

(19)



(11)

EP 3 599 332 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

29.01.2020 Bulletin 2020/05

(51) Int Cl.:

E06B 1/18 (2006.01)

E06B 5/16 (2006.01)

E05D 15/06 (2006.01)

E06B 3/46 (2006.01)

E06B 1/04 (2006.01)

E06B 7/14 (2006.01)

E06B 7/26 (2006.01)

(21) Application number: **19188397.4**

(22) Date of filing: **25.07.2019**

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

Designated Extension States:

BA ME

Designated Validation States:

KH MA MD TN

• **Faria Correia, Miguel Luis**

4465-126 São Mamede de Infesta (PT)

(72) Inventors:

• **Ferreira, Frederico**

4200-479 Porto (PT)

• **Faria Correia, Miguel Luis**

4465-126 São Mamede de Infesta (PT)

(30) Priority: **25.07.2018 PT 2018110884**

(71) Applicants:

• **Ferreira, Frederico**

4200-479 Porto (PT)

(74) Representative: **Ferreira, Maria Silvina**

Clarke, Modet & Co

Av. Casal Ribeiro, N°50-3° andar

1000-93 Lisboa (PT)

(54) **MODULAR SYSTEM FOR PANEL LOCOMOTION IN BUILDING FACADES**

(57) The present application describes a modular system for the locomotion of sliding panels for buildings facades characterized by comprising at least a ring that characterizes the structure of the perimeter ring of the system, panels inserted in the structure of the sliding profile, roller tracks on which the sliding profiles of the panels

are seated and move, finishing caps to the surface of the perimeter ring of the system, vertical puller profiles on the sliding profiles, sealing profiles and insulation on the perimeter ring, in the sliding profiles and in the panels. Common throughout the system is the use of closing systems, bearings and seals.

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Description

Field of the Art

[0001] The present document describes a modular system for the locomotion of sliding panels for buildings facades.

Background

[0002] Document WO2014183595(A1) discloses an assembly structure of a glass curtain wall having a hidden structure comprising a main building body and a glass curtain wall mounted on the main building body. The assembly structure also comprises an assembly base. The glass curtain wall is adjusted to a defined position by way of the assembly fixed base, and the position of the glass curtain walls remains unchanged during the fastening process. The assembly structure is robust and durable, while an assembly method is accurate and safe.

[0003] Document ES2578385 (A1) discloses a building facade cladding and installation procedure. An external cover of a section without cracks of a facade of a building comprising panels arranged between two vertical amounts is provided, said panels being arranged with a transverse profile that allows them to be nailed together, like a shutter of a shading, so that the set of interconnected panels to cover the section can be arranged in position on the facade by moving it in block from an initial position located below or above said section. The invention also comprises a method to install said coating that can be run by specialized operators in vertical work without the need for scaffolding.

[0004] Document CA2072413(A1) discloses a building facade covering comprised of a profiled rail support frame and covering panels connected thereto, the vertically extending profiled rails have brackets onto which the respective covering panel with an edge surface recessed behind the panel front face is placeable. Each profiled rail has two vertically extending hollow boxes in which inserted holding elements are horizontally slidable parallel to the covering panel plane and which protrude with a hook-shaped end. The neighbouring vertical side edges of two respective covering panels are connected to a common profiled rail in such a manner that the hook shaped ends of the holding elements are inserted into the receiving pockets of the covering panels by horizontally sliding them within the hollow boxes, the receiving pockets being arranged at vertical side edges of the covering panels at edge surfaces recessed behind the panel front face.

[0005] Lastly, document WO2011150035(A2) discloses visible and hidden coating systems used to fix panels laminated to structures of buildings. The visible coating systems comprising rails and sliding clamps to slide the laminate panel to the desired location on the wall of the building. The hidden coating systems comprise suspension elements to secure a laminate panel to the wall of

the building.

[0006] Therefore, it is noted that in practice, and in the solutions presented previously, the technical characteristics that the present document seeks to overcome are omitted, namely a modular system for the locomotion of sliding panels for buildings facades. In the identical systems present on the market, notably none offers a solution for protecting pre-ring and roller tracks seated on the access to finishing caps, this being one of the differentiating factors implemented in this system.

Summary

[0007] The present application describes a modular system for the locomotion of sliding panels for buildings facades characterized by comprising:

- i. At least a ring that characterizes the structure of the perimeter ring of the system;
- ii. At least a ring that characterizes the structure of the sliding profile of the panel;
- iii. At least a panel inserted in the structure of the sliding profile;
- iv. Roller tracks on which the sliding profiles of the panels are seated and move;
- v. Finishing caps to the surface of the perimeter ring of the system;
- vi. Vertical puller profiles on the sliding profiles;
- vii. Sealing and insulation profiles on the perimeter ring, sliding profiles and panels;

[0008] Accessories common to the entire system and comprising:

- i. closing systems;
- ii. bearings;
- iii. seals.

[0009] In a particular embodiment of the system, the perimeter rings of the panels move inside the perimeter ring by means of roller tracks.

[0010] In a particular embodiment of the system, the system comprises at least three application typologies:

- i. Apparent;
- ii. Semi-recessed;
- iii. Recessed.

[0011] In a particular embodiment of the system, the type of material of the perimeter ring and of the panel profiles can be metal, fiberglass, polymer or ligno-cellulose.

[0012] In a particular embodiment of the system, the type of filling material of the sliding panels can be glass, metal, ceramic, polymer or ligno-cellulose.

[0013] In a particular embodiment of the system, the perimeter ring and the roller tracks are withdrawn in the soil and the access insulated by means of "clip in and

out" type caps that comprise:

- i. Finishing caps;
- ii. Temporary work covers.

[0014] In a particular embodiment of the system, the finishing caps comprise the application of:

- i. Thermal insulating material;
- ii. Acoustic insulating material;
- iii. Thermal sleeve for producing cold and/or heat;
- iv. LED lighting and signage strips;
- v. Water drainage grilles.

[0015] In yet another particular embodiment of the system, the finishing caps comprise an installation characterized by meeting the face of the surrounding insulating material.

Brief description

[0016] The present document describes a modular system for the locomotion of sliding panels for buildings facades. The modular system for the locomotion of sliding panels described, through its modularity, provides for multiple application typologies, integration with the architecture and finishing materials of the building, even using a rather limited quantity of profiles.

[0017] The system comprises at least a pre-ring, which characterize the perimeter ring of the system, and that depend on the intended quantity of panels, roller tracks, types of finishing caps to the surface of the system, vertical puller and sealing profiles and in the crossing of the panels. In addition to this profiling, the system also comprises accessories, such as closing systems, spherical bearings and seals.

[0018] The modular system for the locomotion of sliding panels offers three application options: the apparent typology, the semi-recessed typology and the recessed typology.

[0019] The system is not restrictive in terms of the constitution of the base material of the perimeter ring and of the panel profiles, that is, all the profiling can be carried out in metal, fiberglass, polymer or ligno-cellulose material.

[0020] Similarly, the profiles that constitute the sliding panels can be filled with various types of material such as glass, metal, ceramic, polymer or ligno-cellulose.

[0021] It should be noted that the system developed is not restrictive in terms of the amount of panels, not least because it is possible to multiply the amount of pre-rings and roller tracks up to a theoretically unlimited number. The modular system for the locomotion of sliding panels always offers, regardless of the type of application, a perfectly homogeneous design solution throughout its perimeter of the span, either in the vertical sections or in the horizontal sections. In any type of application, the system promotes accessibility to people with reduced

mobility, taking into account that there are no protruding or reentrant profiles, one of the differentiating factors of this system. The system was developed with the facilitating vision of the maintenance process and cleaning of the pre-rings and roller tracks, as well as the whole assembly process in the installment stage of construction.

[0022] Evaluating the identical systems present on the market, it is noted that none of the remaining products offers a solution to protect pre-rings and roller tracks seated on the access to the finishing caps, being one of the differentiators implemented in this system.

[0023] This type of system requires installation in a very embryonic construction phase, since only with the pre-rings installed, they can advance with the exterior and interior finishes, since the latter are usually not water repellents. It turns out that, often, the profiles are damaged after their placement, by the phases of work that arise up to the definitive completion of the construction of the building. However, with this system, there is the possibility of installing temporary work caps, so that the building construction can proceed without the concern of damaging the profiles. Therefore, only when the work is finalized are the definitive finishing caps installed, by way of "clip in and out" type profiles.

Brief Description of the Drawings

[0024] For an easier understanding of the present application, the accompanying drawings represent embodiments, though they are not intended to limit the art disclosed herein.

Figure 1 illustrates a typological example - Two sliding panels;

Figure 2 illustrates a horizontal section "01 - 01";

Figure 3 illustrates a vertical section "02 - 02 panel 1";

Figure 4 illustrates a vertical section "03-03 - panel 2";

Figure 5 illustrates a vertical section: Constructive detail - Apparent application;

Figure 6 illustrates a vertical section: Constructive detail - Semi-recessed application;

Figure 7 illustrates a vertical section: Constructive detail - Recessed application;

Figure 8 illustrates a vertical section: Constructive detail - Application of thermal and/or acoustic insulation (1) in the cavities of the frame;

Figure 9 illustrates a vertical section: Constructive detail - Application of thermal sleeve (2) for producing cold or heat in the cavities of the frame;

Figure 10 illustrates a vertical section: Constructive detail - Application of LED lighting strip (4) and acrylic cover (3);

Figure 11 illustrates a vertical section: Constructive detail - Application of grille for water drainage;

Figure 12 illustrates a vertical section: Constructive detail - Installation of the perimeter pre-ring;

Figure 13 illustrates a vertical section: Constructive detail - Installation of the roller tracks;

Figure 14 illustrates a vertical section: Constructive detail - Installation of side tabs;

Figure 15 illustrates a vertical section: Constructive detail - Installation of the mobile panels;

Figure 16 illustrates a vertical section: Constructive detail - Installation of central tab;

Figure 17 illustrates a vertical section: Constructive detail - Installation of the building finishing materials (interior and exterior);

Figure 18 illustrates a vertical section: Constructive detail - Installation of finishing caps;

Figure 19 illustrates a vertical section: Upper detail, listing the handle (5), the side cover (6), the handle tab (7), the panel gutter (8), the panel (9), the closing system (10), the central cover (11), the central tab (12), the brush (13), the side tab (14) and the perimeter pre-ring (15);

Figure 20 illustrates a vertical section: Central detail, listing the panel gutter (16), panel (17), the central cover (18), sealer (19) and brush (20);

Figure 21 illustrates a horizontal section: Top detail, listing the perimeter pre-ring (21), central tab (22), side tab (23), side cover (24), brush (25), central cover (26), gutter and panel (27) and panel (28);

Figure 22 illustrates a horizontal section: Ground detail listing the panel (29), gutter and panel (30), central cover (31), brush (32), side cover (33), roller track (34), side tab (35), central tab (36) and perimeter pre-ring (37);

Figure 23 illustrates an overall isometric perspective of the system;

Figure 24 illustrates an overall isometric perspective of the system - Integration with building materials;

Figure 25 illustrates an overall isometric perspective

of the system - 3D image illustrating the system - apparent installation;

Figure 26 illustrates an overall isometric perspective of the system - 3D image illustrating the system - apparent installation;

Figure 27 illustrates an overall isometric perspective of the system - 3D image illustrating the system - semi-recessed installation.

Description of embodiments

[0025] With reference to the drawings, some embodiments are now described in greater detail, though they are not intended to restrict the scope of the present application.

[0026] The present application describes a modular system for the locomotion of sliding panels for buildings facades.

[0027] For a better understanding of the module system for the locomotion of sliding panels, Fig. 1 presents a scheme that depicts a typology of two sliding panels. This section numerically identifies the repeated horizontal and vertical sections, illustrated in detail in the following drawings:

- Fig. 2 represents the horizontal section "01 - 01";
- Fig. 3 represents the vertical section "02 - 02 panel 1";
- Fig. 4 represents the vertical section "03-03 - panel 2";

[0028] Figures 5-7 represent three vertical sections, demonstrating the three types of possible application in this system, as referred to previously, the apparent typology, the semi-recessed and the recessed.

[0029] In one of the embodiments called Apparent application, where the entire ring is perfectly visible and represents the transition between the interior and exterior materials of the building, the existence of technical cavities has considerable advantages (as represented in figures 8, 9, 10 and 11) enhancing their use for hiding thermal and acoustic materials, and also for creating subsystems.

[0030] These technical perimeter cavities may therefore be used as additional elements that enhance the performance of the system, namely:

- I. Thermal insulation and acoustic foam plates (1);
- II. Flexible sleeves (2) with thermal probes that can heat or cool the profiles of the system, or even the inside of the building (use equivalent to a fan coil);
- III. LED lighting strips (4) for retro-lighting the ring of the system, in which case the finishing caps (3) would be made of translucent material, such as acrylic;

- IV. Safety sensors - intrusion alarm;
- V. Hidden safety closing systems;
- VI. Button systems or any type of switch.

[0031] Instead of using a closed finishing cap, the use of these cavities also allows the use of a grille with drillings or longitudinals for the purpose of functioning as drainage gutter, enhancing the performance of the system in terms of seal-tightness. This type of solution is represented in Fig. 11.

[0032] Figures 12-18 show a step-by-step representation of the whole process of installation and deinstallation of profiles, seated on the concept of simplicity of implementation. For cleaning and periodic maintenance of the system, simply remove the finishing caps (Fig. 18), then the central tab (Fig. 16), followed by the side tabs (Fig. 14), enabling full access to the roller tracks, as represented in Fig. 13.

[0033] Naturally, the present description is in no way restricted to the embodiments presented in this document and a person with average knowledge in the field will be able to envisage many possibilities of modifying it without straying from the general idea, as defined in the claims. The preferred embodiments described above are obviously combinable with each other. The following claims additionally define preferred embodiments.

Claims

1. A modular system for the locomotion of sliding panels for buildings facades **characterized by** comprising:

- i. At least a ring that characterizes the structure of the perimeter ring of the system;
- ii. At least a ring that characterizes the structure of the sliding profile of the panel;
- iii. At least a panel inserted in the structure of the sliding profile;
- iv. Roller tracks on which the sliding profiles of the panels are seated and move;
- v. Finishing caps to the surface of the perimeter ring of the system;
- vi. Vertical pull profiles on the sliding profiles;
- vii. Sealing and insulating profiles on the perimeter ring, sliding profiles and panels;

Accessories common throughout the system and which comprise:

- i. closing systems;
- ii. bearings;
- iii. seals.

2. The modular system for the locomotion of sliding panels for buildings facades according to claim 1 **characterized in that** the perimeter rings of the pan-

els move inside the perimeter ring by means of roller tracks.

3. The modular system for the locomotion of sliding panels of buildings facades according to claim 1 **characterized by** comprising at least three application typologies:

- i. Apparent;
- ii. Semi-recessed;
- iii. Recessed.

4. The modular system for the locomotion of sliding panels of buildings facades according to claim 1 **characterized in that** the type of material of the perimeter ring and of the panel profiles is metal, fiber-glass, polymer or ligno-cellulose.

5. The modular system for the locomotion of sliding panels of buildings facades according to claim 1 **characterized in that** the type of filling material of the sliding panels is glass, metal, ceramic, polymer or ligno-cellulose.

6. The modular system for the locomotion of sliding panels of buildings facades according to any one of the preceding claims, **characterized by** the perimeter ring and the roller tracks are retracted in the soil and the access insulated by means of "clip in and out" type covers that comprise:

- i. Finishing caps;
- ii. Temporary work caps.

7. The modular system for the locomotion of sliding panels of buildings facades according to claim 1, **characterized by** the finishing caps comprise the application of:

- i. Thermal insulating material;
- ii. Acoustic insulating material;
- iii. Thermal sleeve for producing cold and/or heat;
- iv. LED lighting and signage strips;
- v. Water drainage grilles.

8. The modular system for the locomotion of sliding panels of buildings facades according to claims 1 and 7, wherein the finishing caps comprise an installation **characterized by** meeting the face of the surrounding insulating material.

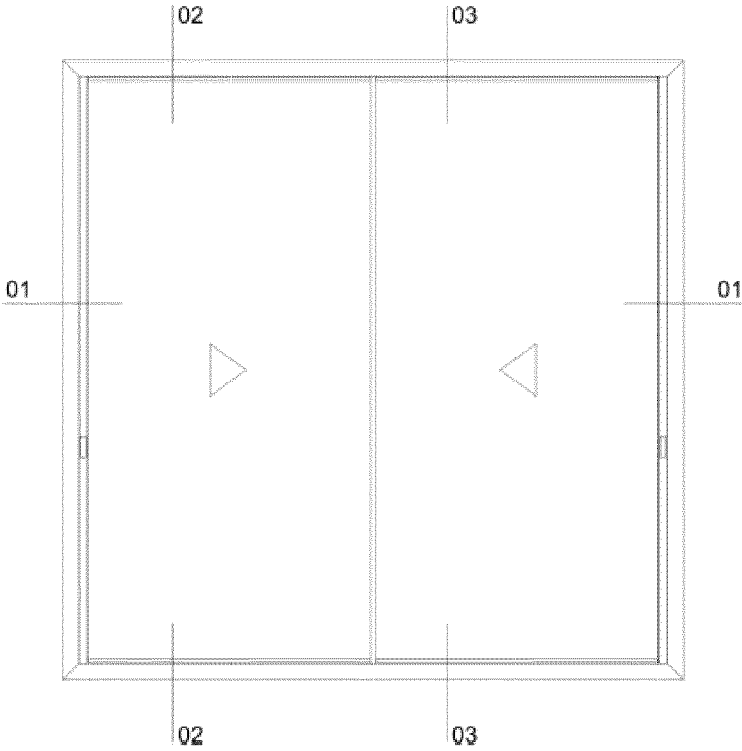


Figure 1

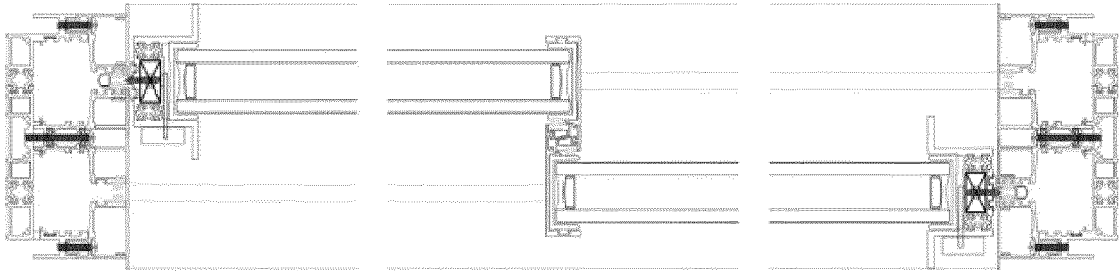


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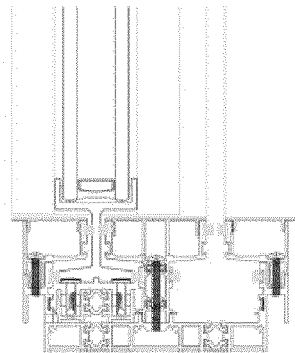
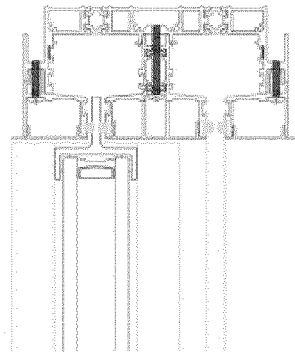


Figure 3

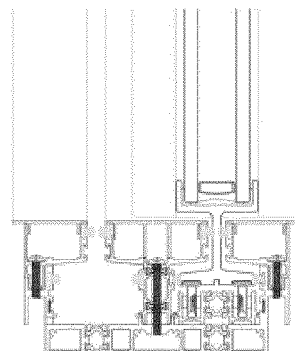
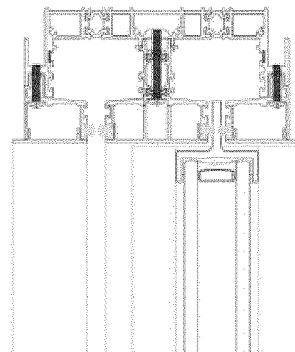


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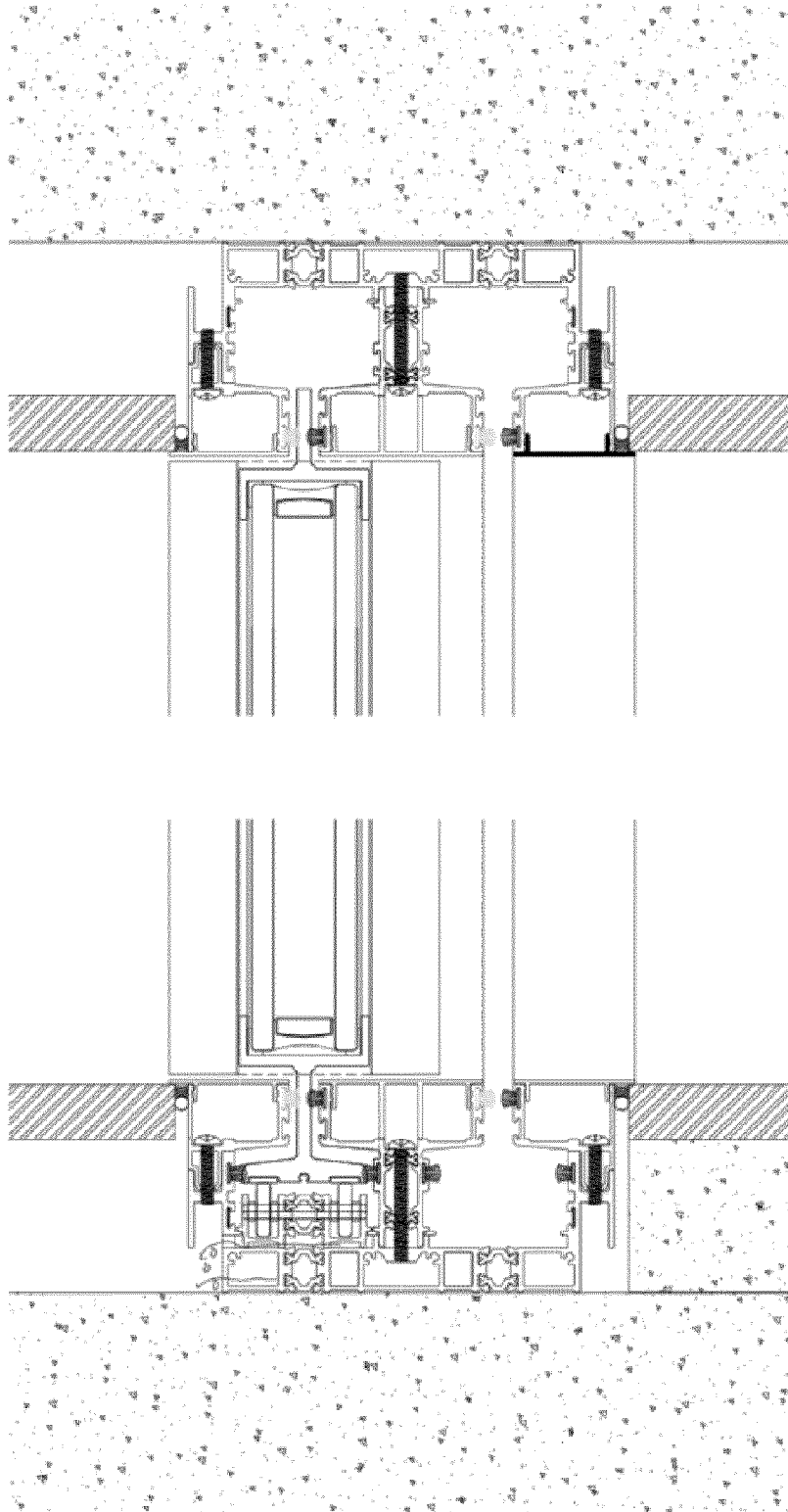


Figure 5

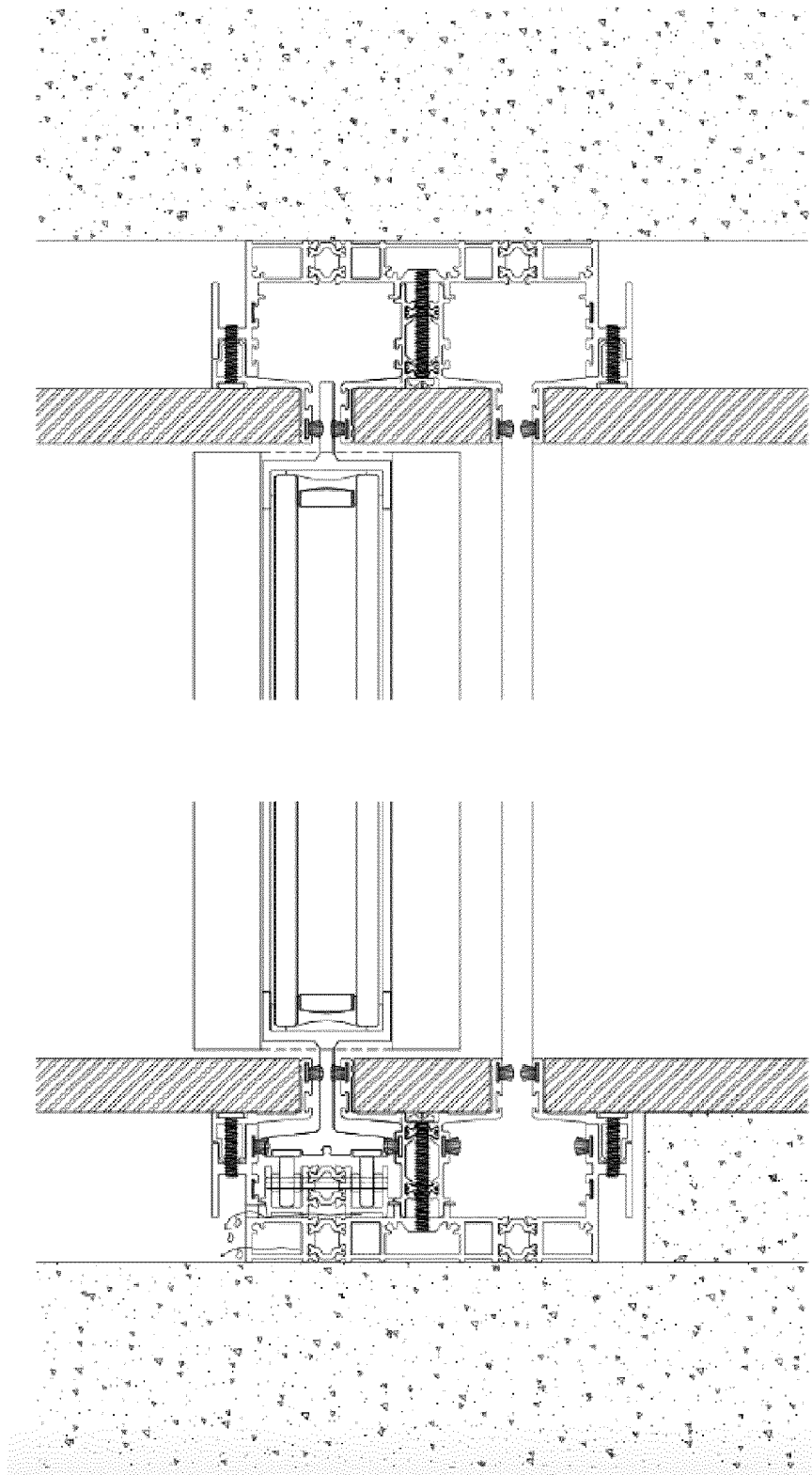


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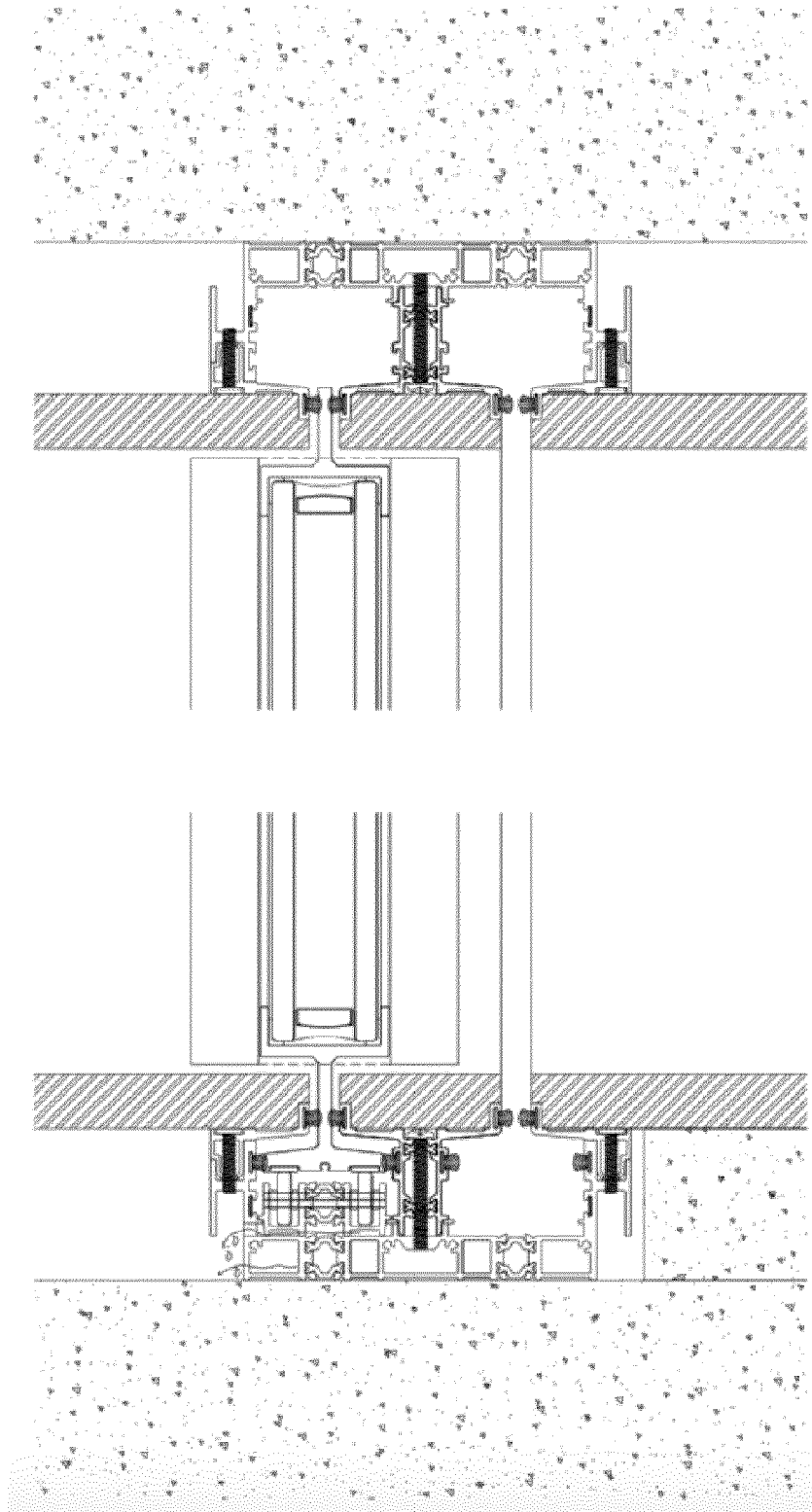


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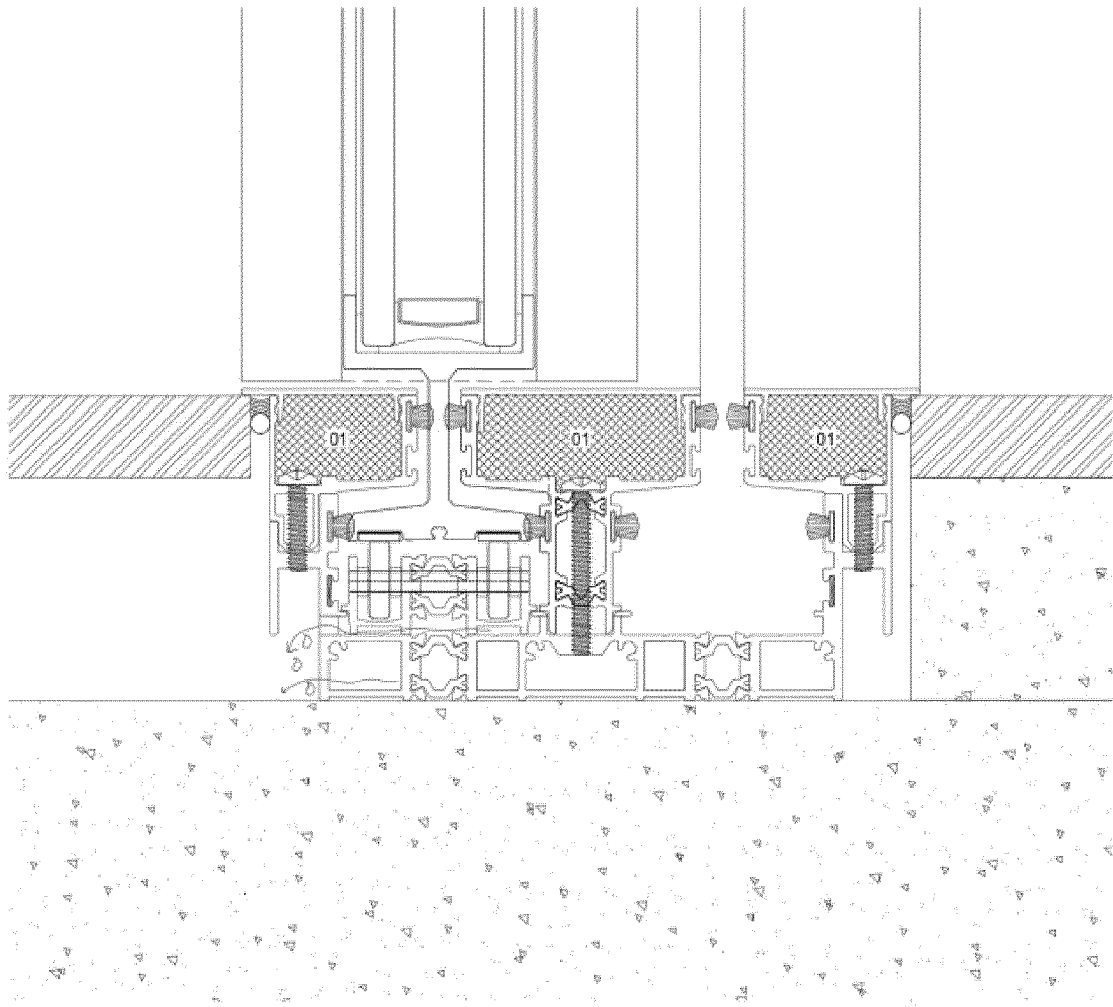


Figure 8

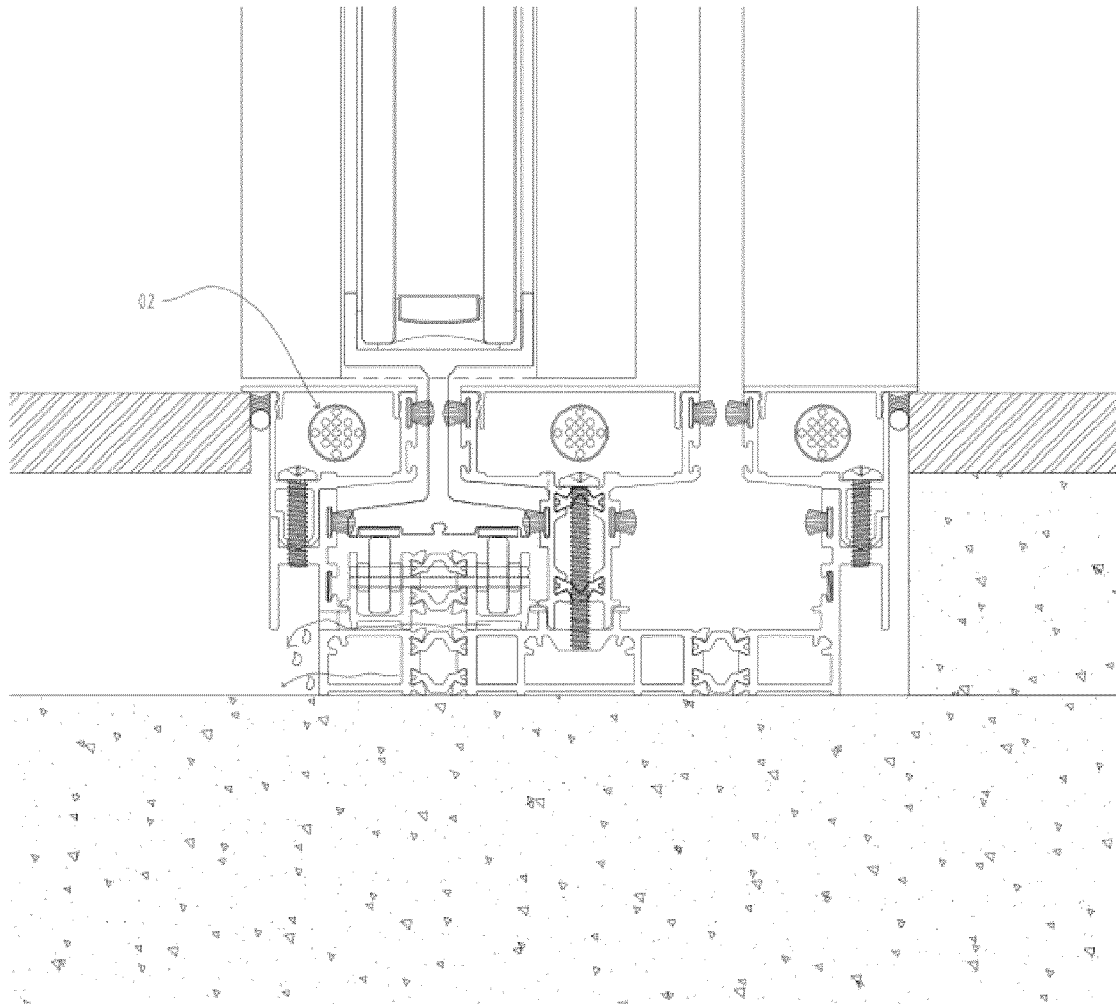


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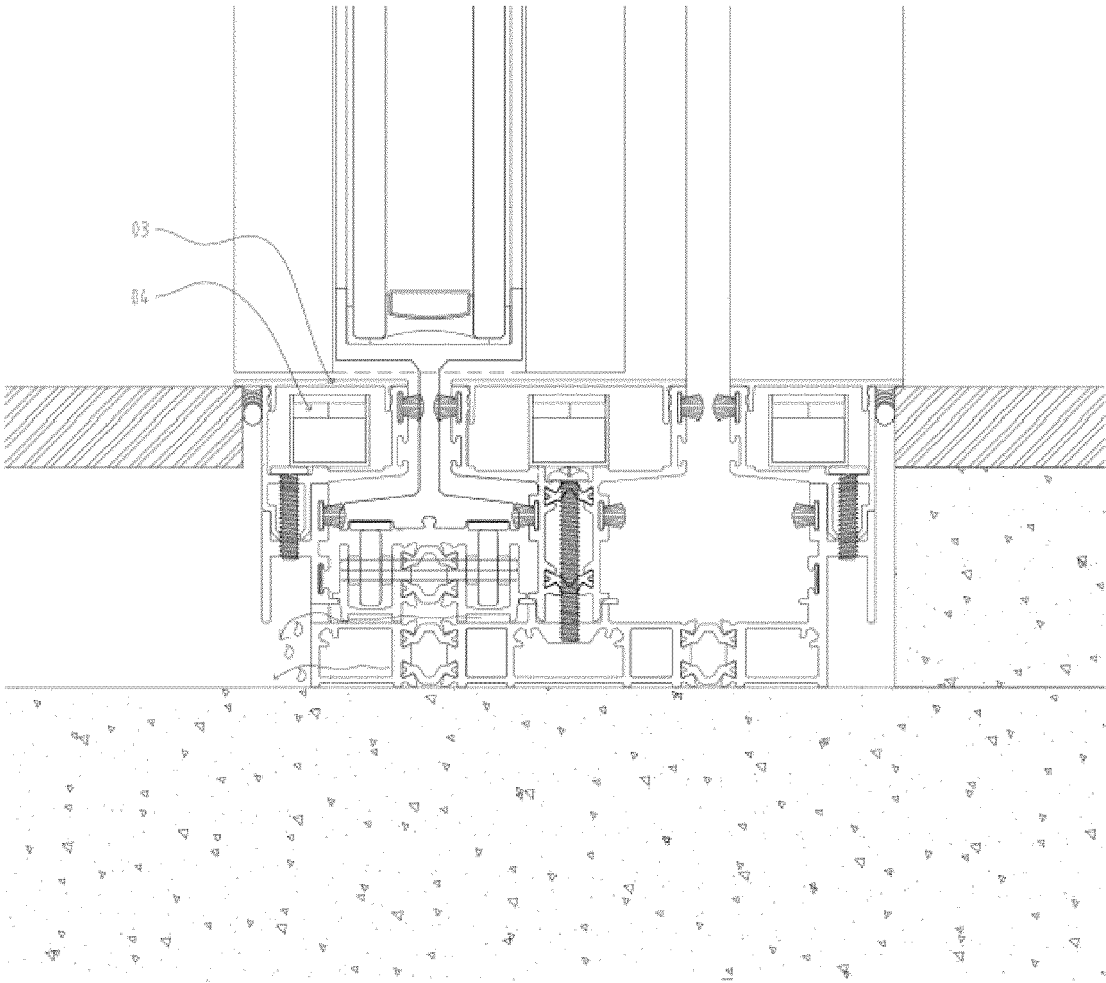


Figure 10

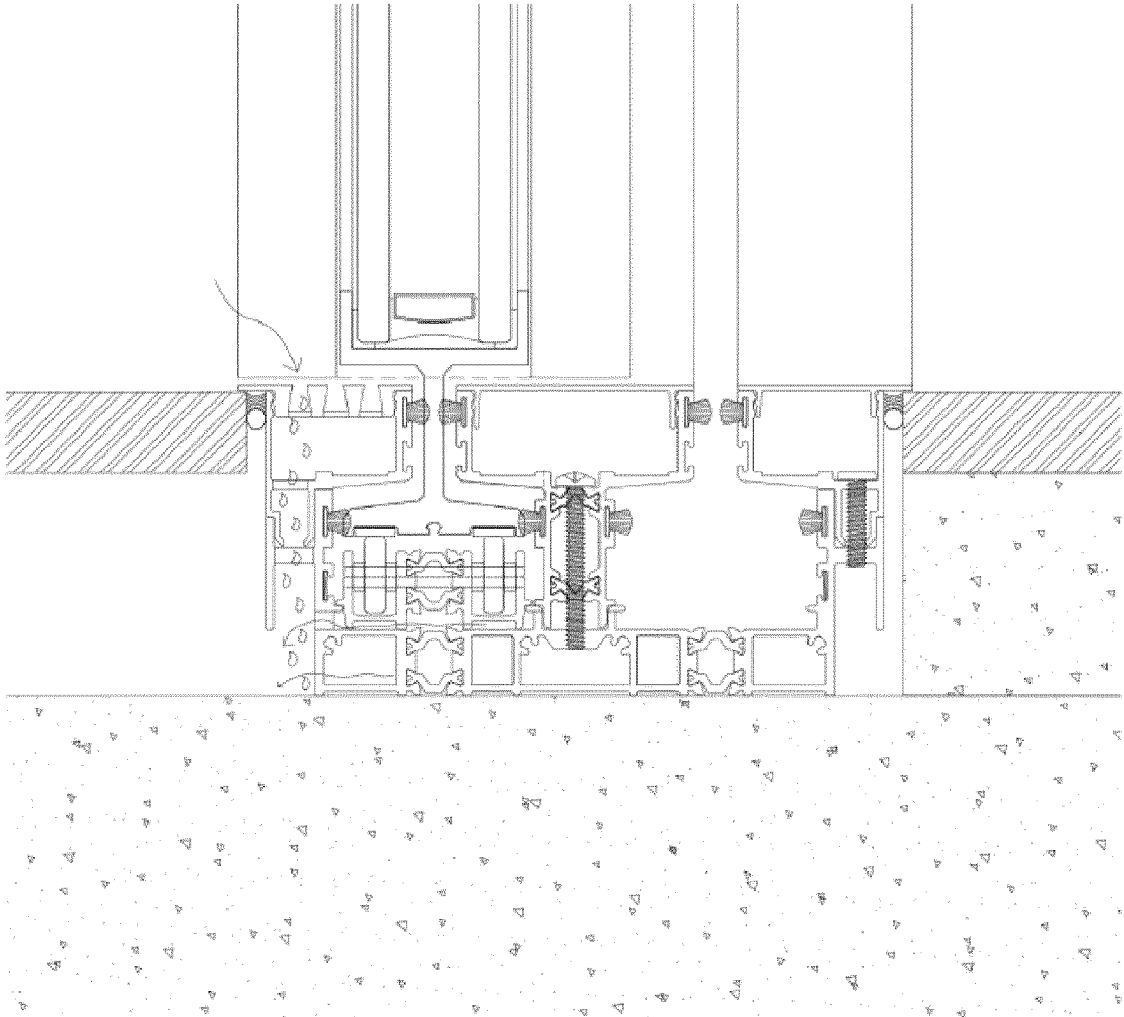


Figure 11

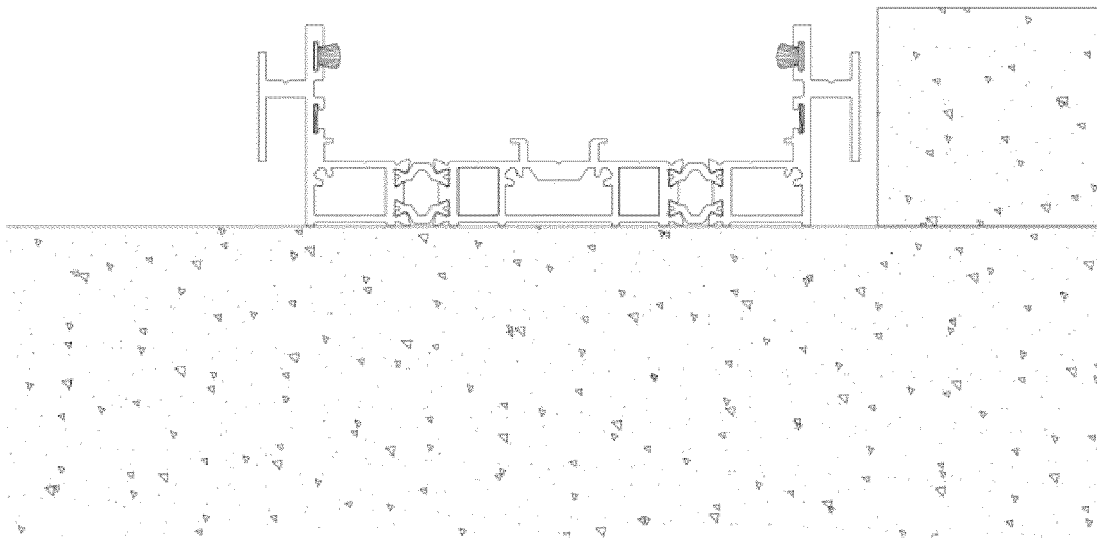


Figure 12

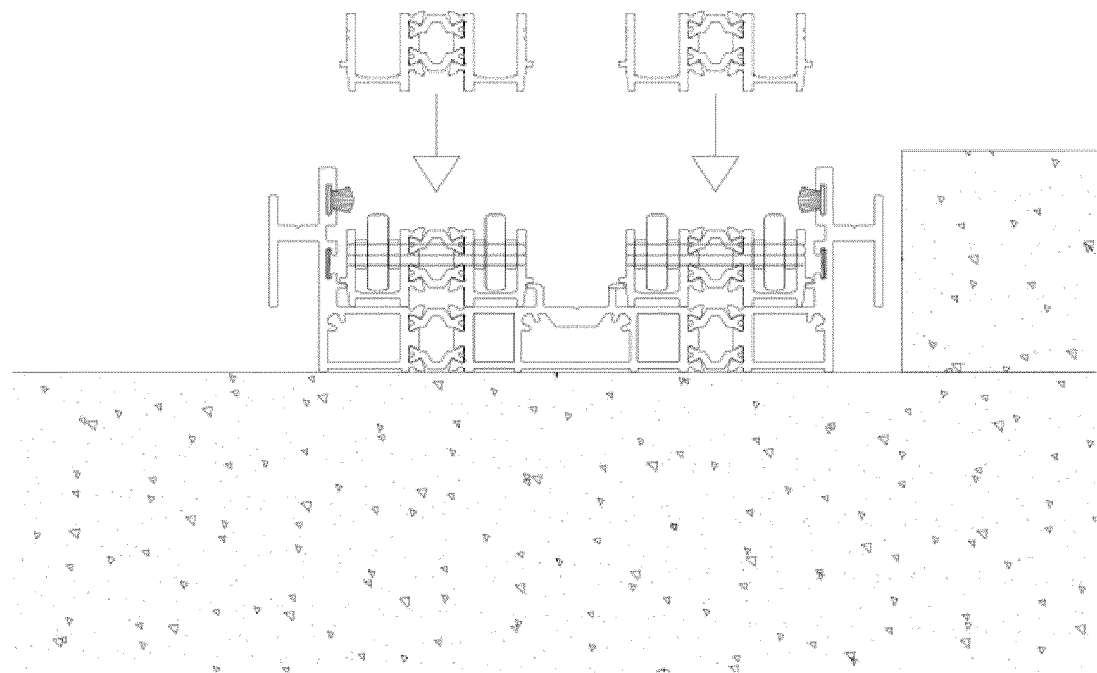


Figure 13

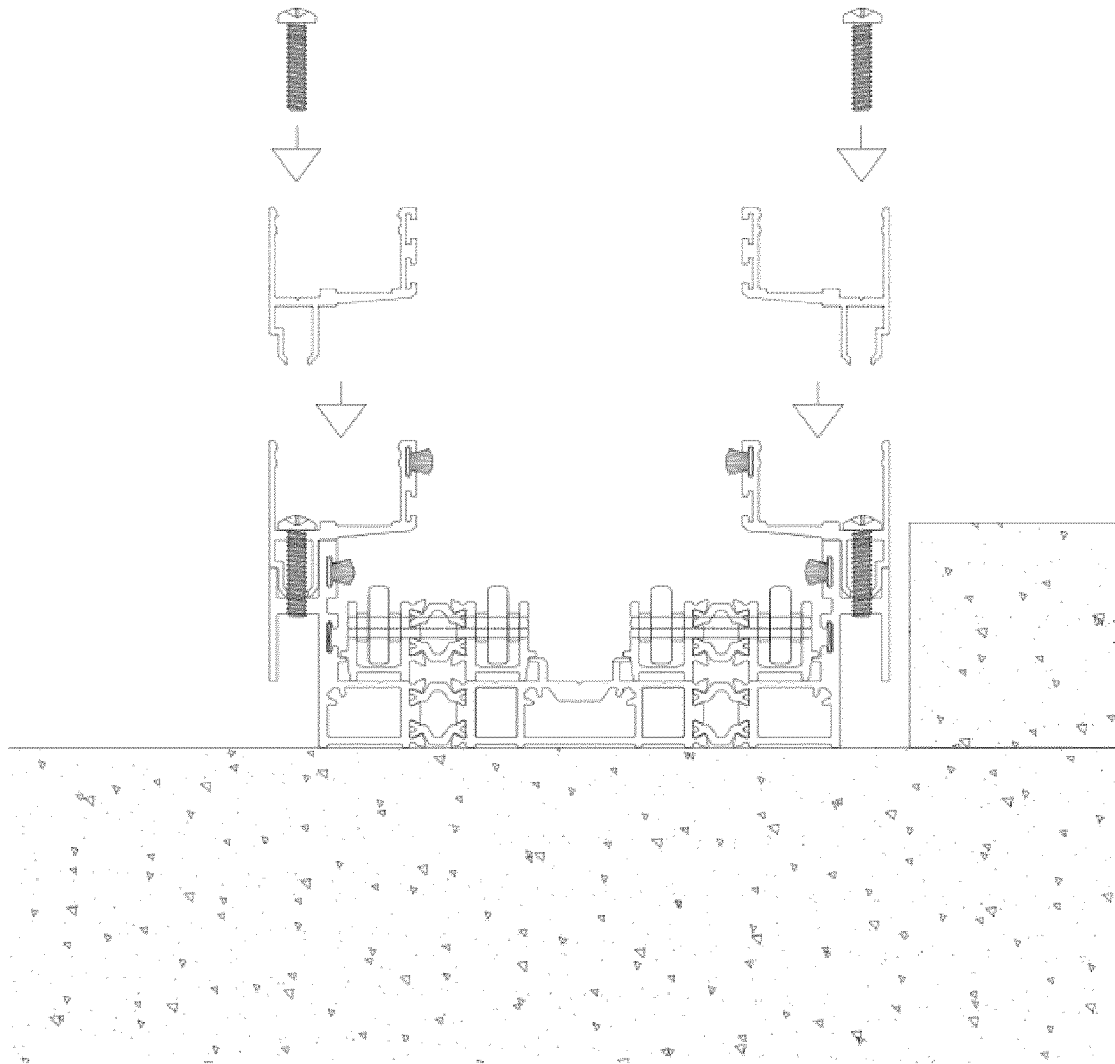


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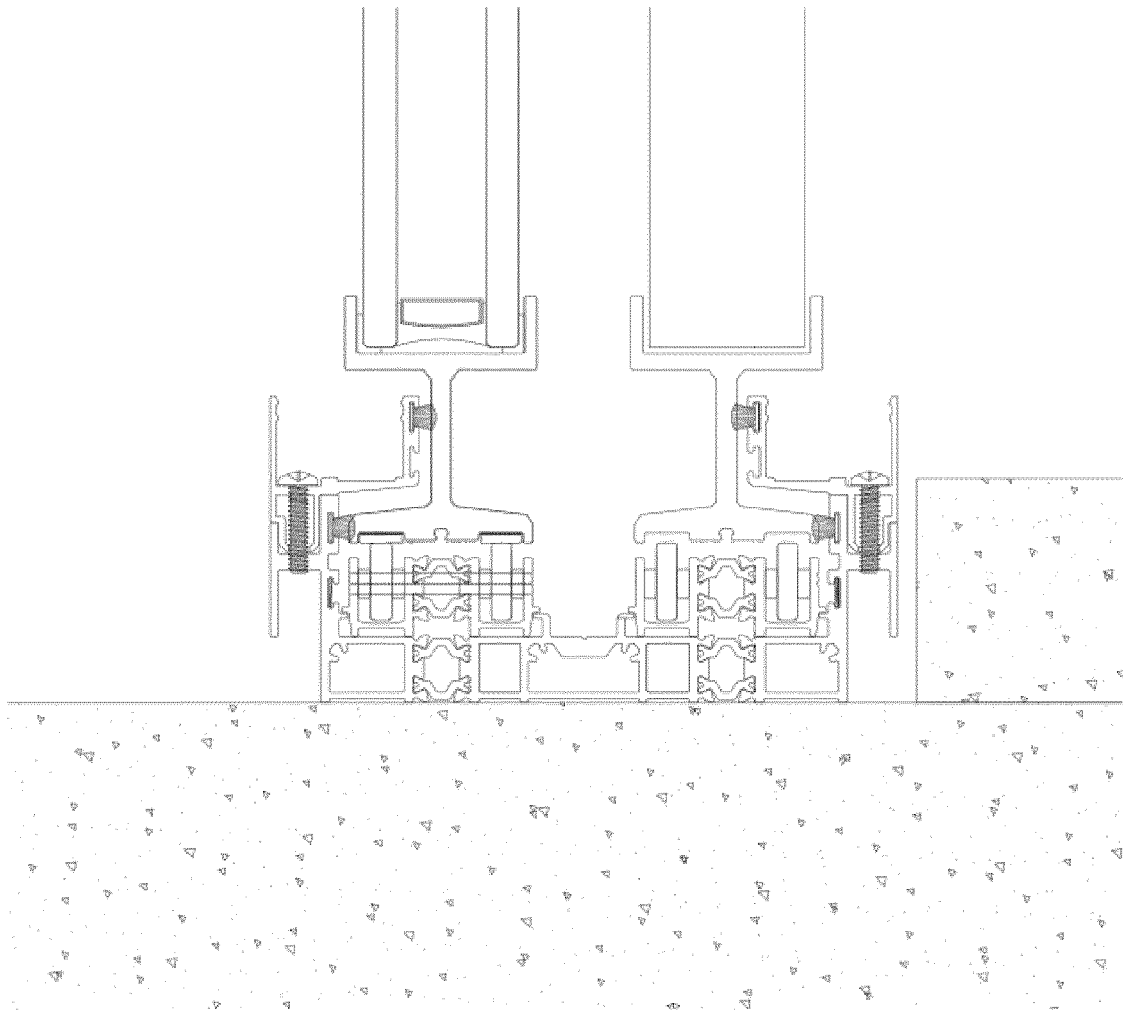


Figure 15

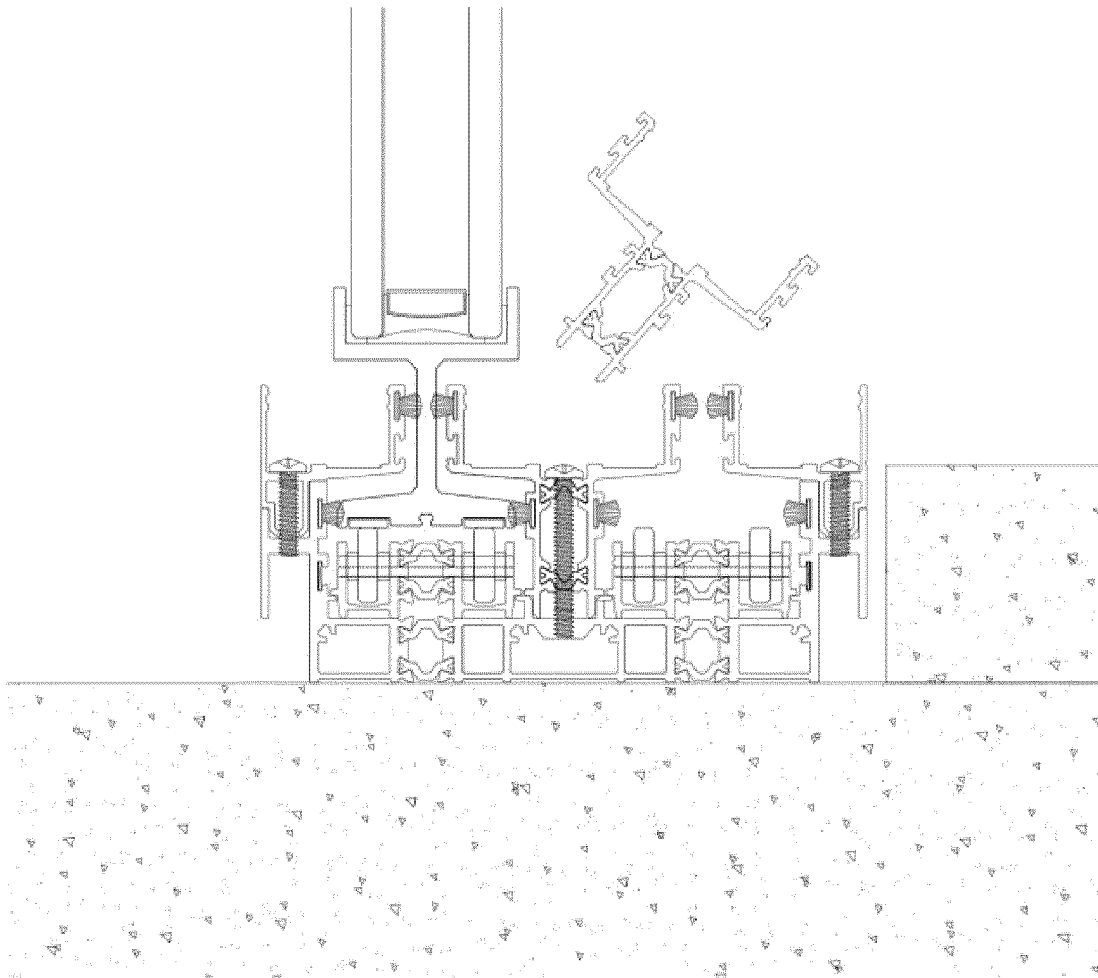


Figure 16

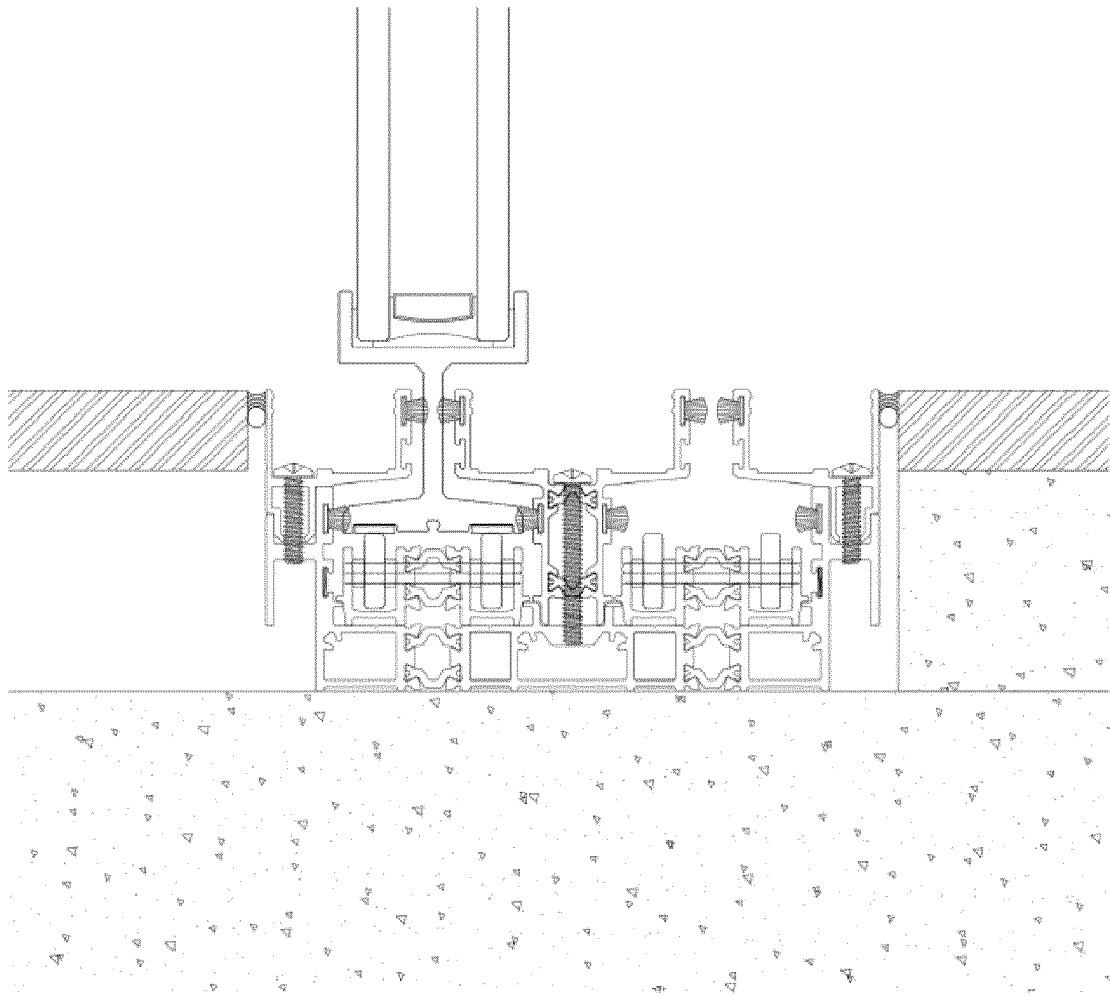


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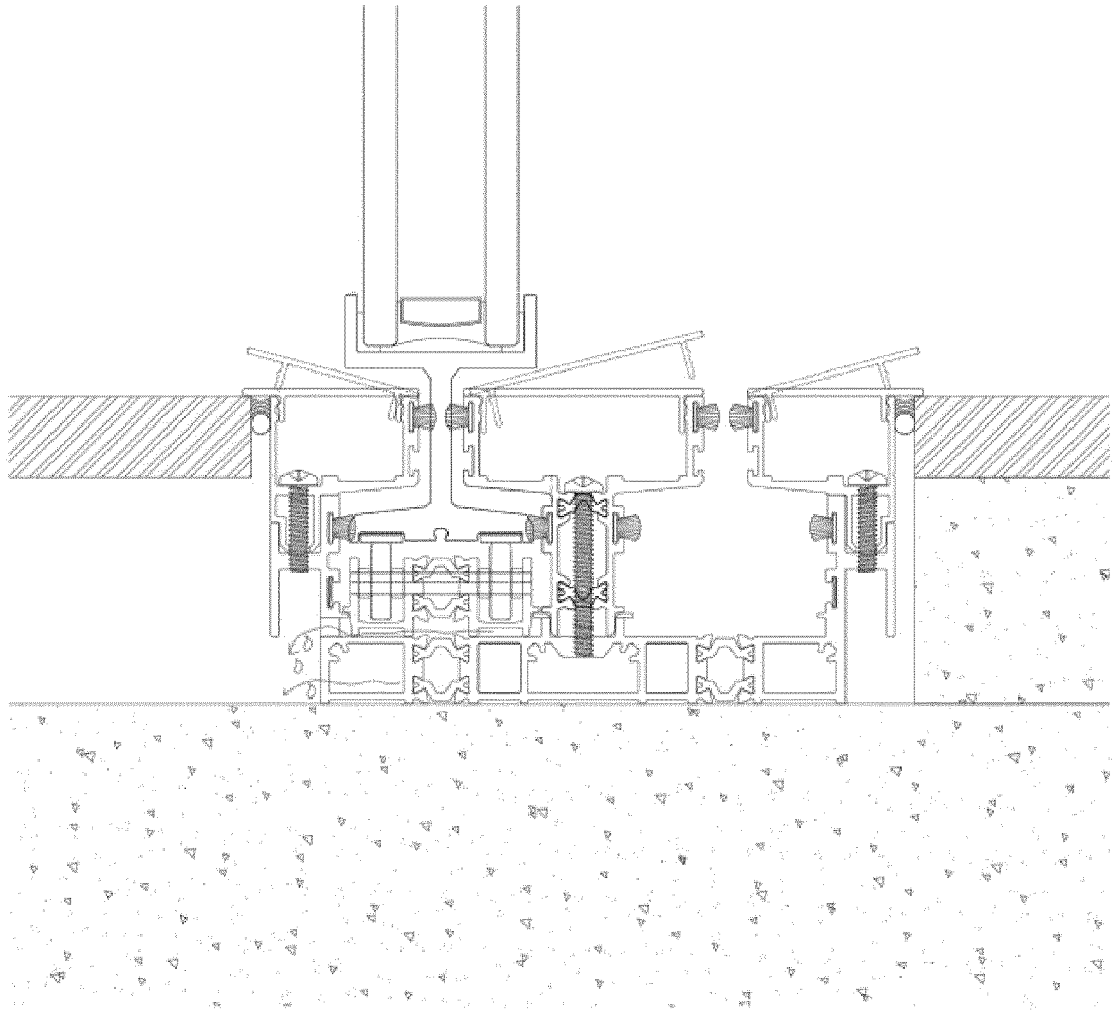


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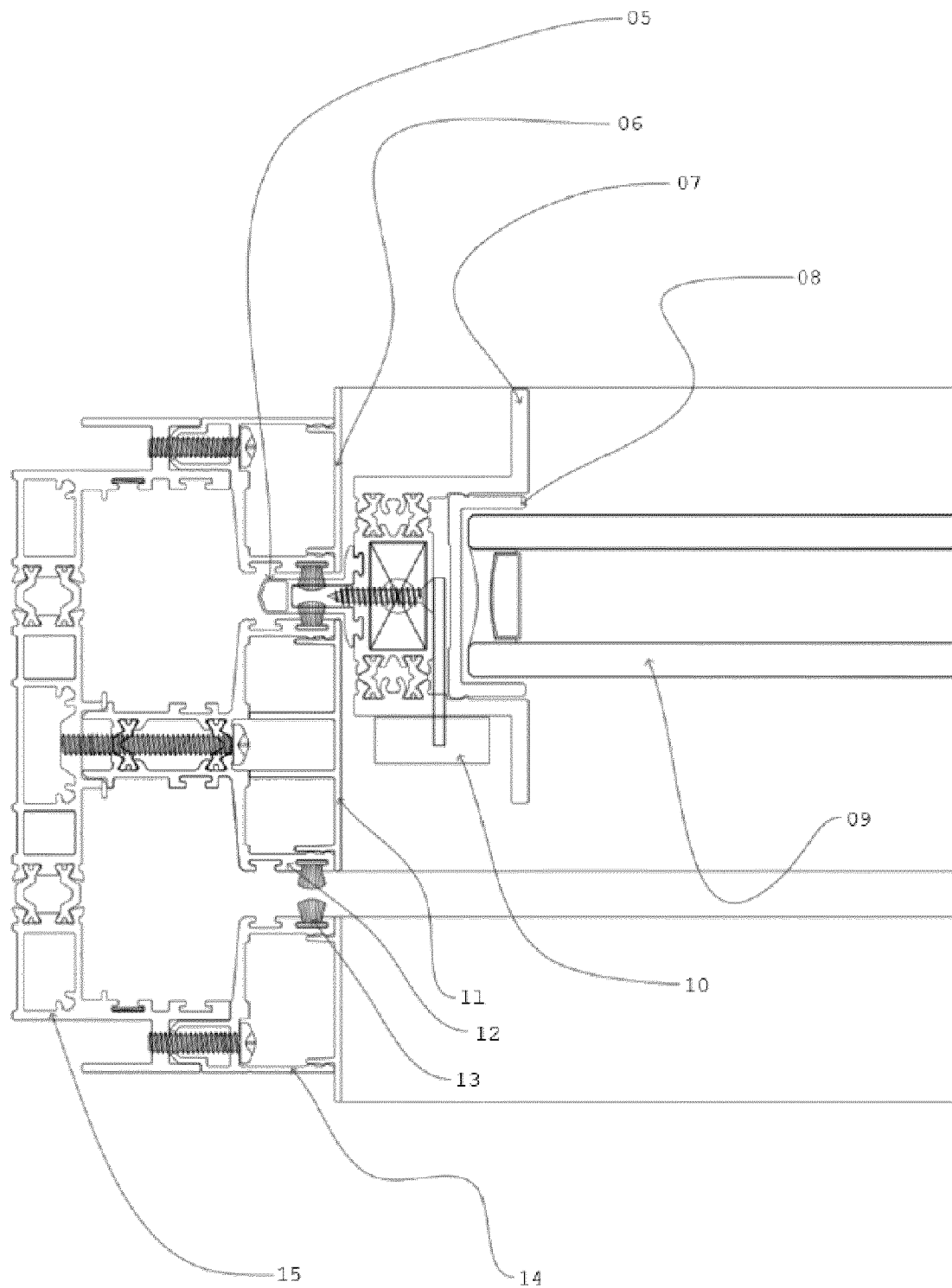


Figure 19

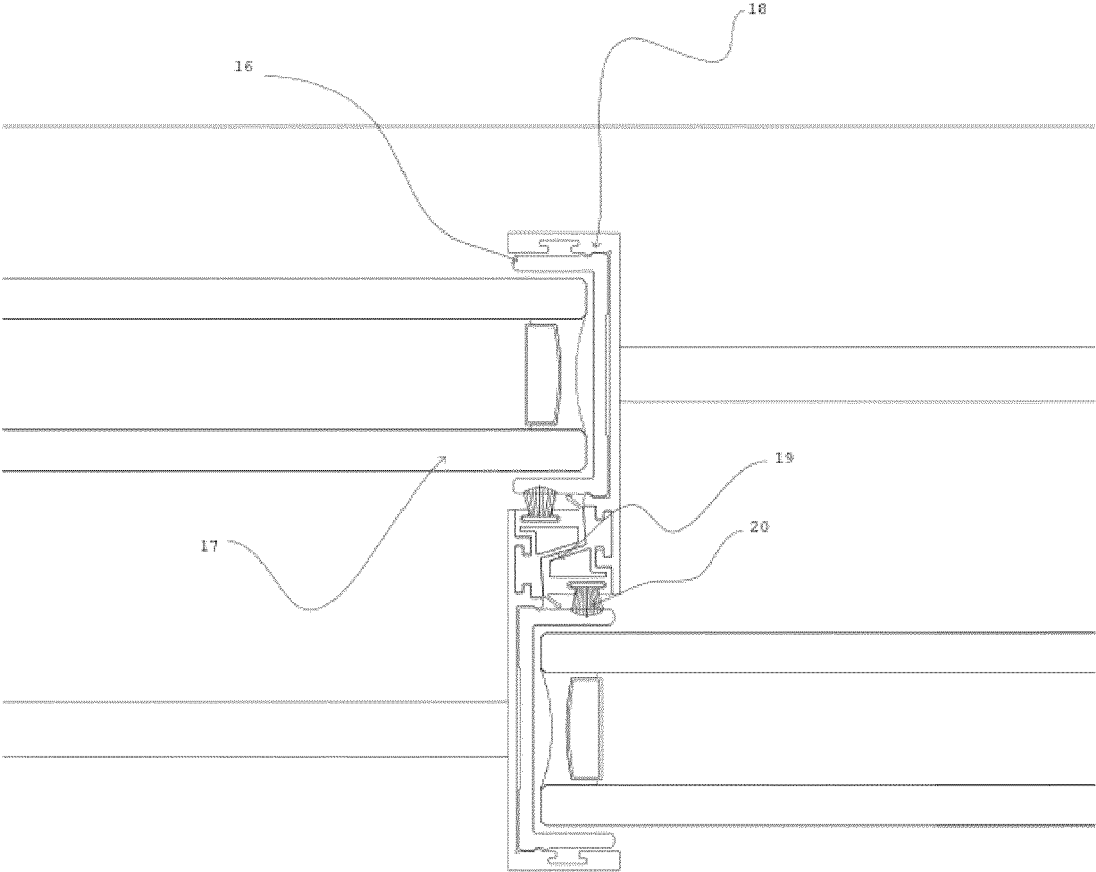


Figure 20

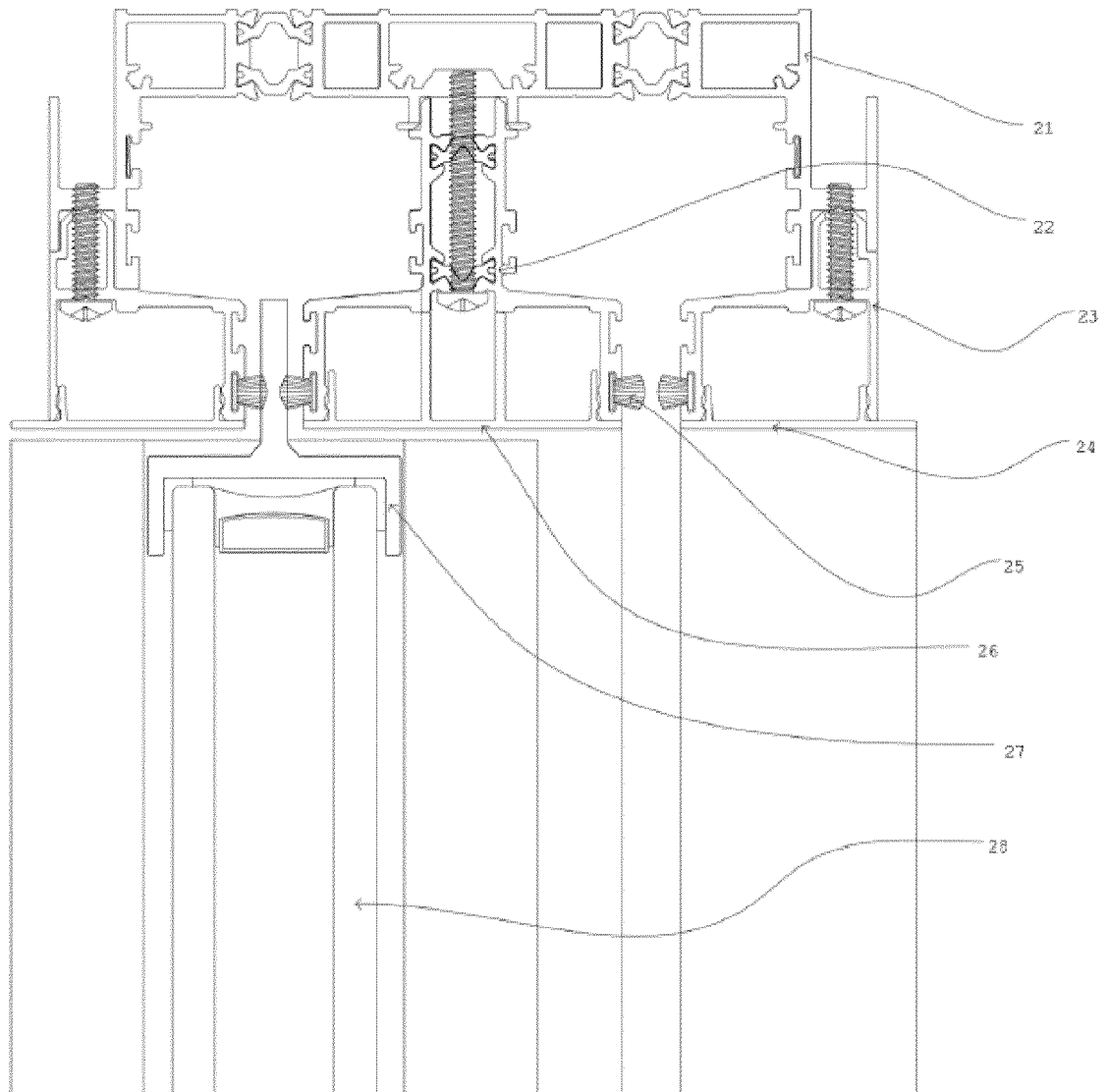


Figure 21

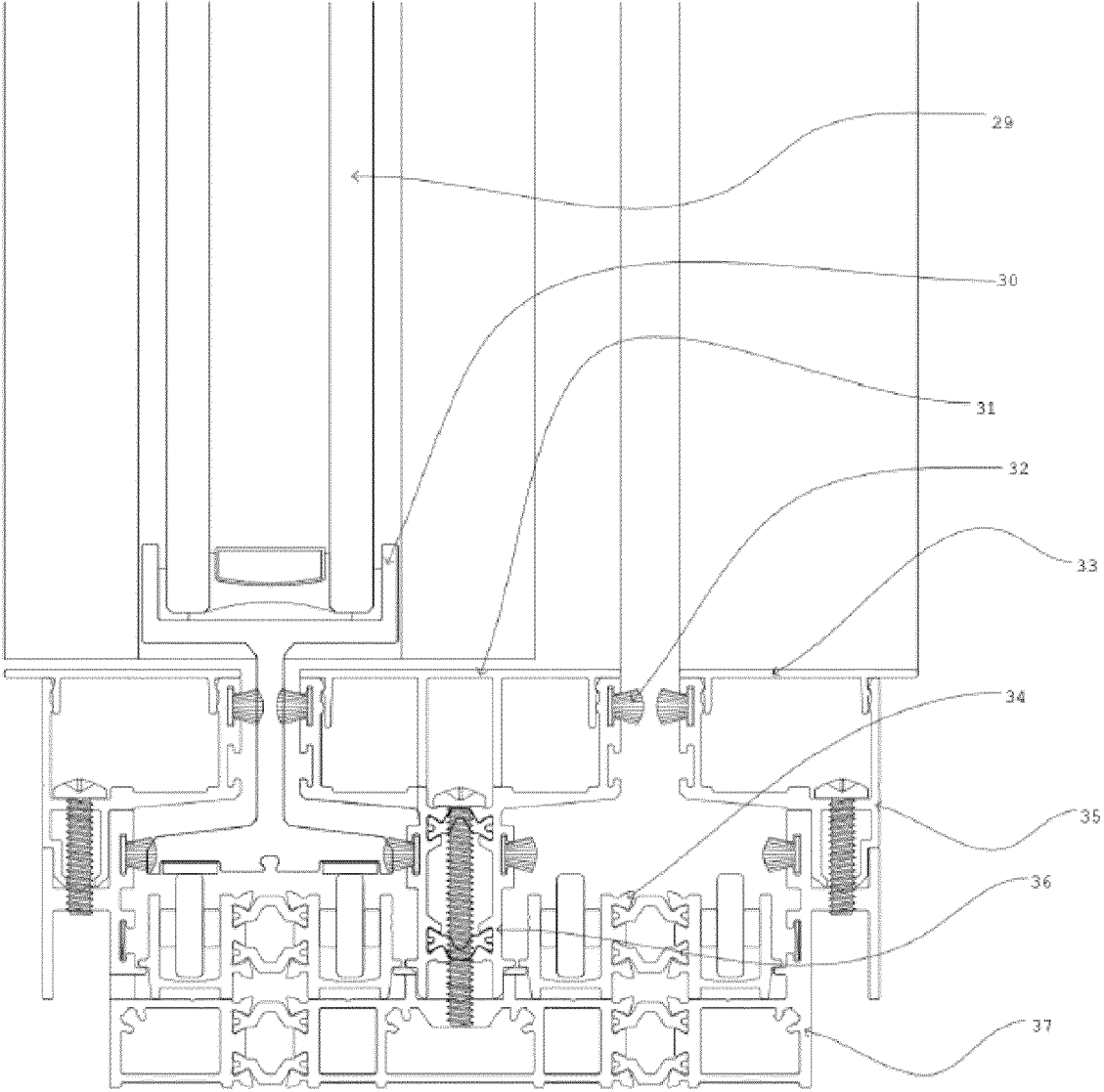


Figure 22

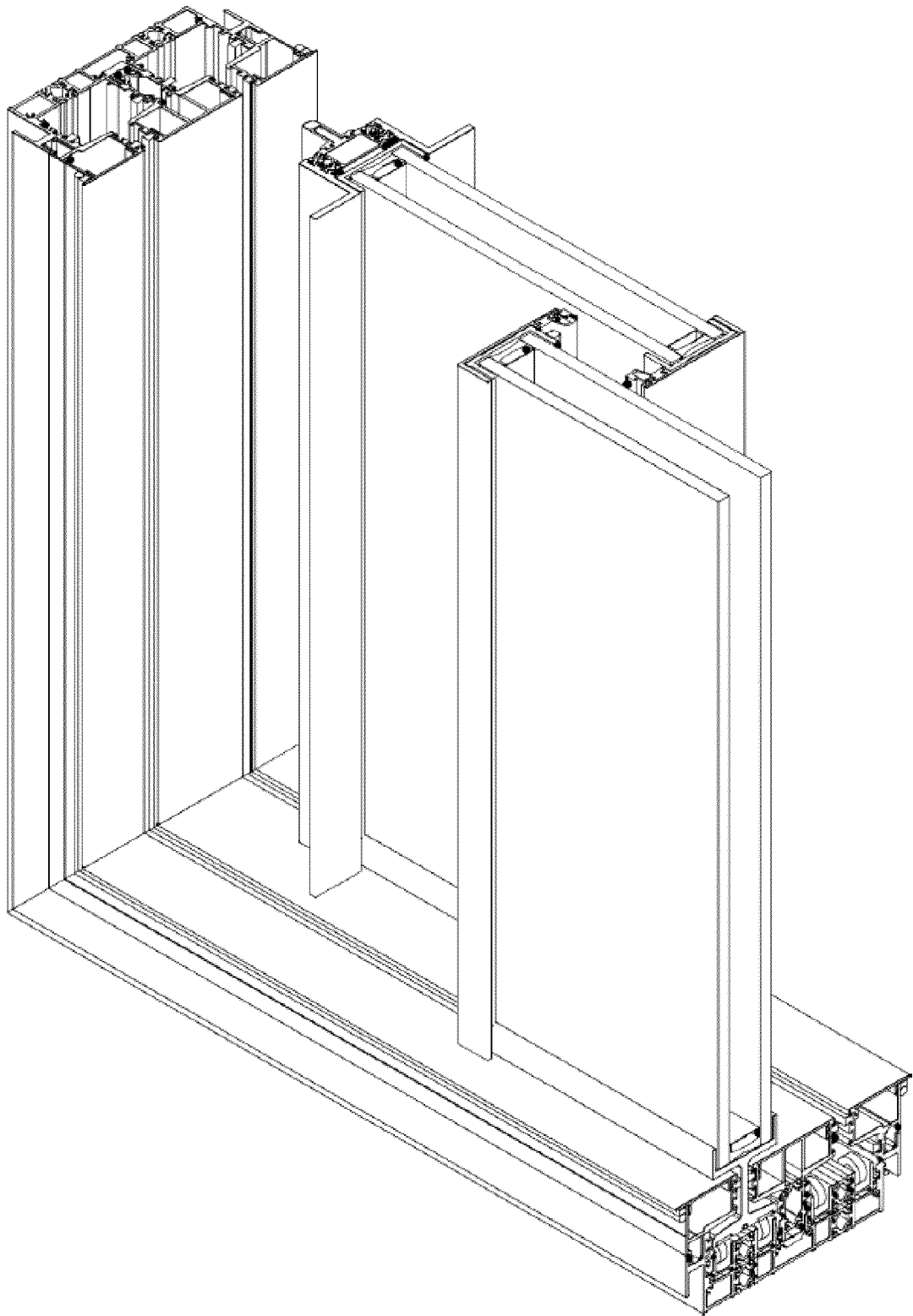


Figure 23

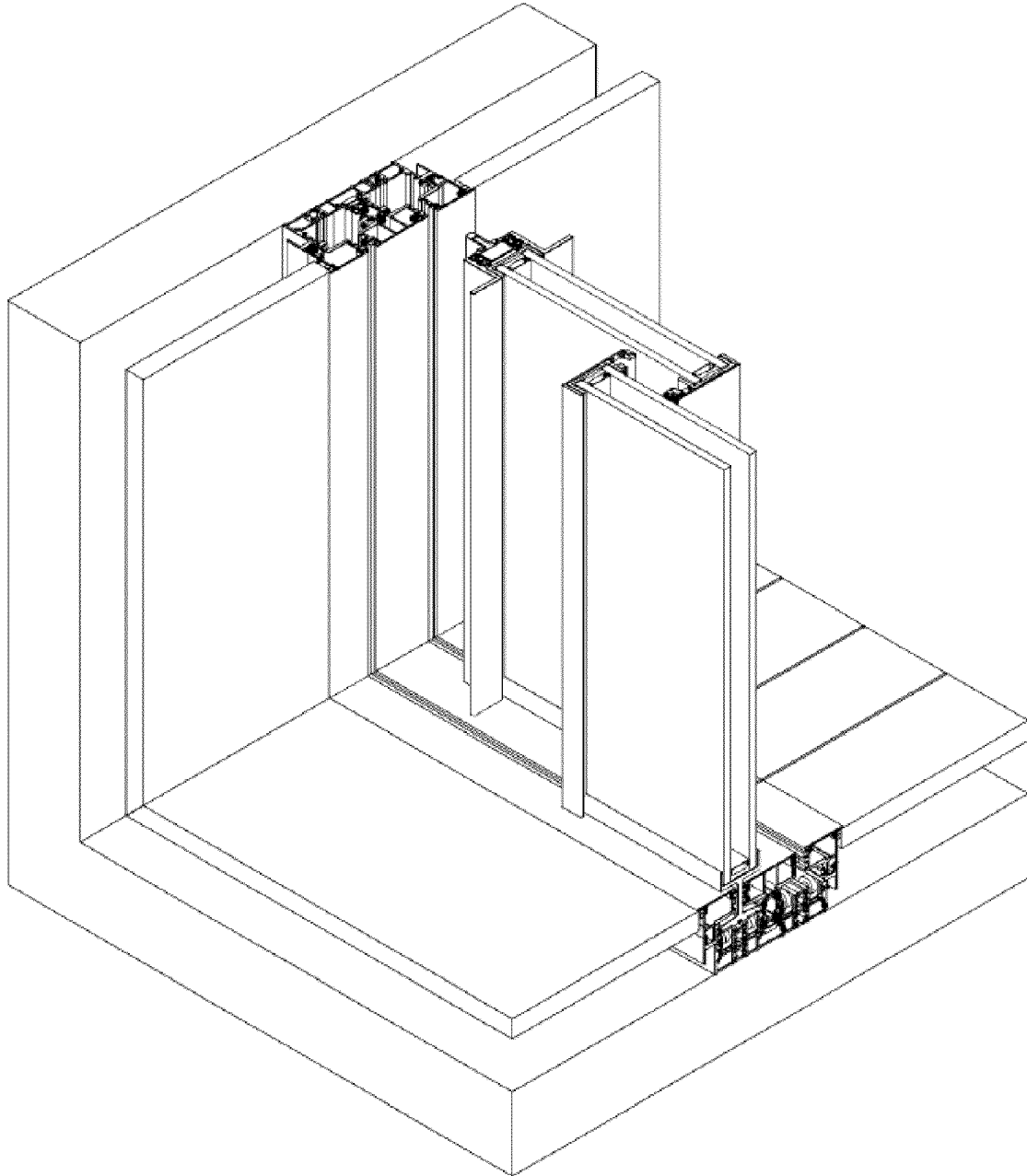


Figure 24

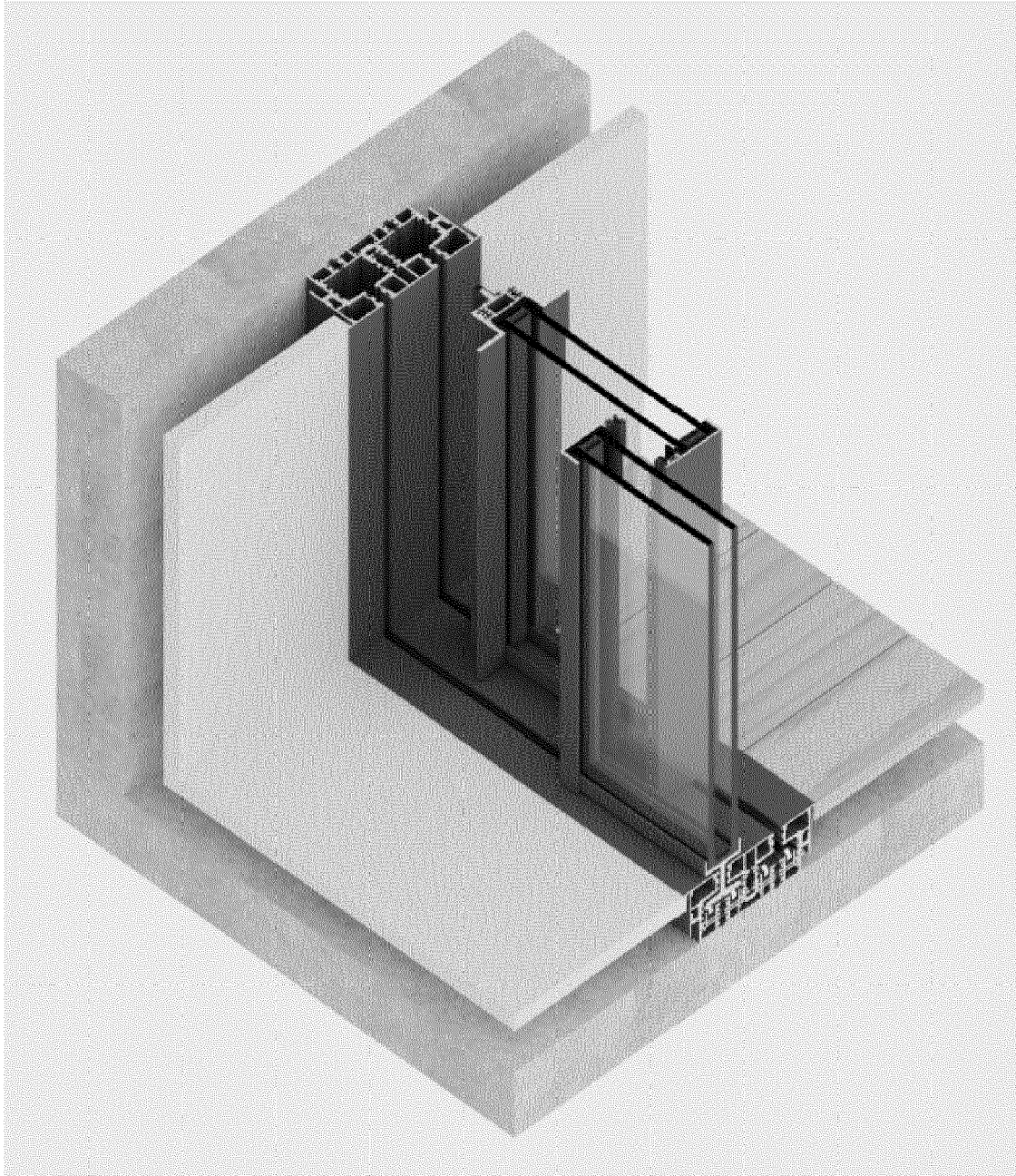


Figure 25

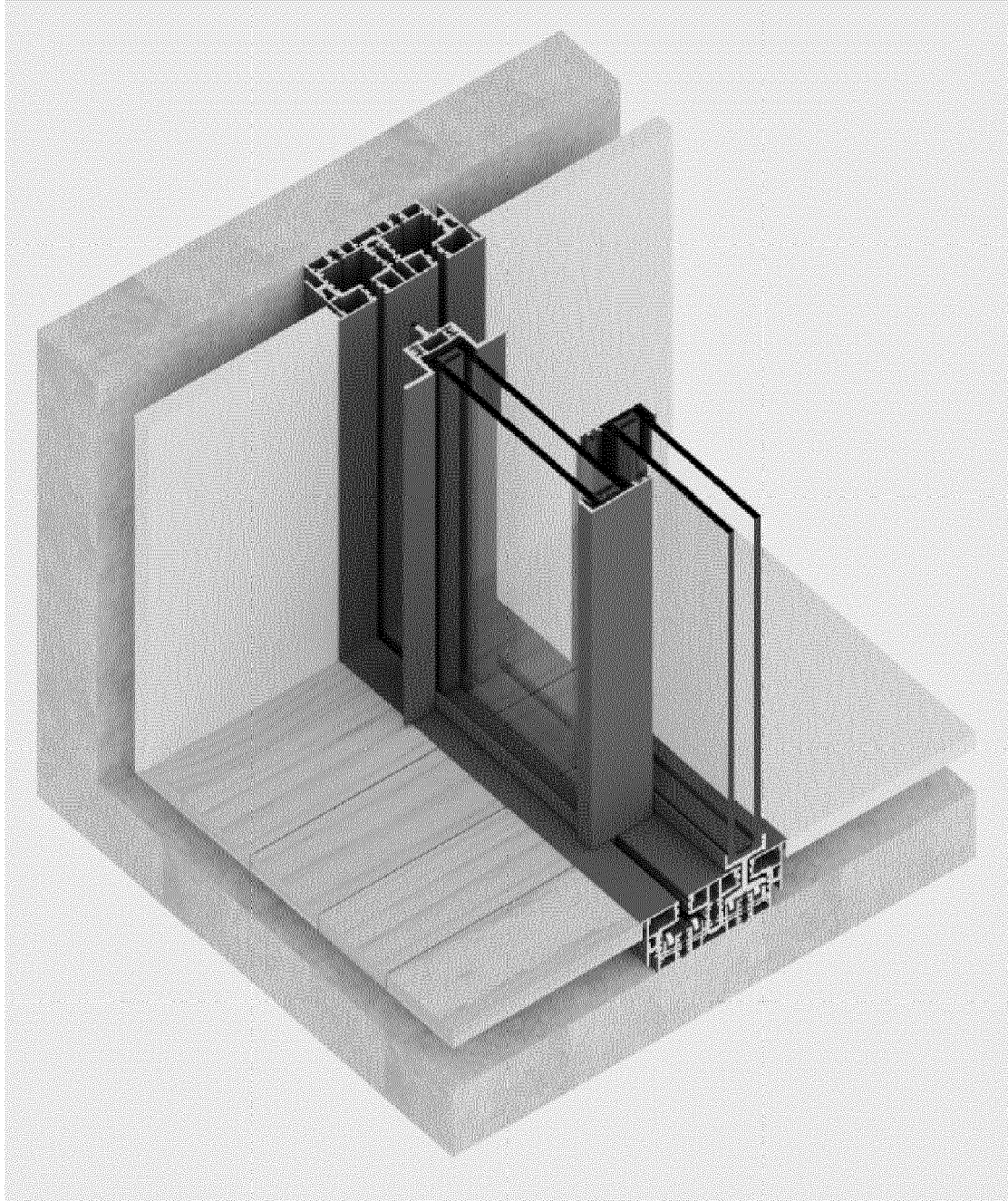


Figure 26

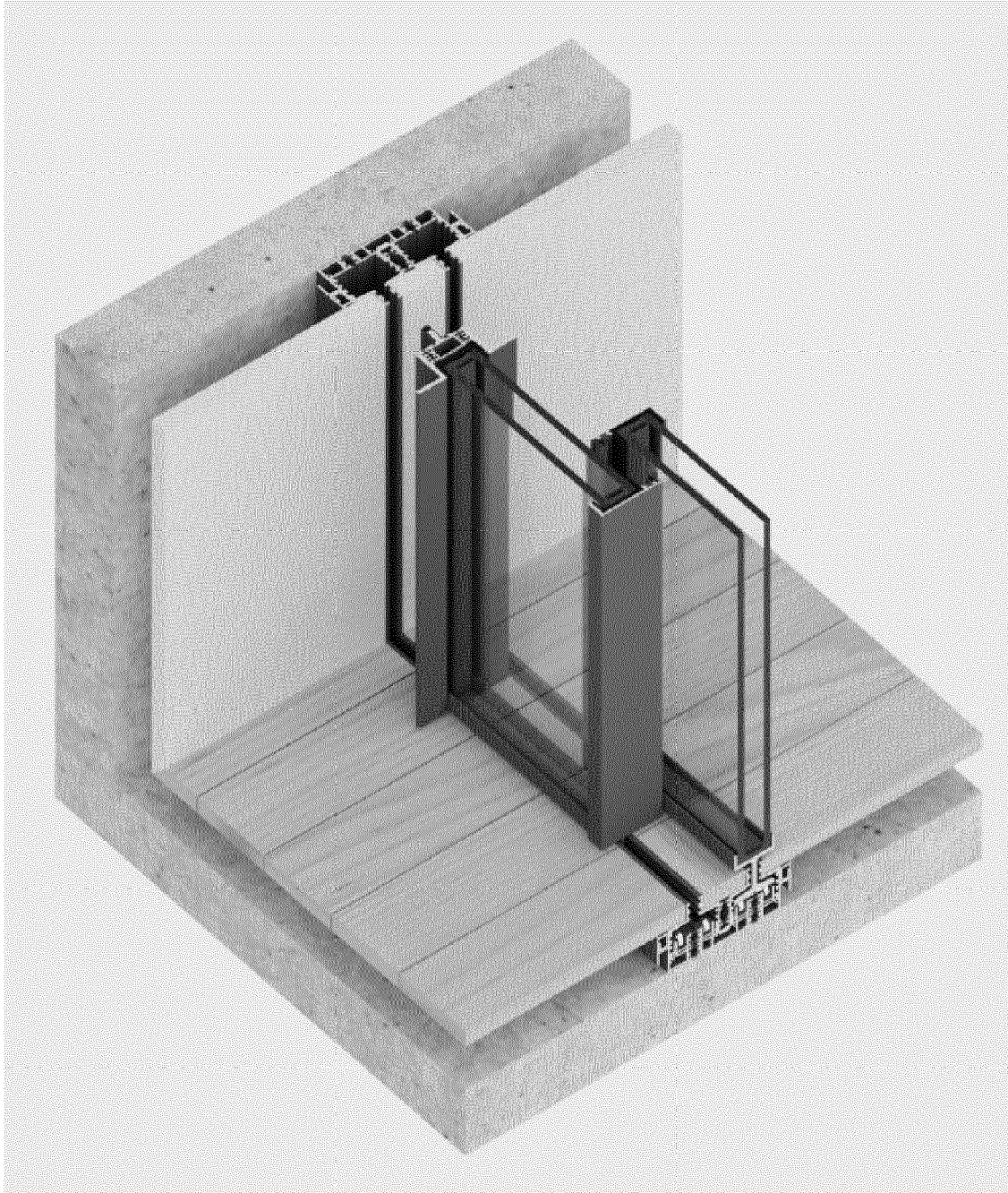


Figure 27



EUROPEAN SEARCH REPORT

 Application Number
 EP 19 18 8397

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A	* page 5, line 21 - page 6, line 31; figures 1-4 *	6	
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			TECHNICAL FIELDS SEARCHED (IPC)
			E06B E05D E05G
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		29 November 2019	Hellberg, Jan
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 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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