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(71) Applicant: **EXPRAL, S.A.**
28320 Pinto Madrid (ES)

(72) Inventor: **TRABAS GIL, Daniel**
28320, PINTO (ES)

(74) Representative: **Esteban Perez-Serrano, Maria Isabel**
UDAPI & ASOCIADOS
Explanada, 8
28040 Madrid (ES)

(54) Water-tightness profiles for metallic doors and windows

(57) The profiles are made from structurally semi-rigid materials with a contact surface / closing pressure ratio high enough to provide a water-tight seal and incorporating on their ends insertion and attachment points allowing coupling in metal profiles of the frame, in the shape of two basic semi-rigid profiles, a long profile (1) and a short profile (2), extruded from polyamide 6.6 with 25% glass fibre or a similar material or mixture of materials, in combination with elastic end profiles (3) or (4) of EPDM or a similar material that are inserted in the free ends of these profiles (1) and (2).

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Description

OBJECT OF THE INVENTION

[0001] The present invention relates to water-tightness profiles for metallic doors and windows, from among profiles of insulating materials meant to provide insulation in doors and windows of buildings.

[0002] The invention is characterised by a special construction of a semi-rigid profile that improves the water-tightness of the door or window, preferably in combination with another elastic profile

BACKGROUND OF THE INVENTION

[0003] Aluminium profiles for doors and windows greatly solve the problem of heat losses through the profiles using intermediate elements that insulate the outside and inside of the building.

[0004] These profiles are rigid inside the profile of the outer frame and inside the mobile component frame, whether it be a door, window or other, while at the meeting point of the fixed and mobile elements a conventional elastic profile is placed, generally of EPDM or the like.

[0005] This elastic profile acts as a small frame that extends out of the fixed profile and is in contact with the mobile profile when it is closed. Its manipulation by the installer is cumbersome and must be performed on site. Regardless of the method used to cut and place the profile in position used when it is mitred, its great elasticity and complex configuration result in great faults in the cutting line which, at the angled meeting point of the two profiles, results in poor unions that allow moisture to pass from the draining chamber to the inside as well as undesired air leaks.

Currently it is attempted to avoid these cutting faults by applying four mitred profiles using bracket pieces used to define the theoretical frame, attaching them to the fixed profile and later placing four intermediate straight profile segments, in this case cut transversally. Despite this, this cutting solution that in principle seems simpler in fact leads to eight points of dubious water-tightness in each window unit.

[0006] The applicant is not aware of the existence of elements aiding to solve the water-tightness problem described above with the simplicity and effectiveness of the profiles of the invention described below.

DESCRIPTION OF THE INVENTION

[0007] The present invention relates to water-tightness profiles for metal doors or windows from among all profiles made of insulating materials meant to provide water-tightness of buildings.

[0008] To this end, the meeting points of double window frames at a central node were analysed, as well as those of a simple window with respect to a node with a continuous fixed pane and a node placed on a lateral profile of a window or door.

[0009] It was found that among the many varied constructions of window profiles in the market and the three constructive arrangements mentioned above, it was possible to extrapolate constant ratios of the adjoining surface between elastic profiles with respect to the closing pressure, which were met in every case in the profiles analysed, and which could be maintained without altering the conventional water-tightness attained by varying either the contact surface and closing pressure parameters, but in addition by varying the elasticity of the material.

[0010] After many experiments, the conclusion was reached that the concept of a profile with a simple union with an elastic closure made of EPDM or the like suffers from great structural limitations, which are responsible for the reduced water-tightness of the mitre joints. Thus, it was decided to study modifications of the elasticity of the materials employed according to the variation of their density, their internal reinforcement, etc. until reaching the opposite conclusion: that the material itself was not suitable for obtaining the required water-tightness conditions.

[0011] The turning point arrived with the idea of experimenting with semi-rigid materials, until reaching the same contact surface / closing pressure ratio as with conventional elastic window profiles, as well as fitting these within the various inner dimensions of the distances between the anchoring points provided in the profiles available in the market, reaching the conclusion of covering these with two basic semi-rigid profiles with minimal variations in configuration.

[0012] It was also observed that in some of the three constructive variants of the frames, the window closure could be aided by certain end elastic profiles the configuration of which allow absorbing the small constructive differences in the adjustment of the frames to each other or to the profiles anchored to the supporting elements of the building.

[0013] Some of these configurations of independent elastic elements can be constructively included as a semi-rigid profile, reducing for this purpose its structural rigidity.

[0014] The invention is characterised by a special construction of the profile based on a single element that improves the water-tightness of the window or door, made from a pedestal that breaks the thermal bridge and a right foot that meets a C or double-C shaped end which houses the base of a conventional elastic profile, the protrusion of which meets the end of the profile that breaks the thermal bridge, corresponding to the antagonistic metal profile.

[0015] The invention is also characterised by a special construction of the profiles based on the combination of two elements, one of them semi-rigid, consisting of a plastic profile of a polyamide or similar material, larger and resting on the fixed profile of the window frame, and when the assembly is provided with a thermal break also

joined to the breaker profile.

[0016] The other profile is smaller and entirely elastic in the area contacting the first profile of the invention, and covers only the area in which they meet.

DESCRIPTION OF THE DRAWINGS

[0017] The present description is accompanied by a set of drawings that illustrate the preferred example and do not limit the invention in any way.

Figure 1 shows a partial horizontal section of the segment in which a window pane meets a fixed metal profile of a window with the building opening, known as the window lateral node, showing in detail one of the semi-rigid joints of the invention at the union of the fixed and mobile metallic parts.

Figure 2 is another partial horizontal section, in this case of the segment in which a window with a fixed pane, known as a fixed node, meets a window pane, showing in detail one of the semi-rigid joints of the invention at the union of the two metal frames.

Figure 3 is a partial horizontal section of the segment in which two window sheets meet, known as a central window node, showing in detail one of the semi-rigid joints of the invention.

Figure 4 shows several different finishes for the semi-rigid profiles according to the metal profiles available in the market for frames with thermal breaks, and exceptionally also for conventional frames without this break.

PREFERRED EMBODIMENT OF THE INVENTION

[0018] In view of the above, the present invention relates to water-tightness profiles for metal windows and doors, from among profiles of insulating materials intended for insulating building windows and doors, essentially characterised in that they are structurally semi-rigid materials with the proper contact surface / closing pressure ratio and points for insertion and attachment provided for coupling in metal profiles, based on two basic semi-rigid profiles, one long (1) and one short (2), extruded from polyamide 6.6 with 25% glass fibre or a similar material or mixture, in combination with elastic end profiles (3) or (4) of EPDM or a similar material or, alternatively to said profiles (3) or (4), special configurations of the contact ends of the long (1) and short (2) basic semi-rigid profiles, in this case with materials of lower structural rigidity, preferably only extrusions of polyamide 6.6, with a rigidity similar to that of PVC or of the latter material, in no case being as elastic as EPDM.

[0019] The long semi-rigid profile (1) is characterised by its construction based on a pedestal (1.1) that breaks the thermal bridge, an extension (1.2) that spans the space between the fixed (5) and mobile (6) metal profiles of the window and has a C-shaped extension (1.3) in which the elastic profile (3) is partially inserted, meeting the end (7.1) of the thermal-break profile (7) housed in the mobile profile (6).

[0020] When the window has two panes the C-shaped end (1.3) is doubled symmetrically to deal with the symmetrical opening positions with a single element or profile (1).

[0021] The semi-rigid plastic profile (2) is characterised by two protrusions, a hook-shaped protrusion (2.1) and a rounded protrusion (2.2), respectively disposed between the two opposite L-shaped protrusions, the protrusion (5.1) of the fixed profile (5) of the window frame and the protrusion (8.1) of the other thermal-break profile (8), the semi-rigid profile (2) being extended in a bracket (2.3) segment with a C-shaped protrusion (2.4) for housing the T-shaped protrusion (4.1) of another elastic profile (4) with a hollow body (4.2) in order to absorb the closing pressure of the mobile profile (6) of the window and maintain the seal between the drainage chamber and the open interior of the fixed profile (2) through the tab (7.1) of the outermost thermal-break profile (7), integrated in the mobile profile (6) of the window.

[0022] The elastic profiles (3) and (4) can be replaced by any conventional water-tightness profile as end pieces of mobile metal profiles against fixed metal profiles, provided their finish is equivalent to that of the closing tab (3.1) of the profile (3) or they have a suitable elastic area, such as foam or a reduced density of the material at the meeting point, such as in the element (4.2) of the elastic profile (4).

[0023] The profile (2), in addition to inserting its rounded protrusion (2.2) under the protrusion (5.1) of the fixed profile (5), can alternatively have another finish symmetrical to the hooked protrusion (2.1), as well as an additional small upper protrusion (2.4) to attach said protrusion (5.1).

[0024] The axial or lateral and symmetrical arrangement of the straight segments (1.2) and (2.3) of the corresponding profiles (1) and (2) with respect to the upper face of the bridges (1.4) and (2.4) is adapted to the structure and arrangement of the metal profiles (5) and (6) that are connected.

[0025] Alternatively, in windows without thermal break, the protrusion (8.1) and the profile (8) become simple extensions of the fixed profile (5), while the protrusion (7.1) and the profile (7) also become simple extensions of the mobile profile (6).

[0026] The essence of this invention is not affected by variations in the materials, shape, size and arrangement of its component elements, described in a non-limiting manner that should allow its reproduction by an expert.

Claims

1. Water-tightness profiles for metallic doors and windows, **characterised by** their construction with structurally semi-rigid materials with a contact surface / closing pressure ratio high enough to provide

a water-tight seal and incorporating on their ends insertion and attachment points allowing coupling in metal profiles of the frame, in the shape of two basic semi-rigid profiles, a long profile (1) and a short profile (2), extruded from polyamide 6.6 with 25% glass fibre or a similar material or mixture of materials, in combination with elastic end profiles (3) or (4) of EPDM or a similar material that are inserted in the free ends of these profiles (1) and (2).

2. Water-tightness profiles for metallic doors and windows according to the previous claim, **characterised in that** the long semi-rigid profile is constructed based on a pedestal (1.1) that breaks the thermal bridge, an extension (1.2) that spans the space between the fixed (5) and mobile (6) metal profiles of the window and has a C-shaped extension (1.3) in which the elastic profile (3) is partially inserted, meeting the end (7.1) of the thermal-break profile (7) housed in the mobile profile (6).

3. Water-tightness profiles for metallic doors and windows according to the previous claims, **characterised in that** when the window has two panes the C-shaped end (1.3) is doubled symmetrically to deal with the symmetrical opening positions with a single element or profile (1).

4. Water-tightness profiles for metallic doors and windows according to claim 1, **characterised in that** the semi-rigid plastic profile (2) has two protrusions, a hook-shaped protrusion (2.1) and a rounded protrusion (2.2), respectively disposed between the two opposite L-shaped protrusions, the protrusion (5.1) of the fixed profile (5) of the window frame and the protrusion (8.1) of the other thermal-break profile (8), the semi-rigid profile (2) also being extended in a bracket segment (2.3) with a C-shaped protrusion (2.4) for housing the T-shaped protrusion (4.1) of another elastic profile (4) with a hollow body (4.2) in order to absorb the closing pressure of the mobile profile (6) of the window and maintain the seal between the drainage chamber and the open interior of the fixed profile (2) through the tab (7.1) of the outermost thermal-break profile (7), integrated in the mobile profile (6) of the window.

5. Water-tightness profiles for metallic doors and windows according to claims 1 and 4, **characterised in that** the profile (2), in addition to inserting its rounded protrusion (2.2) under the protrusion (5.1) of the fixed profile (5), has another hooked protrusion (2.1) as well as an additional small upper protrusion (2.4) to attach said protrusion (5.1).

6. Water-tightness profiles for metallic doors and windows according to claim 1, **characterised in that** alternatively to said profiles (3) and (4) they have special configurations of the contact ends of the long (1) and short (2) basis semi-rigid profiles, in which case with materials of a lower structural rigidity, preferably only of polyamide 6.6 or also PVC.

7. Water-tightness profiles for metallic doors and windows according to claim 1, **characterised in that** the elastic profiles (3) and (4) can be replaced by any conventional water-tightness profile with a finish equivalent to that of the closing tab (3.1) of the profile (3) or with a suitable elastic area, such as foam or a reduced density at the meeting point determined by a lower density of the material, as in the element (4.2) of the elastic profile (4).

8. Water-tightness profiles for metallic doors and windows according to the preceding claims 1 to 5, **characterised in that** the axial or lateral and symmetrical arrangement of the straight segments (1.2) and (2.3) of the corresponding profiles (1) and (2) with respect to the upper face of their bridges (1.4) and (2.4) is adapted to the structure and arrangement of the metal profiles (5) and (6) connected.

9. Water-tightness profiles for metallic doors and windows according to claim 4, **characterised in that** in windows without thermal break, the protrusion (8.1) and the profile (8) alternatively become simple extensions of the fixed profile (5), while the protrusion (7.1) and the profile (7) respectively also become simple extensions of the mobile profile (6).

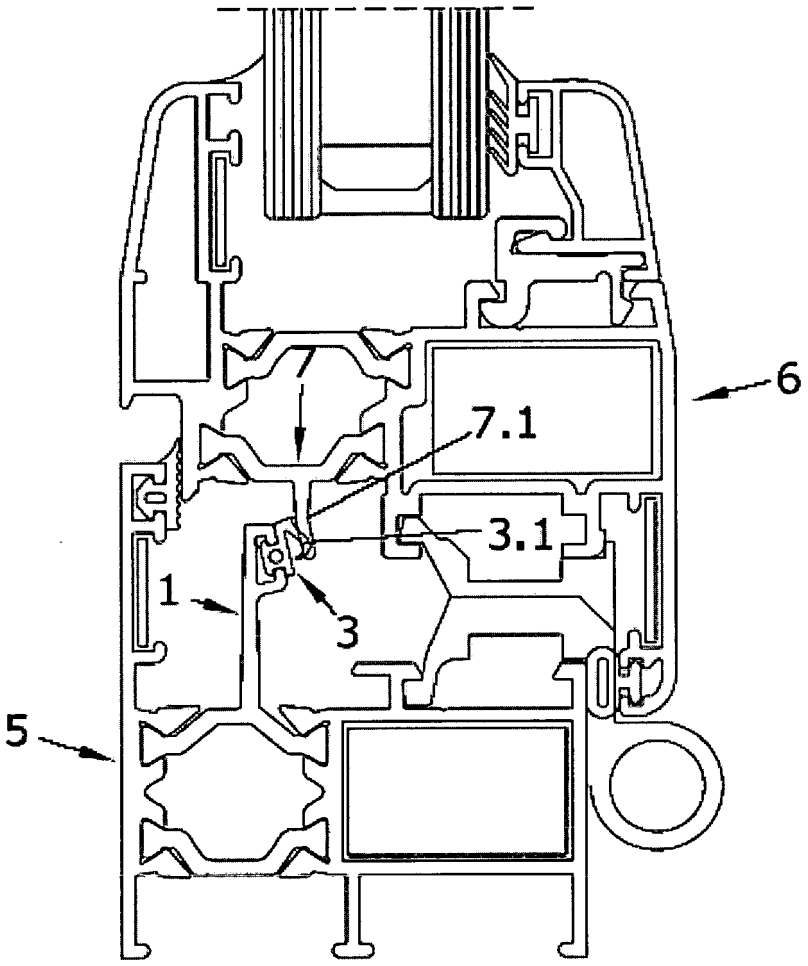

FIG.1

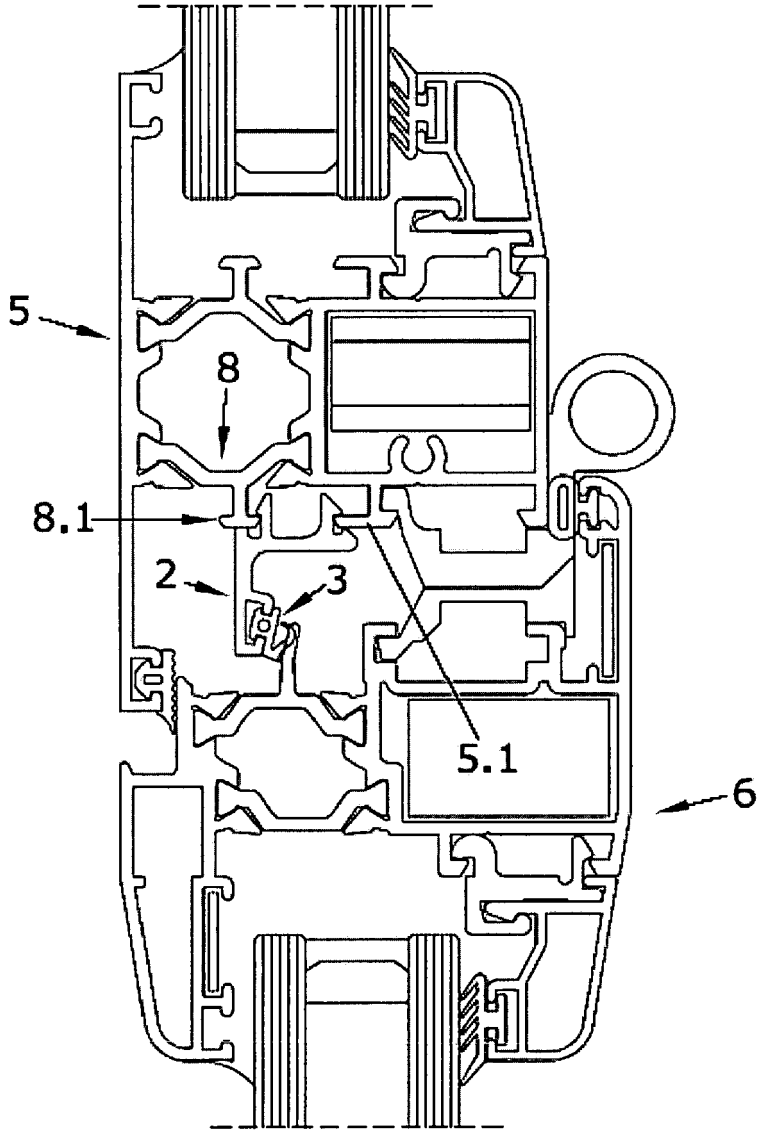

FIG.2

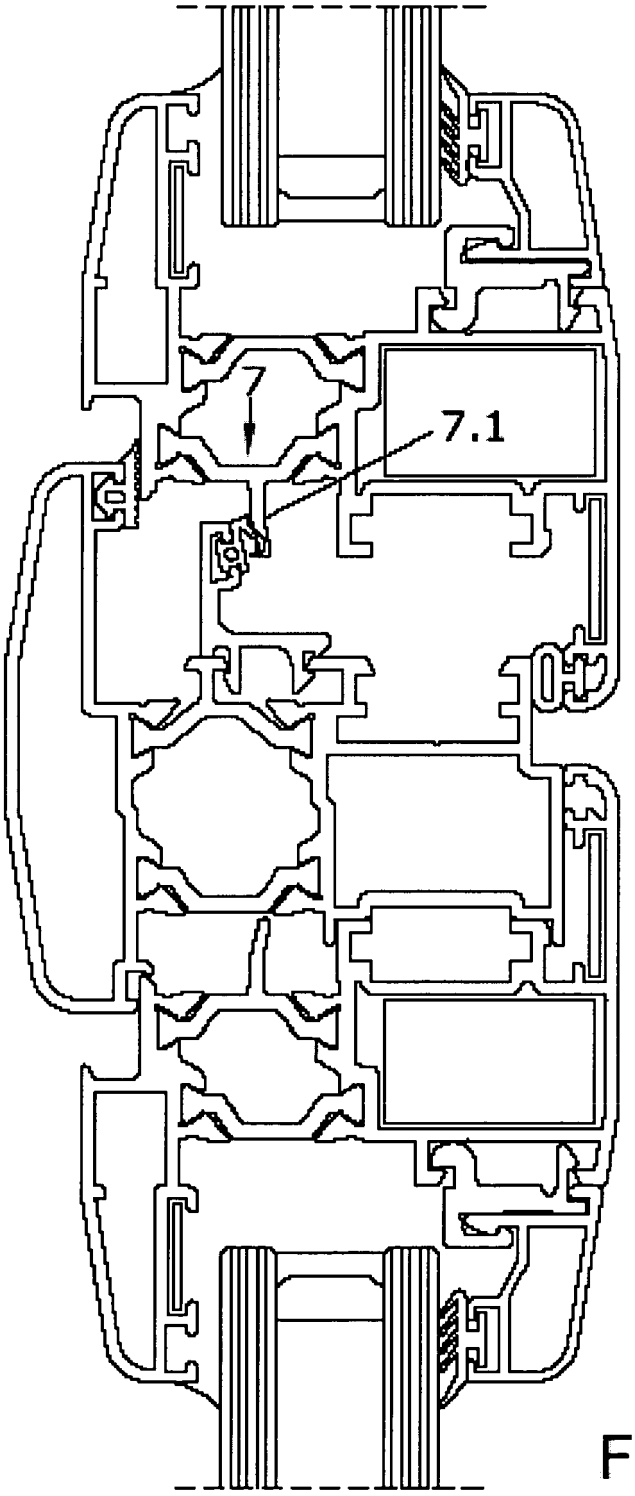

FIG.3

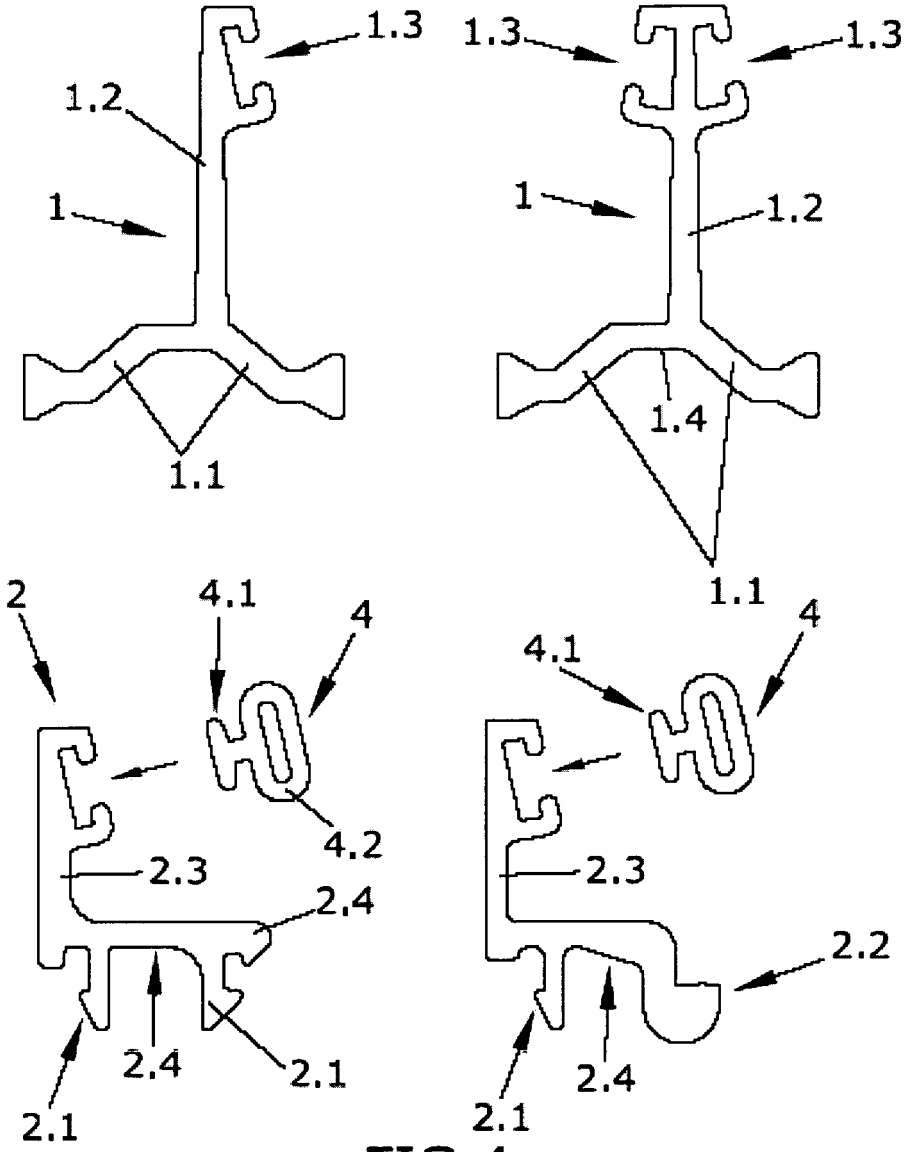

FIG.4