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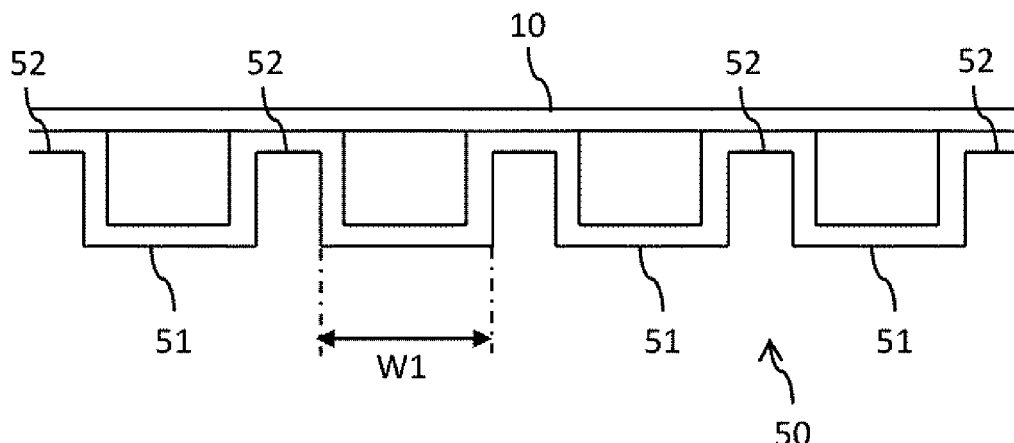
(54) **BUILDING WALL**

(57) An architectural wall that allows an air to flow between an inner member and an exterior wall part is provided.

An architectural wall comprising an inner member

10; and an exterior wall part 50 that is provided on an outer side of the inner member 10 and forms a space where air enters between the exterior wall part 10 and the inner member 50.

FIG. 1



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Description

Technical Field

[0001] The present invention relates to an architectural wall that constitutes an exterior wall of a building.

Background Art

[0002] Conventionally, it is known to use an exterior wall panel. For example, Patent Literature 1 discloses that a building unit has a plurality of columns and upper and lower girders, and these columns and girders are connected in a cubic shape, a first panel is pre-fixed, at a unit manufacturing factory, to an exterior wall surface opening to which an exterior wall panel is attached in a completed building state among four unit openings surrounded by the columns and the girders, and a second panel to be attached to a structure other than the building unit in the completed building state is temporarily fixed. However, the exterior wall is not particularly devised.

Citation List

Patent Literature

[0003] Patent Literature 1: JP 2011-202439 A

SUMMARY OF INVENTION

PROBLEM TO BE SOLVED BY INVENTION

[0004] The present invention provides an architectural wall that has a concept different from a conventional one and allows an air layer to be formed between an inner member and an exterior wall part.

MEANS FOR SOLVING PROBLEM

[0005] An architectural wall according to the present invention may comprise

an inner member; and
an exterior wall part that is provided on an outer side of the inner member and forms a space where air enters between the exterior wall part and the inner member.

[0006] The architectural wall according to the present invention may comprise an eaves part provided so as to cover an upper side of the exterior wall part, wherein a lower end of the eaves part may be positioned below an upper end of the exterior wall part, and a gap through which air flows is provided between the eaves part and the exterior wall part.

[0007] In the architectural wall according to the present invention,

the inner member may have a heat insulating member,
a plurality of plate members may be provided between the heat insulating member and the exterior wall part, and
an air layer may be provided between the plate members.

[0008] In the architectural wall according to the present invention,

the inner member may have a heat insulating member,
a plate member may be provided between the heat insulating member and the exterior wall part,
a sheet member may be provided between the plate member and the exterior wall part, and
air layers may be provided between the plate member and the sheet member and between the sheet member and the exterior wall part.

[0009] In the architectural wall according to the present invention,

one or a plurality of intermediate partition members with drain holes may be provided between the exterior wall part and the inner member.

[0010] In the architectural wall according to the present invention,

the architectural wall may be an exterior wall panel in which the inner member and the exterior wall part is integrated, and
the exterior wall panel may be connectable to another exterior wall panel laterally or in a vertical direction.

[0011] In the architectural wall according to the present invention,

the exterior wall part may have an outwardly projecting part extending in a vertical direction, and the exterior wall part forms a ventilation passage.

[0012] The architectural wall according to the present invention may comprise an eaves part provided so as to cover an upper side of the exterior wall part, wherein

a projecting part may be provided on an upper surface of the inner member, and
the projecting part and the eaves part may be connected by a connecting member.

[0013] In the architectural wall according to the present invention,

the inner member may have an outwardly recessed part or an inwardly recessed part for providing a heat shielding member or a heat insulating member.

[0014] In the architectural wall according to the present invention,

the inner member may have a first inner member

and a second inner member that extends in a direction intersecting the first inner member, and the exterior wall part may have a first exterior wall part provided on a surface on an outer side of the first inner member and a second exterior wall part provided on a surface on an outer side of the second inner member.

[0015] The architectural wall according to the present invention may comprise an eaves part provided so as to cover an upper side of the exterior wall part, wherein

the exterior wall part may have an outwardly projecting part extending in a vertical direction, and a lower end of the eaves part may be positioned below an upper end of the outwardly projecting part, and a gap is provided between the eaves part and the exterior wall part.

[0016] In the architectural wall according to the present invention,

a coating material or a foam material may be provided on a surface on an outer side, a surface on an inner side or a both surfaces on an outer side and an inner side of the exterior wall part.

[0017] In the architectural wall according to the present invention,

the architectural wall may be an exterior wall panel in which the inner member and the exterior wall part is integrated,

the architectural wall may comprise an eaves part provided so as to cover an upper side of the exterior wall part,

the exterior wall part may have an outwardly projecting part extending in a vertical direction,

the exterior wall panel may be connectable to another exterior wall panel in the vertical direction, and when the other exterior wall panel is provided above the exterior wall panel, a gap may be provided between the outwardly projecting part of the other exterior wall panel and the eaves part.

[0018] In the architectural wall according to the present invention,

the inner member may have an upwardly extending part that extends upward, and a lifting hole may be provided in the upwardly extending part.

[0019] In the architectural wall according to the present invention,

the inner member may have an laterally extending part that extends laterally, and a lifting hole may be provided in the laterally extending part.

[0020] In an exterior wall panel according to the present invention,

the exterior wall part may be disposed to be shifted laterally with respect to the inner member, a surface on an outer side of the inner member may not be covered by the exterior wall part on a first side, and

a surface on an inner side of the exterior wall part may not be covered by the inner member on a second side opposite to the first side.

[0021] An exterior wall panel according to the present invention may comprise an eaves part provided so as to cover an upper side of the exterior wall part, wherein the eaves part may have an upper cover part that extends upward.

EFFECT OF INVENTION

[0022] According to one aspect of the present invention, it is possible to provide the exterior wall panel that allows an air layer to be formed between the inner member and the exterior wall part. In addition, heat insulating properties are enhanced, and dew condensation can also be prevented.

BRIEF DESCRIPTION OF DRAWINGS

[0023]

Fig. 1 is a transverse cross-sectional view of an exterior wall panel that can be used in an embodiment of the present invention.

Fig. 2 is a rear view illustrating an inner side of the exterior wall panel that can be used in the embodiment of the present invention.

Fig. 3 is a front view illustrating an outer side of the exterior wall panel that can be used in the embodiment of the present invention.

Fig. 4 is a longitudinal sectional view of the exterior wall panel that can be used in the embodiment of the present invention.

Fig. 5 is a front view illustrating the outer side of the exterior wall panel that can be used in the embodiment of the present invention, and is a front view illustrating an aspect different from that of Fig. 3.

Fig. 6 is a front view in which the exterior wall panels illustrated in Fig. 5 are combined.

Fig. 7(a) is a view showing a photograph of the inner side of the exterior wall panel that can be used in the present embodiment, and Fig. 7(b) is a view showing a photograph of an aspect in which a gypsum board is attached to the exterior wall panel that can be used in the present embodiment.

Fig. 8 is a transverse cross-sectional view of the exterior wall panel that can be used in the embodiment of the present invention, and is a transverse cross-

sectional view illustrating an aspect different from that of Fig. 1.

Fig. 9 is a view showing a photograph of the inner side of an exterior wall part that can be used in the embodiment of the present invention.

Fig. 10(a) is a view illustrating a transverse cross-section of the exterior wall part that can be used in the embodiment of the present invention, and Fig. 10(b) is a perspective view of the exterior wall part illustrated in Fig. 10(a) as viewed from the outer side.

Fig. 11(a) is a view illustrating a transverse cross-section of the exterior wall part that can be used in the embodiment of the present invention, and Fig. 11(b) is a perspective view of the exterior wall part illustrated in Fig. 11(a) as viewed from the outer side.

Fig. 12(a) is a view illustrating a transverse cross-section of the exterior wall part that can be used in the embodiment of the present invention, and Fig. 12(b) is a perspective view of the exterior wall part illustrated in Fig. 12(a) as viewed from the outer side.

Fig. 13(a) is a view illustrating a transverse cross-section of the exterior wall part that can be used in the embodiment of the present invention, and Fig. 13(b) is a perspective view of the exterior wall part illustrated in Fig. 13(a) as viewed from the outer side.

Fig. 14(a) is a view illustrating a transverse cross-section of the exterior wall part that can be used in the embodiment of the present invention, and Fig. 14(b) is a perspective view of the exterior wall part illustrated in Fig. 14(a) as viewed from the outer side.

Fig. 15(a) is a view illustrating a transverse cross-section of the exterior wall part that can be used in the embodiment of the present invention, and Fig. 15(b) is a perspective view of the exterior wall part illustrated in Fig. 15(a) as viewed from the outer side.

Fig. 16(a) is a view illustrating a transverse cross-section of the exterior wall part that can be used in the embodiment of the present invention, and Fig. 16(b) is a perspective view of the exterior wall part illustrated in Fig. 16(a) as viewed from the outer side.

Fig. 17(a) is a view illustrating a transverse cross-section of the exterior wall part that can be used in the embodiment of the present invention, and Fig. 17(b) is a perspective view of the exterior wall part illustrated in Fig. 17(a) as viewed from the outer side.

Fig. 18(a) is a view illustrating a transverse cross-section of the exterior wall part that can be used in the embodiment of the present invention, and Fig. 18(b) is a perspective view of the exterior wall part illustrated in Fig. 18(a) as viewed from the outer side.

Fig. 19(a) is a longitudinal sectional view for explaining effects of the exterior wall panel that can be used in the embodiment of the present invention, and Fig. 19(b) is a perspective view for explaining the effects of the exterior wall panel that can be used in the embodiment of the present invention.

Fig. 20 is a longitudinal sectional view illustrating another example of the exterior wall panel that can be

used in the embodiment of the present invention.

Fig. 21 is a longitudinal sectional view illustrating an example of a case where a window is provided.

Fig. 22 is a longitudinal sectional view illustrating a first modification of an architectural wall that can be used in the present invention.

Fig. 23 is a longitudinal sectional view illustrating a second modification of the architectural wall that can be used in the present invention.

EMBODIMENT FOR CARRYING OUT INVENTION

[0024] The architectural wall according to the present embodiment is, for example, an exterior wall panel. The exterior wall panel may be connectable to another exterior wall panel laterally or in a vertical direction. In the present embodiment, "upper" means an upper side when the exterior wall panel is installed in a building, and "lower" means a lower side when the exterior wall panel is installed in a building. In the present embodiment, "lateral" means a direction orthogonal to the vertical direction, and typically means a direction orthogonal to the vertical direction and in which the surface of the exterior wall panel extends.

[0025] As illustrated in Fig. 1, according to the present embodiment, the exterior wall panel may have an inner member 10 and an exterior wall part 50 that is provided on the outer side of the inner member 10 and has a plurality of outwardly projecting parts 51 for forming a ventilation passage with the inner member 10. The outwardly projecting part 51 may extend in the vertical direction. A width W1 of the outwardly projecting part 51 may be, for example, 5 cm to 30 cm. However, these are merely examples, and the width W1 of the outwardly projecting part 51 may have various sizes. A width W2 (see Fig. 3) of the exterior wall panel can have various sizes, and as an example, the width W2 is 25 cm to 70 cm. In addition, in the present embodiment, "outer side" means an outdoor side when installed in a building, and "inner side" means an indoor side when installed in a building. An outwardly recessed part 52 may be formed between the outwardly projecting parts 51.

[0026] The outwardly projecting part 51 may be formed by bending a metal plate. In a case where the outwardly projecting part 51 is formed of a metal plate, it can be easily processed, and for example, the width of the outwardly projecting part 51 can be changed in increments of 1 cm. The inner member 10 may also be formed by processing a metal plate or may have a housing shape (see Figs. 7(a) and 8).

[0027] The exterior wall part 50 may be formed by combining a plurality of the exterior wall parts 50. The exterior wall part 50 may have a connecting part for connecting to another exterior wall part 50 that is laterally adjacent to the exterior wall part 50. As an example of the connecting part, as illustrated in Figs. 10 to 12, the exterior wall part 50 may have a laterally projecting part 61 that projects laterally and a laterally recessed part 62 that is

recessed laterally. In this case, the laterally projecting part 61 of a certain exterior wall part 50 may be fitted into the laterally recessed part 62 of another adjacent exterior wall part 50 and then fixed by a fastening member or the like. Furthermore, as another example of the connecting part, as illustrated in Figs. 13 to 18, the exterior wall part 50 may have a holding part 66 that projects laterally and holds another adjacent exterior wall part 50. In these cases, the laterally projecting part 61 of a certain exterior wall part 50 may be fixed by a fastening member or the like in a state of being inserted into the laterally recessed part 62 of another adjacent exterior wall part 50. Further, the holding part 66 of a certain exterior wall part 50 may be fixed by a fastening member or the like in a state of holding another adjacent exterior wall part 50. Note that the outwardly projecting parts 51 may be vertically continuous, horizontally continuous, or vertically and horizontally continuous.

[0028] The exterior wall part 50 may be formed of, for example, a zinc steel plate. In a case where the zinc steel plate is used as described above, it is possible to provide an exterior wall that is less likely to rust and is easier to perform maintenance as compared with a case where tiles or natural stones are attached. In addition, by adopting a metal as the exterior wall part 50, it is possible to provide an aspect in which the exterior wall is less likely to be peeled or cracked unlike a conventional case.

[0029] In the aspect illustrated in Fig. 3 and the like, the description has been given using an aspect in which the outwardly projecting part 51 extends in the vertical direction, but it is not limited thereto, and the outwardly projecting part 51 may extend in a lateral direction including a horizontal direction or may extend obliquely with respect to the vertical direction.

[0030] As illustrated in Fig. 3, the inner member 10 may have an upwardly extending part 15 that extends upward. A fastening hole 15a into which a fastening member or the like is inserted may be provided in the vertically extending part 15. As illustrated in Fig. 2, the inner member 10 may have a laterally extending part 16 that extends laterally. A lifting hole 21 used for lifting by a crane or the like may be provided in the laterally extending part 16. In addition, a lifting hole 15b used for lifting by a crane or the like may be provided in the upwardly extending part 15. A fastening hole into which a fastening member or the like is inserted may be provided in the laterally extending part 16.

[0031] Although the exterior wall panel is described as an example of the architectural wall, it is not limited thereto. The inner member 10 and the exterior wall part 50 of the architectural wall are not necessarily integrally formed, and the inner member 10 of the architectural wall may constitute a wall of a building, and the exterior wall part 50 may be provided later on the wall.

[0032] As illustrated in Fig. 4, an eaves part 30 provided so as to cover the upper side of the exterior wall part 50 may be provided.

[0033] As illustrated in Fig. 3, a projecting part 19 may

be provided on the upper surface of the inner member 10. The projecting part 19 and the eaves part 30 may be connected by a connecting member including a fastening member such as a screw. The projecting part 19 may have a U-shape in a transverse cross-section by bending a metal plate.

[0034] As illustrated in Figs. 7(a) and 8, the inner member 10 may have an inwardly recessed part 11. However, it is not limited thereto, and an outwardly recessed part may be provided. A heat shielding member or a heat insulating member 70 (see also Fig. 2) may be provided in the inwardly recessed part 11. The heat insulating member 70 is, for example, rock wool, and the thickness of the rock wool is, for example, 15 cm or more. After the rock wool is blown as described above, as illustrated in Fig. 7(b), a gypsum board 90 may be attached to the inner surface side. According to such an aspect, it is possible not to use a concrete wall. As the heat insulating member 70, a thick plate made by blowing or made of rock wool may be used. Further, the material is not limited to rock wool, and urethane or glass wool may be used.

[0035] Since the concrete wall is not used, it is also possible to eliminate formwork, arrangement, labor of earthmoving, and set-up. According to the exterior wall panel of such an aspect, heat insulation performance can be exhibited as compared with a conventional concrete wall, and sound insulation performance similar to that of concrete can be achieved. In addition, according to such an aspect, it is possible to provide a wall that is extremely lightweight as compared with a concrete wall, and to provide excellent economic efficiency. Furthermore, since it is possible to prevent CO₂ emission when cement is made and to significantly improve the heat insulation performance of a building, it is possible to make a more sustainable building.

[0036] As illustrated in Fig. 8, the inner member 10 may have a first inner member 111 and a second inner member 112 that extends in a direction intersecting the first inner member 111. The exterior wall part 50 may have a first exterior wall part 151 provided on the surface on the outer side of the first inner member 111 and a second exterior wall part 152 provided on the surface on the outer side of the second inner member 112. The first inner member 111 and the second inner member 112 may intersect at an angle of approximately 90 degrees. In the present exemplary embodiment, approximately 90 degrees means 85 degrees to 95 degrees. The first inner member 111 and the second inner member 112 may intersect at various angles α , or may intersect according to the shape of walls of a building.

[0037] As illustrated in Fig. 4, in the aspect in which the outwardly projecting part 51 extends in the vertical direction, the lower end of the eaves part 30 may be positioned below the upper end of the outwardly projecting part 51, and a gap 41 may be provided between the eaves part 30 and the exterior wall part 50. By providing such a gap 41, an opening through which outside air such as air passes may be formed between the eaves part 30

and the upper part of the outwardly projecting part 51.

[0038] In a case where another exterior wall panel is provided above the exterior wall panel, a gap 42 may be provided between the outwardly projecting part 51 of another exterior wall panel and the eaves part 30. By providing such a gap 42, an opening through which air passes may be formed between the eaves part 30 and the lower part of the outwardly projecting part 51.

[0039] As illustrated in Fig. 9, a coating material 59 may be provided on the surface on the inner side of the exterior wall part 50. However, it is not limited thereto, and the coating material 59 may be provided on both or one of the surfaces on the inner and outer sides of the exterior wall part 50. As the coating material 59, for example, urethane foam may be used. In a case where such a coating material 59 is provided, the exterior wall part 50 can enhance the heat shielding performance and the heat insulating performance. Particularly in summer, while outside air is replaced by a chimney effect (see Fig. 19) to be described later, application of heat due to sunlight into a room can be blocked by both the coating material 59 and the heat insulating member 70, so that excellent heat insulation performance can be achieved. As a result, according to such an aspect, excellent heat insulation performance can be achieved as compared with a conventional concrete wall.

[0040] As illustrated in Fig. 5, the exterior wall part 50 may be disposed to be shifted laterally with respect to the inner member 10. In this case, the surface on the outer side (the surface on the front surface side in the drawing) of the inner member 10 may be exposed without being covered by the exterior wall part 50 on a first side (the right side in the aspect illustrated in Fig. 5), and the surface on the inner side (the surface on the back surface side in the drawing) of the exterior wall part 50 may be exposed without being covered by the inner member 10 on a second side (the left side in the aspect illustrated in Fig. 5) opposite to the first side. Such exposed surfaces may be covered by other exterior wall panels installed adjacent thereto. Specifically, in a case where the surface on the outer side of the inner member 10 is exposed on the first side (for example, the right side) and the surface on the inner side of the exterior wall part 50 is exposed on the second side (for example, the left side) opposite to the first side, the surface on the inner side of the exterior wall part 50 may cover the inner member 10 of another second exterior wall panel installed on the second side (for example, the left side), and the surface on the outer side of the inner member 10 may be covered by the exterior wall part 50 of another first exterior wall panel installed on the first side (for example, the right side) (see Fig. 6).

[0041] By providing the exterior wall part 50 as in the present embodiment, an aspect in which no tile is used can be obtained. As a result, it is possible to eliminate plastering. Various decorations can be used for the exterior wall part 50. In a case where the exterior wall part 50 is formed by processing a metal plate, various deco-

rations can be achieved by easy and low cost processing. As an example, decorations as illustrated in Figs. 10 to 18 can be applied to the appearance of the exterior wall part 50. Note that a plate, cloth, film, or the like with various shapes and colors may be provided on the outer side of the exterior wall part 50. Note that the shapes illustrated in Figs. 10 to 18 are merely examples, and it is not limited thereto.

10 <<Effects>>

[0042] Next, functions and effects of the present embodiment with the configuration described above, which have not yet been described, will be mainly described. Note that any configuration described in "Effects" can be used as the configuration of the present embodiment.

[0043] By adopting the exterior wall panel as in the present embodiment, excellent workability can be achieved. For example, the exterior wall panel can be lifted by a crane and pulled and attached from the inside of each floor. As a result, the external scaffold is not used, and thus the cost can be reduced, and the construction period can be shortened. In a case where the exterior wall panel is laterally connectable to another exterior wall panel, the exterior wall having a size suitable for a building in the lateral direction can be formed by laterally connecting the exterior wall panels. In a case where the exterior wall panel is connectable to another exterior wall panel in the vertical direction, the exterior wall having a size suitable for a building in the vertical direction can be formed by connecting the exterior wall panels in the vertical direction.

[0044] In addition, by adopting the exterior wall panel that has the exterior wall part 50 having the outwardly projecting part 51 that forms a ventilation passage with the inner member 10, the air can flow between the inner member 10 and the exterior wall part 50, and the cooling effect can be expected particularly in summer.

[0045] In a case where the outwardly projecting part 51 extends in the vertical direction, this cooling effect is enhanced. Specifically, as illustrated in Fig. 19, when the exterior wall part 50 is warmed by direct sunlight, air starts to flow continuously from the bottom to the top between the outwardly projecting part 51 and the inner member 10 (the chimney effect can be obtained), and an effect of removing heat from a building can be obtained.

[0046] The surface of the inner member 10 on the side of the exterior wall part 50 (the surface on the outer side) may be a flat surface. By adopting such a flat surface, the flow of outside air such as air can be made smooth between the outwardly projecting part 51 and the inner member 10.

[0047] By providing the eaves part 30 so as to cover the upper part of the exterior wall part 50, it is possible to prevent rain or the like from entering between the exterior wall part 50 and the inner member 10. In particular, in a case of adopting an aspect in which the lower end of the eaves part 30 is positioned below the upper end

of the outwardly projecting part 51, it is possible to more effectively prevent rain or the like from entering between the exterior wall part 50 and the inner member 10, and high watertightness can be achieved.

[0048] Even in a case where the eaves part 30 is provided, as illustrated in Fig. 4, in a case where the gap 41 is provided between the eaves part 30 and the exterior wall part 50, the air flowing from the bottom to the top between the outwardly projecting part 51 and the inner member 10 can exit from the gap 41 between the eaves part 30 and the exterior wall part 50 to be exhausted (see Fig. 19(a)).

[0049] In a case where the exterior wall panel is connectable to another exterior wall panel in the vertical direction, when adopting an aspect in which another exterior wall panel is provided above the exterior wall panel, and the gap 42 is provided between the outwardly projecting part 51 of another exterior wall panel and the eaves part 30, air can enter between the outwardly projecting part 51 and the inner member 10 and flow from the bottom to the top between the outwardly projecting part 51 and the inner member 10, and the chimney effect can be obtained (see Figs. 4 and 19(a)) even in a case where the exterior wall panel is continuously provided in the vertical direction.

[0050] As illustrated in Fig. 3, when adopting an aspect in which the projecting part 19 is provided on the upper surface of the inner member 10, and the projecting part 19 and the eaves part 30 are connected by a connecting member, the eaves part 30 can be installed while maintaining a constant distance in the vertical direction between the inner member 10 and the eaves part 30. As a result, for example, as described above, an appropriate gap can be formed between the eaves part 30 and the exterior wall part 50.

[0051] As illustrated in Fig. 2 and the like, when adopting an aspect in which the inner member 10 has the inwardly recessed part 11 for providing the heat insulating member 70, the heat insulating member 70 such as rock wool can be reliably provided in the inwardly recessed part 11, and the wall that achieves a heat insulating effect can be provided.

[0052] As illustrated in Fig. 8, when adopting an aspect in which the inner member 10 has the first inner member 111 and the second inner member 112 extending in a direction intersecting the first inner member 111, and the exterior wall part 50 has the first exterior wall part 151 provided on the surface on the outer side of the first inner member 111 and the second exterior wall part 152 provided on the surface on the outer side of the second inner member 112, not only the shape of a flat wall but also the shape of a curved wall can be achieved. When adopting an aspect in which the first inner member 111 and the second inner member 112 intersect at an angle of approximately 90 degrees, the exterior wall panel of the present embodiment can also be adopted at a corner part of a building.

[0053] The inner member 10 may have the first inner

member 111, the second inner member 112, ..., and an nth inner member 110 ("n" is an integer of 3 or more). The exterior wall part 50 may have the first exterior wall part 151, the second exterior wall part 152, ..., and an nth exterior wall part 50 ("n" is an integer of 3 or more). In a case where a plurality of nth inner members 10 and nth exterior wall parts 50 are provided, the shape of the wall of the building can be freely changed, and it is advantageous in that, for example, an exterior wall that has a shape close to a circular shape in a transverse cross-section can be formed by combining a large number of exterior wall panels.

[0054] As illustrated in Fig. 3, in a case where the inner member 10 has the upwardly extending part 15 that extends upward, for example, the upwardly extending part 15 can be fixed with a fastening member or the like while being inserted into a wall of a building.

[0055] As illustrated in Fig. 2, in a case where the inner member 10 has the laterally extending part 16 that extends laterally, for example, the laterally extending part 16 can be fixed with a fastening member or the like while being inserted into a wall of a building.

[0056] As illustrated in Fig. 5, when adopting an aspect in which the surface on the outer side of the inner member 10 is exposed on the first side (for example, the right side) and the surface on the inner side of the exterior wall part 50 is exposed on the second side (for example, the left side) opposite to the first side, the surface on the inner side of the exterior wall part 50 can cover the inner member 10 of another second exterior wall panel installed on the second side, and the surface on the outer side of the inner member 10 can be covered by another first exterior wall part 50 installed on the first side (see Fig. 6). As a result, the inner member 10 and the exterior wall part 50 are arranged in a nested manner, and it is possible to prevent rain or the like from entering between the inner member 10 and the exterior wall part 50 from the side. Note that in a part of the exterior wall part 50 of the exterior wall panel at the side end part, the part projecting from the inner member 10, may be cut, or the exterior wall part 50 that is originally short in length may be prepared. On the other hand, the inner member 10 of the exterior wall panel at the opposite side end part may be inserted into a building, or the inner member 10 that is originally short in length may be prepared.

[0057] As illustrated in Fig. 20, the eaves part 30 may have an upper cover part 39 that extends upward. The upper cover part 39 may be provided so as to cover all or a part of the boundary between the inner member 10 positioned on the upper side and the eaves part 30 from the outside. The upper end of the upper cover part 39 may be positioned above the lower end of the outwardly projecting part 51 disposed on the upper side. By adopting such an aspect, it is possible to prevent rain or the like entering from the gap 42 between the outwardly projecting part 51 and the eaves part 30 from entering the inside (the interior side) from between the inner member 10 and the eaves part 30.

[0058] As illustrated in Fig. 7(b), a window 95 may be provided. In this case, as illustrated in Fig. 21, the inner member 10 and the exterior wall part 50 may be provided above and below the window 95, respectively, and the eaves part 30 that has the upper cover part 39 may be provided at the lower end of the window 95. The same holds true for a case where other members other than the window 95 are provided. For example, in a case where a door is provided, the inner member 10 and the exterior wall part 50 may be provided above the door.

[First Modification]

[0059] Next, a first modification will be described with reference to Fig. 22. Also in the first modification, an aspect in which concrete is not used can be adopted, and as described later, a heat insulation effect and a heat shielding effect can be enhanced, and dew condensation can also be prevented. In the architectural wall illustrated in Fig. 22, the inner member 10 of the architectural wall may constitute a wall of a building, and the exterior wall part 50 may be provided later on the wall. However, it is not limited thereto, and the inner member 10 and the exterior wall part 50 may be integrated to form an exterior wall panel.

[0060] As illustrated in Fig. 22, one or a plurality of intermediate partition members 130 with drain holes 131 may be provided between the exterior wall part 50 and the inner member 10. In the aspect illustrated in Fig. 22, two intermediate partition members 130 are provided. Further, a plate member 110 formed of one or a plurality of calcium silicate boards (for example, the calcium silicate board has a size of 35 mm or more, but is not limited thereto, and it is not limited to the silica board) or the like may be provided between the heat insulating member 70 of the inner member 10 made of rock wool or the like and the exterior wall part 50. In the aspect illustrated in Fig. 22, two plate members 110 are provided. A moisture-proof sheet 120 may be provided on the outer surface of the plate member 110. In addition, a guide member 140 that has a drain hole 141 and guides rainwater or the like may be provided on a lower side. In the aspect illustrated in Fig. 22, the guide member 140 is provided at the lower end of the plate member 110. A lower end partition member 150 may be provided between the lower end part of the exterior wall part 50 and the inner member 10. The lower end partition member 150 may also have a drain hole 151. In Fig. 22, reference numeral 190 denotes a floor slab, and reference numeral 195 denotes a steel frame. Urethane foam 160, which is a type of a heat insulating member, may be provided below the guide member 140 and the heat insulating member 70, and around the steel frame 195. Note that as illustrated in Fig. 22, a gap through which air flows in and/or out may be provided between the eaves part 30 and the exterior wall part 50. Furthermore, a gap through which air flows in and/or out may also be provided between the lower end part of the exterior wall part 50 and the inner member 10 or a wall

of a building other than the inner member 10.

[0061] As illustrated in Fig. 22, the inner member 10 may have a plate member formed of a gypsum board 90 or the like (not limited to a gypsum board), a base member 180 made of LGS or the like provided on the outer side the gypsum board 90, and the moisture-proof sheet 120 provided between the gypsum board 90 and the base member 180. Although a space is formed between the gypsum board 90 and the base member 180, a higher heat insulating effect can be expected by providing such a space where air enters. In addition, by adopting this aspect, the heat shielding effect can be enhanced, and dew condensation can be prevented. More specifically, the heat shielding effect can be enhanced by the exterior wall part 50, the heat insulating effect can be enhanced by an air layer, and dew condensation can also be prevented.

[0062] Furthermore, in the aspect illustrated in Fig. 22, a space where air enters is provided between a pair of the plate members 110, and by adopting such an aspect, the heat insulation effect and the heat shielding effect can be enhanced, and dew condensation can also be prevented.

[Second Modification]

[0063] Next, a second modification will be described with reference to Fig. 23. Also in the second modification, the aspect in which concrete is not used can be adopted. In the architectural wall illustrated in Fig. 23, the inner member 10 of the architectural wall may constitute a wall of a building, and the exterior wall part 50 may be provided later on the wall. However, it is not limited thereto, and the inner member 10 and the exterior wall part 50 may be integrated to form an exterior wall panel.

[0064] As illustrated in Fig. 23, one or a plurality of projecting members 240 may be provided between the exterior wall part 50 and the inner member 10. In Fig. 23, five projecting members 240 are shown. An outer wall frame 220 may be provided between the projecting member 240 and the exterior wall part 50. In the aspect illustrated in Fig. 23, the outer wall frame 220 is provided at the lower end of the projecting member 240 positioned at the upper end, and the outer wall frame 220 is provided between four projecting members 240 and the exterior wall part 50. Further, the plate member 110 formed of one or a plurality of calcium silicate boards (for example, the calcium silicate board has a size of 35 mm or more, but is not limited thereto, and it is not limited to the silica board) or the like may be provided between the heat insulating member 70 made of rock wool or the like and the exterior wall part 50. In the aspect illustrated in Fig. 23, instead of the heat insulating member 70 provided so as to cover the steel 195, one plate member 110 is provided between the heat insulating member 70 positioned on the outer surface side of the inner member 10 and the exterior wall part 50. A sheet member such as a moisture-proof sheet 121 may be provided on the outer

surface side of the plate member 110. The moisture-proof sheet 121 is thick, and may have a thickness of, for example, 3 mm or more. Alternatively, the moisture-proof sheet 121 may be made of a heat insulating member. The projecting member 240 may extend not only in the horizontal direction but also in the vertical direction. That is, the projecting members 240 may extend so as to form a lattice for the purpose of increasing strength. Note that also in the aspect illustrated in Fig. 23, a gap through which air flows in and/or out may be provided between the eaves part 30 and the exterior wall part 50. Furthermore, the gap through which air flows in and/or out may also be provided between the lower end part of the exterior wall part 50 and the inner member 10 or a wall of a building other than the inner member 10.

[0065] As illustrated in Fig. 23, the inner member 10 may have a plate member formed of the gypsum board 90 or the like (not limited to a gypsum board), the base member 180 made of LGS or the like provided on the outer side of the gypsum board 90, and the moisture-proof sheet 120 provided between the gypsum board 90 and the base member 180. Expanded polystyrene 210 may be provided so as to surround all or a part of the periphery of the steel 195. As illustrated in Fig. 23, the urethane foam 160, which is a type of a heat insulating member, may be provided on the inner surface of the base member 180. A wooden member 230 may be provided on the upper surface of the floor slab 190. An upper member 300 made of expanded polystyrene or the like may be provided above the expanded polystyrene 210. Although the member denoted by reference numeral 210 is described as expanded polystyrene and the member denoted by reference numeral 230 is described as a wooden member, and members denoted by reference numerals 300, 210, and 230 are not limited thereto, and may be formed of any heat insulating member such as plastic, wood, or expanded polystyrene.

[0066] In the aspect illustrated in Fig. 23, an air layer can be formed on both the inner wall side and the outer wall side of a sheet member such as the moisture-proof sheet 121. That is, a first space where air enters is provided between the moisture-proof sheet 121 and the plate member 110, and a second space where air enters is provided between the moisture-proof sheet 121 and the outer wall frame 220. The air in the first space has a property of being difficult to move, and on the other hand, the air in the second space has a property of being easy to move. Consequently, it is advantageous in that the heat insulating effect can be achieved by the air in the first space in winter and the cooling effect can be achieved by the air in the second space in summer.

[0067] Note that the plate member 110 in Fig. 23 may include a pair of the plate members 110 similarly to Fig. 22, and air may be provided therebetween. By adopting such an aspect, the heat insulation effect and the heat shielding effect are enhanced, and dew condensation can be prevented.

[0068] The above description of the embodiment and

the disclosure of the drawings are merely examples for describing the invention defined in the claims, and the invention defined in the claims is not limited by the above description of the embodiment and the disclosure of the drawings. In addition, the description of the claims at the time of filing is only an example, and the description of the claims can be changed as appropriate based on the description of the description, drawings, and the like.

10 Reference Signs List

[0069]

10	inner member
11	inwardly recessed part
15	upwardly extending part
16	laterally extending part
19	projecting part
30	eaves part
41	gap
42	gap
50	exterior wall part
51	outwardly projecting part
59	coating material
70	heat insulating member
111	first inner member
112	second inner member
151	first exterior wall part
152	second exterior wall part

Claims

1. An architectural wall comprising:

an inner member; and
an exterior wall part that is provided on an outer side of the inner member and forms a space where air enters between the exterior wall part and the inner member.

2. The architectural wall according to claim 1 comprising an eaves part provided so as to cover an upper side of the exterior wall part, wherein a lower end of the eaves part is positioned below an upper end of the exterior wall part, and a gap through which air flows is provided between the eaves part and the exterior wall part.

3. The architectural wall according to claim 1 or 2, wherein

the inner member has a heat insulating member, a plurality of plate members are provided between the heat insulating member and the exterior wall part, and
an air layer is provided between the plate members.

4. The architectural wall according to any one of claims 1 to 3, wherein

the inner member has a heat insulating member, a plate member is provided between the heat insulating member and the exterior wall part, a sheet member is provided between the plate member and the exterior wall part, and air layers are provided between the plate member and the sheet member and between the sheet member and the exterior wall part.

5. The architectural wall according to any one of claims 1 to 4, wherein

one or a plurality of intermediate partition members with drain holes are provided between the exterior wall part and the inner member.

6. The architectural wall according to any one of claims 1 to 5, wherein

the architectural wall is an exterior wall panel in which the inner member and the exterior wall part is integrated, and the exterior wall panel is connectable to another exterior wall panel laterally or in a vertical direction.

7. The architectural wall according to any one of claims 1 to 6, wherein

the exterior wall part has an outwardly projecting part extending in a vertical direction, and the exterior wall part forms a ventilation passage.

8. The architectural wall according to any one of claims 1 to 7 comprising an eaves part provided so as to cover an upper side of the exterior wall part, wherein

a projecting part is provided on an upper surface of the inner member, and the projecting part and the eaves part are connected by a connecting member.

9. The architectural wall according to any one of claims 1 to 8, wherein

the inner member has an outwardly recessed part or an inwardly recessed part for providing a heat shielding member or a heat insulating member.

10. The architectural wall according to any one of claims 1 to 9, wherein

the inner member has a first inner member and a second inner member that extends in a direction intersecting the first inner member, and the exterior wall part has a first exterior wall part provided on a surface on an outer side of the first inner member and a second exterior wall

part provided on a surface on an outer side of the second inner member.

11. The architectural wall according to any one of claims 1 to 10 comprising an eaves part provided so as to cover an upper side of the exterior wall part, wherein

the exterior wall part has an outwardly projecting part extending in a vertical direction, and a lower end of the eaves part is positioned below an upper end of the outwardly projecting part, and a gap is provided between the eaves part and the exterior wall part.

12. The architectural wall according to any one of claims 1 to 11, wherein

a coating material or a foam material is provided on a surface on an outer side, a surface on an inner side or a both surfaces on an outer side and an inner side of the exterior wall part.

13. The architectural wall according to any one of claims 1 to 12, wherein

the architectural wall is an exterior wall panel in which the inner member and the exterior wall part is integrated, the architectural wall comprises an eaves part provided so as to cover an upper side of the exterior wall part, the exterior wall part has an outwardly projecting part extending in a vertical direction, the exterior wall panel is connectable to another exterior wall panel in the vertical direction, and when the other exterior wall panel is provided above the exterior wall panel, a gap is provided between the outwardly projecting part of the other exterior wall panel and the eaves part.

14. The architectural wall according to any one of claims 1 to 13, wherein

the inner member has an upwardly extending part that extends upward, and a lifting hole is provided in the upwardly extending part.

15. The architectural wall according to any one of claims 1 to 14, wherein

the inner member has a laterally extending part that extends laterally, and a lifting hole is provided in the laterally extending part.

FIG. 1

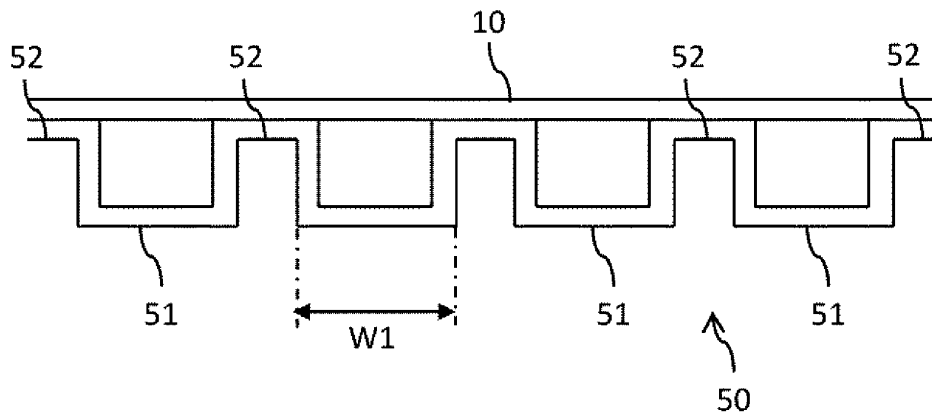


FIG. 2

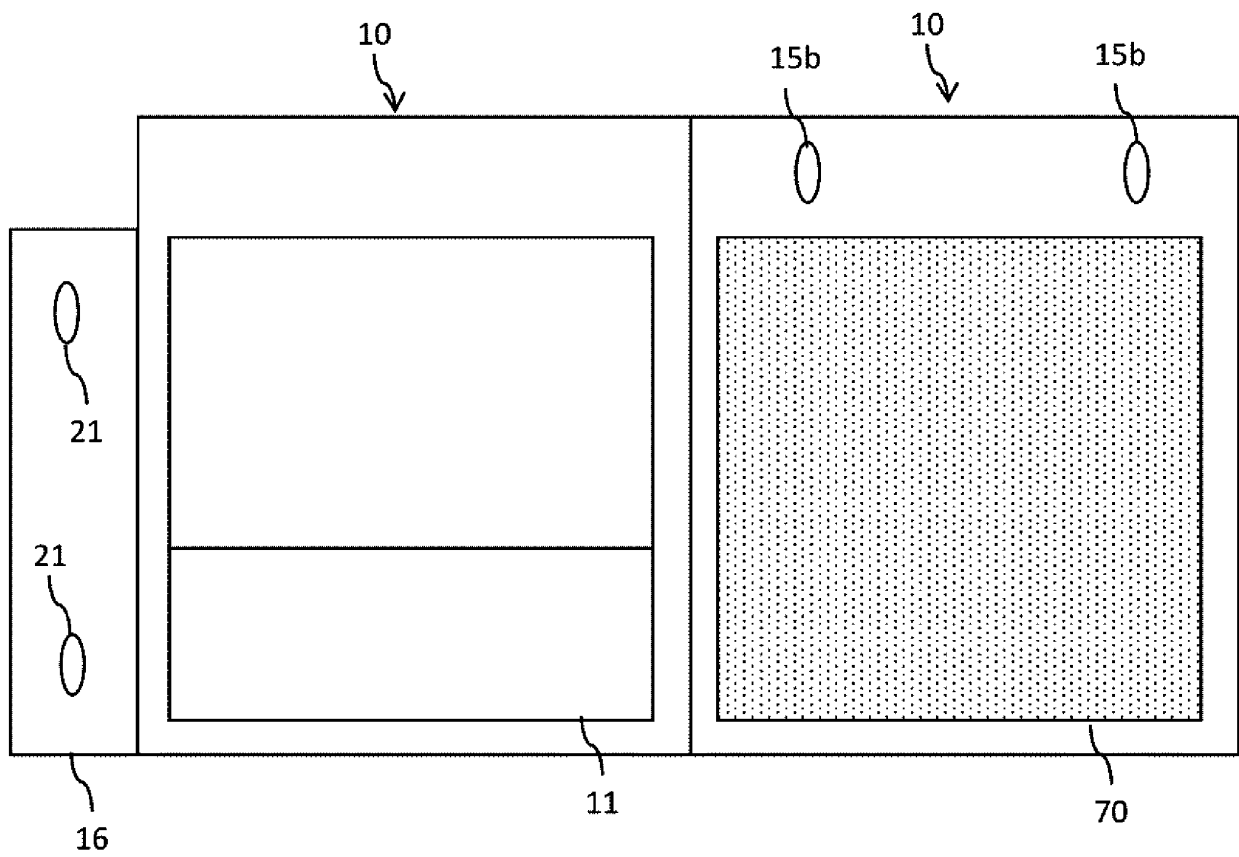


FIG. 3

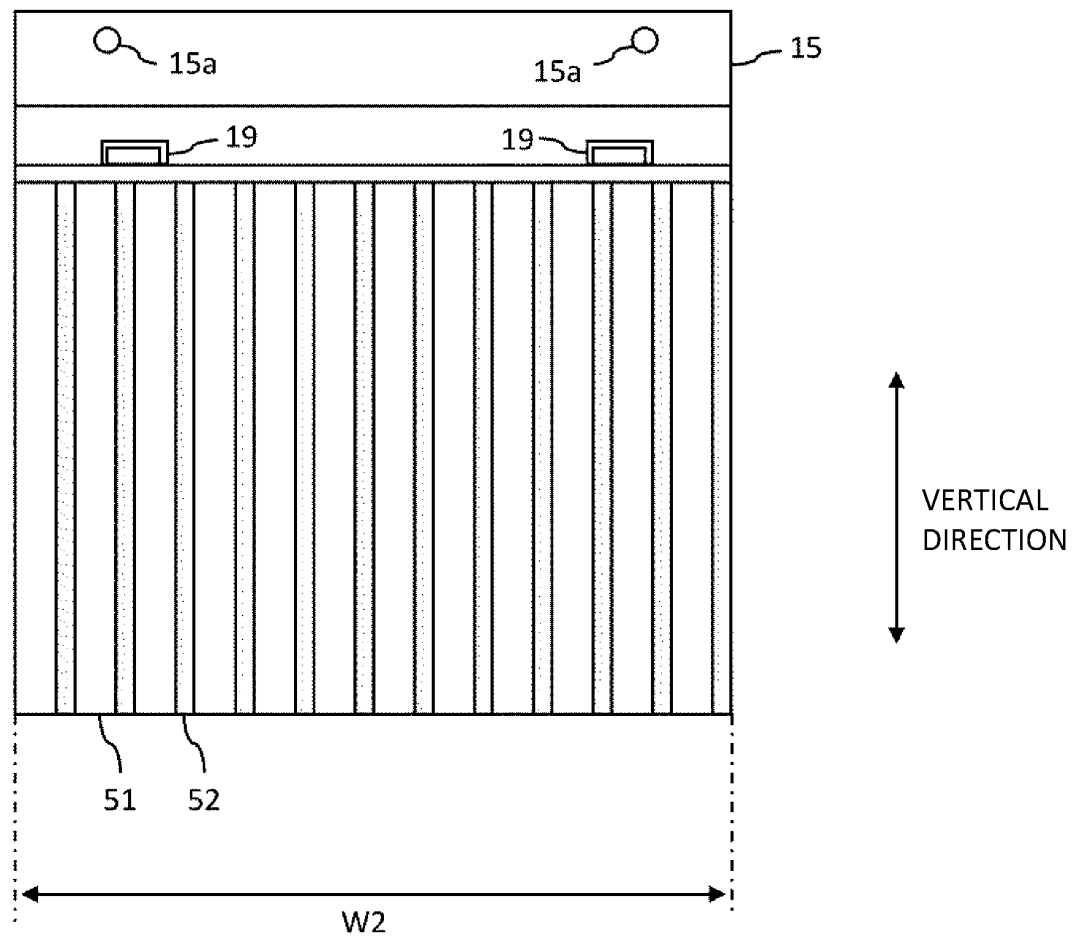


FIG. 4

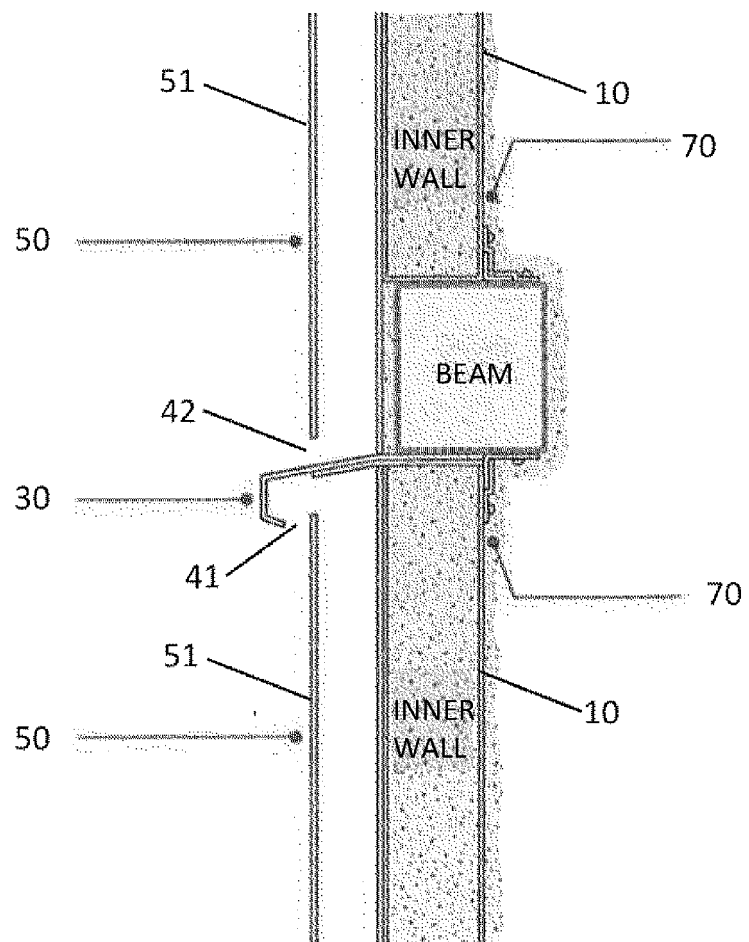


FIG. 5

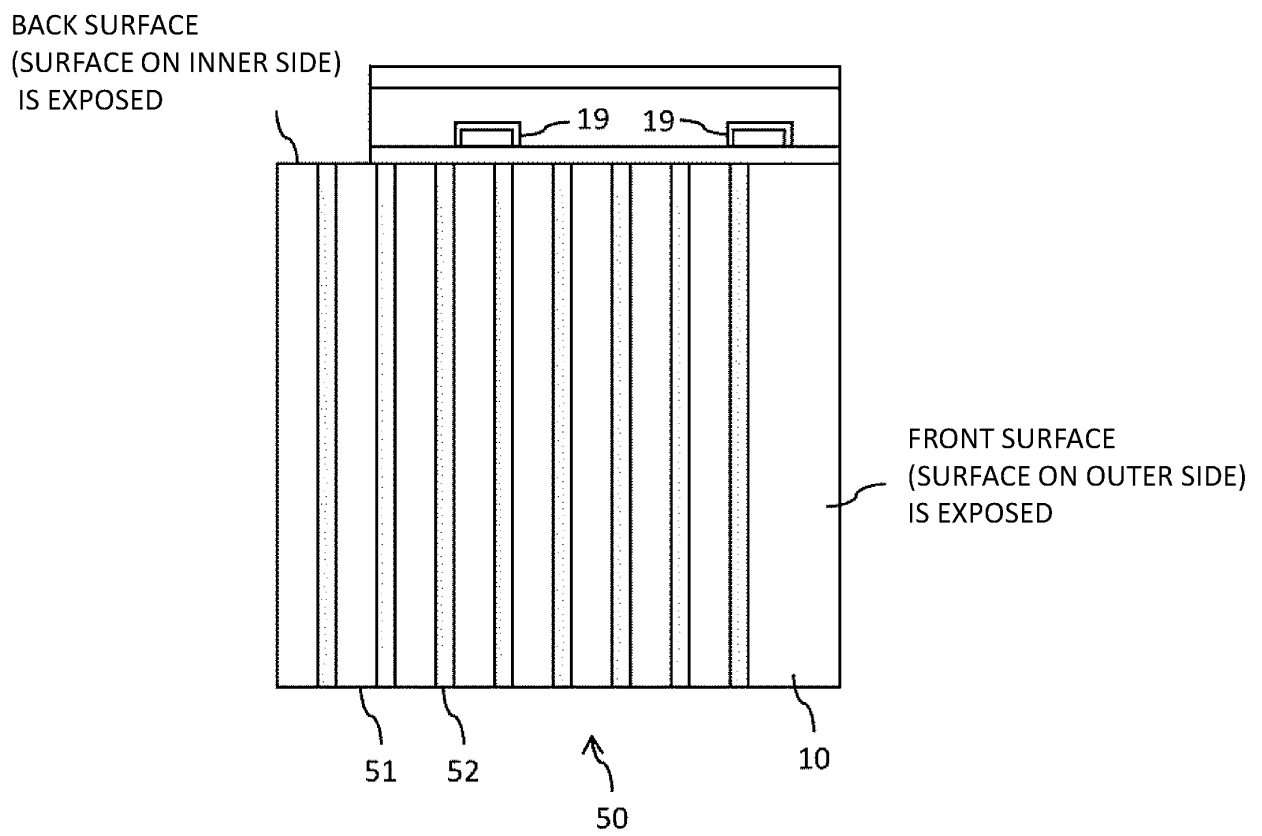


FIG. 6

BACK SURFACE OF EXTERIOR WALL PORTION COVERS
SURFACE ON OUTER SIDE OF EXPOSED INNER MEMBER
OF ADJACENT EXTERIOR WALL PANEL

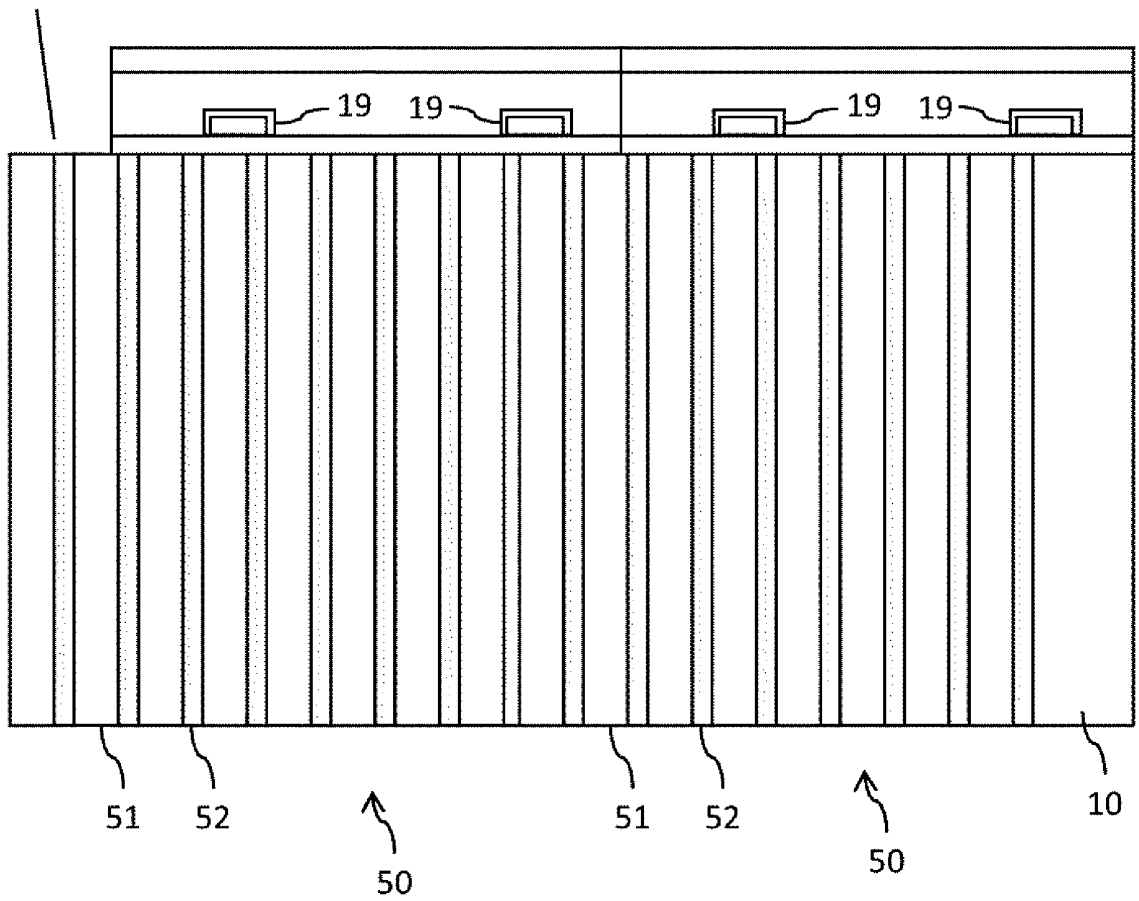
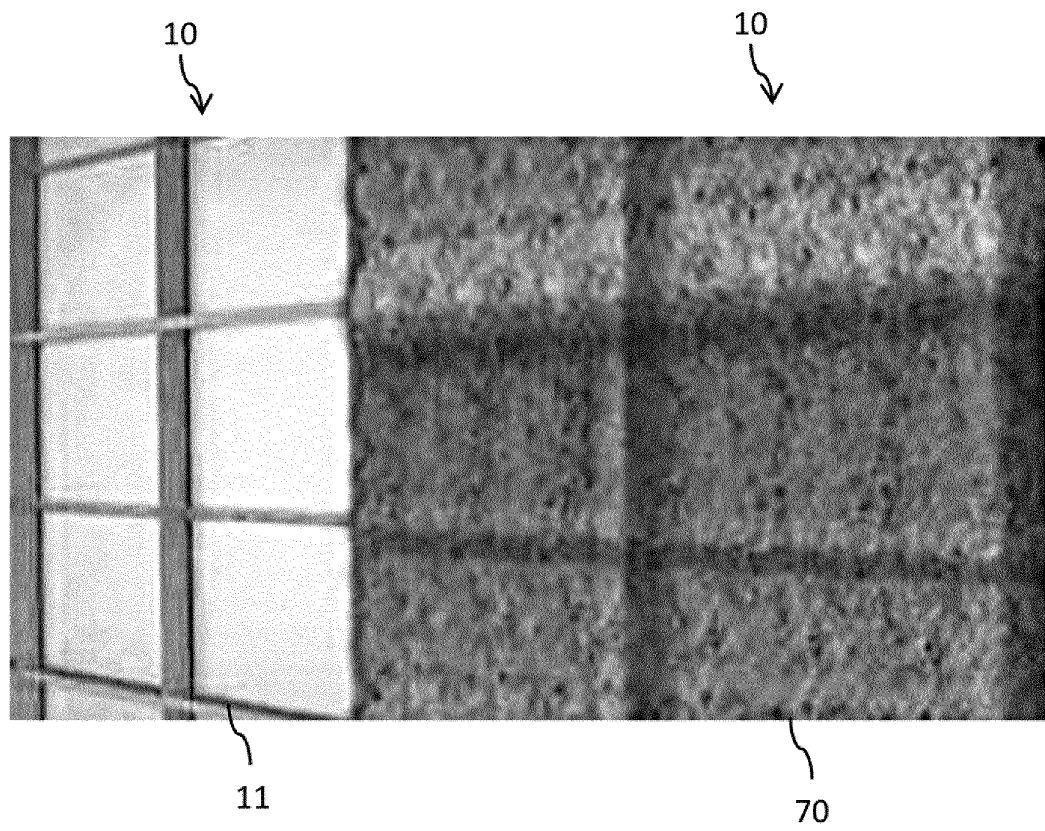


FIG. 7

(a)



(b)

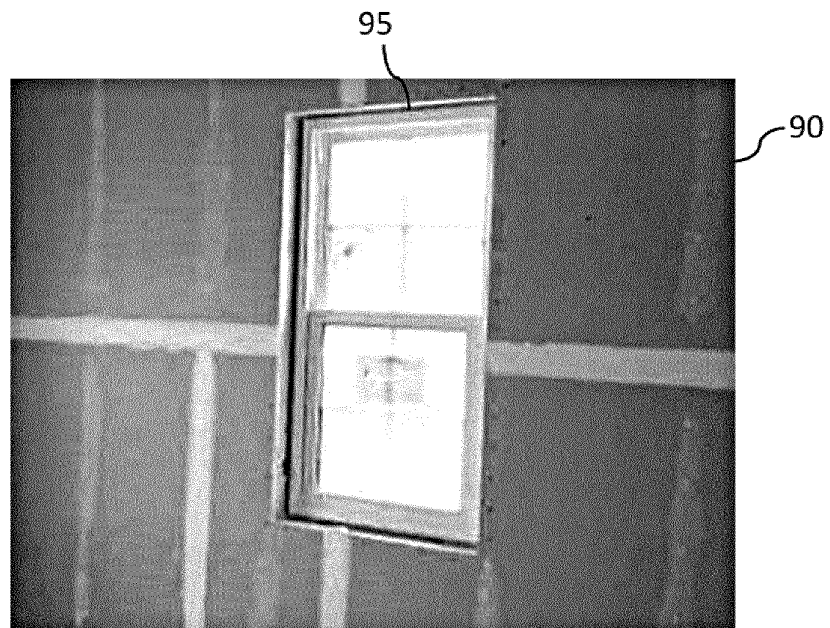


FIG. 8

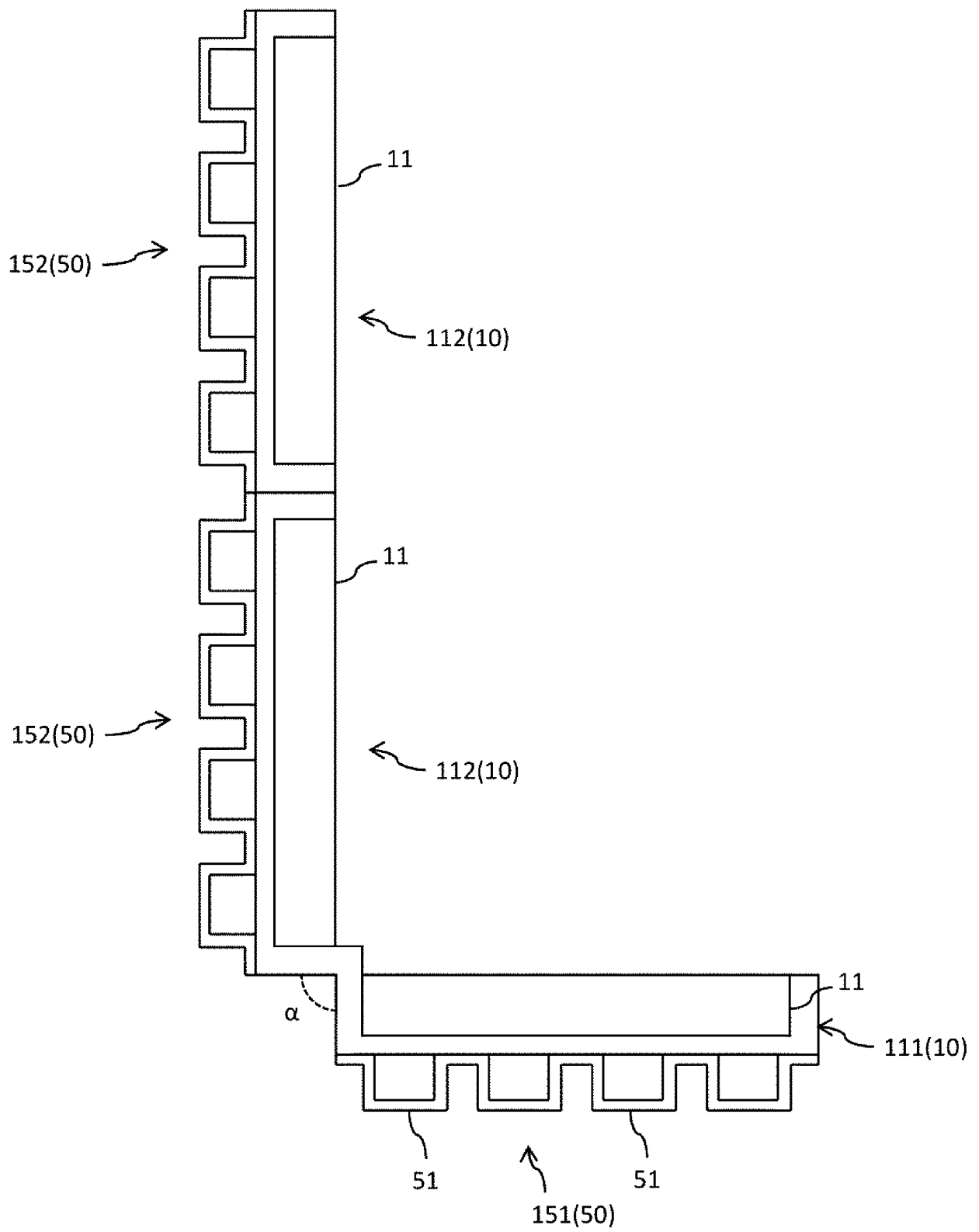


FIG. 9

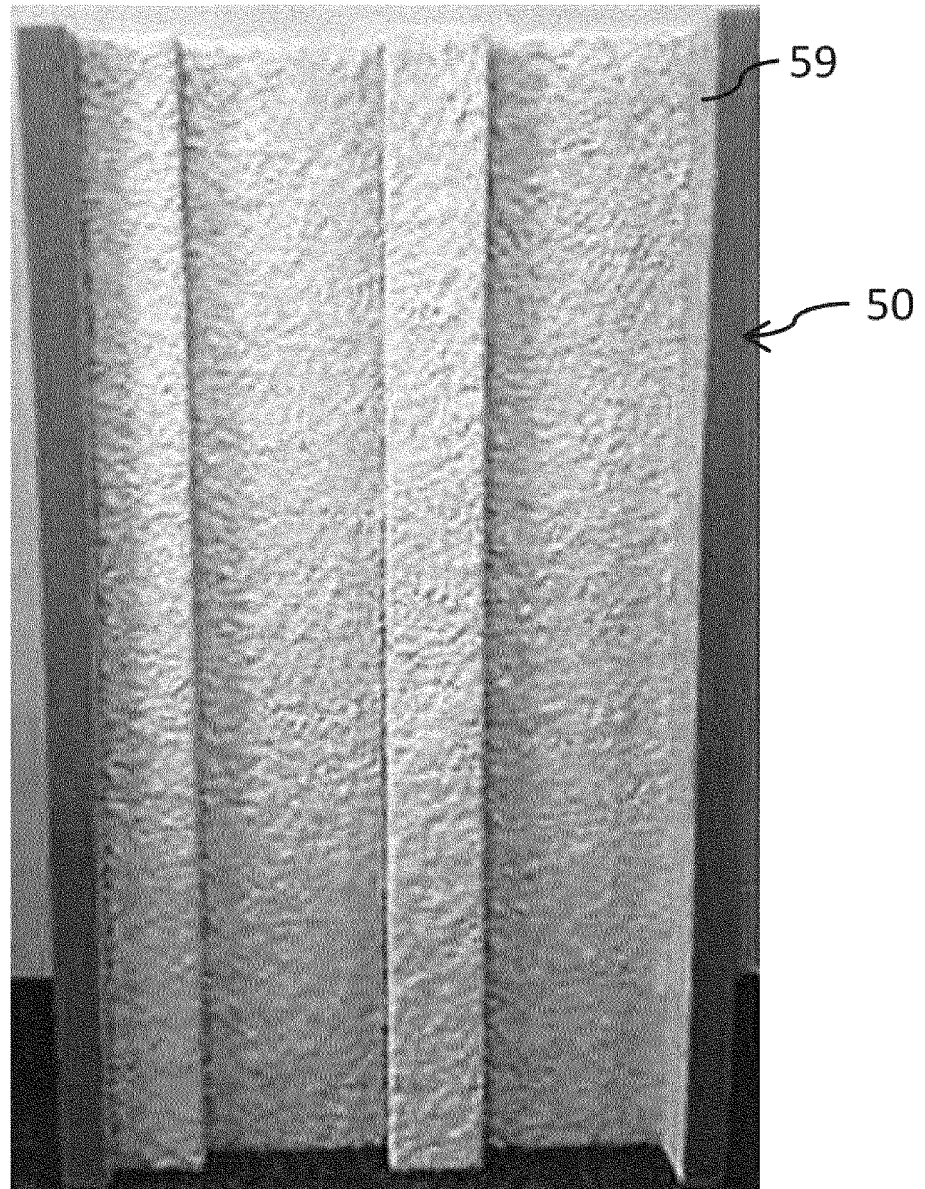


FIG. 10

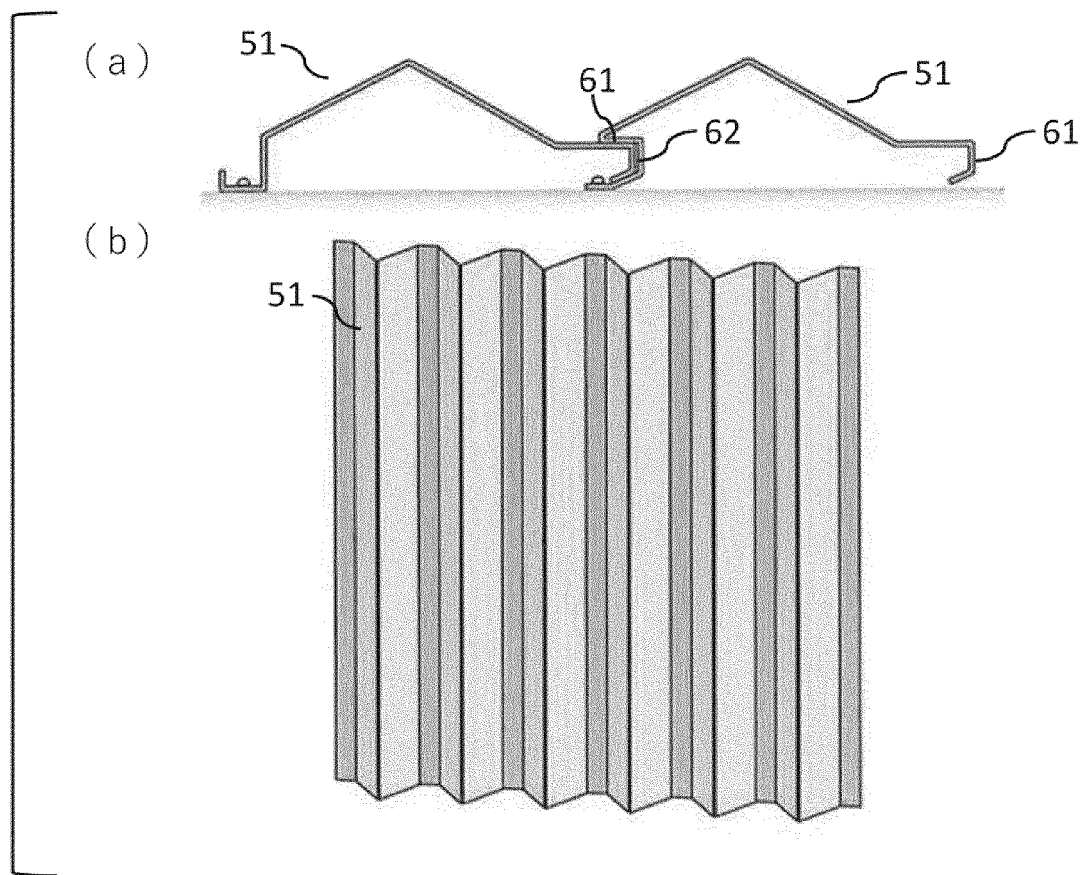


FIG. 11

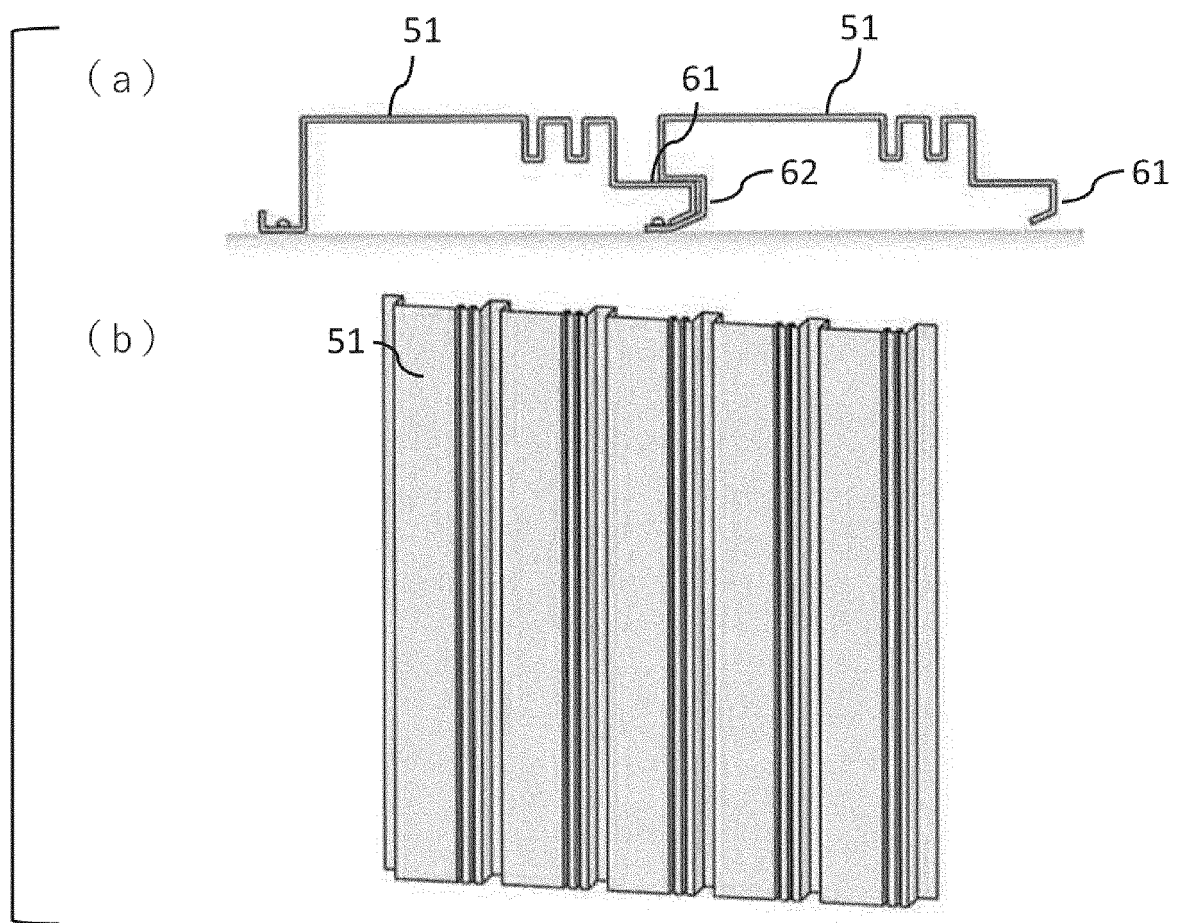


FIG. 12

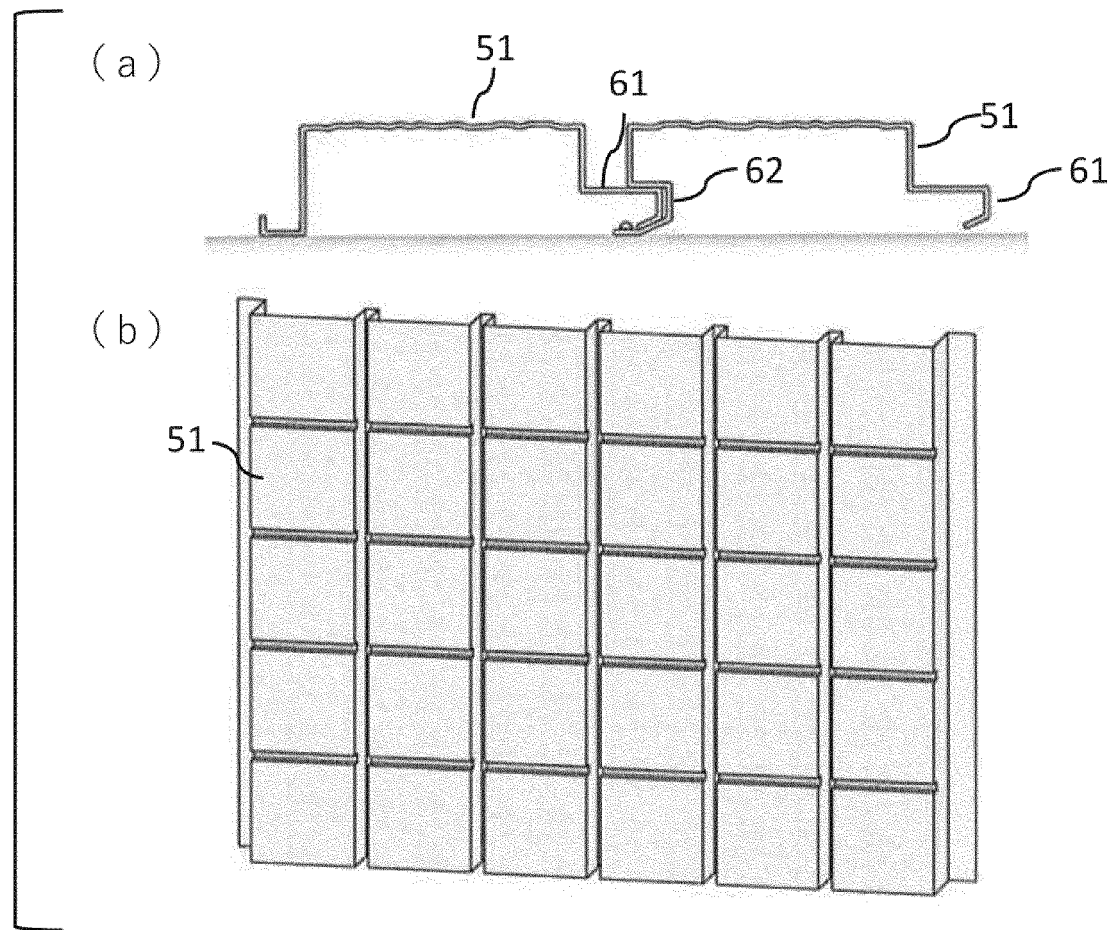


FIG. 13

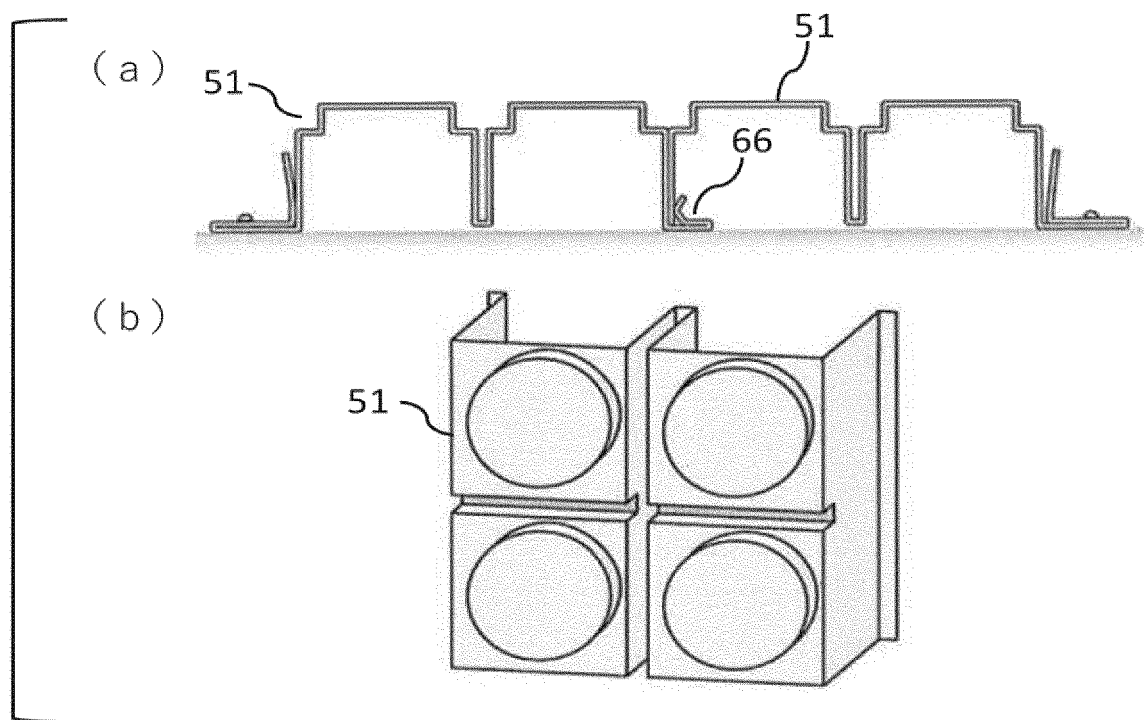


FIG. 14

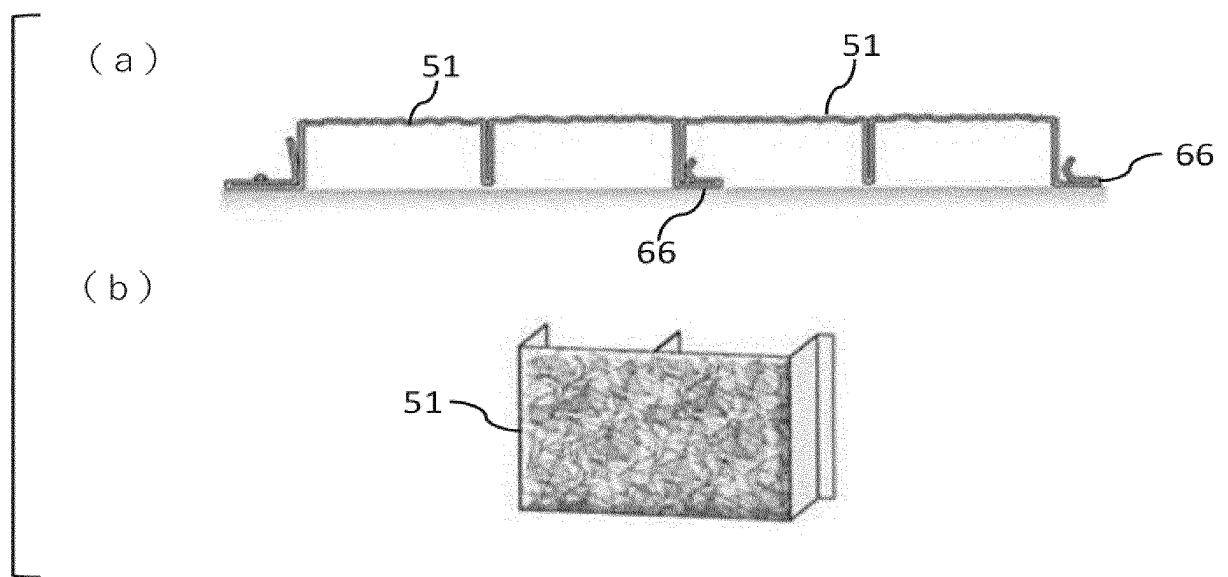


FIG. 15

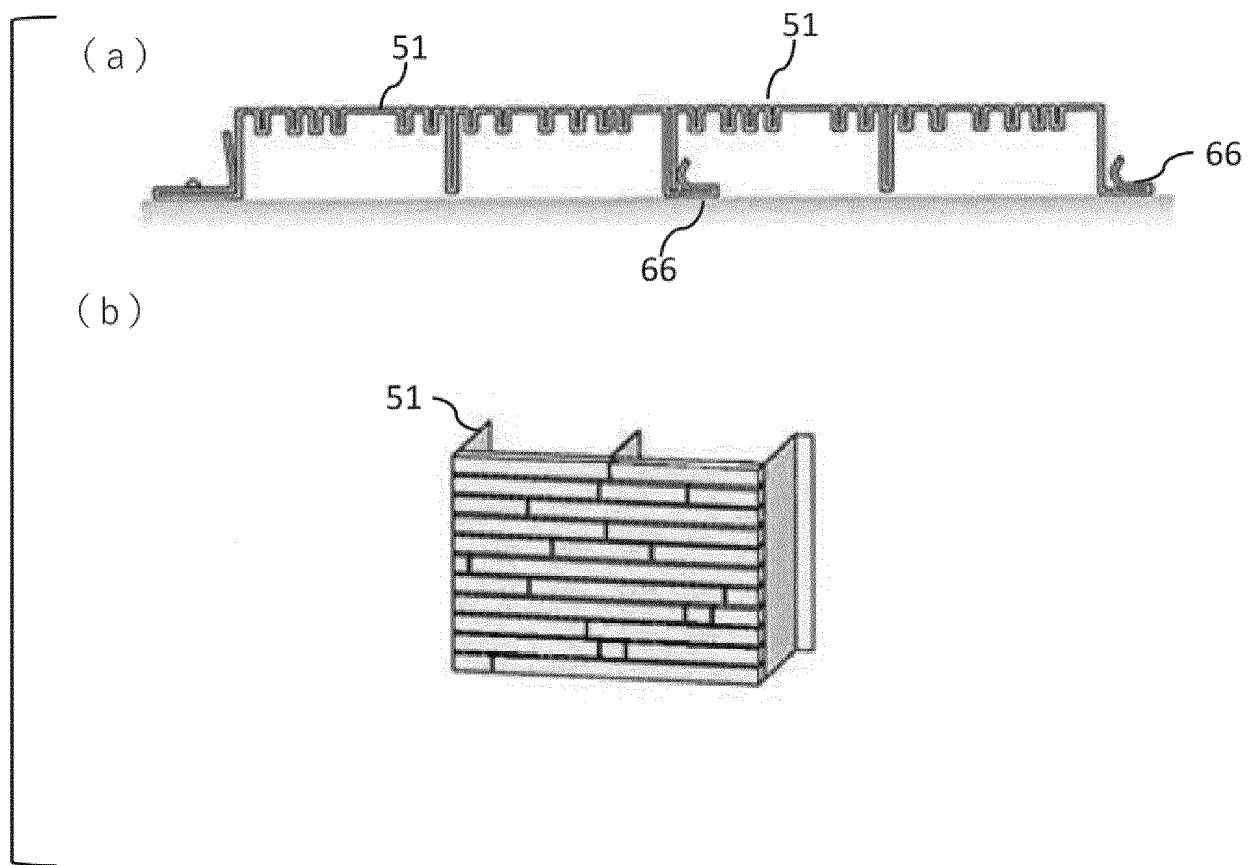


FIG. 16

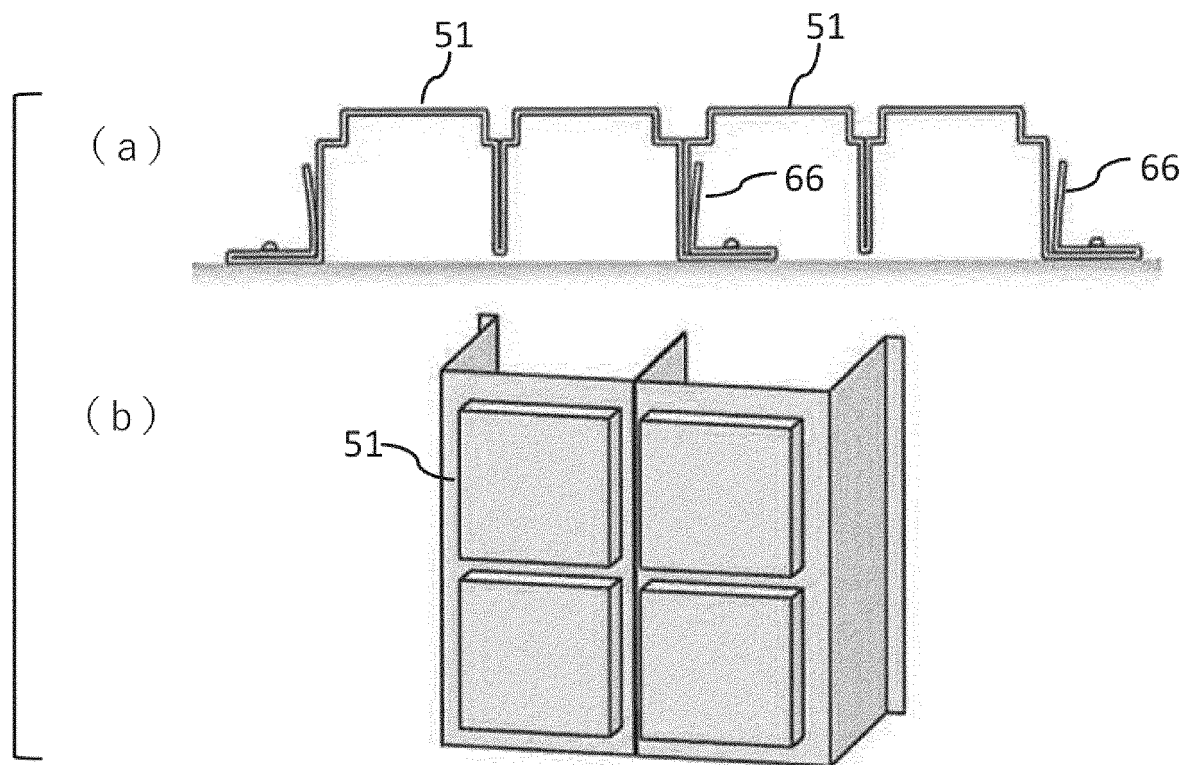


FIG. 17

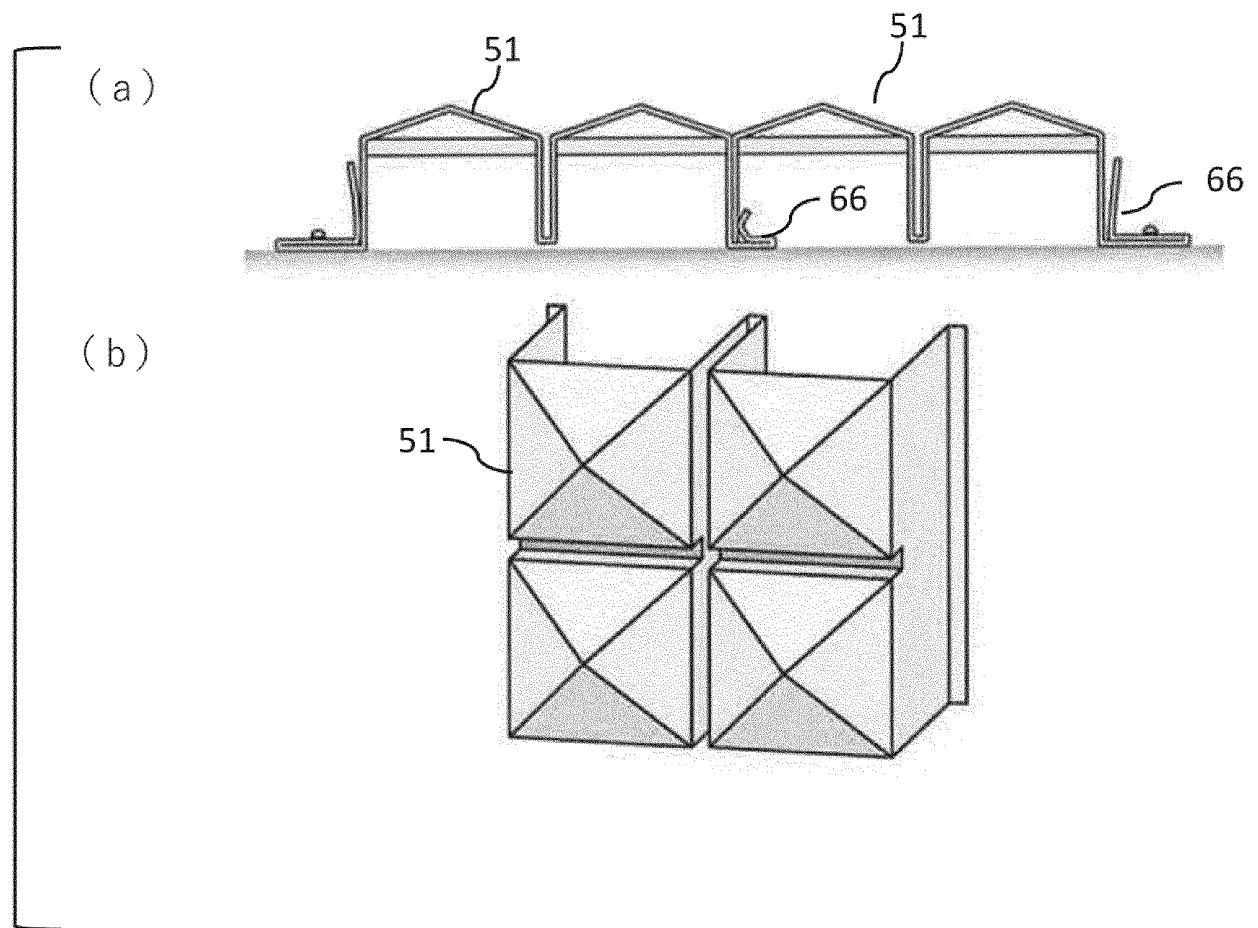


FIG. 18

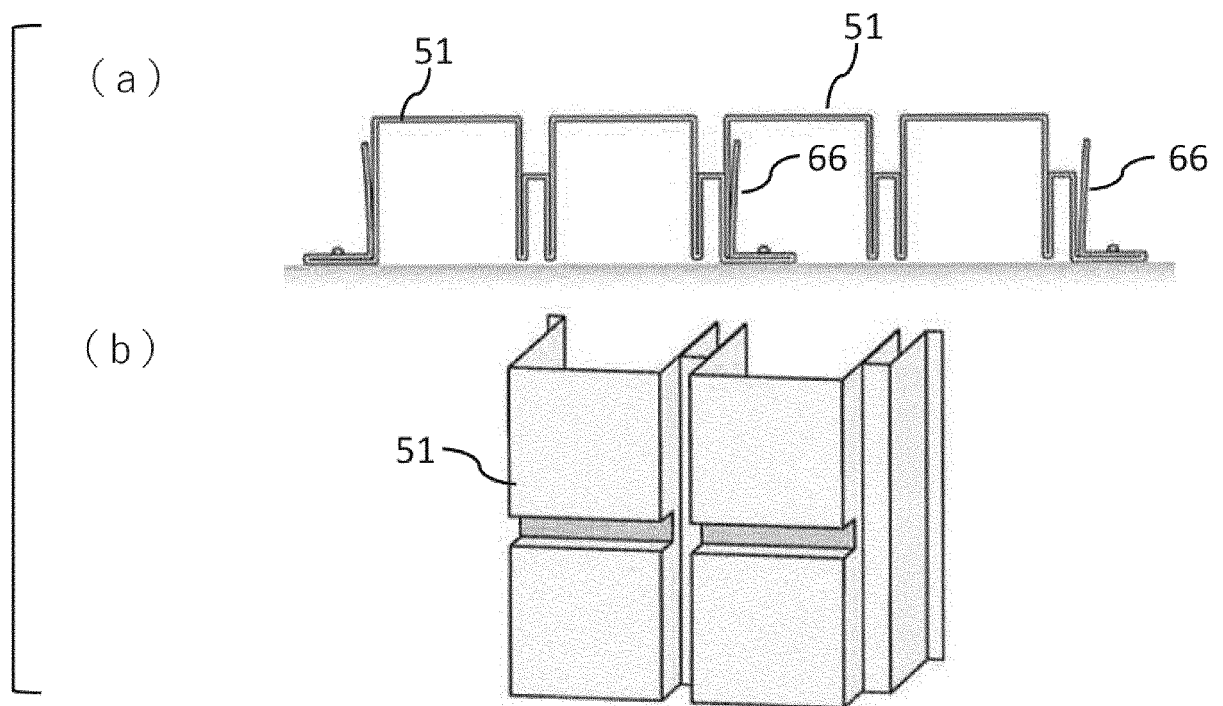


FIG. 19

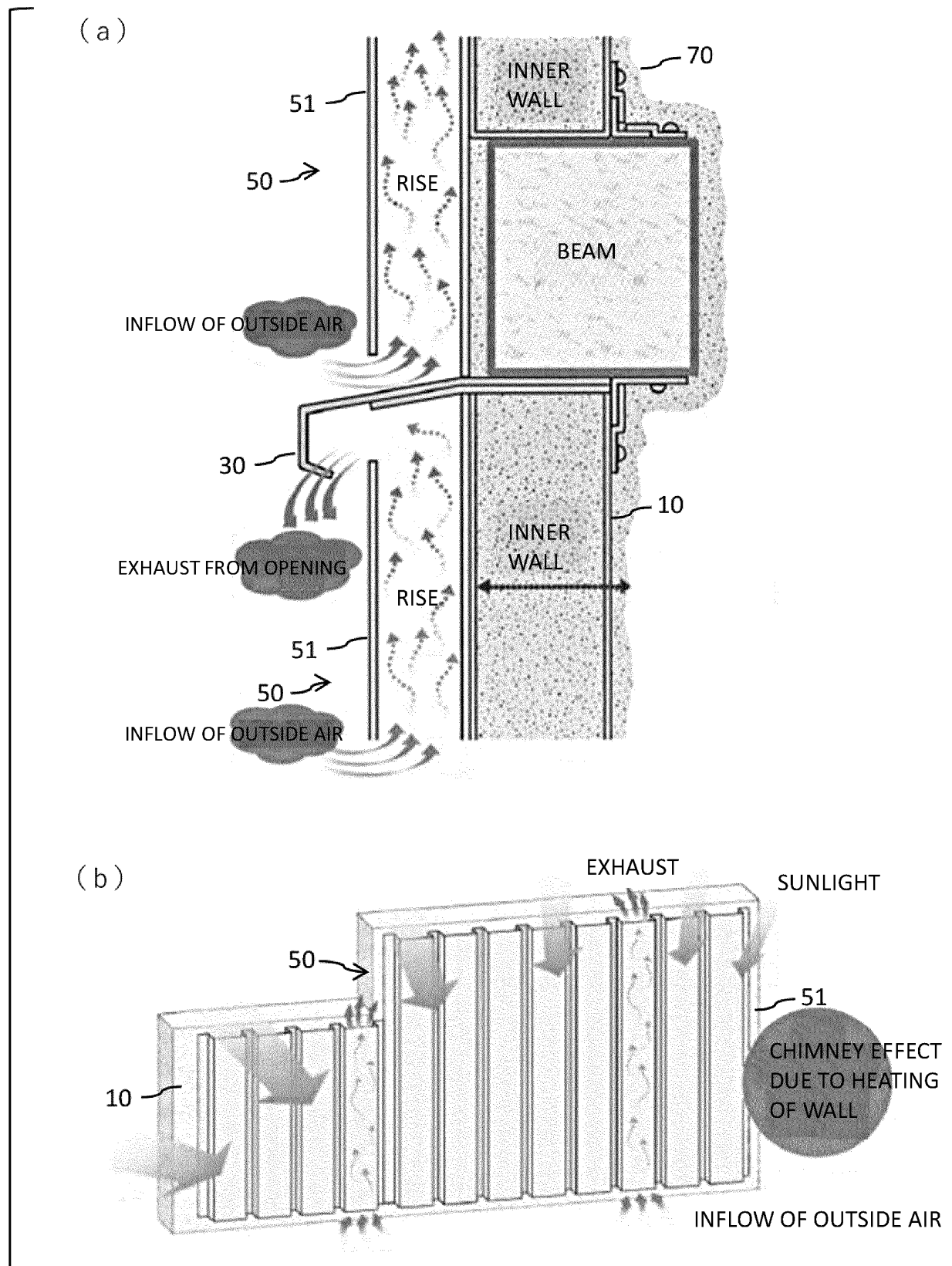


FIG. 20

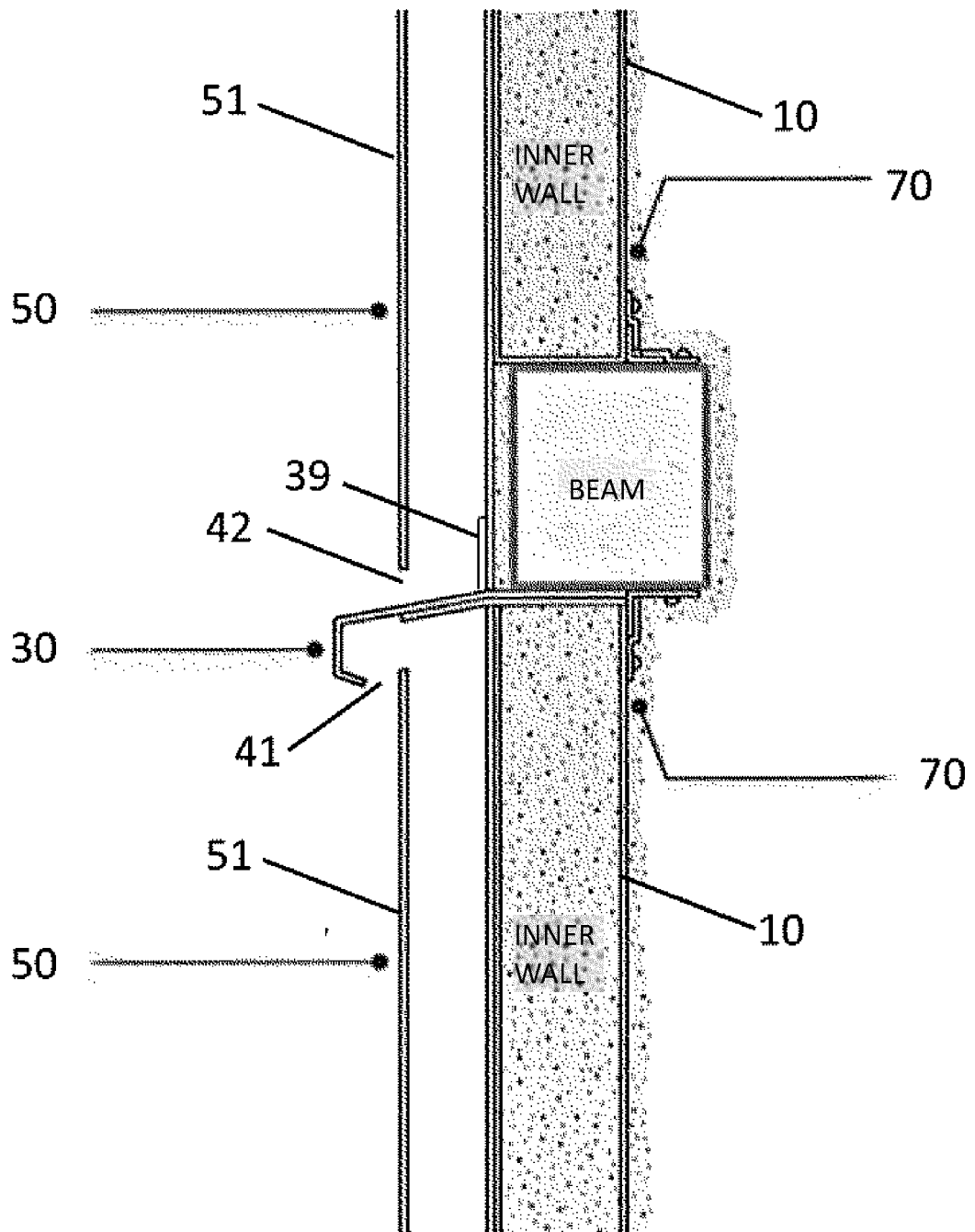


FIG. 21

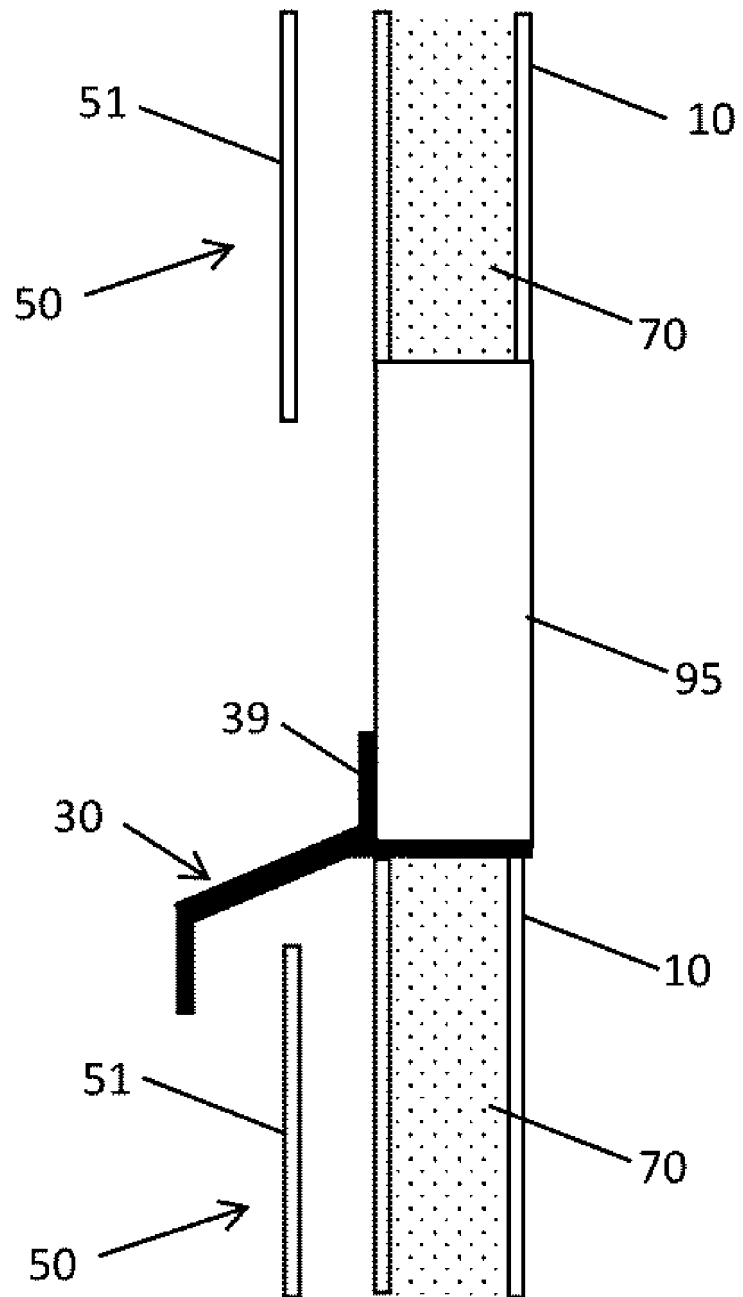


FIG. 22

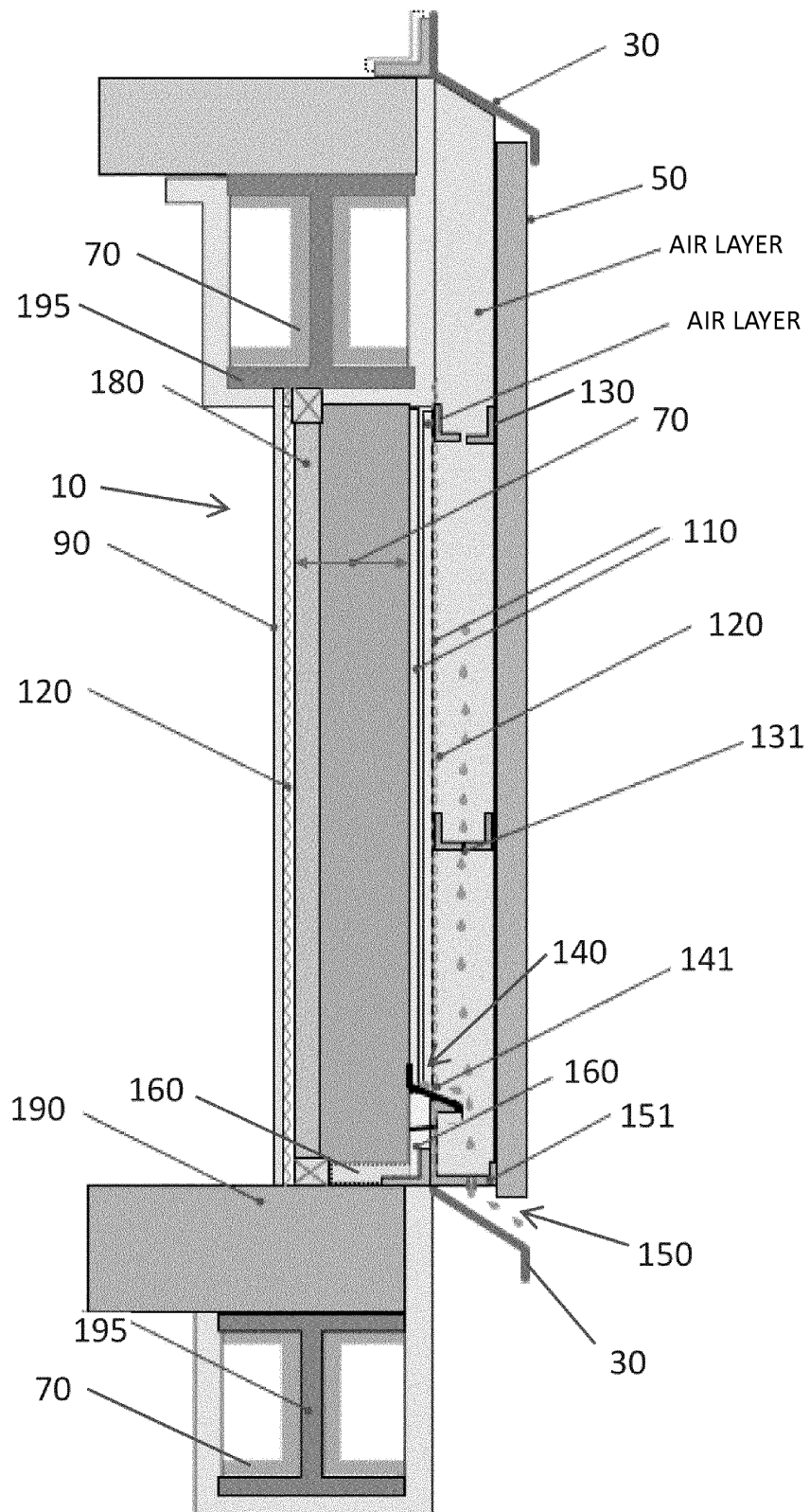
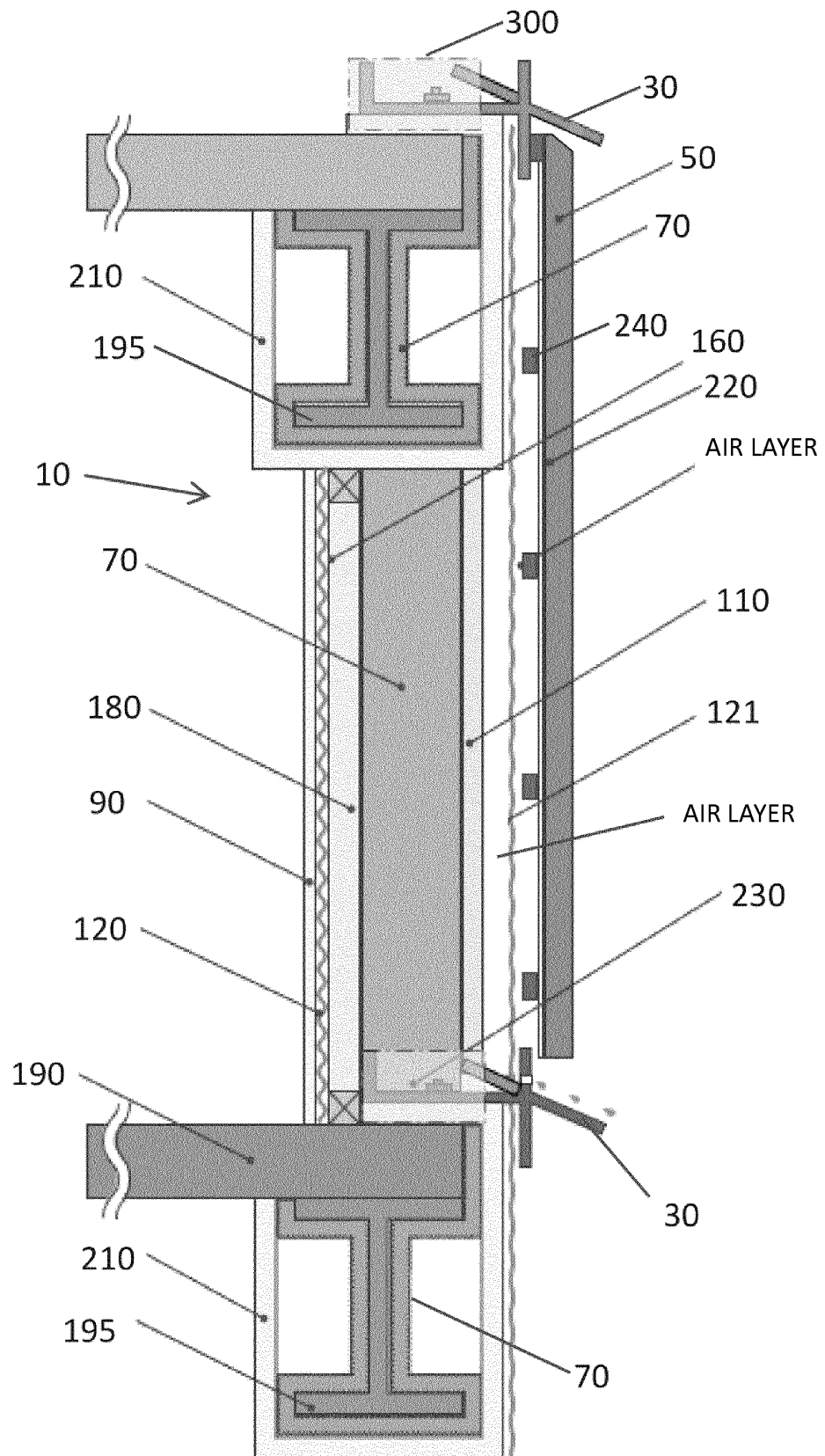


FIG. 23



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2019/010766

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. E04B1/70 (2006.01) i, E04B1/76 (2006.01) 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)

Int. Cl. E04B1/70, E04B1/76

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

Published examined utility model applications of Japan 1922-1996

Published unexamined utility model applications of Japan 1971-2019

Registered utility model specifications of Japan 1996-2019

Published registered utility model applications of Japan 1994-2019

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2010-255194 A (TESUKU KK) 11 November 2010, paragraphs [0042]-[0050], fig. 1-8 (Family: none)	1-3, 6-10, 12, 14-15
Y		4-5, 11, 13
Y	JP 2008-31686 A (TESUKU KK) 14 February 2008, claims 1-10, fig. 1-10 & CN 101113606 A	4-5, 11, 13



Further documents are listed in the continuation of Box C.



See patent family annex.

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"I"

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

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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

14.05.2019

Date of mailing of the international search report

21.05.2019

Name and mailing address of the ISA/

Japan Patent Office

3-4-3, Kasumigaseki, Chiyoda-ku,

Tokyo 100-8915, Japan

Authorized officer

Telephone No.

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2011202439 A [0003]