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(73) Patenthaver: **Godest F.T., ZA de Maudez, 22540 Pedernec, Frankrig**

(72) Opfinder: **GODEST, Yvon, , 22140 Bégard, Frankrig**

(74) Fuldmægtig i Danmark: **Dennemeyer & Associates S.A, P.O. Box 700425, DE-81304 Munich, Tyskland**

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IMPROVED ROOF WINDOW

The present invention relates to an improved glass canopy roof.

A glass canopy roof can be considered as a roof window but the dimensions of which have been enlarged. A conventional glass canopy roof can be three meters long and three meters wide.

A known way of fastening a glass canopy roof consists of letting same rest on two constituent components of the framework of a roof, then fastening said glass canopy roof onto the two components. For this purpose, the glass canopy roof fixed frame has articulated fastening tabs at the two end cross members of same, which are laid flat on the two components. Said fastening tabs are then attached with screws, using e.g. clamps. No provision is made for positioning the glass canopy roof frame with respect to the framework. Moreover, such operating procedure is considered to be difficult to implement.

US 6 729 083 B1 and DE 33 39 121 A1 disclose means for adjusting the distance between the elements of the frame of a roof element and structural elements of the roof on which the frame is installed.

Moreover, with regard to the prior art, the Applicant sought a solution for facilitating the installation of the glass canopy roof in the framework of a roof.

To this end, a glass canopy is proposed, comprising a fixed frame intended to receive an opening frame bearing at least one glazing or a second fixed frame bearing at least one glazing, the fixed frame being designed to be attached by the bottom part and by the opposite top part of same between two components arranged substantially parallel with respect to each other and that are constituents of the framework of the roof. According to the invention, the fixed frame comprises two pairs of profiles, each pair comprising a first, inner profile and a second, outer profile, each bottom part or each top part of the fixed frame being fastened to the first profile, each second profile being dimensioned so as to be fastened to a corresponding component, and the two profiles comprise means of separation or of relative separation between the two profiles and/or means allowing the orientation, in a median plane with respect to the second profile, of the first profile with respect to the second profile, the means comprising adjustment bolts.

By acting on the adjustment bolts, it becomes possible to adjust the positioning of the glass canopy roof in the roof and in particular by correctly fastening same onto two constituent components of the framework, the parallelism of said framework being imperfect. According to an additional feature of the invention, the two profiles forming a

pair are identical, the second profile being oriented at 180° about an elongated axis and facing the first profile.

The manufacturing cost of the two constituent profiles is optimized. According to an additional feature of the invention, each profile comprises:

- a flat main plate, which is provided on a first elongated edge with a flat wall that extends perpendicular to and on either side of said flat main plate, the two flat walls being used, in cooperation with the two flat main plates,

on the one hand, to act as corner wedging for the two second profiles, bearing in particular on the two components and,

on the other hand, to act as corner wedging for the two first profiles, bearing and fastening constituent fastening profiles of chevrons involved in the construction of the fixed frame.

The fixed frame can thereby be installed easily on the framework of the roof. According to an additional feature of the invention, each profile comprises:

- two elongated protuberances of H-shaped section that are formed on one face of the flat main plate, extending longitudinally and parallel to one another, each elongated protuberance being defined by two parallel flanges that are joined towards the middle thereof by an intermediate flange,
- two openings passing through the flat main plate in line with the two elongated protuberances, each opening emerging between the two parallel flanges of a corresponding elongated protuberance,
- the volume delimited between the two parallel flanges, the intermediate flange and the flat main plate of each elongated protuberance forming a corresponding groove,
- a plurality of nuts positioned in the grooves of the second profile,
- a first series of holes passing through the flat main plate,
- a second series of holes passing through the intermediate flanges of the two elongated protuberances,
- the adjustment bolts comprising screws mounted in the first profile cooperating with the nuts.

The screwing/unscrewing of the screws causes a relative displacement between the two profiles. According to an additional feature of the invention, the bottom part and the top part respectively of the fixed frame comprise two rows of fastening panels, the fastening panels of one and the same row being fastened to the other face of the flat main plate of the first profile, via fastening bolts, each fastening bolt comprising a screw cooperating with a nut mounted in a groove of the first profile.

It is thereby possible to clamp the glass canopy roof onto each profile just by bolting.

According to one feature of the invention, each fastening panel comprises a flat metal plate on which extend, from one and the same edge and parallel to said plate, two side pieces, one end of a constituent chevron of the fixed frame being fastened between the two side pieces.

Such construction allows the chevrons to extend close to the top and bottom parts of the fixed frame of the glass canopy roof and thereby allows the glazed surface area to be increased. The aforementioned features, as well as others, will become clearer upon reading the following description of an example of embodiment, said description being given with reference to the enclosed drawings, wherein:

[Figure 1] shows a perspective view of a glass canopy roof according to the invention,

[Figure 2] shows a front sectional view of a glass canopy roof according to the invention,

[Figure 3] shows a perspective view of part of a first constituent profile of a glass canopy roof according to the invention,

[Figure 4] shows a perspective view of a second constituent profile of a glass canopy roof according to the invention,

[Figure 5] shows a perspective view of a first profile that is fastened onto the component according to the invention,

[Figure 6] shows a perspective view of part of a second constituent profile that is fastened onto the fixed frame of a glass canopy roof according to the invention and,

[Figure 7] shows a perspective view of a constituent fastening plate second of the fixed frame of a glass canopy roof according to the invention.

The glass canopy roof 100 shown in Figure 1 is intended to be installed on a roof. Said glass canopy roof consists of a fixed frame Cd wherein is mounted in an articulated manner, an opening frame Co including at least one glazing Vg. On this Figure 1, the glass canopy roof 100 has an articulation An of horizontal axis allowing the opening frame Co to open upwards and arranged in the top part of said glass canopy roof, considering the installation position of said articulation on an inclined roof panel. The inscription “TOP” on the top right-hand of the Figure 1, indicates the top part of the glass canopy roof 100 in the installation position thereof, whereas the inscription “BOTTOM” on the bottom left-hand of the Figure 1, indicates the bottom part of the glass canopy roof 100. Said glass canopy roof 100 is a so-called “projection” glass canopy.

In an alternative embodiment not shown, the constituent glazing or glazings of the glass canopy roof are rigidly mounted on the fixed frame. There is hence no opening frame but a second fixed frame bearing the glazing or glazings.

In the Figures 1 and 2, the top part and the bottom part of the fixed frame Cd of the glass canopy roof 100 are fastened respectively to two pairs of profiles. Each pair comprises a first inner profile P1 and a second outer profile P2. The two profiles P1 and P2 of each pair are mutually assembled.

The two outer profiles P2 are designed and dimensioned to be fastened respectively to two constituent components of the framework of a roof. Said two components are arranged in a manner substantially parallel to each other and are separated by a particular distance. The difficulty of the installation, on the framework of the two components, means that said components are rarely parallel.

According to an embodiment shown in the Figures 1 and 2, said two components are respectively, a bottom component Pnb and a top component Pnh.

The two inner profiles P1 are designed and dimensioned for bearing and fastening the fixed frame Cd of the glass canopy roof 100.

The two profiles, P1 and P2 of a pair are advantageously identical. The two profiles P1 and P2 of each pair are arranged top-to-bottom. The second profile P2 being oriented at 180° about an elongated axis and facing the first profile P1.

Each profile P1 or P2 is advantageously manufactured in aluminum by extrusion. In the Figures 3 and 4, each profile P1, P2 comprises a flat main plate Pn delimited by two parallel faces A and B. Two elongated protuberances Pg1 and Pg2 of H-shaped section that are formed on one face B extending longitudinally and parallel to one another. Each elongated protuberance Pg1 and Pg2 is thereby defined by two parallel flanges joined towards the middle thereof by an intermediate flange.

Two openings R1 and R2 passing through the flat main plate Pn in line with the two elongated protuberances Pg1 and Pg2. Each opening R1 or R2 emerging between the two parallel flanges of a corresponding elongated protuberance Pg1 or Pg2. The width of each opening R1 or R2 is narrower than the distance separating the two constituent parallel flanges of an elongated protuberance Pg1 or Pg2. The volume delimited between the two parallel flanges, the intermediate flange and the flat main plate Pn of each elongated protuberance Pg1 and Pg2, form a corresponding groove N1 or N2 intended to receive a plurality of nuts Ec.

Each nut Ec is preferentially a special nut provided with a ball locking the sliding movement thereof in a corresponding groove N1 or N2 for maintaining a desired position in said groove. One of the two parallel flanges of the elongated protuberance Pg1 or Pg2 is provided on the outside with a first edge G1.

A first wall Cn1 extends perpendicularly on the side B and is provided on with a second edge G2. The first wall Cn1 and the edge G2 thereof with a profile P1 or P2 are arranged so that the second edge G2 can cooperate with the first edge G1 of the other profile P2 or P1, turned opposite, to form together a means of retaining preventing the undesired separation of the two profiles P1 and P2 when said profiles are mutually interlocked with one another. In the Figures 3 and 4, the first wall Cn1 extends between the two elongated protuberances Pg1 and Pg2. A second wall Cn2 extends perpendicularly on the face B of each profile P1 or P2. Said wall is arranged as to be able to bear on a parallel flange belonging to the elongated protuberance Pg1 or Pg2 of the other profile P2 or P1 turned opposite, for transferring a load and more precisely, a part of the weight of the glass canopy roof, via a corresponding component.

The flat main plate Pn is provided on a first elongated edge with a flat wall Pp that extends perpendicular to and on either side of said flat main plate Pn. The two flat walls Pp are used, in cooperation with the two flat main plates Pn,

on the one hand, to act as corner wedging for the two second profiles P2, bearing in particular on the two components Pnb and Pnh and,

on the other hand, to act as corner wedging for the two profiles P1, bearing and fastening constituent fastening profiles of chevrons involved in the construction of the fixed frame Cd.

This situation is shown schematically in Figure 2.

The fixed frame Cd can thus be installed easily on the framework of the roof, pending the positioning of said fixed frame and the fastening thereof on the two components Pnb and Pnh.

In the Figures 3 and 4, the flat wall Pp is provided with a third edge G3 turned outwards.

The flat main plate Pn is provided on the second elongated edge thereof with a ledge Rb that extends perpendicular to the flat main plate Pn and on the side of the two elongated protuberances Pg1 and Pg2. The ledge Rb is provided with a fourth edge G4 turned inwards. The third edge G3 of a profile P1 or P2 is arranged so that the third edge G3 can cooperate with the fourth edge G4 of the other profile P2 or P1, turned opposite, to form together a means of retaining avoiding the undesired separation of the two profiles P1 and P2 when said profiles are mutually interlocked with one another.

The second wall Cn2 extends between the elongated protuberance Pg1 and the flat wall Pp.

A first series of holes T1 pass through the flat main plate Pn. The holes T1 are grouped by family of four in the Figures 3 and 4.

The holes T1 serve, for the profile P1, for the passage of constituent screws of the adjustment bolts, intended to adjust the separation, the bringing closer, of the two profiles P1 and P2 and/or to modify the orientation in a median plane with respect to profile P2, of profile P1 with respect to profile P2.

The holes T1 serve, for the profile P2, for the passage of lag bolts intended to fasten said profile P2 onto a component.

In the Figures 3 and 4, a second series of holes T2 passing through the intermediate flanges of the two elongated protuberances Pg1 and Pg2. The holes T2 are grouped by family of four in the Figures 3 and 4.

The holes T2 serve, for the profile P1, for the passage of constituent screws of the fastening bolts intended to fasten said profile P1 onto a lateral side of the fixed frame.

The holes T2 serve, for the profile P2, for the passage of constituent screws of the adjustment bolts, intended to adjust the separation, the bringing closer, of the two profiles P1 and P2 and/or to modify the orientation in a median plane with respect to profile P2, of profile P1 with respect to profile P2.

In Figure 2, the bolts carrying the reference Blf for fastening bolts of a lateral side of the fixed frame Cd onto the profile P1 and the reference Blr for the adjustment bolts, intended to adjust the separation, the bringing together, of the profile P1 with regard to P2 and/or to adjust the orientation in a median plane with respect to profile P2, of profile P1 with respect to profile P2.

Each fastening bolt Blf is comprised of a screw Vs threaded into the profile P1 and cooperating with the nut Ec, threaded on a groove N1 or N2 of the profile P1.

Each adjustment bolt Blr consists of a screw Vs threaded into the profile P1, cooperating with the nut Ec, threaded into a groove N1 or N2 of the other profile P2 arranged on the opposite side.

The adjustment bolts Blr form a means of adjusting the relative separation or the bringing closer, of the two profiles P1 and P2 and/or the adjustment of the orientation in a median plane with respect to profile P2, of profile P1 with respect to profile P2.

In Figure 6, the profile P1 is fastened onto the bottom or corresponding top part and in the Figure 6, the top part of the fixed frame Cd. More precisely, each top or bottom part of the fixed frame Cd is equipped with fastening panels Pf, said being fastened at intervals defined by the dimensions of the glazing, onto the profile P1.

In Figure 7, each fastening panel Pfis consists of a flat metal plate Pm on which extend, from one and the same edge and parallel to said plate, two side pieces J1 and J2.

In Figure 6, each metal plate Pm is fastened against face A of the profile P1 by means of fastening bolts Blf.

In Figure 6, an end of a constituent chevron Cv1 of the fixed frame Cd is fastened between said two side pieces J1 and J2.

Where appropriate, an end of a constituent chevron Cv2 of the opening frame Co is mounted between said two side pieces J1 and J2. Only the half of the fastening panels Pf, arranged on the same side, are used to support in an articulated manner, around the articulation An, the opening frame Co bearing the glazings. In Figure 7, at least one of the two side pieces crossed by a hole Tr intended to receive the articulation An. The fastening panels Pf arranged between the two fastening panels Pf are crossed respectively by two holes for allowing the articulation An to pass through as shown in the Figure 7.

Such construction allows the chevrons to extend close to the top and bottom parts of the glass canopy roof and thereby allows the glazed surface area to be increased.

In an alternative embodiment not shown, the glass canopy does not have an opening frame. The glazings are then held in a second fixed frame. It is thus not necessary that the side pieces of the fastening panels are crossed by holes.

In Figure 7, notches En cross through the metal plate Pm, emerging laterally on either side of the two side pieces J1 and J2, thereby allowing, by lateral sliding of the captive fastening bolts of the two first profiles, said bolts to be inserted into said notches. The screwing of the screw cooperating with the nuts thereby serve to clamp the fixed frame Cd of the glass canopy roof onto the two first profiles.

In Figure 5, the profile P2 is fastened onto a component and the top component Pnh in the Figure 5, by means of lag bolts Tf the stems of which are mounted beforehand in the holes T1 crossing through the flat main plate Pn. The lag bolts Tf are fastened by screwing into the thickness of the top component Pnh.

In the invention, two pairs of profiles P1 and P2 are used to fasten the fixed frame Cd into the framework of the roof and to correctly adjust the positioning of said fixed frame Cd of the glass canopy roof 100 into the framework of the roof.

The installation and correct positioning of the glass canopy roof 100 are done in the following way:

1) The two profiles P2 turned opposite one another are fastened onto the two components Pnb and Pnh, by means of lag bolts Tf.

2) Each profile P1 is interlocked onto a corresponding profile P2. The edges G1, G2; G3, G4 of the two profiles mutually cooperate for keeping said edges mutually hooked together.

3) The fixed frame Cd is then simply arranged on the flat walls Pp of the two profiles P1. The fixed frame Cd is thereby stabilized on the framework of the roof. It is relatively simple to fasten and position said fixed frame with regard to the two components Pnb and Pnh.

4) The fixed frame Cd is thereby fastened onto the faces A of each profile P1. To this end, the top part and the bottom part are suitably positioned in the fixed frame Cd on the two profiles P1, and then the two top and bottom parts are fastened by the lateral sliding of the fastening bolts Blf, mounted beforehand in the two profiles P1, in the constituent notches En of the fastening panels Pf.

5) The two profiles P1 and P2 are then mechanically connected by mounting the screws Vs in the openings R1 and R2 respectively of the profile P1 and by screwing said screws into the nuts Ec inserted and suitably positioned beforehand in the grooves N1 and N2 of the other profile P2, i.e. in front of the holes T2. The screws Vs are constituents of the adjustment bolts Blr.

In the invention, the adjustment bolts Blr are used to suitably position the glass canopy roof 100 in the roof. The parallelism fault between two components can thus in principle be corrected. If the parallelism is incorrect, the adjustment bolts Blr can be screwed in or screwed out thereby displacing each profile P1 with respect to the corresponding profile P2 thereof, in particular for orienting the glass canopy roof 100 in the plane of the roof, until the top part and the bottom part of the fixed frame Cd can be correctly clamped against the two components. It is also possible to provide a bit larger separation between the two components, on the order of one or a few centimeters to allow the fixed frame Cd to be arranged between the two profiles P1 and then to be clamped between the two components.

The construction of the glass canopy roof of the invention will allow same to change the positioning thereof in the roof.

The construction allows the possibility of having a relative imprecision in the construction of the framework between the components.

The installation of the glass canopy roof in the framework of the roof is facilitated.

The four profiles used in the construction thereof are identical.

Perfektionerede tagruder

PATENTKRAV

1. Tagrude (100) med en fast ramme (Cd), der er beregnet til at modtage en åbningsramme (Co) med mindst en glasrude eller en anden fast ramme med mindst en glasrude, idet den faste ramme (Cd) er beregnet til at blive fastgjort med sin nedre del og sin øvre del over for hinanden mellem to komponenter (Pnb og Pnh), der er anbragt grundlæggende parallelt med hinanden, og som udgør en del af tagets struktur, kendetegnet ved, at den faste ramme (Cd) består af to par profiler, hvor hvert par består af en første indre profil (P1) og en anden ydre profil (P2), hvor hver nedre eller øvre del af den faste ramme (Cd) er fastgjort til den første profil (P1), og hvor hver anden profil (P2) er beregnet til at blive fastgjort til en af de to tilsvarende komponenter (Pnb og Pnh), og ved at de to profiler (P1, P2) omfatter midler til at flytte de to profiler (P1 og P2) fra hinanden eller tættere på hinanden og/eller midler til at orientere den første profil (P1) i forhold til den anden profil (P2) i et gennemsnitligt plan i forhold til den anden profil (P2), idet disse midler omfatter justeringsbolte (Blr).

2. Tagrude (100) ifølge krav 1, kendetegnet ved, at de to profiler (P1, P2), der udgør et par, er identiske, idet den anden profil (P2) er orienteret 180° i forhold til en længdeakse i forhold til den første profil (P1).

3. Tagrude (100) ifølge krav 2, kendetegnet ved, at hver profil (P1 eller P2) omfatter,
- en flad hovedplade (Pn), der på en første langsgående kant er forsynet med en flad væg (Pp), der strækker sig vinkelret og på hver side af den nævnte flade hovedplade (Pn), idet de to flade vægge (Pp) anvendes i samarbejde med de to flade hovedplader (Pn),
på den ene side at fungere som hjørnekile for de to andre profiler (P2) ved især at støtte på de to komponenter (Pnb og Pnh) og,
på den anden side at fungere som en hjørnekile for de to første profiler (P1) ved at støtte og fastgørelsesprofiler, der danner spær (Cv), der bruges til konstruktion af den faste ramme (Cd).

4. Tagrude (100) ifølge krav 3, kendetegnet ved, at hver profil (P1 eller P2) omfatter,
- to aflange fremspring (Pg1 og Pg2), som er H-formede i tværsnit, og som er dannet på den ene side (B) af den flade hovedplade (Pn), der strækker sig i længderetningen og

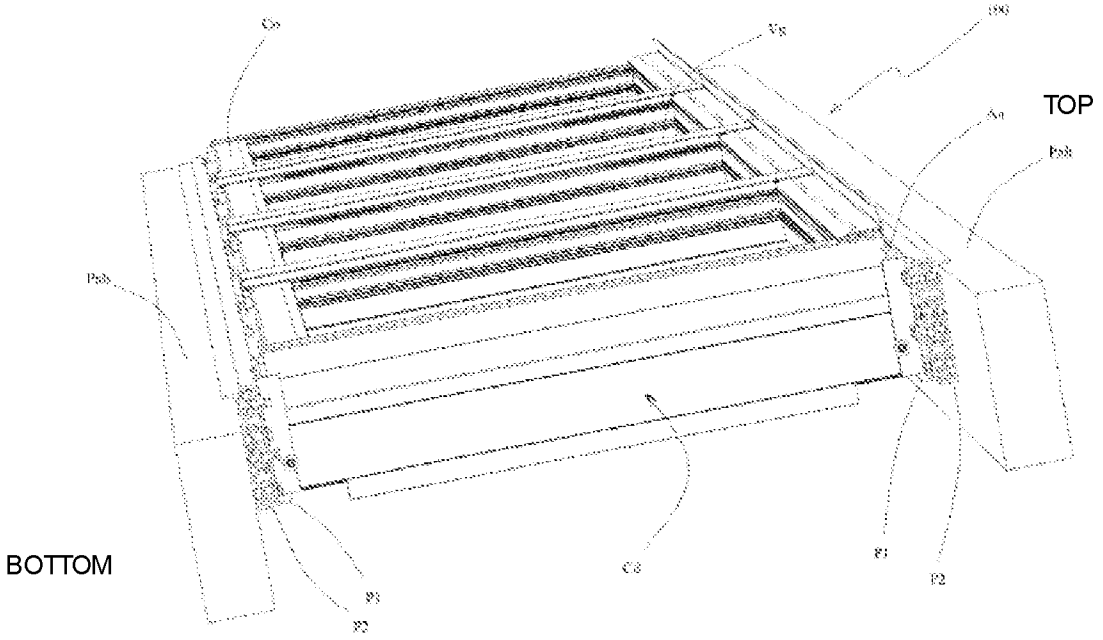
parallelt med hinanden, idet hvert af de aflange fremspring (Pg1 og Pg2) er defineret af to parallelle flanger, der er forbundet mod deres midte af en mellemliggende flange,

- to åbninger (R1 og R2), der passerer gennem den flade hovedplade (Pn) på linje med de to aflange fremspring (Pg1 og Pg2), idet hver åbning (R1 eller R2) udspringer mellem de to parallelle vinger på et tilsvarende aflangt fremspring (Pg1 eller Pg2),
- det volumen, der er afgrænset mellem de to parallelle flanger, den mellemliggende flange og den flade hovedplade (Pn) på hver af de aflange fremspring (Pg1 og Pg2), danner en tilsvarende rille (N1 eller N2),
- en række møtrikker (Ec), der er placeret i rillerne (N1 og N2) i den anden profil (P2),
- en første række huller (T1), der går gennem den flade hovedplade (Pn),
- en anden række huller (T2), der passerer gennem de mellemliggende flanger på de to aflange fremspring (Pg1 og Pg2),
- justeringsboltene (Blr) omfatter skruer (Vs), der er monteret i den første profil (P1), og som samvirker med møtrikkerne (Ec).

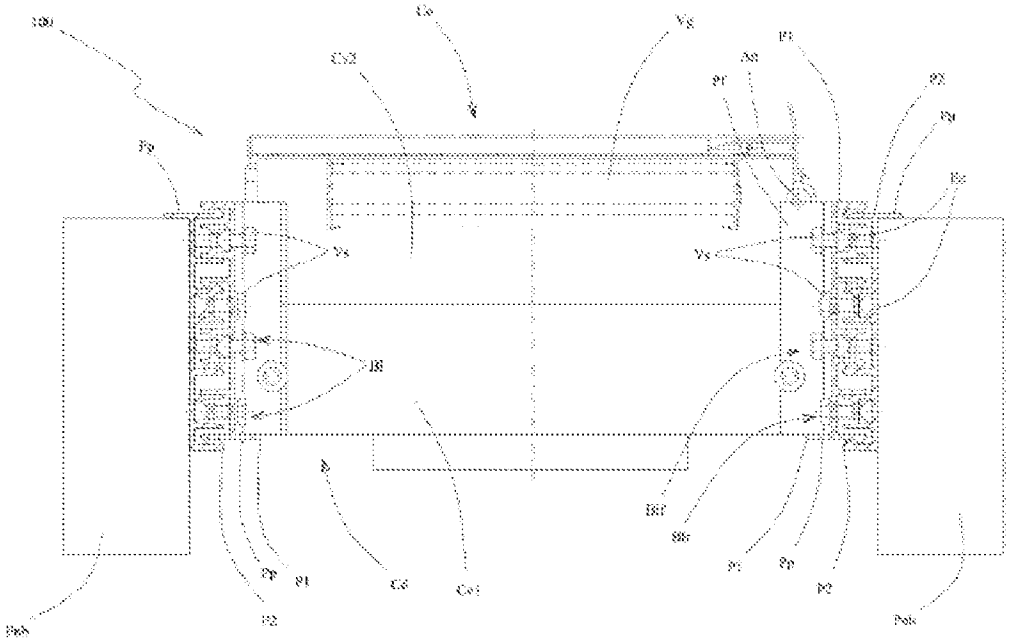
5. Tagrude (100) ifølge krav 2, 3 eller 4, kendetegnet ved, at den nedre del og den øvre del af den faste ramme (Cd) henholdsvis omfatter to rækker af fastgørelsesplader (Pf), hvor fastgørelsespladerne (Pf) i samme række er fastgjort til den anden side (A) af den flade hovedplade (Pn) af den første profil (P1) ved hjælp af fastgørelsesbolte (Blf), hvor hver fastgørelsesbolt (Blf) omfatter en skrue (Vs), der samvirker med en møtrik (Ec), der er monteret i en rille (N1 eller N2) af det første profil (P1).

6. Tagrude (100) ifølge krav 5, kendetegnet ved, at hver fastgørelsesplade (Pf) omfatter en flad metalplade (Pm), på hvilken der fra den samme kant og parallelt med pladen strækker sig to sider (J1 og J2), idet den ene ende af et spær (Cv1), der udgør den faste ramme (Cd), er fastgjort mellem disse to sider (J1 og J2).

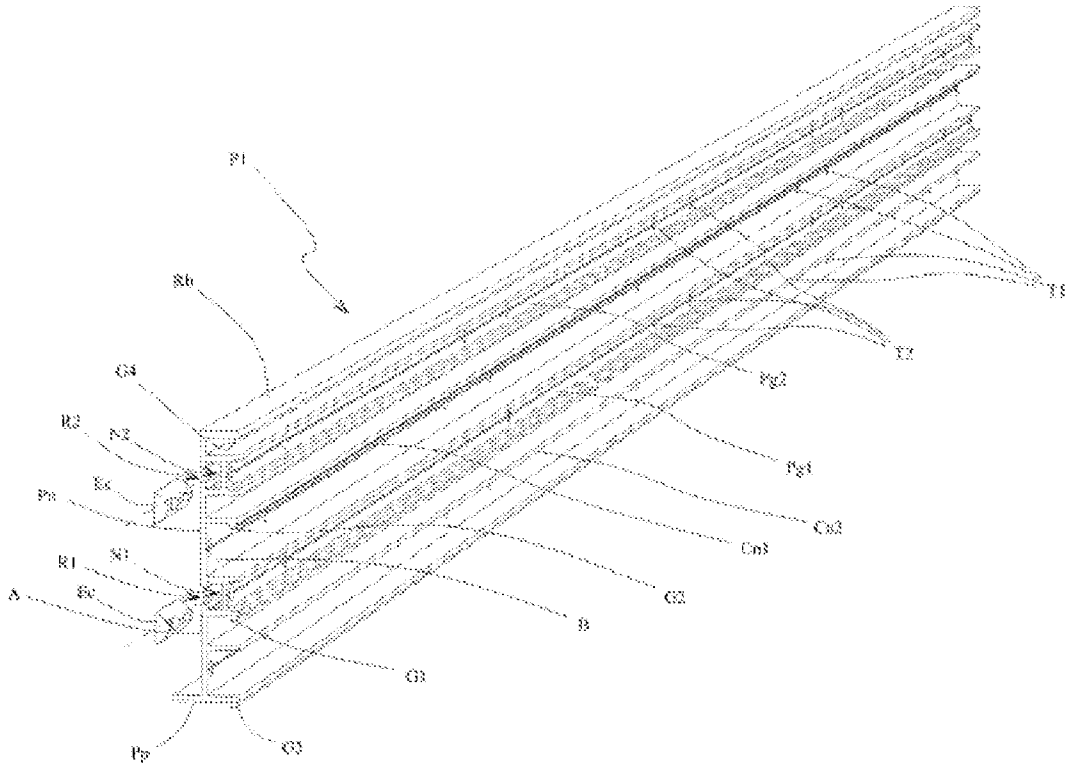
[Fig. 1]



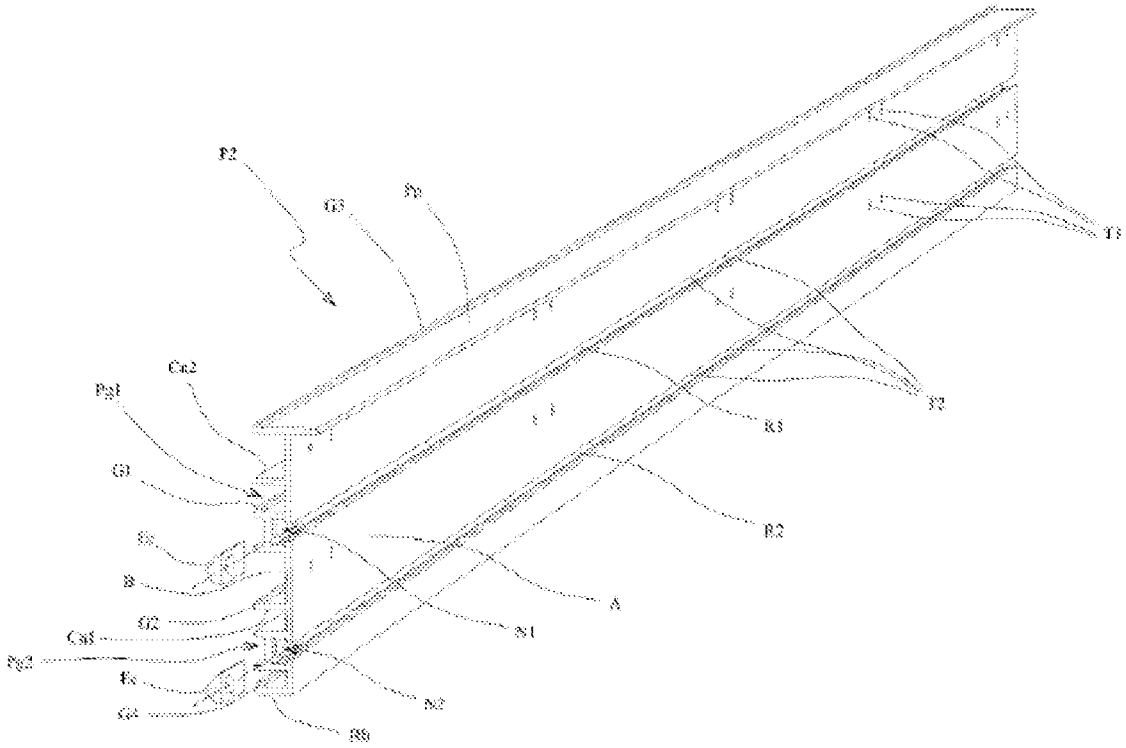
[Fig. 2]



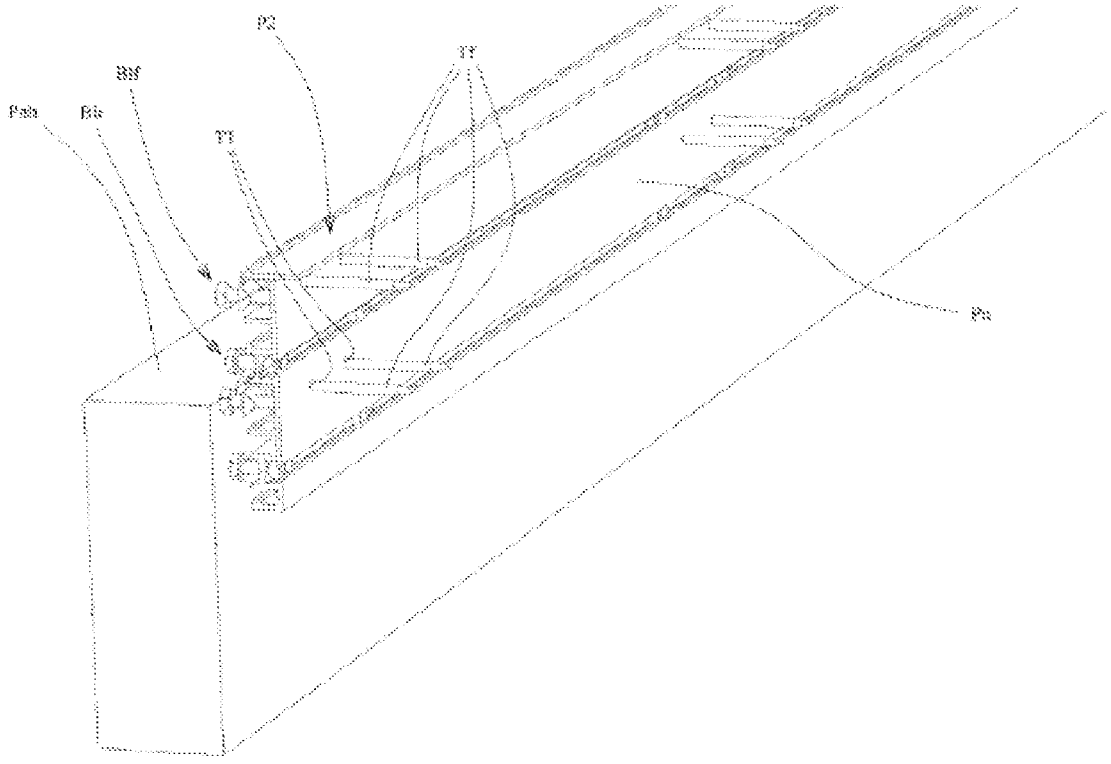
[Fig. 3]



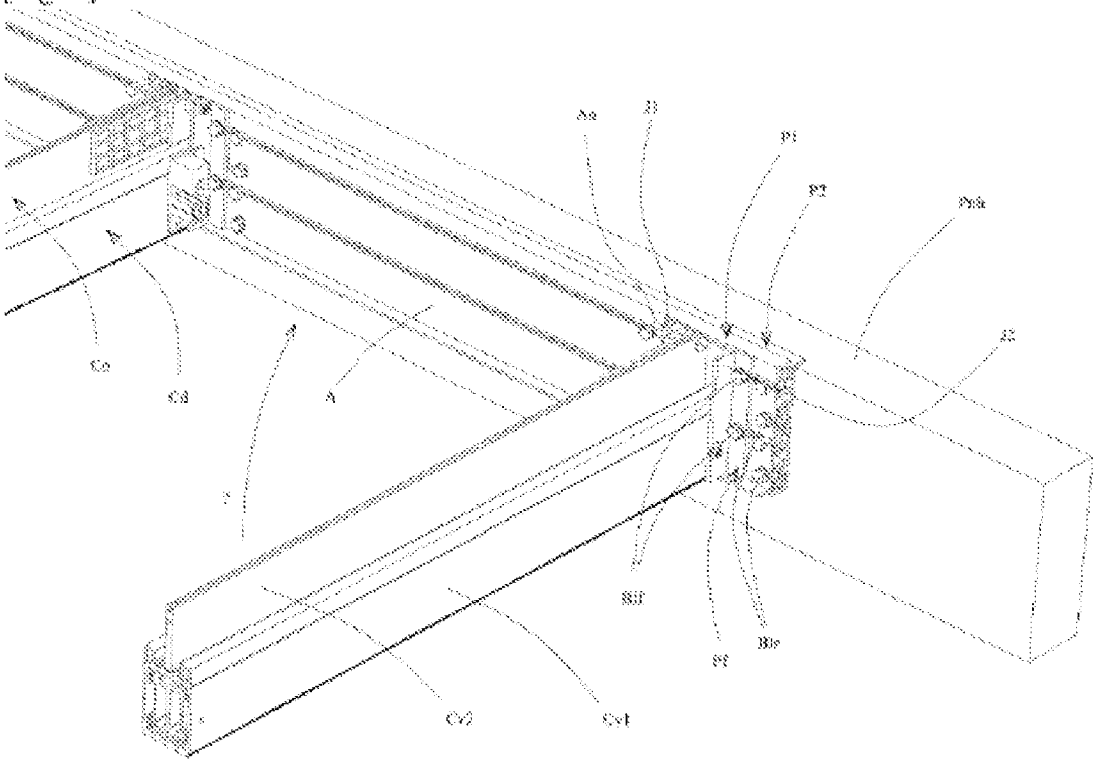
[Fig. 4]



[Fig.5]



[Fig. 6]



[Fig. 7]