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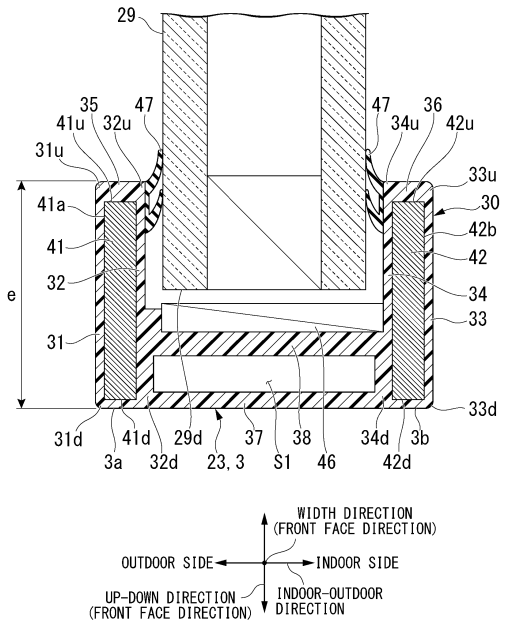
(54) SLIDING DOOR AND FITTINGS

(57) A sliding sash includes a stile body formed in a square frame shape, wherein the stile body includes a resin member formed from resin; and a core member enclosed in the resin member, the core member being integrally configured with the resin member.

FIG. 3



EP 3 978 713 A1

Description

[Technical Field]

[0001] The present disclosure relates to a sliding sash and a fitting.

[0002] The present application claims priority on Japanese Patent Application No. 2019-098331 filed on May 27, 2019, and the content of the Japanese Patent Application is incorporated herein by reference.

[Description of Related Art]

[0003] Conventionally, a structure in which a stile body formed in a square frame shape is assembled and glass is provided within the stile body is known as a sliding sash for a fitting. For example, in Patent Document 1 shown below, stiles including an upper stile, a lower stile, vertical stiles and the like are formed from resin and formed in a hollow shape, respectively, and a metal reinforce member having a cross section in a U shape or a rectangular shape is provided inside the stiles.

[Citation List]

[Patent Document]

[0004] [Patent Document 1] Japanese Unexamined Patent Application, First Publication No. 2019-52536

[Summary of Invention]

[Technical Problem]

[0005] As described in Patent Document 1, according to the configuration in which the reinforce member having the U-shaped or rectangular-shaped cross section is disposed within the stiles, a width of the stile viewed in a front face direction becomes large.

[0006] The present disclosure is made in consideration of such circumstances so as to provide a sliding sash including a stile body having a slim design while ensuring a strength thereof and a fitting.

[Solution to Solve Problem]

[0007] In order to achieve the above object, the present disclosure employs the following means. A sliding sash according to the present disclosure includes a stile body formed in a square frame shape, and the stile body includes a resin member formed from resin and a core member enclosed in the resin member, wherein the core member is integrally configured with the resin member.

[0008] A fitting according to the present disclosure includes a frame body formed in a square frame shape, and the above-described sliding sash provided within the frame body, wherein a plurality of the sliding sashes are disposed to be slidable along a width direction within the frame body, and the core member is disposed in a mating portion of the sliding sash.

[BRIEF DESCRIPTION OF DRAWINGS]

[0009]

Fig. 1 is a front view of a fitting viewed from an indoor side according to an embodiment of the present disclosure.

Fig. 2 is a horizontal cross-sectional view of the fitting according to the embodiment of the present disclosure.

Fig. 3 is a cross-sectional view showing a lower stile portion of a sliding sash according to the embodiment of the present disclosure.

[DETAILED DESCRIPTION OF EMBODIMENTS]

[0010] Hereinafter, a double sliding sash as an example of a fitting according to an embodiment of the present disclosure will be described with reference from Fig. 1 to Fig. 3. As shown in Fig. 1, which is a front view of the fitting according to the embodiment of the present disclosure as viewed from the indoor side, a double sliding sash 100 is provided in an opening W of a building. The double sliding sash 100 includes a frame body 1 formed in a square frame shape and two sliding sashes 2 provided within the frame body 1. In the following description, a direction connecting the outdoor side and the indoor side is referred to as an indoor-outdoor direction. Directions orthogonal to the indoor-outdoor direction are referred to as front face directions. In the front face directions, a direction along a horizontal direction is referred to as a width direction, and a vertical direction is referred to as an up-down direction. Along the front face directions, a direction toward a center side of the double sliding sash 100 is referred to as an inside, and a direction toward an end side of the double sliding sash 100 is referred to as an outside.

[0011] The frame body 1 includes a pair of vertical frames 11 extending in the up-down direction, and an upper frame 12 and a lower frame 13 extending in the width direction. The upper frame 12 connects upper end portions of the pair of vertical frames 11. The lower frame 13 connects lower end portions of the pair of vertical frames 11. According to the present embodiment, the frame body 1 is configured from a resin material.

[0012] Fig. 2 is a horizontal cross-sectional view of the double sliding sash 100 according to the present embodiment of the present disclosure. As shown in Fig. 2, the two sliding sashes are provided in the width direction to be slidable. The two double sliding sashes 2 are arranged to close the inside of the frame body 1 in a closed state. According to the present embodiment, two double sliding sashes 2 are provided; however, three or more than three double sliding sashes 2 may be provided.

[0013] As shown in Fig. 1, each sliding sash 2 includes

a stile body 20 and glass 29. The stile body 20 is formed in a square frame shape. The glass 29 is enclosed within the stile body 20. The glass 29 corresponds to a panel member. The panel member may be a member formed from the resin material and formed in a panel shape.

[0014] The stile body 20 includes a pair of vertical stiles 21 extending in the up-down direction, and an upper stile 22 and a lower stile 23 extending in the width direction. In the pair of vertical stiles 21, the vertical stile 21 disposed at a door-end side is referred to as a door-end stile 21A, and the vertical stile 21 disposed at the opposite side of the door-end side, that is, disposed in the mating portion is referred to as a mating stile 21B. The upper stile 22 connects upper end portions of the pair of vertical stiles 21. The lower stile 23 is connects lower end portions of the pair of vertical stiles 21. In the description below, the vertical stiles 21, the upper stile 22, and the lower stile 23 are referred to as a stile 3, respectively.

[0015] Next, a configuration of the stile 3 will be described. Fig. 3 is a vertical cross-sectional view along the indoor-outdoor direction showing the lower stile 23 of the sliding sash 2. Hereinafter, the configuration of the lower stile 23 will be described using Fig. 3 as the configuration of the stile 3. As shown in Fig. 3, the stile 3 includes a resin stile body 30 as a resin member, an outdoor-side reinforcement portion 41, and an indoor-side reinforcement portion 42. Each of the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 corresponds to a core member.

[0016] The resin stile body 30 is configured from the resin material. The resin stile body 30 includes an outdoor-side first plate 31, an outdoor-side second plate 32, an indoor-side first plate 33, an indoor-side second plate 34, an outdoor-side upper plate 35, an indoor-side upper plate 36, an end plate 37, and a connection plate 38.

[0017] The outdoor-side first plate 31 is disposed at the outdoor side with respect to the glass 29. The outdoor-side second plate 32 is disposed at the outdoor side with respect to the glass 29 and at the indoor side with respect to the outdoor-side first plate 31.

[0018] The outdoor-side first plate 31 and the outdoor-side second plate 32 are formed in a plate shape. Each of the outdoor-side first plate 31 and the outdoor-side second plate 32 is disposed such that a plate thickness direction is directed to the indoor-outdoor direction.

[0019] When viewed in the indoor-outdoor direction, the outdoor-side first plate 31 and the outdoor-side second plate 32 are disposed to overlap the glass 29. In other words, an upper end portion 31u of the outdoor-side first plate 31 and an upper end portion 32u of the outdoor-side second plate 32 are disposed at the upper side with respect to a lower end portion 29d of the glass 29. A lower end portion 31d of the outdoor-side first plate 31 and a lower end portion 32d of the outdoor-side second plate 32 are disposed at the lower side with respect to the lower end portion 29d of the glass 29.

[0020] The indoor-side first plate 33 is disposed at the indoor side with respect to the glass 29. The indoor-side second plate 34 is disposed at the indoor side with respect to the glass 29 and at the outdoor side with respect to the indoor-side first plate 33.

[0021] The indoor-side first plate 33 and the indoor-side second plate 34 are formed in a plate shape. Each of the indoor-side first plate 33 and the indoor-side second plate 34 is disposed such that a plate thickness direction is directed to the indoor-outdoor direction.

[0022] When viewed in the indoor-outdoor direction, the indoor-side first plate 33 and the outdoor-side second plate 34 are disposed to overlap the glass 29. In other words, an upper end portion 33u of the indoor-side first plate 33 and an upper end portion 34u of the indoor-side second plate 34 are disposed at the upper side with respect to the lower end portion 29d of the glass 29. A lower end portion 33d of the indoor-side first plate 33 and a lower end portion 34d of the indoor-side second plate 34 are disposed at the lower side with respect to the lower end portion 29d of the glass 29.

[0023] The outdoor-side upper plate 35 connects the upper end portion 31u of the outdoor-side first plate 31 with the upper end portion 32u of the outdoor-side second plate 32. The outdoor-side upper plate 35 is formed in a plate shape. The outdoor-side upper plate 35 is disposed such that a plate thickness direction is directed to the up-down direction.

[0024] The indoor-side upper plate 36 connects the upper end portion 33u of the indoor-side first plate 33 with the upper end portion 34u of the indoor-side second plate 34. The indoor-side upper plate 36 is formed in a plate shape. The indoor-side upper plate 36 is disposed such that a plate thickness direction is directed to the up-down direction.

[0025] The end plate 37 connects a lower end portion 31d of the outdoor-side first plate 31, a lower end portion 32d of the outdoor-side second plate 32, a lower end portion 34d of the indoor-side second plate 34, and a lower end portion 33d of the indoor-side first plate 33. The end plate 37 is formed in a plate shape. The end plate 37 is disposed such that a plate thickness direction is directed to the up-down direction.

[0026] The connection plate 38 is disposed to be at the upper side with respect to the end plate 37. The connection plate 38 connects a lower portion of the outdoor-side second plate 32 with a lower portion of the indoor-side second plate 34. The connection plate 38 is formed in a plate shape. The connection plate 38 is configured such that a plate thickness direction is directed to the up-down direction.

[0027] An outdoor-side stile 3a is formed by the outdoor-side portions of the outdoor-side first plate 31, the outdoor-side second plate 32, the outdoor-side upper plate 35, and the end plate 37, and a vertical cross-sectional of the outdoor-side stile 3a along the indoor-outdoor direction is formed in a rectangle shape. An outdoor-side reinforcement portion 41 is provided inside the outdoor-side stile 3a.

[0028] An indoor-side stile 3b is formed by the indoor-

side portions of the indoor-side first plate 33, the indoor-side second plate 34, the indoor-side upper plate 36, and the end plate 37, and a vertical cross-sectional of the indoor-side stile 3b along the indoor-outdoor direction is formed in a rectangle shape. An indoor-side reinforcement portion 42 is provided inside the indoor-side stile 3b.

[0029] The outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 are formed in a plate shape. The outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 are configured with the plate thickness direction along the indoor-outdoor direction. In other words, the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 are disposed such that a plate surface 41a and a plate surface 42b are in a front plane of the resin stile body 30 which is a surface along the front face direction. In the present embodiment, the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 are formed from metal materials such as the aluminum or the like. The outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 may be formed from fibers such as the carbon fiber, the glass fiber or the like, or the fiber-reinforced resin material of the above-described fibers.

[0030] The outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 are provided over the substantial entire length of the lower stile 23 in the extending direction of the lower stile 23. The outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 may be divided in the extending direction of the lower stile 23 to be intermittently configured.

[0031] The outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 are disposed to overlap the glass 29 when viewed from the indoor-outdoor direction. In other words, an upper end portion 41u of the outdoor-side reinforcement portion 41 and an upper end portion 42u of the indoor-side reinforcement portion 42 are disposed at the upper side with respect to the lower end portion 29d of the glass 29. The upper end portion 41u of the outdoor-side reinforcement portion 41 corresponds to the inside end portion in the front face direction. The upper end portion 42u of the indoor-side reinforcement portion 42 corresponds to the inside end portion in the front face direction. A lower end portion 41d of the outdoor-side reinforcement portion 41 and a lower end portion 42d of the indoor-side reinforcement portion 42 are disposed to be lower than the lower end portion 29d of the glass 29.

[0032] The outdoor-side reinforcement portion 41 is enclosed within the outdoor-side stile 3a, and integrally configured with the outdoor-side stile 3a by being bonded using an adhesive agent or the like that is not shown in figures. The indoor-side reinforcement portion 42 is enclosed within the indoor-side stile 3b, and integrally configured with the indoor-side stile 3b by being bonded using an adhesive agent or the like that is not shown in figures. For example, when the resin stile body 30 is formed by the extrusion molding, the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 that are made from the metal material are configured within the mold, the resin material are configured to cover the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42, and the resin stile body 30 is molded to enclose the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42. It is preferable that the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 are in close contact with the outdoor-side stile 3a and the indoor-side stile 3b respectively with a shear strength equal to or more than 2MPa.

[0033] The upper stile 22 is the same as the configuration of the lower stile 23 being inverted upside down, the vertical stile 21 is the same as the configuration of the lower stile 23 being rotated at 90 degrees in the front plane, and the descriptions thereof are omitted. In the vertical stile 21, the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 may be provided in both the door-end stile 21A and the mating stile 21B, or the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 may be provided in the mating stile 21B only.

[0034] A hollow portion S1 is formed by the connection plate 38, the end plate 37, the lower portion of the outdoor-side second plate 32, and the lower portion of the indoor-side second plate 34.

[0035] A support member 46 that supports the glass 29 is provided at the upper side of the connection plate 38, that is, at the inside in the front face direction. The support member 46 is formed from an elastic material such as rubber or the like.

[0036] A fin portion 47 is provided in the upper end portion 32u of the outdoor-side second plate 32 and the upper end portion 34u of the indoor-side second plate 34. The fin portion 47 is formed from an elastic material for pressing the glass 29 such as rubber or the like.

[0037] According to the double sliding sash 100 with such a configuration, the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 are enclosed within the resin stile body 30 and bonded with the resin stile body 30 to be integrally configured with the resin stile body 30 so as to ensure the strength of the stile body 20. Accordingly, it is not necessary to improve the rigidness of the stile body by providing the three-dimensional core member having the U-shaped or rectangle-shaped cross section, and it is possible to utilize the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 with a reduced cross section. Accordingly, it is possible to ensure the strength of the stile body 20 and configure the stile body 20 in a slim design.

[0038] The plate surface 41a, 42b of the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 are disposed in the front plane respectively such that it is possible to secure a large area of the portion to receive the wind pressure, that is, the pressure

in the indoor-outdoor direction, of the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 in the front plane. Accordingly, it is possible to improve the strength with respect to the wind pressure resistance of the stile body 20. Since it is not necessary to provide the core member outside the glass 29, the width of the stile body 20, that is, a length e in the front plane as shown in Fig. 3 can be set to be small to realize a slim design. The outside of the glass 29 corresponds to the outside in the extension direction, for example, the lower stile 23 may be at the lower side of the glass 29.

[0039] The upper end portions 41u, 42u of the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 are provided to overlap the glass 29 such that the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 may definitely resist the wind pressure received by the glass 29. Accordingly, the strength of the stile body 20 with respect to the wind pressure may be further improved.

[0040] The outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 are formed from the metal material such that it is possible to definitely ensure the strength of the stile body 20.

[0041] Since the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 are disposed in the mating stile 21B, in other words, in the mating portion to which the wind pressure is greatly applied, it is possible to prevent the mating stile 21B from being deformed.

[0042] The hollow portion S1 is formed by the connection plate 38, the end plate 37, the lower portion of the outdoor-side second plate 32, and the lower portion of the indoor-side second plate 34. The deformation of the stile body 20 may be absorbed by the hollow portion S1, and it is possible to improve the adiabaticity by the hollow portion S1.

[0043] Various shapes or combinations of each configuration member as described in the present embodiment are shown as examples, and various changes based on technical design are possible without departing from the spirit of the present disclosure.

[0044] For example, in the above-described embodiment, the plate surfaces 41b, 42b of the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 are disposed in the front plane of the resin stile body 30; however, the present disclosure is not limited to the configuration. The plate surface 41a, 42b may be disposed in a depth plane, that is, a plane orthogonal to the front plane. More specifically, the core member may be disposed such that the plate surface is in the horizontal plane in the lower end portion of the lower stile 23, the core member may be disposed such that the plate surface is in the horizontal plane in the upper end portion of the upper stile 22, and the core member may be disposed such that the plate surface is in the vertical plane in the indoor-outdoor direction in the end portion of the width direction of the vertical stile 21.

[0045] According to the above-described embodiment, the upper end portions 41u, 42u of the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 overlap the glass 29; however, the present disclosure is not limited to the configuration. The inside end portion of the core member in the front face direction may not overlap the panel member. For example, in the lower stile 23, the upper end portions 41u, 42u of the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 may be disposed at the lower side with respect to the lower end portion 28d of the glass 29.

[0046] In the above-described embodiment, the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 are disposed at the two sides in the indoor-outdoor direction to sandwich the glass 29; however, the present disclosure is not limited to the configuration. The core member may be disposed at only one side of the indoor side or the outdoor side of the panel member. In the mating stile 21B, if the core member is configured at only one side in the indoor-outdoor direction of each sliding sash 2, as shown in Fig. 2, it is preferable that the core member is provided in an outdoor-side portion 21c of the outside sliding sash, that is, the sliding sash 2A at the outdoor side, and provided in an indoor-side portion 21d of the inside sliding sash, that is, the sliding sash 2B at the indoor side for resisting the wind pressure.

[0047] In the above-described embodiment, the outdoor-side stile 3a and the indoor-side stile 3b enclose the outdoor-side reinforcement portion 41 and the indoor-side reinforcement portion 42 to cover all of the surfaces thereof; however, the present disclosure is not limited to the configuration. The configuration of the resin member enclosing the core member may be an embodiment of exposing one surface of the core member while covering other surfaces of the core member, or an embodiment of exposing part of the core member while covering remaining part of the core member.

[0048] As the resin configuring the outdoor-side stile 3a and the indoor-side stile 3b, a thermoplastic resin is preferable, and vinyl chloride resin, chlorinated polyethylene, polystyrene, polypropylene, ABS, AES and the like can be used. A vinyl chloride resin is particularly preferable from the viewpoint of easy molding, bending rigidity and durability.

[0049] In the above-described embodiment, the double sliding sash has been described as an example; however, the present disclosure is not limited thereto, and the configuration is applicable to other sashes such as a single sliding door, a sash door or the like.

[Industrial Applicability]

[0050] According to the above-described embodiments of the present disclosure, it is possible to provide a sliding sash including a stile body having a slim design while ensuring a strength thereof and a fitting.

[Reference Signs List]

[0051]

1	frame body
2	sliding sash
3	stile
3a	outdoor-side stile
3b	indoor-side stile
11	vertical frame
12	upper frame
13	lower frame
20	stile body
21	vertical stile
22	upper stile
23	lower stile
29	glass (panel member)
30	resin stile body (resin member)
41	outdoor-side reinforcement portion (core member)
41a, 42a	plate surface
42	indoor-side reinforcement portion (core member)
100	double sliding sash

Claims

1. A sliding sash, comprising:

a stile body formed in a square frame shape, wherein the stile body comprises:

a resin member formed from resin; and
a core member enclosed in the resin member, the core member being integrally configured with the resin member.

2. The sliding sash according to claim 1, wherein the core member is formed in a plate shape, and a plate surface of the core member is arranged in a front plane.

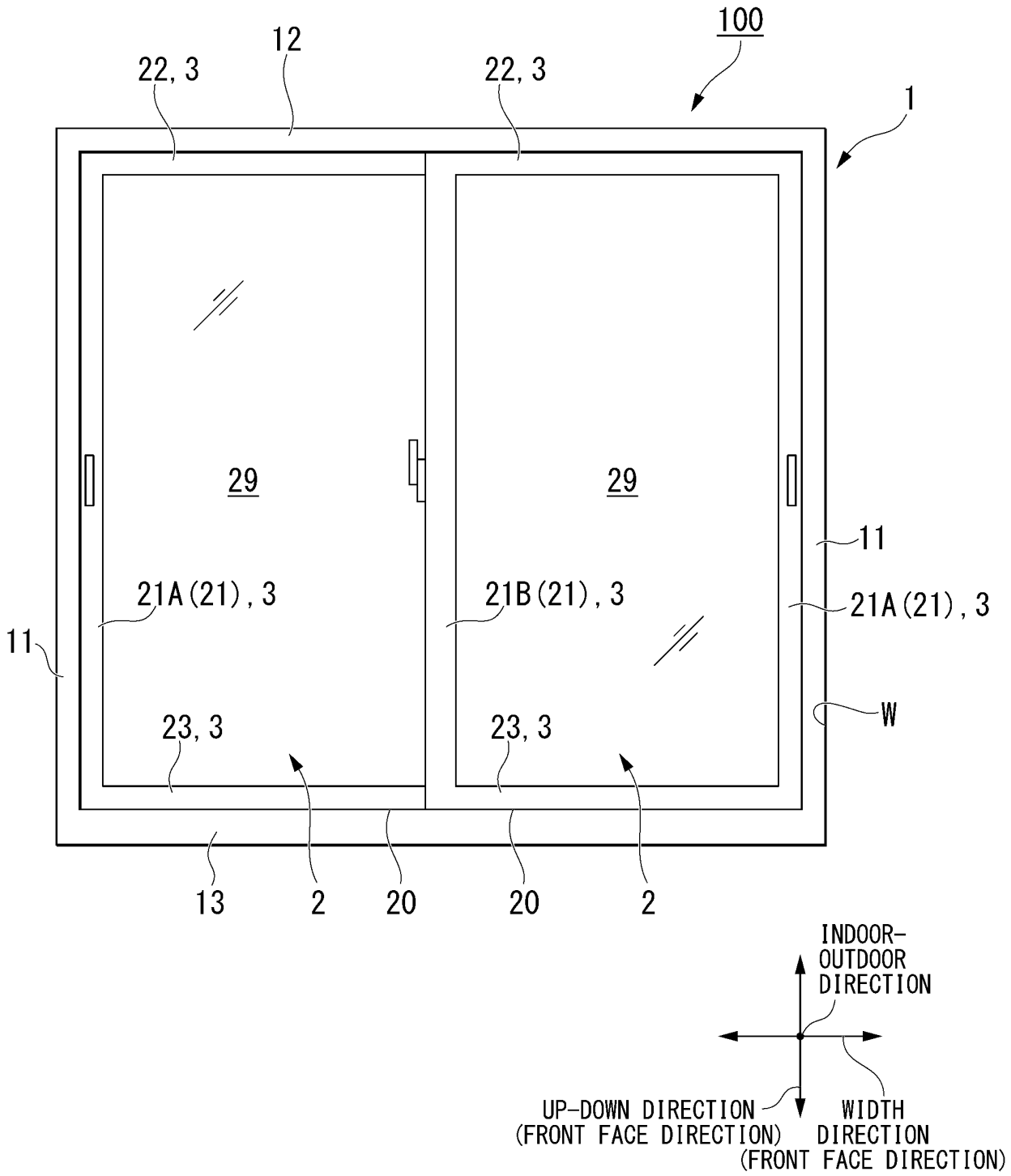
3. The sliding sash according to claim 1 or 2, further comprising a panel member provided within the stile body, wherein an inside end portion of the core member in a front face direction is configured to overlap the panel member.

4. The sliding sash according to any one from claim 1 to 3, wherein the core member is formed from metal.

5. A fitting, comprising:

a frame body formed in a square frame shape; and
the sliding sash provided within the frame body according to any one from claim 1 to 4,
wherein a plurality of the sliding sashes are disposed to be slidable along a width direction within the frame body, and
the core member is disposed in a mating portion of the sliding sash.

FIG. 1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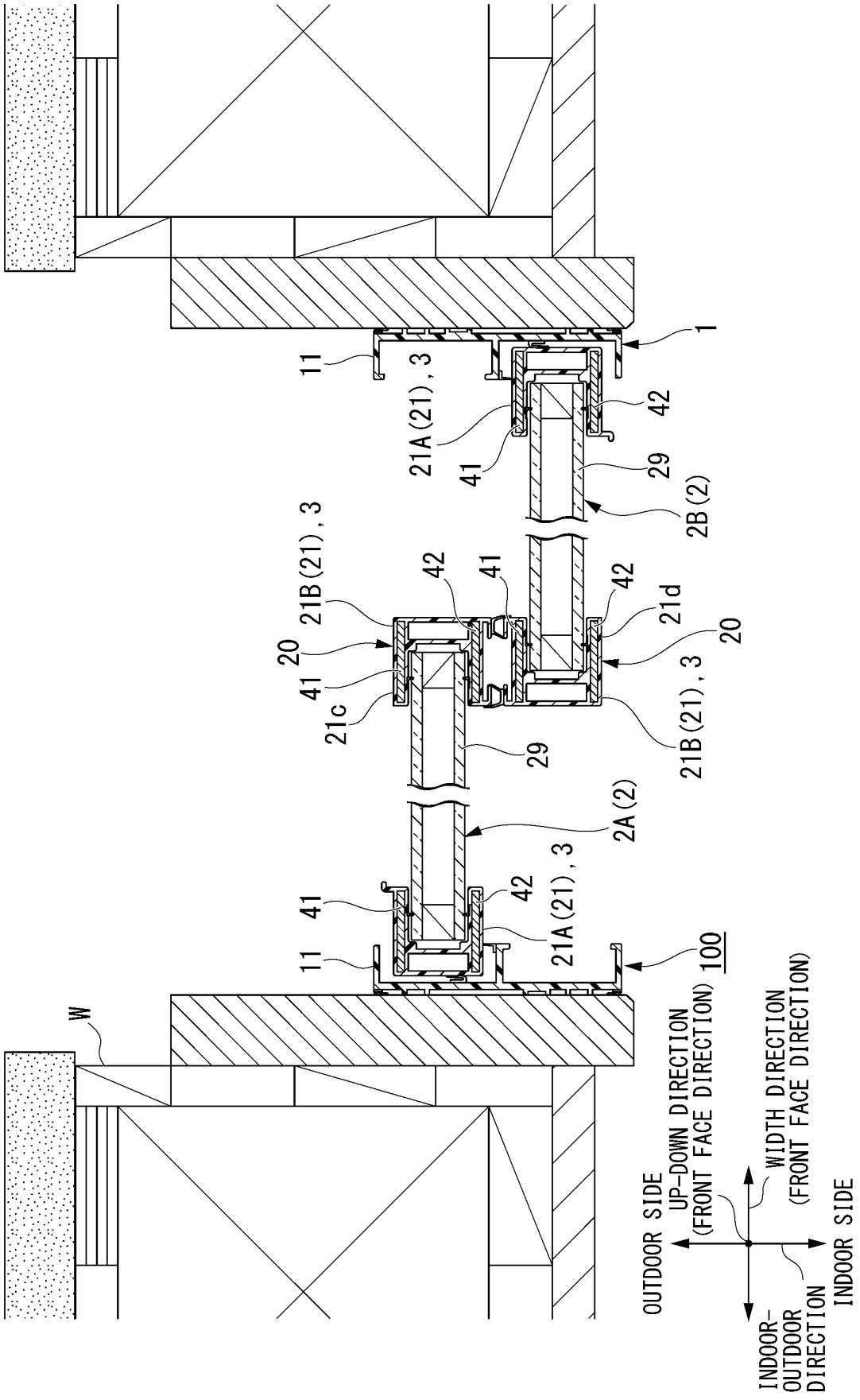
UP-DOWN DIRECTION (FRONT FACE DIRECTION)
WIDTH DIRECTION (FRONT FACE DIRECTION)

FIG. 2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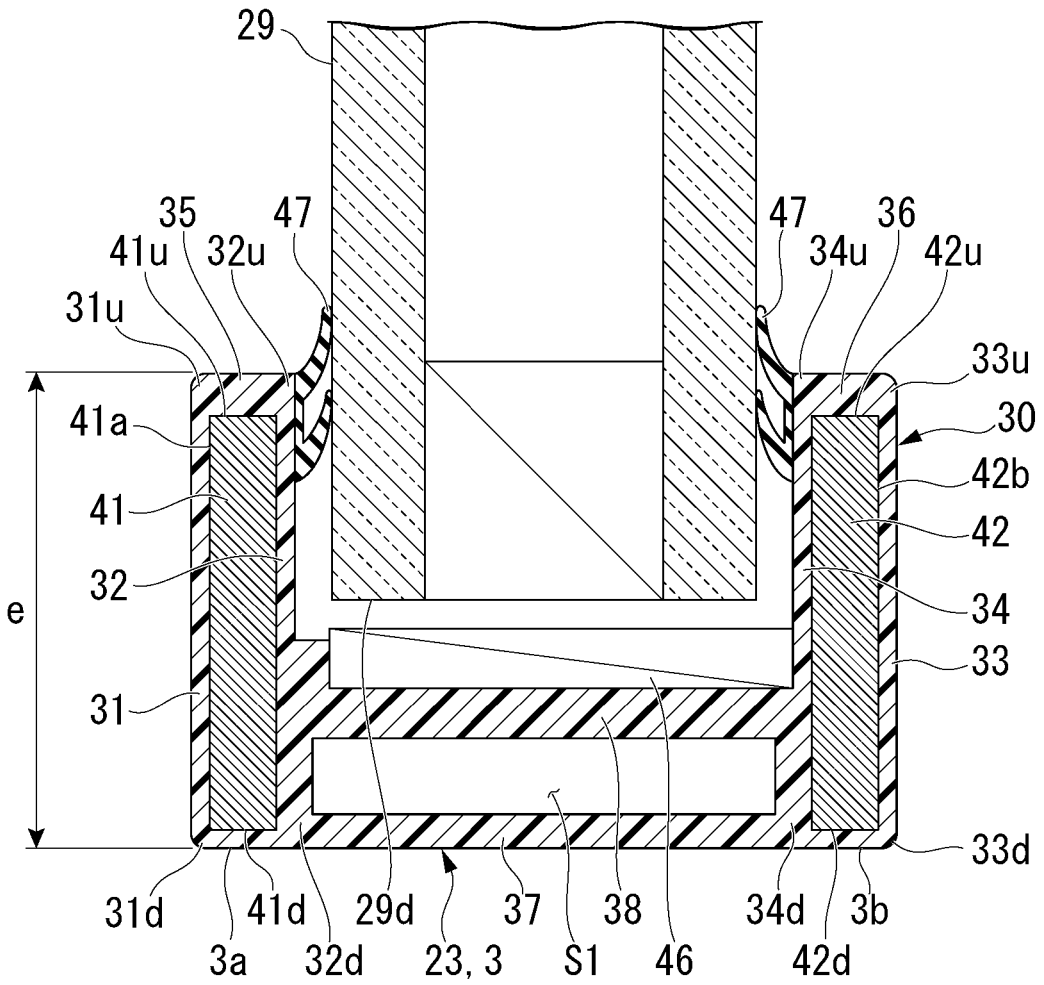
INDOOR-
OUTDOOR
DIRECTION
INDOOR SIDE

FIG. 3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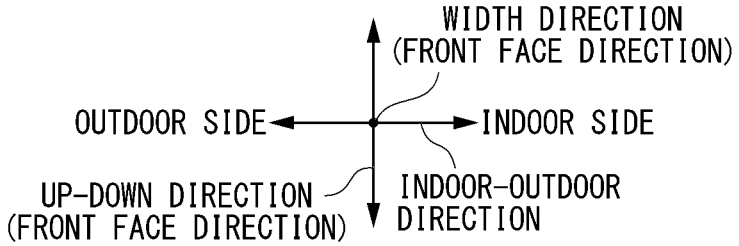
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(FRONT FACE DIRECTION)
OUTDOOR SIDE
INDOOR SIDE
UP-DOWN DIRECTION
(FRONT FACE DIRECTION)
INDOOR-OUTDOOR
DIRECTION

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2020/020733

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl. E06B3/22(2006.01)i
FI: E06B3/22
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. E06B3/04-3/46, E06B5/16

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	1971-2020
Registered utility model specifications of Japan	1996-2020
Published registered utility model applications of Japan	1994-2020

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 A	JP 2018-071181 A (LIXIL CORP.) 10.05.2018 (2018-05-10), paragraphs [0015], [0018], [0056]-[0059], [0065], [0067], fig. 6 (Family: none)	1-2, 4-5 3
X A	JP 2019-060071 A (SANKYOTATEYAMA INC.) 18.04.2019 (2019-04-18), paragraphs [0009], [0025], [0026], fig. 3 (Family: none)	1, 3-5 2
A	JP 2019-070275 A (YKK AP INC.) 09.05.2019 (2019-05-09), entire text, all drawings (Family: none)	1-5
A	JP 2016-023529 A (YKK AP INC.) 08.02.2016 (2016-02-08), entire text, all drawings (Family: none)	1-5
A	JP 2017-061856 A (YKK AP INC.) 30.03.2017 (2017-03-30), entire text, all drawings (Family: none)	1-5

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

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
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"P" document published prior to the international filing date but later than the priority date claimed
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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
09.06.2020	23.06.2020

Name and mailing address of the ISA/	Authorized officer
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A	US 2006/0026913 A1 (TURNER, P. A.) 09.02.2006 (2006-02-09), entire text, all drawings (Family: none)	1-5

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REFERENCES CITED IN THE DESCRIPTION

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