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(54) **PANEL FOR LIFT DOORS AND RELATIVE ASSEMBLY METHOD THEREOF**

PLATTE FÜR AUFZUGTÜREN UND MONTAGEVERFAHREN DAFÜR

PANNEAU POUR PORTES D'ASCENSEUR ET PROCÉDÉ D'ASSEMBLAGE RELATIF DE CELUI-CI

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Description

[0001] The present invention relates to a panel for lift doors and a method of assembling a panel for lift doors.

[0002] In particular, the present invention relates to a panel for automatic lift doors, comprising at least one portion in glass or similar material.

[0003] The panels comprising a portion in glass are generally composed of profiles soldered so as to contain and block the glass portion in place. E.g. document JP H05-254770 A discloses a panel according to the preamble of claim 1.

[0004] The known assembly methods of such panels envisage, after positioning of the glass portion, a step of soldering the profiles to each other and to the frame.

[0005] The soldered profiles present problems related to the tolerance deriving from the placing of two elements to be soldered alongside each other as well as to the thermal deformation which produces tensions between the metal sheets forming the profiles.

[0006] To attempt to overcome such drawback the use of suitable templates in the soldering step, able to simplify assembly, has been introduced. Such templates, in the case of automatic doors for lifts, must necessarily be of the parametric type, depending on the width and height of the elements to be soldered.

[0007] Such methods are time consuming, complex and expensive however and the panels obtained therewith have similar drawbacks.

[0008] One purpose of the present invention is therefore to make available a panel for lift doors, a lift cabin comprising such panel and an assembly method of a panel for lift doors free of such drawback.

[0009] These and further objectives are achieved by a panel, a lift cabin and an assembly method as described respectively in claims 1, 6 and 7 hereto attached.

[0010] In particular, according to a first aspect, the invention relates to a panel for lift doors comprising: a frame; at least one portion in glass; at least one pair of longitudinal profiles, and at least one pair of transversal profiles, said longitudinal and transversal profiles being suitable for enclosing the glass portion, wherein each of said longitudinal profiles presents at least one mechanical coupling element to a corresponding mechanical coupling element of the transversal profile.

[0011] The presence of mechanical coupling elements in the profiles permits a precise positioning of the profiles to be achieved during the assembly step of the panel, thereby avoiding the use of specific templates, as well as the subsequent step of soldering.

[0012] This results in advantages as regards the reduction of costs, the reduction of assembly times of the panels and thereby an optimisation of the relative production process.

[0013] Such a panel in addition, makes it possible to avoid both the subsequent steps of painting, often needed to cover up the scorching caused by soldering, and subsequent steps of covering the panel in that the panel

thus assembled proves complete.

[0014] According to a preferred embodiment, the invention envisages that the mechanical coupling element of the longitudinal profile comprises a tongue and that said corresponding mechanical coupling element of the transversal profile comprises a slot suitable for receiving the tongue.

[0015] Such preferred solution proves particularly simple to make, as well as achieving rapid assembly times of the panel with evident cost optimisation.

[0016] Even more preferably each longitudinal profile comprises two tongues, each positioned at one longitudinal end, and each transversal profile comprises two respective slots, each positioned substantially at one of its longitudinal ends.

[0017] According to preferred embodiments, at least one of the longitudinal or transversal profiles is provided with a groove, longitudinal in relation to its axis, suitable for receiving a rim of the glass portion.

[0018] In such case the assembly of the panel is simplified in that the groove acts as a guide and support of the glass portion which is thereby better positioned.

[0019] Preferably, the longitudinal and transversal profiles are made in aluminium or alloy thereof. This way they are particularly economical.

[0020] According to a second aspect, the invention relates to a lift cabin comprising at least one panel as described above and detailed below.

[0021] Such a cabin achieves the same advantages as those achieved by the panel.

[0022] According to a further aspect, the invention relates to an assembly method of a panel for lift doors provided with a frame and at least one glass portion, comprising the following steps:

- i. arranging at least one pair of longitudinal profiles and at least one pair of transversal profiles, each of said longitudinal profiles presenting at least one mechanical coupling element to a corresponding mechanical coupling element of the transversal profile;
- ii. positioning the first transversal profile of said pair of transversal profiles in an assembly position in relation to the frame;
- iii. resting the glass portion on the first transversal profile of said pair of transversal profiles;
- iv. fixing the first transversal profile to the frame by attachment means,
- v. positioning each longitudinal profile, in an assembly position, at a longitudinal rim of the glass portion;
- vi. mechanically coupling the two longitudinal profiles to the first transversal profile by means of the respective coupling means;
- vii. fixing the longitudinal profiles to the frame by attachment means;
- viii. positioning the second transversal profile of said pair of transversal profiles, in an assembly position, at a free transversal rim of the glass portion;
- ix. mechanically coupling the two longitudinal pro-

files to the second transversal profile by means of the respective coupling means;
 x. fixing the second transversal profile to the frame by attachment means.

[0023] Such a method makes it possible to avoid the soldering processes and thereby the aforementioned related drawbacks.

[0024] Moreover, such an assembly method permits a reduction of the times and costs of the process in that it makes it possible to prevent the panel from having to pass through a further production area, that of soldering.

[0025] Moreover, the assembly method claimed, makes it possible to avoid the painting and covering steps of the panel, as well as the use of welding templates.

[0026] Preferably, the aforementioned steps are actuated sequentially.

[0027] According to alternative actuation embodiments of the method, step iv is actuated before step iii.

[0028] Preferably, such method comprises, before step ii or iii, a step of applying silicone to the portions of the frame destined to come into contact with the glass portion.

[0029] According to preferred actuation embodiments of the method according to the invention, said attachment means comprise rivets. Such solution is particularly economical.

[0030] Preferably, the mechanical coupling element of the longitudinal profile comprises a tongue and the corresponding mechanical coupling element of the transversal profile comprises a slot suitable for receiving the tongue. Such preferred solution is also particularly economical.

[0031] For a clearer comprehension of the invention and its advantages, a description of some of the embodiments of the panel for lift doors, of the lift cabin comprising such panel and of the assembly method of panel for lift doors according to the present invention will be provided below by way of a nonlimiting examples, with reference to the appended drawings, wherein:

- figure 1 shows a perspective view of a panel for lift doors, already assembled, according to one embodiment of the invention;
- figure 2 shows an exploded view of the panel in figure 1;
- figure 3a shows a perspective view of a detail of the longitudinal profile of a panel according to the invention, and
- figure 3b shows a perspective view of a transversal profile of a panel according to the invention.

[0032] With reference to such figures, reference numeral 1 globally denotes a panel for lift doors. Such panel comprises, in the known manner, a frame 2, at least one portion in glass 3, or similar material, at least one pair of longitudinal profiles 4; and at least one pair of transversal profiles 5.

[0033] In this context the terms "longitudinal" and "transversal" refer to the assembled panel, except where specifically indicated otherwise.

[0034] The longitudinal 4 and transversal profiles 5 are suitable for enclosing the glass portion 3, that is, to keep it in its seat. They are preferably made from aluminium or its alloys or similar material.

[0035] According to the present invention, each of said longitudinal profiles 4 presents at least one mechanical coupling element to a corresponding mechanical coupling element of the transversal profile 5.

[0036] In particular, said mechanical coupling element of the longitudinal profile 4 comprises a tongue 6, or a protuberance having a smaller cross-section than that of the profile.

[0037] In the same way, each of said transversal profiles 5 presents at least one corresponding mechanical coupling element to the mechanical coupling element of the longitudinal profile 4.

[0038] In particular, said corresponding mechanical coupling element of the transversal profile 5 comprises a slot 7, or aperture, suitable for receiving a tongue 6.

[0039] According to preferred embodiments of the invention, shown in the figures, each longitudinal profile 4 comprises two tongues 6, each positioned at one of its longitudinal ends.

[0040] Moreover, according to such embodiments, each transversal profile 5 comprises two respective slots 7, each positioned substantially at one of its longitudinal ends. In particular, the distance between the two slots 7 is substantially equal to the length of the transversal rim of the glass portion 3.

[0041] Preferably, at least one of the longitudinal 4 or transversal profiles 5 is provided with a groove, longitudinal in relation to its axis, suitable for receiving a rim of the glass portion 3. These are slotted grooves, which the glass portion rests in, further simplifying the positioning of the glass. Such embodiment is not shown in the figures.

[0042] In the case shown in the figures, where grooved slots are not envisaged, the glass portion 3 is simply blocked like a sandwich between the profiles, with a reduction of the production costs of the profiles.

[0043] The present invention also relates to a lift cabin, not shown in the figures, comprising at least one panel 1 as described above.

[0044] Such cabin comprises, in the known manner, one or more panels according to the present invention and will therefore not be described further.

[0045] A method of assembling a panel 1 of lift doors according to the invention will now be described.

[0046] In particular, an assembly method of a panel 1 for lift doors provided with a frame 2 and at least one glass portion 3 will be described.

[0047] According to a first step i, such method envisages arranging at least one pair of longitudinal profiles 4 and at least one pair of transversal profiles 5, each of said longitudinal profiles 4 presenting at least one me-

chanical coupling element to a corresponding mechanical coupling element of the transversal profile 5.

[0048] According to a further step ii, the method envisages positioning the first transversal profile 5 of said pair of transversal profiles 5 in an assembly position in relation to the frame 2.

[0049] After, which a step iii is envisaged of resting the glass portion 3 on the transversal profile 5 of said pair of transversal profiles 5.

[0050] Before or after such step a step iv is envisaged of fixing the first transversal profile 5 to the frame 2 by attachment means.

[0051] Such attachment means preferably comprise rivets 8, or similar means.

[0052] After which, the longitudinal profiles 4 are positioned in an assembly position, at a longitudinal rim of the glass portion 3, according to step v.

[0053] The method according to the invention comprises then a step vi of mechanical coupling of the two longitudinal profiles 4 to the first transversal profile 5 by means of the respective coupling means.

[0054] Step vii envisages fixing the longitudinal profiles 4 to the frame 2 by attachment means. Such attachment means preferably comprise rivets 8', or similar means.

[0055] The method further comprises a step viii of positioning the second transversal profile 5 of said pair of transversal profiles 5, in an assembly position, at a free transversal rim of the glass portion 3.

[0056] After which, the two longitudinal profiles 4 are mechanically coupled to the second transversal profile 5 by means of the respective coupling means, according to step ix of the method according to the invention.

[0057] Step x envisages fixing the second transversal profile 5 to the frame 2 by means of the attachment means. Such attachment means preferably comprise rivets 8, or similar means.

[0058] The aforementioned steps are preferably performed in the order described but it is also possible to envisage a different order of assembly, while remaining within the sphere of protection of the present invention.

[0059] It is possible to envisage preferably before step ii or iii, a step of applying silicone, or similar material, to the portions of the frame 2 destined to come into contact with the glass portion 3.

[0060] As already explained above, it is advantageous to envisage that the mechanical coupling element of the longitudinal profile 4 comprises a tongue 6 and that the corresponding mechanical coupling element of the transversal profile 5 comprises a slot 7 suitable for receiving the tongue 6.

[0061] It is also advantageous to envisage the presence of longitudinal grooves, in relation to their axes, in one or more longitudinal 4 or transversal profiles 5.

[0062] A person skilled in the art may make further modifications and variations to the panel for lift doors and to the assembly method of a panel for lift doors according to the present invention so as to satisfy contingent and specific requirements, while remaining within the scope

of protection of the present invention.

Claims

1. Panel (1) for lift doors comprising:

a frame (2); at least one portion in glass (3); at least one pair of longitudinal profiles (4), and at least one pair of transversal profiles (5), said longitudinal (4) and transversal profiles (5) being suitable for enclosing the glass portion (3), each of said longitudinal profiles (4) presenting at least one mechanical coupling element to a corresponding mechanical coupling element of the transversal profile (5);
said panel (1) being **characterized in that** the transversal profiles (5) are fixed to the frame (2) by attachment means, e.g. comprising rivets (8).

2. Panel (1) according to claim 1, wherein said mechanical coupling element of the longitudinal profile (4) comprises a tongue (6) and the corresponding mechanical coupling element of the transversal profile (5) comprises a slot (7) suitable for receiving the tongue (6).

3. Panel (1) according to claim 2, wherein each longitudinal profile (4) comprises two tongues (6), each positioned at one of its longitudinal ends, and each transversal profile (5) comprises two at one of its longitudinal ends.

4. Panel (1) according to any of the previous claims, wherein at least one of the longitudinal (4) or transversal profiles (5) is provided with a groove, longitudinal in relation to its axis, suitable for receiving a rim of the glass portion (3).

5. Panel (1) according to any of the previous claims, wherein the longitudinal (4) and transversal profiles (5) are made in aluminium or alloy thereof.

6. Lift cabin comprising at least one panel (1) according to any of the previous claims,

7. Assembly method of a panel (1) for lift doors provided with a frame (2) and at least one glass portion (3), comprising the following steps:

i. arranging at least one pair of longitudinal profiles (4) and at least one pair of transversal profiles (5), each of said longitudinal profiles (4) presenting at least one mechanical coupling element to a corresponding mechanical coupling element of the transversal profile (5).

ii. positioning the first transversal profile (5) of said pair of transversal profiles (5) in an assem-

- bly position in relation to the frame (2);
 iii. resting the glass portion (3) on the first transversal profile (5) of said pair of transversal profiles (5);
 iv. fixing the first transversal profile (5) to the frame (2) by attachment means,
 v. positioning each longitudinal profile (4), in an assembly position, at a longitudinal rim of the glass portion (3);
 vi. mechanically coupling the two longitudinal profiles (4) to the first transversal profile (5) by means of the respective coupling means;
 vii. fixing the longitudinal profiles (4) to the frame (2) by attachment means;
 viii. positioning the second transversal profile (5) of said pair of transversal profiles (5), in an assembly position, at a free transversal rim of the glass portion (3);
 ix. mechanically coupling the two longitudinal profiles (4) to the second transversal profile (5) by means of the respective coupling means;
 x. fixing the second transversal profile (5) to the frame (2) by attachment means.
8. Assembly method of a panel (1) according to claim 7, wherein the aforementioned steps are actuated sequentially.
9. Assembly method of a panel (1) according to claim 7, wherein step iv is actuated before step iii.
10. Assembly method of a panel (1) according to any of the claims 7-9 comprising, before step ii or iii, a step of applying silicone to the portions of frame (2) destined to come into contact with the glass portion (3).
11. Assembly method of a panel (1) according to any of the claims 7-10, wherein said attachment means comprise rivets (8).
12. Assembly method of a panel (1) according to any of the claims 7-11, wherein said mechanical coupling element of the longitudinal profile (4) comprises a tongue (6) and said corresponding mechanical coupling element of the transversal profile (5) comprises a slot (7) suitable for receiving the tongue (6).
- Patentansprüche**
1. Platte (1) für Aufzugtüren, die umfasst: einen Rahmen (2); wenigstens einen Abschnitt in Glas (3); wenigstens ein Paar von Längsprofilen (4) und wenigstens ein Paar von Querprofilen (5), wobei die Längs-(4) und Querprofile (5) geeignet sind, um den Glasabschnitt (3) zu umschließen, wobei jedes der Längsprofile (4) wenigstens ein mechanisches Kopplungselement mit einem entsprechenden mechanischen Kopplungselement des Querprofils (5) bietet;
 wobei die Platte (1) **dadurch gekennzeichnet ist, dass** die Querprofile (5) durch Befestigungsmittel, die z.B. Nieten (8) umfassen, an dem Rahmen (2) befestigt sind.
2. Platte (1) nach Anspruch 1, wobei das mechanische Kopplungselement des Längsprofils (4) eine Zunge (6) umfasst und das entsprechende mechanische Kopplungselement des Querprofils (5) einen Schlitz (7) umfasst, der geeignet ist, um die Zunge (6) aufzunehmen.
3. Platte (1) nach Anspruch 2, wobei jedes der Längsprofile (4) zwei Zungen (6) umfasst, von denen jede an einem seiner Längsenden positioniert ist, und wobei jedes Querprofil (5) zwei jeweilige Schlitz (7) umfasst, die jeweils im Wesentlichen an einem seiner Längsenden positioniert sind.
4. Platte (1) nach einem der vorhergehenden Ansprüche, wobei wenigstens eines der Längs- (4) oder Querprofile (5) mit einer Nut versehen ist, die in Bezug auf seine Achse längs ist und dazu geeignet ist, einen Rand des Glasabschnitts (3) aufzunehmen.
5. Platte (1) nach einem der vorhergehenden Ansprüche, wobei die Längs- (4) oder Querprofile (5) aus Aluminium oder einer Legierung davon hergestellt sind.
6. Aufzugskabine, die wenigstens eine Platte (1) nach einem der vorhergehenden Ansprüche umfasst.
7. Montageverfahren einer Platte (1) für Aufzugtüren, die mit einem Rahmen (2) und wenigstens einem Glasabschnitt (3) versehen ist, das die folgenden Schritte umfasst:
- i. Anordnen wenigstens eines Paares von Längsprofilen (4) und wenigstens eines Paares von Querprofilen (5), wobei jedes der Längsprofile (4) wenigstens ein mechanisches Kopplungselement mit einem entsprechenden mechanischen Kopplungselement des Querprofils (5) umfasst;
 ii. Positionieren des ersten Querprofils (5) des Paares von Querprofilen (5) in einer Montageposition in Bezug auf den Rahmen (2);
 iii. Auflegen des Glasabschnitts (3) auf das erste Querprofil (5) des Paares von Querprofilen (5);
 iv. Befestigen des ersten Querprofils (5) an dem Rahmen (2) mittels Befestigungsmitteln;
 v. Positionieren jedes Längsprofils (4) in einer Montageposition an einem Längsrand des Glasabschnitts (3);
 vi. mechanisches Koppeln der zwei Längsprofile

- (4) mit dem ersten Querprofil (5) mittels der jeweiligen Kopplungsmittel;
vii. Befestigen der Längsprofile (4) an dem Rahmen (2) mittels Befestigungsmitteln;
viii. Positionieren des zweiten Querprofils (5) des Paares von Querprofilen (5) in einer Montageposition an einem freien Querrand des Glasabschnitts (3);
ix. mechanisches Koppeln der zwei Längsprofile (4) mit dem zweiten Querprofil (5) mittels der jeweiligen Kopplungsmittel;
x. Befestigen des zweiten Querprofils (5) an dem Rahmen (2) durch Befestigungsmittel.
8. Montageverfahren nach Anspruch 7, wobei die vorstehend erwähnten Schritte der Reihe nach betätigt werden. 15
9. Montageverfahren einer Platte (1) nach Anspruch 7, wobei der Schritt iv vor dem Schritt iii betätigt wird. 20
10. Montageverfahren einer Platte (1) nach einem der Ansprüche 7 - 9, das vor dem Schritt ii oder iii einen Schritt zum Aufbringen von Silikon auf die Abschnitte des Rahmens (2) umfasst, die dafür bestimmt sind, in Kontakt mit dem Glasabschnitt (3) zu kommen. 25
11. Montageverfahren einer Platte (1) nach einem der Ansprüche 7 - 10, wobei die Befestigungsmittel Nieten (8) umfassen. 30
12. Montageverfahren einer Platte (1) nach einem der Ansprüche 7 - 11, wobei das mechanische Koppelungselement des Längsprofils (4) eine Zunge (6) umfasst und das entsprechende mechanische Koppelungselement des Querprofils (5) einen Schlitz (7) umfasst, der geeignet ist, um die Zunge (6) aufzunehmen. 35
- Revendications** 40
1. Panneau (1) pour portes d'ascenseur, comprenant :
- un cadre (2), au moins une partie en verre (3), au moins une paire de profilés longitudinaux (4) et au moins une paire de profilés transversaux (5), les profilés longitudinaux (4) et transversaux (5) étant adaptés pour entourer la partie en verre (3), chacun des profilés longitudinaux (4) comprenant au moins un élément d'accouplement mécanique pour un élément d'accouplement mécanique correspondant du profilé transversal (5), la panneau (1) étant **caractérisé en ce que** les profilés transversaux (5) sont fixés au cadre (2) à l'aide de moyens de fixation comprenant par exemple des rivets (8). 45
2. Panneau (1) selon la revendication 1, **caractérisé en ce que** l'élément d'accouplement mécanique du profilé longitudinal (4) comprend une languette (6) et l'élément d'accouplement mécanique correspondant du profilé transversal (5) comprend une fente (7) adaptée pour recevoir la languette (6). 5
3. Panneau (1) selon la revendication 2, **caractérisé en ce que** chaque profilé longitudinal (4) comprend deux languettes (6), chacune disposée à une de ses extrémités longitudinales, et chaque profilé transversal (5) comprend deux fentes respectives (7), chacune disposée à une de ses extrémités longitudinales. 10
4. Panneau (1) selon l'une des revendications précédentes, **caractérisé en ce qu'**au moins un des profilés longitudinaux (4) ou transversaux (5) est pourvu d'une rainure longitudinale par rapport à son axe, adaptée pour recevoir un bord de la partie en verre (3). 15
5. Panneau (1) selon l'une des revendications précédentes, **caractérisé en ce que** les profilés longitudinaux (4) et transversaux (5) sont faits en aluminium ou en un alliage de celui-ci. 20
6. Cabine d'ascenseur comprenant au moins un panneau (1) selon l'une des revendications précédentes. 25
7. Procédé d'assemblage d'un panneau (1) pour portes d'ascenseur ayant un cadre (2) et au moins une partie en verre (3), comprenant les étapes suivantes :
- i. mettre à disposition au moins une paire de profilés longitudinaux (4) et au moins une paire de profilés transversaux (5), chacun des profilés longitudinaux (4) comprenant au moins un élément d'accouplement mécanique pour un élément d'accouplement mécanique correspondant du profilé transversal (5) ;
ii. positionner le premier profilé transversal (5) de la paire de profilés transversaux (5) dans une position d'assemblage par rapport au cadre (2) ;
iii. poser la partie en verre (3) sur le premier profilé transversal (5) de la paire de profilés transversaux (5) ;
iv. fixer le premier profilé transversal (5) sur le cadre (2) à l'aide de moyens de fixation ;
v. positionner chaque profilé longitudinal (4), dans une position d'assemblage, sur un bord longitudinal de la partie en verre (3) ;
vi. accoupler mécaniquement les deux profilés longitudinaux (4) au premier profilé transversal (5) à l'aide des moyens respectifs d'accouplement ;
vii. fixer les profilés longitudinaux (4) au cadre 30

- (2) à l'aide de moyens de fixation ;
 viii. positionner le deuxième profilé transversal (5) de la paire de profilés transversaux (5), dans une position d'assemblage, sur un bord transversal libre de la partie en verre (3) ; 5
 ix. accoupler mécaniquement les deux profilés longitudinaux (4) au deuxième profilé transversal (5) à l'aide des moyens respectifs d'accouplement ;
 x. fixer le deuxième profilé transversal (5) au cadre (2) à l'aide de moyens de fixation. 10
8. Procédé d'assemblage d'un panneau (1) selon la revendication 7, **caractérisé en ce que** les étapes mentionnées ci-avant sont mises en oeuvre dans un ordre séquentiel. 15
9. Procédé d'assemblage d'un panneau (1) selon la revendication 7, **caractérisé en ce que** l'étape iv. est mise en oeuvre avant l'étape iii. 20
10. Procédé d'assemblage d'un panneau (1) selon l'une des revendications 7 à 9, comprenant avant l'étape ii. ou iii. une étape d'application de silicone aux parties du cadre (2) destinées à venir en contact avec la partie en verre (3). 25
11. Procédé d'assemblage d'un panneau (1) selon l'une des revendications 7 à 10, **caractérisé en ce que** les moyens de fixation comprennent des rivets (8). 30
12. Procédé d'assemblage d'un panneau (1) selon l'une des revendications 7 à 11, **caractérisé en ce que** l'élément d'accouplement mécanique du profilé longitudinal (4) comprend une languette (6) et l'élément d'accouplement mécanique correspondant du profilé transversal (5) comprend une fente (7) adaptée pour recevoir la languette (6). 35

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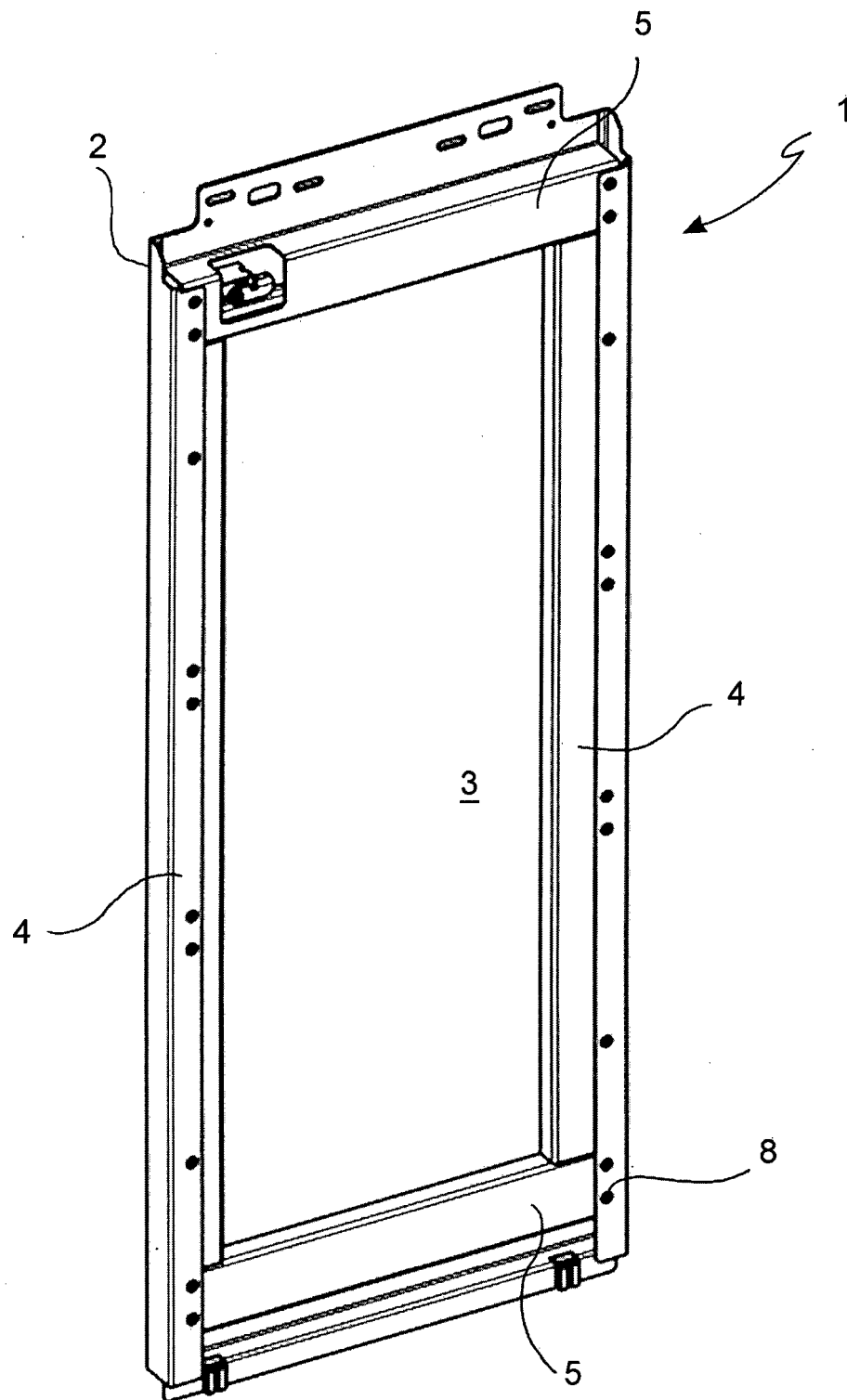


FIG. 1

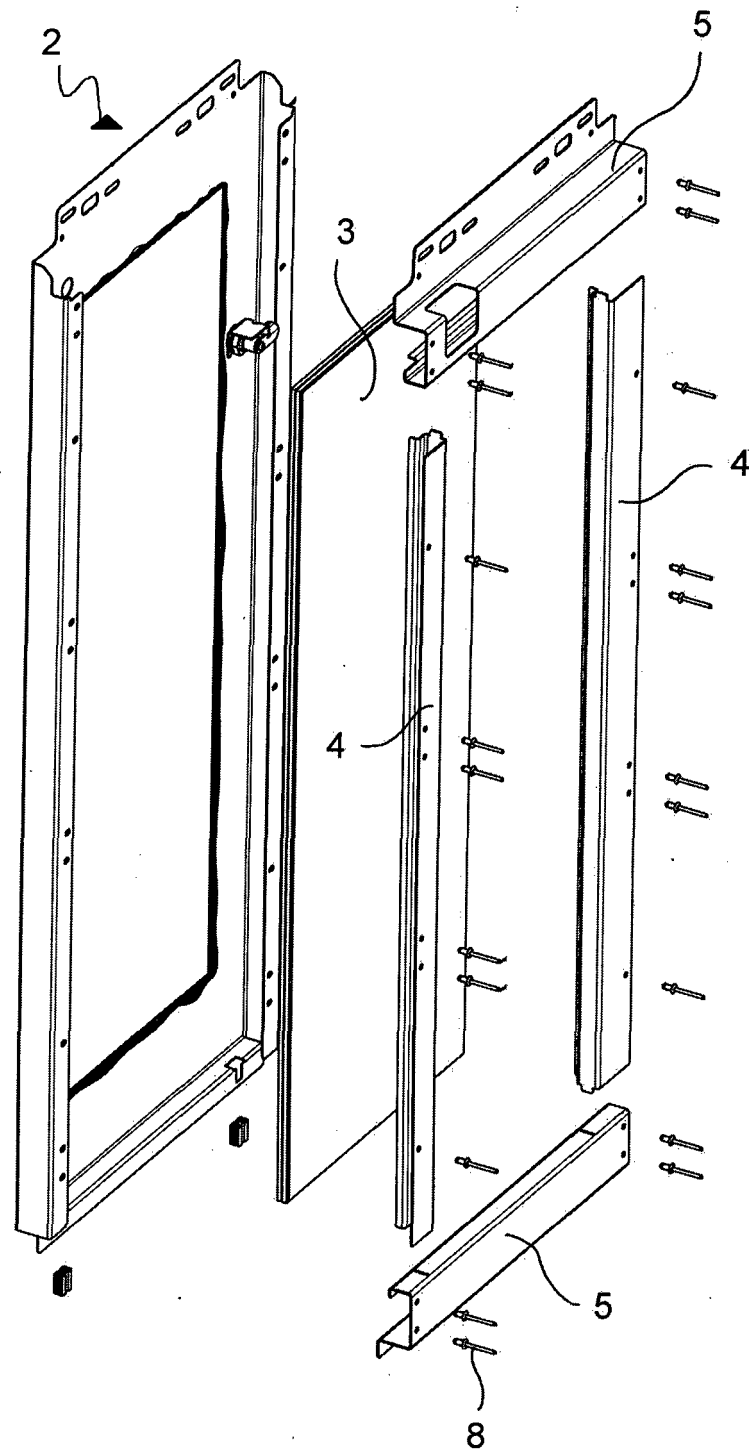


FIG. 2

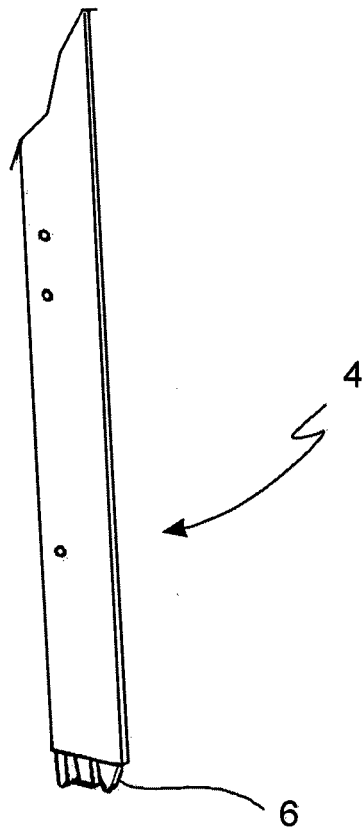


FIG. 3a

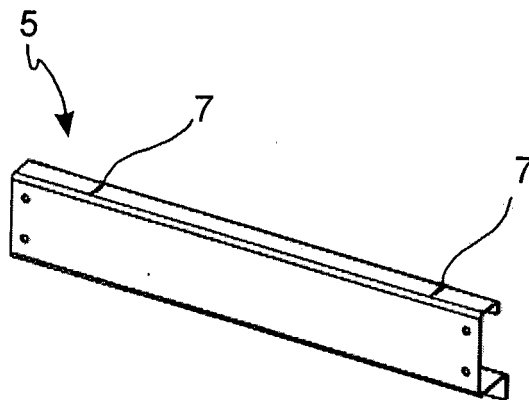


FIG. 3b

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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