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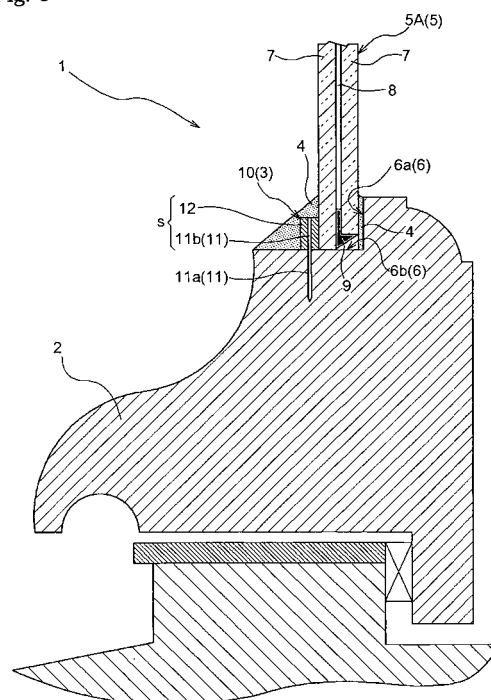
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(54) **METHOD OF MOUNTING PLATE GLASS BODY**

(57) In a method of mounting a glass plate body, including the steps of fitting the glass plate body 5 to a sash 2, fixing the glass plate body 5 to the sash 2 with a fixing member 3, and applying an amount of putty 4 to the entire periphery of the glass plate body 5 for fixing it in a sealed state, the fixing member 3 includes a pin 10 having a leg portion 11a capable of entering the sash 2 to be fixed thereto and a supporting portion (s) capable of supporting an edge of the glass plate body 5. The supporting portion (s) has a synthetic resin portion 12 cushionable relative to the glass plate body 5 edge. The pin 10 is fixed to the sash 2 so that the synthetic resin portion 12 is placed in contact with the glass plate body 5 edge fitted to the sash 2.

Fig. 3



Description

TECHNICAL FIELD

[0001] The present invention relates to a method of mounting a glass plate body, including the steps of fitting the glass plate body to a sash (e.g. a wooden sash), fixing the glass plate body to the sash with a fixing member (e.g. a nail), and applying an amount of putty to the entire periphery of the glass plate body for fixing it in a sealed state.

BACKGROUND ART

[0002] Conventionally, as this type of method of mounting a glass plate body, there is known a method using a metal fixing member such as a nail, a wire clip, etc.

[0003] For instance, as shown in Fig. 7, an amount of putty 4 is applied as a thin layer to a groove wall 6a of a groove portion 6 of a sash 2. Then, under this condition, a glass plate body 5 is fitted into the groove portion 6, with placing an outer peripheral edge of one face of the glass plate body 5 in contact with the putty 4 disposed at the groove portion 6a. Under this condition, a metal fixing member 20 is stuck into a groove bottom 6b at a border between this groove bottom 6b and the other face of the glass plate body 5 so as to place the edge of the other face of the glass plate body 5 in contact with a lateral face of the metal fixing member 20, thereby to provide a temporary fixation.

[0004] Thereafter, an additional amount of putty 4 is charged and applied along the entire periphery of the sash 2 on the other side of the glass plate body 5 at the groove portion 6 in such a manner as not to form any gap therebetween, thereby to provide a permanent fixation (see e.g. Non-Patent Document 1).

[0005] Non-Patent Document 1: Architectural Institute of Japan: "Manual of Construction Work Standards: Commentary: JASS17 Glazing Work" Gihodo Shuppan Co., Ltd. April 30, 1999, 3rd Edition, 4th Print: p. 78.

DISCLOSURE OF THE INVENTION

OBJECT TO BE ACHIEVED BY INVENTION

[0006] According to the conventional method of mounting a glass plate body, the glass plate body is mounted to the sash, with the surface of the metal fitting tool and a portion of the edge of the glass plate body being in contact with each other.

[0007] In the above, if e.g. a force/vibration due to an earthquake, wind, sound, etc. is applied to the glass plate body and/or the sash, this tends to invite stress concentration at fixed portions which are the contacting portions between the glass plate body and the fixing member.

[0008] As a result, a crack or a chipping may occur mainly at the fixed portion of the glass plate body. Or, even worse, the glass plate body might be broken and

become disengaged from the sash.

[0009] In view of the above, an object of the present invention is to provide a method of mounting a glass plate body, which can effectively restrict such damage in the glass plate body even in the event of application of an external force/vibration or the like under the fitted condition of the glass plate body to the sash.

MEANS TO ACHIEVE THE OBJECT

[0010] For achieving the above-noted object, according to a first characterizing feature of the inventive method of mounting a glass plate body, in the method including the steps of fitting the glass plate body to a sash, fixing the glass plate body to the sash with a fixing member, and applying an amount of putty to the entire periphery of the glass plate body for fixing it in a sealed state, the method is characterized in that the fixing member comprises a pin including a leg portion capable of entering the sash to be fixed thereto and a supporting portion capable of supporting an edge of the glass plate body, the supporting portion having a synthetic resin portion cushionable relative to the edge of glass plate body; and the pin is fixed to the sash so that the synthetic resin portion is placed in contact with the edge of glass plate body fitted to the sash.

[0011] With the above-described first characterizing feature, when the glass plate body is mounted to the sash, the edge of the glass plate body is fixed by the supporting portion of the pin via the cushionable synthetic resin portion, so that it is possible to maintain an mounted condition free from occurrence of damage to the edge of glass plate body due to e.g. hitting of a hard object thereto. That is, the glass plate body is fixed to the sash under the stable condition realized by the cooperative function of the fixing member and the putty, and at the same time, there is no direct contact of any hard portion of the pin to the edge of glass plate body. Hence, the problem with the convention, i.e. the occurrence of stress concentration at the fixed portion of the edge of glass plate body, has been overcome.

[0012] Consequently, even in the event of application of an external force/vibration under the condition of the glass plate body being mounted to the sash, break or crack at the fixed portion of the glass plate body hardly occurs, and such inconvenience as the damage of the glass plate body and/or subsequent accidental disengagement thereof can be readily prevented.

[0013] Therefore, according to the above-described construction, the glass plate body can be used for a longer period of time. Further, breakage can be restricted even in case a glass plate body having lower strength than the standard glass plate body (e.g. a glass plate body formed of low-strength glass, a thin glass plate body, a glass glazing with high heat-insulating performance comprised of a plurality of thin glass plates assembled together with a gap therebetween) is installed to a sash.

[0014] According to a second characterizing of the inventive method of mounting a glass plate body, in the method including the steps of fitting the glass plate body to a sash, fixing the glass plate body to the sash with a fixing member, and applying an amount of putty to the entire periphery of the glass plate body for fixing it in a sealed state, the method is characterized in that wherein the fixing member comprises a pair of engaging sheets having engaging faces engageable with each other; one of the engaging sheets is fixed to at least a portion of a receiving face of the sash for the glass plate body; the other engaging sheet is fixed to a portion of the glass plate body opposed to the portion to which the one engaging sheet is fixed; and the glass plate body is fixed to the sash so that the engaging sheets engage with each other.

[0015] With the above-described second characterizing feature, temporary fixing operation of the glass plate body to the sash can be done with an extremely simple procedure using a pair of engaging sheets.

[0016] And, the glass plate body mounted to the sash has its edge fixed to the sash with the putty and the pair of engaging sheets, so that it is possible to maintain a favorable condition free from occurrence of damage to the edge of glass plate body due to e.g. hitting of a hard object thereto.

[0017] That is, the glass plate body is fixed to the sash under the stable condition realized by the cooperative function of the pair of engaging sheets and the putty, and at the same time, unlike the convention, there is no direct contact of the hard portion of the metal fixing member with the edge of glass plate body. Hence, the problem of occurrence of stress concentration at the fixed portion of the edge of glass plate body, has been overcome.

[0018] Consequently, even in the event of application of an external force/vibration under the condition of the glass plate body being mounted to the sash, break or crack at the fixed portion of the glass plate body hardly occurs, and such inconvenience as the damage of the glass plate body and subsequent accidental disengagement thereof can be readily prevented.

[0019] Therefore, according to the above-described construction, the glass plate body can be used for a longer period of time. Further, breakage can be restricted even in case a glass plate body having lower strength than the standard glass plate body (e.g. a glass plate body formed of low-strength glass, a thin glass plate body, a glass glazing with high heat-insulating performance comprised of a plurality of thin glass plates assembled together with a gap therebetween) is installed to a sash.

BEST MODE OF EMBODYING THE INVENTION

[0020] Next, an embodiment of the present invention will be described with reference to the accompanying drawings. Incidentally, the portions denoted with the same reference numerals as the conventional construc-

tion represent the same or equivalent portions.

[First Embodiment]

[0021] Figs. 1 through 4 show a sash door 1 constructed with using a method of mounting a glass plate body according to the present invention. The sash door 1 includes a sash 2, and a glass plate body 5 mounted to the sash 2 with using a plurality of fixing members 3 and an amount of putty 4.

[0022] In the instant embodiment, the sash 2 is formed of wood material and comprises an assembly of an upper edge frame member forming an outer periphery of the sash door 1, a pair of side edge frame members, and a lower edge frame member, assembled together in the form of a rectangle as shown.

[0023] As shown in Fig. 3, at a portion of each frame member corresponding to an inner peripheral face of the sash, there is formed a groove portion 6 into which the plate glass body 5 can be fitted.

[0024] In this groove portion 6, there is provided a groove wall 6a only on one of the front and rear faces of the door, so that this groove wall 6a may receive an edge of the glass plate body 5 which is fitted into the groove portion 6 from the other of the front and rear faces of the door. Whereas, a groove bottom 6b of the groove portion 6 can receive the fixing members 3 after the fitting of the glass plate body 5 into the groove portion 6.

[0025] In this embodiment, the glass plate body 5 is exemplified by a double glazing 5A which uses thin glass plates, but provides high heat-insulating effect.

[0026] The double glazing 5A comprises a pair of glass plates 7 disposed side by side with a gap 8 therebetween, with the gap 8 being sealed by a seal portion 9 provided along the outer periphery of the glazing. Incidentally, though not shown, the outer perimeter edge of the double glazing 5A is provided with a resin coating expected to provide a protecting function.

[0027] Also, in order to cause the double glazing 5A to provide enhanced heat insulating performance, the gap 8 will be evacuated.

[0028] The fixing member 3, as shown in Fig. 3, is constructed as a pin 10 which can be struck into and fixed to the groove bottom 6b of the sash 2.

[0029] As shown in Fig. 2, the pin 10 comprises a plurality of pin bodies 11 formed of a metal such as stainless steel, brass, carbon steel, etc and a synthetic resin portion 12 which can be engaged on one longitudinal end of the respective pin body 11. Then, by striking the pin 10 into the groove bottom 6b of the sash 2, leg portions 11a as lower portions of the pin bodies 11 will advance into the sash 2 to be fixed therein.

[0030] When the fixing member 3 is fixed to the sash 2, the upper portion of each pin body 11 is engaged within the synthetic resin portion 12, thereby preventing direct contact of the pin body 11 with the glass plate body 5, so that the glass plate body 5 can be supported in a cushionable manner.

[0031] The synthetic resin portion 12 employs, preferably, a material having oil resistance, since this portion is to be placed in contact with the putty. Its shape is exemplified by a rectangular parallelepiped as shown in Fig. 2, in this embodiment. The synthetic resin portion 12 defines insertion holes 12a formed separate from each other for allowing insertion of the respective pin bodies 11.

[0032] Like the double glazing 5A described in the foregoing embodiment, in case the two glass plates 7 are sized so as to form a step at their edges, the height of the synthetic resin portion 12 will be set to be greater than the above-described step between the plate edges. In short, the height of the synthetic resin portion 12 should be set so as to allow the two glass plates 7 to be effectively bound between the groove wall 6a and the synthetic resin portion 12. Therefore, it becomes possible to support the glass plates 7 even more firmly.

[0033] Incidentally, of the synthetic resin portion 12 and the respective pin body 11, the pin body portion 11b on which the synthetic resin portion 12 is engaged is referred to as "supporting portion (s)".

[0034] Next, a mounting procedure of the double glazing 5A to the sash 2 will be described.

[1] First, an amount of putty 4 is applied, in the form of a thin layer, to the groove wall 6a of the sash 2. Then, under this condition, the double glazing 5A is fitted into the groove portion 6, with the outer peripheral edge of the double glazing 5A being placed in contact with the putty applied to the groove wall 6a (see Fig. 4 (a)).

[2] The pin 10 is struck into the groove bottom 6b of the sash 2 so as to place the synthetic resin portion 12 in abutment against the edge of the double glazing 5A (see Fig. 4 (b)). This operation is effected to each one of the upper edge frame portion, the side edge frame portions and the lower edge frame portion, with an appropriate spacing being provided along the longitudinal direction of the frame (see Fig. 1). In the above, in the setting of the pin 10, one exemplary method therefor comprises the steps of: setting the synthetic resin portion 12 along the edge of the double glazing 5A and then inserting and striking the respective pin bodies 11 into the respective insertion holes 12a of this synthetic resin portion 12.

Another exemplary method comprises the steps of: inserting the respective pin bodies 11 into the respective insertion holes 12a of the synthetic resin portion 12 in advance, subsequently setting this pin 10 at the edge of the double glazing 5A and then striking the pin bodies 11 into the sash 2.

According to the former method, the pin bodies 11 are struck into the sash after the synthetic resin portion 12 has been placed in contact with the double glazing 5A. Therefore, this method allows accurate setting of the pin 10 at a target position. On the other hand, according to the latter method, the setting op-

eration is less troublesome, so that the pin 10 can be set more efficiently.

[3] Next, as shown in Fig. 4 (c), an amount of putty 4 is charged into the groove portion 6 along the entire periphery of the double glazing 5A so as to provide sealing. In this, the pins 10 also will be covered with the putty 4.

[0035] According to the glass plate body mounting method of this embodiment, the finished appearance after the mounting of the glass plate body 5 to the sash 2 differs in no way from that of the conventional art. And, even when an external force such as vibration is applied to the sash door 1, as the outer peripheral edge of the glass plate body 5 is gently supported, it is possible to prevent generation of breakage or crack therein; hence, durability of the sash door 1 can be improved.

[Second Embodiment]

[0036] Discussion of portions of this embodiment overlapped with those of the first embodiment described above will be omitted and different features will be described mainly.

[0037] The fixing member 3 employed in this embodiment, instead of the pin 10 described in the foregoing embodiment, comprises a pair of magic tapes ("Magic Tape" registered trademark) (an example of engaging sheets 13) 13A having engaging surfaces (k) engageable with each other, as shown in Figs. 5 and 6.

[0038] To at least a portion of the groove wall 6a acting as a glass plate body receiving face of the sash 2, a magic tape 13Aa of one of the pair of magic tapes 13A is fixed by such means as adhesion. And, to an opposing portion of the double glazing 5A corresponding to this engaging sheet fixed portion, the other magic tape 13Ab is fixed by such means as adhesion. And, the double glazing 5A is fitted to the sash 2 so as to allow engagement between the magic tapes, and then the putty 4 is charged into the groove portion 6 for fixation.

[0039] In the case of this embodiment too, an amount of putty 4 is applied in advance in the form of a thin layer to the groove wall 6a between the one side magic tapes 13Aa disposed adjacent in the peripheral direction of the sash 2.

[0040] According to this embodiment, like the foregoing embodiment, the finished appearance after the mounting of the glass plate body 5 to the sash 2 differs in no way from that of the conventional art. And, even when an external force such as vibration is applied to the sash door 1, as the outer peripheral edge of the glass plate body 5 is gently supported, it is possible to prevent generation of breakage or crack therein; hence, durability of the sash door 1 can be improved.

[Other Embodiments]

[0041] Next, some other embodiments of the invention

will be described.

(1) The sash 2 is not limited to the sash made of wooden material described in the foregoing embodiments. For instance, the sash can be formed of metal, synthetic resin, etc. In that case, the above-described striking setting type fixing member 3 is not feasible. Then, in place of this type, it is possible to employ a further method of setting the fixing member, according to which setting holes are formed in advance at the corresponding portion of the sash 2, and then the leg portions of the pin are inserted into these setting holes for the fixation. Of course, the engaging sheet type method can also be employed. However, for a wooden sash, it is preferred that the striking type fixing member be used, in terms of workability, setting stability, etc. On the other hand, for a sash formed of a metal or a synthetic resin, sufficient adhesion can be readily available. Hence, it is preferred, in such case, that the fixing member using the adhesion of magic tapes be employed.

(2) The glass plate body 5 is not limited to the double glazing described in the foregoing embodiments. For instance, this can be singly a conventional single glass plate, a laminated glass, a variety of functional glass, or can be combinations of these. All of these are generically referred to as "glass plate body" herein.

(3) The pin 10 is not limited to the one described in the foregoing embodiments comprising the pin bodies 11 and the synthetic resin portion 12 provided as separate parts. Instead, for instance, these parts may be formed integral as one member. Further, the pin 10 is not limited to the one having one synthetic resin portion 12 for the plurality of pin bodies 11. Instead, for instance, the pin 10 can comprise one synthetic resin portion 12 for each pin body 11. Further, the material and/or the shape of the synthetic resin portion 12 may vary in many ways.

(4) The synthetic resin portion 12 may be formed of an elastic material such as rubber. With this, e.g. when the pin 10 is stuck into the groove bottom 6b of the sash 2, even if the synthetic resin portion 12 of the pin 10 comes too near the double glazing 5, the synthetic resin portion 12, which is formed of the elastic material, will contract by an appropriate amount to provide reliable fixation of the double glazing 5.

(5) The synthetic resin portion 12 may be formed of a plurality of members. For instance, the portion may be formed of two members of different materials, having two different colors, with the members being affixed to each other. In doing this, the synthetic resin portion 12 may be constructed such that one of the

two members is formed of an elastic material, and this elastic material member may be disposed on the side facing the double glazing 5. With this, the frictional force of the synthetic resin portion 12 relative to the double glazing 5 is increased, so that even when an external force is applied to the double glazing 5, positional displacement between the double glazing 5 and the synthetic resin portion 12 may be effectively resisted.

(6) For the fixing member 3, at the supporting portion (s) of the pin body 11, there may be provided a stopper means for preventing inadvertent withdrawal of this pin body 11 from the synthetic resin portion 12. This stopper means can be one or more projections or grooves. Further alternatively, it may be preliminary application of adhesive agent.

[0042] Incidentally, in the above, reference numerals and marks are provided for the purpose of facilitating reference to the accompanying drawings. It is understood, however, that the provision thereof is not to limit the scope of the present invention to the constructions shown in the drawings: Further, it is needless to say that the present invention may be embodied in many other ways as long as such modifications may come within the essence of the present invention.

INDUSTRIAL APPLICABILITY

[0043] The present invention may be used in a method of mounting a glass plate body, comprising the steps of fitting the glass plate body to a sash, fixing the glass plate body to the sash with a fixing member and applying an amount of putty to the entire periphery of the glass plate body for fixing the body in a sealed state.

BRIEF DESCRIPTION OF THE DRAWINGS

[0044]

[Fig. 1] a partially cutaway view showing principal portions of a sash door according to a first embodiment of the invention,

[Fig. 2] a perspective view showing a fixing member relating to the first embodiment,

[Fig. 3] a section view showing principal portions of the sash door relating to the first embodiment,

[Fig. 4] a section view illustrating a mounting procedure of the glass plate body according to the first embodiment,

[Fig. 5] an exploded perspective view showing principal portions of a sash door relating to a second embodiment of the invention,

[Fig. 6] a section view showing principal portions of the sash door relating to the second embodiment, and

[Fig. 7] a section view showing principal portions of

a sash door according to the prior art.

DESCRIPTION OF RERENCE MARKS

[0045]	5
2	sash
3	fixing member
4	putty
5	glass plate body
10	pin
11a	leg portion
12	synthetic resin portion
13	engaging sheet
13Aa	one magic tape
13Ab	the other magic tape
k	engaging surface
s	supporting portion

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Claims

1. A method of mounting a glass plate body, the method including the steps of fitting the glass plate body to a sash, fixing the glass plate body to the sash with a fixing member, and applying an amount of putty to the entire periphery of the glass plate body for fixing it in a sealed state, wherein the fixing member comprises a pin including a leg portion capable of entering the sash to be fixed thereto and a supporting portion capable of supporting an edge of the glass plate body, the supporting portion having a synthetic resin portion cushionable relative to the edge of glass plate body; and the pin is fixed to the sash so that the synthetic resin portion is placed in contact with the edge of glass plate body fitted to the sash. 25
2. A method of mounting a glass plate body, the method including the steps of fitting the glass plate body to a sash, fixing the glass plate body to the sash with a fixing member, and applying an amount of putty to the entire periphery of the glass plate body for fixing it in a sealed state, wherein the fixing member comprises a pair of engaging sheets having engaging faces engageable with each other; one of the engaging sheets is fixed to at least a portion of a receiving face of the sash for the glass plate body; the other engaging sheet is fixed to a portion of the glass plate body opposed to the portion to which the one engaging sheet is fixed; and the glass plate body is fixed to the sash so that the engaging sheets engage with each other. 40

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Fig. 1

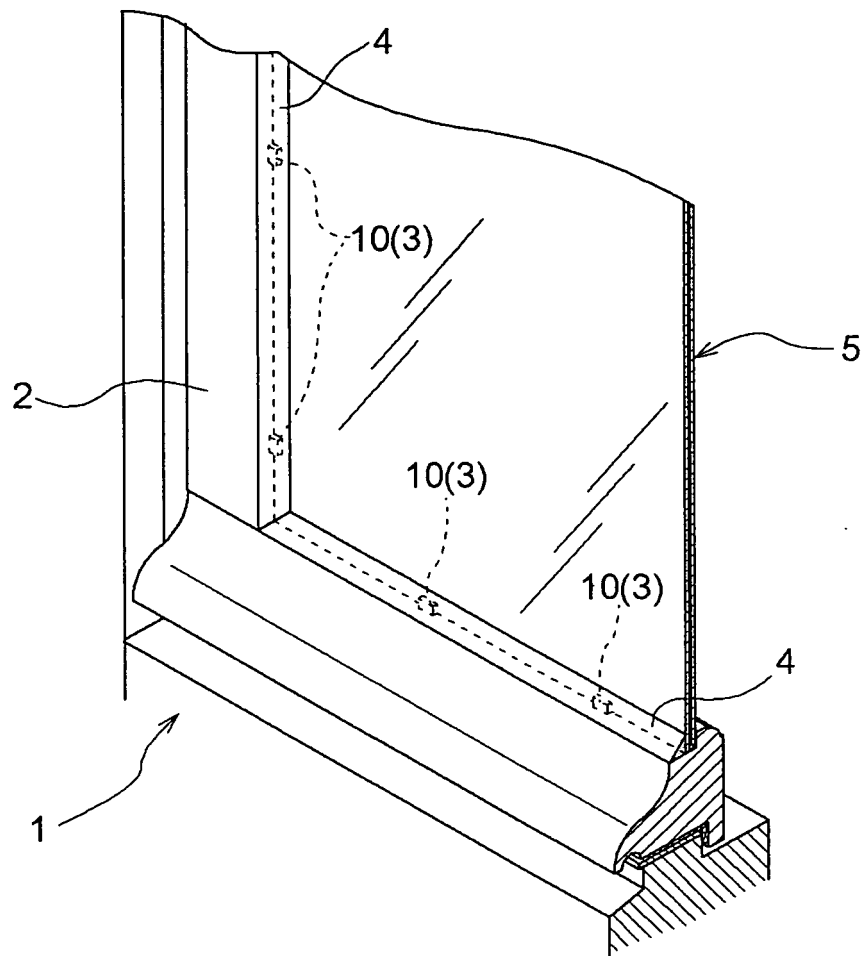


Fig. 2

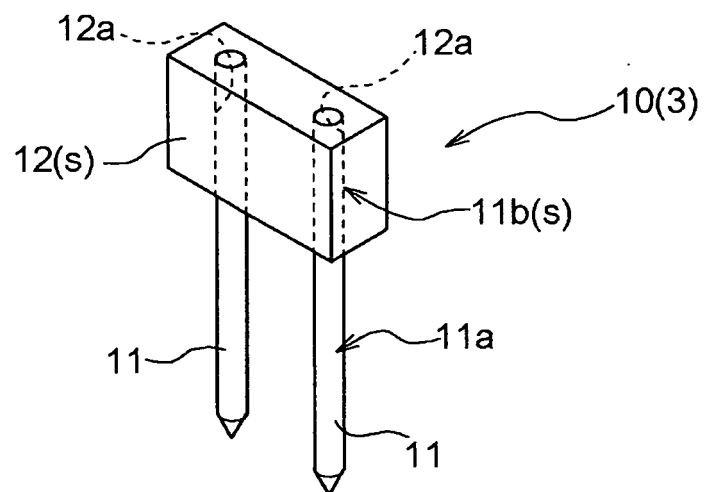


Fig. 3

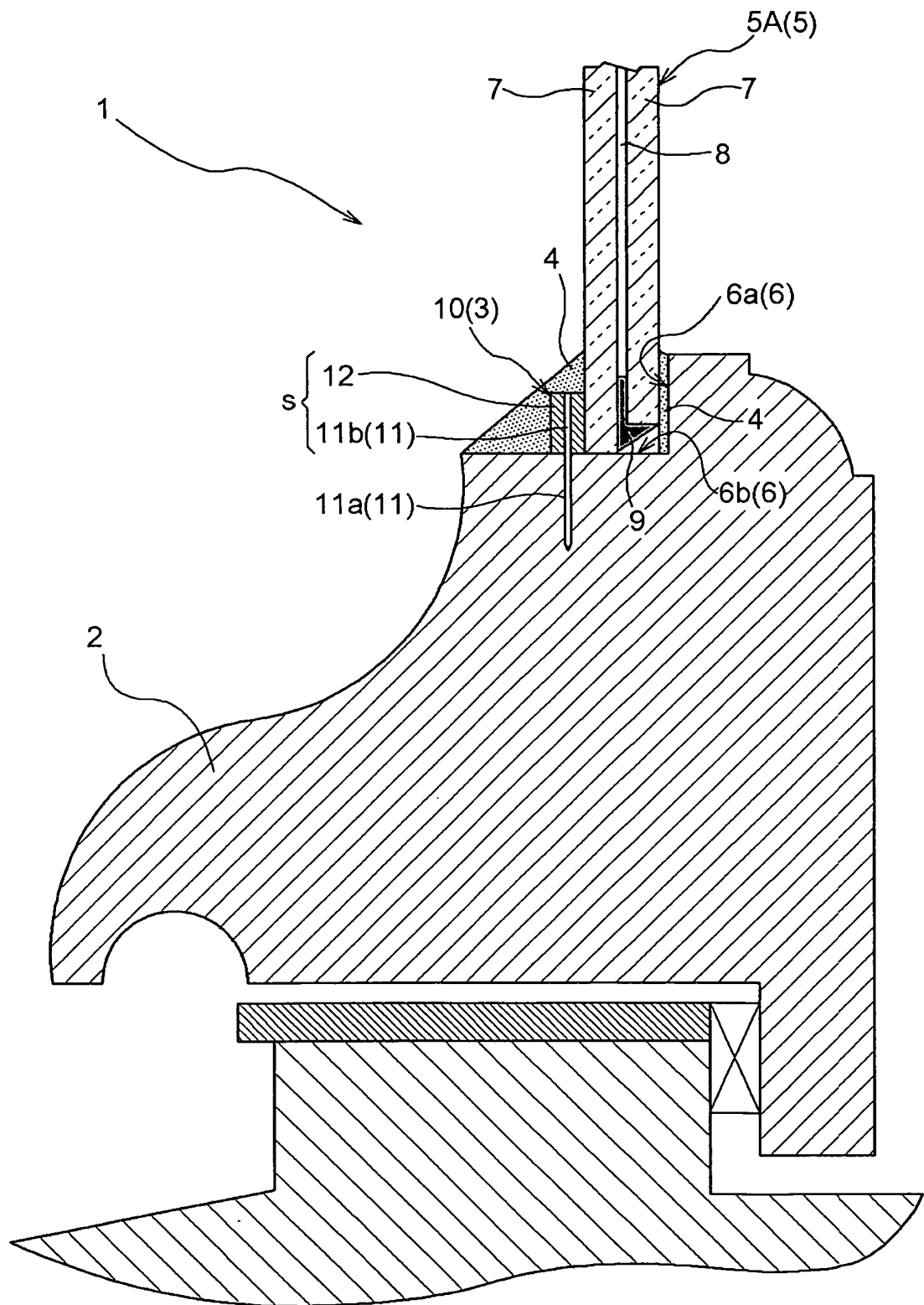


Fig. 4

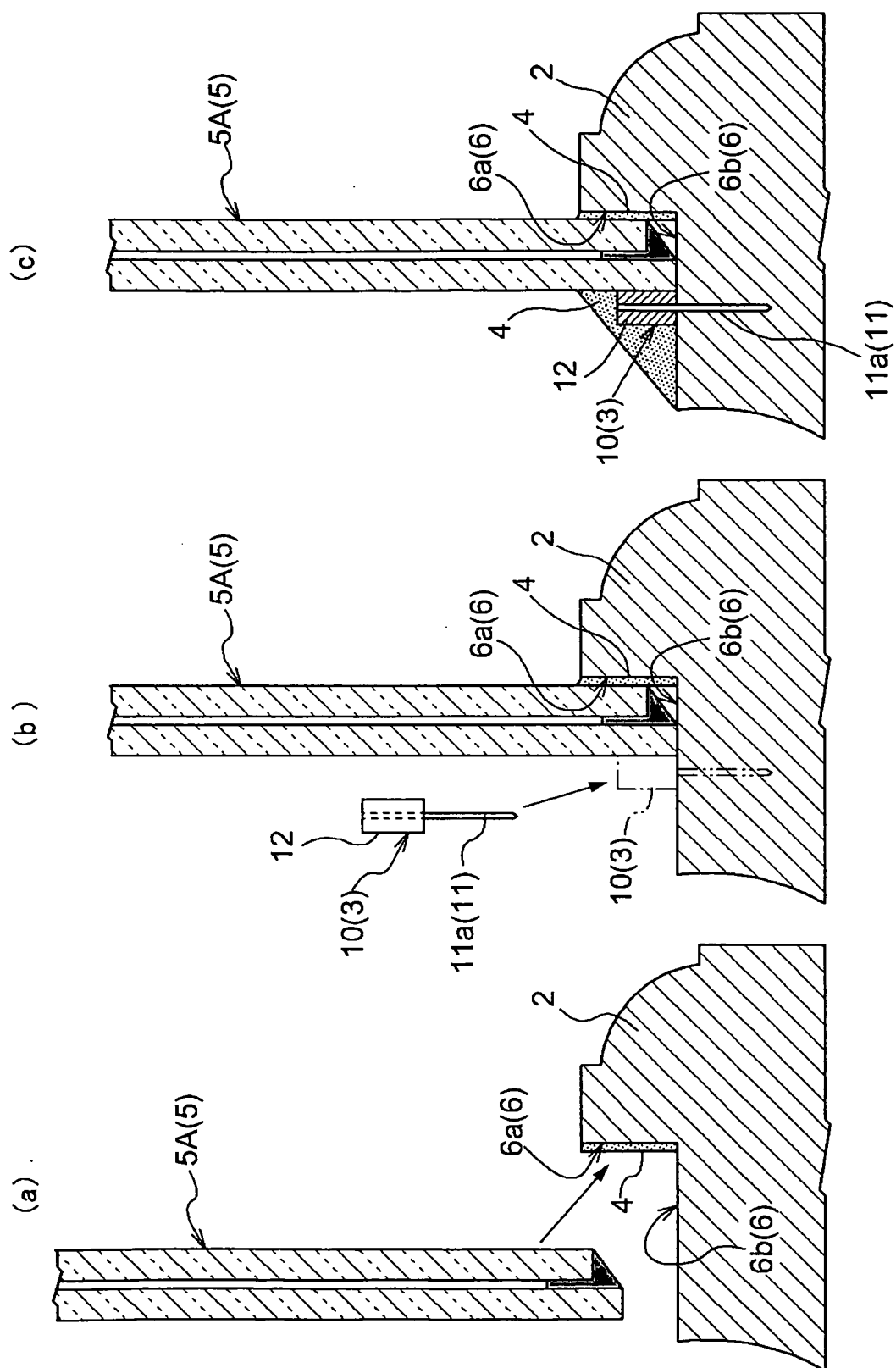


Fig. 5

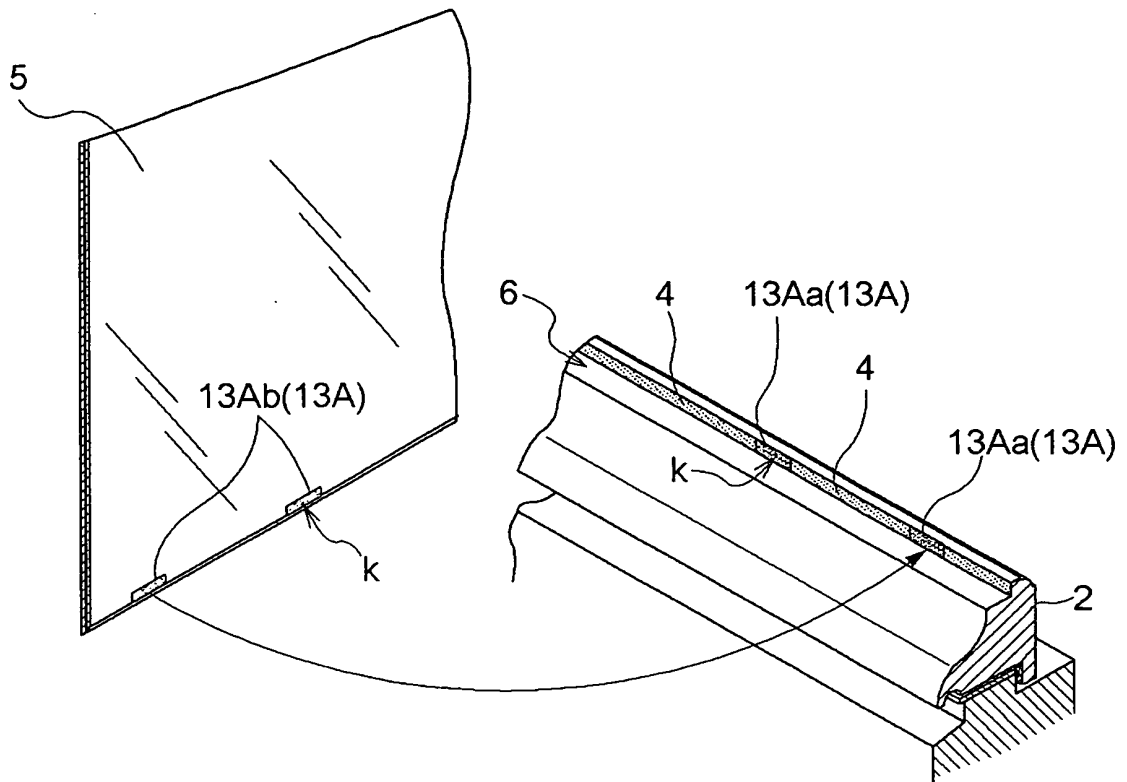


Fig. 6

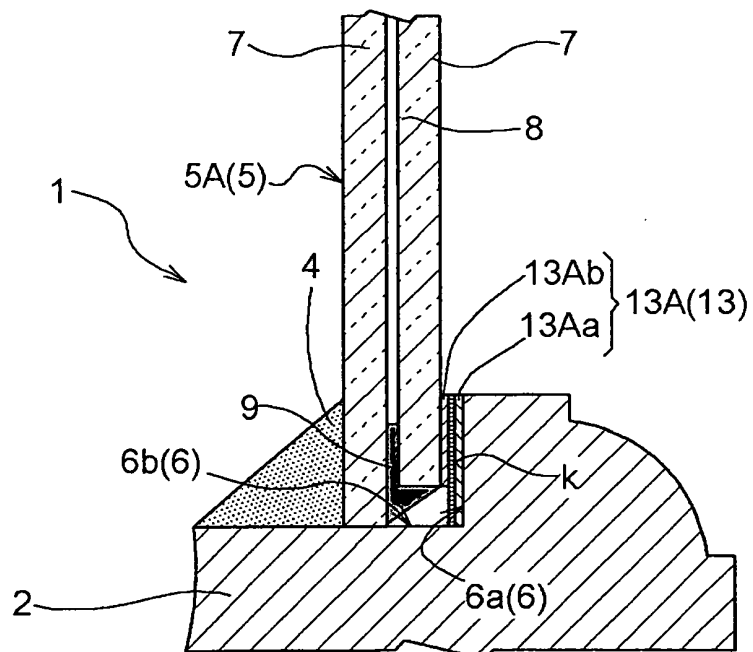
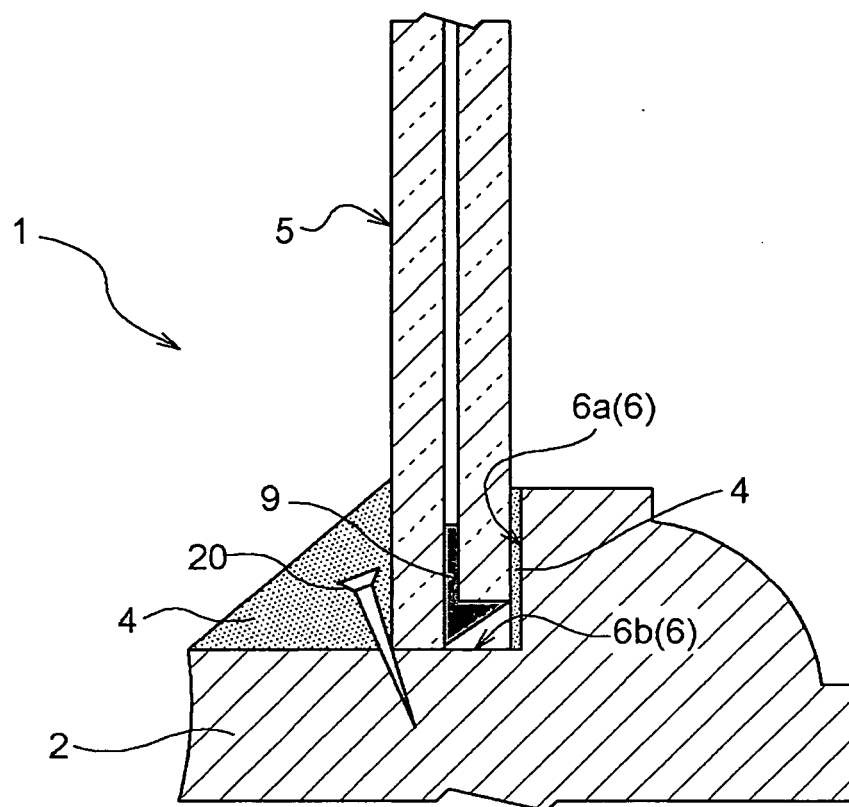


Fig. 7



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2006/311298

A. CLASSIFICATION OF SUBJECT MATTER

E06B3/62(2006.01) i, E06B3/56(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)

E06B3/62, E06B3/56

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

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2006
Kokai Jitsuyo Shinan Koho	1971-2006	Toroku Jitsuyo Shinan Koho	1994-2006

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.
Y	US 1496916 A (BENJAMIN B. WHITTAM), 10 June, 1924 (10.06.24), Page 1, left column, lines 11 to 17; page 2, left column, lines 48 to 58, right column, lines 112 to 121; page 3, left column, lines 4 to 9; Fig. 21 (Family: none)	1-2
Y	JP 2004-19151 A (Panefuri Kogyo Kabushiki Kaisha), 22 January, 2004 (22.01.04), Par. Nos. [0001], [0026] to [0043]; Fig. 7 (Family: none)	1

☒ 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

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"&" document member of the same patent family

Date of the actual completion of the international search
23 August, 2006 (23.08.06)Date of mailing of the international search report
05 September, 2006 (05.09.06)Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2006/311298

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2000-190883 A (Central Glass Co., Ltd.), 11 July, 2000 (11.07.00), Par. Nos. [0015], [0037] to [0038]; Figs. 1, 9 (Family: none)	2

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Non-patent literature cited in the description

- Manual of Construction Work Standards: Commentary: JASS17 Glazing Work. Gihodo Shuppan Co., Ltd, 30 April 1999, 78 [0005]