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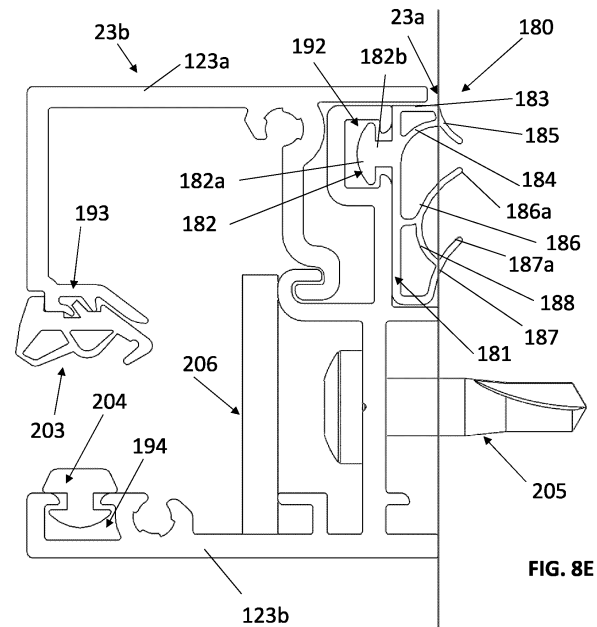
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(54) RAFTER PROFILE ASSEMBLY FOR ROOF CONSTRUCTION

(57) Rafter profile assembly for a roof construction, wherein the rafter profile assembly is provided with a central profile (23a) and with a side profile (23b, 23c) in which an outer end of a panel (50) is receivable, wherein a sealing profile (180) is received between the central profile and the side profile, wherein the sealing profile has a base (181) which is provided on one side with a protruding mounting foot (182) which is fixable in one of the side profile and the central profile, and is provided on an opposite, other side with two protruding support legs (183, 184) and a sealing tongue (185) which is connected thereto and is intended to make contact with the other of the side profile and the central profile, wherein the support legs and the sealing tongue are shaped such that the sealing tongue lies at an angle to the base in the unmounted state and is substantially parallel to the base in the mounted state.

**FIG. 8E****EP 4 575 123 A1**

Description**FIELD OF THE INVENTION**

[0001] The invention relates to roof constructions, particularly canopies, constructed from crown beam profiles and rafter profiles, wherein a roof infill can be provided between the rafter profiles.

PRIOR ART

[0002] Such roof constructions, particularly canopies, are generally installed in order to shield an outdoor location. Such roof constructions are thus often set up at homes, restaurants, shops and so on in order to shield a patio or the like from solar rays and/or precipitation and/or wind, or to allow solar rays to enter temporarily. These roof constructions can for instance be used for pergolas, verandas, carports and so on.

[0003] Such a roof construction typically comprises a roof frame constructed from crown beam profiles and rafter profiles. The crown beam profiles are typically supported at least partially by columns. A roof infill can be fixed between two rafter profiles (also referred to as rafters). The roof infill can be fixed or displaceable. The roof infill can for instance comprise panels which are made at least partially of glass or plastic, such as PC or PMMA and/or solar panels which can optionally be integrated into the glass and/or sandwich panels. Such a roof construction is typically supported by four (or more) columns between which a wall infill can be provided. Fewer columns can however also be used if the roof construction is supported by other structures, such as a wall of an already existing structure. The wall infill can be fixed or displaceable. Examples are a retractable cloth or screen, or movable, i.e. slidable or foldable, panels.

[0004] The crown beam profiles and/or the rafter profiles and/or the columns can be adapted to provide lines to electrical/electronic equipment, to comprise electrical components such as lighting and/or to comprise discharge pipes or gutters for discharge of precipitation and/or to comprise guiding or cover profiles.

[0005] In such roof constructions it is important that the forces are transmitted properly from the rafter profiles carrying the roof infill to the crown beam profiles, and that the roof construction can be constructed in simple and rapid manner.

[0006] In existing systems the crown beam profile is embodied with a support tongue on which the rafter profiles are supported, wherein the rafter profiles are attached to the crown beam profile, and a cover is optionally arranged at the position of the connection of the rafter profile to the crown beam profile. Such systems are laborious and the force transmission and distribution are not optimal.

SUMMARY

[0007] The object of embodiments of the invention relates to providing a roof construction with a crown beam profile and a plurality of rafter profiles, wherein the rafter profiles can be coupled to the crown beam profile in an improved manner.

[0008] According to a first aspect, the invention relates to a roof construction comprising a crown beam profile and a plurality of rafter profiles. This can be a freestanding roof construction on posts, or a roof construction fixed to a wall. The roof construction comprises a plurality of crown beam support pieces which are fixed transversely of a front wall of the crown beam profile at a pitch distance from each other and a plurality of rafter support pieces which are configured to co-act with the plurality of crown beam support pieces. Each rafter support piece is either configured to be fixed to an end of a rafter profile or integrated with a rafter profile. Each crown beam support piece is provided with opposite sides, wherein each rafter support piece is shaped such that an outer end thereof is arrangeable over a corresponding crown beam support piece such that forces are transmitted via inter alia the opposite sides.

[0009] The rafter profiles can then be placed in simple manner by arranging the rafter support pieces over the corresponding crown beam support pieces, wherein a good distribution of forces is obtained, inter alia by the transmission of forces on the rafter profile to the sides of the crown beam support pieces.

[0010] The rafter support piece is preferably provided with a cavity in which the crown beam support piece is at least partially arrangeable, wherein the cavity is bounded by an open underside along which the crown beam support piece is insertable, and an open rear side intended to be directed toward the crown beam profile, an upper wall and opposite side walls connecting to the opposite sides of the crown beam support piece.

[0011] In this way the rafter support piece can as it were be hooked over the crown beam support piece, wherein the forces are transmitted not only via the upper wall but also via the opposite side walls, and a good distribution of forces is obtained.

[0012] The crown beam support piece and the crown beam profile are preferably embodied such that the crown beam support piece is hookable or snappable or slidable into the crown beam profile. For this purpose the crown beam profile can be provided with a number of slots provided at a pitch distance from each other, and the crown beam support pieces can each be provided with a protruding tongue which is hookable or snappable or slidable into a corresponding slot.

[0013] In this way the crown beam support pieces can be mounted against the crown beam profile in simple manner.

[0014] Preferably, the crown beam support piece has a rear side which is fixed against the crown beam profile, and the rear side is provided with hooks which hook into

slots in the crown beam profile. Still more preferably, the crown beam profile has a front wall, a rear wall and an inner wall between the front and rear wall, wherein the front wall is connected via a number of intermediate walls to the inner wall. The slots are then preferably provided in the front wall, wherein the hooks support at least partially on the intermediate walls.

[0015] In this way a robust mounting of the crown beam support pieces on the crown beam profile can be ensured, and the acting forces are distributed properly.

[0016] The crown beam support pieces are preferably fixed to the crown beam profile by screws or bolts or rivets. In this way the crown beam support pieces can connect properly to the crown beam profile, and are fixed firmly onto the crown beam profile.

[0017] The rafter support piece is preferably provided with one or more supports for supporting the rafter profile. The rafter profile can for instance have opposite inner walls which are provided with one or more ribs which are supported on the one or more supports of the rafter support piece.

[0018] In this way the forces acting on a rafter profile can be transmitted to the rafter support piece in proper manner.

[0019] The rafter support piece is preferably provided with one or more protruding support ribs which are intended to make contact with opposite inner walls of the rafter profile. In this way the distribution of forces can be improved further.

[0020] The roof construction preferably further comprises a tightening plate with corresponding tightening means for making the rafter support piece connect to the crown beam profile. In a particularly advantageous embodiment the side walls of the rafter support piece have lower edges sloping downward toward the crown beam profile and the tightening plate is mounted against the downward sloping lower edges, and the tightening means is a screw or bolt which is tightened through the tightening plate into the crown beam support piece. The crown beam support piece then preferably has a corresponding downward sloping lower wall.

[0021] Using such a tightening plate with tightening means pulls the rafter support piece toward the crown beam profile. It is particularly when tightening of the tightening means results in a force with both a horizontal and a vertical component that the forces are transmitted even better to the crown beam profile.

[0022] The rafter profile is preferably provided with a central part with an outer end in which the rafter support piece is received and with two side parts in which an outer end of a panel is in each case receivable, wherein the side parts extend on opposite longitudinal sides of the central part.

[0023] In this way a panel can be provided between two rafter profiles in simple manner in order to thus form a closed roof construction.

[0024] The rafter support piece is preferably wholly receivable in an end of the rafter profile.

[0025] Preferably, the rafter profile is provided with a screw channel which extends in the length of the rafter profile and the rafter support piece is fixed in the rafter profile by a screw which is tightened into the screw channel. The rafter support piece is still more preferably provided with a receiving channel which extends in the length of the rafter profile and in which the screw channel is receivable, such that the head of a screw tightened into the screw channel strikes against an outer end of the receiving channel of the rafter support piece.

[0026] The crown beam support piece is preferably provided with a bore which extends substantially vertically, wherein the rafter support piece is provided with an opening in line with the bore and the rafter profile is provided with an opening in line with the bore, and wherein a screw fixes the rafter profile and rafter support piece to the crown beam support piece through these openings. The opening in the rafter support piece can optionally be elongate in the longitudinal direction of the rafter profile in order to allow some clearance.

[0027] In this way the rafter profile, the rafter support piece and the crown beam support piece can be connected firmly to each other.

[0028] A lower end of the rafter profile is preferably provided with a longitudinal channel with an open lower end in which an LED strip can be arranged, which longitudinal channel preferably extends to a position under the rafter support piece. The crown beam profile is then preferably provided with a recess at the position of the connection to the longitudinal channel of the rafter profile, all this such that the LED strip can be connected via this recess to an electric line in the crown beam profile.

[0029] The crown beam support piece is preferably a solid piece which is provided with a number of substantially horizontal screw channels. This results in a strong, robust construction.

[0030] The crown beam profile is preferably provided with a cavity, preferably an elongate cavity, in which a screen roller is receivable. It is however also possible to provide other elements, such as a strengthening profile or one or more other functional elements (electronics and so on), in this cavity.

[0031] In this way the crown beam profile can be used to accommodate an unrollable screen that can be rolled out vertically downward from the crown beam profile through an open lower end of the crown beam profile.

[0032] The crown beam profile preferably has an upper wall, a front wall against which the crown beam support pieces are fixed, a rear wall and a lower wall, wherein a number of intermediate walls are provided between the front wall and an inner wall bounding the cavity.

[0033] In this way the crown beam profile takes on the side of the front wall at it were a double-walled form, with intermediate walls between the front wall and the inner wall, whereby additional load-bearing capacity is imparted to the front side of the crown beam profile against which the crown beam support pieces are fixed.

[0034] The rear wall of the crown beam profile is op-

tionally configured to receive a cover element, preferably a cover profile.

[0035] The lower wall of the crown beam profile is optionally configured to receive one or more cover elements. One of the one or more cover elements can optionally be configured to receive an LED strip. One of the one or more cover elements can optionally be configured as a gutter for collecting water. Such a gutter then preferably extends over the whole length of the crown beam profile.

[0036] An elongate seal is typically provided between an edge of the gutter and the panels situated between two rafter profiles. This elongate seal is interrupted at the position of the rafter profiles. According to an advantageous embodiment, a rafter seal, preferably a substantially U-shaped rafter seal, is provided between the gutter and a lower end of the rafter support piece, wherein the rafter seal preferably extends into the rafter profile. The rafter seal preferably extends in a vertical plane from an edge of the gutter, at least to a position against the lower end of the rafter profile and preferably into the rafter profile. The rafter seal is preferably a plate-like element with a shape adapted to the shape of the rafter profile. When the rafter profile is provided with two side parts, the seal is preferably fixed against an outer end of the side parts. In such an embodiment the rafter seal can be a substantially U-shaped plate-like element, wherein the two legs of the U seal the outer ends of the two side parts. The rafter seal can for instance extend between an open end of a side part and an end plate fixed against the open end with interposing of the rafter seal.

[0037] According to a further aspect of the invention, a rafter profile assembly for a roof construction is provided, preferably a roof construction according to any one of the above described embodiments. The rafter profile assembly is provided with a central profile and with a side profile in which an outer end of the panel is receivable, wherein a sealing profile is received between the central profile and the side profile. The sealing profile has a base which is provided on one side with a protruding mounting foot which can be fixed in one of the side profile and the central profile. The base is provided on an opposite, other side with two protruding support legs and a sealing tongue which is connected thereto and is intended to make contact with the other of the side profile and the central profile. The support legs and the sealing tongue are shaped such that the sealing tongue lies at an angle to the base in the unmounted state and is substantially parallel to the base in the mounted state.

[0038] In this way a wide contact surface can be obtained between the sealing tongue and the other of the side profile and the central profile.

[0039] At least one of the support legs preferably takes a sufficiently flexible form to enable it to be deformed when the sealing profile is pressed against the other of the side profile and the central profile.

[0040] The upper support leg of the two support legs is preferably directed substantially horizontally in the

mounted position.

[0041] The support legs and the sealing tongue are preferably shaped such that the sealing tongue extends over a contact surface with a width greater than 0.5 cm, more preferably greater than 1 cm.

[0042] The sealing tongue preferably has a length greater than the length of the side profile.

[0043] The other side of the base is preferably further provided with one or more additional sealing tongues which are connected to the base and are shaped to make contact with the other of the side profile and the central profile only with an end edge in the mounted position. These one or more additional sealing tongues form on one hand an additional guarantee against leakage and, on the other, do not prevent the sealing tongue from making proper contact with a wide contact surface, since they are shaped to make contact only with a resilient end edge.

[0044] The additional sealing tongues can optionally be mutually connected to a connecting leg at a distance from the base. In this way additional robustness is imparted to the sealing profile.

[0045] The one or more additional sealing tongues preferably extend at an angle relative to the base in the direction of the sealing tongue. In the mounted state the sealing tongue is preferably directed straight down and the additional sealing tongues are preferably directed obliquely upward.

[0046] The sealing profile is preferably an extruded profile, more preferably a co-extruded profile. The mounting foot is preferably manufactured from a less soft plastic than the support legs and sealing tongue.

BRIEF DESCRIPTION OF THE FIGURES

[0047] The above and other advantageous features and objectives of the invention will become more apparent and the invention better understood with reference to the following detailed description when read in combination with the accompanying drawings, in which:

Figures 1A and 1B show a perspective view of an embodiment of a roof construction, when looking at respectively an underside and an upper side of the roof construction;

Figures 2A and 2B illustrate respectively a perspective view and a cross-section of an embodiment of a crown beam profile with a crown beam support piece;

Figures 2C and 2D show respectively a cross-section and a perspective view of an embodiment of a crown beam profile with a cover element locked thereto;

Figures 3A and 3B show respectively a cross-sectional perspective view and a perspective view, when looking at the underside of the roof construction, of the connection of a rafter profile to a crown beam profile;

Figure 4 shows a perspective view of the connection of a rafter profile to a crown beam profile, wherein the rafter profile is drawn transparently so as to make the rafter support piece visible;

Figures 5A and 5B show a perspective view of the rafter support piece, when looking at respectively a front side intended to connect to the crown beam profile and a rear side intended to extend in a rafter profile;

Figure 6 shows a perspective view of a rafter profile; Figure 7 shows a cross-section of a rafter profile piece which is mounted in a rafter profile;

Figure 8A shows a perspective view of a rafter profile with a central part and two side parts, when looking at a first end of the rafter profile;

Figure 8B shows a perspective view of the rafter profile of Figure 8A, when looking at a second end of the rafter profile, wherein the rafter profile is drawn transparently so as to make the rafter support piece and an LED strip visible;

Figure 8C shows a perspective detail view of an outer end of the rafter profile with seal;

Figure 8D shows a perspective detail view of an outer end of the rafter profile with seal, wherein an end plate has been removed from a side part so as to make the seal visible;

Figure 8E illustrates a cross-section of a side part of the rafter profile in more detail;

Figure 8F illustrates a perspective detail view of an outer end of the rafter profile;

Figure 9 shows a perspective view of the connection of a panel of the roof construction to the crown beam profile and the rafter profile;

Figure 10A shows a perspective detail view of the seal at the position of the connection of the rafter profile to the crown beam profile;

Figure 10B shows a perspective detail view of the fixing of the crown beam profile by means of a wall support;

Figures 10C and 10D show respectively a perspective view and a cross-section of an embodiment of a crown beam profile with a cover element with gutter locked thereto;

Figures 11A and 11B show a section of a further embodiment of a rafter profile;

Figures 12A and 12B show perspective views of another embodiment of a crown beam profile with crown beam support pieces, and figures 12C and 12D show a section of this embodiment;

Figure 13A shows a perspective view of another embodiment of a rafter profile with a central part and two side parts, when looking at a first end of the rafter profile;

Figure 13B illustrates a cross-section of the rafter profile in detail;

Figures 13C, 13D and 13E show perspective views of the rafter profile of Figure 13A; and

Figure 13F shows a perspective view of the connec-

tion of a panel of the roof construction to the crown beam profile and the rafter profile of Figure 13A.

DETAILED EMBODIMENTS

[0048] Figures 1A and 1B illustrate an embodiment of a roof construction comprising a crown beam profile 10 and a plurality of rafter profiles 20. This can be a freestanding roof construction on columns, or a roof construction fixed to a wall. The crown beam profiles 10 are typically supported at least partially by columns (not shown). A roof infill can be fixed between two rafter profiles (also referred to as rafters). The roof infill can be fixed or displaceable. In figures 1A and 1B the roof infill is formed by panels 50, which are for instance made at least partially from glass or plastic, such as PC or PMMA. These panels 50 can also be sandwich panels which can be manufactured from any suitable material, or solar panels which may or may not be integrated into glass. Such a roof construction is typically supported by four (or more) columns (not shown) between which a wall infill (not shown) can be provided. Fewer columns can however also be used if the roof construction is supported by other structures, such as a wall of an already existing structure. The wall infill can be fixed or displaceable. Examples are a retractable cloth or screen, or movable, i.e. slidable or foldable, panels.

[0049] The crown beam profiles 10 and/or the rafter profiles 20 and/or the columns can be adapted to provide lines to electrical/electronic equipment and/or to comprise electrical/electronic components such as lighting and/or to comprise discharge pipes or gutters for discharge of precipitation and/or to comprise guiding or cover profiles.

[0050] The roof construction comprises a plurality of crown beam support pieces 30 which are fixed transversely of a front wall 12 of crown beam profile 10 at a pitch distance from each other, see Figures 2A and 2B, and a plurality of rafter support pieces 40 which are configured to co-act with the plurality of crown beam support pieces 30, see Figures 3A and 3B. Each rafter support piece 40 is either configured to be fixed to an end of a rafter profile 20, as illustrated in Figures 3A and 3B, or integrated with a rafter profile 20 (not illustrated). In the variant of Figure 2A the rear wall 13 of crown beam profile 10 is typically, though not exclusively, intended to form the edge of a roof, on a flank not adjoining a facade wall or coupled roof, although according to another variant, the crown beam profile 10 can be given a different form, for instance symmetrical, and crown beam support pieces 30 can be provided on both front wall 12 and rear wall 13. This can be advantageous for making for instance coupled roofs, with crown beam support pieces on one side or on both sides. In this way roofs with different roof infills (rafters, plates, slats, wood, sunblind fabric, and so on) can be made.

[0051] According to the variant of Figure 10B, the crown beam profile 10 is intended to be mounted against

an outer wall by means of one or more supports 200, wherein support posts are not needed. This is typically applied when it is desirable to have a gutter on a wall side or when the beam extends further than the wall, so that the roof is supported by one or more supports 200 and a plurality of posts. The supports 200 have a rear wall 220 intended for fixing against the wall side, for instance using a number of screws, and two side flanges 230 protruding from rear wall 220 into the cavity 16. The two side flanges 230 can be connected by an upper wall 210 which rests against an inner wall 16a of cavity 16.

[0052] According to another variant, which is illustrated in Figures 12A-D, the crown beam profile 10 is a slenderer wall profile, typically without gutter, which is provided with the same crown beam support pieces 30. This variant is intended particularly for mounting against a wall for roofs supported by a wall. The wall here also provides for the load-bearing capacity, and not much internal space is needed in the beam.

[0053] Each crown beam support piece 30 is provided with opposite sides 31, 32, see Figure 2A. Each rafter support piece 40 is shaped such that an outer end thereof is arrangeable over a corresponding crown beam support piece 30 such that forces are preferably transmitted via inter alia the opposite sides 31, 32.

[0054] The rafter profiles 20 can then be placed in simple manner by arranging the rafter support pieces 40 over the corresponding crown beam support pieces 30, wherein a good distribution of forces is obtained, inter alia by transmission of forces acting on rafter profile 20 to the sides 31, 32 of the crown beam support pieces 30.

[0055] As can be seen most clearly in Figures 5A and 5B, rafter support piece 40 is preferably provided with a cavity 45 in which the crown beam support piece 30 can be arranged at least partially, see also Figure 3A. The cavity 45 is bounded by an open underside 43, along which the crown beam support piece 30 is insertable, an open rear side 44 intended to be directed toward the crown beam profile 10, an upper wall 46 and opposite side walls 41, 42 connecting to the opposite sides 31, 32 of the crown beam support piece 30.

[0056] In this way the rafter support piece 40 can as it were be hooked over the crown beam support piece 30, wherein the forces are transmitted not only via the upper wall 46 but also via the opposite side walls 41, 42, and a good distribution of forces is obtained.

[0057] The crown beam support piece 30 and the crown beam profile 10 are preferably embodied such that the crown beam support piece 30 is hookable or snappable or slidable into crown beam profile 10. The embodiment of Figure 2B and Figure 3A illustrates that the crown beam profile 10 can for instance be provided with one or more slots 15 provided at a pitch distance from each other, and the crown beam support pieces 30 can each be provided with one or more protruding tongues 35 which are hookable into the one or more corresponding slots 15. In other variants the slots can take a different form, for instance T-shaped slots, and the tongues can for

instance be slidable into the slots.

[0058] In the variant of Figure 2A the crown beam profile 10 has an upper wall 11, a front wall 12, a rear wall 13 and an inner wall 17 between the front and rear wall 12, 13. The front wall 12 is connected via a number of intermediate walls 18 to inner wall 17. The slots 15 are then preferably provided in the front wall 12, wherein the hooks 35 support at least partially on the intermediate walls 18. In this way a robust mounting of the crown beam support pieces 30 on crown beam profile 10 can be ensured, and the acting forces are distributed properly. According to the slenderer embodiment of Figures 12A-D, no inner wall 17 is provided and intermediate walls 18 extend directly between front wall 12 and rear wall 13. One of the hooks 35 here also supports on an intermediate wall 18.

[0059] The crown beam support piece 30 is preferably a solid piece which is provided with one or more substantially horizontal screw channels 36 for one or more screws 60 or bolts or rivets. The crown beam support pieces 30 are preferably further fixed to crown beam profile 10 by the one or more screws 60 or bolts or rivets, see Figures 2B and 3A. In this way the crown beam support pieces 30 can connect properly to the crown beam profile 10, and are fixed firmly onto crown beam profile 10.

[0060] As illustrated in Figures 5A, 5B and 7, the rafter support piece 40 is preferably provided with one or more supports 47 for the purpose of supporting the rafter profile 20. As shown in Figure 6, the rafter profile 20 can for instance have opposite inner walls 21, 22 which are provided with one or more ribs 27 which are supported on the one or more supports 47 of the rafter support piece 40. The rafter support piece 40 is preferably wholly receivable in an end of the rafter profile 20. In this way the forces acting on a rafter profile 20 can be transmitted to the rafter support piece 40 in proper manner. The supports 47 here take the form of guides for the ribs 27, although the skilled person will appreciate that the supports 47 can take many forms. The rafter support piece 40 is further preferably provided with one or more protruding support ribs 48 which are intended to make contact with opposite inner walls 21, 22 of rafter profile 20. In this way the distribution of forces can be improved further.

[0061] As can be seen most clearly in Figures 2A and 3A, the roof construction can further comprise a tightening plate 70 with corresponding tightening means 71 for making the rafter support piece 40 connect to the crown beam profile 10. In a particularly advantageous embodiment the side walls 41, 42 of rafter support piece 40 have lower edges 49 sloping downward toward the crown beam profile 10, the tightening plate 70 is mounted against the downward sloping lower edges 49, and the tightening means 71 is a screw or bolt which is tightened through the tightening plate 70 into the crown beam support piece 30. The crown beam support piece 30 then preferably has a corresponding downward sloping lower

wall 39. Using such a tightening plate 70 with tightening means 71 pushes the rafter support piece 40 toward crown beam profile 10 in both horizontal and vertical direction, whereby the forces are transmitted even better to crown beam profile 10.

[0062] For mounting of a crown beam support piece 30 the screws 60 are fixed first, after which the rafter profile 20 with rafter support piece 40 is placed, tightening plate 70 is turned to the correct position and tightening means 71 is tightened.

[0063] In a possible embodiment illustrated in Figures 8A and 8B, rafter profile 20 is provided with a central part 23a with an outer end in which the rafter support piece 40 is received and with two side parts 23b, 23c in which an outer end of a panel 50 is in each case receivable, see also Figures 1A and 1B, wherein the side parts 23b, 23c extend on opposite longitudinal sides of the central part 23a. In this way a panel 50 can be provided between two rafter profiles 20 in simple manner in order to thus form a closed roof construction. Note that the central part 23a can also be provided with one side part 23b instead of two side parts 23b, 23c.

[0064] Figure 8E illustrates one of the side parts 23b in more detail. The side part 23b is here a combined side profile consisting of an upper and lower side profile 123a, 123b which hook into each other. The side part 23b is provided with an opening bounded by an upper elongate support edge 193 and a lower elongate support edge 194. An outer end of the panel 50 is receivable in this opening. The upper elongate support edge 193 can be configured to co-act with a seal 203 which is provided between panel 50 and the upper support edge 193. The lower elongate support edge 194 can be configured to co-act with a seal 204 which is provided between panel 50 and the lower support edge 194. A stop 206 against which the panel 50 strikes can further be provided in the side part 23b. Side part 23b can be fixed to central part 23a by screws 205.

[0065] In the embodiment of Figures 5A, 5B, 6 and 7 the rafter profile 20 is provided with a screw channel 208 which extends in the length of rafter profile 20, and the rafter support piece 40 is fixed in rafter profile 20 by a screw 80 which is tightened into the screw channel 208. The rafter support piece 40 is still more preferably provided with a receiving channel 408 which extends in the length of rafter profile 20 and in which the screw channel 208 is receivable with some clearance, such that the head of a screw 80 tightened into screw channel 208 strikes against an outer end of the receiving channel 408 of rafter support piece 40.

[0066] Figure 3A shows that the crown beam support piece 30 is provided with a bore 109 which extends substantially vertically. Figures 5A and 5B show that the rafter support piece 40 is provided with an opening 409 in line with the bore 109 and Figure 6 shows that the rafter profile 20 is provided with an opening 209 in line with the bore 109. A screw 90 protrudes through these openings 209, 409 in order to fix rafter profile 20 and rafter

support piece 40 to the crown beam support piece 30, see Figure 3A. The opening 409 in rafter support piece 40 and/or the opening 209 in rafter profile 20 can optionally be elongate in the longitudinal direction of rafter profile 20 in order to allow some clearance. In this way the rafter profile 20, the rafter support piece 40 and the crown beam support piece 30 can be connected firmly to each other.

[0067] Figures 6 and 7 further illustrate that a lower end of rafter profile 20 can be provided with a longitudinal channel 29 with an open lower end, in which an LED strip 95 can be arranged. The longitudinal channel 29 preferably extends to a position under the rafter support piece 40. As can be seen most clearly in Figure 3B and Figure 4, the crown beam profile 10 is then preferably provided with a recess 19 at the position of the connection to the longitudinal channel 29 of rafter profile 20, all this such that the LED strip 95 can be connected via this recess 19 to an electric line (not shown) in or along the crown beam profile 10. Figure 2A also shows the recess 19, and Figures 2A and 2B show that the crown beam profile 10 can be provided with one or more cover elements 110a, 110b for the purpose of forming one or more compartments 115a, 115b, and so on extending in the longitudinal direction of the profile 10, for instance a compartment 115a for receiving electrical conduits. In the embodiment of Figures 12A-D the crown beam profile 10 is also provided with a cover element 110a for the purpose of forming a compartment 115a extending in the longitudinal direction of profile 10, for instance a compartment 115a for receiving electrical conduits and/or electronics and/or fastenings.

[0068] Figure 11A illustrates another variant in which, instead of LED strip 95, a different mounting profile 96 is fixed in the lower end of rafter profile 20. In the illustrated embodiment lighting elements are accommodated in the mounting profile 96. The skilled person will appreciate that different typical elements, such as a sensor, a lighting element, a heating element, an atomizer, a ventilation element, electric cabling, a partition wall, and so on are receivable in the lower end of rafter profile 20, optionally using an additional mounting profile 96. If no additional functionalities need be provided, a simple cover profile can also be arranged instead of the mounting profile 96 in order to cover the channel in the lower wall of rafter profile 20, see Figure 11B.

[0069] In the illustrated embodiment of Figure 2B a first cover profile 110a is fixed pivotally on a lower end of the crown beam profile 10 and secured using a partition 120. A second cover profile 110b can further be provided to close the compartment 115a. The first cover profile 110a is configured here to receive an LED strip 195, wherein an additional opaque cover element 110d can also be provided for the purpose of closing the channel in which the LED strip 195 is received. As illustrated in Figures 2C and 2D, the cover profile 110a can optionally be locked onto crown beam profile 10. For this purpose one or more adjusting screws 114a can for instance be fixed with one or more corresponding clamping blocks 112a in the

crown beam profile 10, wherein the adjusting screws 114a strike against a stop 116a of cover profile 110a. This stop 116a is provided such that a pivoting of cover profile 110a is counteracted when the adjusting screw 114a pushes against the stop 116a, and thus provides for a blocking of the cover profile 110a. A plurality of adjusting screws 114a can optionally be mounted over the length of the crown beam profile 10 as needed.

[0070] The cover profile 110a can be mounted as follows. Cover profile 110a is pivoted in crown beam profile 10. Partition 20 is then placed. The clamping block 112a is mounted by having it drop together with the corresponding adjusting screw 114a into a slot 112b in crown beam profile 10 intended for this purpose. The adjusting screw 114a is tightened until the cover profile 110a is blocked against the stops 116a of crown beam profile 10.

[0071] A cover profile 110a', see Figure 10A, can optionally be configured to form a gutter-like compartment 115a for collecting water. Such a gutter-like compartment 115a then preferably extends over the whole length of the crown beam profile 10. One or more removable filter elements 111 can optionally be provided in the gutter-like compartment 115a in order to stop dirt and the like. A plurality of filter elements 111 are preferably arranged adjacently of each other in the gutter-like compartment 115a. When a filter element requires cleaning or replacing, a user can in this way remove and replace it in simple manner. The filter elements 111 can for instance be flexible and/or pre-formed perforated plates, profiles or grates. The filter elements 111 preferably extend between the front wall 12 of crown beam profile 10 and a front gutter wall 113 of the gutter-like compartment 115a.

[0072] The cover profile 110a' can optionally be locked in the same manner with one or more adjusting screws 114a and corresponding clamping blocks 112a, as was described above with reference to Figures 2C and 2D. Additional locking elements can optionally also be provided, as is illustrated in Figure 10C. An additional screw 118a, which can be screwed (in concealed manner) into a rafter profile 20 in order to eliminate any flexibility of the gutter, can optionally be provided. An outer end of the additional screw 118a is here fixed in rafter profile 20. A gutter end plate 119a can also be provided on both outer ends of the cover profile 110a', which gutter end plate 119a follows the contour of the crown beam profile 10 and so blocks the cover profile 110a' in the desired position. Mounting of cover profile 110a' can take place in the same manner as that of cover profile 110a, wherein further gutter end plate 119a is optionally mounted with a plurality of screws. An additional screw 118a can further be screwed (in concealed manner) into rafter profile 20, for instance at the construction site, in order to prevent sagging of the gutter.

[0073] In the illustrated embodiment of Figures 12A-D the cover profile 110a is fixed pivotally on a lower end of the crown beam profile 10 and can be secured at the outer ends. The cover profile 110a is configured to receive an

LED strip 195, wherein another additional opaque cover element 110d can be provided for the purpose of closing the channel in which the LED strip 195 is received.

[0074] Figure 2B further shows that the crown beam profile 10 can be provided with a cavity 16, for instance a screen roller cavity 16 in which a screen roller (not shown) is receivable, although this cavity can also be used to accommodate one or more other functional elements, such as a strengthening profile, for instance an I-profile, electronic components, and so on. The cavity allows for provision of a screen which can be moved via an opening at the lower end of crown beam profile 10 vertically outward in order to extend for instance between two columns on either side of crown beam profile 10. The cavity 16 is preferably provided between the inner wall 17 and the rear wall 13 of the crown beam profile, and a number of intermediate walls 18 are preferably provided between the front wall 12 and the inner wall 17 bounding the cavity. In this way the crown beam profile 10 takes on the side of the front wall 12 at it were a double-walled form, with intermediate walls 18 between front wall 12 and inner wall 17, whereby additional load-bearing capacity is imparted to the front side of the crown beam profile 10 against which the crown beam support pieces 30 are fixed. The rear wall 13 of crown beam profile 10 is optionally configured to receive a cover element 110c which forms a wall of a guide channel for the screen that can be rolled out. The lower wall 14 of the crown beam profile 10 is optionally configured to receive one or more cover profiles 110a, 110b, as was described above.

[0075] Figures 9 and 10A show that an elongate seal 170 is provided between an edge of the gutter-like compartment 115a and the panels 50 situated between two rafter profiles 20. This seal 170 is interrupted at the position of the rafter profiles 20. According to an advantageous embodiment, an additional rafter seal 160, preferably a substantially U-shaped rafter seal, is provided between the gutter-like compartment 115a and a lower end of the rafter support piece 40, wherein the rafter seal 160 preferably extends into the rafter profile 20, as can be seen more clearly in Figures 8C and 8D. In the variant of Figure 8C the rafter seal 160 protrudes slightly further into rafter profile 20 than in the variant of Figure 8D. The rafter seal 160 preferably extends in a vertical plane from an edge of the gutter-like compartment 115a, at least to a position against the lower end of rafter profile 20 and preferably into rafter profile 20. The rafter seal 160 is preferably a plate-like element with a shape adapted to the shape of the rafter profile 20. When rafter profile 20 is provided with two side parts 23b, 23c, the rafter seal 160 is preferably fixed against an outer end of the side parts 23b, 23c. In such an embodiment the rafter seal 160 can be a substantially U-shaped plate-like element, wherein the two legs of the U seal the outer ends of the two side parts 23b, 23c. Rafter seal 160 can for instance extend between an open end of a side part 23b, 23c and an end plate 24b, 24c which is fixed by means of screws 25b, 25c against the open end with interposing of the rafter seal

160, see Figure 8C. In Figure 8D the end plate 25c has been omitted in order to make the rafter seal 160 more clearly visible.

[0076] When rafter profile 20 is provided with a side part 23b, 23c, a lateral seal 180, here a sealing profile, is preferably arranged between the central part 23a and the side part 23b, 23c, see Figure 8C. This lateral seal 180 is preferably shaped to seal optimally when the side part 23b is screwed against the central part 23a.

[0077] Figures 8E and 8F illustrate in more detail an advantageous embodiment of the lateral seal 180. The lateral seal comprises a base 181 which is provided on one side with a protruding mounting foot 182 which can be fixed in the side part 23b and is provided on an opposite, other side with two protruding support legs 183, 184 and a sealing tongue 185 connected thereto. The support legs 183, 184 and the sealing tongue 185 are preferably shaped such that the sealing tongue 185 lies at an angle to the base 181 in the unmounted state and is substantially parallel to the base 181 in the mounted state. For this purpose one of the support legs 184 preferably takes a sufficiently flexible form to enable it to be deformed when seal 180 is pressed against central part 23a. Sealing tongue 185 is thus as it were arranged pivotally and directed downward here. The upper support leg 183 is preferably directed substantially horizontally in the mounted position. In this way any stagnant water can be avoided or reduced. This water would otherwise expand in freezing temperatures and could push beyond the seal. The aluminium glazing bar cover profile also connects to the contact surface of the sealing tongue 185.

[0078] The support legs 183, 184 and the sealing tongue 185 are preferably shaped such that the sealing tongue 185 extends over a contact surface with a width greater than 0.5 cm, more preferably greater than 1 cm. In this way production tolerances and the roughness of textured paint can be accommodated. The sealing tongue 185 preferably has a length greater than the length of the side part 23b, see Figure 8F, and preferably protrudes beyond the seal 160 and for instance to a position beyond end plate 24b, 24c, so that water is discharged in the gutter-like compartment 115a without problem, see also Figure 10A.

[0079] One or more additional sealing tongues 186, 187 are optionally also provided, these being connected to the base and shaped to make contact with the central part 23a only with an end edge in the mounted position, and so over an area much smaller than the area over which the sealing tongue 185 makes contact with the central part 23a. These additional sealing tongues 186, 187 can optionally be mutually connected to a connecting leg 188 at a distance from the base in order to increase the integrity of seal 180. The additional sealing tongues 186, 187 preferably extend at an angle relative to the base 181 toward the sealing tongue 185, and are therefore directed upward here. The additional sealing tongues 186, 187 are oriented upward and settle along the central part 23a. The shape is such that an end edge

186a, 187a maintains contact with the central part 23a and the other end edge is connected to the base 181. In this way one or more gutters, here two gutters 186b, 187b, are created, which can discharge water if it were to still make its way beyond the upper sealing tongue 185 unexpectedly.

[0080] The lateral seal 180 is preferably an extruded profile, more preferably a co-extruded profile wherein the mounting foot 182 is manufactured from a less soft plastic than the support legs 183, 184 and the sealing tongues 185, 186, 187. The plastic and shape of the mounting foot 182 preferably allow it to be pushed through into a groove of side part 23b and/or to be pulled through the groove 192 in simple manner. Mounting foot 182 preferably has a support leg 182a which is for instance oriented substantially perpendicularly of the base 181 and a head 182b which protrudes relative to the support leg and is intended to lock the mounting foot to 182 into the groove 192 of side part 23b.

[0081] Figures 13A to 13F illustrate yet another variant of a rafter profile 20 according to the invention. The rafter profile 20 is provided with a central part 23a with an outer end in which the rafter support piece 40 is received and with two side parts 23b, 23c in which an outer end of a panel (not shown) is in each case receivable, wherein the side parts 23b, 23c extend on opposite longitudinal sides of the central part 23a. A difference between the variant of Figure 8A and the variant of Figures 13A-13F is that the side parts 23b, 23c continue on further and extend over the whole length of the central part 23a. The rafter seal 160, end plates 24b, 24c and screws 25b, 25c of the variant of Figures 8A to 8F are not present in the variant of Figures 13A to 13F. As can be seen most clearly in Figure 13F, the side parts 23b, 23c continuing on further results in the side parts 23b, 23c and also the panels 50 arranged therein continuing on to a position over the gutter-like compartment 115a for collecting water. The distance between an edge of a panel 50 and the crown beam profile 10 can for instance be between 1 and 3 cm.

[0082] As described for the variant of Figure 10A, the gutter-like compartment 115a preferably also extends here over the whole length of the crown beam profile 10. One or more removable filter elements (not shown) can optionally be provided in the gutter-like compartment 115a in order to stop dirt and the like. An elongate seal 170 is provided between an edge of the gutter-like compartment 115a and the panels 50 situated between two rafter profiles 20.

[0083] Figure 13B illustrates the side parts 23b, 23c in more detail. The side part 23b is a combined side profile consisting of an upper side profile 123a and lower side profile 123b which hook into each other. The side part 23b is provided with an opening bounded by an upper elongate support edge 193 and a lower elongate support edge 194. An outer end of the panel is receivable in this opening. The upper elongate support edge 193 can be configured to co-act with a seal 203 which is provided between panel 50 and the upper support edge 193. The

lower elongate support edge 194 can be configured to co-act with a seal 204 which is provided between panel 50 and the lower support edge 194. A stop (not shown) against which the panel 50 strikes can optionally be provided in side part 23b. Side part 23b can be fixed to central part 23a by screws 205. A lateral seal 180, here a sealing profile, is preferably arranged between the central part 23a and the side part 23b, 23c. This seal 180 is identical to the seal 180 described with reference to Figures 8E and 8F, and will therefore not be described again. A second seal 190, for instance a self-adhesive foam tape, is further provided between the central part 23a and the side part 23b, 23c at the position of the screws 205, wherein the screws 205 protrude through the seal 190.

[0084] The lower side profile 123b is preferably sawn off diagonally at the position of the gutter-like compartment 115a and can be sealed there, for instance by sealing with mastic, so that no water will infiltrate, see Figure 13C. The upper side profile 123a extends over the chamfered outer end, as can be seen in Figure 13D. As illustrated in Figure 13E, the central part 23a is provided at an outer end extending over the gutter-like compartment 115a with a recess 191 so that water has the option of running past the gutter along this surface.

[0085] The skilled person will appreciate that the invention is not limited to the above described embodiments and that many modifications and variants are possible within the scope of the invention, which is defined solely by the following claims.

Claims

1. Rafter profile assembly for a roof construction, wherein the rafter profile assembly is provided with a central profile (23a) and with a side profile (23b, 23c) in which an outer end of a panel (50) is receivable, wherein a sealing profile (180) is received between the central profile and the side profile, wherein the sealing profile has a base (181) which is provided on one side with a protruding mounting foot (182) which is fixable in one of the side profile and the central profile, and is provided on an opposite, other side with two protruding support legs (183, 184) and a sealing tongue (185) which is connected thereto and is intended to make contact with the other of the side profile and the central profile, wherein the support legs and the sealing tongue are shaped such that the sealing tongue lies at an angle to the base in the unmounted state and is substantially parallel to the base in the mounted state.
2. Rafter profile assembly according to the foregoing claim, wherein at least one (184) of the support legs takes a sufficiently flexible form to enable it to be deformed when the sealing profile is pressed against the other of the side profile and the central profile.
3. Rafter profile assembly according to any one of the foregoing claims, wherein the upper support leg (183) of the two support legs is directed substantially horizontally in the mounted position.
4. Rafter profile assembly according to any one of the foregoing claims, wherein the support legs (183, 184) and the sealing tongue (185) are shaped such that the sealing tongue (185) extends over a contact surface with a width greater than 0.5 cm, more preferably greater than 1 cm.
5. Rafter profile assembly according to any one of the foregoing claims, wherein the sealing tongue (185) has a length greater than the length of the side profile.
6. Rafter profile assembly according to any one of the foregoing claims, wherein the other side of the base (181) is further provided with one or more additional sealing tongues (186, 187) which are connected to the base and are shaped to make contact with the other of the side profile and the central profile only with an end edge (186a, 187a) in the mounted position.
7. Rafter profile assembly according to the foregoing claim, wherein the additional sealing tongues are mutually connected to a connecting leg (188) at a distance from the base.
8. Rafter profile assembly according to claim 6 or 7, wherein the additional sealing tongues (186, 187) extend at an angle relative to the base toward the sealing tongue (185).
9. Rafter profile assembly according to any one of the foregoing claims, wherein the sealing profile (180) is an extruded profile, more preferably a co-extruded profile; and/or wherein the mounting foot (182) is manufactured from a less soft plastic than the support legs (183, 184) and sealing tongue (185).
10. Rafter profile assembly according to any one of the foregoing claims, wherein a lower end of the central profile (23a) is provided with a longitudinal channel (29) with an open lower end, in which an LED strip (95) can be arranged.
11. Roof construction comprising a crown beam profile (10) and a plurality of rafter profile assemblies according to any one of the foregoing claims, wherein the roof construction preferably comprises a plurality of crown beam support pieces (30) which are fixed transversely of a front wall (12) of the crown beam profile at a pitch distance from each other and preferably comprises a plurality of rafter support pieces (40) which are configured to co-act with the plurality

of crown beam support pieces (30), wherein each rafter support piece (40) is either configured to be fixed to an end of the central profile (23a) or integrated with the centre profile (23a), wherein each crown beam support piece (30) is provided with opposite sides (31, 32), wherein each rafter support piece (40) is shaped such that an outer end thereof is arrangeable over a corresponding crown beam support piece (30) such that forces are transmitted via inter alia the opposite sides (31, 32).

12. Roof construction according to claim 11, wherein the rafter support piece (40) is provided with a cavity (45) in which the crown beam support piece (30) is at least partially arrangeable, wherein the cavity is bounded by an open underside (43) along which the crown beam support piece is insertable, an open rear side (44) intended to be directed toward the crown beam profile, an upper wall (46) and opposite side walls (41, 42) connecting to the opposite sides (31, 32) of the crown beam support piece; and/or wherein the crown beam support piece (30) and the crown beam profile (10) are embodied such that the crown beam support piece is hookable or snappable or slidable into the crown beam profile.

13. Roof construction according to claim 11 or 12, wherein the crown beam support piece (30) has a rear side (33) which is fixed against the crown beam profile, and the rear side is provided with one or more hooks (35) which hook into one or more slots (15) in the crown beam profile, wherein at least one of the one or more hooks is preferably supported on an internal wall (18) of the crown beam profile (10).

14. Roof construction according to any one of the claims 11-13, wherein the rafter support piece (40) is provided with one or more supports (47) for the purpose of supporting the rafter profile assembly;

wherein the central profile (23a) preferably has opposite inner walls (21, 22) which are provided with one or more ribs (27) which are supported on the one or more supports (47) of the rafter support piece (40); and/or wherein the rafter support piece (40) is provided with one or more protruding support ribs (48) which are intended to make contact with opposite inner walls (21, 22) of the central profile (23a); and/or further comprising a tightening plate (70) with corresponding tightening means (71) for making the rafter support piece (40) connect to the crown beam profile; and/or wherein the side walls (41, 42) of the rafter support piece have lower edges (49) sloping downward toward the crown beam profile and the tightening plate (70) is mounted against the

downward sloping lower edges, and the tightening means (71) is a screw or bolt which is tightened through the tightening plate into the crown beam support piece (30), wherein the crown beam support piece (30) preferably has a corresponding downward sloping lower wall (39); and/or

wherein the rafter support piece is wholly receivable in an end of the central profile; and/or wherein the central profile (23a) is provided with a screw channel (208) which extends in the length of the central profile (23a), and wherein the rafter support piece (40) is fixed in the central profile (23a) by a screw (80) which is tightened therein;

wherein the rafter support piece (40) is preferably provided with a receiving channel (408) which extends in the length of the central profile (23a) and in which the screw channel (208) is receivable; and/or

wherein the crown beam support piece (30) is provided with a bore (109) which extends substantially vertically, wherein the rafter support piece (40) is provided with an opening (409) in line with the bore (109) and the central profile (23a) is provided with an opening (209) in line with the bore (109), and wherein a screw (90) fixes the central profile (23a) and rafter support piece (40) to the crown beam support piece (30) through these openings.

15. Roof construction according to any one of the claims 12-14, wherein the crown beam profile (10) is provided with a cavity (16) in which a screen roller is receivable;

wherein the crown beam profile (10) preferably has an upper wall (11), a front wall (12) against which the crown beam support pieces are fixed, a rear wall (13) and a lower wall (14), wherein a number of intermediate walls (18) are provided between the front wall (12) and an inner wall (17) bounding the cavity (16); wherein the rear wall is preferably configured to receive a cover element (110c); wherein the lower wall is preferably configured to receive one or more cover elements (110a, 110b).

wherein one of the one or more cover elements (110a) is preferably configured to receive an LED strip (195); and/or wherein one of the one or more cover elements is configured as a gutter for collecting water.

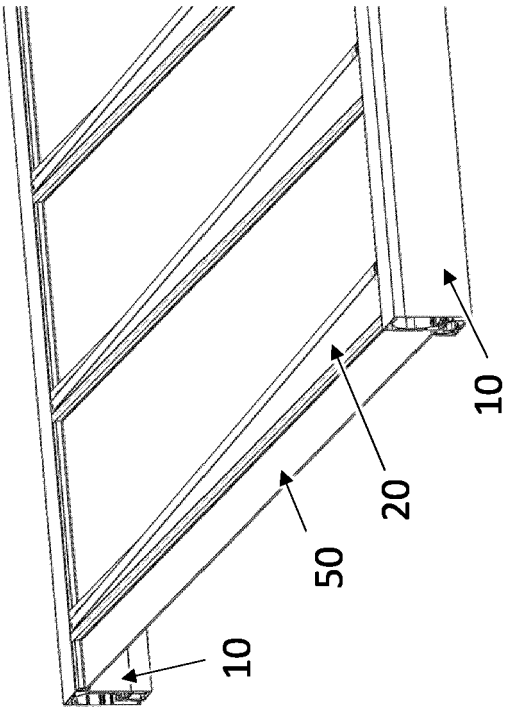


FIG. 1B

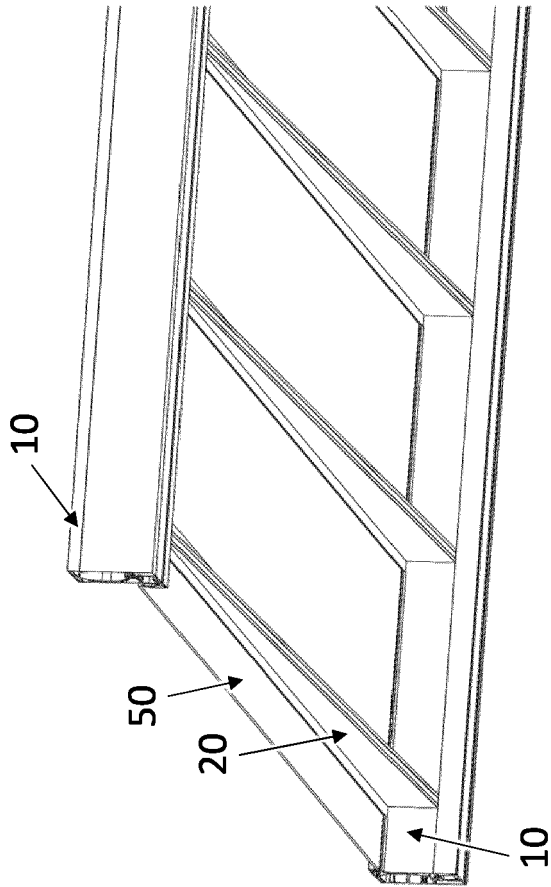
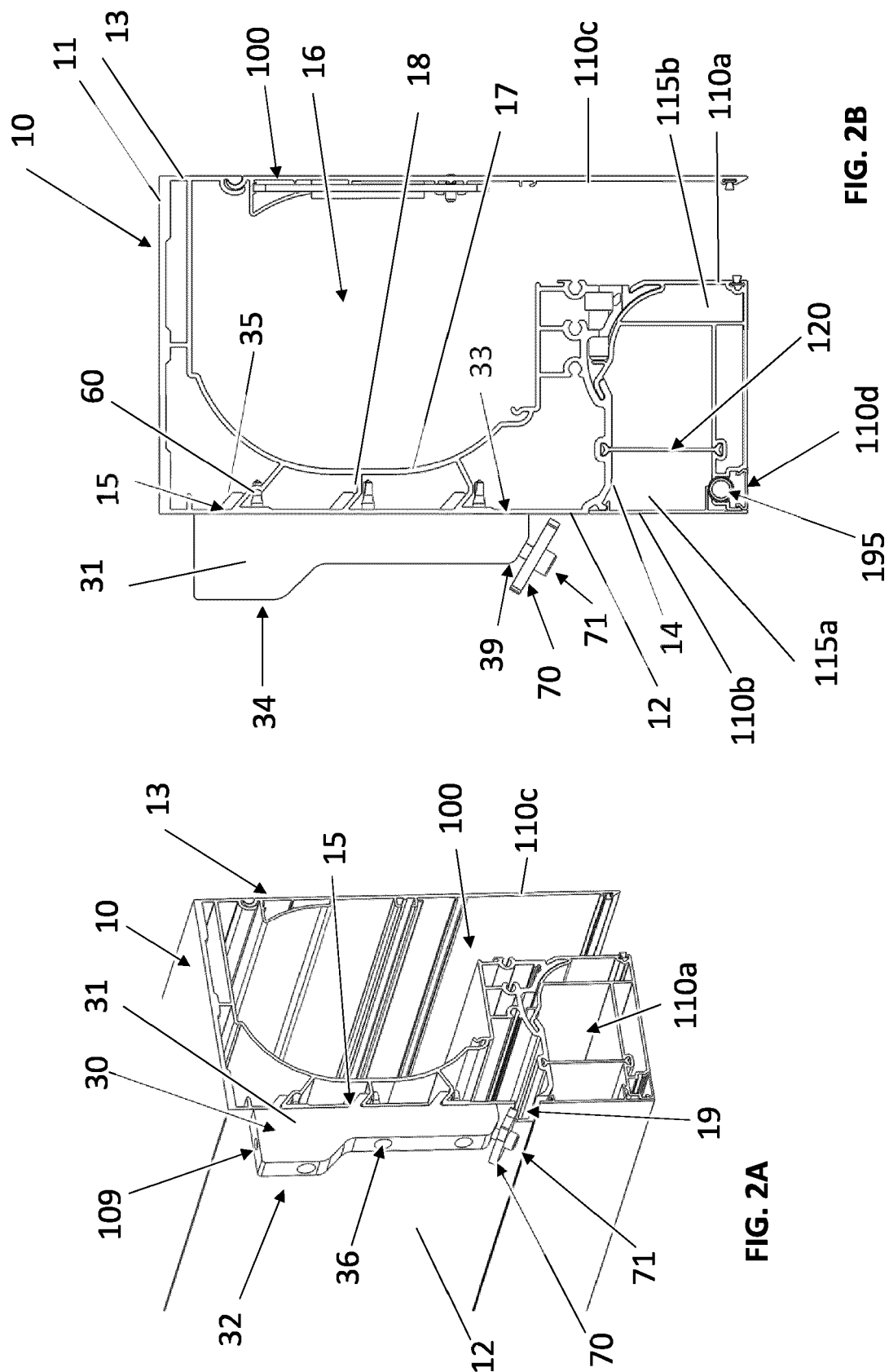


FIG. 1A



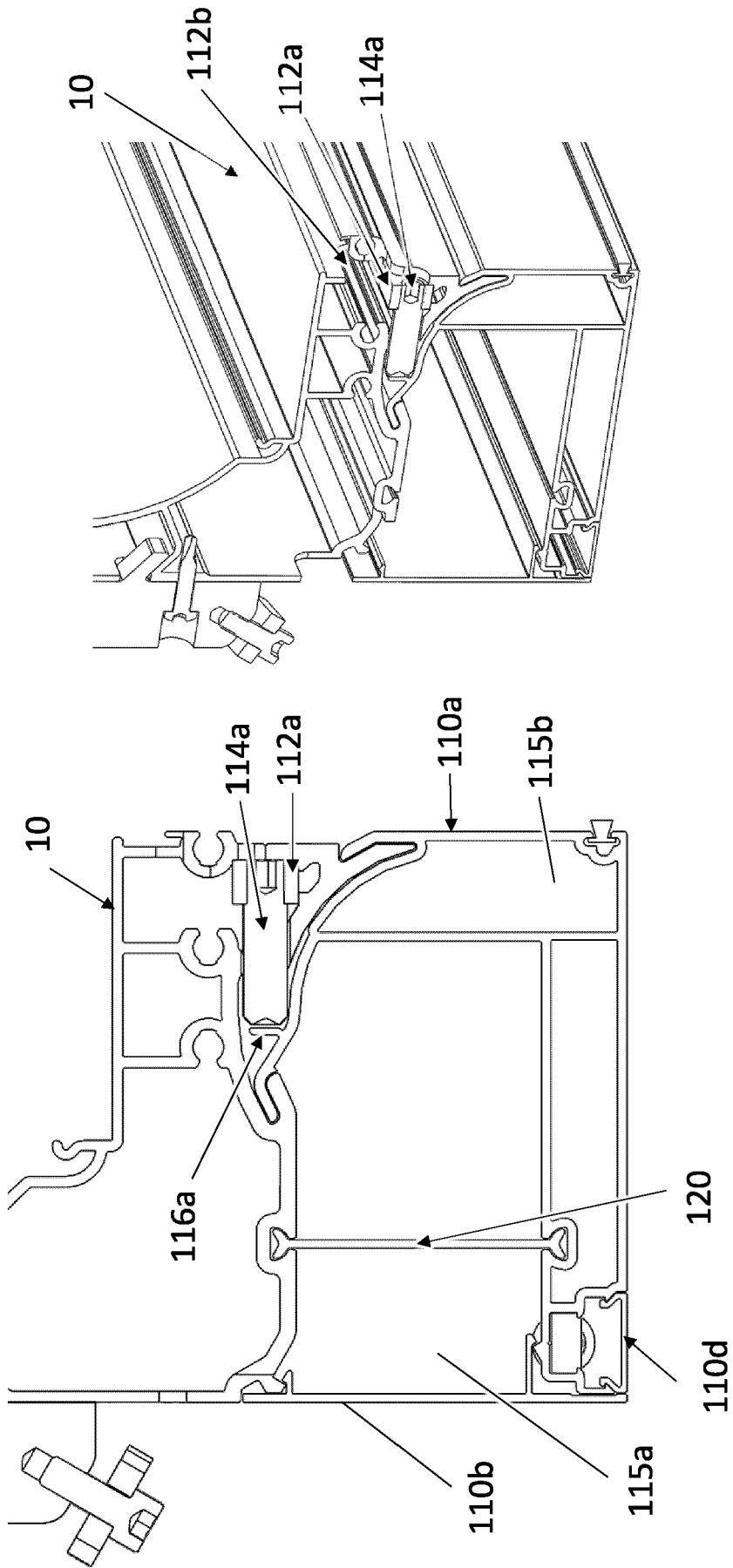


FIG. 2D

FIG. 2C

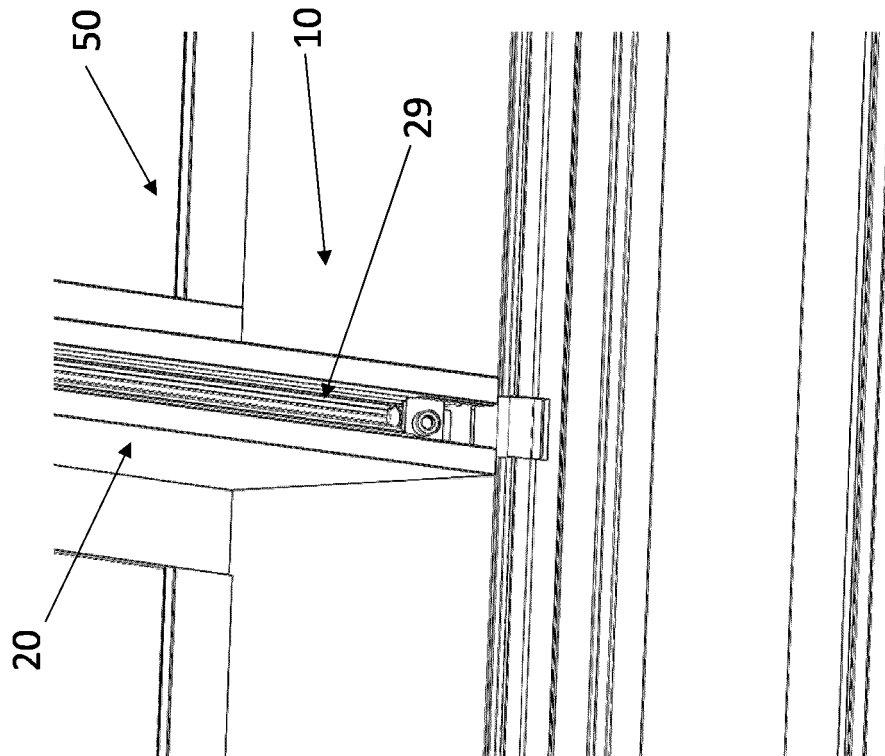


FIG. 3B

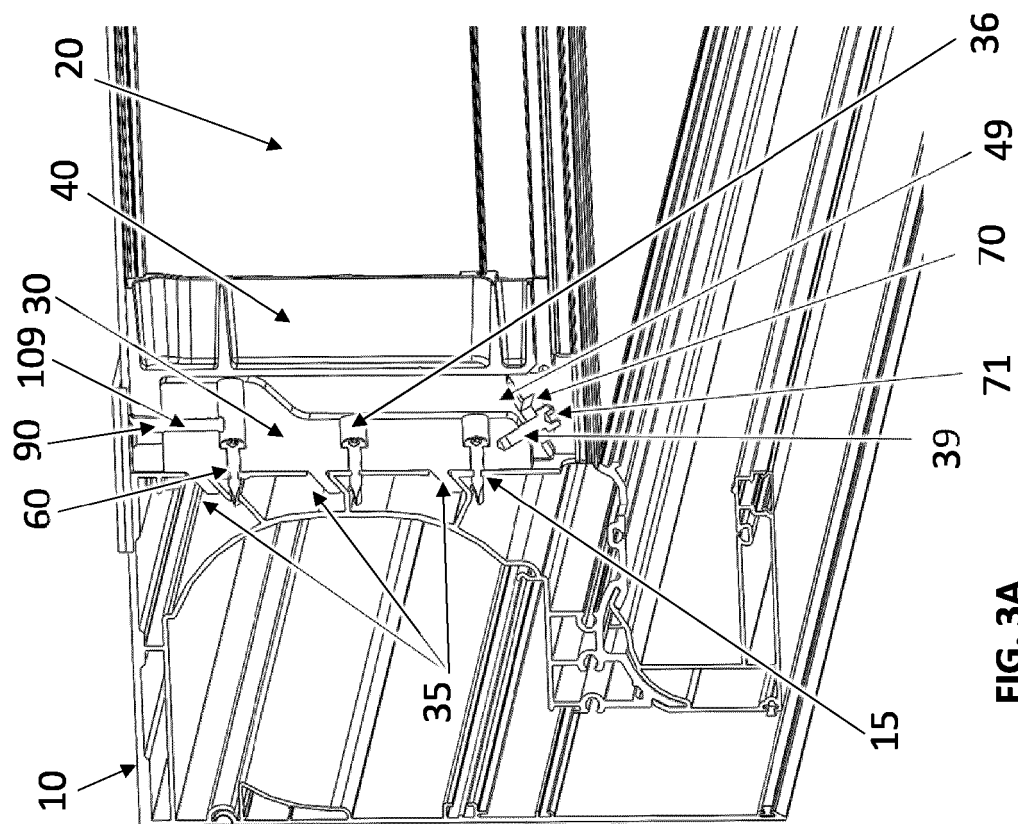


FIG. 3A

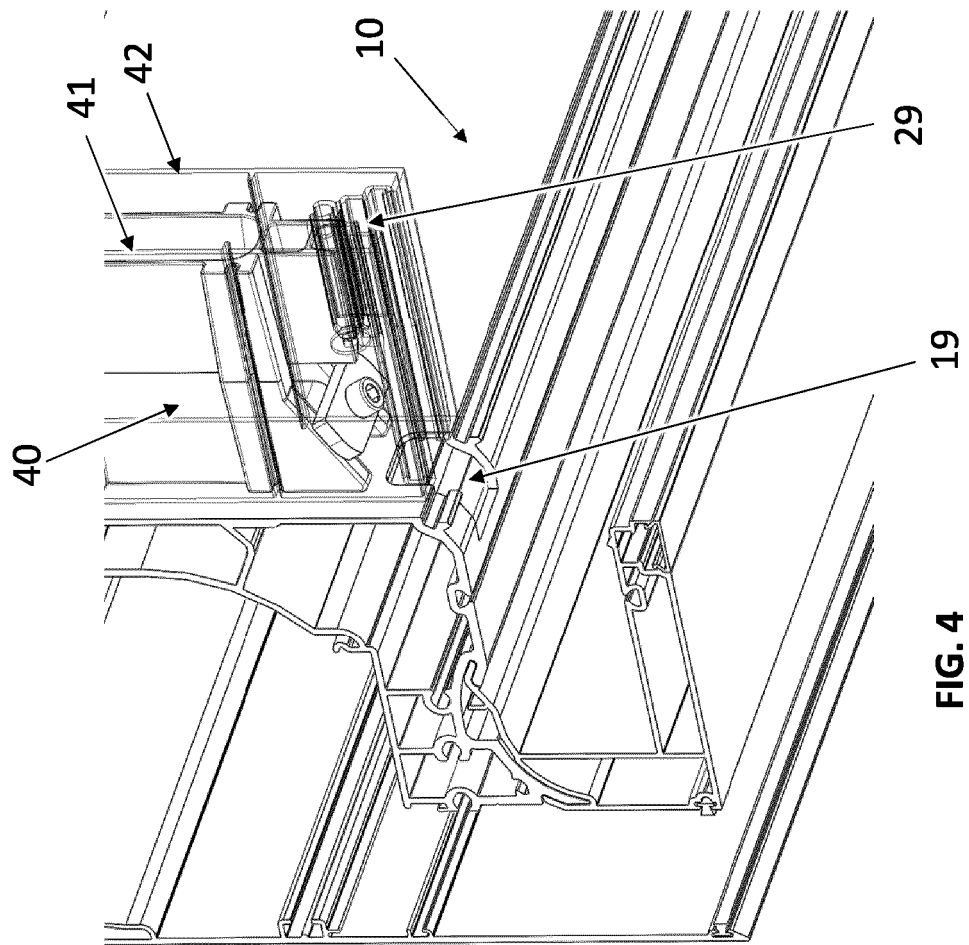


FIG. 4

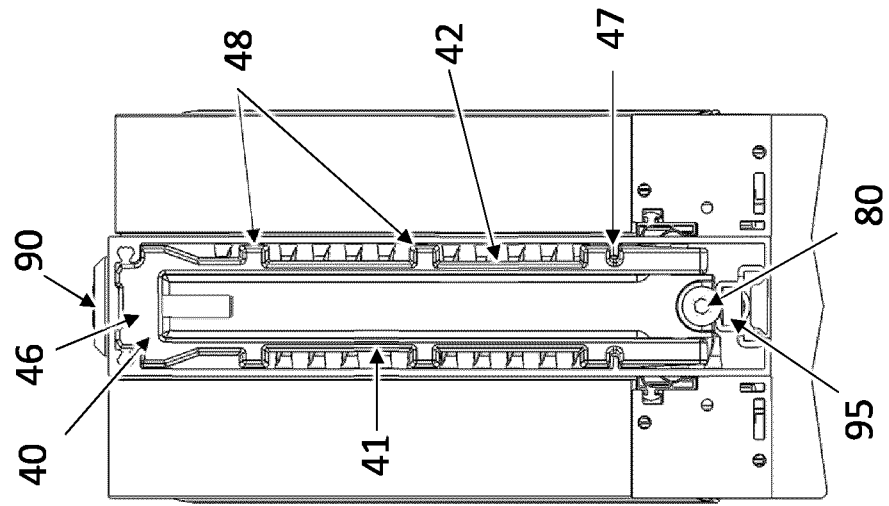


FIG. 7

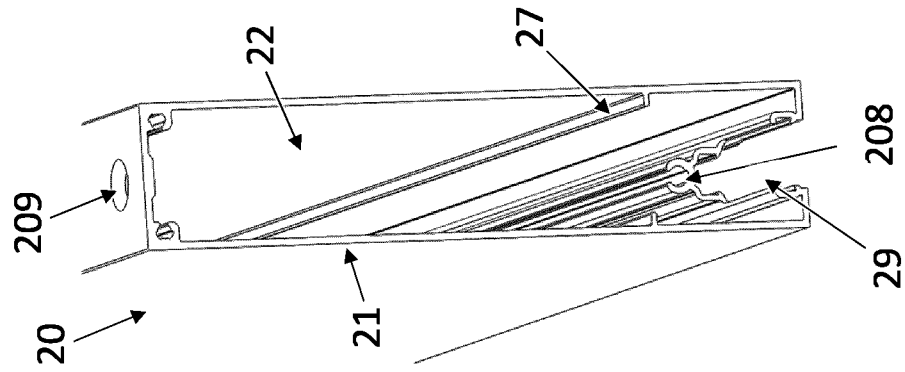


FIG. 6

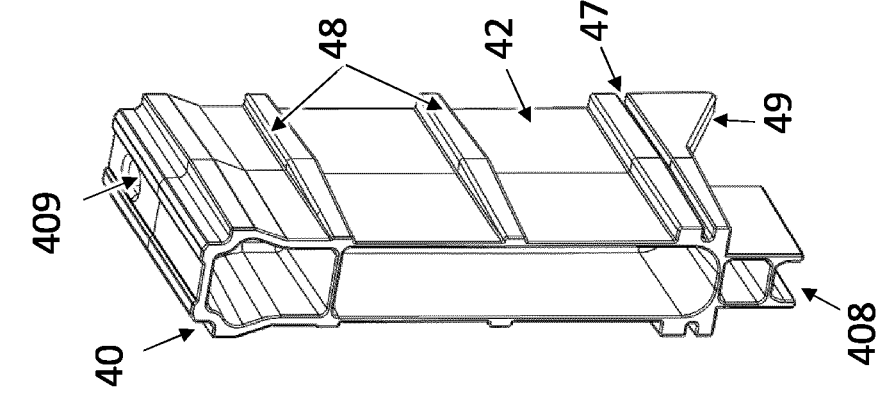


FIG. 5B

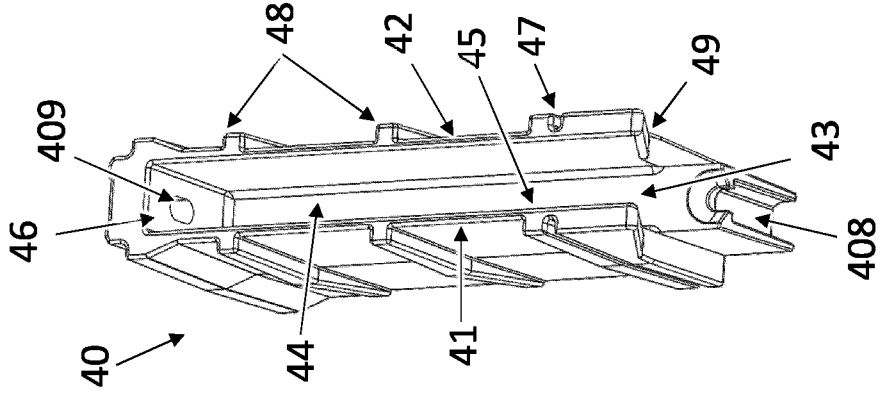


FIG. 5A

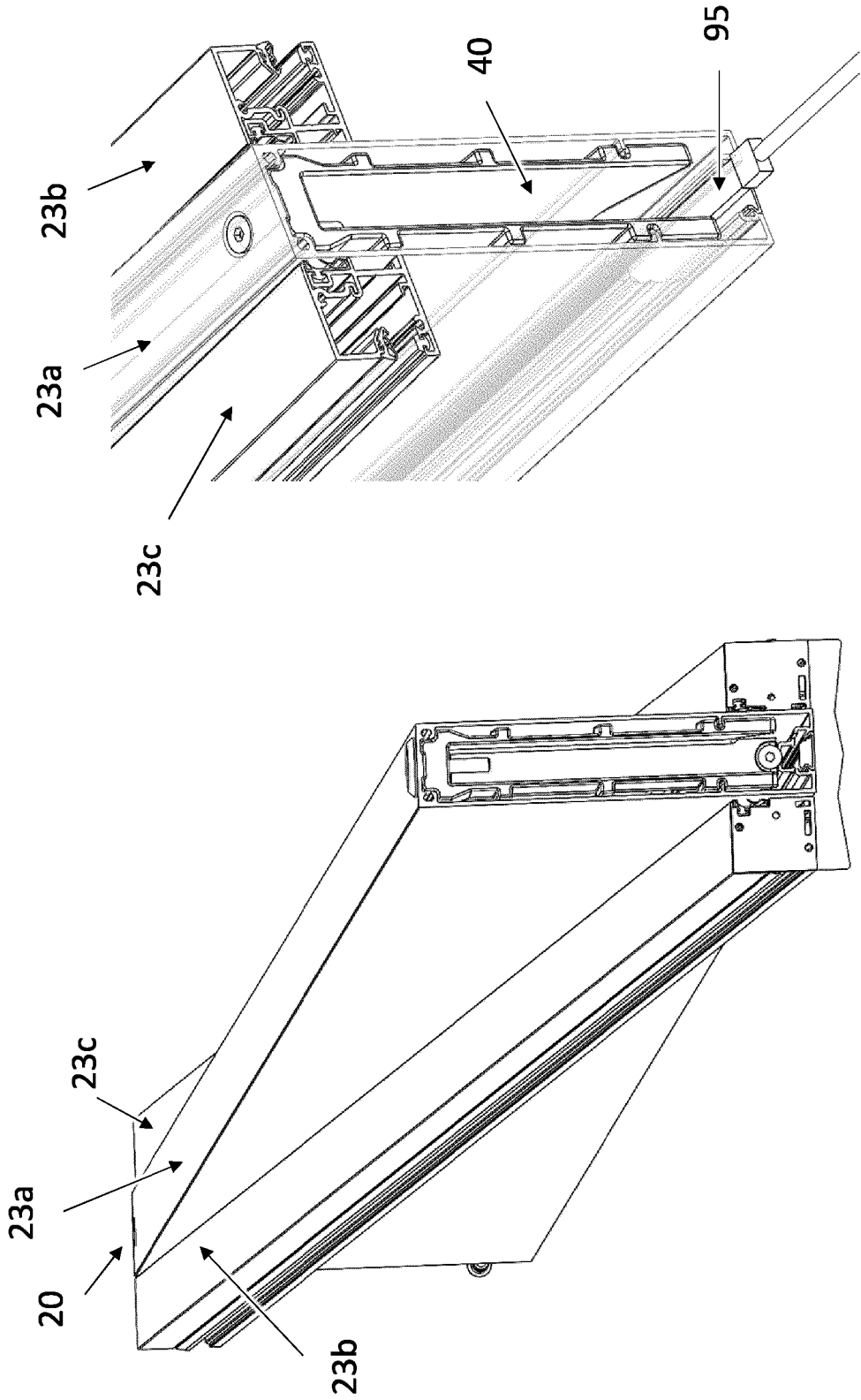
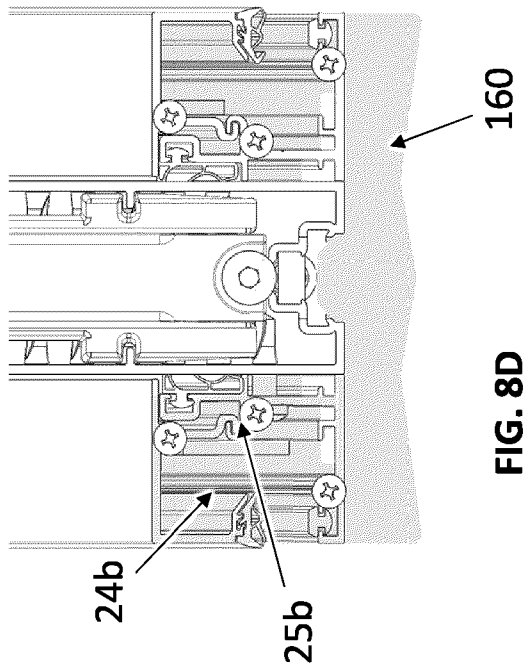
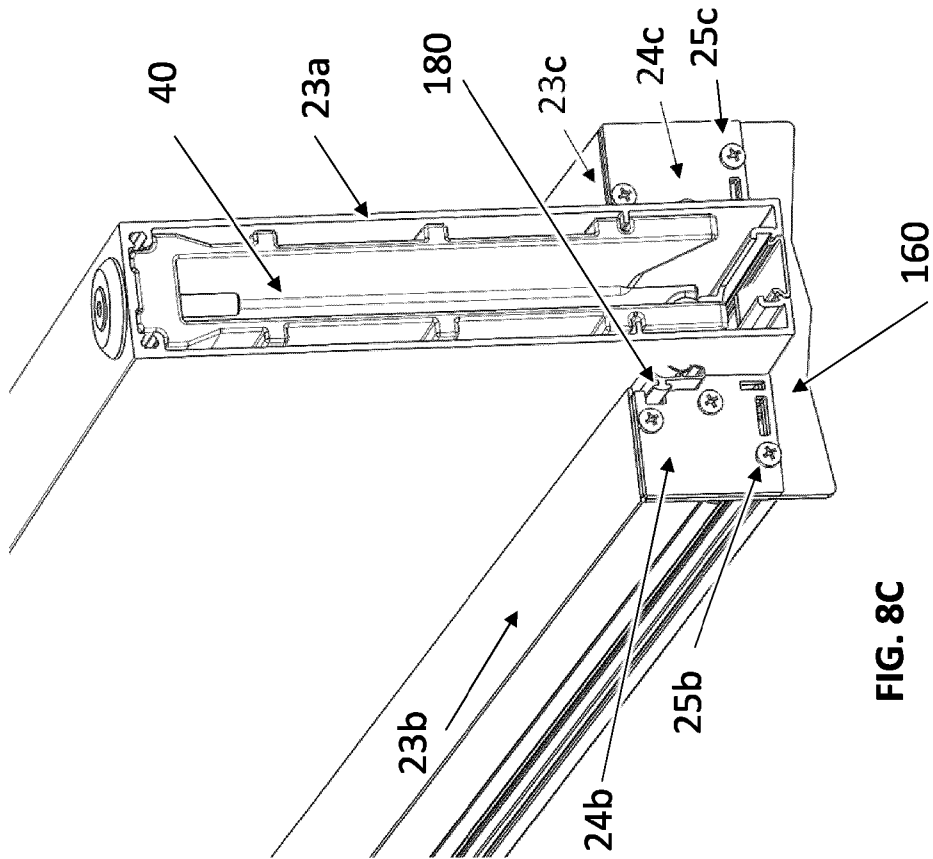
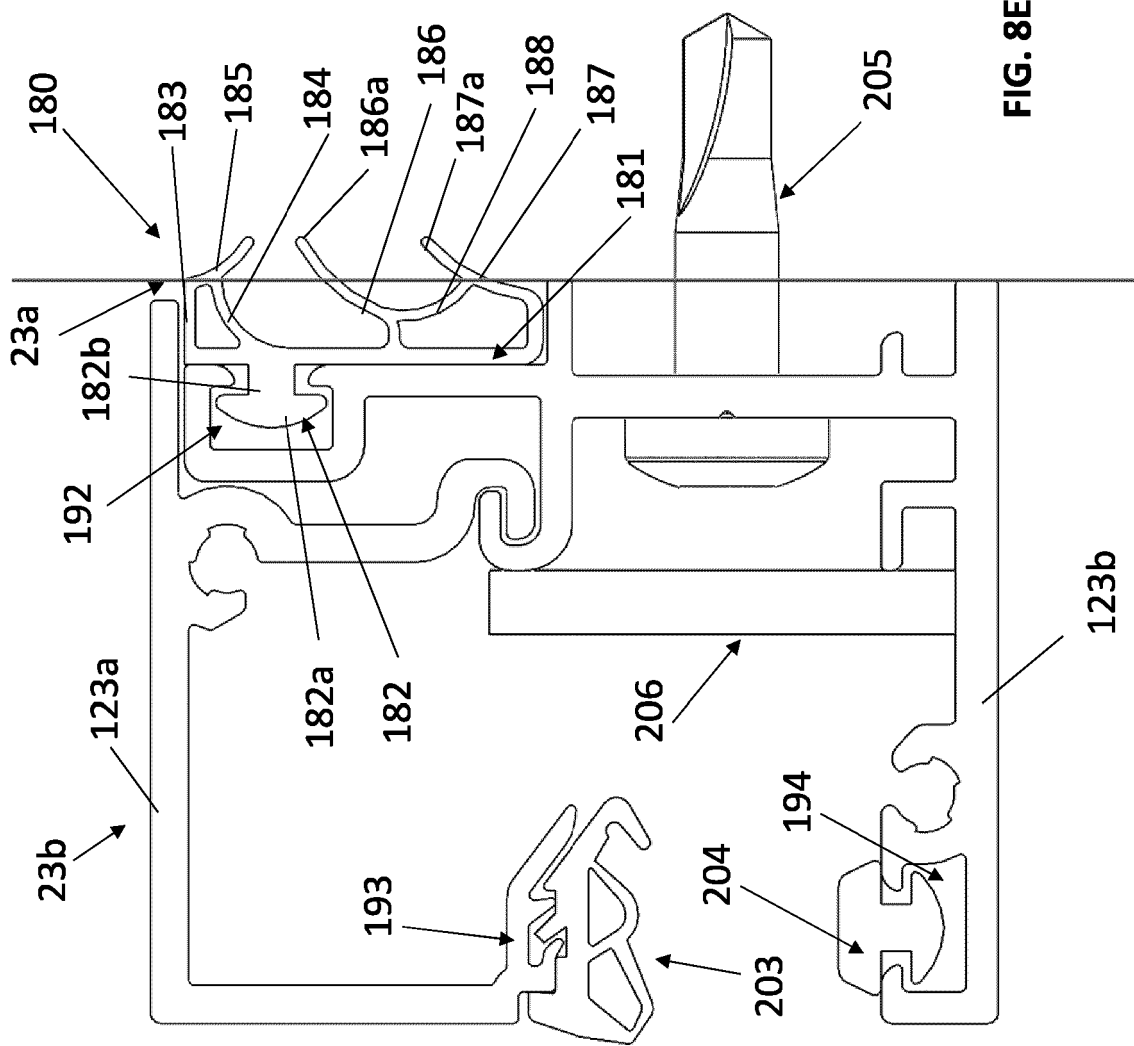
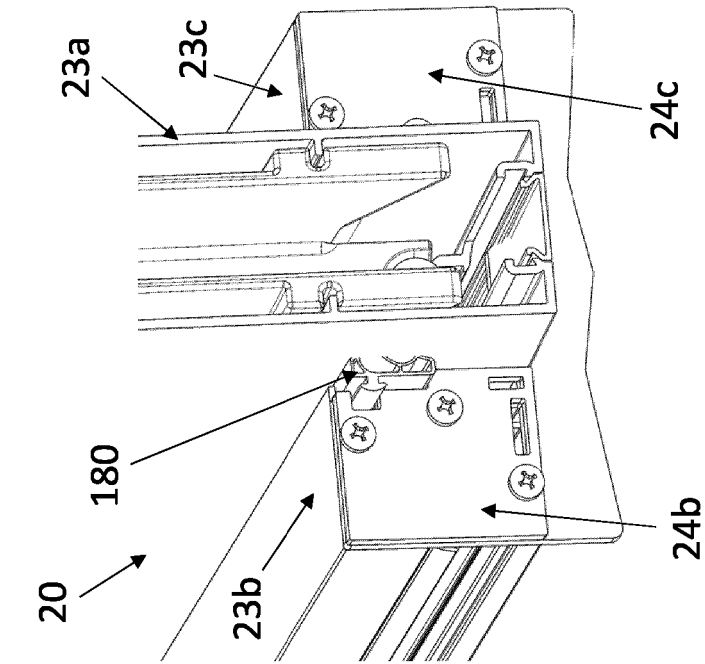


FIG. 8B

FIG. 8A





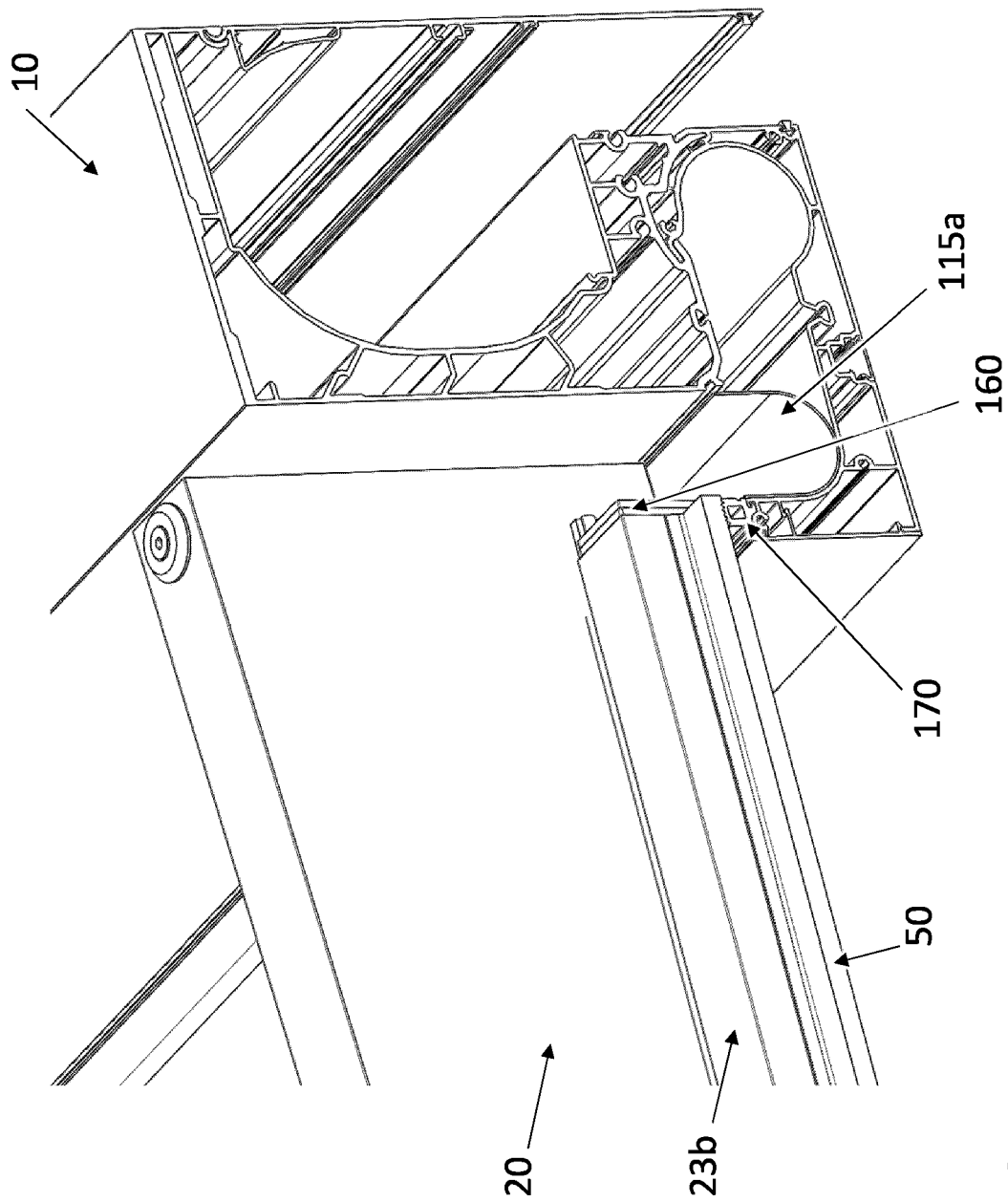


FIG. 9

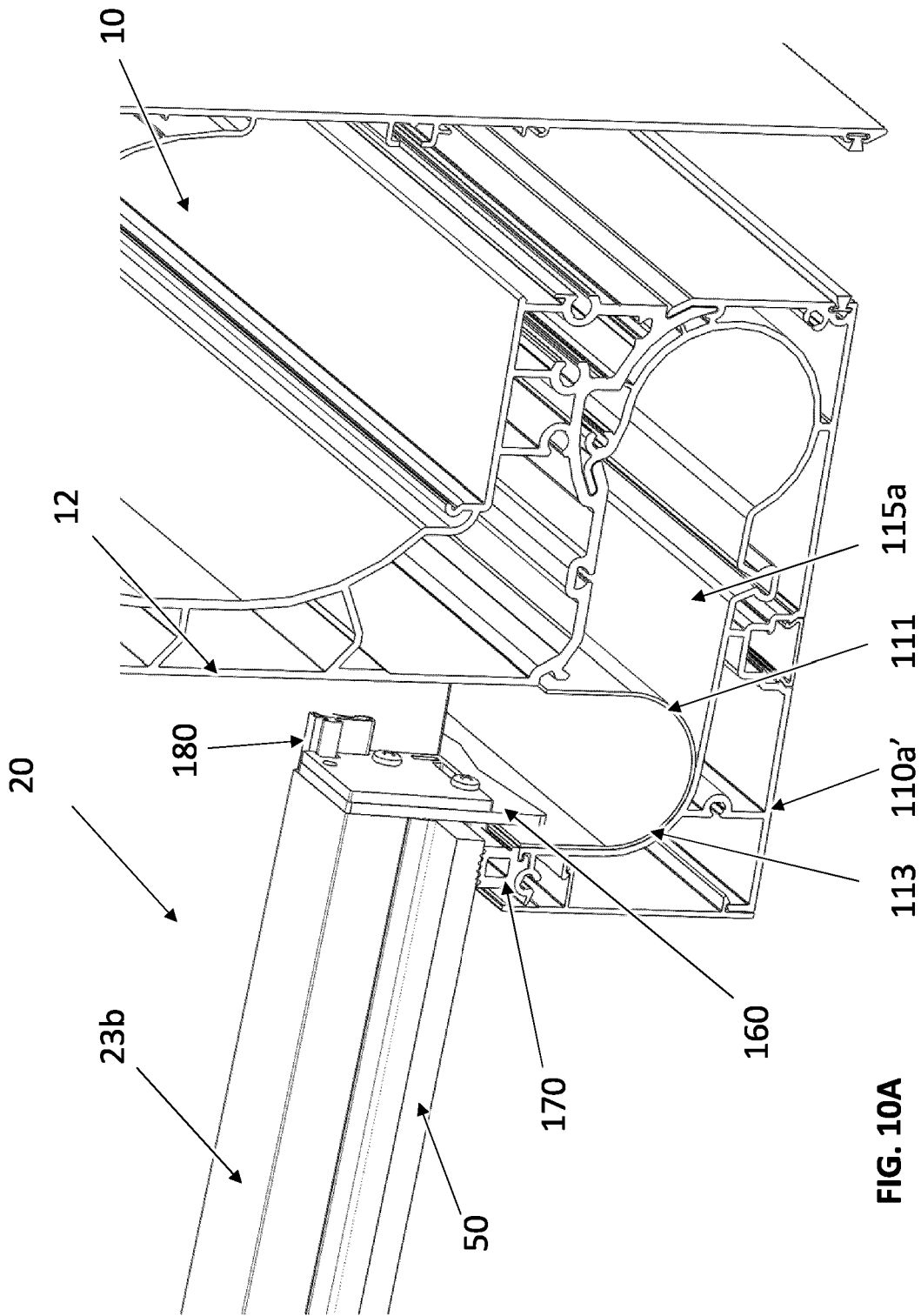


FIG. 10A

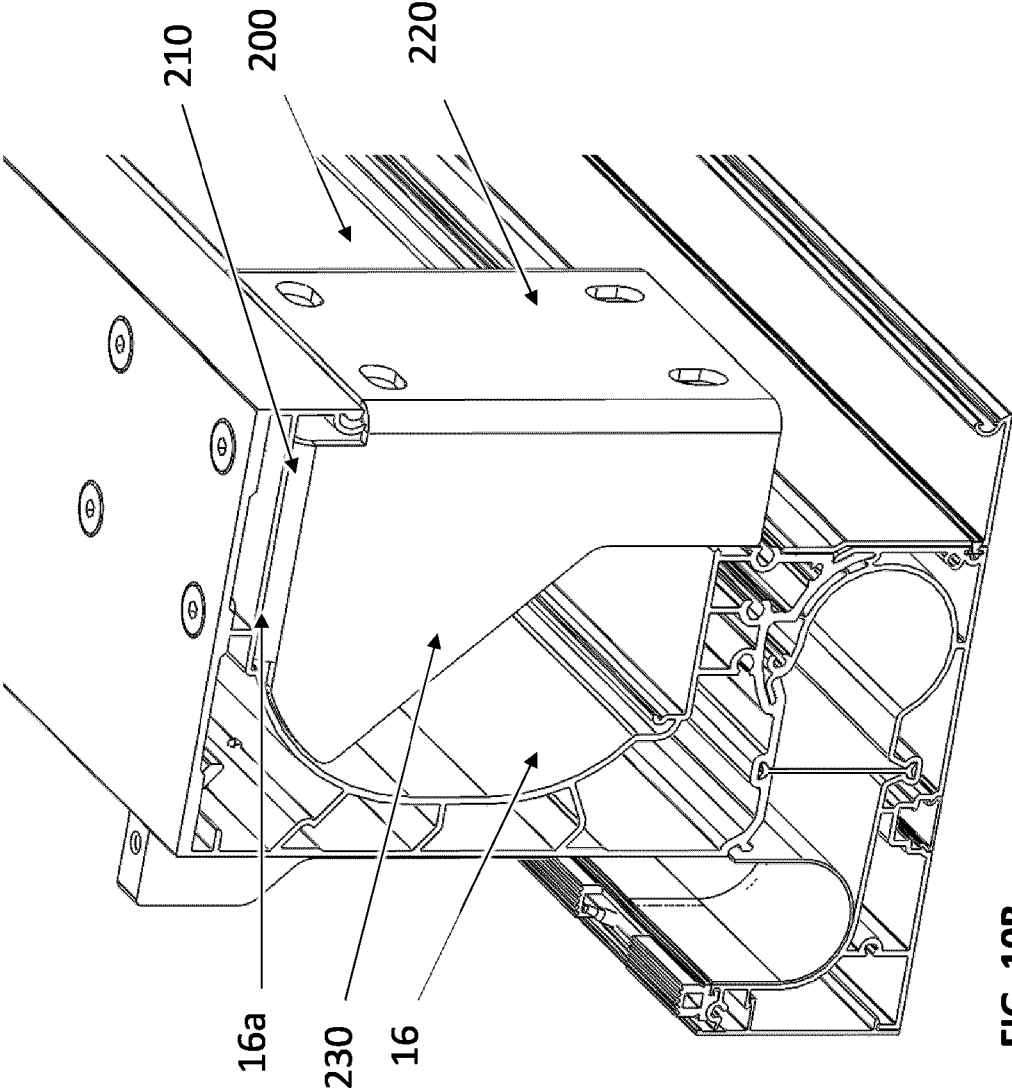


FIG. 10B

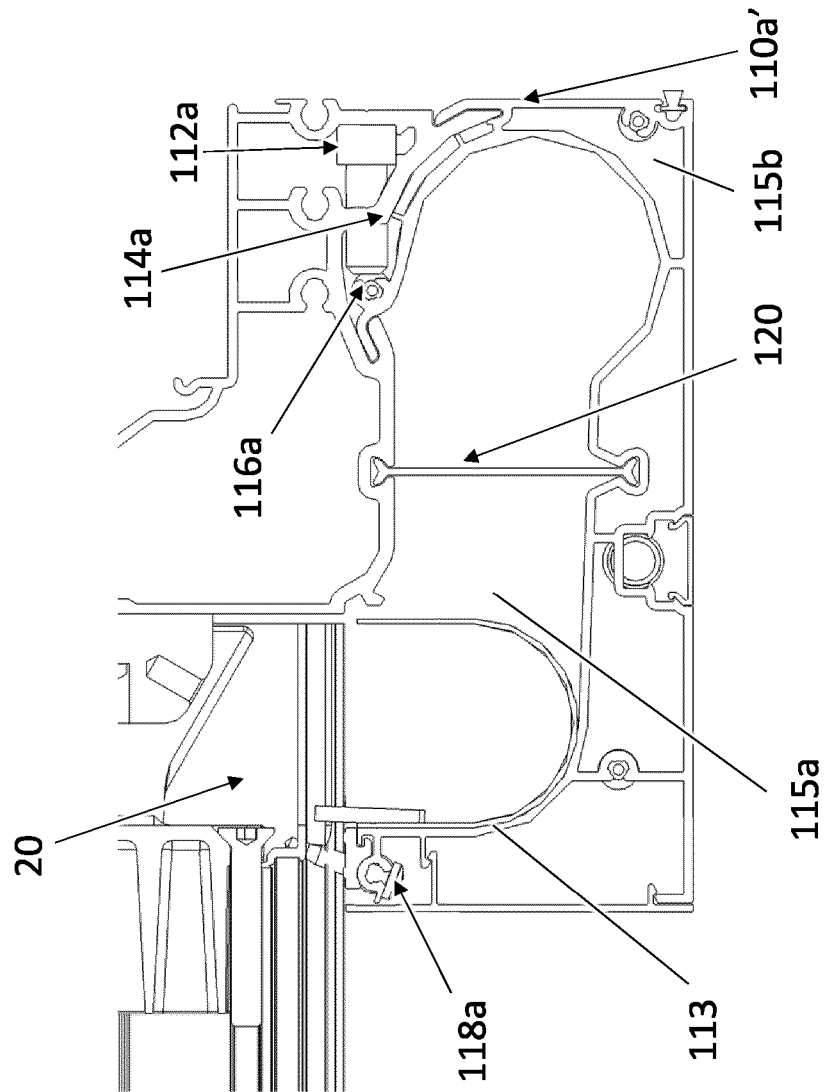


FIG. 10D

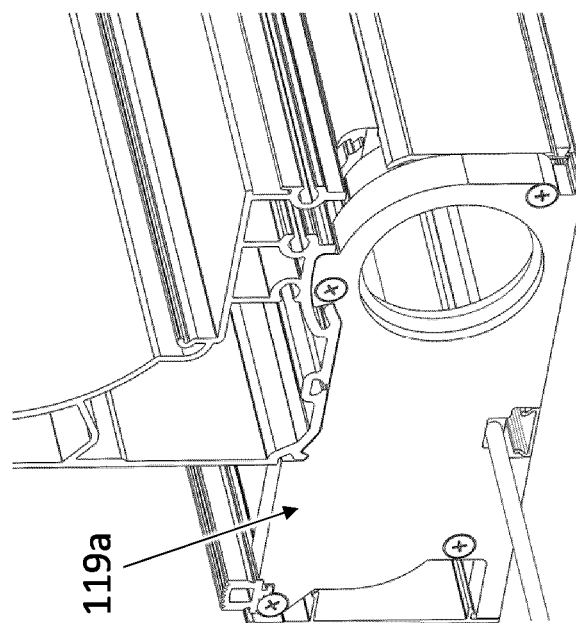


FIG. 10C

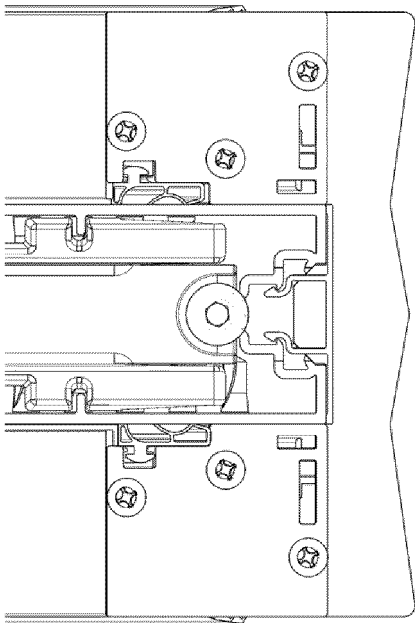


FIG. 11B

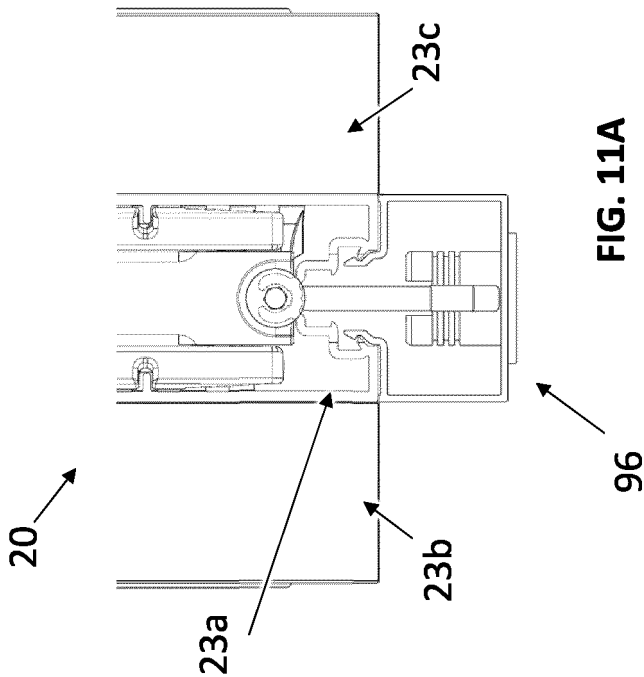


FIG. 11A

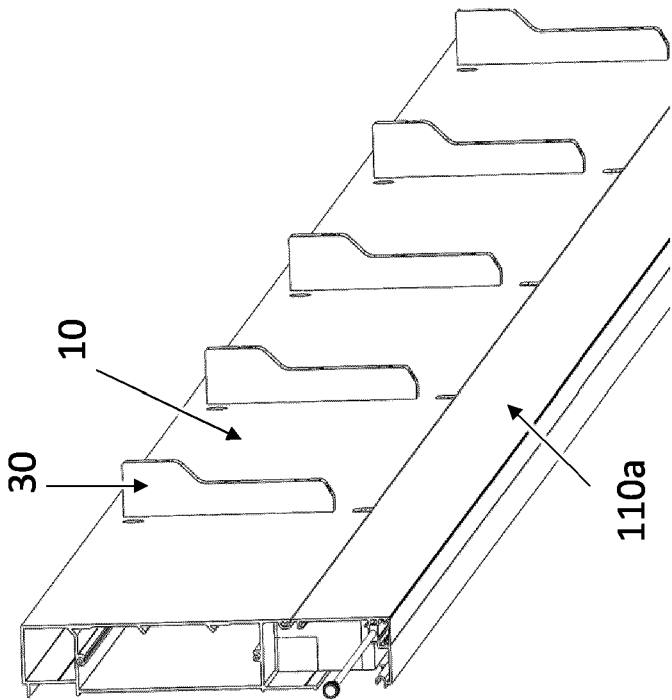


FIG. 12B

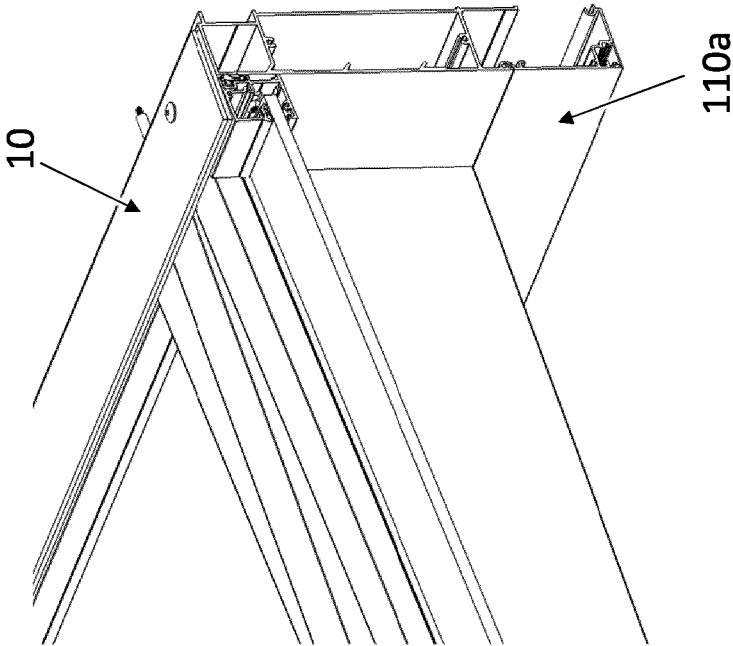


FIG. 12A

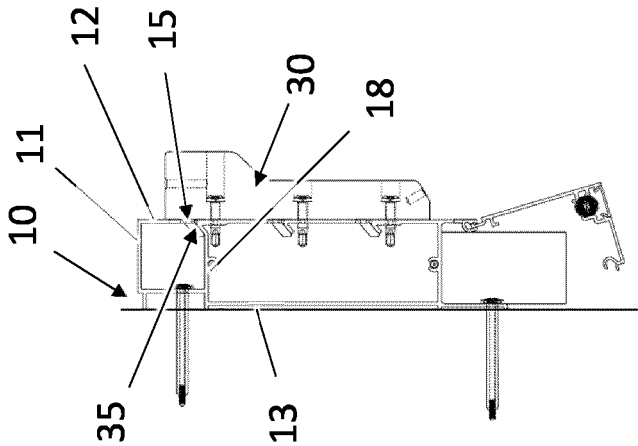


FIG. 12D

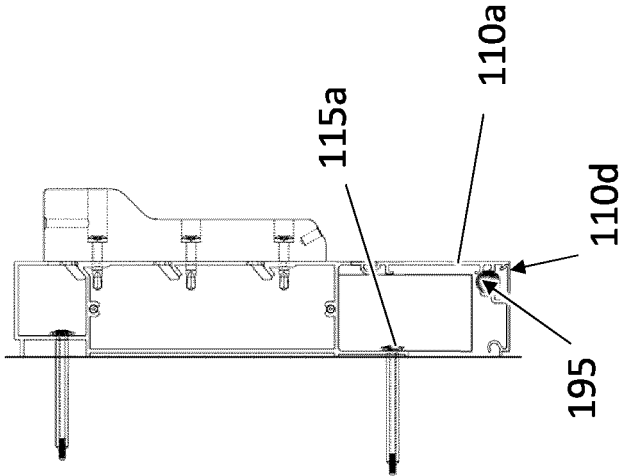


FIG. 12C

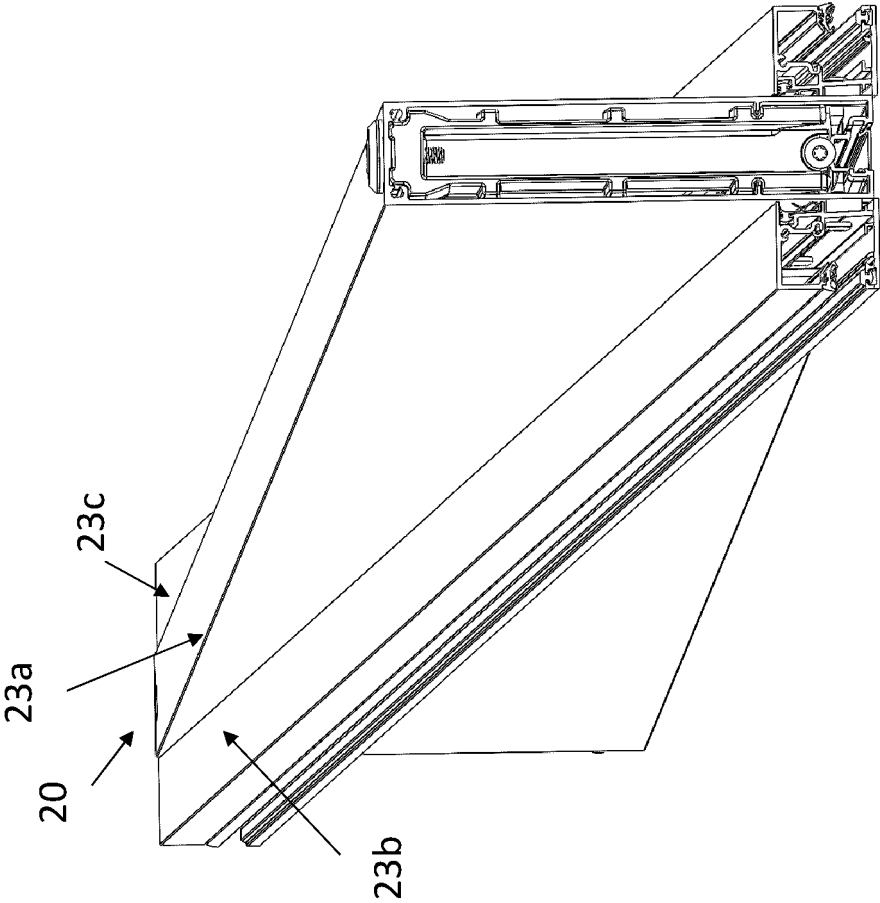
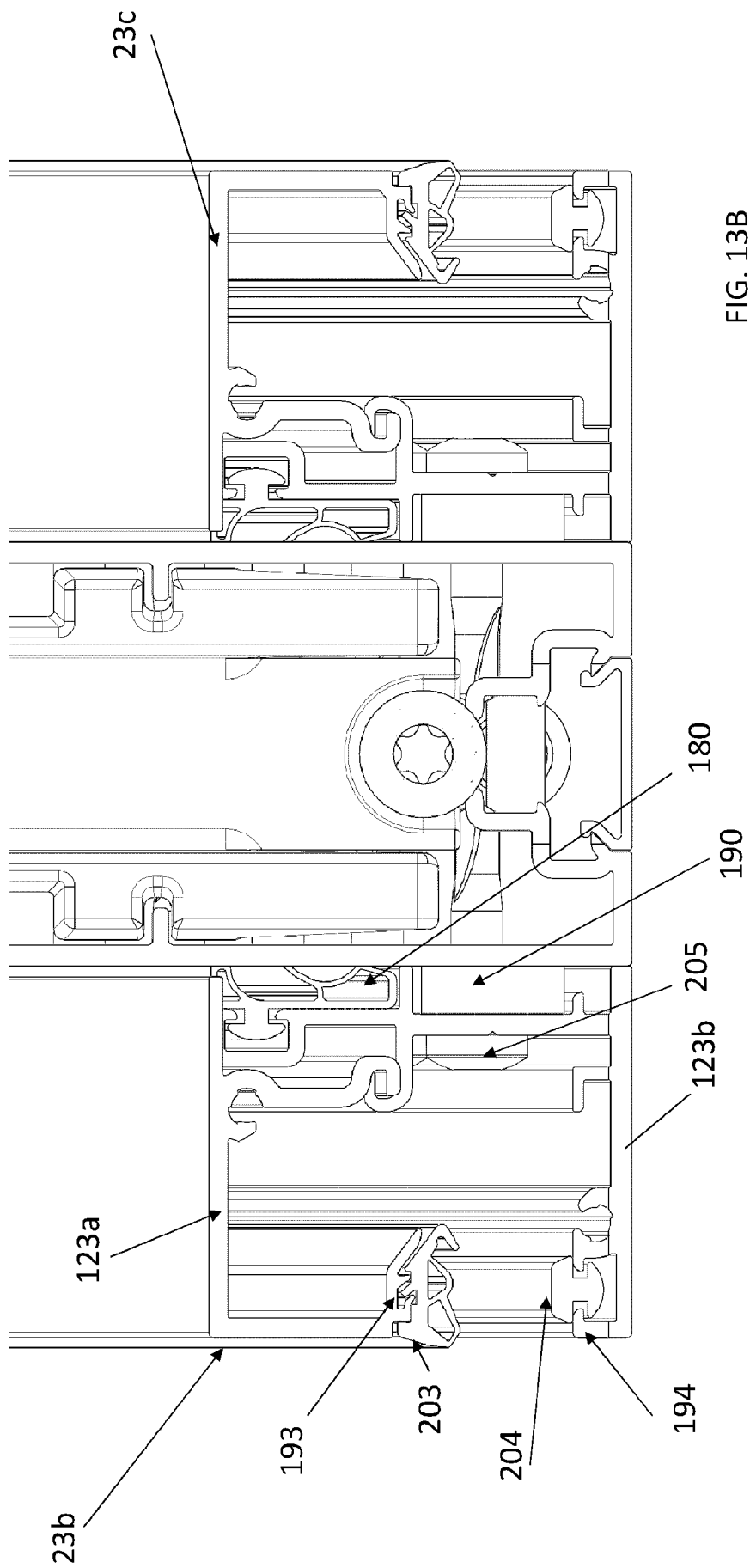


FIG. 13A



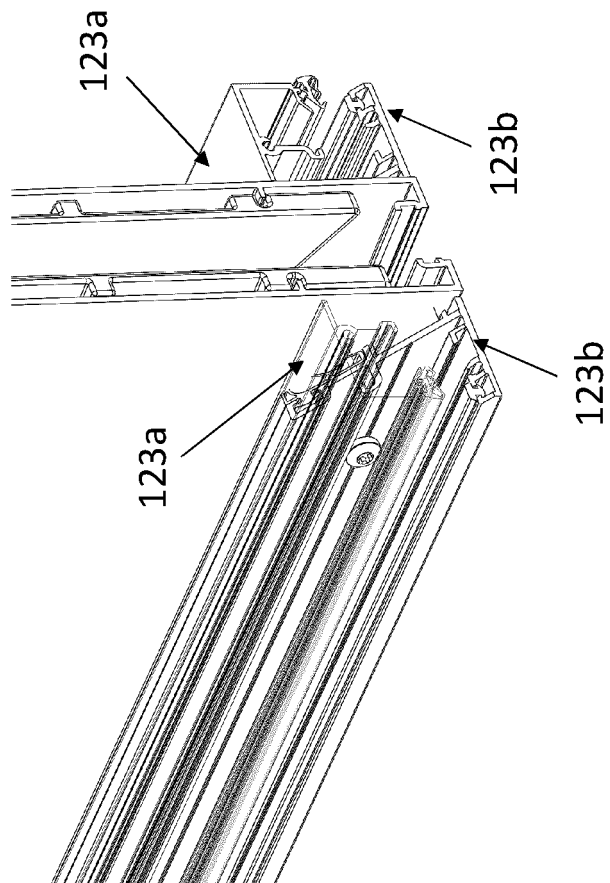


FIG. 13D

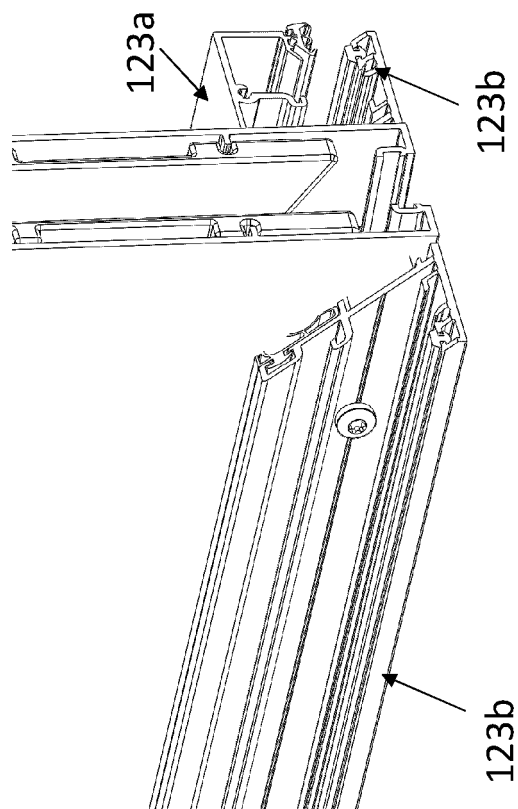


FIG. 13C

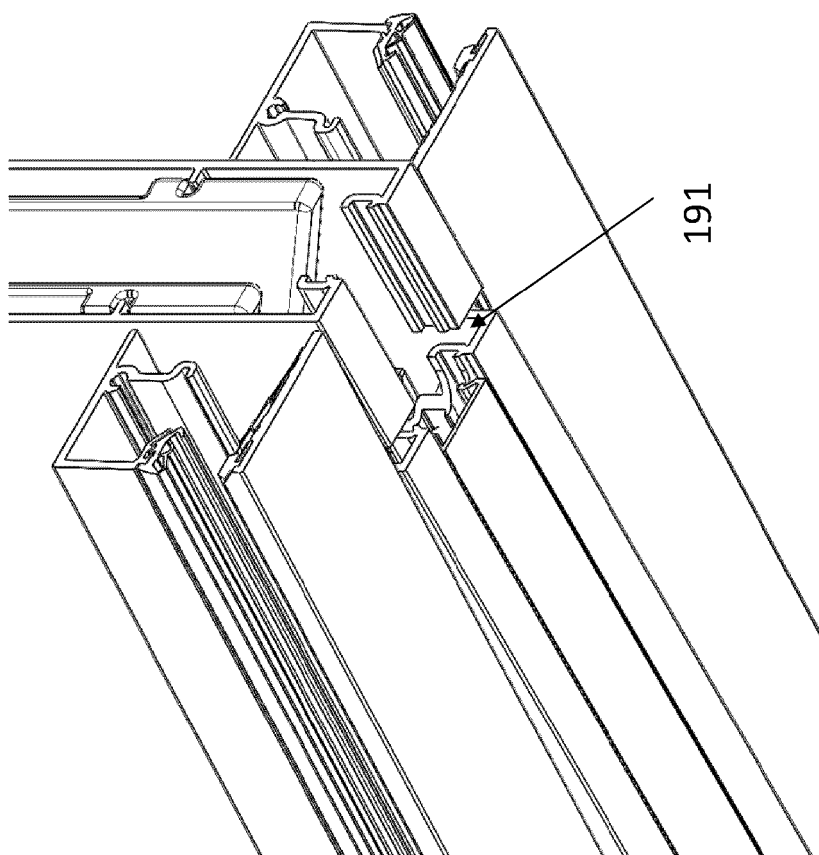


FIG. 13E

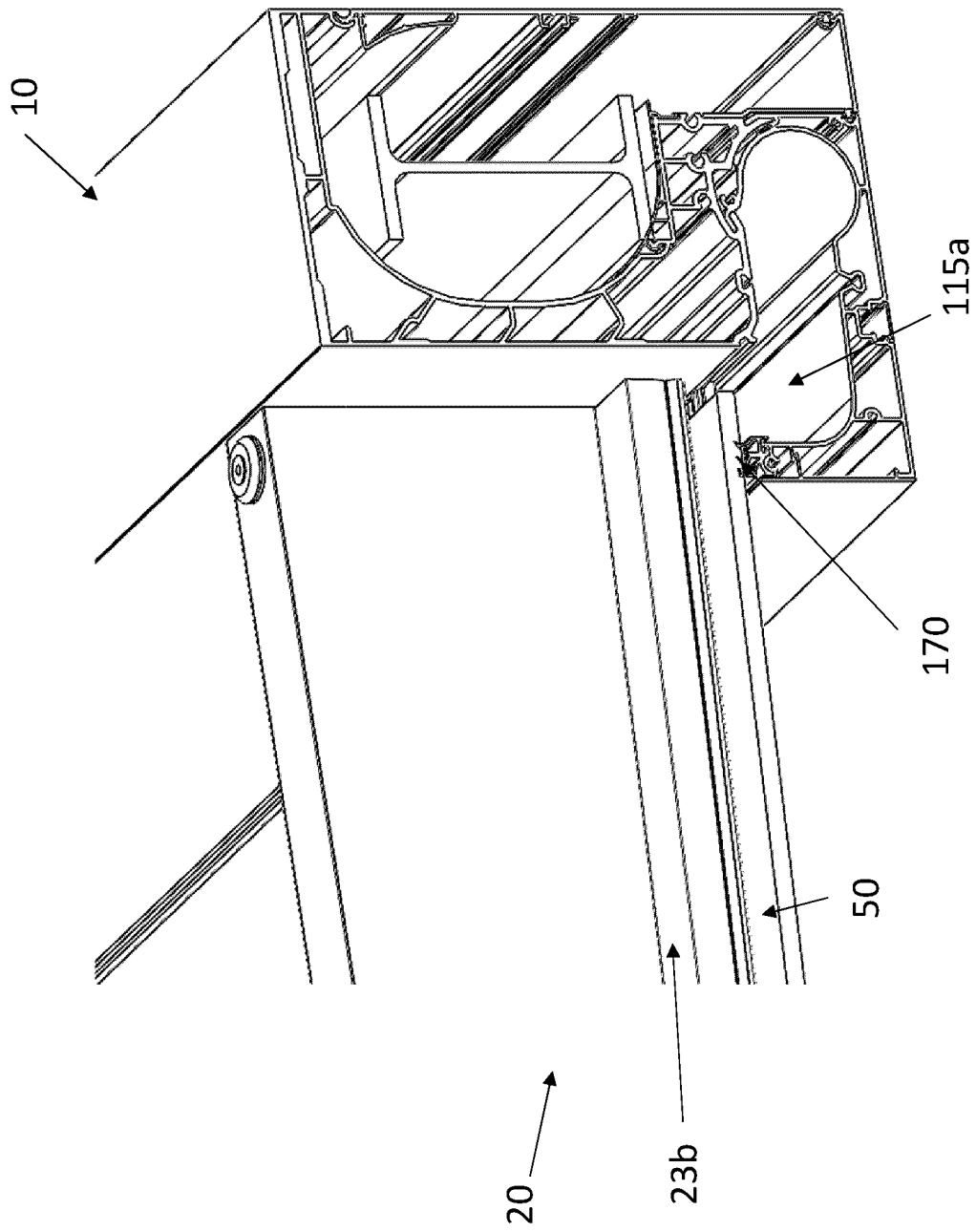


FIG. 13F



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