support module 100 and the indoor module 2 and the outdoor module 3 may be improved.

[0046] FIG. 6 is an enlarged view of the connection support module 100 in the window-type air conditioner 1 according to the embodiment, which is fixed to the outdoor housing 35, and FIG. 7 is a diagram for illustrating the connection support module 100 in the window-type air conditioner 1 according to the embodiment, which is fixed to the indoor housing 24 and the outdoor housing 35. In FIG. 7, a first soundproof member 61 is omitted for convenience of description.

[0047] Referring to FIGS. 4 to 7, the connection support module 100 may include fixed portions 120 at opposite end portions to be fixed to the outdoor housing 35 or the indoor housing 24, and a connecting portion 130 connecting the fixed portions 120. For example, each of the first and second support plates 111 and 112 may include the fixed portions 120 arranged at opposite end portions in the back and forth direction (X), and the connecting portion 130 connecting the fixed portions 120. The connecting portion 130 may extend from the fixed portions 120 at the opposite end portions in the back and forth direction (X).

[0048] When the widths of the protruding portions 510 in the outdoor housing 35 and the indoor housing 24 are equal to each other, the connecting portions 130 of the first and second support plates 111 and 112 may be parallel to each other without having a step. In another example, although not shown in the drawings, when the widths of the protruding portions 510 of the outdoor housing 35 and the indoor housing 24 are different from each other, the connecting portions 130 of the first and second support plates 111 and 112 may have a step therebetween or may not be parallel to each other.

[0049] The fixed portions 120 may be fixed to the protruding portions 510 and the remaining portions 550 of the opposite surfaces 501 and 502. For example, the fixed portion 120 may include an inner fixed portion 122 fixed to the protruding portion 510 of each of the opposite surfaces 501 and 502, and a flange fixed portion 121 fixed to the remaining portion 550 in each of the opposite surfaces 501 and 502.

[0050] The flange fixed portion 121 may extend in a direction parallel to the remaining portion 550 in each of the opposite surfaces 501 and 502 of the outdoor housing 35 or the indoor housing 24. For example, the flange fixed portion 121 may extend in a direction (Y or Z) perpendicular to the back and forth direction (X).

[0051] The inner fixed portion 122 may be arranged between the flange fixed portion 121 and the connecting portion 130. The inner fixed portion 122 extends from the connecting portion 130 and may be fixed to the connecting surface 530 of the protruding portion 510. The inner fixed portion 122 may extend along the direction in which the connecting portion 130 extends.

[0052] The flange fixed portion 121 may be bent from the inner fixed portion 122. An angle between the flange fixed portion 121 and the inner fixed portion 122 may be a right angle. The fixed portion 120 may have an L-shape. However, the angle formed by the flange fixed portion 121 and the inner fixed portion 122 is not limited to the above example, that is, may be an acute angle or obtuse angle.

[0053] The remaining portions 550 of the opposite surfaces 501 and 502 provide first fixed regions fixed to the flange fixed portions 121. The first fixed portion comes into contact with the flange fixed portion 121, and may have a plurality of first fastening holes H1 in which first fastening members V1 are inserted. The flange fixed portion 121 may have third fastening holes H3 in which the first fastening members V1 may be inserted.

[0054] The protruding portion 510 in each of the opposite surface 501 and 502 includes the protruding surface 520 and the connecting surfaces 530. The protruding surface 520 may have a piping hole 5201 through which the refrigerant pipe 40 passes. The protruding surface 520 may have a wire hole 5202 through which the wire 43 passes, and a drain hole 5203 through which the drain hose 44 passes.

[0055] The connecting surface 530 in each of the opposite surfaces 501 and 502 may provide a second fixed region fixed to the inner fixed portion 122. The second fixed region comes into contact with the inner surface of the inner fixed portion 122, and may have a plurality of second fastening holes H2 in which second fastening members V2 are inserted. The inner fixed portion 122 may have fourth fastening holes H4 in which the second fastening members V2 may be inserted.

[0056] Referring to FIGS. 5 to 7, the connection support module 100 may be fixed to the indoor housing 24 and the outdoor housing 35 in different directions by the first and second fastening members V1 and V2. Because the first fastening members V1 are inserted in a first direction, e.g., the back and forth direction (X), to be fastened to the third fastening holes H3 of the flange fixed portion 121 and the first fastening holes H1 of the first fixed portion, the connection support module 100 may be pressed in the first direction, e.g., the back and forth direction (X), to be fixed to the outdoor housing 35 or the indoor housing 24. Shaking of the connection support module 100 in the first direction may be prevented due to

the first fastening members V1 inserted into the first fastening holes H1 and the third fastening holes H3.

[0057] Because the second fastening members V2 are inserted in a second direction that is different from the first direction, e.g., in the left and right direction (Y), to be fastened to the fourth fastening holes H4 of the inner fixed portion 122 and the second fastening holes H2 of the second fixed portion, the connection support module 100 may be pressed in the second direction, e.g., the left and right direction (Y), and fixed to the outdoor housing 35 or the indoor housing 24. Shaking of the connection support module 100 in the second direction may be prevented due to the second fastening members V2 inserted into the second fastening holes H2 and the fourth fastening holes H4.

[0058] As described above, because the connection support module 100 is fixed to the outdoor housing 35 and the indoor housing 24 in at least two directions, the connection strength of the connection support module 100 with respect to the outdoor housing 35 and the indoor housing 24 may be improved.

[0059] In addition, in the above embodiment, an example in which the connection support module 100 is restricted from moving in the first direction, e.g., the back and forth direction (X), due to the first fastening members V1, and restricted from moving in the second direction, e.g., the left and right direction (Y), due to the second fastening members (V2) is described above. However, the fixing structure of the connection support module 100 is not limited to the above example, and some components may be omitted. For example, because the protruding portion 510 is inserted into the connection support module 100, as shown in FIG. 8, the inner fixed portion 122 of the connection support module 100 is supported by the protruding portions 510 in the left and right direction (Y), and thus, may be restricted from moving in the left and right direction (Y) without using the second fastening members V2.

[0060] Referring back to FIG. 5, the connection support module 100 may include a third support plate 113 connecting the first and second support plates 111 and 112 to each other.

[0061] The third support plate 113 may connect upper ends of the first and second support plates 111 and 112 to each other. The first support plate 111 and the second support plate 112 may be integrated as one body due to the third support plate 113. In an example for this, the third support plate 113 may have a structure bent from the first support plate 111 and the second support plate 112. The third support plate 113 may have a structure bent from the upper end of the first support plate 111 and the upper end of the second support plate 112. The third support plate 113 may include a material that is the same as that included in the first and second support plates 111 and 112.

[0062] However, the third support plate 113 may be optional and may be omitted as necessary. For example, as shown in FIG. 9, a connection support module 100A

may have the first support plate 111 and the second support plate 112 that are separate members spaced apart from each other, without including the third support plate 113.

[0063] Referring back to FIG. 5, a lower surface 532 and the outdoor housing 35 may include a first body 241 surrounding the compressor 31 and the outdoor heat exchanger 32, and a first upper cover 242 assembled onto the upper portion of the first body 241. The first upper cover 242 may be fitted to be assembled onto the first body 241, but is not limited thereto, and may be variously modified provided that the coupling method is performed for the assembly.

[0064] The outdoor housing 35 may include a first lower cover 243 assembled onto the lower portion of the first body 241. The first lower cover 243 may be fitted to be assembled onto the first body 241, but is not limited thereto, and may be variously modified provided that the coupling method is performed for the assembly.

[0065] The indoor housing 24 may include a second body 351 surrounding the indoor heat exchanger 21, and a second upper cover 352 assembled onto the upper portion of the second body 351. The second upper cover 352 may be fitted to be assembled onto the second body 351, but is not limited thereto, and may be variously modified provided that the coupling method is performed for the assembly.

[0066] The indoor housing 24 may include a second lower cover 353 assembled onto the lower portion of the second body 351. The second lower cover 353 may be fitted to be assembled onto the second body 351, but is not limited thereto, and may be variously modified provided that the coupling method is performed for the assembly.

[0067] The connection support module 100 may further include an upper plate 115 connecting the first upper cover 242 to the second upper cover 352. The first upper cover 242, the second upper cover 352, and the upper plate 115 may be formed in one body. Because the first connection plate of the connection support module 100 is configured as one body along with the first upper cover 242 and the second upper cover 352, the connection strength of the connection support module 100 with respect to the outdoor housing 35 and the indoor housing 24 may be reinforced.

[0068] The connection support module 100 may further include a lower plate 116 connecting the first lower cover 243 to the second lower cover 353. The first lower cover 243, the second lower cover 353, and the lower plate 116 may be formed as one body. Because the lower plate 116 of the connection support module 100 is configured as one body along with the first lower cover 243 and the second lower cover 353, the connection strength of the connection support module 100 with respect to the outdoor housing 35 and the indoor housing 24 may be reinforced.

[0069] However, in the connection support module 100, the upper plate 115 for connecting the first and

second upper covers 242 and 352 and the lower plate 116 for connecting the first and second lower covers 243 and 353 are optional, and may be omitted as necessary.

[0070] FIG. 10 is a perspective view showing an example in which the upper plate 115 is omitted from the connection support module 100 of the window-type air conditioner 1 according to the embodiment.

[0071] Referring to FIG. 10, the window-type air conditioner 1 according to the embodiment may not include the upper plate 115 in a connection support module 100B. In this case, parts of the first and second upper covers 242 and 352 may be arranged to overlap the first and second support plates 111 and 112. Some parts of the first and second upper covers 242 and 352 may be arranged to overlap the third support plate 113.

[0072] In addition, in the above embodiment, an example in which the connection support module 100 is fixed to the outdoor housing 35 and the indoor housing 24 in two directions by the first and second fastening members V2 fastened in different directions is described. However, a structure for improving the connection strength of the connection support module 100 is not limited to the above example, and the connection support module 100 may be fixed to the outdoor housing 35 and the indoor housing 24 in three or more directions.

[0073] FIG. 11 is an assembly perspective view of a window-type air conditioner 1A according to an embodiment, and FIG. 12 is an exploded perspective view of the window-type air conditioner 1A of FIG. 11.

[0074] Referring to FIGS. 11 and 12, the window-type air conditioner 1A according to the embodiment may include the outdoor module 3, the indoor module 2, and a connection support module 100C for connecting the outdoor module 3 and the indoor module 2 to each other. Descriptions about the same components as those of the above embodiments are omitted, and differences are described below.

[0075] The outdoor housing 35 of the outdoor module 3 and the indoor housing 24 of the indoor module 2 may include the protruding portions 510. The height h of the protruding portion 510 in the vertical direction (Z) may be less than heights h1 and h2 of the opposite surfaces 501 and 502 in the vertical direction Z. For example, the protruding portions 510 may be formed on upper regions of the opposite surfaces 501 and 502. For example, although not shown in the drawings, the protruding portions 510 may be formed on lower regions of the opposite surfaces 501 and 502.

[0076] The connection support module 100C may include the first support plate 111, the second support plate 112, and a fourth support plate 114. The first and second support plates 111 and 112 may be separate members arranged parallel to each other.

[0077] Heights of the first and second support plates 111 and 112 may correspond to the height h of the protruding portion 510. The heights of the first and second support plates 111 and 112 may be less than the heights h1 and h2 of the indoor housing 24 or the outdoor

housing 35.

[0078] The fourth support plate 114 may be arranged under the first support plate 111 and the second support plate 112. The fourth support plate 114 may be arranged to overlap the lower portions of the first support plate 111 and the second support plate 112.

[0079] The connection support module 100C may include the fixed portions 120 arranged at both ends in the back and forth direction (X), and a connecting portion 130 connecting the fixed portions 120. The fixed portion 120 may include the flange fixed portion 121 and the inner fixed portion 122.

[0080] The flange fixed portions 121 of the first support plate 111, the second support plate 112, and the fourth support plate 114 may be fixed by the first fastening members V1 inserted in the first direction, back and forth direction (X).

[0081] The inner fixed portions 122 of the first support plate 111 and the second support plate 112 are fixed by the second fastening members V2 that are inserted in the second direction, the left and right direction (Y), and the inner fixed portions 122 of the fourth support plate 113 may be fixed by the second fastening members V2 that are inserted in the second direction, the left and right direction (Y), and third fastening members V3 inserted in a third direction, e.g., the vertical direction (Z).

[0082] The connecting surface 530 of the protruding portion 510 may include side surfaces 531 on opposite sides of the protruding surface 520, and a lower surface 532 arranged under the protruding surface 520. The second fastening members V2 are fastened to the side surfaces 531 of the connecting surface 530, and third fastening members V3 may be fastened to the lower surface 532 of the connecting surface 530. The third fastening member V3 may be fastened through a fifth fastening hole H5 of the inner fixed portion 122 of the third support plate 113 and the lower surface 532 of the protruding portion 510.

[0083] Due to the first, second, and third fastening members V1, V2, and V3 inserted in different directions, the connection support module 100C may be fixed to the outdoor housing 35 and the indoor housing 24 in three directions. Accordingly, even when the external force is applied to the window-type air conditioner 1A in the back and forth direction (X), and the vertical direction (Z) and the left and right direction (Y) that are perpendicular to the back and forth direction (X), twisting or damage of the window-type air conditioner 1A may be prevented.

[0084] In addition, although not shown in the drawings, the connection support module 100C may be fixed to the protruding portion 510 in a direction in addition to the above-described first, second, and third directions, e.g., a diagonal direction. For example, another fastening member may be inserted in a slant direction inclined with respect to the first, second, and third directions, so as to fix the connection support module 100C to the protruding portion 510. In this case, the connection support module 100C may be fixed to the indoor housing 24 and the

outdoor housing 35 in four or more directions.

[0085] In addition, when the window-type air conditioner 1 and 1A according to the previous embodiments each have a structure in which the refrigerant pipe 40 passes through the protruding portion 510, the noise generated from the compressor 31 of the outdoor module 3 may be transferred to the indoor module 2 via the protruding portions 510 and the connection support module 100, 100A, 100C, 100C.

[0086] The window-type air conditioner 1, 1A according to the embodiment may further include at least one soundproof member for blocking the noise transfer through the connection support module 100, 100A, 100B, 100C. The soundproof member may be arranged in the connection support module 100, 100A, 100B, 100C so as to surround the refrigerant pipe. Through the soundproof member, transfer of the noise generated from the compressor 31, etc. of the outdoor module 3 to the indoor module 2 via the connection support module 100, 100A, 100B, 100C may be minimized.

[0087] FIG. 13 is a cross-sectional view for describing the first soundproof member 61 of the window-type air conditioner 1 of FIG. 5.

[0088] Referring to FIGS. 5 and 13, the soundproof member of the window-type air conditioner 1 according to the embodiment may include the first soundproof member 61 which is arranged in the protruding portion 510 that is inserted into the connection support module 100 and surrounds the refrigerant pipe 40. The first soundproof member 61 may be filled in the protruding portion 510. The first soundproof member 61 may include a first through hole 611 through which the refrigerant pipe 40 passes.

[0089] The first soundproof member 61 may include a foam material. For example, the first soundproof member 61 may include polyurethane (PU) foam or a polyethylene (PE) foam. However, the material in the first soundproof member 61 is not limited thereto, but may be variously selected.

[0090] The first soundproof member 61 may be arranged in at least one of the protruding portion 510 of the outdoor housing 35 and the protruding portion 510 of the indoor housing 24. For example, the first soundproof member 61 may be arranged in each of the protruding portion 510 of the outdoor housing 35 and the protruding portion 510 of the indoor housing 24. For example, although not shown in the drawings, the first soundproof member 61 may be arranged in the protruding portion 510 of the outdoor housing 35 or the protruding portion 510 of the indoor housing 24.

[0091] Because the first soundproof member 61 is arranged in the protruding portion 510, the noise transferred from the compressor 31 to the protruding portion 510 may be absorbed by the first soundproof member 61 and transferring of the noise via the refrigerant pipe 40 may be prevented.

[0092] The first soundproof member 61 may be formed to surround the wire 43 and the drain hose 44. For

example, the first soundproof member 61 may include a second through hole 612 through which the wire 43 passes, and a third through hole 613 through which the drain hose 44 passes.

[0093] FIG. 14 is a perspective view of a window-type air conditioner 1B according to the embodiment. Referring to FIG. 14, a soundproof member of the window-type air conditioner 1B according to the embodiment may include a second soundproof member 62 that is arranged on the outside of the protruding portion 510 in the connection support module 100A and surrounds the refrigerant pipe 40. The soundproof member may further include the first soundproof member 61 arranged in the protruding portion 510, but is not limited thereto, and the first soundproof member 61 may be omitted.

[0094] The second soundproof member 62 may include a foaming material. For example, the second soundproof member 62 may include PU foam or a PE foam. However, the material in the second soundproof member 62 is not limited thereto, but may be variously selected.

[0095] The second soundproof member 62 may be arranged between the first support plate 111 and the second support plate 112. The second soundproof member 62 may block the transfer of noise through the refrigerant pipe 40 while maintaining the position of the refrigerant pipe 40 in the connection support module 100A. The second soundproof member 62 may include a first through hole 621 through which the refrigerant pipe 40 passes. The second soundproof member 62 may further include a second through hole 622 surrounding the wire 43, and a third through hole 623 surrounding the drain hose 44. The first, second, and third through holes 621, 622, and 623 may have cut side portions. Accordingly, in the process of installing the window-type air conditioner 1, the second soundproof member 62 may be arranged to surround the refrigerant pipe 40, the wire 43, and the drain hose 44.

[0096] The second soundproof members 62 may be arranged on opposite end portions of the connecting portion 130 in the connection support module 100A. However, the arrangement and structure of the second soundproof member 62 are not limited thereto, but may be variously modified. For example, although not shown in the drawings, a plurality of second soundproof members 62 may be arranged in a direction in which the connecting portion 130 extends, for example, the back and forth direction (X), or may have different thicknesses from each other.

[0097] In addition, in the window-type air conditioner 1, 1A, 1B according to the above-described embodiments, an example in which the protruding portions 510 are formed respectively on the indoor housing 24 and the outdoor housing 35 as a structure for improving the connecting strength of the connection support module 100, 100A, 100B, 100C. However, in the window-type air conditioner 1, 1A, 1B according to the embodiment is not limited thereto, and as necessary, the protruding portion

510 may be formed on any one of the indoor housing 24 and the outdoor housing 35 and is not formed on the other. For example, as shown in FIG. 15, in the window-type air conditioner 1C according to the embodiment, the protruding portion 510 is provided on the opposite surface 501 and 502 of the outdoor housing 35 and may not be provided on the opposite surface 501 and 502 of the indoor housing 24. In this case, one end portion of the connection support module 100 facing the protruding portion 510 may be fixed in two or more directions, and the other end portion of the connection support module 100 facing the opposite surface 501 or 502 on which the protruding portion 510 is not provided may be fixed in one direction. In this case, the other end of the connection support module 100 fixed in one direction may be fixed by a fastening member having greater fastening strength as compared with one end portion of the connection support module 100.

[0098] FIG. 16 is a perspective view showing an installation state of the window-type air conditioner 1 according to the embodiment. FIG. 17 is a perspective view showing an installation state of the window-type air conditioner 1 according to the embodiment.

[0099] Referring to FIG. 16, the window-type air conditioner 1 according to the embodiment may be installed so that the connection support module 100 may be arranged between the window frame 1010 and the window 1000. For example, at least one of the connection support module 100, the indoor housing 24, and the outdoor housing 35 of the window-type air conditioner 1 may be fixed to the window frame 1010 via a plurality of brackets (not shown).

[0100] A gap blocking member 200 may be arranged between the window frame 1010 and the window 1000. Transferring of heat or noise through the gap defined by the window frame 1010, the window 1000, and the connection support module 100 may be prevented by the gap blocking member 200.

[0101] However, the installation aspect of the window-type air conditioner 1 may vary depending on the shape of the connection support module 100 of the window-type air conditioner 1. For example, when the height h of the connection support module 100C in the window-type air conditioner 1A is less than the height h1 of the outdoor housing 35 or the height h2 of the indoor housing 24, the window-type air conditioner 1A may be installed as shown in FIG. 17.

[0102] For the purposes of promoting an understanding of the principles of the disclosure, reference has been made to the exemplary embodiments illustrated in the drawings, and specific language has been used to describe these exemplary embodiments. However, no limitation of the scope of the disclosure is intended by this specific language, and the disclosure should be construed to encompass all exemplary embodiments that would normally occur to one of ordinary skill in the art.

[0103] The particular implementations shown and described in the disclosure are illustrative examples and are

not intended to otherwise limit the scope of the disclosure in any way. For the sake of brevity, electronics, control systems, software, and other functional aspects of the systems according to the related art may not be described in detail. Furthermore, the connecting lines or connectors shown in the drawings are intended to represent example functional relationships and/or physical or logical couplings between the various elements. It should be noted that many alternative or additional functional relationships, physical connections, or logical connections may be present in a practical device. Moreover, no item or component is essential to the practice of the disclosure unless the element is specifically described as "essential" or "critical". It will also be recognized that the terms "comprises," "comprising," as used herein, are specifically intended to be read as open-ended terms of art.

[0104] The singular forms "a," "an" and "the" in the specification of the embodiments (in particular, claims) may be intended to include the plural forms as well. Unless otherwise defined, the ranges defined herein is intended to include values within the range as individually applied and may be considered to be the same as individual values constituting the range in the detailed description. Finally, operations constituting methods according to the present disclosure may be performed in appropriate order unless explicitly described in terms of order or described to the contrary. The present disclosure is not limited to the described order of the steps. The use of any and all examples, or example language (e.g., "such as") provided herein, is intended merely to better illuminate the present disclosure and does not pose a limitation on the scope of the present disclosure unless otherwise claimed. In view of this disclosure, numerous modifications and adaptations will be readily apparent to those skilled in this art without departing from the spirit and scope of this disclosure.

[0105] The window-type air conditioner according to an embodiment may have a structure capable of improving a connection strength of the connection support module with respect to the indoor module and the outdoor module, in consideration of the factor that external force may apply in various directions.

[0106] According to an embodiment, a window-type air conditioner, which is installable in a window frame, includes an outdoor module including a compressor for compressing a refrigerant, an outdoor heat exchanger in which heat exchange between an outdoor air and the refrigerant occurs, and an outdoor housing accommodating the compressor and the outdoor heat exchanger, an indoor module including an indoor housing spaced apart from the outdoor housing, and an indoor heat exchanger which is arranged in the indoor housing and in which a heat exchange between an indoor air and the refrigerant occurs, a refrigerant pipe providing a flow path in which the refrigerant moves between the indoor module and the outdoor module, and a connection support module that connects the indoor module and the outdoor module, and

is configured so that opposite end portions thereof support the indoor housing and the outdoor housing.

[0107] At least one soundproof member surrounding the refrigerant pipe may be arranged in the connection support module.

[0108] At least one of the outdoor housing and the indoor housing may include a protruding portion that protrudes from a part of opposite surfaces facing each other to be inserted into the connection support module.

[0109] The soundproof member may include a first soundproof member arranged in the protruding portion and surrounding the refrigerant pipe.

[0110] An end portion of the connection support module includes an inner fixed portion fixed to the protruding portion inserted therein, and a flange fixed portion fixed to a remaining portion that is a portion of the opposite surfaces other than the protruding portion.

[0111] The flange fixed portion may be fixed to the remaining portion of the opposite surfaces by a first fastening member fastened in a first direction, and the inner fixed portion may be fixed to the protruding portion of the opposite surfaces by a second fastening member that is fastened in a second direction that is different from the first direction.

[0112] The protruding portion may include a protruding surface, and a connecting surface connecting the protruding surface to the remaining portion and having an orientation different from the remaining portion.

[0113] A height of the protruding portion may be equal to a height of the outdoor housing or the indoor housing.

[0114] The inner fixed portion may be fixed to the protruding portion of the opposite surface by a third fastening member that is fastened in a third direction that is different from the first direction and the second direction.

[0115] The connecting surface may include side surfaces on opposite sides of the protruding surface, and a lower surface arranged under the protruding surface, the second fastening member may be fastened to the side surfaces of the connecting surface, and the third fastening member may be fastened to the lower surface of the connecting surface.

[0116] A height of the protruding portion may be less than a height of the outdoor housing or the indoor housing.

[0117] The connection support module may include first and second support plates that are spaced apart from each other with the refrigerant pipe provided therebetween.

[0118] The connection support module may include a third support plate connecting the first and second support plates so that the first and second support plates form one body.

[0119] The first connecting plate and the second connecting plate are separation members spaced apart from each other.

[0120] The outdoor housing may include a first body surrounding the compressor and the outdoor heat ex-

changer, and a first upper cover assembled onto an upper portion of the first body, the indoor housing may include a second body surrounding the indoor heat exchanger, and a second upper cover assembled onto an upper portion of the second body, and the connection support module may further include an upper plate connecting the first upper cover and the second upper cover so that the first upper cover and the second upper cover are integrated in one body.

[0121] The outdoor housing may include the first body surrounding the compressor and the outdoor heat exchanger, and a first lower cover assembled onto a lower portion of the first body, the indoor housing may include the second body surrounding the indoor heat exchanger, and a second lower cover assembled onto a lower portion of the second body, and the connection support module may further include a lower plate connecting the first lower cover and the second lower cover so that the first lower cover and the second lower cover are integrated in one body.

[0122] The soundproof member may include a second soundproof member that is arranged outside the protruding portion in the connection support module and surrounds the refrigerant pipe.

[0123] A wire for electrically connecting the indoor module and the outdoor module, and a drain hose for transferring condensate water generated in the indoor heat exchanger to the outdoor module may be further included, and the wire and the drain hose may be arranged in the connection support module,

Claims

1. A window-type air conditioner (1) which is installable in a window frame, the window-type air conditioner comprising:

an outdoor module (3) including a compressor (31) for compressing a refrigerant, an outdoor heat exchanger (32) in which heat exchange between outdoor air and the refrigerant occurs, and an outdoor housing (35) accommodating the compressor and the outdoor heat exchanger;

an indoor module (2) including an indoor housing (24) spaced apart from the outdoor housing, and an indoor heat exchanger (21) which is arranged in the indoor housing and in which heat exchange between indoor air and the refrigerant occurs;

a refrigerant pipe (40) providing a flow path in which the refrigerant moves between the indoor module and the outdoor module; and a connection support module (100) connecting the indoor module and the outdoor module, and being configured so that opposite end portions thereof support the indoor housing and the out-

door housing, wherein at least one soundproof member (61, 62) surrounding the refrigerant pipe is arranged in the connection support module (100).

2. The window-type air conditioner of claim 1, wherein at least one of the outdoor housing and the indoor housing includes a protruding portion (510) that protrudes from a part of opposite surfaces (501, 502) facing each other, to be inserted into the connection support module.

3. The window-type air conditioner of claim 2, wherein the soundproof member includes a first soundproof member (61) that is arranged in the protruding portion inserted into the connection support module and surrounds the refrigerant pipe.

4. The window-type air conditioner of claim 2, wherein an end portion of the connection support module includes an inner fixed portion (122) fixed to the protruding portion (510) inserted therein, and a flange fixed portion (121) fixed to a remaining portion (550) that is a portion of the opposite surfaces (501, 502) other than the protruding portion.

5. The window-type air conditioner of claim 4, wherein

the flange fixed portion is fixed to the remaining portion of the opposite surfaces by a first fastening member (V1) fastened in a first direction (X), and

the inner fixed portion is fixed to the protruding portion of the opposite surfaces by a second fastening member (V2) that is fastened in a second direction (Y) that is different from the first direction.

6. The window-type air conditioner of claim 4, wherein

the protruding portion (510) includes a protruding surface (520) and a connecting surface (530) connecting the protruding surface to the remaining portion and having an orientation different from the remaining portion, and the second fastening member is fastened with the connecting surface.

7. The window-type air conditioner of claim 6, wherein the inner fixed portion is fixed to the protruding portion of the opposite surface by a third fastening member (V3) that is fastened in a third direction (Z) that is different from the first direction and the second direction.

8. The window-type air conditioner of claim 7, wherein

the connecting surface (530) includes side sur-

faces (531) on opposite sides of the protruding surface, and a lower surface (532) arranged under the protruding surface, the second fastening member is fastened to the side surfaces of the connecting surface, and the third fastening member is fastened to the lower surface of the connecting surface.

9. The window-type air conditioner of claim 7, wherein a height (h) of the protruding portion is less than a height (h1, h2) of the outdoor housing or the indoor housing.

10. The window-type air conditioner of any one of claims 1 to 9, wherein the connection support module includes first and second support plates (111, 112) spaced apart from each other with the refrigerant pipe provided therebetween.

11. The window-type air conditioner of claim 10, wherein

the connection support module includes a third support plate (113) connecting the first and second support plates so that the first and second support plates form one body.

12. The window-type air conditioner of claim 10, wherein the first support plate and the second support plate are separate members spaced apart from each other.

13. The window-type air conditioner of any one of claims 1 to 12, wherein

the outdoor housing (35) includes a first body (351) surrounding the compressor and the outdoor heat exchanger, and a first upper cover (352) assembled onto an upper portion of the first body,

the indoor housing (24) includes a second body (241) surrounding the indoor heat exchanger, and a second upper cover (242) assembled onto an upper portion of the second body, and the connection support module further includes an upper plate (115) connecting the first upper cover and the second upper cover so that the first upper cover and the second upper cover are integrated as one body.

14. The window-type air conditioner of any one of claims 11 to 13, wherein

the outdoor housing includes the first body (351) surrounding the compressor and the outdoor heat exchanger, and a first lower cover (353) assembled onto a lower portion of the first body, the indoor housing includes the second body

(241) surrounding the indoor heat exchanger, and a second lower cover (243) assembled onto a lower portion of the second body, and the connection support module further includes a lower plate (116) connecting the first lower cover and the second lower cover so that the first lower cover and the second lower cover are integrated as one body.

15. The window-type air conditioner of any one of claims 1 to 14, wherein the soundproof member includes a second soundproof member (62) that is arranged outside the protruding portion, inside the connection support module, and surrounds the refrigerant pipe.

FIG. 1

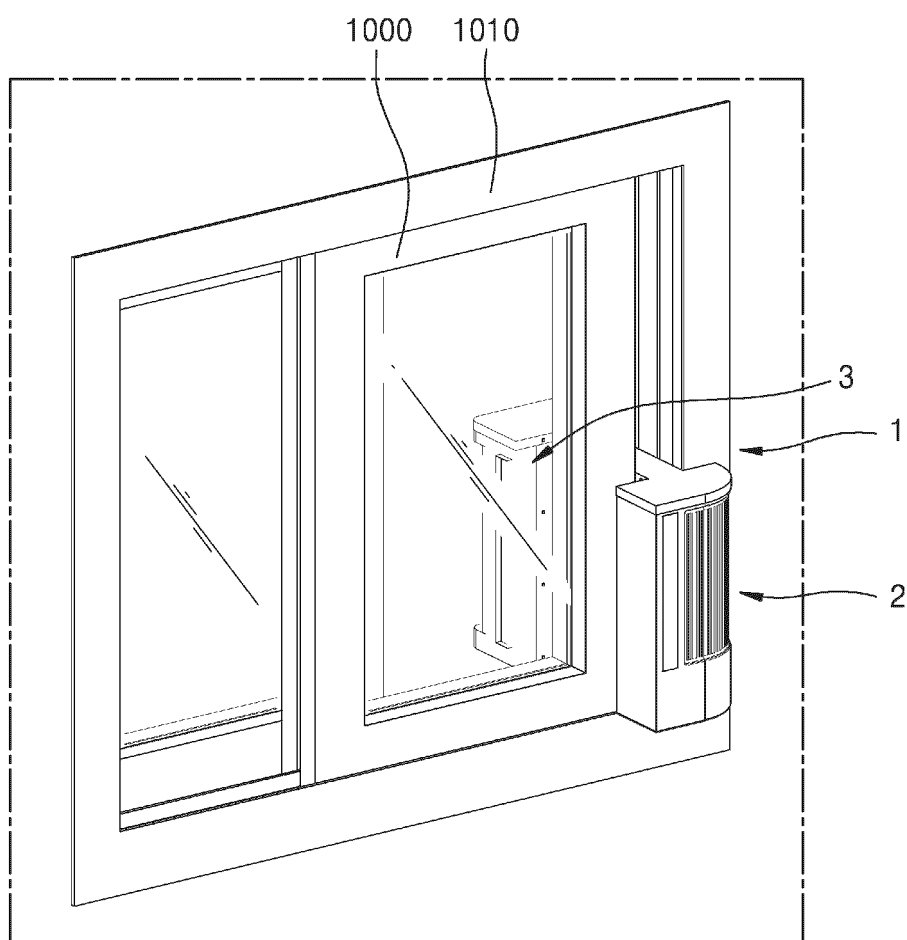


FIG. 2

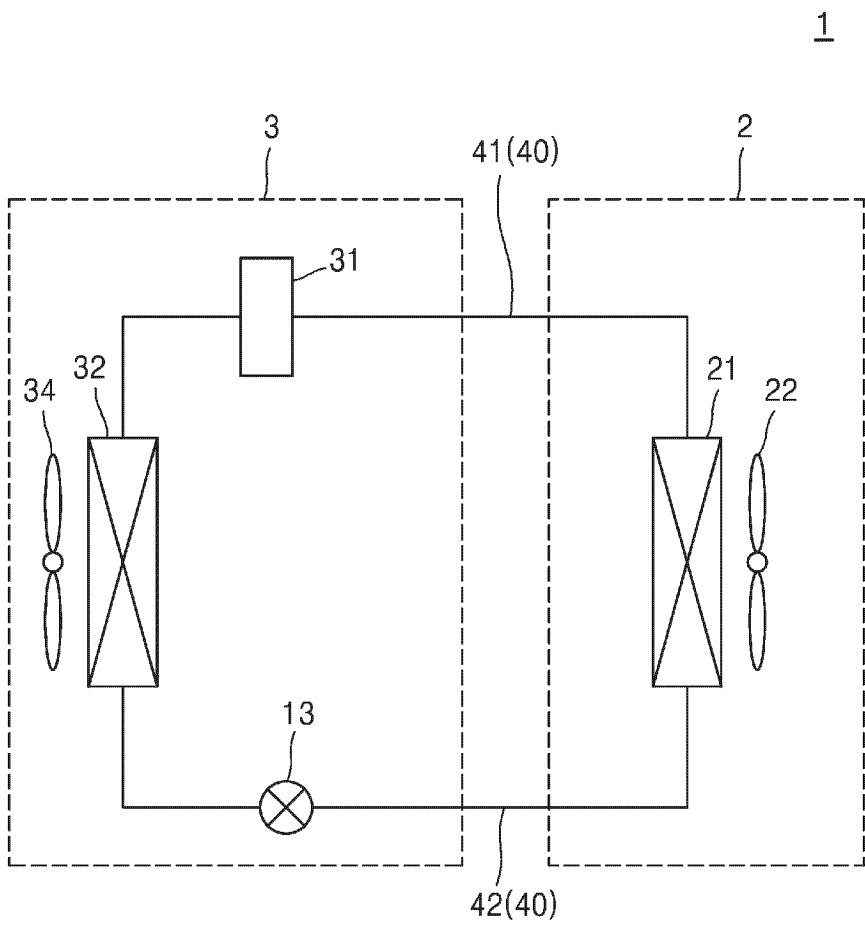


FIG. 3

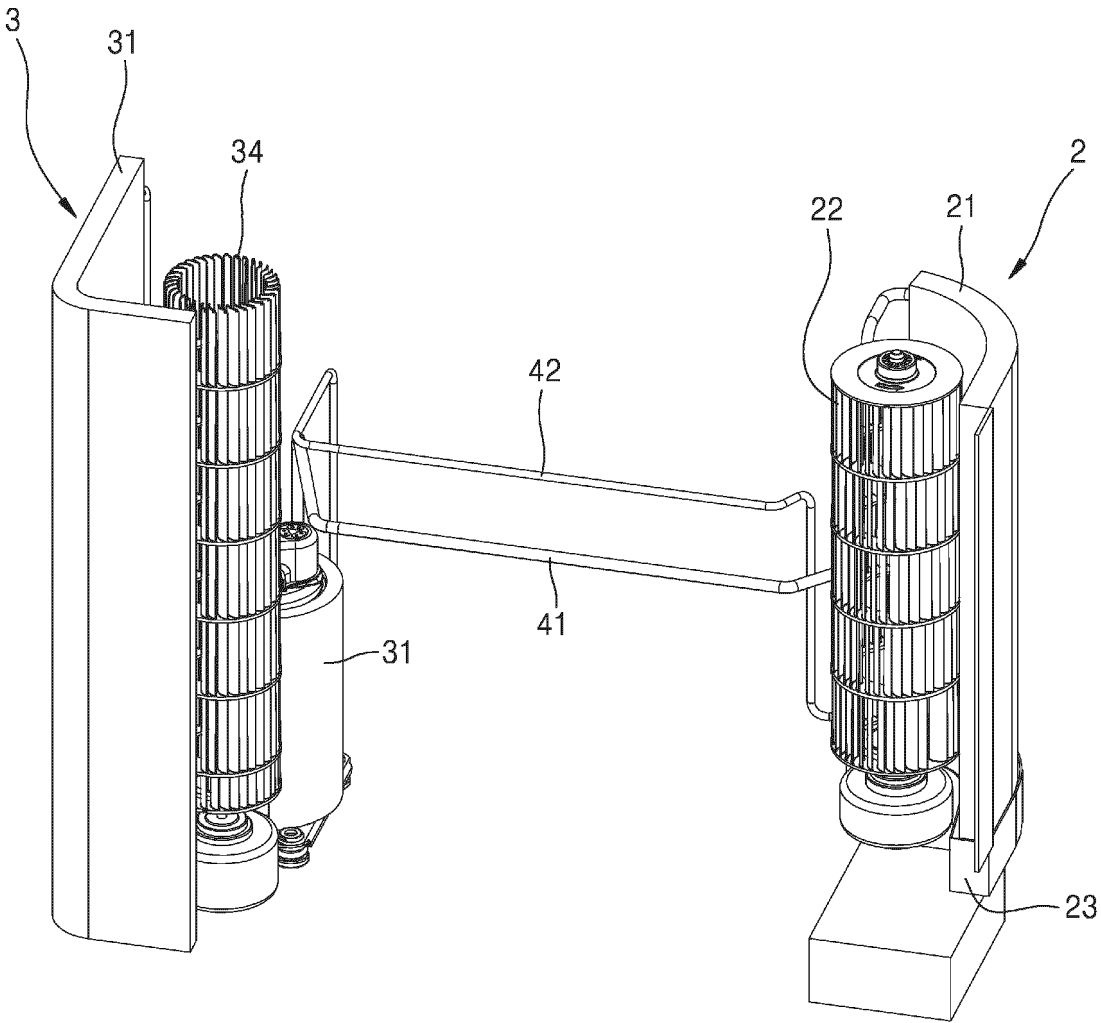


FIG. 4

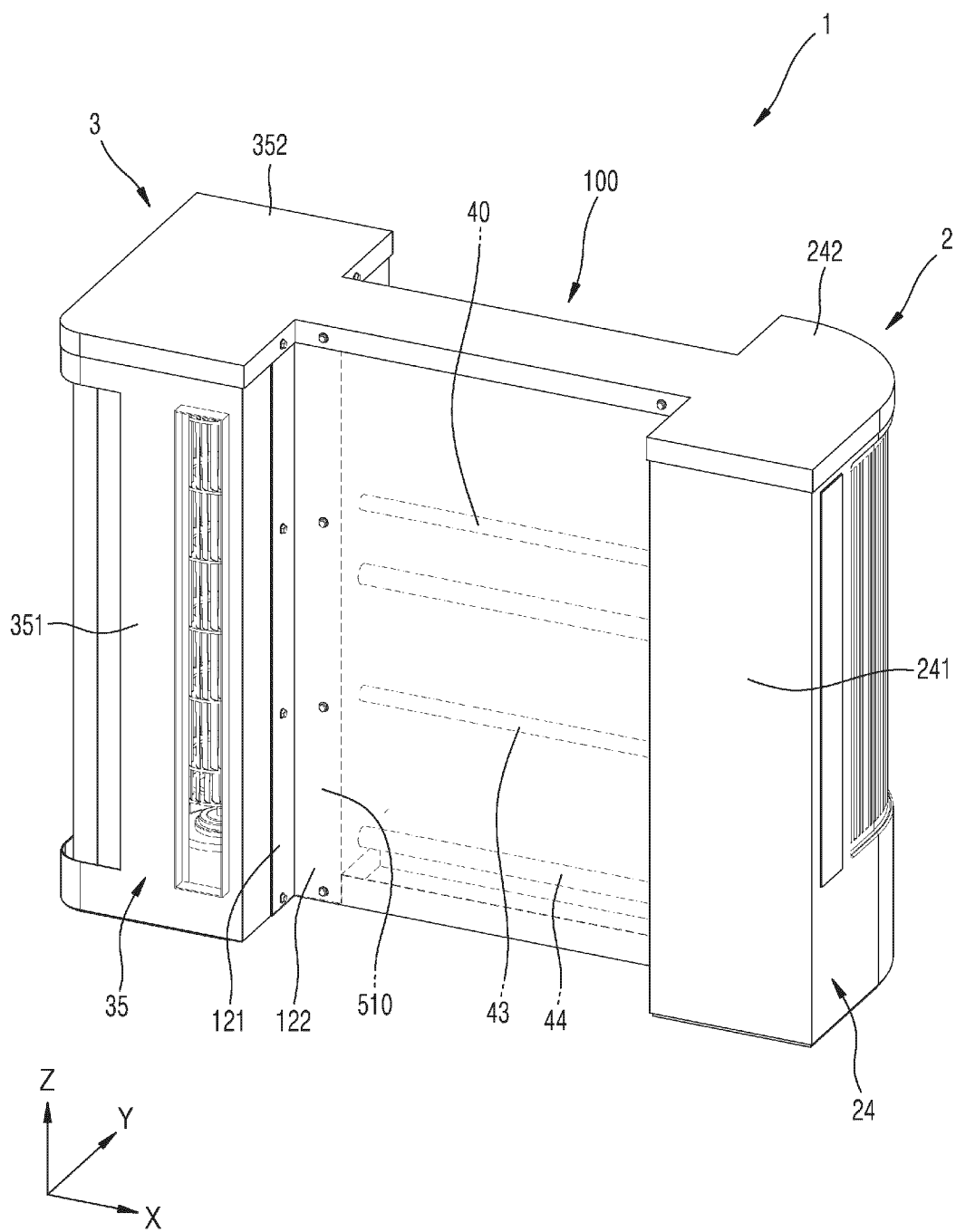


FIG. 5

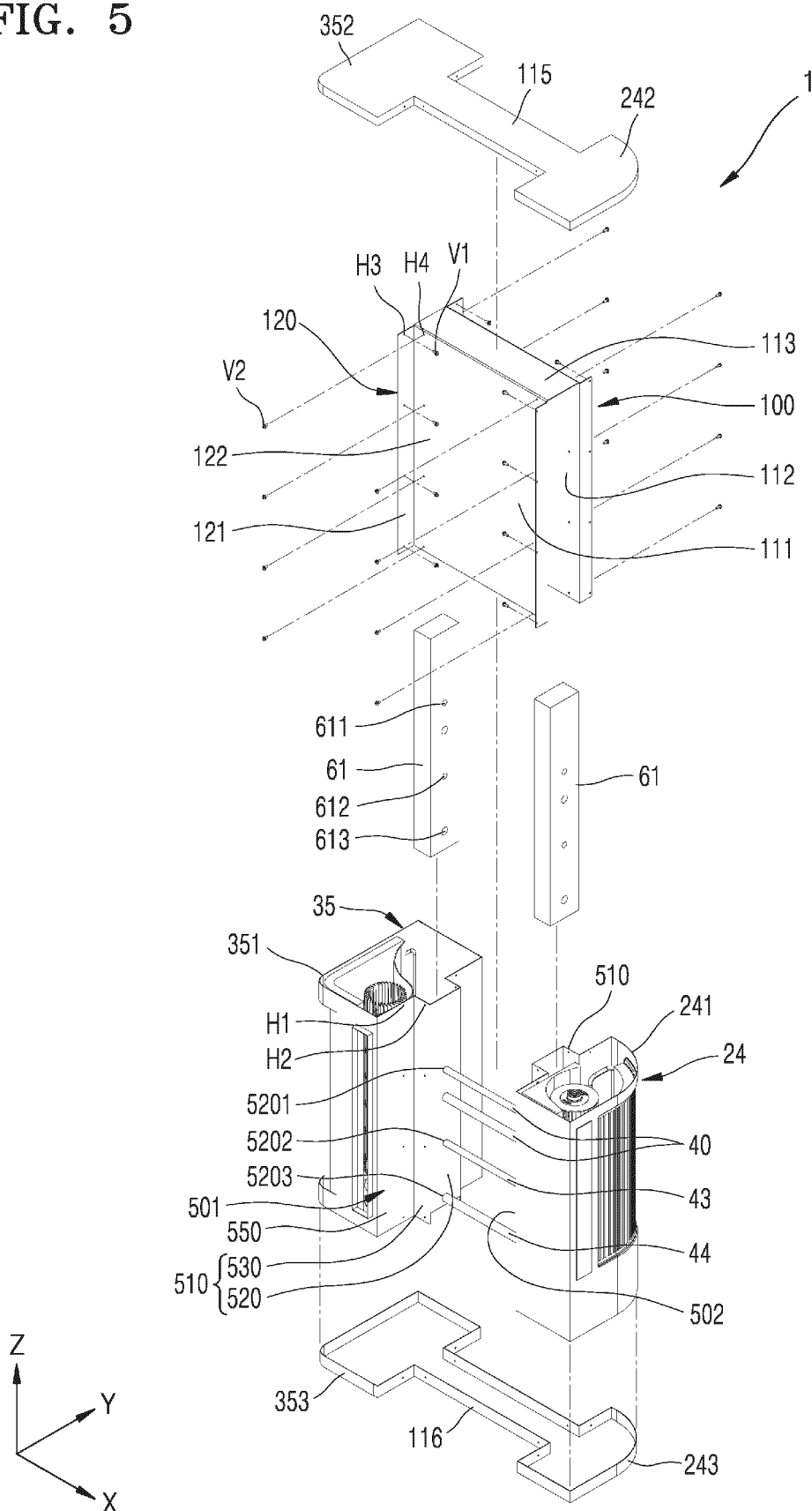


FIG. 6

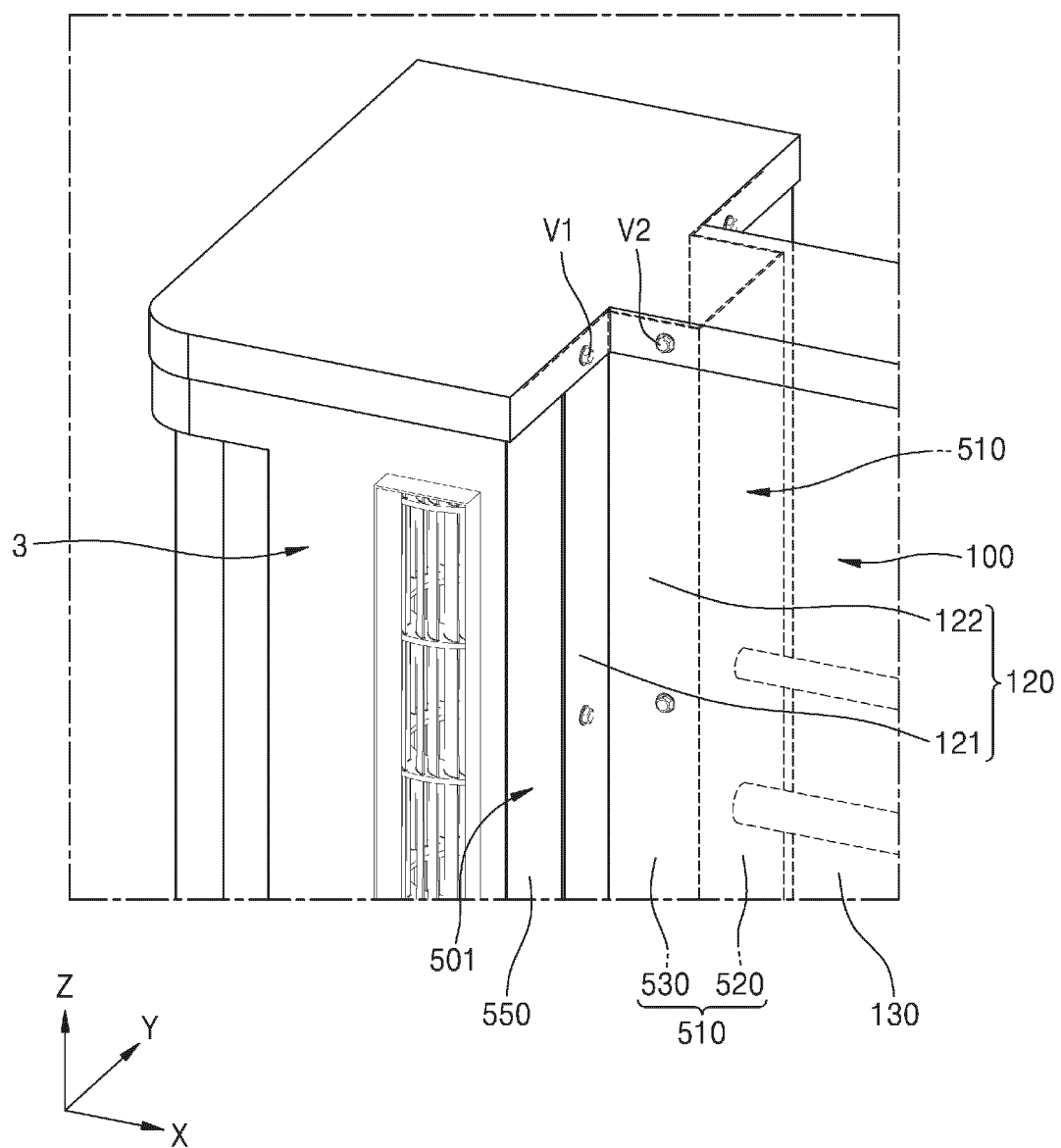


FIG. 7

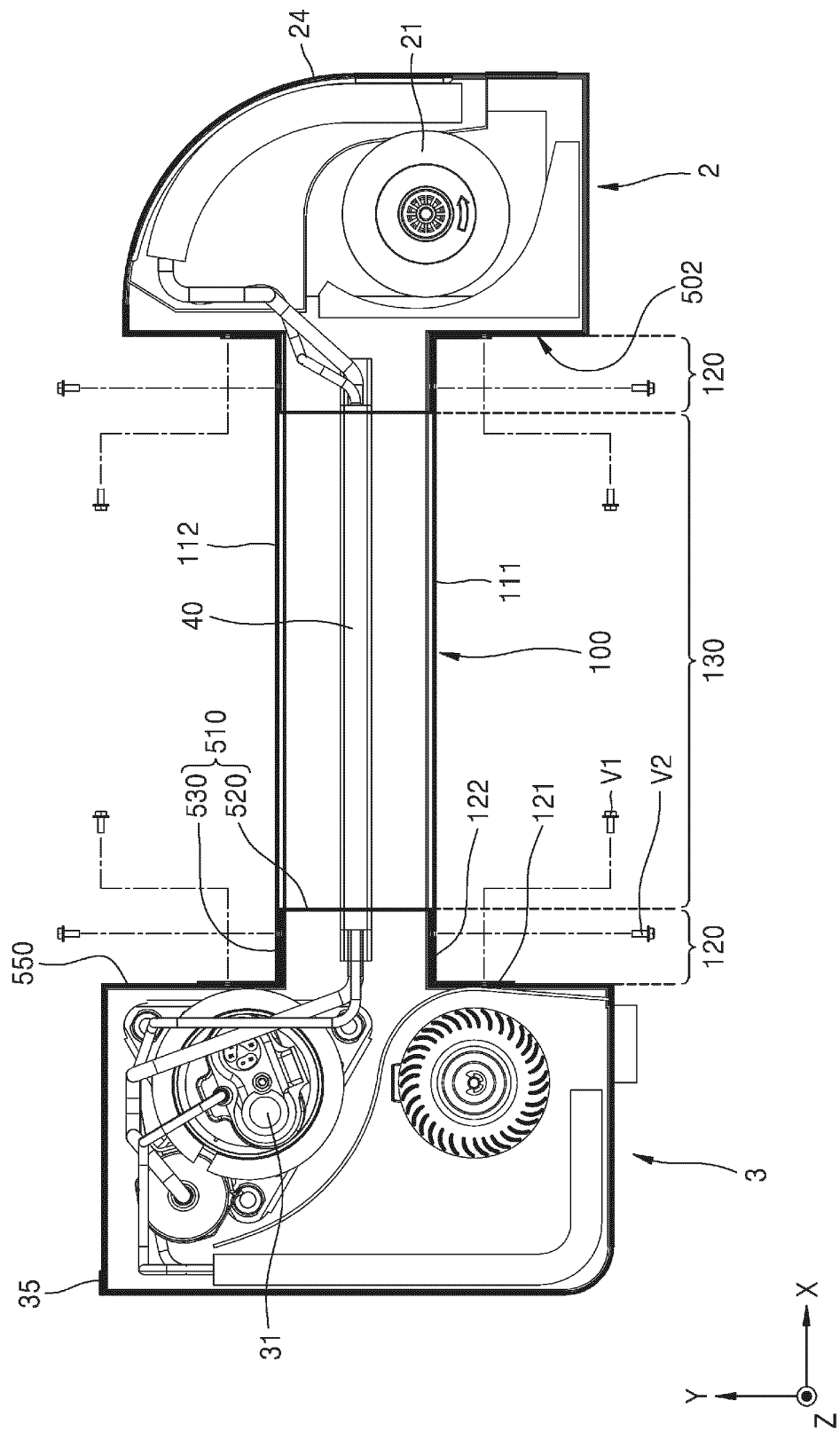


FIG. 8

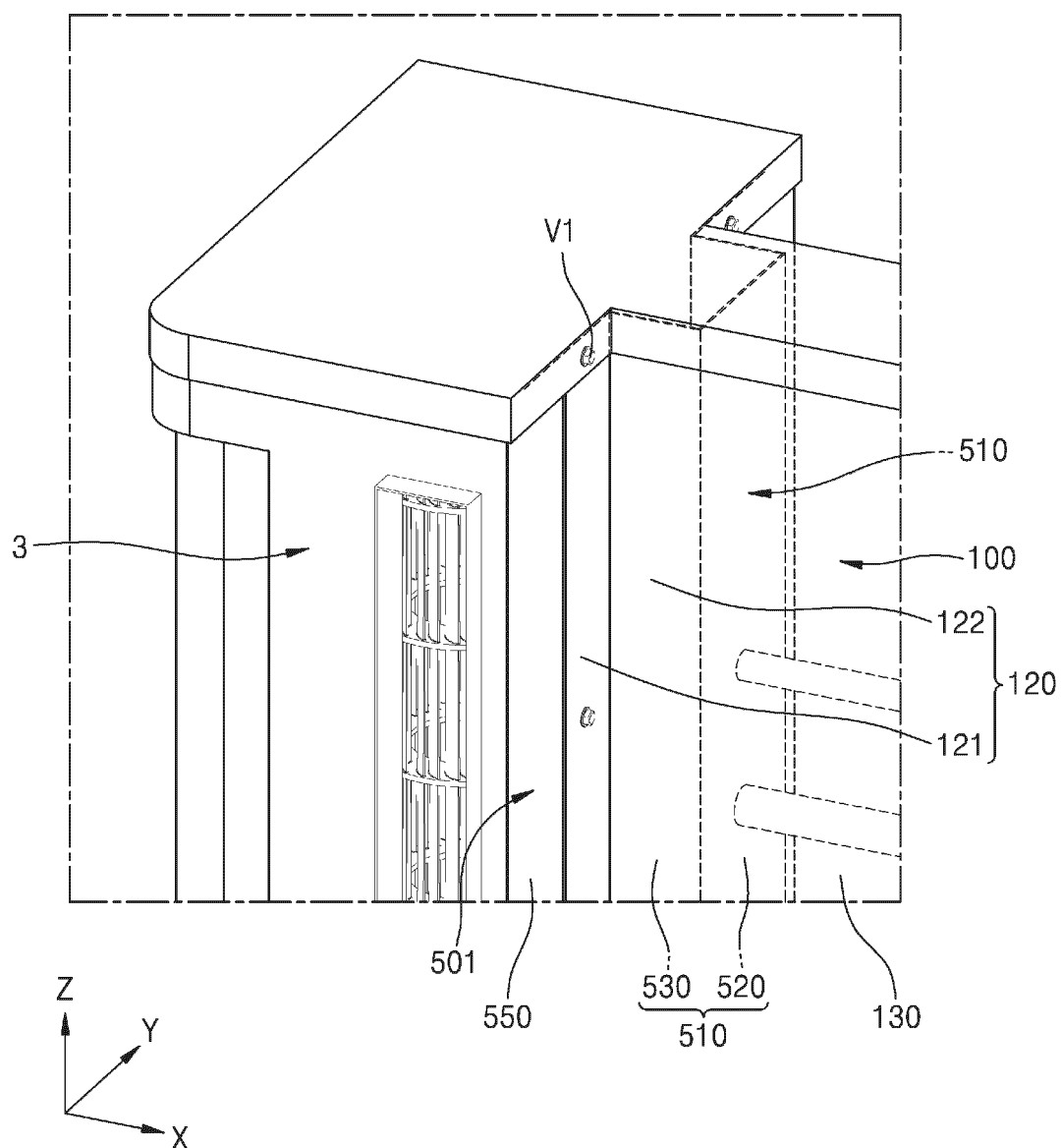


FIG. 9

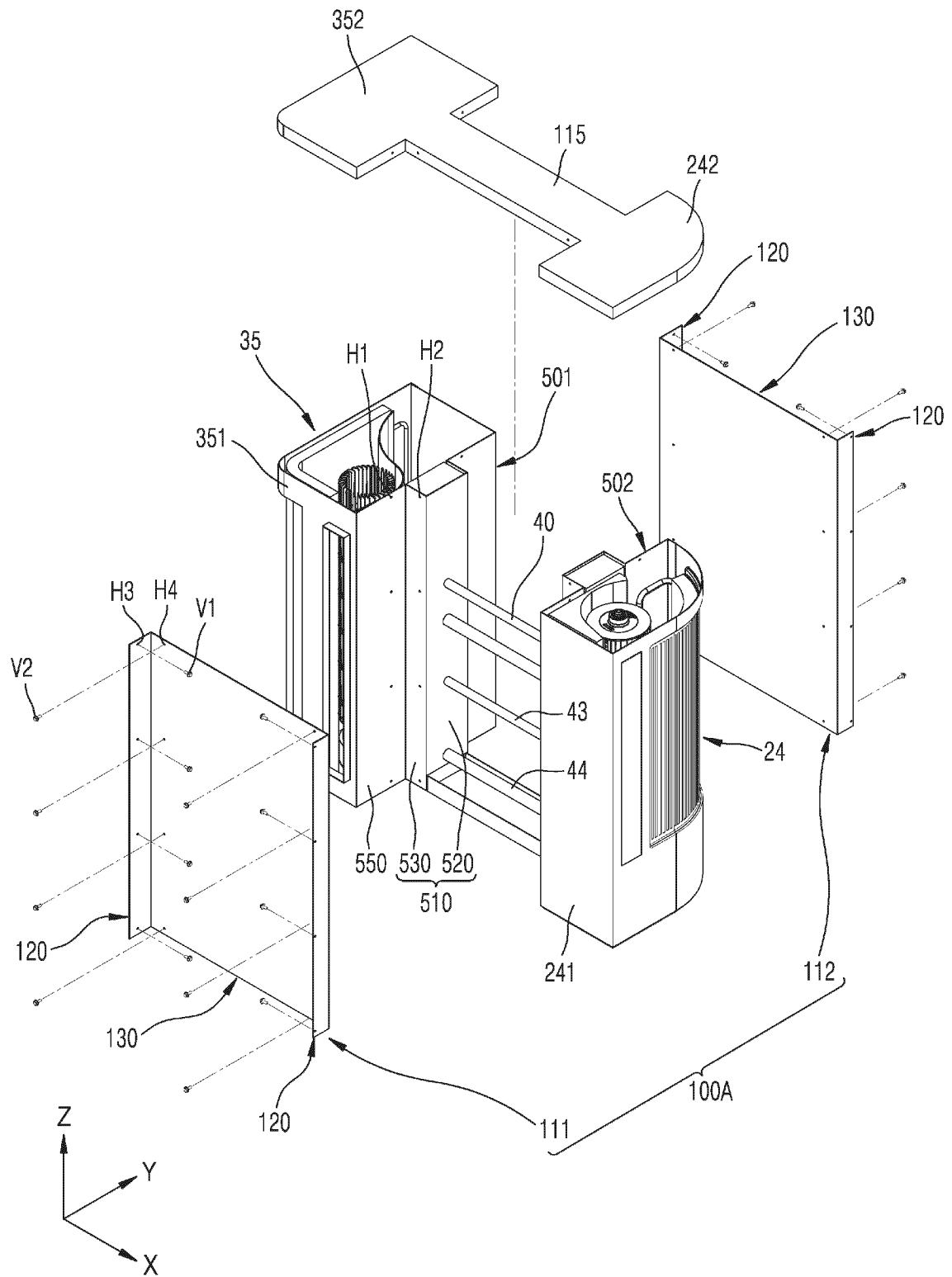


FIG. 10

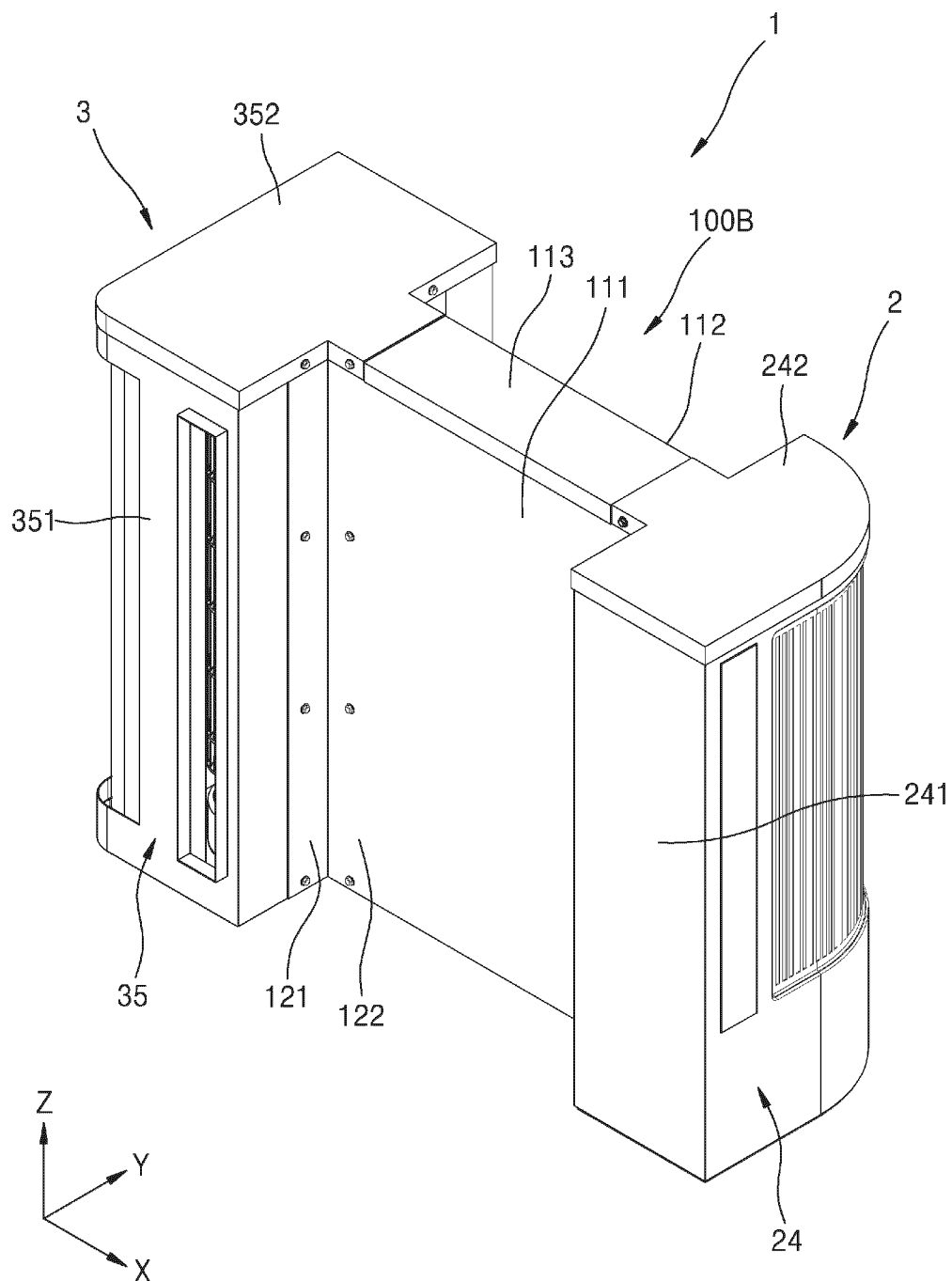


FIG. 11

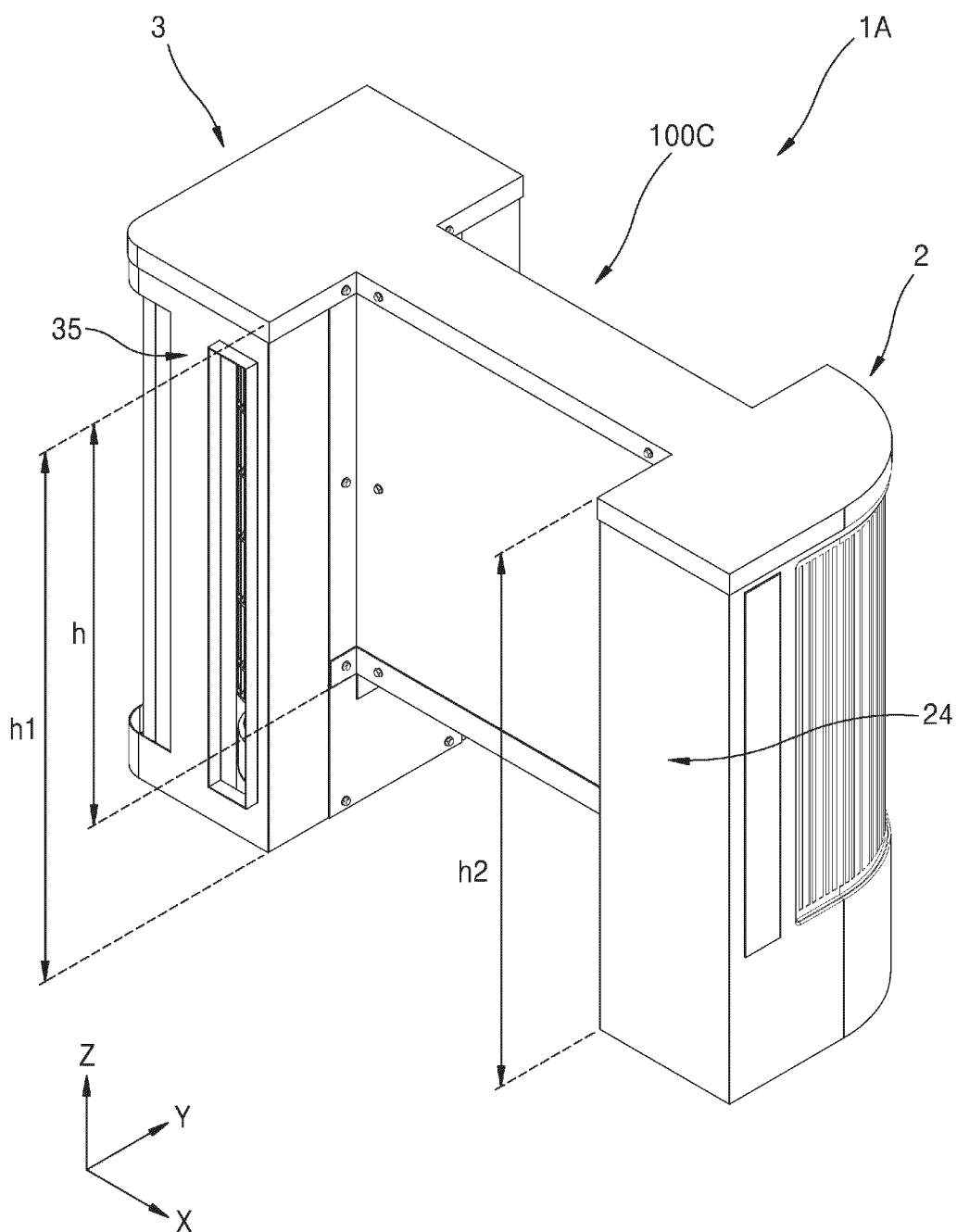


FIG. 12

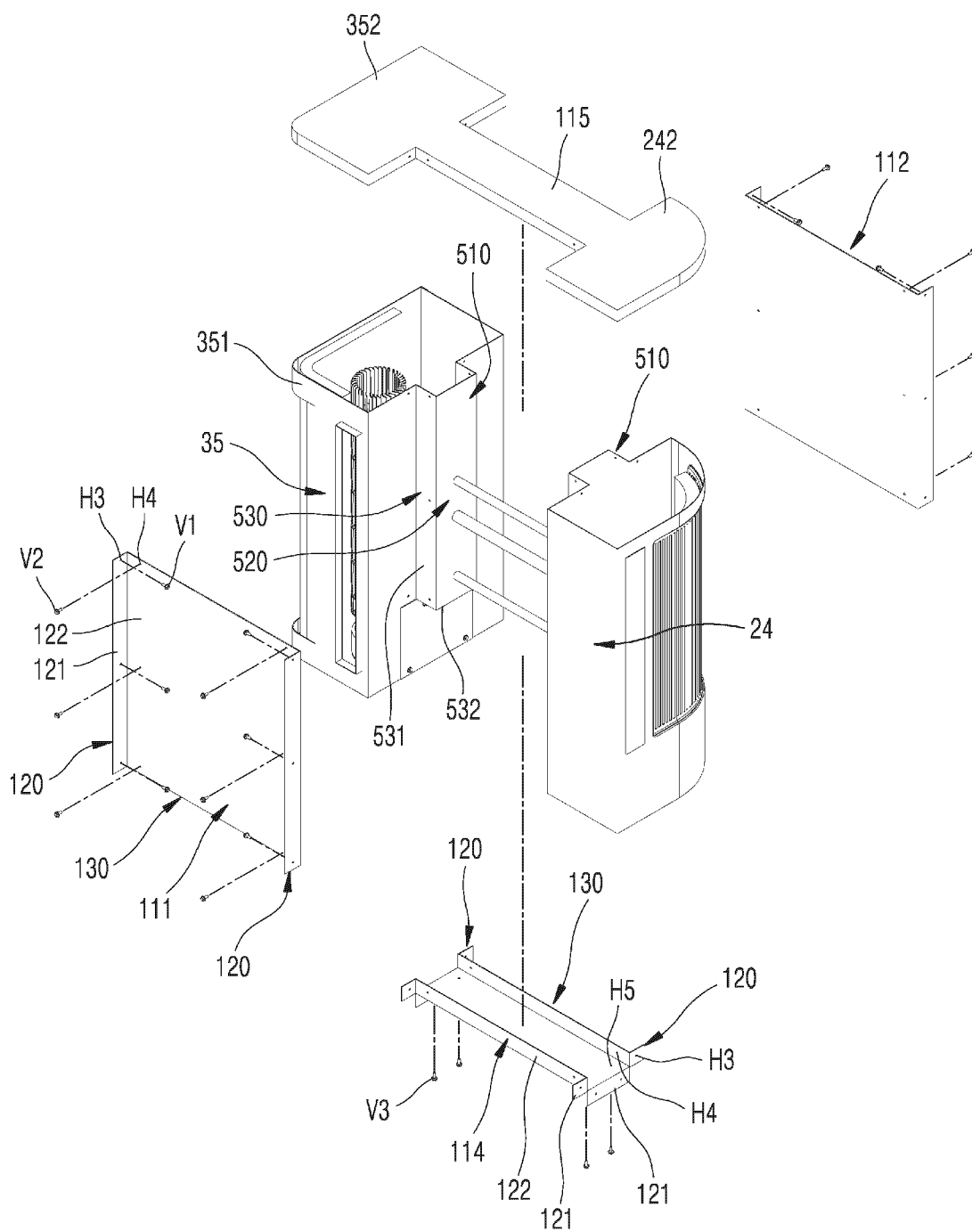


FIG. 13

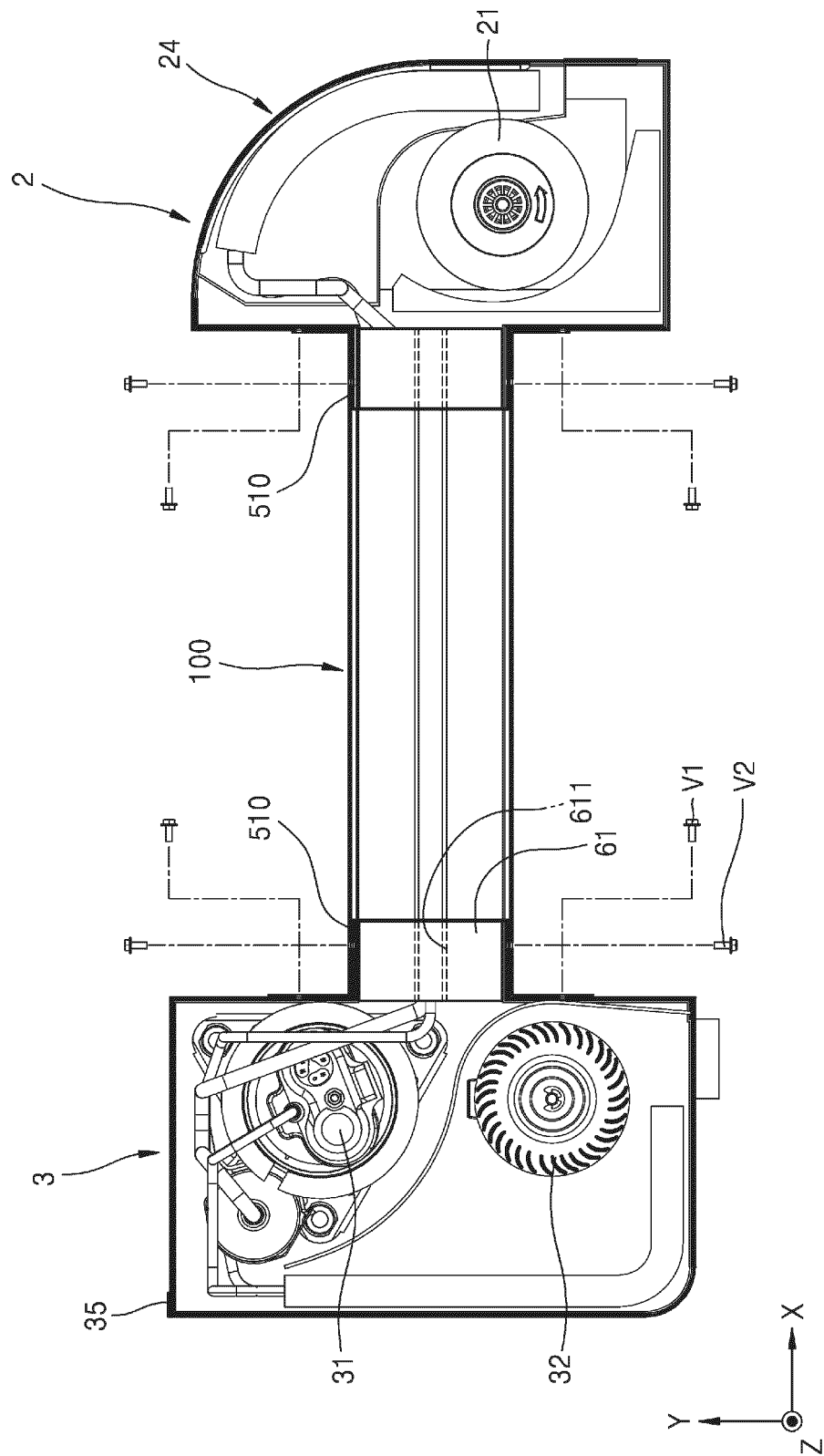


FIG. 14

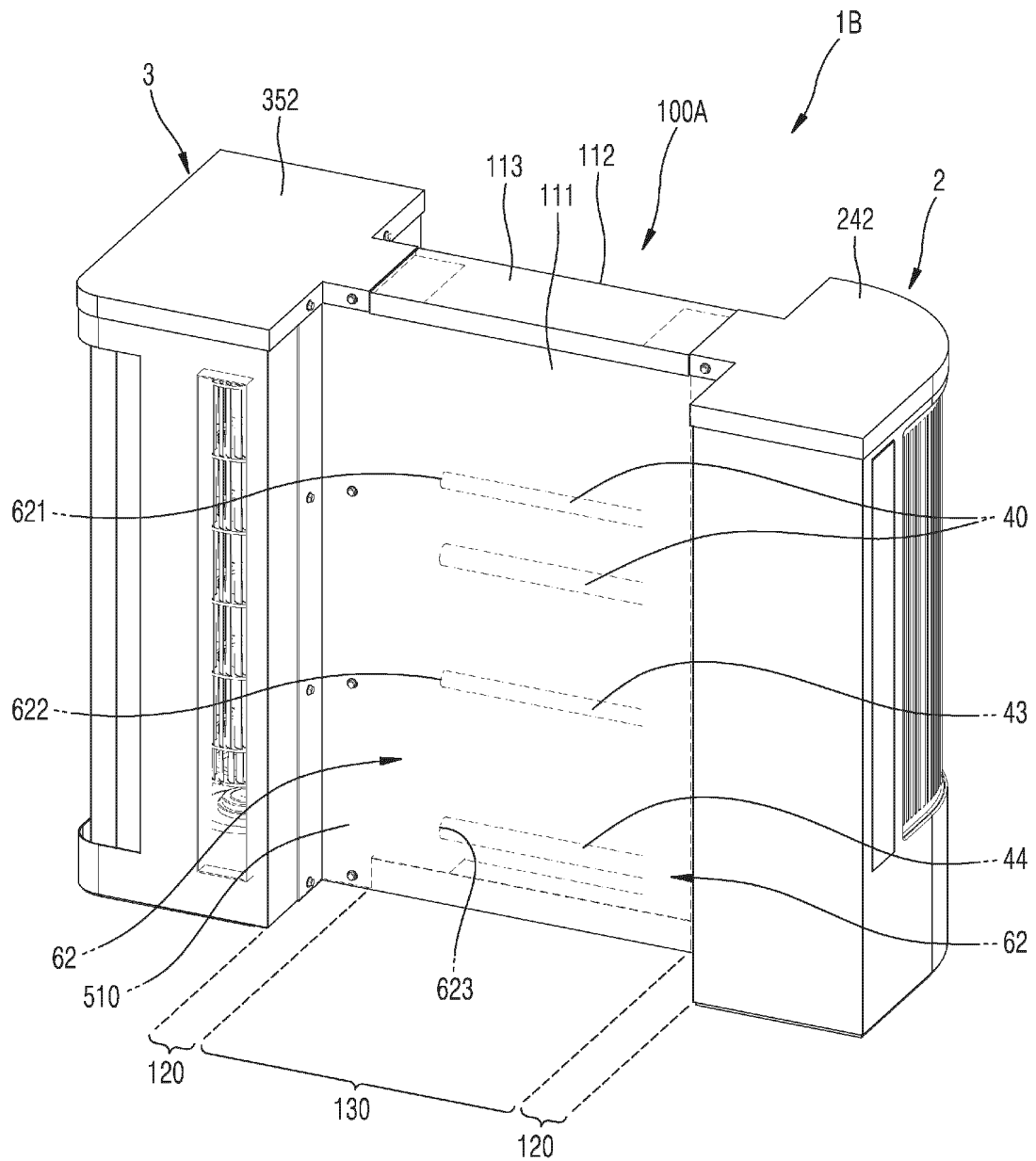


FIG. 15

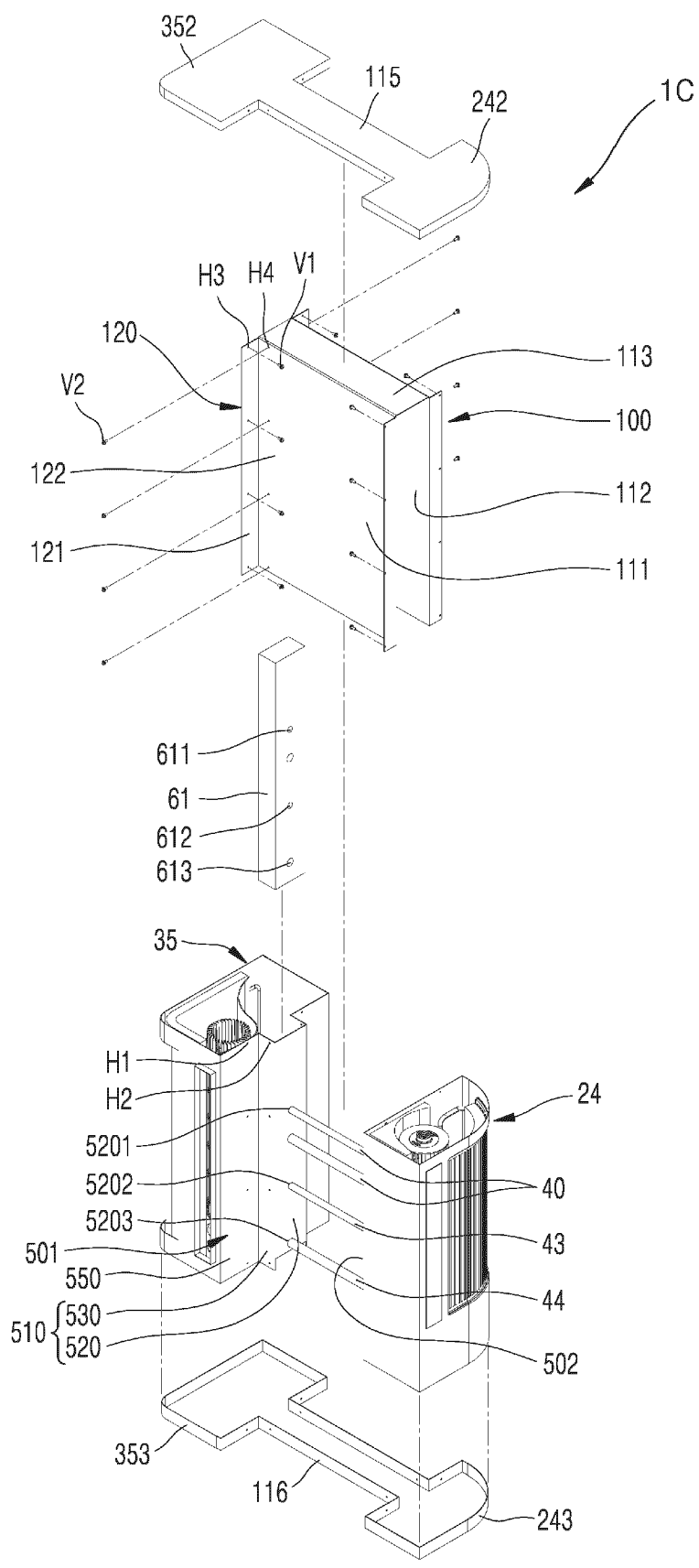


FIG. 16

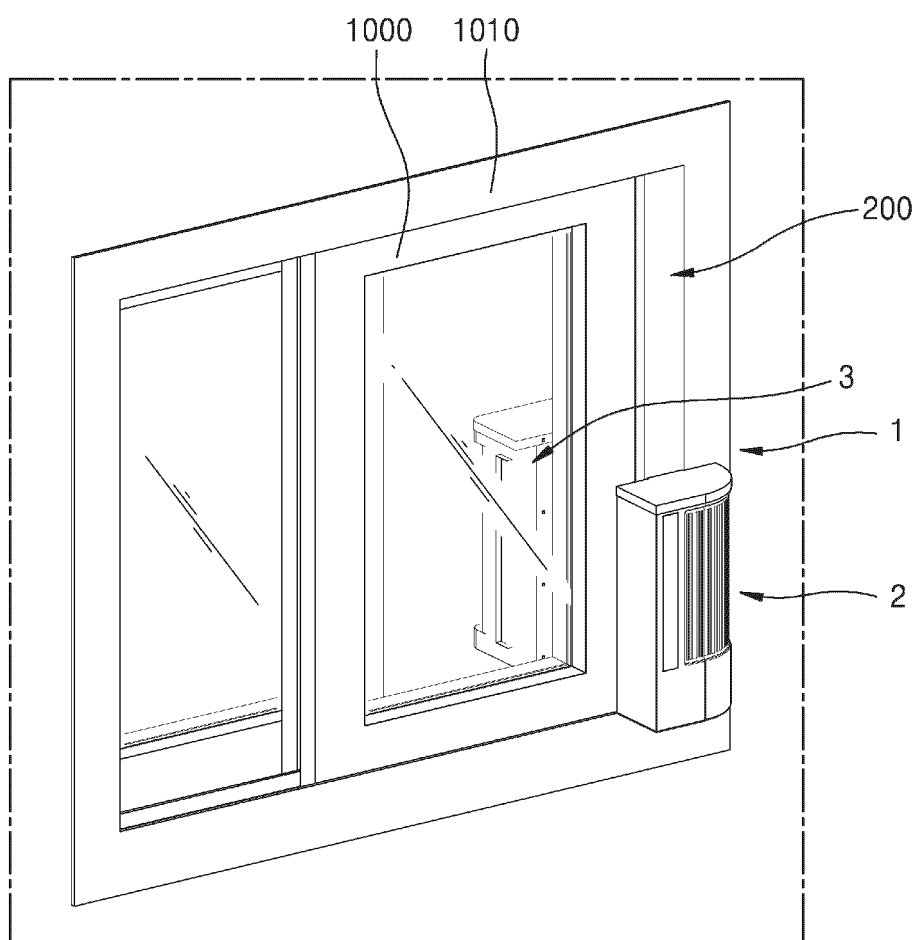
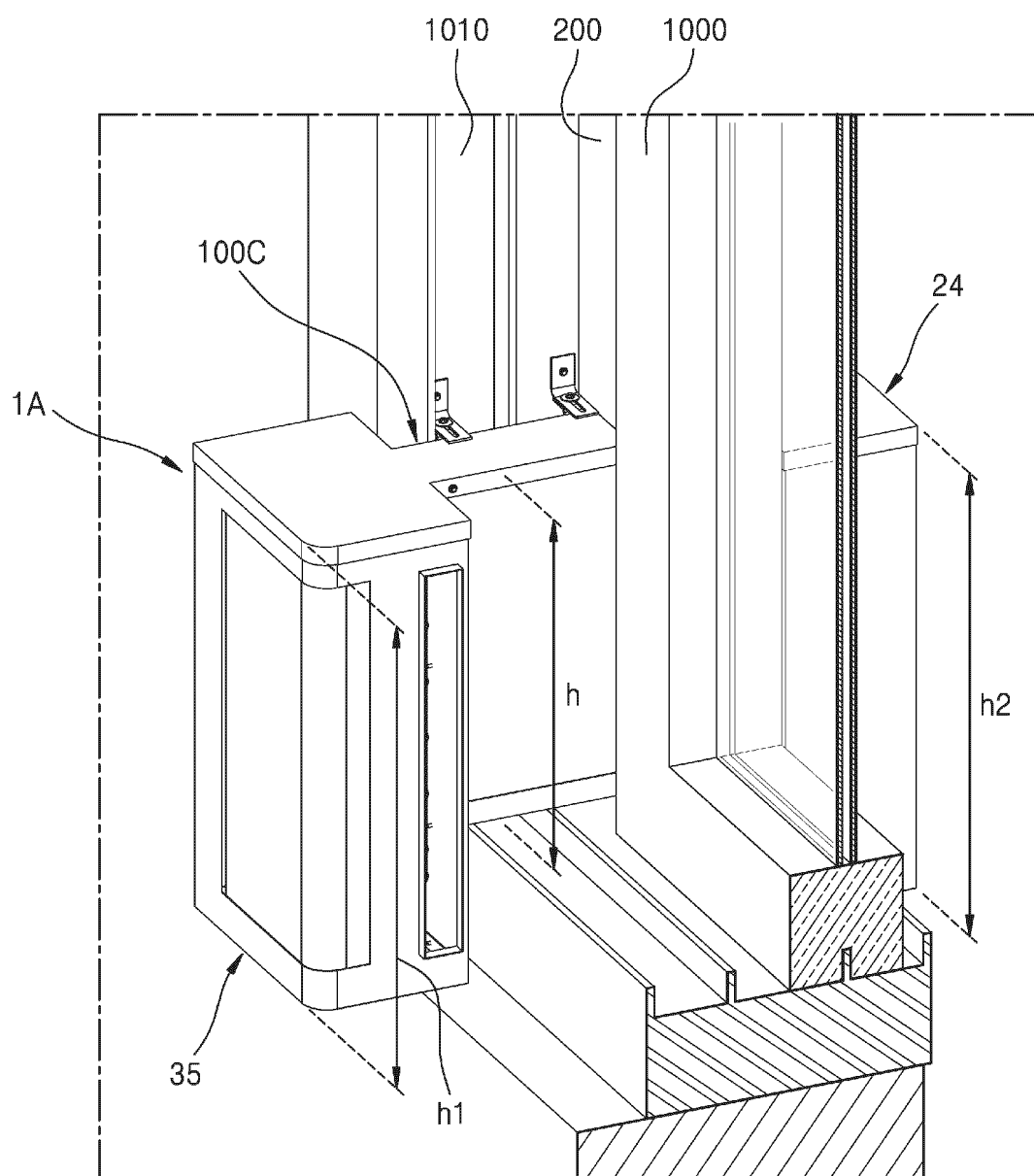


FIG. 17



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2023/013106

A. CLASSIFICATION OF SUBJECT MATTER**F24F 1/027**(2019.01)i; **F24F 13/24**(2006.01)i; **F24F 13/20**(2006.01)i; **F24F 1/0326**(2019.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F24F 1/027(2019.01); F16F 15/02(2006.01); F16F 15/08(2006.01); F24F 1/0003(2019.01); F24F 1/0043(2019.01);
F24F 1/40(2011.01); F24F 13/24(2006.01); F24F 13/32(2006.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models: IPC as above

Japanese utility models and applications for utility models: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS (KIPO internal) & keywords: 창문(window), 공기조기(air conditioner), 실내기(indoor unit), 실외기(outdoor unit), 모듈(module), 흡음(sound absorption), 소음(noise)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 10-2021-0080821 A (WINSAY CO., LTD.) 01 July 2021 (2021-07-01) See paragraphs [0041], [0044]-[0045], [0054]-[0058], [0085] and [0090], claim 1 and figures 2 and 7.	1,15
A		2-14
Y	JP 2012-189291 A (MITSUBISHI ELECTRIC CORP.) 04 October 2012 (2012-10-04) See paragraphs [0001], [0012] and [0015] and figure 3.	1,15
A	WO 2021-050726 A1 (TREAU, INC.) 18 March 2021 (2021-03-18) See paragraph [0059] and figure 1.	1-15
A	JP 07-037089 Y2 (NAGURA, Ken) 23 August 1995 (1995-08-23) See claim 1 and figure 1.	1-15
A	KR 20-0109810 Y1 (SAMSUNG ELECTRONICS CO., LTD.) 28 November 1997 (1997-11-28) See claim 1 and figure 2.	1-15

☐ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

* Special categories of cited documents:

“A” document defining the general state of the art which is not considered to be of particular relevance

“D” document cited by the applicant in the international application

“E” earlier application or patent but published on or after the international filing date

“L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

“O” document referring to an oral disclosure, use, exhibition or other means

“P” document published prior to the international filing date but later than the priority date claimed

“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

“&” document member of the same patent family

Date of the actual completion of the international search

29 November 2023

Date of mailing of the international search report

29 November 2023

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon Building 4, 189 Cheongsaro, Seo-gu, Daejeon 35208

Facsimile No. +82-42-481-8578

Authorized officer

Telephone No.

Form PCT/ISA/210 (second sheet) (July 2022)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2023/013106

5

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
KR	10-2021-0080821	A	01 July 2021	KR	10-2311991	B1	14 October 2021
JP	2012-189291	A	04 October 2012	JP	5496131	B2	21 May 2014
WO	2021-050726	A1	18 March 2021	CN	114746701	A	12 July 2022
				EP	4028696	A1	20 July 2022
				US	11498163	B2	15 November 2022
				US	2021-0078118	A1	18 March 2021
				US	2023-0059481	A1	23 February 2023
JP	07-037089	Y2	23 August 1995	JP	06-018819	U	11 March 1994
KR	20-0109810	Y1	28 November 1997	KR	20-1995-0001800	U	04 January 1995

Form PCT/ISA/210 (patent family annex) (July 2022)