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(54) **PANEL SYSTEM**

(57) The invention is related to a fixed panel system that can be used both with and without handrails in housings, schools, hospitals, shopping centers, stadiums, etc.

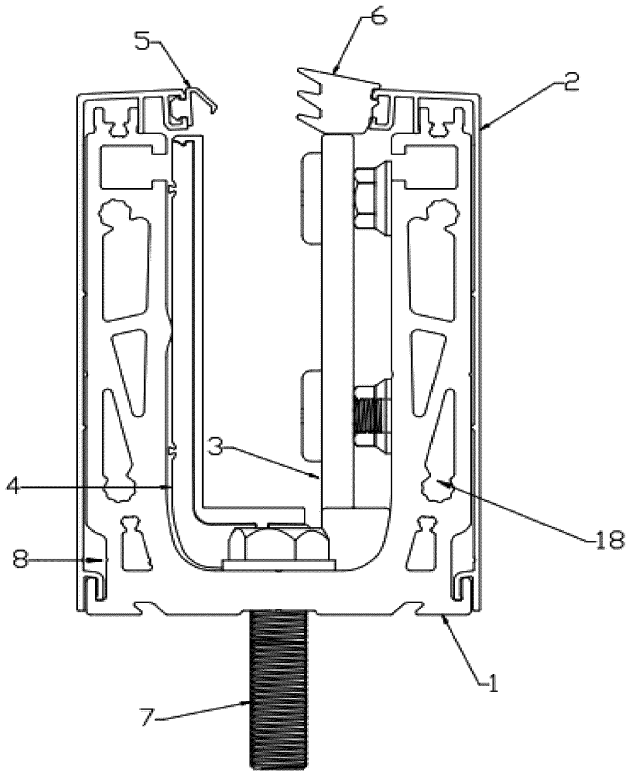

Figure-1

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Description

TECHNICAL FIELD

[0001] The invention is related to a fixed panel system that can be used with or without handrails in houses, schools, hospitals, shopping malls, stadiums, etc.

PRIOR ART

[0002] In the known state of the art, the montage from within the railing is not possible and a scaffold is required. This requirement can have negative consequences in several ways. For example, this situation causes both difficulty of montage and increased costs, in addition to scaffolding accidents. It can be dangerous to raise a scaffold, especially on higher levels. Additionally, improper scaffold usage or faulty installations can have irreversible consequences.

[0003] In the present systems, montage difficulty can be faced in several different ways. For example, in the case of adjusting once more, the scaffold is built again and adjustment is made from both sides. This means extra financial costs and time loss. Apart from that, the obligation of making adjustments from both sides decreases the precision of the adjustment in addition to making it more difficult. Especially on higher floors, adjusting both sides can be time-consuming and troublesome. Each time, to make sure that the glasses are at the right place, a scale should be used on the right and left sides of the railing. This will decrease the accuracy of the adjustment with every small movement.

[0004] In the present systems, in addition to difficult and complex montage, montage takes time. In large housing or on higher floors, this causes time loss in addition to the difficulty of montage. The montage of heavier and thicker glass will be more difficult. Since the complexity and difficulty of the montage depend on several factors, the precision of the adjustments on the thickness of glass, number of flows, scaffolding, etc. will not be the same all the time, which will decrease the reliability of the system.

[0005] There are not many solutions present for the adjustment of angle difference between glass panels in the present systems. Generally, dimensions may differ from the desired measurements due to glass production lines. Therefore, it is not possible to adjust the angle between glasses, especially for railings without handrails. In the methods presented as a solution in the previous techniques, adjustments are generally made from two sides and with the help of a wedge. In other words, in the present solutions, hard plastic wedges are used to make up for the angle difference between glasses. These wedges are generally placed within the aluminum base from two sides (from the right and left of the base profile) and with the help of a hammer. In the case of re-adjustment, it is very difficult to remove these hard wedges from their place, as well as time-consuming. Therefore, this method is not a flexible and easy solution. For example, as can be seen in the document patent number ES2743800, there are no steel bolts or metal pieces in the glass fixing mechanism adjustment. This suggests that the fixed glass is only dependent on the plastic pieces. The possibility of these plastic parts being loosened and separated from the glass can be considered. Therefore, the system is not very secure.

[0006] In the present systems, there is no easy solution for the remedy of irregularities on the floor. These errors will cause vertical variations between glasses. Attempts for making adjustments despite these irregularities cause hardship and mistakes in the montage. These errors will create negative impacts in terms of both aesthetics and safety.

[0007] In the present systems, there are not many base profile options suitable for thick glasses. These thick glasses, which can be used in stadiums especially, has at least 8 PVB layers. This is important in terms of safety in crowded spaces. Since narrow glass gaps eliminate the flexibility of design depending on the project, the usage area for railings is limited.

[0008] The present systems do not give way to montage diversity very much. The same base profile cannot be buried into the floor, connected to the eaves, and mounted onto the surface. For example, in the patent registration number 2013 05591, the subject of the invention of which is a glass railing is observed to have been mounted solely on the floor.

[0009] In the present systems, there are no solutions for closing the mouth of the claw, which is opened from the right and the left during or after the montage of the glass railing. This problem arises when the glass panel or internal systems are placed within the base during the montage. These loads which cause the base profile to open will affect the base profile directly and be more effective as the glass panel gets heavier. Besides, the external loads born on the glass panel by the user can cause an opening at the mouth of the base profile. Also, wind bears a load on the panels as well. This load can get heavier in windy spaces and the base profile may be subjected to heavier loads. Openings are formed on the base that is exposed to load. This opening can become larger and loosen the placement of the panel. The loosening decreases the durability and safety of the glass railing against impacts. This weakness builds and shortens the life of the railing.

[0010] Even though glass railings are recently one of the most popular and commonly produced systems, there are not enough systems that conform to the standards. The systems that can provide aesthetics and safety at the same time are minuscule in comparison to the total of the glass railings produced. Glass railings that are suitable for national and international standards are one of the most important criteria for design and the entirety of the system should be designed based on the same. These standards are of utmost importance in terms of safety.

[0011] The invention which is the subject of the application is developed as a solution to the above-mentioned problems affecting the quality of the glass railing negatively.

BRIEF DESCRIPTION AND PURPOSES OF THE INVENTION

[0012] The present invention is related to a fixed panel system that can be used with and without handrails, to eliminate the above-mentioned disadvantages and bring new advantages to the related technical field.

[0013] The said system which places importance on safety as well as aesthetics is designed to be suitable for different glass types.

[0014] Thanks to its simple design, the duration of the montage is decreased. The comprehensible method and rapid installation are more time and cost-saving. The precision and ease of the method do not depend on the thickness of the glass panel. Due to the option of mounting from within, it provides a safe montage method that does not require a scaffold. This system provides a safe working platform along with the ease of access for working spaces that are difficult to reach.

[0015] Another purpose of the invention is to bring precision and ease to the glass alignment method. The most important issue for these types of systems is eliminating the errors of glass production during the montage.

[0016] The design which places great importance on safety provides new solutions for closing the mouth of the base profile. In this way, the extra opening arising from external loads can be closed and the glass panels can be rendered more sturdy against impacts. This method, which is performed without piercing the glass (pulling/stretching system) is designed as a precaution. Also, another advantage of this method is being able to remedy the tolerance mistake by opening the mouth of the base profile that has smaller tolerance backward. In this manner, no difficulty will be faced as the glass and other inner systems are placed. Besides, it is possible to fasten the railing systems which have expanded due to thermal changes through time, by only removing the side cap profile and with the help of the pulling/stretching system.

[0017] The system is used in semi-circle balconies in 90 degrees and other shapes with different angles.

[0018] The main purpose of this invention which is suitable for different glass types is to provide ease of montage. Therefore, the installation time is minimized by making the montage less difficult. The purposes of developing the fixed panel system of the invention are;

- Eliminating the need for a scaffold in the montage. Since mounting from within the panel is possible with the newly developed montage and panel fixing method, no scaffolding is needed. This method is more time and cost-saving.
- A more secure working environment is provided. This system provides a safe working platform with the ease of access to working spaces that are difficult to reach, with the option of mounting from within the panel. The design which is provided to prevent scaffold accidents removes the need for building a scaffold.
- It provides the ease of making re-adjustments. Thanks to this design, in the case of a possible re-adjustment, there is no need for building a scaffold again and making external adjustments. All the adjustments can be made from easily from inside of the mounting place.
- The mounting increases the precision of the mounting adjustments. With the help of the montage which is made inside the railing (thereby removing the need for building a scaffold on the outside), the adjustments are made from one side at once and with more precision compared to two-sided mounting. The method which minimizes the need for a scale provides for a mounting method with higher accuracy.
- It eliminates the montage methods which are difficult, time-consuming, complex, and dependent on various factors. Especially in bigger projects, the complexity causes slower montage and setbacks for the project. In the new method, placing the glass and adjusting its connections to the base profile is more rapid and easy. The precision and ease of the method do not depend on the thickness. This system is both time and cost-saving.
- It brings precision and easiness to the glass alignment method. In these types of systems, the most important issue is eliminating the glass dimension errors which occurs during thr production. The said method provides a solution for the horizontal angle differences between the panels. This method provides the ability to make these adjustments with a more flexible and permanent system instead of fixing the wedges with a hammer. Therefore, it provides an easy glass alignment solution for in-floor, fascia and on-floor installation types The adjustments can be performed rapidly and repeatedly. With the seasaw movement, the panel can be brought to the desired angle and fixed. By interfering with the angle fixing kit from above, an angle alteration can be performed even after the side cap profiles of the base profile are slipped into the base. With these types of procedures, the angle can be adjusted by reaching the inner alignment kit after removing the gasket only. This method provides for aligning the panels up to at least 40 mm in addition to rapid and easy montage.
- It brings a safety factor to the adjusted glass alignment method. Thanks to the steel bolts used in this method, the mechanism is rendered stronger and the amount of external load the system can resist is increased.
- A base profile that can be used both in part (as small sections) and bulk (as lengthy sections) is designed. Thanks to the special design, it is possible to use the

same as both part and bulk. The invention which can be used in the form of parts decreases the costs.

- It aims to eliminate the difficulty of montage which arises from the irregularities on the floor. Thanks to the invention, a solution is provided for the difficulties during the montage in the passage of the side cap profiles of the base profile. Thanks to the adjusted side cap profile, the irregularities on the floor can be remedied up to 4mm. Thereby, during the montage of side caps and base profile , and especially in the installations made in parts, no difficulty is faced.
- To close the vertical sides of the base (mouth of the U profile). To close the opening which emerges as the glass panel is placed during the montage or due to the loads imposed on the panels at a further date (the loads applied by the user and/or wind loads, etc.). This opening expands through time and loosens the place wherein the panel is placed (open mouth of the base profile). This loosening imposes a danger in terms of the security of the railing which is made from glass or a similar material. The smart pulling/stretching method that is put forth in the invention is an important design for prolonging the life of the railing and increasing its safety. Also, thanks to this system, the glass panel will be rendered more durable against impacts or lateral loads. Thanks to this method, the fixed panel system is rendered more durable against wind loads. Even in the cases where the distance between the panels is zero, the system which is used without piercing the glass or similar material panels renders the base profile and consequently, the fixed panel system sturdier and more reliable.
- Correcting the tolerance errors is aimed. Another advantage of mouth pulling/stretching is being able to seal the tolerance errors of the base profile by opening the mouth backward. For example, the difficulties faced when the faulty internal systems (inner systems that are produced on larger measurements than the actual measurements) are placed within the faulty base (the base produced on smaller measurements than the actual measurements) can be eliminated by opening the mouth of the base backward. In this manner, no difficulties will be faced as the panel and other inner systems are placed. In addition to this, thanks to this system which renders the base profile more durable, it is possible to save from base material. This renders the fixed panel system more economical.
- To eliminate the expansions that emerges in the railing systems due to thermal changes. With the rise of temperature, expansions can occur on the base profile in time. This expansion can loosen the inner systems and consequently, where the panel is placed. The glass panel which is not fixed sufficiently will lose its durability against loads. To eliminate this problem, the base mouth pulling/stretching system can be used. Thanks to this system, the base will be pressed to bring the same to the desired opening again. This adjustment can be made repeatedly with ease and rapidly by removing the side cap profiles only.
- To expand the limited usage space of the fixed panel system: thanks to the wide glass gap, the fixed panel system can be used in shopping centers, schools, stadiums, hospitals, and similar crowded spaces, in addition to special living quarters. The base profile which is designed according to different glass thicknesses is suitable for crowded places wherein safety is important. Various glass options will increase the design flexibility based on the project by expanding the usage area of the fixed panel system.
- To provide montage diversity. Thanks to the invention developed, the base profile can be buried into the floor, connected to the eaves, or mounted onto the surface.
- To provide for the alignment of the base profiles. Thanks to the slot pins designed, the connection and alignment of the base profiles to each other are rendered easier and more rapid.
- To make up for the shortcoming of the designs that is not suitable according to standards. Another purpose of the invention is being able to provide aesthetics and safety in the same design. This system is prepared according to the criteria set forth by the national and international safety standards.

Description of the Illustrative Figures

[0019] Figures used to describe the fixed panel system developed by the invention better are as follows.

Figure 1 Fixed panel system
Figure 2 View of the glass pushing apparatus
Figure 3 View of the alignment kit
Figure 4 View of the railing with the top LED
Figure 5 fascia-mounted view
Figure 6 in-floor montage view
Figure 7 View of the pulling/stretching system for the base profile mouth

Description of the Parts and Elements of the Invention

[0020] The parts and elements of the fixed panel system developed by the invention are separately numbered as follows.

1. Base profile
2. Side cap profile
3. Glass pushing apparatus
4. Glass alignment kit
5. Outer glass gasket
6. Inner glass gasket
7. Floor connection bolt
8. Water drainage channel

9. Adjustment bolt
10. Cap nut
11. Glass pushing frame
12. Glass pushing wedges
13. Glass alignment profile
14. Glass alignment wedge
15. LED profile
16. gasket
17. Top handrail profile with LED
18. Pin connection housing
19. Fascia cap profile
20. Fascia mounting bolt
21. Small cap profile
22. LED housing for fascia cap profile
23. Square cap nut/first hexagon cap nut
24. Reverse tooth
25. Axle
26. Second hexagon cap nut/square cap nut
27. Base mouth pulling/stretching system
28. Straight tooth
29. Square cap nut/hexagon cap nut

DETAILED DESCRIPTION OF THE INVENTION

[0021] In this detailed explanation, the innovation subject to the invention is described with examples given for a better understanding of the subject in a way not to impose any limiting effect on the same.

[0022] In Figure-1, the cross-section view of the fixed panel system of the invention is shown. It is composed of the pushing apparatus kit (3) which is adjusted from the top, being placed within the base profile (1), a glass alignment kit (4), side cap profiles (2), top handrail profile with LED (17), water drainage channel (8) on its foot, pin connection housing (18) and inner glass gasket (6) and outer glass gaskets (5).

[0023] In the mountings which are placed on the floor (Figure-1), the same was mounted onto the floor first with the help of a floor connection bolt (7). As can be seen in Figure-5 and Figure-6, the said design is suitable for various montage types.

[0024] Thanks to the invention, this system can be used by mounting onto the eaves or as buried in the floor with the pushing apparatus kit (3) and glass alignment kit (4), inner glass gasket (6) and outer glass gaskets(5), and the floor connection bolt (7). When it is used as mounted on the eaves, the eaves closure profile (19) which has an LED housing for fascia cap profile (22) and a small cap profile (21) is used. For the buried-type montage, the side cap profiles (2) are replaced with small cap profiles (21).

[0025] Especially where the panel system (Figure-1) is used in bulk, it protrudes from the previously opened water drainage channel (8). Thereby, water leaks are prevented.

[0026] When there is a need for connecting the base profiles (1), the pin connection housings (18) can be used. Thanks to this design, the connection of the bases (1) is made rapidly and with ease, and easy alignment is provided.

[0027] Inner systems (pushing apparatus kit (3) and glass alignment kit (4)) are placed within the base profile which has been mounted onto the floor, eaves, or within the floor. The inner systems provide for the glass to be positioned and fixed at the desired place. One of the main elements of the invention which provides for the angular movement of the glass, the sea-saw apparatus (4) is shown in Figure-3. The glass alignment profile (13), which is developed for the panel system shown in Figure-1, is composed of a support and a glass alignment wedge (14). This wedge has different thicknesses for different types of glass. The glass alignment kit is placed within the base after connecting the base onto the floor. Afterward, the glass is placed on this kit. The glass alignment kit (4) provides for the movement of the glass together with the pushing apparatuskit (3) and can bring the glass panel to the desired angle.

[0028] The pushing apparatus kit (3), which is another part of the system which provides for the angular movement of the glass is shown in Figure-2. After the glass is placed within the glass alignment kit (4) pushing apparatus kit (3) is slipped onto the claws of the glass alignment profile (13) and placed within the base. Thanks to these claws, two kits (the pushing apparatus kit (3) and the glass alignment kit (4)) are locked together. The pushing apparatus kit (3) is composed of at least one Glass pushing frame (11), glass pushing wedges (12), adjustment bolts (9), and cap nuts (10). As the cap nuts (10) are turned, the connecting bolts (9) move forwards, thus pushing the glass pushing wedges (12) forward as well. The bottom and top wedges which are pushed forwards can be brought back with the movement of the cap nuts. This pushing apparatus kit (3) is placed opposite to the glass alignment kit (4) and provides an angular movement for the glass. In this manner, horizontal glass errors can be fixed up to at least 40 mm.

[0029] After the glass is brought to the desired position, the base mouth pulling/stretching system (27) is activated. The base mouth pulling/stretching system (27) is shown in Figure-7. The purpose of this system is to remedy the expansion which emerges after the glass panels are placed within the base. This base mouth pulling/stretching system (27) which is used for closing the vertical sides of the base profile (1) by pulling the same together is composed of at least four different cap nuts: two square (or hexagon cap nuts, etc.) (29) and two hexagon cap nuts (or square, etc.) (23,26). There is a regular tooth (28) on one side and a reverse tooth (24) on the other. One of the hexagon cap nuts is fixed and the other is movable. The movable cap nut is responsible for locking and prevents the axle (25) from loosening backward. As the cap nut is turned with the help of a wrench, the axle (25) will turn as well and the square cap nuts on the ides (29) will come towards each other, thereby, the mouth of the base profile (1) is compressed. Thanks to this system, in the cases where the mouth of the base

profile (1) is opened, the open mouth can be closed and brought back to its former state by applying reverse force.

[0030] Thanks to the inner systems of the panel system (Figure-1), after the glass, is brought to the desired position and the vertical sides are closed, side cap profiles (2), which are designed so that the inner systems remain unharmed and the open parts of the profile are closed, are used. Another advantage of these cap profilesis eliminating the difficulties of the hatch connections which emerge due to the irregularities on the floor during the montage. The position of the cap profile (2) on the base profile (1) is not at the same alignment all the time, due to the protrusions and recesses on the floor. At some locations, it may be attached on the base profile (1) while at other locations, the hatch may not have been attached. With the side cap profiles (2) developed by this invention, the irregularities on the floor can be eliminated at least 4mm and can remain attached in any case, thanks to the special hatch claws. The side cap profiles (2) can be placed within the base profile (1) thanks to their claws.

[0031] The inner glass gasket (6) and outer glass gasket (5) designed with this invention are used according to different glass types. These gaskets prevent the contact of the glass panels with the base. At the same time, the gaskets go between the glass and the base and prevent the panel from being harmed. Also, these gaskets close the gap between the base and the glass after the glass panels are positioned and press the glass panels as such. Also, thanks to the outer gasket (5) design, this gasket is placed by being slipped into the side hatch (2) before the glass panel is placed. Thereby, there is no need to attach the gasket by bending over the glass panel. Thanks to the inner glass gasket (6) design, the gasket is placed by pressing on the side hatch (2) at the end of the montage. Therefore, montage is easier and the glass panel is fixed in its place more sturdily.

[0032] The top handrail profile with LED (17) which closes the top of the glass mounted within the panel system (Figure-1) is shown in Figure-4. The top handrail profile with LED (17) is an option for closing the top of the glass panel and it will be mounted at the highest level of the glass by being placed with a U-shaped glass gasket (16) within a LED profile (15). Thanks to this design, the glass is protected from outer factors, which prolongs the life of the lamination layer on the glass. Also, all the glasses are connected to a single handrail profile (17) from the topmost point. The top handrail profile with LED (17) is attached to the wall from the sides. Therefore, the glasses will be sturdier and they will remain in their place.

Claims

1. A fixed panel system which can be used with or without handrails in houses, schools, hospitals, shopping centers, stadiums, etc. and which can be mounted on the floor or the eaves, and buried into the floor, **characterized in that** it comprises;

   • A side closing hatch (2), in the cases that the base profile (1) is used in parts, eliminates the montage difficulties emerging from the irregularities on the floor and also closes the open places of the base profile (1) and prevents the inner systems from being harmed,
   • A glass alignment kit (3) which provides for the angular movement of the glass panels as well as fixation of the glass by being brought to the desired position,
   • A glass alignment kit (4) which provides the angular movement of the glass panels and is placed within the panel system after the panel system's connection onto the floor,
   • A water drainage channel (8) which provides for the water accumulated in the base (1) to be discharged outside the base profile (1),
   • At least one outer glass gasket (5) on the outer part presses the glass panels by closing the gap between the base and the glass, and is placed by being slipped into the side hatch (2) before the glass panel is placed,
   • At least one inner glass gasket (6) at the inner part is placed by pressing on the side hatch (2) at the end of montage and is used to prevent the contact of glass panels with the base,
   • Top handrail profile with LED (17), which is mounted within the panel system and is used when the topmost part of the glass panel is desired to be closed,
   • A pin connection housing (18), which provides for the base profiles (1) to be connected and to be aligned with ease.

2. Fixed panel system according to Claim 1, **characterized in that** the glass alignment kit (3) comprises;

   • An alignment kit frame (11) in which the glass pushing wedges (12) will be placed,
   • Glass wedges (12) which provide for the alignment of the glass panels,
   • At least one adjustment bolt (9) which provides angular movement for the glass by pushing the glass wedges (12) forwards,
   • At least one cap nut (10) which provides for pushing the adjustment bolt (9).

3. Fixed panel system (1) according to Claim 1, **characterized in that** the glass alignment kit (4) comprises;

   • Glass alignment profile (13) which is opposite the glass alignment kit (3) and which provides for it to be placed within the base profile (1) thanks to the clawed structure at its end,
   • Glass alignment wedge (14) which is attached within the sea-saw glass alignment profile (13).

4. Fixed panel system according to Claim 1, **characterized in that** the top handrail profile with LED (17) comprises;

    • U-shaped glass gasket (16) which provides for the glass panel to be fixed within the top handrail profile with LED,
    • LED profile (15) which can be used when using LED lights is desired.

5. Fixed panel system according to Claim 1, **characterized in that** it comprises a base mouth pulling/stretching system (27) which provides for the elimination of the expansion that occurs after the glass panels are placed within the base profile (1).

6. Fixed panel system according to Claim 5, **characterized in that** the base profile mouth pulling/stretching system (27) comprises;

    • At least two square and/or hexagon cap nuts (29) which prevent the pulling/stretching system from coming out from its housing,
    • At least two first hexagon cap nuts (23) which provide for the axle (25) to turn and which provide the pulling/stretching movement of the entire system,
    • At least one straight tooth (28) and a reverse tooth (24) which provides for the square cap nuts (29) to pull each other as the axle moves and which provides for the pulling/stretching movement of the system.

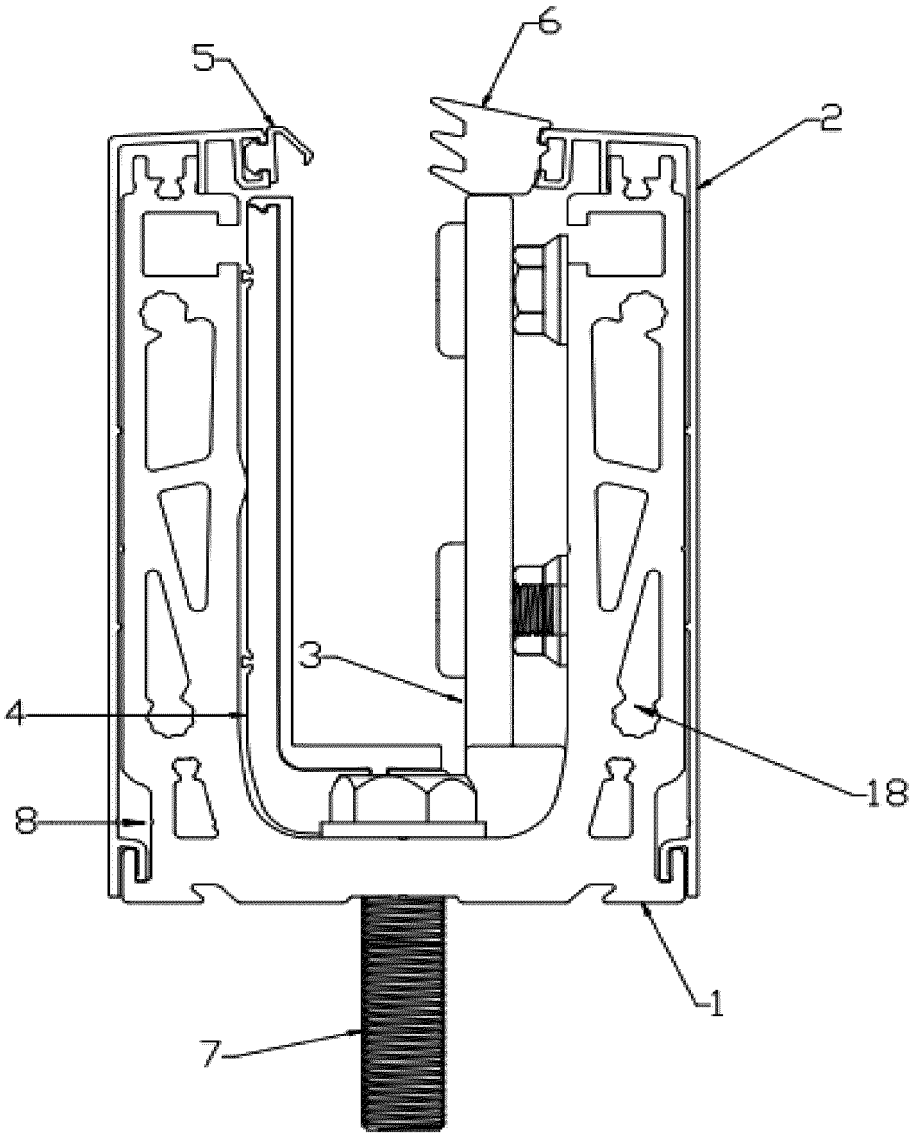

Figure-1

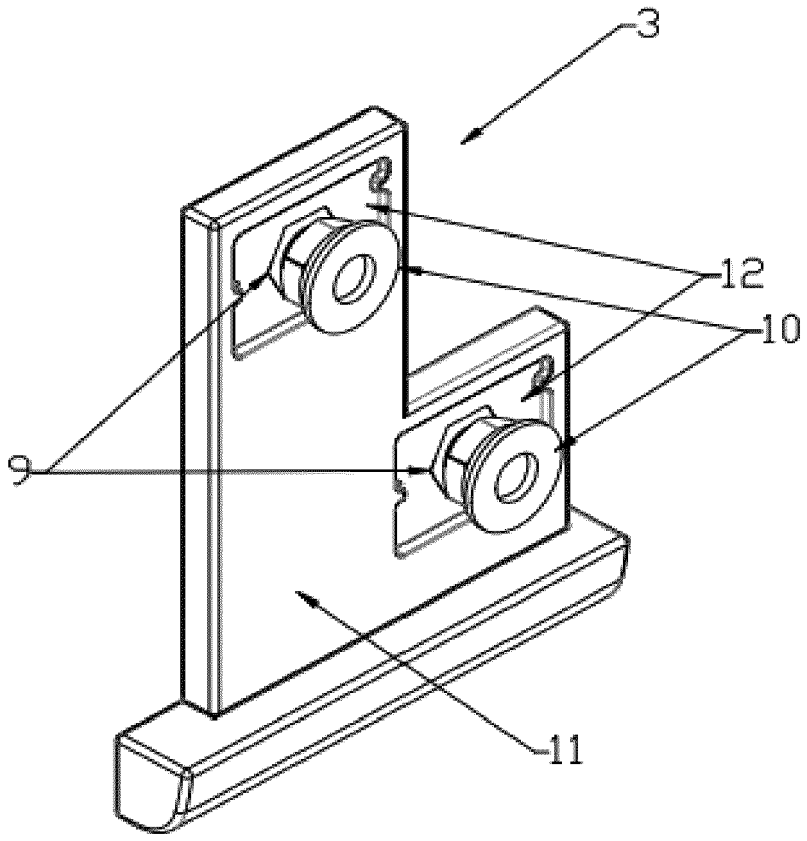

Figure-2

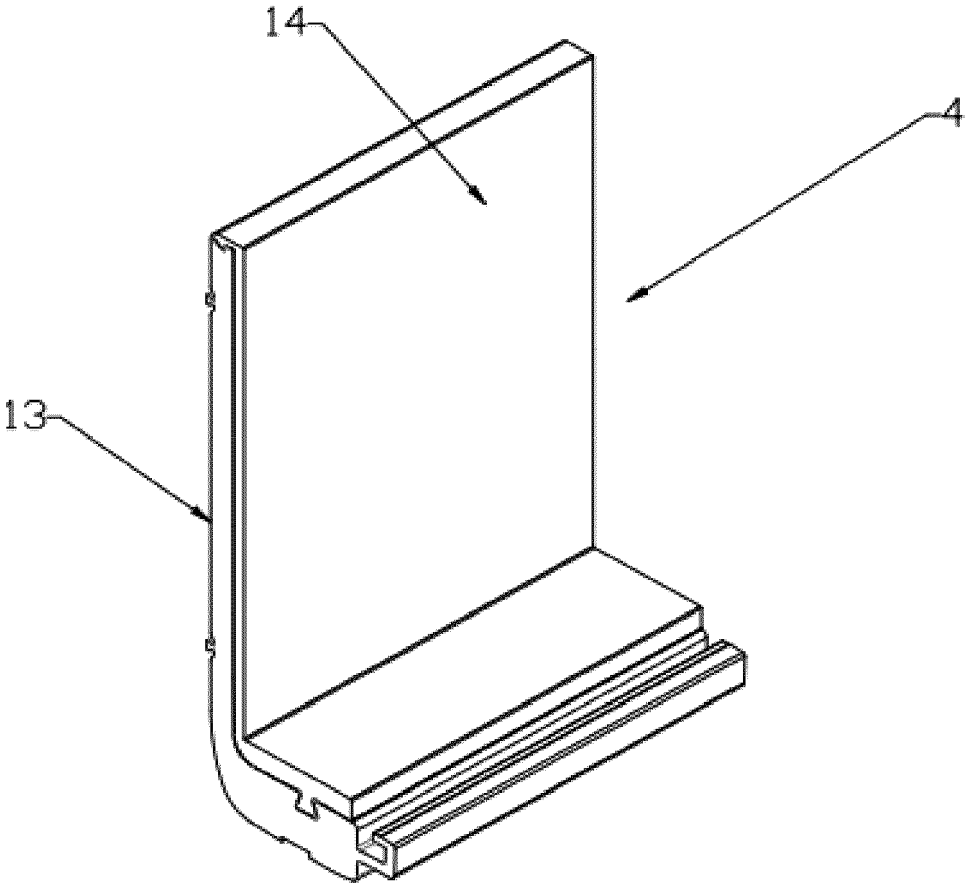

Figure-3

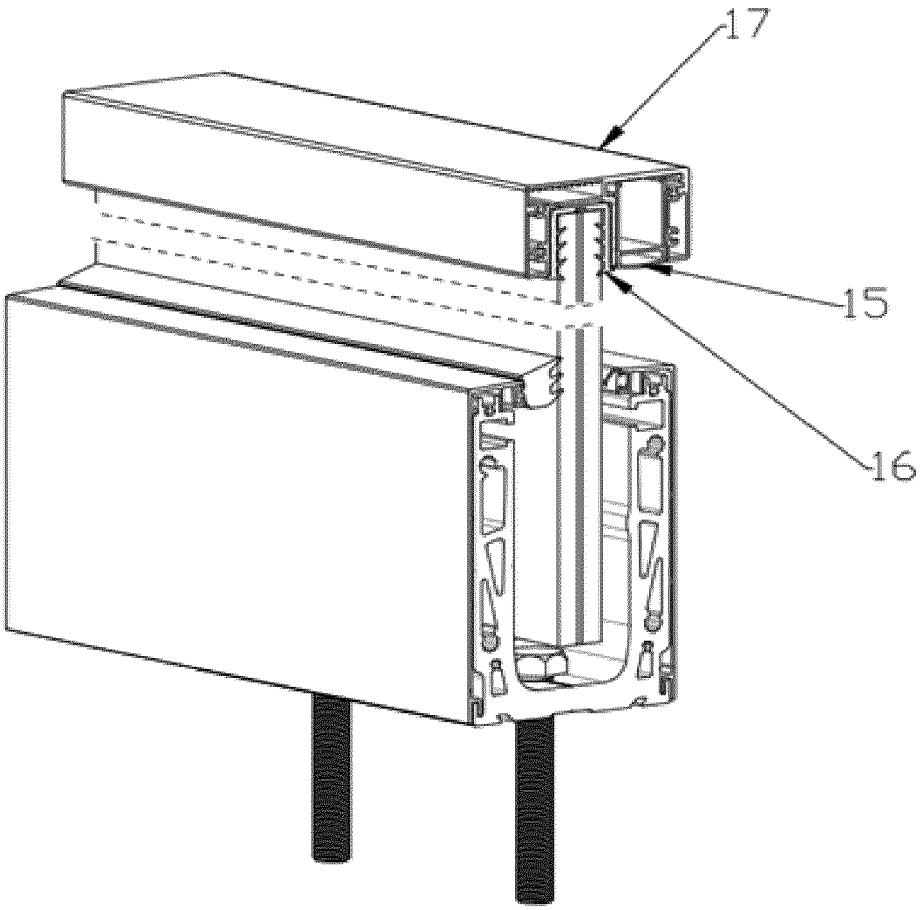

Figure-4

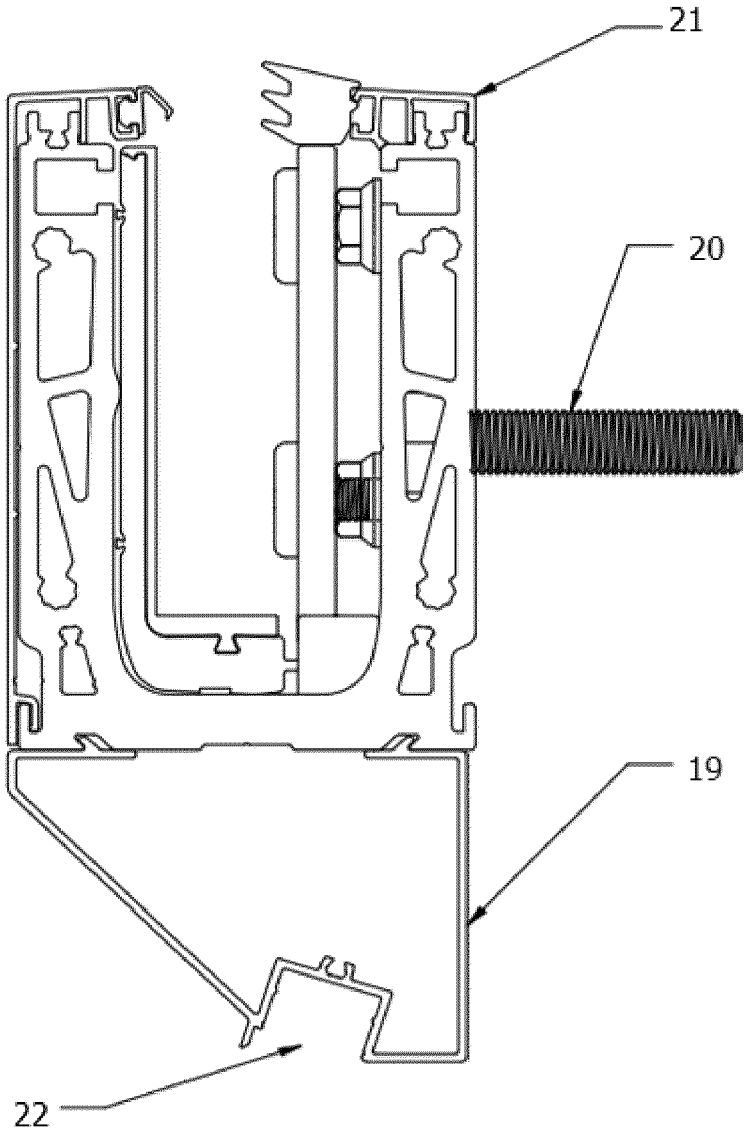

Figure-5

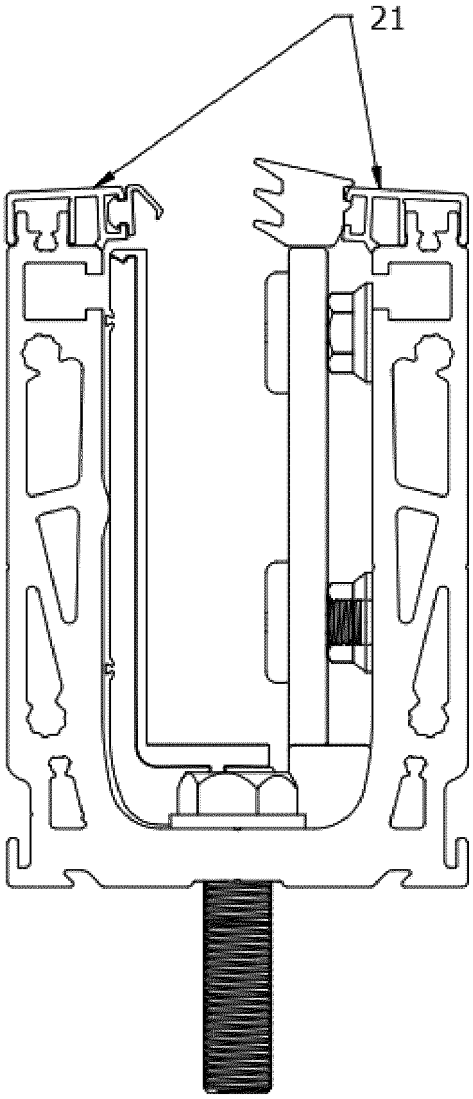

Figure-6

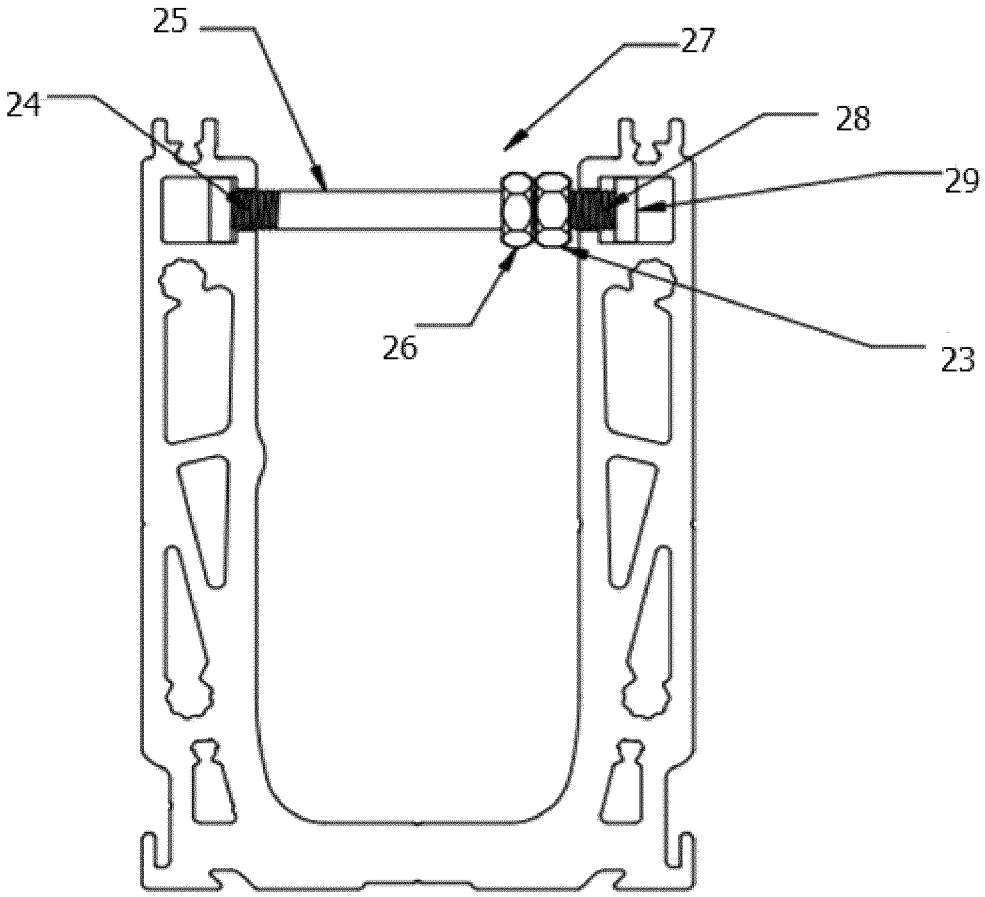

Figure-7

Europäisches Patentamt
European Patent Office
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EUROPEAN SEARCH REPORT

Application Number
EP 21 16 3303

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y A	WO 2016/193806 A1 (FARAONE S R L [IT]) 8 December 2016 (2016-12-08) * figure 1 *	1-5 6	INV. E04F11/18
Y	DE 10 2018 007029 A1 (ABEL KLAUS PETER [DE]) 5 March 2020 (2020-03-05) * figure 3 *	1-5	
Y	DE 20 2014 105038 U1 (RAILING EUROP GMBH & CO KG Q [DE]) 25 January 2016 (2016-01-25) * figure 2 *	1-5	
Y	US 2020/087919 A1 (RAVAN ALI [CA] ET AL) 19 March 2020 (2020-03-19) * figure 2 *	2,3	
Y	DE 10 2018 118981 A1 (GLOCKNER DIETER [DE]) 7 February 2019 (2019-02-07) * figure 1 *	5	
			TECHNICAL FIELDS SEARCHED (IPC) E04F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	2 September 2021	Fournier, Thomas

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
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 21 16 3303

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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02-09-2021

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2016193806 A1	08-12-2016	EP 3303727 A1	11-04-2018
		IT UB201543392 U1	05-12-2016
		WO 2016193806 A1	08-12-2016
DE 102018007029 A1	05-03-2020	NONE	
DE 202014105038 U1	25-01-2016	NONE	
US 2020087919 A1	19-03-2020	CA 3055815 A1	19-03-2020
		US 2020087919 A1	19-03-2020
DE 102018118981 A1	07-02-2019	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- ES 2743800 **[0005]**