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CURTAIN WALL UNIT FRAME

BACKGROUND OF THE INVENTION

5 1.FIELD OF THE INVENTION

The present invention relates to a curtain wall unit for constructing a curtain wall skin of a building.

10 2.DESCRPTION OF RELATED ART

A prefabricated curtain wall unit is often used as a curtain wall component for external facing of a building on account of advantages such as improvement in workability at construction site.

As shown in Fig. 10, a curtain wall unit 1 has a frame 4 composed of frame members extending vertically and horizontally (a vertical frame member 2 and a horizontal frame member 3) and an external facing member 5 held at an inside of the frame (such as glass plate and wall surface panel). The external facing members 5 are disposed vertically and horizontally by the frame 4 to constitute an exterior wall 6 of a building.

Incidentally, appearance of the curtain wall unit as the exterior wall is changed by covering outdoor side of the frame exposed to borders of the exterior facing material with a decorative panel for decorative purpose (e.g. Japanese Patent Application Laid-Open Publication No. Sho 56-25540).

However, when an independent decorative panel is attached to the frame for decoration, the decorative panel has to be superposed to the surface of the frame, which resulted in structural or spatial problems such as interference against adjacent beam and mullion and complication of connection.

Further, various members such as glass, metal panel, inorganic material panel can be used for the exterior facing material held to the frame, the members having different thickness and end configuration. Alternatively, the exterior facing material may be an openable window as well as fixed facing. In accordance with the type of the exterior facing material and required property such as openable and fixed structure, a large number of variations are required for the frame. Accordingly, the same frame member cannot be used and parts type increases in accordance with combination of the various differences (e.g. glass and aluminum panel use mutually different parts for the same openable facing).

On the other hand, the frame has been conventionally constructed by a pair of base member jointed in back-to-back manner. Such joint type frame has a joint seal on the outdoor side of the frame for preventing invasion of rainwater etc. Such joint seal is not preferable in its appearance. Further, since conventional joint seal is wet type, the joint seal can be discolored and cracked by sunlight.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a curtain wall unit frame capable of obtaining design effect superior in appearance and being suitable for various exterior facing materials with fewer parts types.

In the present invention, a bulging portion continuously bulging from a portion where the exterior facing material such as glass and panel are held to the outdoor side is formed to the base member of the frame, and design effect is applied to the frame itself by applying decorativeness to the bulging portion. Accordingly, no independent decorative panel is required and complication of structure accompanied by the decorative panel can be prevented.

The bulging portion forms a regular pattern on a surface of the exterior wall surface of a building with the base member of the frame being adjacent in vertical and horizontal direction. And shadow is cast over the surface of the exterior facing material by natural light, thus obtaining appearance decorative effect.

Further, the holder is independent from the base member of the frame and the holder is adapted to the various exterior facing material, the base member can be selected in accordance with basic performance as a frame and the holder suitable for the exterior facing material can be selected and combined to the base member, thus avoiding increase in parts type.

Specifically, the present invention is a frame having assembled vertical frame member and horizontal frame member for holding a curtain wall unit by holding an external facing member at an inner circumference thereof, the frame further including: a base member for constituting the vertical frame member and the horizontal frame member; a holder formed at an intermediate portion in depth direction of an inner circumference of the base member; and a bulging portion continuously bulging toward outdoor side of the base member, where the base member, the holder and the bulging portion extend continuously along a periphery of the external facing member; and where the holder is independent from the base member and the bulging portion.

In the above arrangement, the holder preferably fixedly holds the external facing member, or alternatively, the holder preferably holds an openable external facing member.

5 In the above arrangement, a hollow portion having box-shape cross section may preferably be formed between the holder and the base member when the holder and the base member are connected, the hollow member also extending along the periphery of the external facing member.

Another object of the present invention is to provide a curtain wall unit frame capable of obtaining superior appearance design effect and further
10 capable of protecting joint seal.

In another aspect of the present invention, the aforesaid bulging portion obtains the design effect and a cover member is disposed between the bulging portions to cover the joint seal.

Specifically, the present invention is a frame having assembled vertical
15 frame member and horizontal frame member for holding a curtain wall unit by holding an external facing member at an inner circumference thereof, the frame including: a base member for constituting the vertical frame member and the horizontal frame member; a holder formed at an intermediate portion in depth direction of an inner circumference of the base member; and a bulging portion
20 continuously bulging toward outdoor side of the base member, where the base member, the holder and the bulging portion extend continuously along a periphery of the external facing member; and where the base member composes the vertical frame member and the horizontal frame member by being connected to the other base member in back-to-back manner, the
25 back-to-back connected pair of base member having a cover member between the respective bulging portions on the outdoor side thereof.

In the above arrangement, a dry seal member may preferably be press-fitted between the respective bulging portions on the outdoor side of the back-to-back connected pair of base member, the cover member being
30 attached to the dry seal member.

Accordingly, conventional wet type seal process can be eliminated to improve workability, and the cover member can also be attached, thus simplifying structure of the frame.

In the above arrangement, the base member may preferably include a
35 reinforcing rib having either L-shape cross section or T-shape cross section continuous in respective longitudinal direction on a side being connected to the other base member.

Accordingly, deformation of the base member, especially flexure deformation likely to be generated at intermediate portions of vertical and horizontal side of the external facing member can be avoided, thus preventing detachment of the cover member or loosening of the dry seal member on account of deformation of respective back-to-back base members.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an enlarged cross section showing primary portion of first embodiment of the present invention;

Fig. 2 is an exploded view showing primary portion of the first embodiment;

Fig. 3 is an enlarged cross section of the first embodiment applied to a corner portion;

Fig. 4 is an exploded view of the first embodiment applied to the corner portion;

Fig. 5 is an enlarged cross section showing primary portion of second embodiment of the present invention;

Fig. 6 is an exploded view showing primary portion of the second embodiment;

Fig. 7 is an enlarged cross section showing primary portion of third embodiment;

Fig. 8 is an exploded view showing primary portion of the third embodiment;

Fig. 9 is an enlarged cross section of the third embodiment applied to a corner portion; and

Fig. 10 is a front elevation showing a related art of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT(S)

[First Embodiment]

First embodiment of the present invention will be described below with reference to Figs. 1 to 4.

The present embodiment has the same basic arrangement as the curtain wall unit 1 shown in Fig. 10. Specifically, the present embodiment has a frame 4 composed of frame members (vertical frame member 2 and horizontal frame member 3) extending vertically and horizontally and exterior surface material 5 (such as glass plate and wall surface panel) held at inner periphery

of the frame.

In Fig. 1, outer periphery of the curtain wall unit 1 is fixed to inner periphery of a building 7. The frame 4 (vertical frame member 2 and horizontal frame member 3) constituting the curtain wall unit 1 is constructed
5 mainly by a base member 10.

As shown in Fig. 2, a pair of the base member 10 is disposed back-to-back manner to form the frame 4. The respective base member 10 is a flat plate formed by extrusion-molding of aluminum alloy having L-shaped cross section, and reinforcing ribs 108 and 109 having T-shaped or L-shaped
10 cross section are continuously formed in longitudinal direction on one surface of the base member 10.

The base member 10 is connected with a joint 30 with the side having the reinforcing ribs 108 and 109 being opposed therewith. A holder 20 for holding the external facing member 5 is attached to a side opposite to the joint
15 30 of the respective base member 10.

In the present embodiment, a pair glass 51 is used as the external facing member 5. Holding members 21 and 22 are used for the holder 20 corresponding to the pair glass 51. Further, joint members 31 and 32 are used as the joint 30.

A bulging portion 19 bulging continuously from an attachment surface of the holder 20 over the connecting portion of the joint member 32 is respectively formed to the outdoor side end of the base member 10. Dry seal member 41 and a cover member 42 are disposed between the respective
20 bulging portions 19 to cover the connecting portion of the joint member 32.

A recess 211 on indoor side end of the holding member 21 is fitted to a protrusion 101 of the base member 10 and an intermediate portion thereof is clamped by a screw 213 to the base member 10, so that the holding member 21 is fixed to the base member 10 at two locations. The holding member and the base member 10 form a box hollow portion 18.
25

Two rows of hook 221 on indoor side end of the holding member 22 are engageable to two rows of hook 214 of the holding member 21. By the engagement, the holding member 22 is stopped relative to the holding member 21 not to be separated toward the outdoor side.
30

The pair glass 51 is disposed between the holding member 21 and the holding member 22 prior to attaching the holding member 22, so that the pair glass 51 is sandwiched between an elastic member 215 of the holding member 21 and an elastic member 222 of the holding member 22.
35

In accordance with the pair glass being sandwiched, counterforce is generated to the respective elastic members 215 and 222, so that the holding member 22 is pressed to the outdoor side. The engagement by the two rows of hooks 221 and 214 is effected by the press. Accordingly, the holding member 21, the pair glass 51 and the holding member 22 are fixed together, thus fixedly holding the pair glass 51 as the external facing member 5.

Incidentally, the holding members 21 and 22 are also elongated member made by extrusion-molding of aluminum alloy.

An end of the joint member 31 is fitted to a recess 102 of one base member 10 (left in Fig. 2) and the other end of the joint member 31 is clamped to the other base member 10 (right in Fig. 2) by a screw 312. Accordingly, indoor side of the pair of base member 10 is mutually connected.

A protrusion 321 on one end and intermediate protrusion 322 of the joint member 31 are respectively fitted to a recess 103 and 104 of one base member 10 (left in Fig. 2), and a protrusion 323 on the other end is fitted to a recess 104 of the base member 10 (right in Fig. 2). Further, an auxiliary member 324 is disposed along the protrusion 323 and is fixed by being clamped by a screw 325. At this time, rib 105 of the respective base member 10 is sandwiched between the auxiliary member 324 and the joint member 32. The outdoor side of the pair of base member 10 is mutually jointed by the fitting of the recess and the protrusion and by being sandwiched by the rib 105.

The joint members 31 and 32 may preferably be elongated members made of extrusion-molding of aluminum alloy, or alternatively, may be pieces disposed at a predetermined interval. Further alternatively, the joint members 31 and 32 may be made of other material such as stainless steel alloy and plastic molding.

The dry seal member 41 is made of elastomeric material such as rubber and has a sawtooth portion 411 on both sides thereof. Distance between pointed ends of the sawtooth portion 411 on both sides is sufficiently larger than interval between portions adjacent to outdoor side ends of the rib 105 when a pair of the base member 10 is connected. Accordingly, the dry seal member 41 is press-fitted to the portion from the outdoor side to be stopped by frictional force.

The cover member 42 is an elongated member made by extrusion-molding of aluminum alloy, which includes a flat exterior portion 421 and an insert portion 422 formed at the back of the exterior portion 421.

The insert portion 422 has an arrowhead shape at a pointed end thereof, which is inserted to be held by a slit 412 formed at the center of the dry seal member 41. Accordingly, the cover member 42 is attached between the pair of bulging portion 19.

5 The exterior portion 421 is exposed between the pair of bulging portion 19 to affect the appearance of the frame 4. The surface of the exterior portion 421 may be direct surface of the aluminum alloy as in the base member 10 and the holding members 21 and 22 (other exposed portions), or alternatively, may be painted in a specific color or may be attached with a
10 sheet of a predetermined material.

 The base member 10, the hollow portion 18, the bulging portion 19, the holder 20, the dry seal member 41 and the cover member 42 continuously surround the entire periphery of the respective exterior surface members 5, i.e. the pair glass 51.

15 According to the present embodiment, following effects can be obtained.

 The bulging portion 19 casts regular pattern on the surface of the exterior wall of the building 7 by the vertically and horizontally adjacent base member 10 of the frame 4. Or alternatively, shadow is generated on the
20 surface of the external facing member 5 by natural light, thus obtaining appearance decorative effect.

 Further, disposition of the cover member 42 between the bulging portions 19 further ameliorates the appearance.

 On the other hand, since the holder 20 is independent from the base
25 member 10 and the holder 20 is collectively adapted to the external facing member 5, the holder 20 suitable for the exterior facing material 51 can be selected and used, thus avoiding increase in parts type. For instance, in the present embodiment, the holding members 21 and 22 are selected for the fixed pair glass 51 and combined to the base member 10, so that the fixed pair glass
30 curtain wall unit 1 can be obtained.

 Since the hollow portion 18 having box-shape cross section is formed between the holder 20 and the base member 10 when the holder 20 and the base member 10 are connected with each other, the hollow portion 18 continuously extending along the periphery of the external facing member 5,
35 strength of the periphery of the exterior member 5 and curtain wall unit 1 can be secured.

 Since the dry seal member 41 is used, conventional wet seal process

can be eliminated, thus improving workability.

Since the cover member 42 is attached through the dry seal member 41, structure can be simplified.

Since the reinforcing ribs 108 and 109 having L-shaped or T-shaped cross section extending continuously in longitudinal direction is provided on a side of the base member 10 to be connected to the other base member 10, flexure deformation likely to generate at the intermediate portion can be avoided, thus preventing detachment of the cover member 41 and loosening of the dry seal member 42.

10 [Application of the First Embodiment to Corner Portion]

In the above-described first embodiment, a corner member 60 shown in Figs. 3 and 4 can be used in applying the curtain wall unit 1 to a corner portion of a building.

The corner member 60 is formed in a square pole shape, and the base member 10 is connected along adjacent two surfaces thereof. Accordingly, a pair of the base member 10 is mutually connected at a right angle and the pair glass 51 (the external facing member 5) is held orthogonally by the holding members 21 and 22 (the holder 20) attached to the respective base member 10.

The corner member 60 has an inner member 61 having Y-shaped cross section and an outer member 62 having W-shaped cross section, respectively being elongated member of aluminum alloy. A pair of end portion 611 being open in Y-shape is formed on the inner member 61. Ribs 621 are formed on two locations on bottom of W-shape of the outer member 62. The pair of end 611 is set along the corresponding ribs 621 and is mutually bonded by screws 612 at a predetermined interval, so that the inner member 61 and the outer member 62 are formed in hollow pipe having square cross section.

A pair of protrusion 613 is formed on a bottom of Y-shape of the inner member 61. The respective protrusions 613 correspond to the aforesaid protrusion 311 of the joint member 31 (see Fig. 2), respectively capable of being fitted to the recess 102 on indoor side of the base member 10. The pair of protrusion 613 is arranged orthogonal with each other in accordance with orthogonal arrangement of the base 10.

A bulging portion 69, a recess 624, a rib 625 are formed on both ends of the W-shape of the outer member 62 as the bulging portion 19, the recess 104 and the rib 105 of the base member 10 (see Fig. 2), which are connected to corresponding base member 10 through the aforesaid joint member 32.

The joint mechanism would be readily understood by replacing the base member 10 on the right side of Fig. 2 with the outer member 62 in the description of the joint member 32.

Further, the dry seal member 41 and the cover member 42 are disposed
 5 between the bulging portion 19 of the base member 10 and the bulging portion 69 of the outer member 62 disposed parallel with each other. Description for respective members is the same as those described so far, and is omitted here.

Using the above-described corner member 60, the arrangement of the first embodiment can be directly applied to the corner portion, thus enlarging
 10 application range.

Further, since the corner member 60 has a simple construction composed of the inner member 61 and the outer member 62, the corner member 60 can be utilized for the other external facing member 5 without increasing parts type by exchanging the base member 10 or the holder 20.
 15 [Second Embodiment]

Second embodiment of the present invention will be described with reference to Figs. 5 to 6.

In the present embodiment, a part of the external facing member 5 is openable in contrast to the external facing member 5 of the aforesaid first
 20 embodiment having fixed arrangement. Accordingly, different component is used for the holder 20 for adapting to the external facing member 5 different from the first embodiment.

In the present embodiment, the base member 10, the bulging portion 19, the joint 30, the dry seal member 41 and the cover member 42 are the
 25 same as the aforesaid first embodiment. Accordingly, description therefor is omitted and only parts different therefrom will be described below.

In the present embodiment, the pair glass 51 is used as the external facing member 5. The pair glass 51 at the center of Fig. 5 is fixed and the same holding members 21 and 22 as the aforesaid first embodiment are used
 30 as the holder for holding the pair glass 51. On the other hand, the pair glass 51 on both ends in Fig. 5 is openable and holding members 23, 24 and 25 are used as the holder 20.

The holding members 23, 24 and 25 are elongated members made by extrusion-molding of aluminum alloy.

35 The holding members 24 and 25 are attached to the periphery of the pair glass 51 and are corresponding to window sash frame, the holding members 24 and 25 being supported openably relative to the holding member

23 fixed to the base member 10. For instance, both upper sides of the holding member 24 are rotatably supported by the holding member 23, so that lower portion thereof can be rotated to protrude toward the outdoor side (in a condition shown in single-dotted line in Fig. 5) to be opened.

5 An indoor side recess 231 of the holding member 23 is fitted to the protrusion 101 of the base member 10 and outdoor side end 232 of the holding member 23 is clamped to the base member 10 by a screw 233, so that the holding member 23 is fixed to the base member 10 at two locations. The box hollow portion 18 is formed between the holding member 23 and the base
10 member 10 in the same manner as between the holding member 21 and the base member 10.

A packing 234 is attached to an indoor side end of the holding member 23 remote from the base member 10 and another packing 235 is attached to the outdoor side end. The packing 234 and 235 are continuous body made of
15 elastomer such as rubber, which abuts to the holding member 24 to secure sealability when the pair glass 51 is closed.

A hollow portion 241 extending orthogonally with the pair glass 51 is formed on the indoor side of the holding member 24 to secure strength as the aforesaid window sash frame. A step shape for receiving the pair glass 51 is
20 formed on the outdoor side of the holding member 24 and a plurality of row of packing 245 is attached to the step shape. The packing 245 is a continuous body made of elastomer such as rubber, which is in close contact with an end surface of the pair glass 51 (first row) and indoor side surface adjacent to the end (second row).

25 The holding member 25 has two rows of hook 251 engageable to two rows of hook 244 of the holding member 24. On account of the engagement, the holding member 25 is stopped so as not to separate from the holding member 24 toward outdoor side.

The pair glass 51 is disposed between the holding member 24 and the
30 holding member 25 prior to attaching the holding member 25, so that the pair glass 51 is sandwiched between an elastic member 245 of the holding member 24 and an elastic member 252 of the holding member 25. The holding members 24 and 25 are connected by thus sandwiching the pair glass 51 as in the above-mentioned description of the holding members 21 and 22, and
35 description thereof is omitted here.

The pair glass 51 is held by the holding members 24 and 25, and the holding members 24, 25 and the pair glass 51 constitute a window openable

relative to the holding member 23 and the base member 10.

According to the present embodiment, the same effect as in the above-described first embodiment can be obtained, and a part of the external facing member can be made into an openable window, thus satisfying request
5 for ventilation.

Further, though a part of the external facing member is fixed window and another part is openable window, the frame 4 such as the base member 10 and the joint 30 is common to both windows. Accordingly, different window type can be dealt with by switching the holder 20 between the holding
10 members 21, 22 (fixed type) and the holding members 23, 24 and 25 (openable type).

Accordingly, desired various curtain wall unit 1 can be manufactured with fewer parts type.

[Third Embodiment]

15 Third embodiment of the present invention will be described below with reference to Figs. 7 to 9.

The external facing member 5 of the present embodiment is a wall surface panel including heat and sound insulation member as opposed to the external facing member 5 of the aforesaid first embodiment made of
20 light-penetrating glass material. For the object, the present embodiment uses different component as the holder 20 for the external facing member 5 different from the first embodiment.

In the present embodiment, the base member 10, the bulging portion 19, the joint 30, the dry seal member 41 and the cover member 42 are the
25 same as in the aforesaid first embodiment. Accordingly, description therefor will not be reiterated and only different components will be described below.

A wall surface panel 52 is used as the external facing member 5 in the present embodiment. A glass wool 53 for securing sound and heat insulation is attached to a backside of the wall surface panel 52. Further, an inner panel
30 54 is attached to indoor side. The wall surface panel 52 and the inner panel 54 are respectively made of facing of aluminum alloy or laminated material having surface material with various textures formed thereon etc.

A holding member 26 is used as the holder 20 for holding the wall surface panel 52, the glass wool 53, and the inner panel 54.

35 A protrusion 261 on indoor side end of the holding member 26 is fitted to the recess 101 of the base member 10. A rib 262 extending toward the base member 10 is provided at the center of the holding member 26, and a

pointed end of the rib 262 extends along the base member 10 to be clamped to the base member 10 by a screw 263. Accordingly, the holding member 26 is fixed to the base member 10 at two locations. The holding member 26 and the base member 10 form a box hollow portion 18.

5 A rib 264 extending toward the base member 10 is provided at an outdoor side end of the holding member 26. A pointed end of the rib 264 abuts to a side of the bulging portion 19 of the base member when the holding member 26 is fixed to the base member 10.

A rib 265 extending toward opposite side of the base member 10 is formed adjacent to the indoor side end of the holding member 26 and another rib 266 is formed adjacent to the outdoor side end of the holding member 26.

The wall surface panel 52 is fixed from the outdoor side with a periphery thereof being in contact with the rib 264 of the holding member 26. A joint 267 which is so-called a "structure seal" of, for instance, silicon rubber type is attached to the outdoor side of the rib 266, thus securing adhesion and desired sealing property.

The glass wool 53 is fixed to the panel 52 from the indoor side.

The inner panel 54 is fixed to the rib 265 from the indoor side.

According to the present embodiment, the same effect as the aforesaid first embodiment can be obtained, and, furthermore, the wall surface panel 52 etc. can be used as the exterior surface member 5 instead of the light-penetrating glass facing material, thus easily obtaining different design effect.

Further, by providing the glass wool along the wall surface panel 52, sound and heat insulation property required for the exterior wall surface can be secured.

Further, the frame 4 portion is common in spite of change in arrangement in accordance with design and functional requirement, different window type can be achieved by switching the holding members 21 and 22 of the holder 20 into the holding member 26.

Accordingly, desired various types of curtain wall unit 1 can be manufactured with fewer parts type.

[Application of the Third Embodiment to Corner Portion]

When the curtain wall unit 1 of the above-described third embodiment is disposed to a corner portion of a building, a corner member 60 can be used as shown in Fig. 9.

In Fig. 9, the wall surface panel 52, the glass wool 53, the inner panel

54 of the component of the third embodiment is held to the base member 10 through the holding member 26. Pair of the respective panels and the base member 10 are orthogonally disposed to form the corner portion. The corner member 60 is used for connecting the pair of the base member 10 at the corner
5 portion.

The corner member 60 is the same as the one previously described in the application of the corner portion in the first embodiment (see Fig. 3 and 4). In other words, the difference between the third and the first embodiment is the external facing member 5 and the holder 20 corresponding thereto, and the
10 base member 10 is completely the same. Accordingly, it would be readily understood that the same corner member 60 can be commonly used for the same base member 10.

By utilizing the corner member 60, the same arrangement as the third embodiment can be applied to the corner portion, thus enlarging applicability.

15 Further, since the corner member 60 has a simple arrangement composed of the inner member 61 and the outer member 62, the corner member 60 can be used to the other external facing member 5 by exchanging the base member 10 or the holder 20, thus not increasing the parts type.
[Modifications]

20 Incidentally, the scope of the present invention is not restricted to the above-described embodiments, but includes modifications etc. as long as an object of the present invention can be achieved.

The base member 10, the holder 20, the joint 30, the cover member 42, the corner member 60 etc. are not restricted to the extrusion molding material
25 made of aluminum but may be made of other material such as stainless steel and by plate bending process as long as required function of respective components can be achieved.

Further, any desirable elastomer material such as rubber may be used for the dry seal member 41, other seal member and packing, which can be
30 determined in accordance with the material used for the other components.

In the aforesaid embodiment, an arrangement made up of the base member 10, the bulging portion 19 and the holder 20 of the present invention is applied to both the vertical frame member 2 and the horizontal frame member 3 of the frame 4. However, the arrangement of the present invention
35 may be applied partially and/or to either one of the vertical frame member 2 and the horizontal frame member 3.

The dry seal member 42, the reinforcing ribs 108 and 109, and the

hollow portion 18 are auxiliary arrangement of the present invention, which can be employed in accordance with the requirement in implementation.

In applying the aforesaid embodiments to the corner portion, it is not necessary to connect the inner member 61 and the outer member 62 to form
5 the hollow pole. The hollow portion may be formed on the either one of or both of the inner and the outer members 61 and 62 in advance.



WHAT IS CLAIMED IS:

1. A frame having assembled vertical frame member and horizontal frame member for holding a curtain wall unit by holding an external facing member at an inner circumference thereof, comprising:
 - a base member for constituting the vertical frame member and the horizontal frame member;
 - a holder formed at an intermediate portion in depth direction of an inner circumference of the base member; and
 - a bulging portion continuously bulging toward outdoor side of the base member,
 - wherein the base member, the holder and the bulging portion extend continuously along a periphery of the external facing member; and
 - wherein the holder is independent from the base member and the bulging portion.
2. The curtain wall unit frame according to Claim 1, wherein the holder fixedly holds the external facing member.
3. The curtain wall unit frame according to Claim 1, wherein the holder holds an openable external facing member.
4. The curtain wall unit frame according to any one of Claims 1 to 3, wherein a hollow portion having box-shape cross section is formed between the holder and the base member when the holder and the base member are connected, the hollow member also extending along the periphery of the external facing member.
5. A frame having assembled vertical frame member and horizontal frame member for holding a curtain wall unit by holding an external facing member at an inner circumference thereof, comprising:
 - a base member for constituting the vertical frame member and the horizontal frame member;
 - a holder formed at an intermediate portion in depth direction of an inner circumference of the base member; and
 - a bulging portion continuously bulging toward outdoor side of the base member,



wherein the base member, the holder and the bulging portion extend continuously along a periphery of the external facing member; and

5 wherein the base member composes the vertical frame member and the horizontal frame member by being connected to the other base member in back-to-back manner, the back-to-back connected pair of base member having a cover member between the respective bulging portions on the outdoor side thereof.

6. The curtain wall unit frame according to Claim 5, wherein a dry seal
10 member is press-fitted between the respective bulging portions on the outdoor side of the back-to-back connected pair of base member, the cover member being attached to the dry seal member.

7. The curtain wall unit frame according to Claim 5 or 6, wherein the
15 base member includes a reinforcing rib having either L-shape cross section or T-shape cross section continuous in respective longitudinal direction on a side being connected to the other base member.

ABSTRACT

5 A frame 4 being assembled by a vertical frame member 2 and horizontal frame member 3 for holding a curtain wall unit 1 by holding an external facing member at an inner circumference thereof is provided, where a base member 10, a holder 20 and a bulging portion 19 of the frame 4 continuously extend along periphery of the external facing member.

The holder 20 is independent from the base member 10 and the bulging portion 19, and is adapted to a fixed and openable external facing member 5.

10 The base member 10 constitutes the vertical frame member and the horizontal frame member by being connected with the other base member in back-to-back manner. A cover member 42 is attached to an outdoor side of a pair of back-to-back connected base member between respective bulging portions.

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REPLACED

FIG. 1

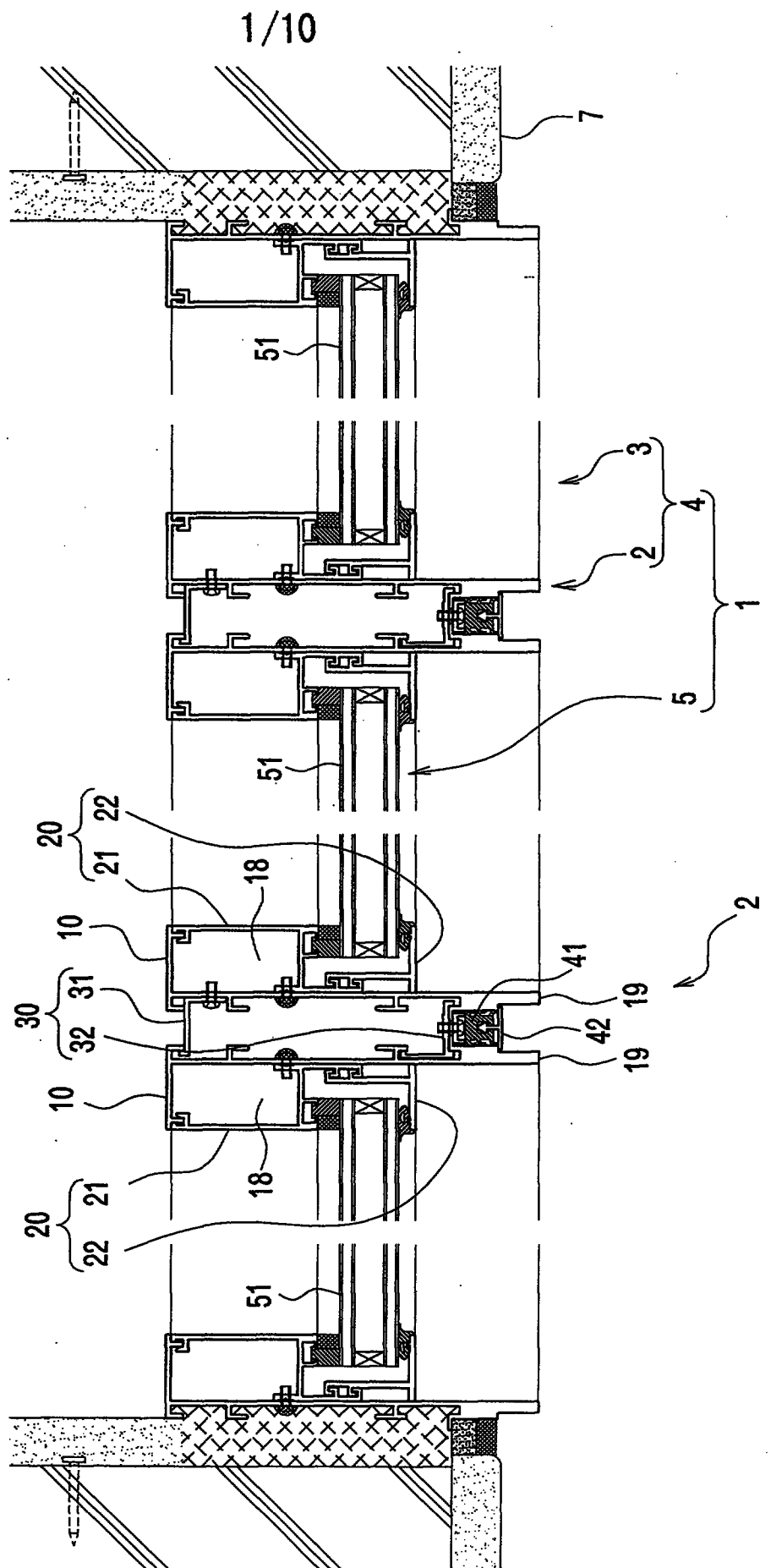


FIG. 2

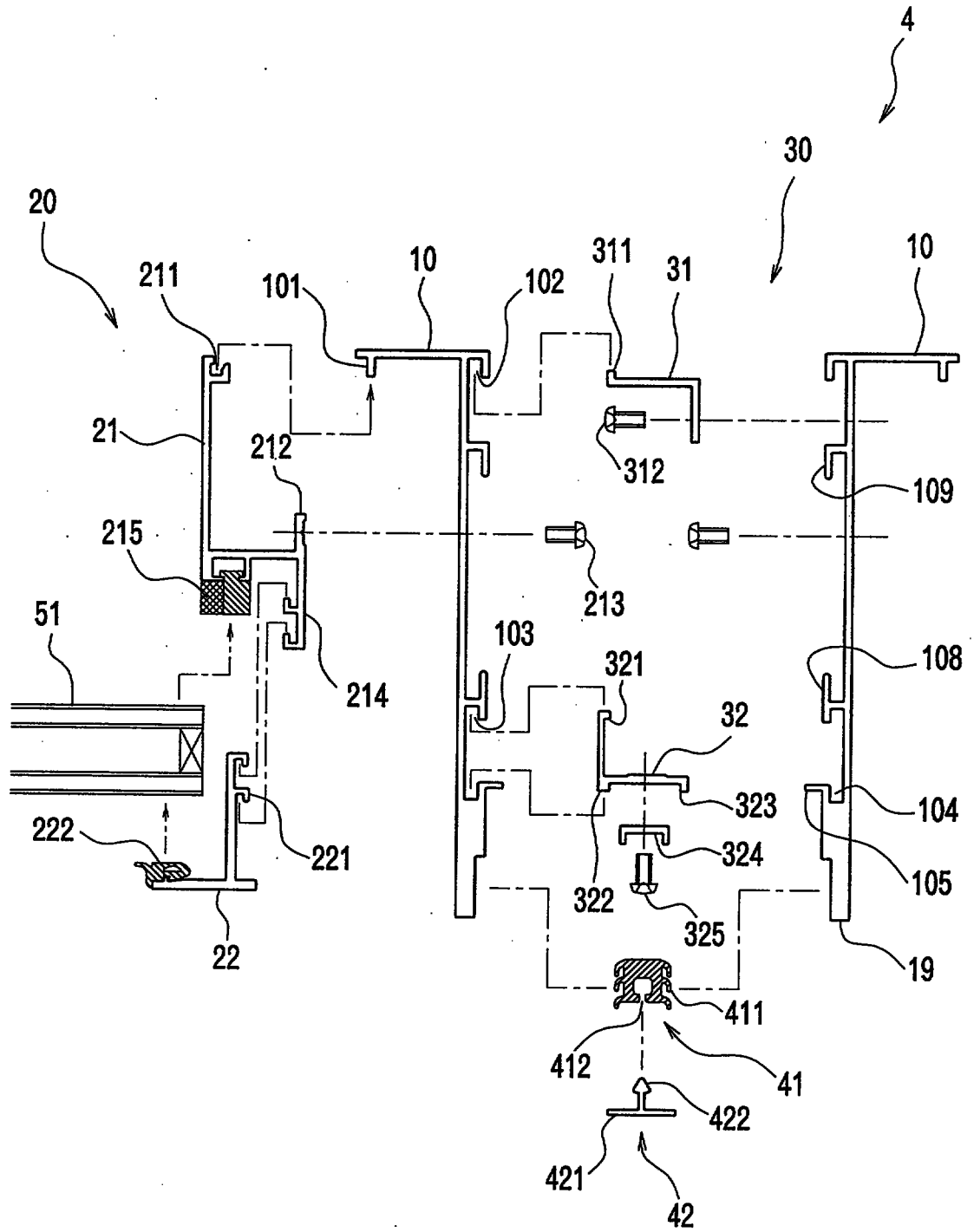


FIG. 3

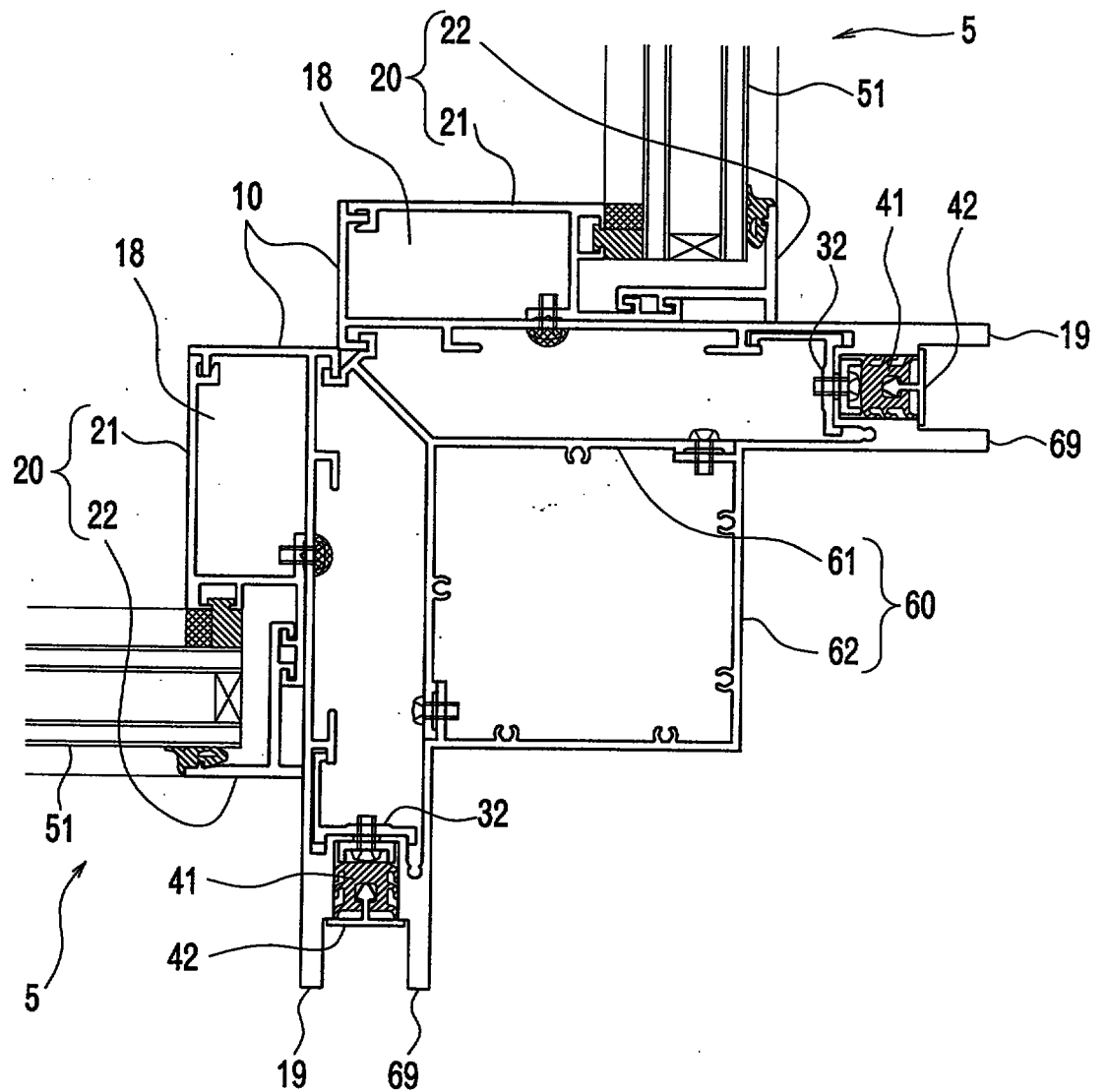


FIG. 4

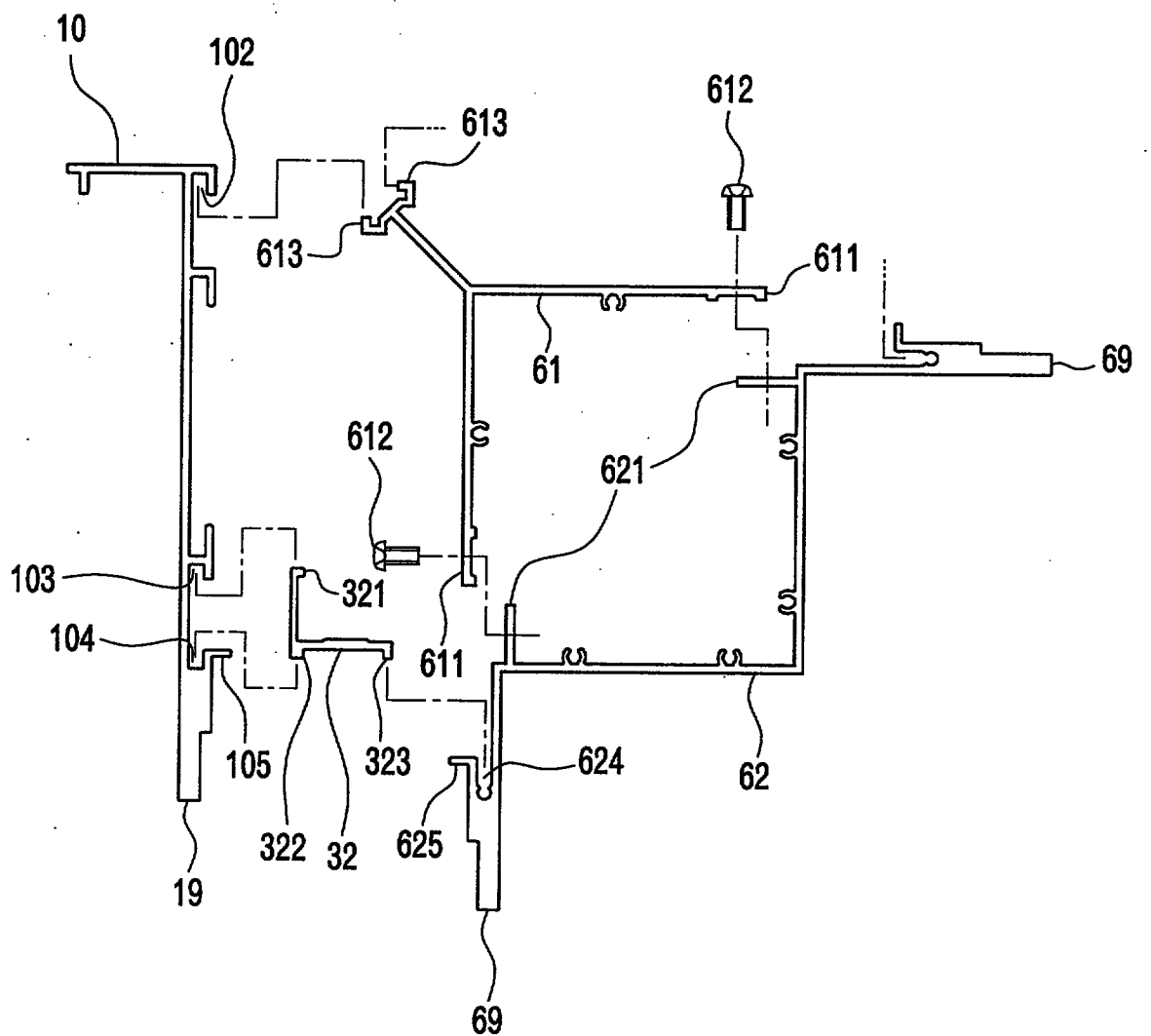


FIG. 5

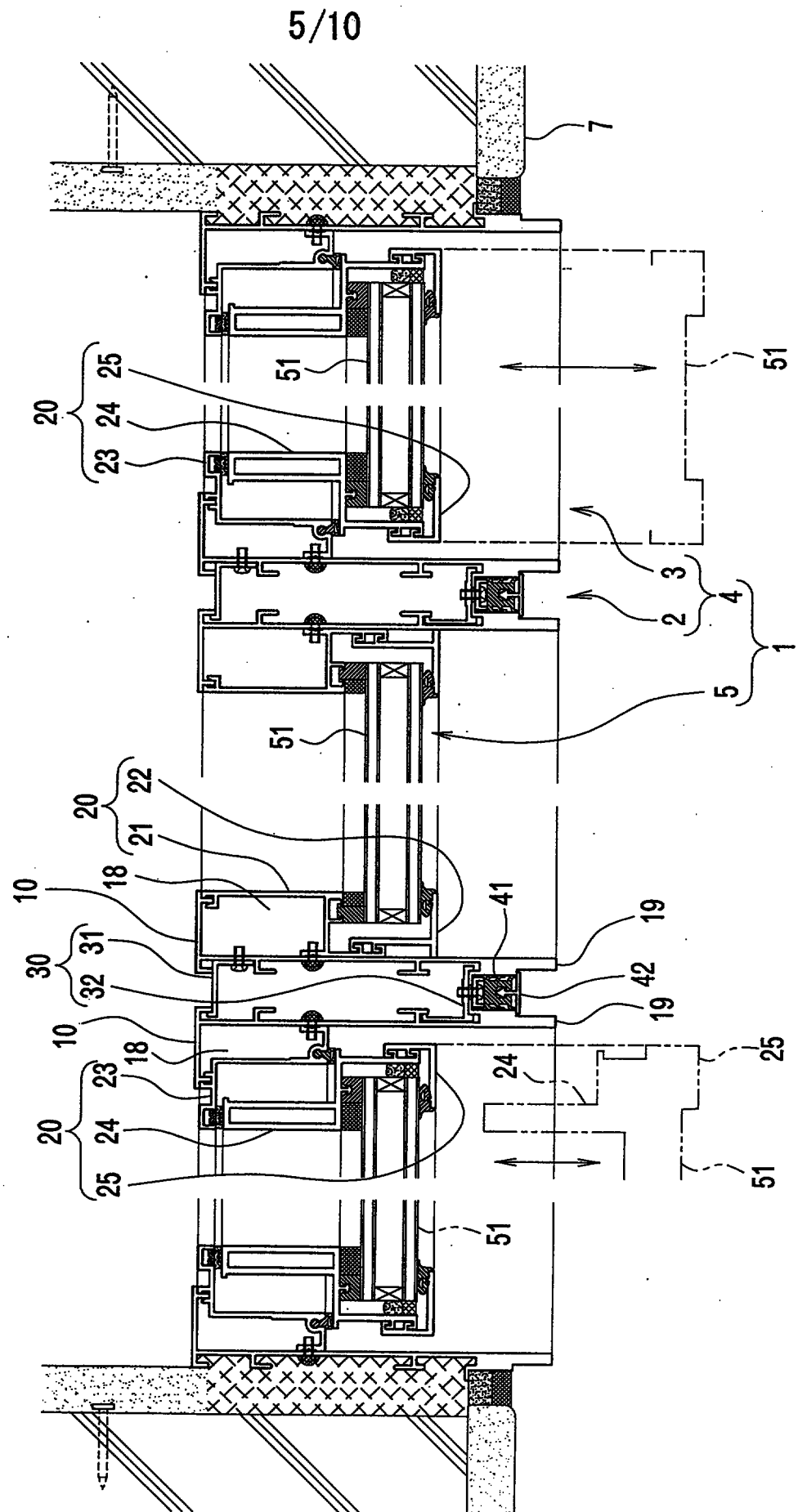


FIG. 6

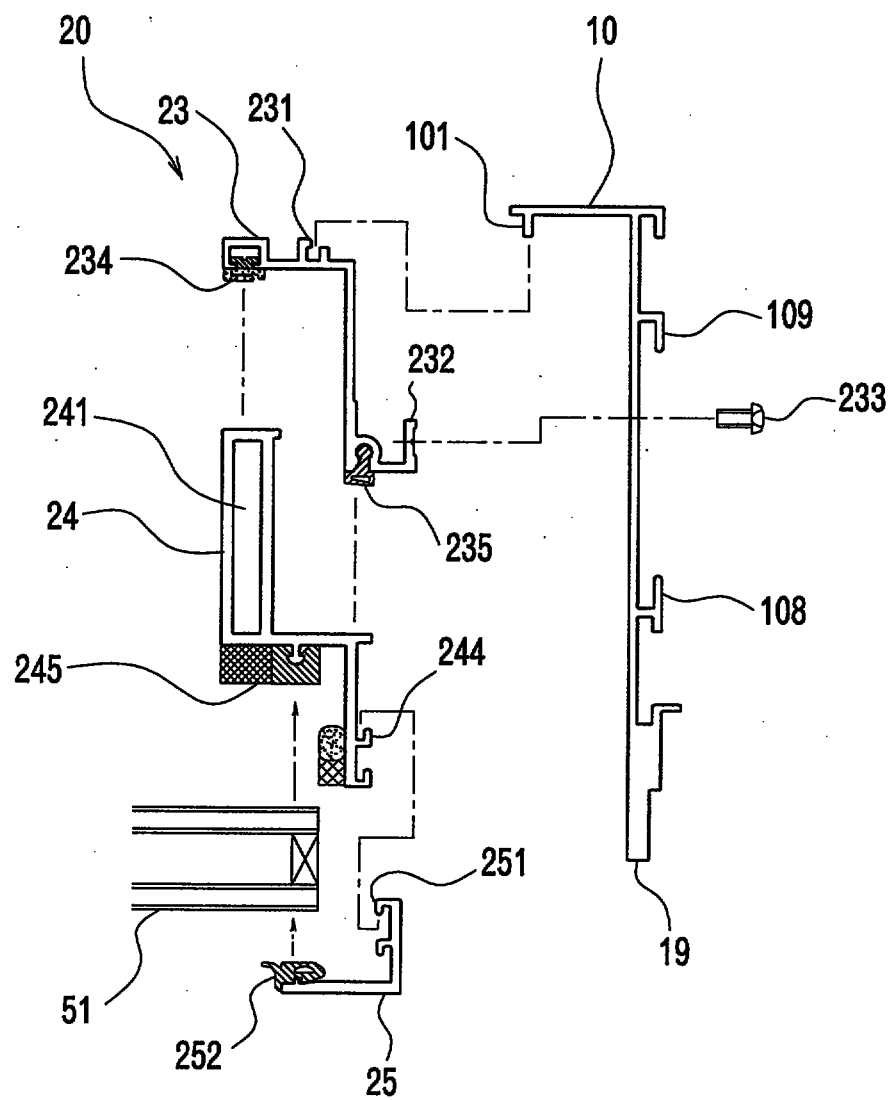


FIG. 7

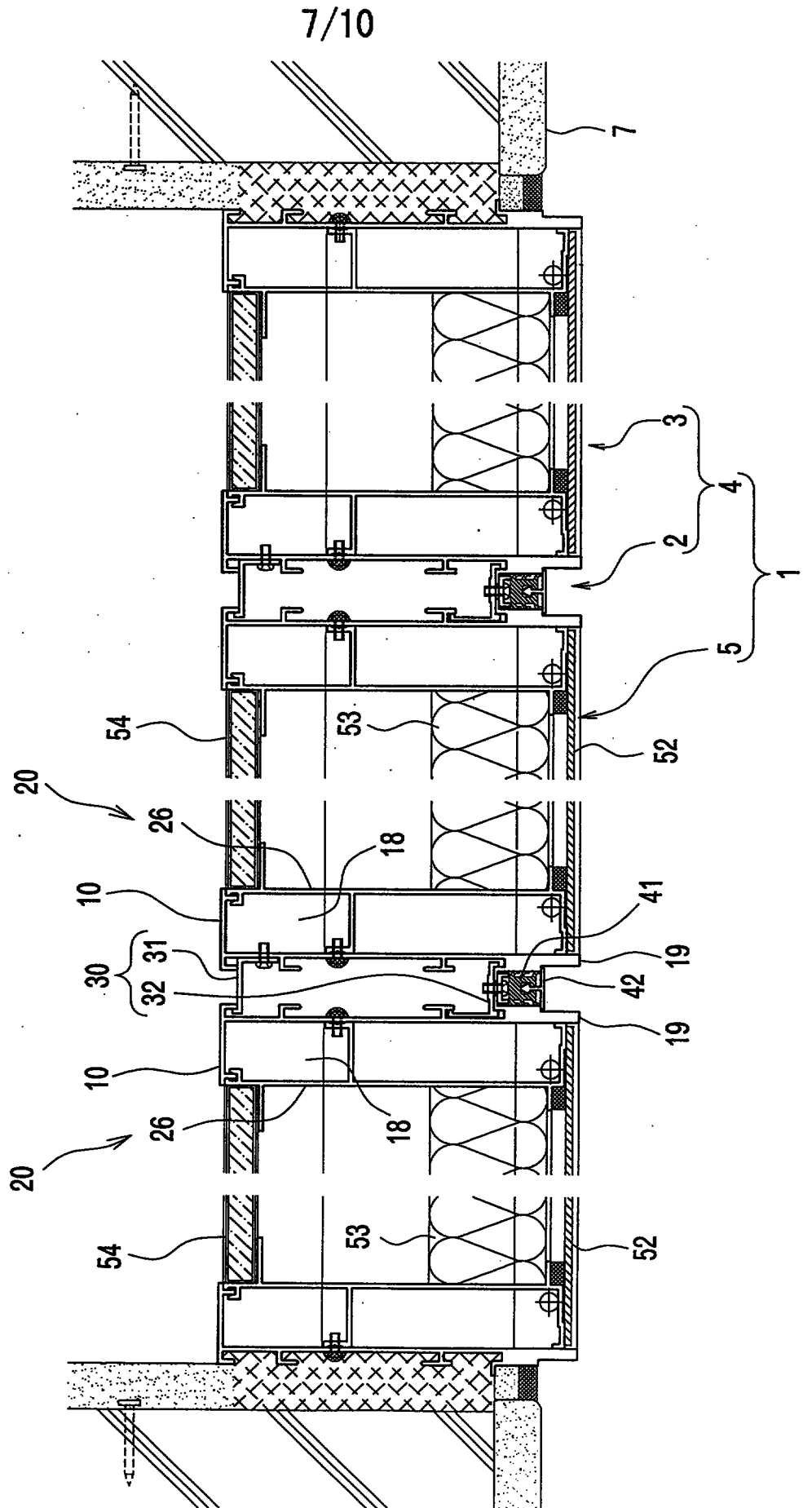


FIG. 8

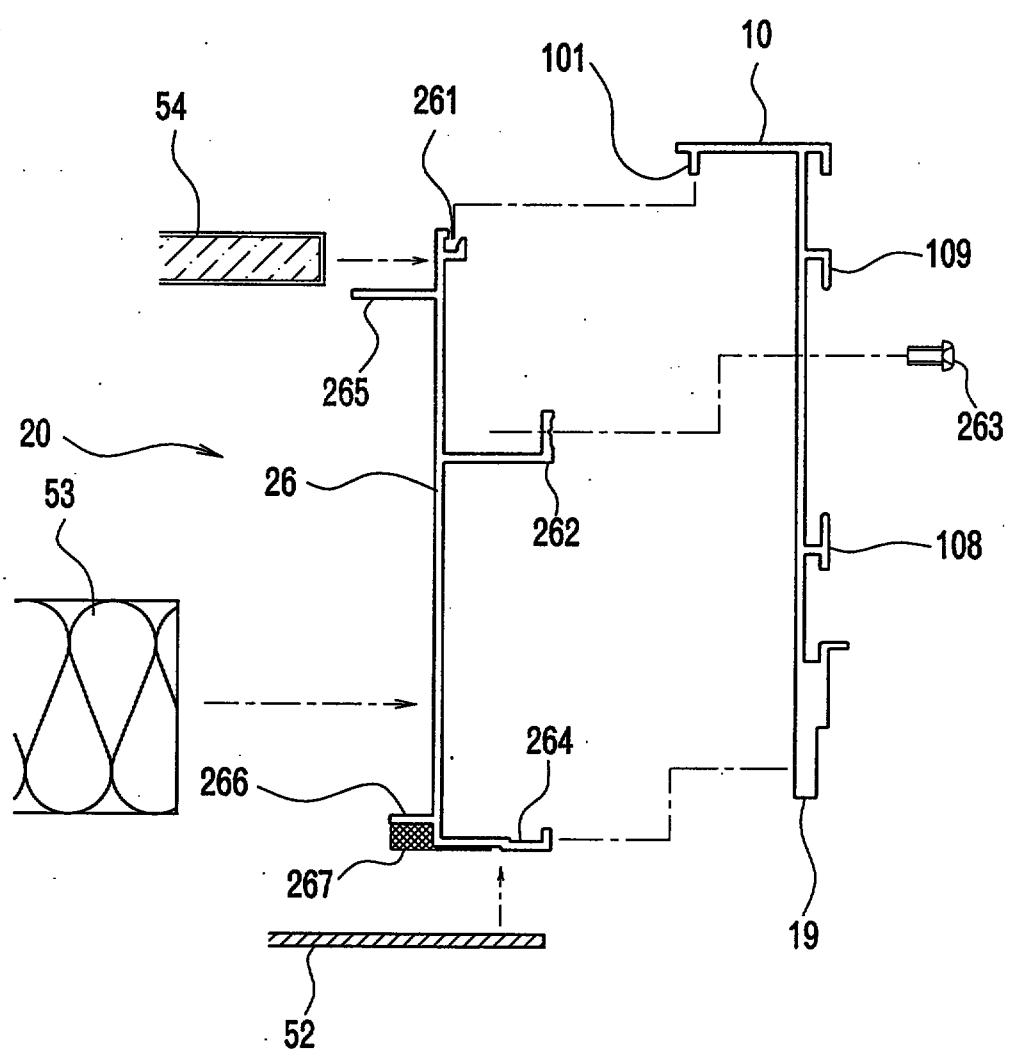
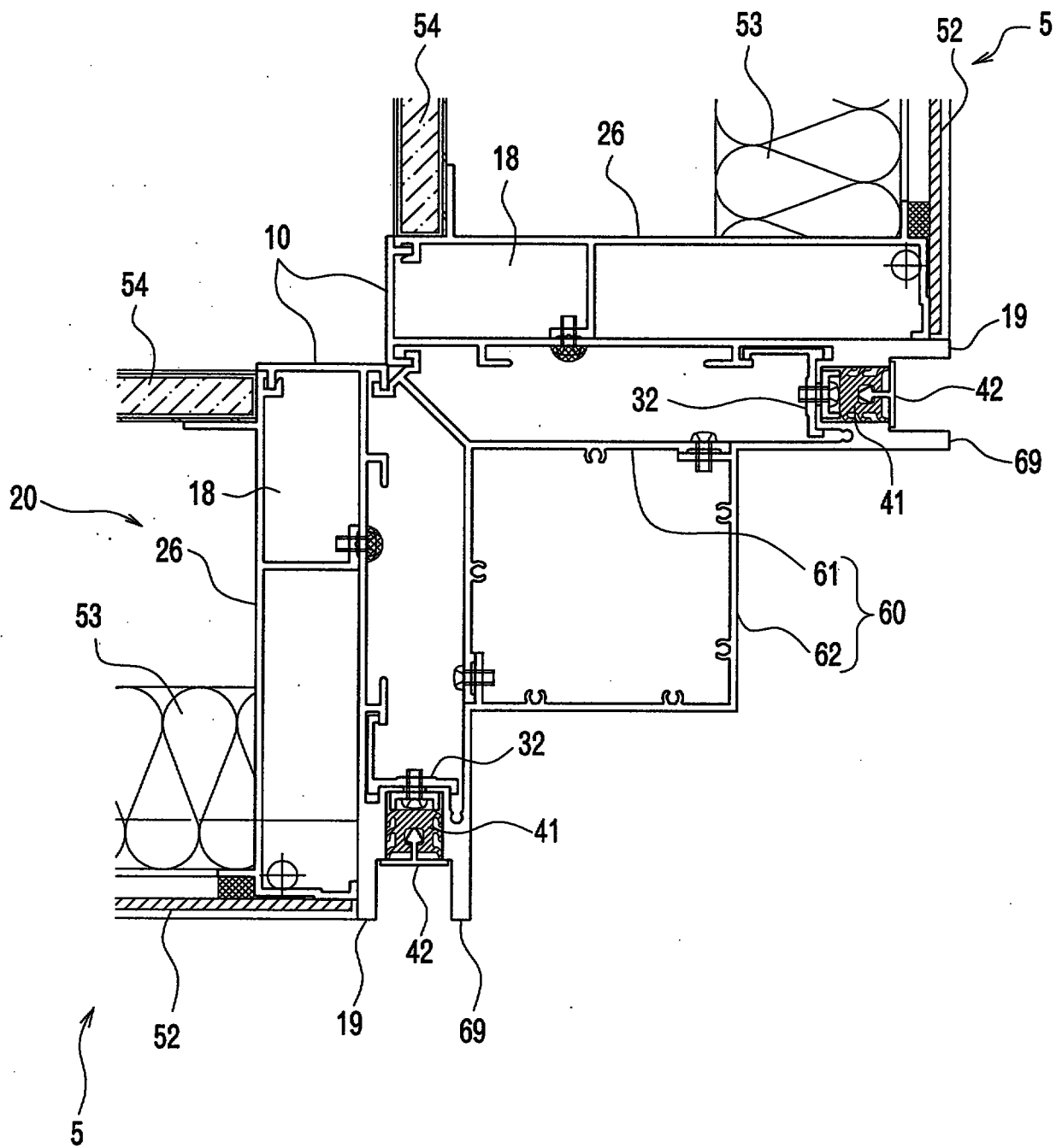


FIG. 9



CURTAIN WALL UNIT FRAME

ABSTRACT

A frame 4 being assembled by a vertical frame member 2 and horizontal frame member 3 for holding a curtain wall unit 1 by holding an external facing member at an inner circumference thereof is provided, where a
5 base member 10, a holder 20 and a bulging portion 19 of the frame 4 continuously extend along periphery of the external facing member.

The holder 20 is independent from the base member 10 and the bulging portion 19, and is adapted to a fixed and openable external facing member 5.

10 The base member 10 constitutes the vertical frame member and the horizontal frame member by being connected with the other base member in back-to-back manner. A cover member 42 is attached to an outdoor side of a pair of back-to-back connected base member between respective bulging portions.

Figure 1

