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(54) **Sash window and method of assembling thereof**

Schiebefenster und Verfahren zur dessen Montage

Fenêtre à guillotine et son procédé d'assemblage

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Description

[0001] The present invention relates to a sash window consisting of a window frame which, in turn, has the inner and outer sashes that can move vertically within the window frame.

[0002] Sash windows are used in many buildings, and they are particularly characteristic of buildings belonging to a certain historical period and style. Such sash windows usually consist of the outer frame with the upper and lower sliding sashes installed in different vertical planes within the frame. The positions of sliding sashes are arranged in such a way that when the window is closed, the sashes fully cover the inner part of the frame. In order to open the window, one of the sashes is moved vertically up or down so that it covers the other sash. A variety of latching mechanisms can be used to retain sashes in the open position.

[0003] Usually the upper and lower sashes are installed within the frame by first inserting from the inner side of the window frame the upper sliding sash, thereafter a vertical partition separating the inside of the frame into two separate vertical and parallel channels for the upper and lower sliding sashes, and, finally, the lower sliding sash which is then restrained in its position by separate holding strips or brackets affixed to the inner side of the window frame in front of the edge of the lower sliding sash. Such design of sash windows is described, for example, in a patent application No. GB2488329.

[0004] Sash windows of such design have a deficiency whereby the aforementioned strips or brackets of the lower sliding sash in the window frame impair the aesthetic view of the entire sash window, since the window visually has additional fasteners, and, moreover, they weaken the entire structure of the sash window.

[0005] Australian patent application No. AU2010201588 describes a sash window assembly including a pair of jambs and a pair of rails for fastening to respective jambs. Each rail includes a body and a pair of beads which can be releasably fastened relative to the body to form a pair of window channels. Each bead can be readily unfastened from its body to provide access to the internal window assembly. The window assembly further includes a quartet of spacers for locating within respective window channels to locate respective beads. A pair of windows is located within the window channels and move along the rails. US 2,720,682 discloses a sash window with the features of the preamble of claim 1, as well as a method for the assembly of the sash window.

[0006] The goal of this invention is to eliminate the above-mentioned shortcomings and to simplify the process of assembling the sash window. Unlike the previous sash windows, where the upper and lower sliding sashes are installed within the window frame by restraining them from the one side with peripheral edges of the window frame itself and from another side with additional elements for fixing the lower sliding sash within the window frame, the sash-window of the present invention has no

additional elements for fixing the lower or upper sashes the window frame, and visually appears alike both from the inner and outer sides of the sash window. The inventive sash window is defined in independent claim 1, and the method for assembling the inventive sash window is defined in independent claim 4.

[0007] In an embodiment of the invention, this was implemented in the following way. The frame of the sash window has two separate vertical U-shaped profiles formed from a metal sheet, interconnected with their lateral surfaces to make two vertical channels separately for each sliding sash. The inner horizontal distance between the U-shaped profiles placed in the left and right sides of the frame and being in the same vertical plane is slightly larger than the width of the sliding sash, and is equal to the sum of the sash thickness and the thickness of intermediate laths fitted on each side of the window frame between the U-shaped profiles and the edge of the sash window, whereas the distance between the outer edges of the U-shaped profiles placed in the left and right sides of the window frame and being in the same vertical plane is less than the sliding sash by the thickness of the two intermediate laths. Intermediate laths are pre-fitted to the one side of the U-shaped profiles of the sash window frame with screws, or glue. Afterwards, one edge of the sliding sash is inserted into the side of the U-shaped profile of the sash window frame with no intermediate laths, the other edge of the sliding pane is then turned inwards of the frame, and the entire sliding sash is pressed to the intermediate lath on the opposite side of the U-shaped profile, thus forming a gap on the other side between the edge of the sliding sash and the U-shaped profile. The sash inserted between the two vertical U-shaped profiles of the window frame is lifted up, and the intermediate laths are inserted from the bottom into the free gap between the sliding sash and the U-shaped profile and attached to the inner side of the U-shaped profile, thus finally forming the channels between the opposite U-shaped profiles for sliding the window. The other sliding sash is installed in exact same way on the opposite side of the window frame.

[0008] The sash-window of such design is characterized by the absence of any additional individual elements for the attachment of the sash window within the window frame, and visually it looks the same from the outside and the inside of the window frame. The elements for the attachment of the sash window within the window frame do not need to be dismantled in order to remove the window, when it becomes necessary. One has just to lift the removable sliding window all the way to the top, remove the intermediate laths from the one side of the window frame, push the window down, press one side of it against the U-shaped profile with the removed intermediate laths, rotate the opposite side of the sliding window outwards and pull it off.

[0009] Below the invention will be described in more detail with reference to the attached drawings, in which:

Fig. 1 shows the partial section view of the sash window demonstrating the entire window structure;
 Fig. 2 shows the view of the sash window of the present invention with intermediate laths removed from the one side of the window frame;
 Fig. 3 shows the view of the sash window with one edge of the sliding sash inserted into the frame;
 Fig. 4 shows the top section view of Fig. 2;
 Fig. 5 shows the sash window with the sliding pane inserted within the window frame;
 Fig. 6 is the top section view of Fig. 4;
 Fig. 7 shows the sash window with a sliding sash inserted within the window frame, pressed against the opposite side of the frame and lifted up;
 Fig. 8 is the sash window view with one intermediate lath inserted;
 Fig. 9 is the sash window view with the second intermediate lath inserted;
 Fig. 10 shows the top section view of the finally assembled sash-window.

[0010] As shown in Fig. 1, the sash window consists of a metal frame 1 with two U-shaped profiles 2 installed on left and right sides of the window frame 1. The U-shaped profiles 2 are formed from the metal sheet or another similar material and are interconnected to each other with their outer surfaces. The profiles 2 provide channels to slide each individual sash 3 and 4. Both the inner and outer sides of the sash window frame 1 are covered with decorative finishing strips 5.

[0011] Laths 6 are inserted on one side of the frame and laths 7 on the other side of the frame between the U-shaped profiles 2 and the edges of the sliding sashes 3 and 4.

[0012] The sash window of such design is characterized by the absence of any additional individual elements for mounting the sliding sash 3 or 4 within the frame 1, and the visual appearance thereof is the same from both the outside and inside of the window frame 1.

[0013] The mounting of the sash window of such design starts with the installation of all intermediate laths 6 in both interconnected profiles 2 of one side of the window frame 1, whereas the only one intermediate lath 7 is mounted on each of the both interconnected profiles 2 on the other side of the window frame 1 by attaching the laths 6 and 7 to the inner surfaces of the profiles 2 with screws or glue. Thus, we have the frame of the sash window shown in Fig. 2. Then, as shown in Fig. 3, one edge of the sliding sash 3 is inserted into the side 1 of the window frame 1 without intermediate laths 7 by pressing it against the inner surface of the profile 2. We then have the installation as shown in Fig. 4. Next, the opposite edge of the sash 3 that remains outside of the window frame 1 is turned inwards the frame 1 and the entire edge of the whole sash 3 is pressed against the intermediate lath 6 on the opposite side of the U-shaped profile 2, thus forming a narrow gap on the other side between the window frame 3 and the U-shaped profile 2, as shown in Fig.

5. The sliding sash 3 that is inserted between the two vertical U-shaped profiles 2 on the opposing sides of the window frame 1, as shown in Fig. 6, is then lifted up to obtain the situation shown in Fig. 7. The intermediate laths 7 are inserted one-by-one from the bottom into the resulting empty gap between the edge of the sliding sash 3 and the inner surface of the U-shaped profile 2, as shown in Fig. 8 and 9, thus finally assembling the sash window and forming channels for sliding the sash 3 between the U-shaped profiles 2 on the opposite sides of the window frame 1.

[0014] The other sliding sash 4 is installed in exact same way on the opposite side of the window frame. The section view of the assembled sash window is shown in Fig. 10.

[0015] For the sashes 3, 4 to slide smoothly in their vertical planes between the profiles 2 on the opposite sides of the window frame 1, the inner horizontal distance A between the inner surfaces of the U-shaped profiles 2 appearing on the opposite sides of the window frame 1 and in the same vertical plane is 3-5 mm larger than the sum of the thicknesses of the sliding sash 3 or 4 and the corresponding intermediate laths 6 and 7 of the sash 3 or 4. To insert in or remove the sliding sashes from the window frame 1, the distance B between the external edges of the U-shaped profiles 2 appearing on the opposite sides of the window frame 1 and in the same vertical plane is less than the width of the sliding sash 3 or 4 by the sum of the thicknesses of the intermediate laths 6 and 7.

[0016] The sash window of such design is characterized by the absence of any additional individual elements for mounting the sliding sashes 3 and 4 inside the window frame 1 and visually looks the same from both the outside and inside of the window frame. The elements for mounting the sash window within the window frame 1 do not need to be dismantled in order to remove the window, when it becomes necessary. It is just enough to lift the removable sliding sash 3 or 4 up all the way to the top, remove the intermediate laths 6 and 7 from one side of the window, press the sash with one of its edges against the U-shaped profile 2 with removed intermediate laths, turn the opposite edge of the sliding sash outwards from the window frame and pull it out.

Claims

1. A sash window comprising a window frame (1) with at least two sliding sashes (3, 4) installed within the frame (1), whereby the window frame (1) comprises two U-shaped profiles (2) on each side of the frame (1), **characterized in that**

- the U-shaped profiles (2) are having legs which are interconnected with their outer surfaces to the frame (1) and making two vertical channels

in two vertical and parallel to each other planes for each single sliding sash (3, 4);

- multiple intermediate laths (6, 7) are attached to the inner surfaces of each of the U-shaped profiles (2) of the window frame (1) with screws or glue;

- the sliding sashes (3, 4) are mounted in each vertical plane between the intermediate laths (6, 7) appearing between the legs of the U-shaped profiles (2) of the frame (1).

2. The sash window according to claim 1, **characterized in that** the inner horizontal distance (A) between the inner surfaces of the U-shaped profiles (2) appearing on the opposite sides of the window frame (1) and in the same vertical plane is 3-5 mm larger than the sum of thickness of the sliding sash (3) or (4) and the total thickness of both corresponding intermediate laths (6) and (7).

3. The sash window according to claim 1, **characterized in that** the distance (B) between the outer edges of the U-shaped profiles (2) appearing on the opposite sides of the window frame (1) and in the same vertical plane is less than the width of the sliding sash (3) or (4) by the total thickness of two intermediate laths (6) and (7).

4. A method of assembling the sash window according to claims 1 to 3, comprising assembling of the sliding sashes (3, 4) in the window frame (1), comprising the steps of

a) mounting all intermediate laths (6) in both interconnected profiles (2) of one side of the window frame (1) and only one upper intermediate lath (7) on both interconnected profiles (2) on the other side of the window frame (1), by attaching the laths (6, 7) to the inner surfaces of the profiles (2) with screws or glue;

b) inserting one edge of the sliding sash (3) into the side of the window frame (1) without intermediate laths (7) and pressing against the inner surface of the profile (2);

c) turning the edge of the sash (3) remaining outside the window frame (1) inwards the frame (1) and pressing the entire edge of the sliding sash (3) against the opposite intermediate lath (6) on the opposite side of the U-shaped profile (2), thus forming a gap on the opposite side between the edge of the sliding sash (3) and the inner surface of the U-shaped profile (2);

d) lifting up the sliding sash (3) inserted between two vertical U-shaped profiles (2) on both opposite sides of the window frame (1) and pressed against the intermediate lath (6);

e) inserting the intermediate laths (7) one-by-one from the bottom into the resulting empty gap

between the edge of the sliding sash (3) and the inner surface of the U-shaped profile (2) and attaching them to the inner surface of the U-shaped profile, thus completing the assembling of the sash window and forming the channels between the U-shaped profiles (2) on the opposite sides of the window frame (1) for the sliding of the sash (3);

f) repeating the steps b) to e) on the other side of the window frame (1) to mount the another sliding sash (4).

Patentansprüche

1. Schiebefenster, umfassend einen Fensterrahmen (1) mit mindestens zwei Schiebeflügeln (3, 4), die im Rahmen (1) eingebaut sind, wobei der Fensterrahmen (1) zwei U-förmige Profile (2) an jeder Seite des Rahmens (1) umfasst, **dadurch gekennzeichnet, dass**

- die U-förmigen Profile (2) Schenkel haben, die mit ihren Außenflächen mit dem Rahmen (1) verbunden sind und zwei vertikale Kanäle in zwei vertikal und parallel zueinander liegenden Ebenen für jeden einzelnen Schiebeflügel (3, 4) bilden;

- mehrere Zwischenflügel (6, 7) an den Innenflächen jedes der U-förmigen Profile (2) des Fensterrahmens (1) mit Schrauben oder Klebstoff befestigt sind;

- die Schiebeflügel (3, 4) in jeder vertikalen Ebene zwischen den Zwischenflügeln (6, 7) montiert sind, die zwischen den Schenkeln der U-förmigen Profile (2) des Rahmens (1) erscheinen.

2. Schiebefenster nach Anspruch 1, **dadurch gekennzeichnet, dass** der innere horizontale Abstand (A) zwischen den Innenflächen der U-förmigen Profile (2), die an den gegenüberliegenden Seiten des Fensterrahmens (1) und in derselben vertikalen Ebene erscheinen, 3 - 5 mm größer ist als die Summe der Dicke des Schiebeflügels (3) oder (4) und der Gesamtdicke beider entsprechender Zwischenflügel (6) und (7).

3. Schiebefenster nach Anspruch 1, **dadurch gekennzeichnet, dass** der Abstand (B) zwischen den Außenrändern der U-förmigen Profile (2), die an den gegenüberliegenden Seiten des Fensterrahmens (1) und in derselben vertikalen Ebene erscheinen, um die Gesamtdicke von zwei Zwischenflügeln (6) und (7) kleiner ist als die Breite des Schiebeflügels (3) oder (4) .

4. Verfahren zum Zusammenbauen des Schiebefensters nach Ansprüchen 1 bis 3, umfassend ein Zu-

sammenbauen der Schiebeflügel (3, 4) im Fensterrahmen (1), umfassend die Schritte

- a) Montieren aller Zwischenflügel (6) in beiden verbundenen Profilen (2) einer Seite des Fensterrahmens (1) und nur eines oberen Zwischenflügels (7) an beiden verbundenen Profilen (2) an der anderen Seite des Fensterrahmens (1) durch Befestigen der Flügel (6, 7) an den Innenflächen der Profile (2) mit Schrauben oder Klebstoff; 5
- b) Einsetzen eines Randes des Schiebeflügels (3) in die Seite des Fensterrahmens (1) ohne Zwischenflügel (7) und Pressen gegen die Innenfläche des Profils (2); 10
- c) Drehen des Randes des Flügels (3), der außerhalb des Fensterrahmens (1) verbleibt, vom Rahmen (1) nach innen und Pressen des gesamten Randes des Schiebeflügels (3) gegen den gegenüberliegenden Zwischenflügel (6) an der gegenüberliegenden Seite des U-förmigen Profils (2), wodurch ein Spalt an der gegenüberliegenden Seite zwischen dem Rand des Schiebeflügels (3) und der Innenfläche des U-förmigen Profils (2) gebildet wird; 20
- d) Anheben des Schiebeflügels (3), der zwischen zwei vertikalen U-förmigen Profilen (2) an beiden Seiten des Fensterrahmens (1) eingesetzt und gegen den Zwischenflügel (6) gepresst ist; 25
- e) Einsetzen der Zwischenflügel (7) einzeln vom Boden in den resultierenden leeren Spalt zwischen dem Rand des Schiebeflügels (3) und der Innenfläche des U-förmigen Profils (2) und Befestigen derselben an der Innenfläche des U-förmigen Profils, wodurch der Zusammenbau des Schiebefensters vollendet ist und die Kanäle zwischen den U-förmigen Profilen (2) an den gegenüberliegenden Seiten des Fensterrahmens (1) zum Schieben des Flügels (3) gebildet sind; 30
- f) Wiederholen der Schritte b) bis e) an der anderen Seite des Fensterrahmens (1) zur Montage des anderen Schiebeflügels (4). 35

Revendications

1. Fenêtre à guillotine comprenant un cadre de fenêtre (1) avec au moins deux châssis coulissants (3, 4) installés à l'intérieur du cadre (1), moyennant quoi le cadre de fenêtre (1) comprend deux profilés en forme de U (2) de chaque côté du cadre (1), **caractérisée en ce** 50
 - **que** les profilés en forme de U (2) ont des branches interconnectées avec leurs surfaces extérieures avec le cadre (1) et formant deux canaux 55

verticaux dans deux plans verticaux et parallèles entre eux pour chaque châssis coulissant (3, 4) individuel ;

- **qu'**une pluralité de lattes intermédiaires (6, 7) sont reliées aux surfaces intérieures de chacun des profilés en forme de U (2) du cadre de fenêtre (1) avec des vis ou de la colle ;

- **que** les châssis coulissants (3, 4) sont montés dans chaque plan vertical entre les lattes intermédiaires (6, 7) apparaissant entre les branches des profilés en forme de U (2) du cadre (1) .

2. Fenêtre à guillotine selon la revendication 1, **caractérisée en ce que** la distance horizontale intérieure (A) entre les surfaces intérieures des profilés en forme de U (2) apparaissant sur les côtés opposés du cadre de fenêtre (1) et dans le même plan vertical est de 3 - 5 mm plus grande que la somme de l'épaisseur du châssis coulissant (3) ou (4) et l'épaisseur totale des deux châssis intermédiaires (6) et (7) correspondants. 15

3. Fenêtre à guillotine selon la revendication 1, **caractérisée en ce que** la distance (B) entre les bords extérieurs des profilés en forme de U (2) apparaissant sur les côtés opposés du cadre de fenêtre (1) et dans le même plan vertical est inférieure à la largeur du châssis coulissant (3) ou (4) par l'épaisseur totale de deux châssis intermédiaires (6) et (7). 25

4. Procédé d'assemblage de la fenêtre à guillotine selon les revendications 1 à 3, comprenant l'assemblage des châssis coulissants (3, 4) dans le cadre de fenêtre (1), comprenant les étapes suivantes : 30

- a) le montage de toutes les lattes intermédiaires (6) dans les deux profilés interconnectés (2) d'un côté du cadre de fenêtre (1) et de seulement une latte intermédiaire supérieure (7) sur les deux profilés interconnectés (2) de l'autre côté du cadre de fenêtre (1) en fixant les lattes (6, 7) aux surfaces intérieures des profilés (2) avec des vis ou de la colle ;

- b) l'insertion d'un bord du châssis coulissant (3) dans le côté du cadre de fenêtre (1) sans lattes intermédiaires (7) et l'application par pression contre la surface intérieure du profilé (2) ;

- c) la mise en rotation du bord du châssis (3) restant à l'extérieur du cadre de fenêtre (1) vers l'intérieur du cadre (1) et l'application par pression du bord entier du châssis coulissant (3) contre la latte intermédiaire opposée (6) du côté opposé du profilé en forme de U (2) en formant ainsi un espace du côté opposé entre le bord du châssis coulissant (3) et la surface intérieure du profilé en forme de U (2) ;

- d) le soulèvement du châssis coulissant (3) inséré entre deux profilés en forme de U verticaux

(2) sur les deux côtés opposés du cadre de fenêtre (1) et appliqué par pression contre la latte intermédiaire (6) ;

e) l'insertion des lattes intermédiaires (7) une par une à partir du bas dans l'espace vide résultant entre le bord du châssis coulissant (3) et la surface intérieure du profilé en forme de U (2) et leur fixation sur la surface intérieure du profilé en forme de U en achevant ainsi l'assemblage de la fenêtre à guillotine et en formant les canaux entre les profilés en forme de U (2) des côtés opposés du cadre de fenêtre (1) pour le coulis-

sement du châssis (3) ;
f) la répétition des étapes b) à e) de l'autre côté du cadre de fenêtre (1) pour monter l'autre châssis coulissant (4).

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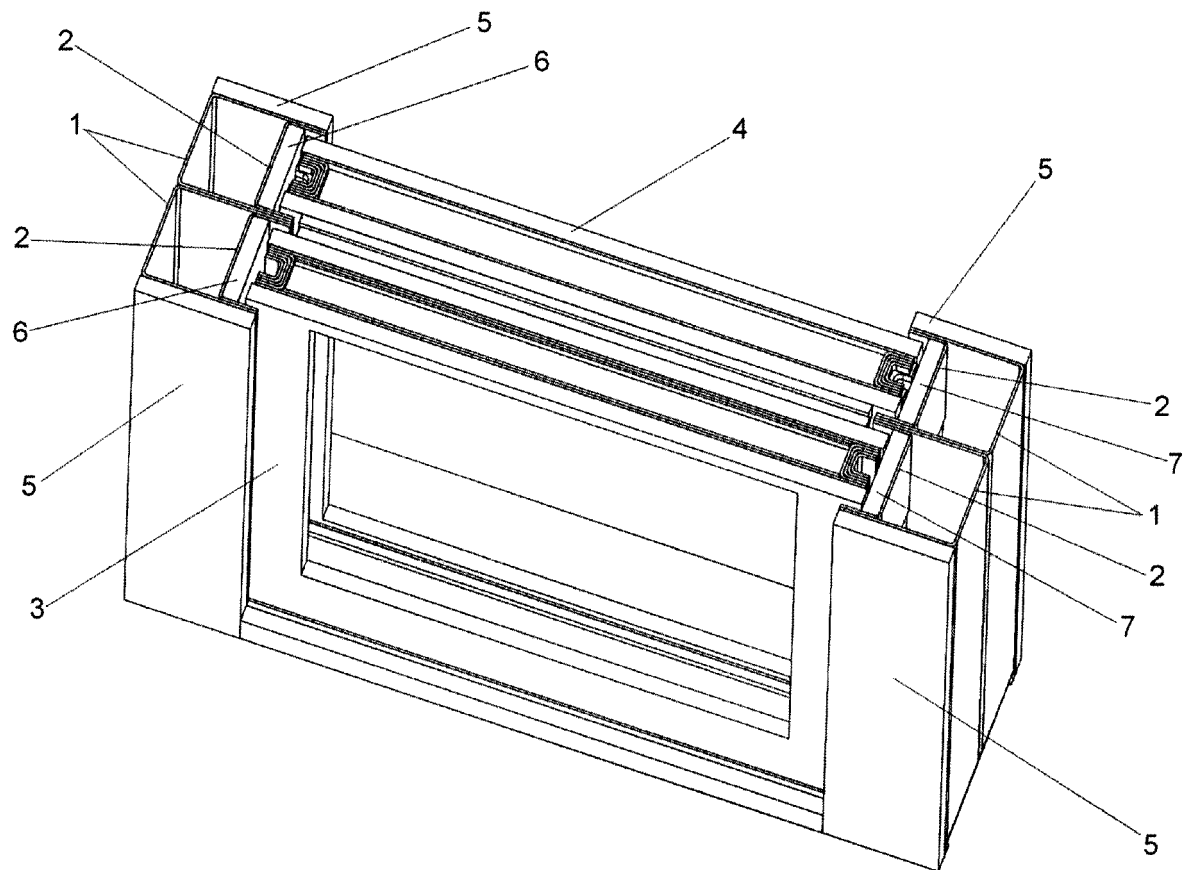


Fig. 1

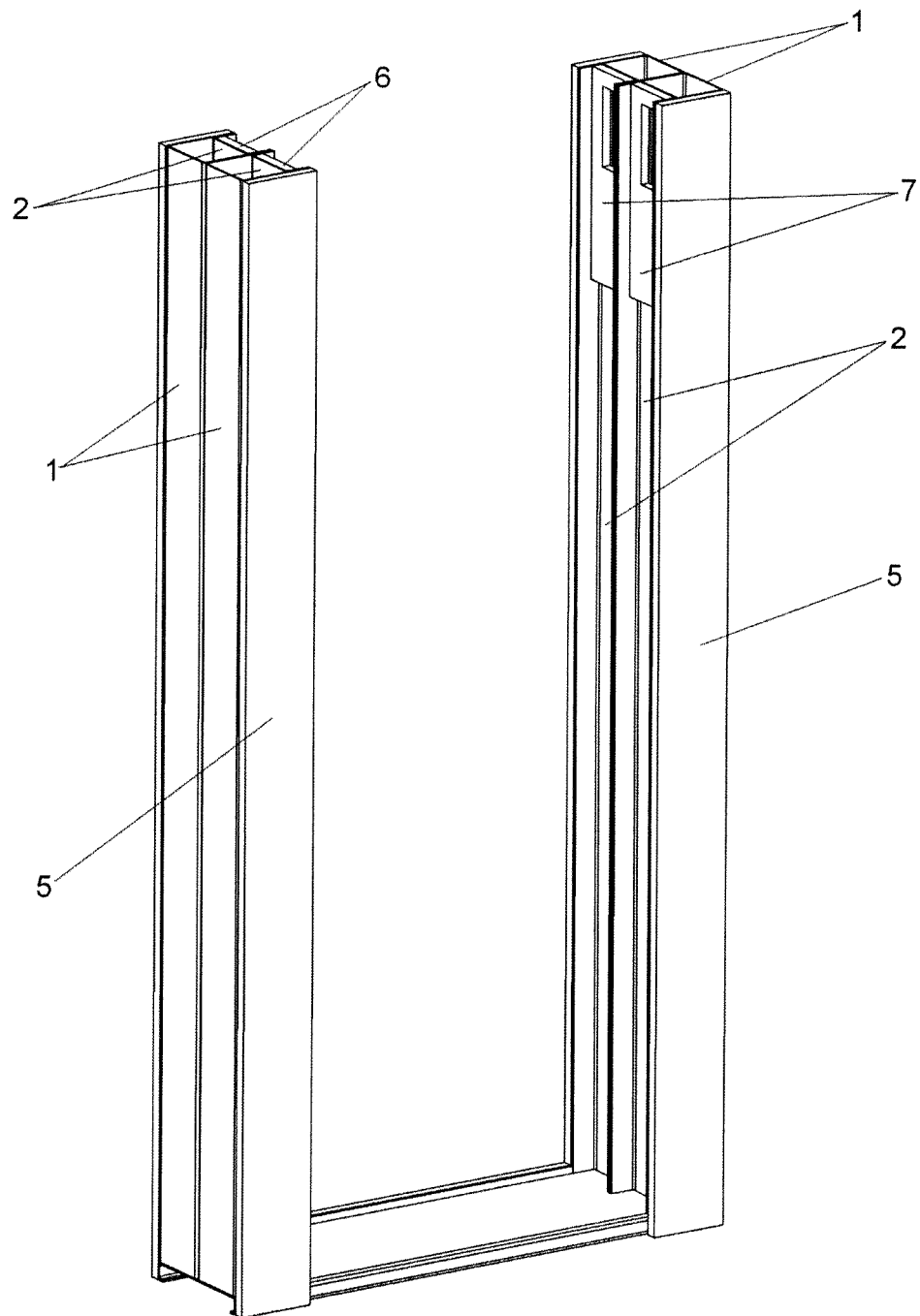


Fig. 2

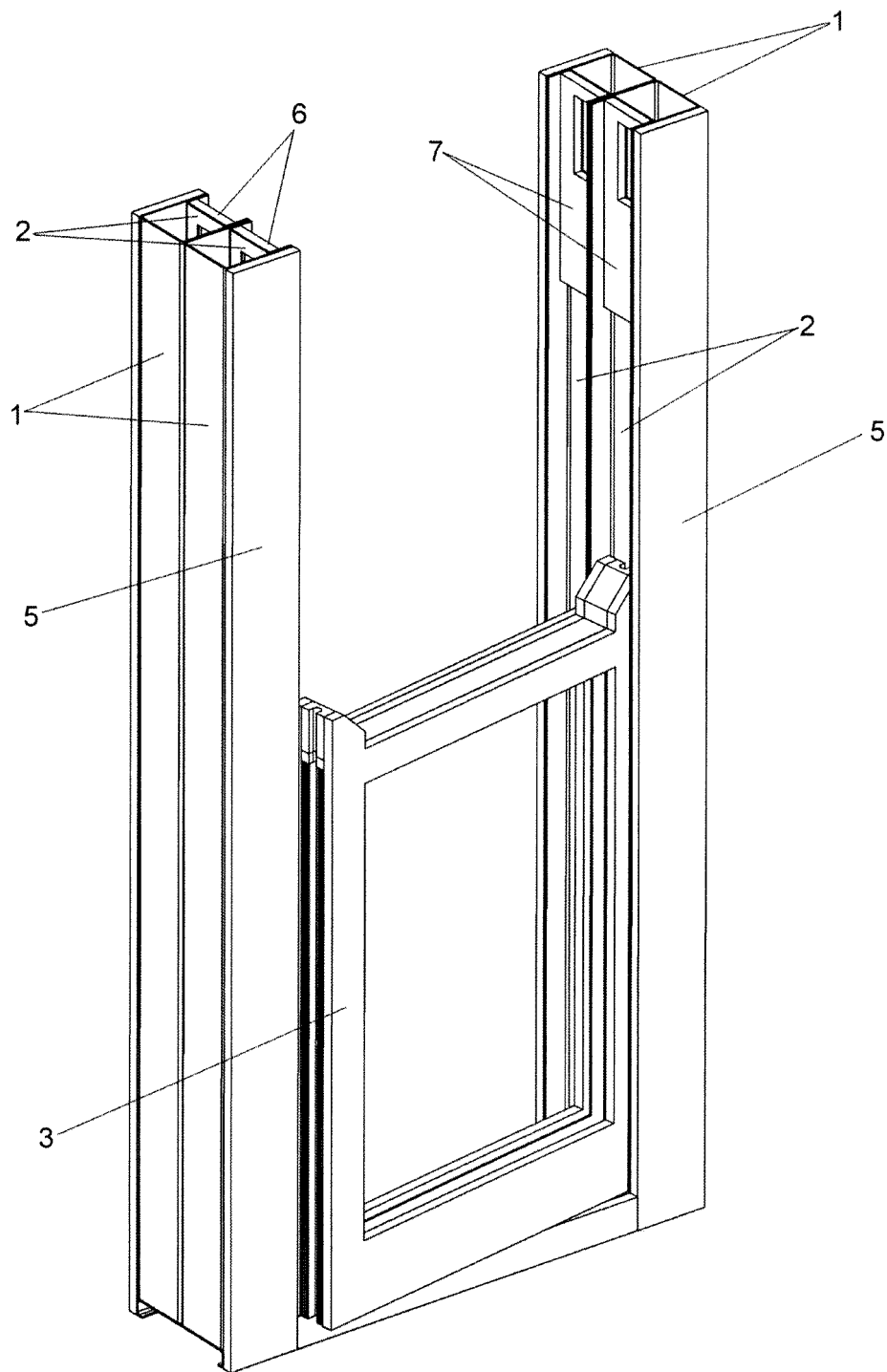


Fig. 3

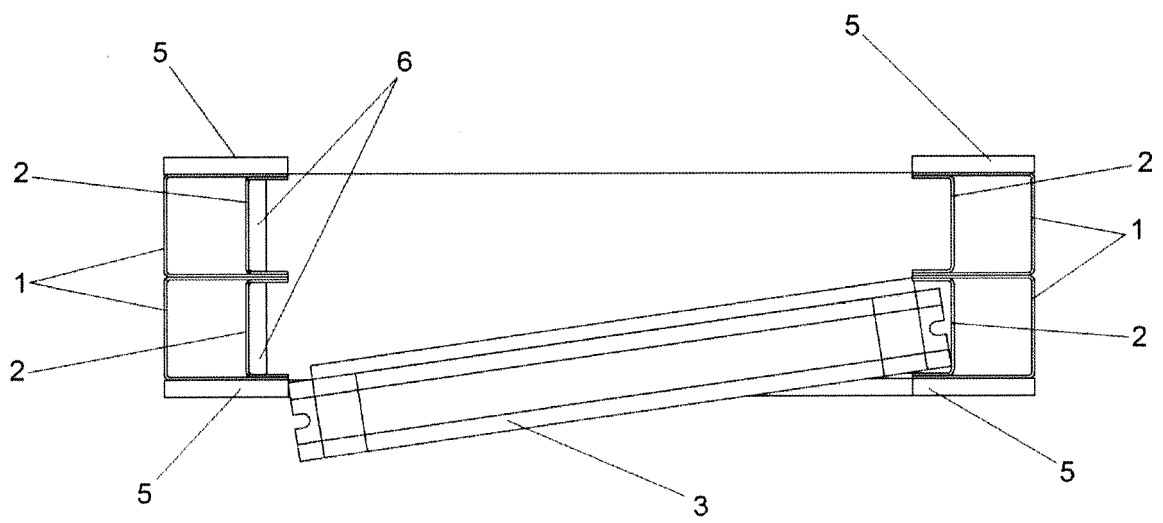


Fig. 4

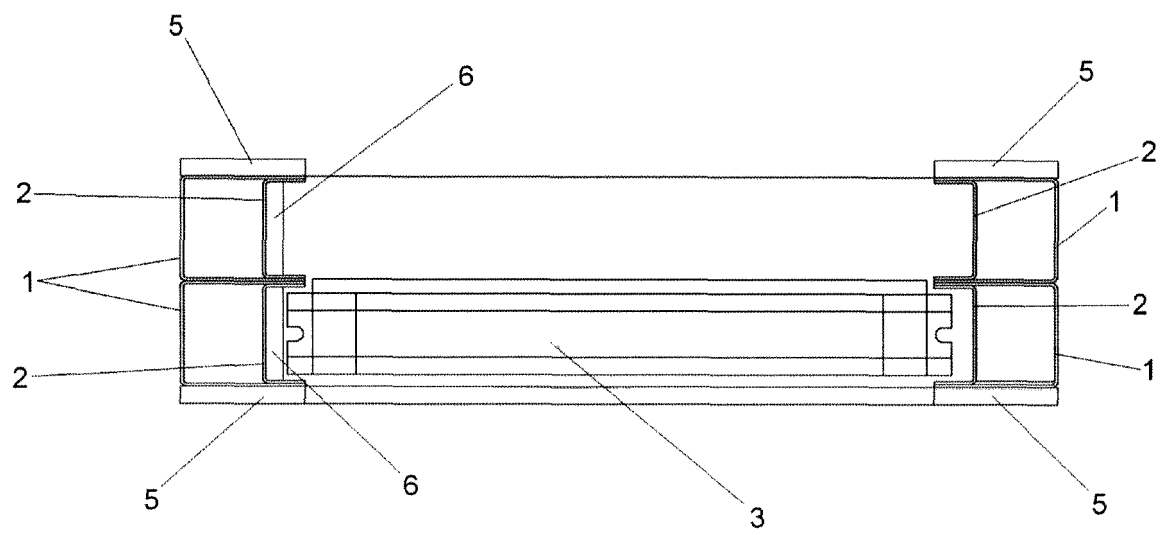


Fig. 5

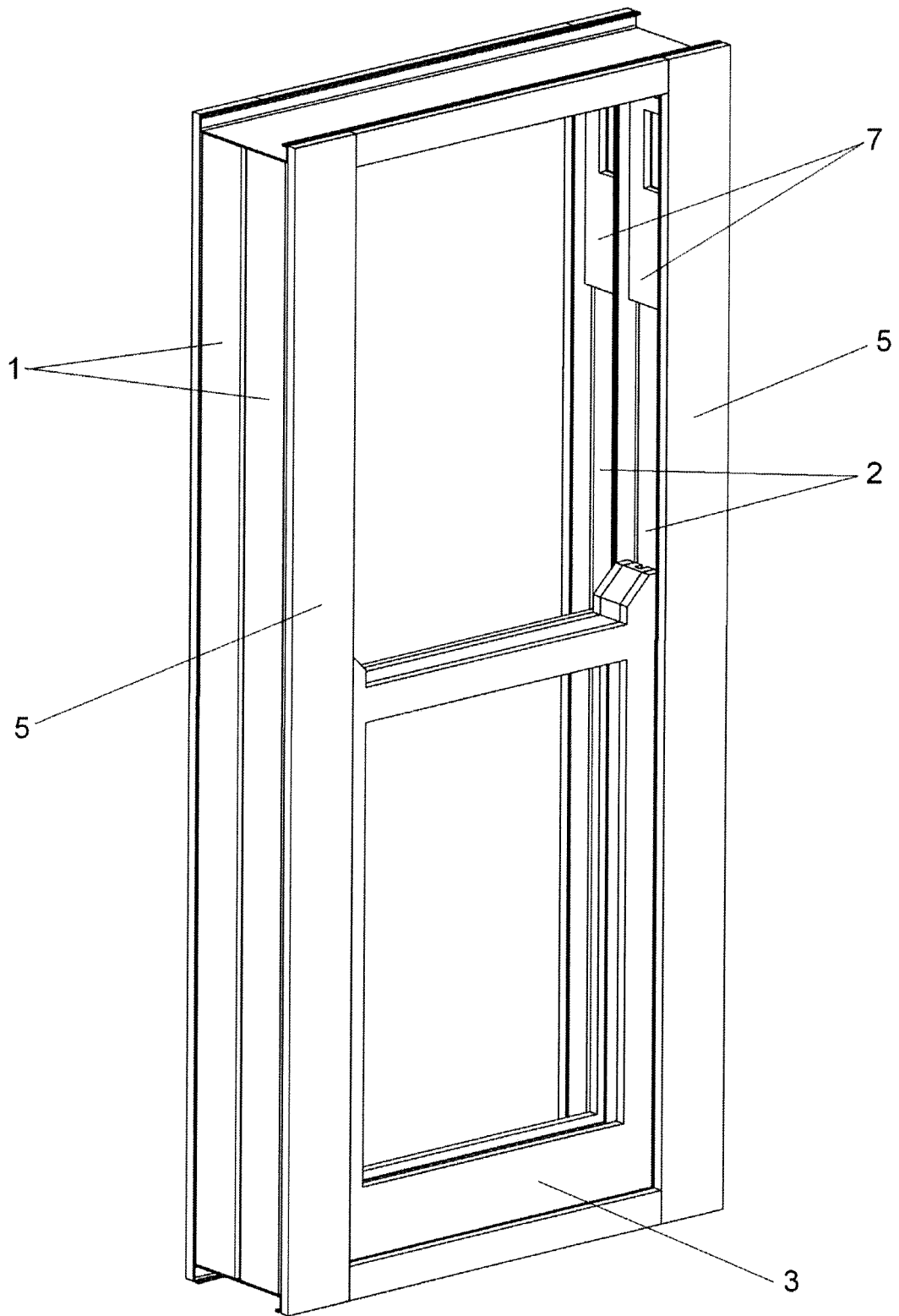


Fig. 6

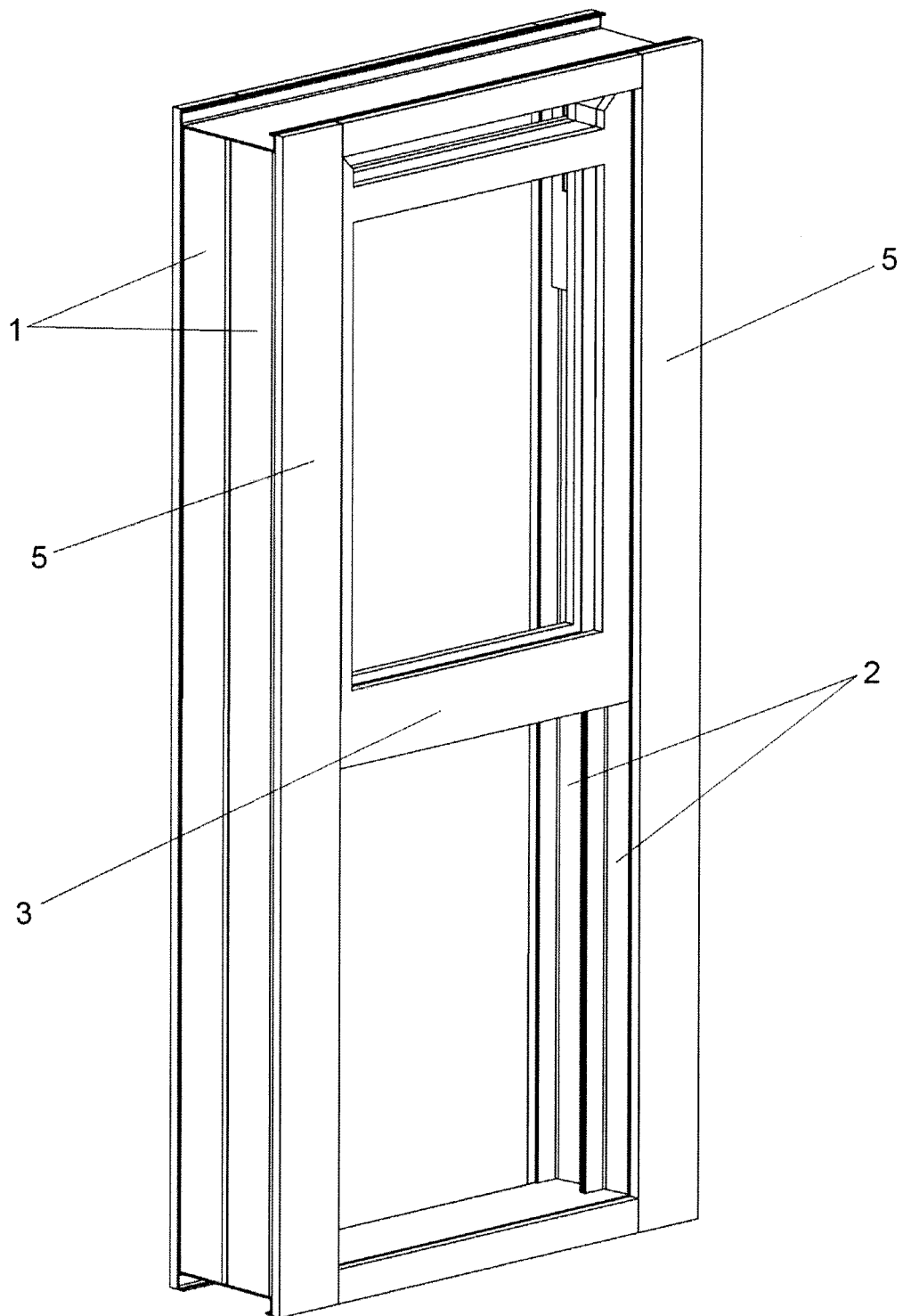


Fig. 7

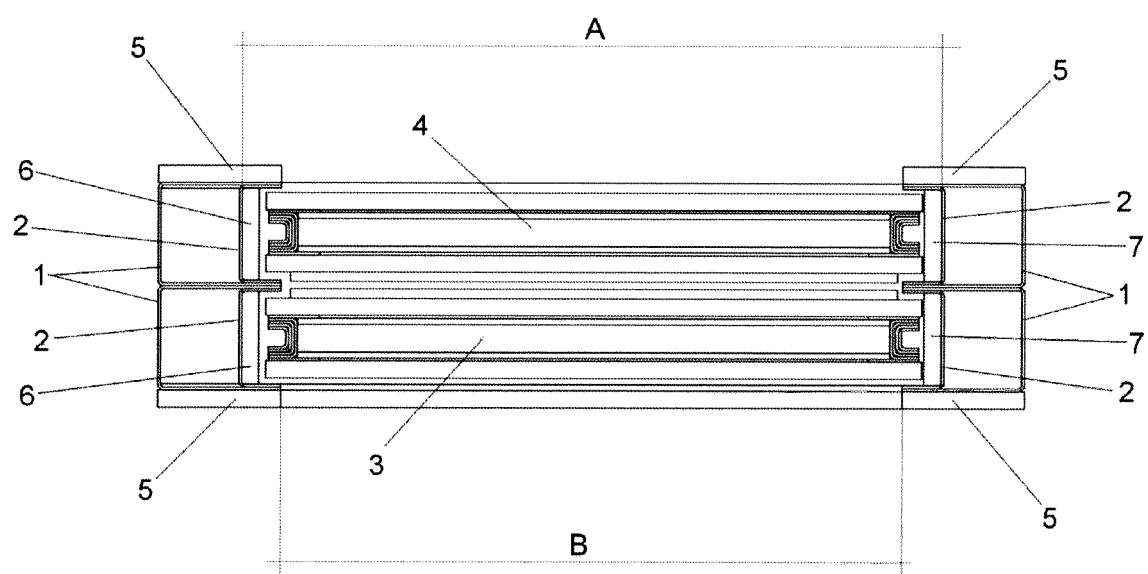


Fig. 10

REFERENCES CITED IN THE DESCRIPTION

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