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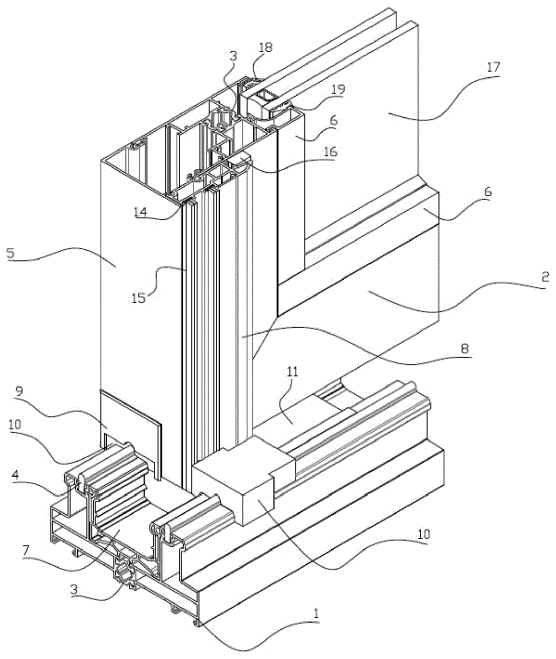
(54) WATERTIGHTNESS AND AIRTIGHTNESS SYSTEM IN SLIDING AND LIFT-SLIDING FENESTRATIONS

(57) The present invention relates to a method for providing water and air sealing in aluminum, PVC, wood or steel sliding and lift-sliding fenestration systems; which comprises frame and sash profiles (1, 2) having a special geometric section; frame insulation plastic (7) mounted in the frame profile (1); at least one frame bottom seal (11) which is made of materials such as epdm, epdm foam, rubber, foam, etc. which are viscoelastic that can revert back to its original state during use, do not allow water penetration by means of their closed cell structure, and have low heat transmission coefficient; at least one clamp insulation plastic (8) mounted on the sash profiles; at least one sash bottom sealing plastic (9) fixed onto the sash profile (2); and at least one sash bottom seal (10), which is disposed within the sash bottom sealing plastic, and which is geometrically compatible with the frame profile (1) and the rail profile (4); and which provides high water and air sealing by means of the pressure that the frame bottom seal (11) and the sash bottom seal (10) apply to each other at the clamp region.

Figure 1



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Description

Field of the Invention

[0001] The present invention relates to providing watertightness and airtightness between the outdoor environment and the indoor environment at the clamp region at every kind of weather condition in aluminum, PVC, wood or steel sliding and lift-sliding fenestration systems.

Background of the Invention

[0002] In the current watertightness and airtightness methods, sealing is provided by the seal disposed in the frame profile or the frame insulation plastic provided in the frame profile. In these applications, passage of water and air from the outdoor environment to indoor environment is partially prevented by means of the seals mounted inside the sash plastic. In this application, the incompatibility of the contact between the seal and the plastic causes water and air leakages from the outdoor environment to the indoor environment at the clamp region.

[0003] In another state of the art application, although they are always used, the sash gaskets provided on the sash profiles cannot provide watertightness and airtightness between the outdoor environment and indoor environment at a direction perpendicular to the slot where they are mounted at the clamp region.

[0004] In another state of the art application, the sash sealing gasket can be used in different geometries at the lower horizontal and vertical and even upper horizontal parts. This brings along difficulties at corner connections of the gaskets in different geometries and in attaining sealing.

[0005] In another state of the art application, it is aimed to provide watertightness and airtightness between the indoor and outdoor environments by using a sealing plastic without using a sash gasket on the clamp region. The said application causes water and air leakages due to the material, geometry and contact incompatibility between the sash gasket, sealing plastic and the seal.

[0006] Different from the current applications, the present invention eliminates the above mentioned disadvantages by providing a different sealing method to be used in sliding or lift-siding fenestration systems.

Summary of the Invention

[0007] The objective of the invention is to provide a watertightness and airtightness system for use in sliding or lift-sliding fenestration systems, which provides water and air sealing between the outdoor environment and the indoor environment. For this purpose, it provides sealing between the sash and the frame by means of the foams that are mutually in contact with each other.

[0008] The objective of the invention is to facilitate corner connection and sealing by using a gasket of the same geometry at the lower horizontal and upper horizontal and vertical parts.

[0009] Another objective of the invention, different from the prior art, is to provide watertightness and airtightness without using locally used parts that separate the frame from each other at the sealed clamp region.

[0010] A further objective of the invention is to ensure that the developed sealing method is applicable to different typologies of sliding or lift-sliding fenestration systems and to achieve the same performance in all systems.

Detailed Description of the Invention

[0011] The "The Method of Providing Watertightness and Airtightness in Sliding and Lift-Sliding Fenestrations" developed to fulfill the objectives of the present invention is illustrated in the accompanying figures, in which:

Figure 1 is an isometric view of the inventive watertightness and airtightness method in sliding or lift-sliding fenestration systems.

Figure 2 is an isometric view of the assembly of the frame bottom seal of the present invention.

Figure 3 is an isometric view of the sash and frame bottom seals of the present invention.

Figure 4 is an isometric view of the assembly of the sash bottom seal, frame bottom seal and clamp insulation plastic cap of the present invention.

Figure 5 is a sectional view of the fenestration system of the present invention.

Figure 6 is a sectional view of the clamp detail of the system of the present invention.

[0012] The components given in the figures are assigned reference numbers as follows:

1. Frame profile
2. Sash profile
3. Thermal breaks
4. Rail profile
5. Clamp cover profile
6. Glazing bead profile
7. Frame insulation plastic
8. Clamp insulation plastic
9. Sash bottom sealing plastic

10. Sash bottom seal

11. Frame bottom seal

12. Sash gasket groove

13. Sash sealing gasket

14. Gasket groove on the clamp insulation plastic

15. Plastic leaf brush gasket

16. Clamp gasket

17. Glazing

18. Outside glazing gasket

19. Inside glazing gasket

20. Setting block

21. Clamp insulation plastic cap

22. Contact point of the sash bottom seal and the frame bottom seal

[0013] In this detailed description, preferred embodiments of the thermally insulated high sealing fenestration system of the present invention are described only to facilitate better understanding of the invention without producing any limiting effect.

[0014] The method of providing watertightness and airtightness sealing in sliding or lift-sliding fenestration systems according to the present invention is generally comprised of:

Frame profile (1) and sash profile (2) having a special geometric section; thermal breaks (3) providing insulation between the said frame and sash profiles; rail profile (4); clamp cover profile (5); glass bead profile (6); frame insulation plastic (7) disposed in the frame profile (1) for enhancing thermal and sealing performance; clamp insulation plastic (8) mounted on the sash profile (2) and the clamp cover profile (5) at the clamp region; sash bottom sealing plastic (9) mounted to the sash profile at the clamp region; sash bottom seal (10) disposed within the sash bottom sealing plastic; frame bottom seal (11) disposed within the frame profile (1) at the clamp region; a sash gasket groove (12) provided on the sash profile and a sash sealing gasket (13) mounted to the said groove; plastic leaf brush gasket (15) reducing water penetration mounted to the gasket groove (14) provided on the clamp insulation plastic (8); clamp gasket (16) providing watertightness between the clamp insulation plastics (8) at the clamp region; glazing (17); outside glazing gasket (18) preventing water penetration from the outdoor environment to the indoor environment; inside glazing gasket (19) filling the gap between the glazing bead profile (6) and the glazing (17); plastic setting block (20) preventing contact of the glazing and the aluminum profile; and an clamp insulation plastic cap (21) mounted to the ends of the clamp insulation plastic (8).

[0015] In the embodiment of the invention, a frame is formed from the frame profile (1) by making corner connections of 45 degrees or 90 degrees upon preference by means of hydraulic presses or mechanical connections. The frame insulation plastic (7), which is disposed in the frame profile (1) by 45 degree or 90 degree corner connections, is placed in 2 pieces by leaving a space as much as the width of the clamp in the axis of the frame profile (1). A frame bottom seal (11); which is geometrically compatible with the frame insulation plastic (7), and is made of materials such as epdm, epdm foam, rubber, foam, etc. which are viscoelastic that can revert back to its original state during use, do not allow water penetration by means of their closed cell structure, and have low thermal transmission coefficient; is inserted into the space provided between the frame insulation plastics (7). A frame is formed from the sash profile (2) by making corner connections of 45 degrees or 90 degrees upon preference by using hydraulic presses or mechanical connection methods. At the clamp region, the clamp insulation plastic (8) is mechanically fixed on the sash profile (2). The clamp cover profile (4) is mounted onto the clamp insulation plastic (8) and the sash profile (2). A hole, into which the sash bottom sealing plastic will be inserted, is drilled on the clamp cover profile (5) by milling process. The sash bottom sealing plastic (9) that is inserted into the said hole is mechanically coupled to the sash profile (2). A sash bottom seal (10); which is compatible with the geometries of the rail profile (3) provided on the frame profile (1), the frame profile (1) and the frame insulation plastic (7), and which is made of materials such as epdm, epdm foam, rubber, foam, etc. which are viscoelastic that can revert back to its original state during use, do not allow water penetration by means of their closed cell structure, and have low thermal transmission coefficient; is inserted into sash bottom sealing plastic (9) provided on the sash profile (2). When the sashes are locked, high watertightness and airtightness is achieved by means of the pressure applied by the frame bottom seal (11) and the sash bottom seal (10) to each other at the clamp region, and their compatible geometries.

[0016] While the inventive method of providing watertightness and airtightness in sliding and lift-sliding fenestration systems is generally as described above; the present invention can be derived from system elements designed in different geometries provided that the disclosed sealing system remains the same.

Claims

1. A method for watertightness and airtightness at the clamp region of aluminum, PVC, wood or steel sliding and lift-sliding fenestration systems; **character-**

ized by frame and sash profiles (1, 2) having a special geometric section; frame insulation plastic (7) mounted in the frame profile (1); at least one frame bottom seal (11) which is made of materials such as epdm, epdm foam, rubber, foam, etc. which are viscoelastic that can revert back to its original state during use and do not allow water penetration by means of their closed cell structure; at least one clamp insulation plastic (8) mounted on the sash profiles; at least one sash bottom sealing plastic (9) fixed onto the sash profile (2); and at least one sash bottom seal (10), which is disposed within the sash bottom sealing plastic, contacts (22) the frame bottom seal when the sash is closed and has similar material properties with the frame bottom seal (11).

2. Method for watertightness and airtightness in sliding and lift-sliding fenestration systems according to Claim 1, **characterized by** at least one sash bottom seal (10) which is mounted within the sash bottom sealing plastic and which provides watertightness and airtightness by covering the space between the frame profile (1) and the sash bottom sealing plastic (9).

3. Method for watertightness and airtightness in sliding and lift-sliding fenestration systems according to Claim 1, **characterized by** a sash sealing gasket (13) which is mounted on the sash profile (2), has a compatible geometry with the frame profile (1) and the frame insulation plastic (7), and has a geometry and rigidity that reduces friction on the contact surfaces, and which can be continuously used all around the sash at the lower horizontal, upper horizontal and vertical parts.

4. Method for watertightness and airtightness in sliding and lift-sliding fenestration systems according to Claim 1, **characterized by** the sash bottom sealing plastic (9) which is mounted to the said sash profile (2) and has a suitable geometric connection with the sash bottom seal (10), clamp gasket (16), clamp insulation plastic (8) and the sash profile (2).

5. Method for watertightness and airtightness in sliding and lift-sliding fenestration systems according to Claim 1, **characterized by** at least one clamp insulation plastic cap (21), which is mounted to the upper and lower parts of the clamp insulation plastic (8), and which provides watertightness and airtightness by applying pressure on the frame bottom seal (11).

Figure 1

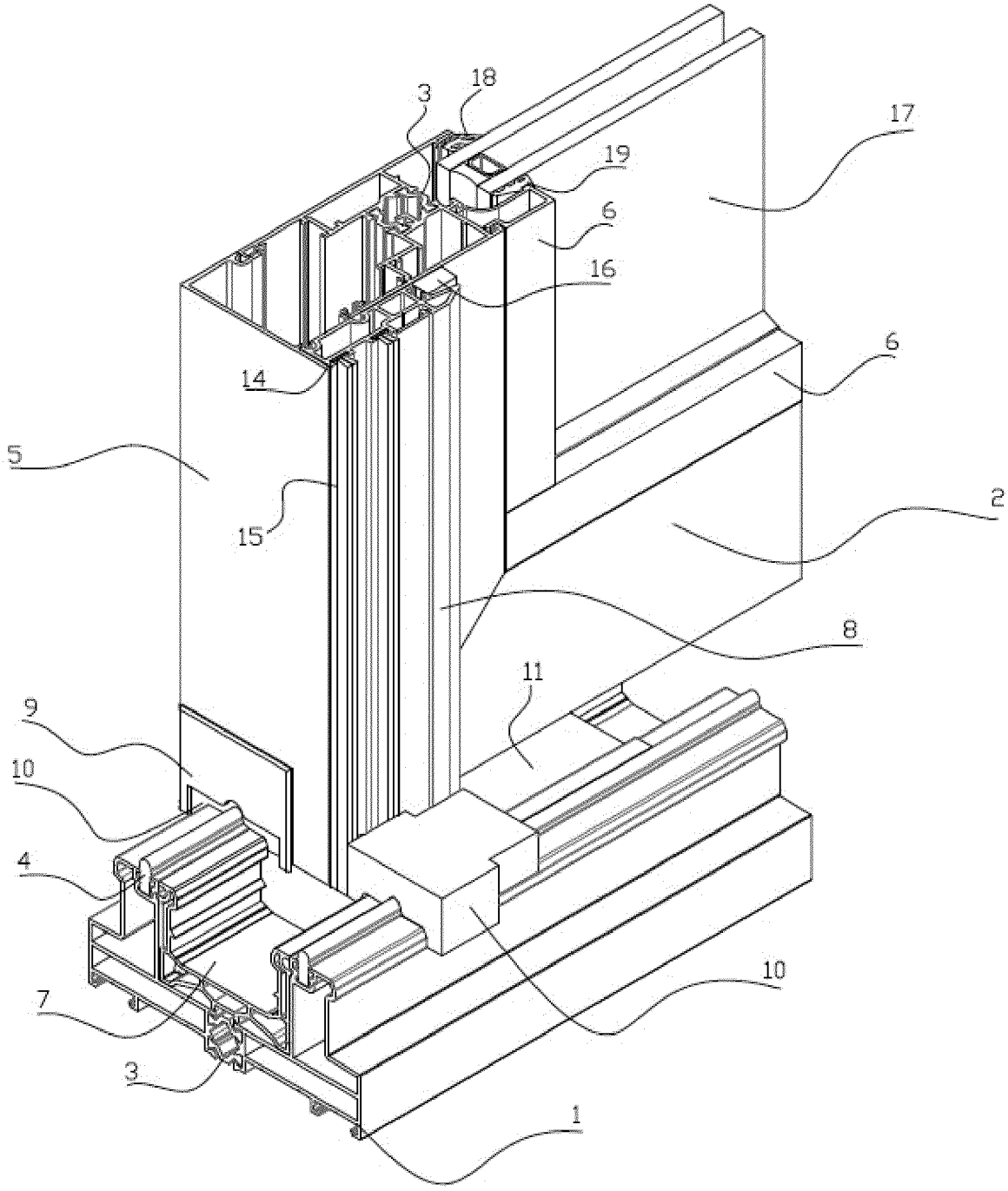


Figure 2

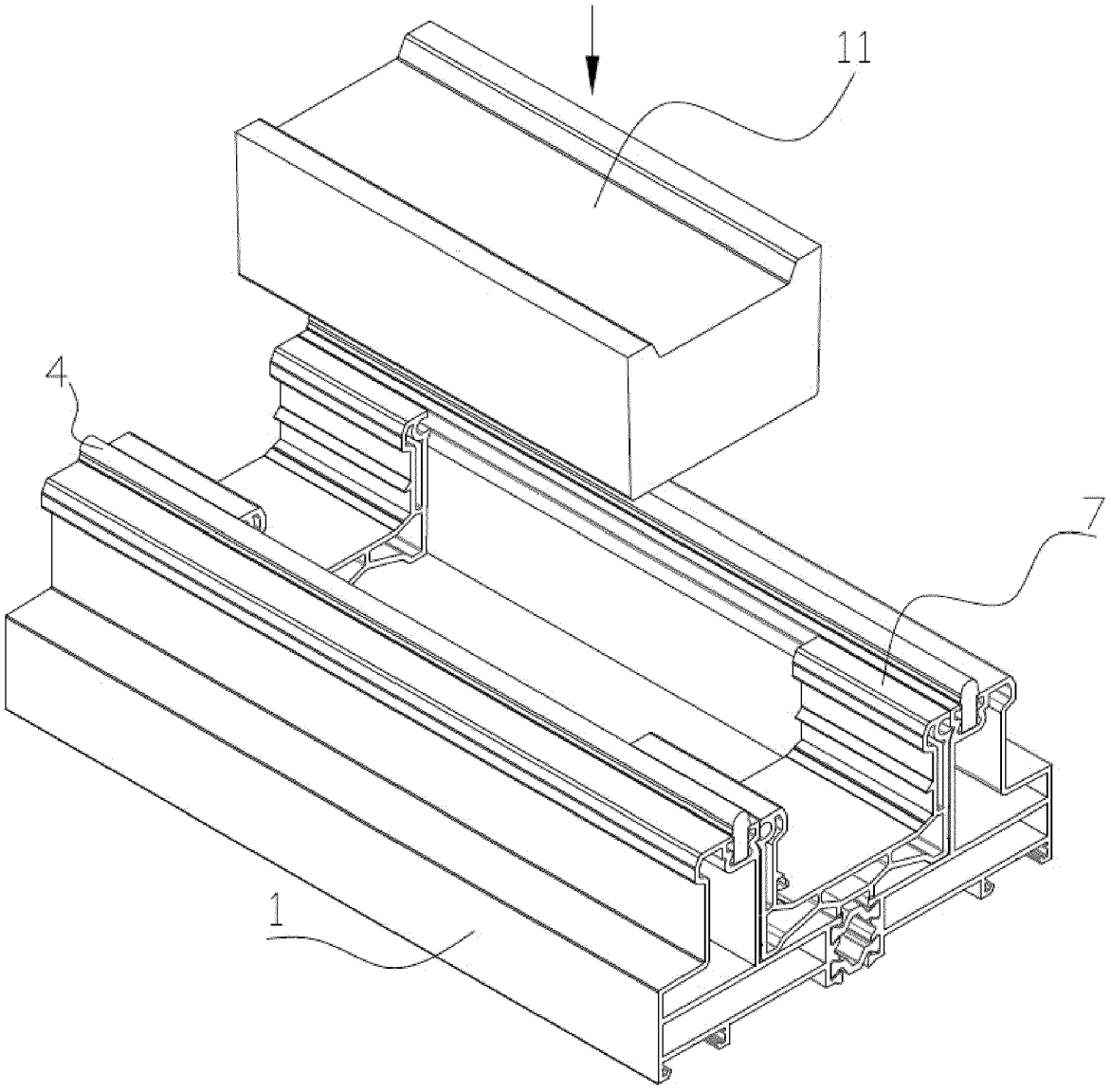


Figure 3

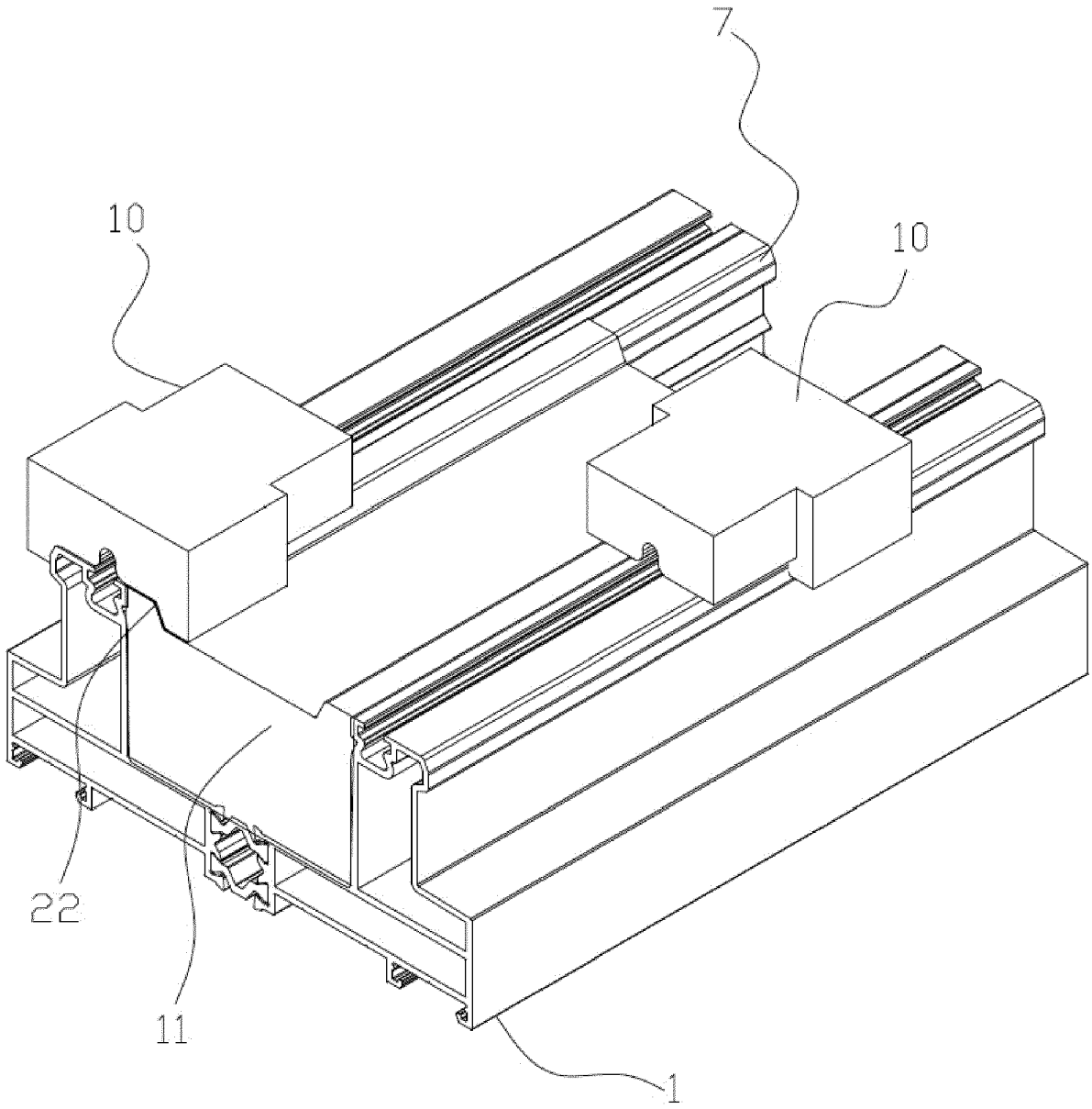


Figure 4

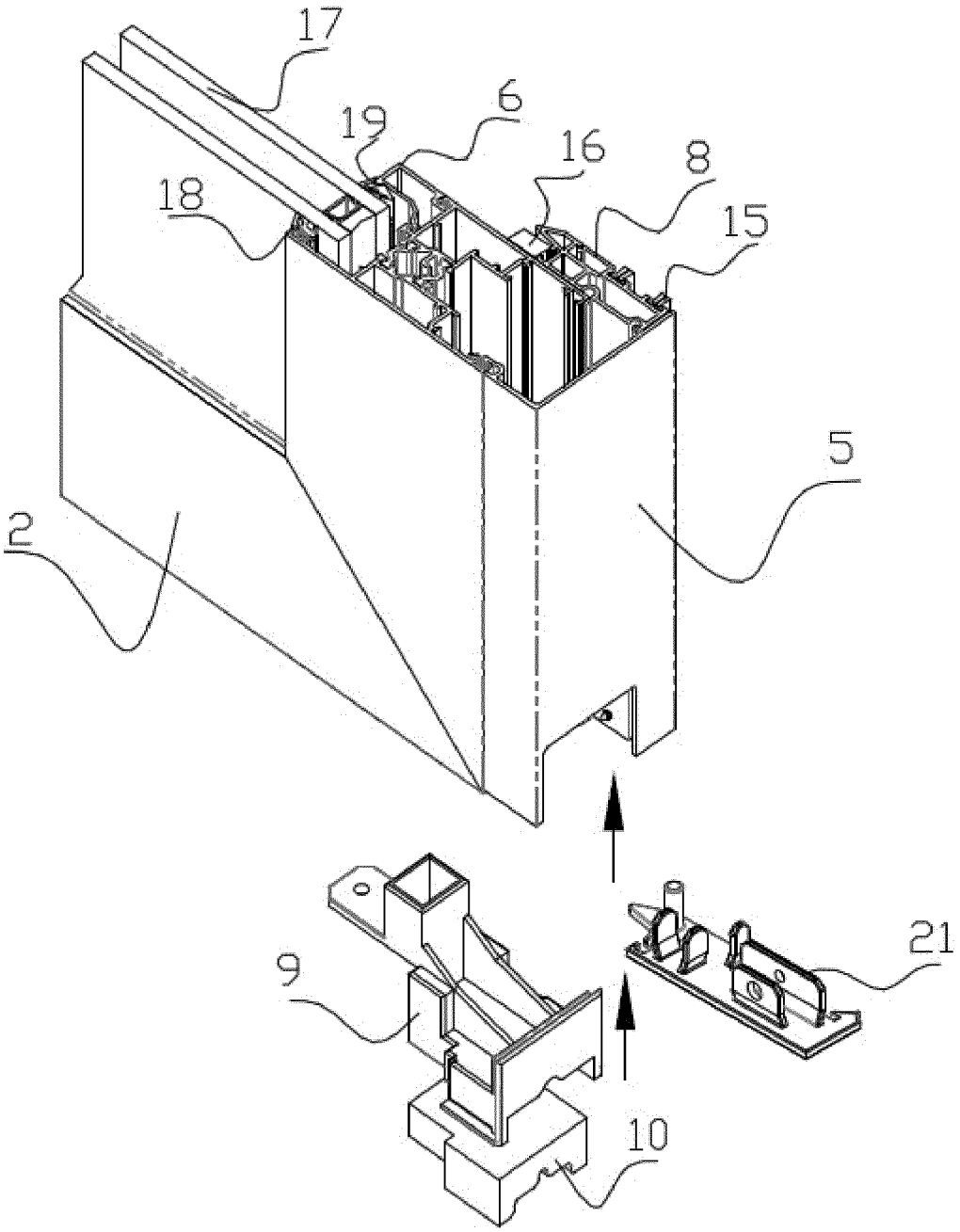


Figure 5

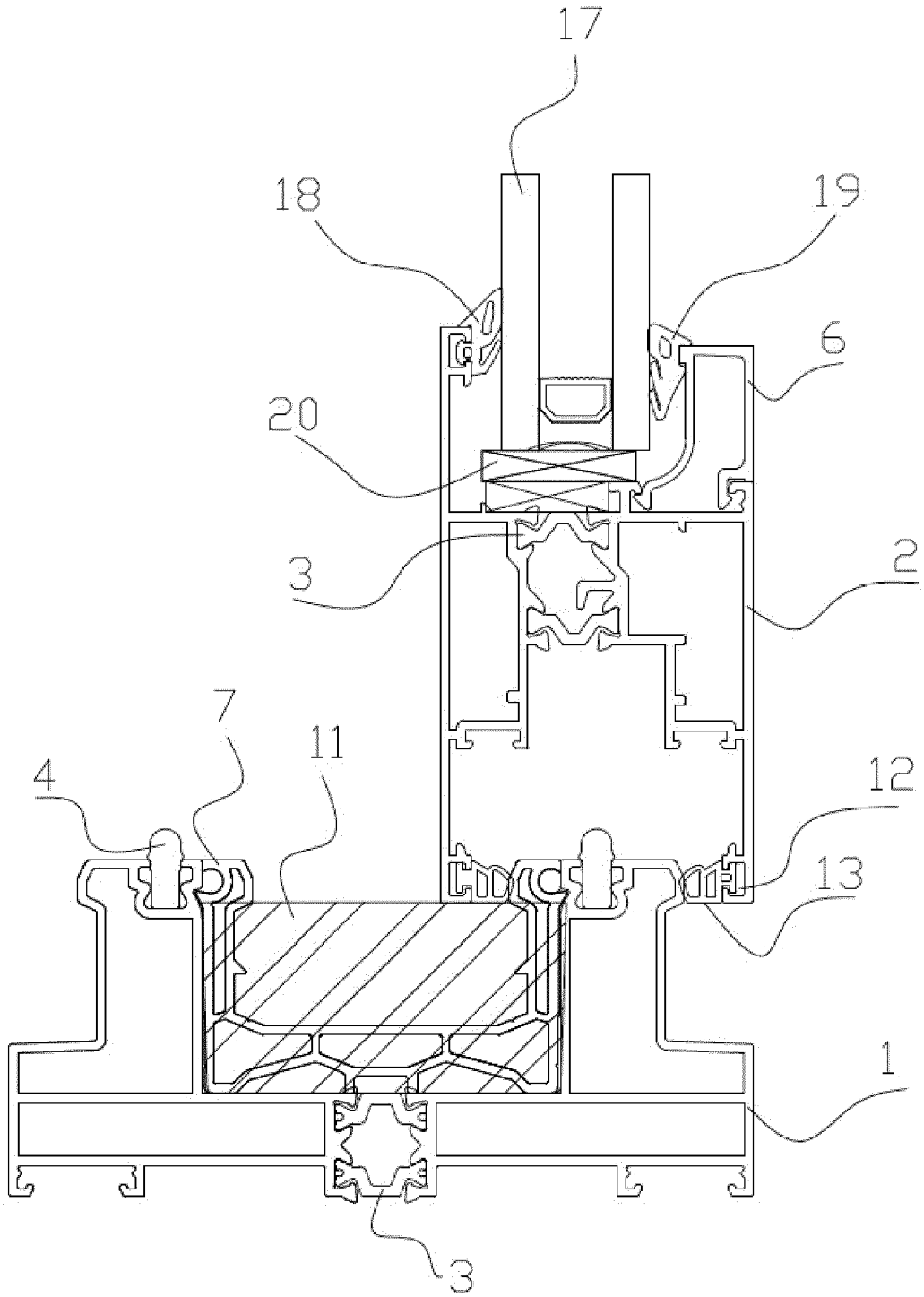
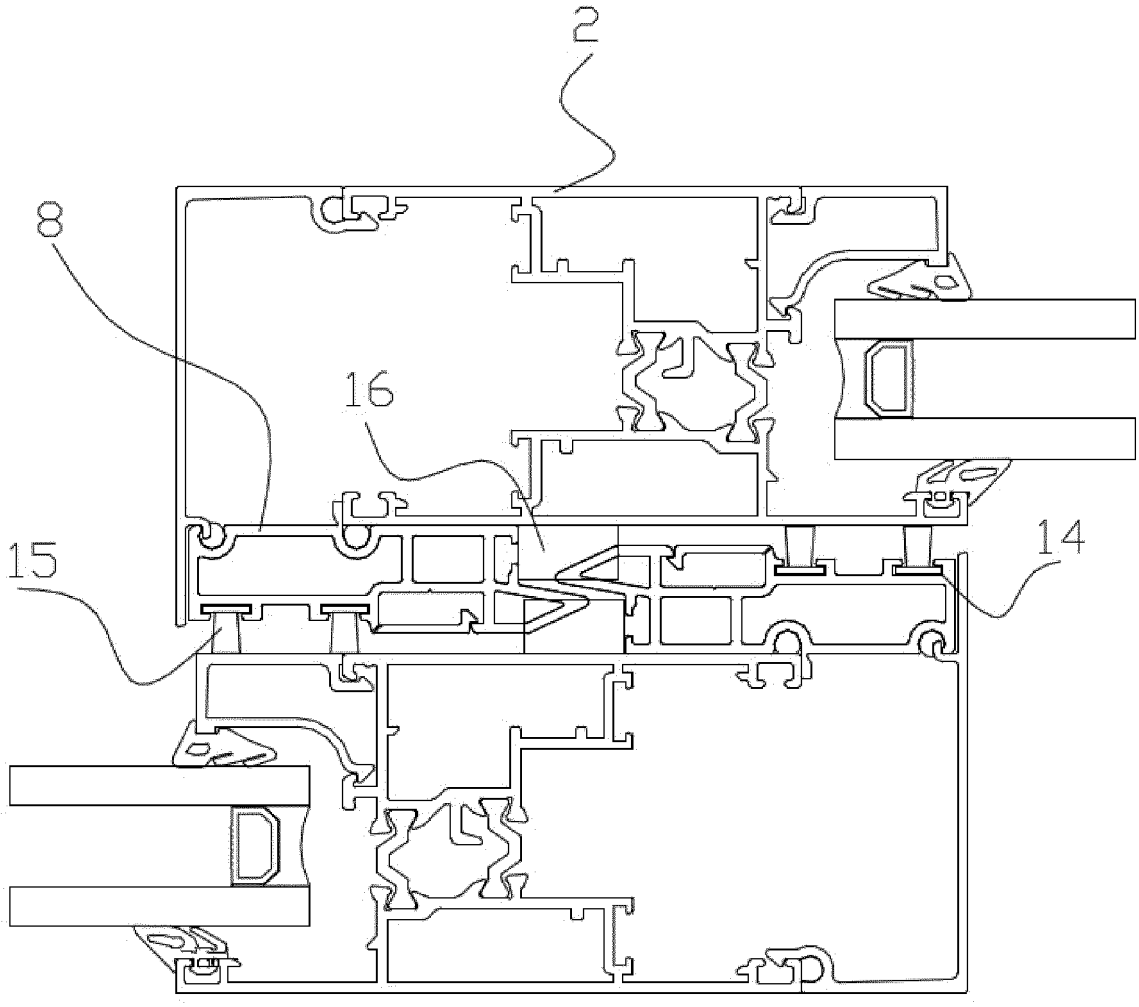


Figure 6



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EUROPEAN SEARCH REPORT

Application Number
EP 19 21 9595

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 20 2008 013043 U1 (GRETSCH UNITAS GMBH [DE]) 12 February 2009 (2009-02-12) * paragraph [0022] - paragraph [0024]; figures 1-4 * -----	1-5	INV. E06B3/46 E06B3/52 E06B7/22

TECHNICAL FIELDS SEARCHED (IPC)

E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	18 May 2020	Cobusneanu, D

CATEGORY OF CITED DOCUMENTS

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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18-05-2020

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 202008013043 U1	12-02-2009	NONE	

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