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Remarks:
Amended claims in accordance with Rule 137(2) EPC.

(54) PROFILE SYSTEM FOR ALUMINIUM AND PVC DOOR SASH

(57) The invention aims to achieve a profile system from aluminium with thermal break and PVC, implicitly a door with a door sash covered that has the characteristics of a door with high mechanical stability, high resistance to thermal stress and a high thermal insulation coefficient. For the door, it was designed as an assembly of PVC profile (1), provided with shoulders for clipping (3,4) and an aluminium profile with thermal break (2) provided with the proper channels for the shoulder's clipping. The aluminium profile (2) is assembled at the corners by welding or another solid assembling, forming a frame. There is also made a frame of PVC profile (1) which is clamped over the aluminium profile. Then the two elements are assembled by screw. This frame is filled with the material (8), optional glass (9) and covered with sheets of aluminium or other material (7).

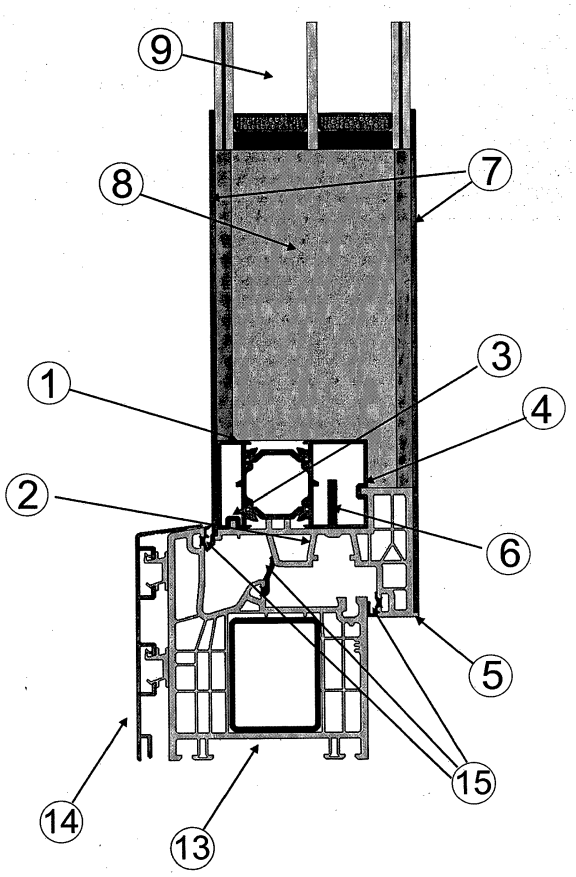

Fig. 2

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Description

Technical Domain: ***Elements of external joinery with opening system and opening systems for external joinery***

[0001] The invention relates to an assembly of aluminium profiles and PVC intended for doors that have the sash covered with a sheet of aluminium of 1-4 mm in order to eliminate deficiencies in classic PVC doors with the sash covered.

Technical Status:

[0002] At present, current systems of PVC doors are clad with aluminium panel by sticking to traditional PVC profile. This method has a number of deficiencies among which the most important and difficult to eliminate is the distortion due to the effect of differential expansion between aluminium sheet and PVC profile, the tape or adhesive bonding taking over the difference only in a limited capacity.

[0003] The trend for new elements of PVC in general and doors, is to be done with constructive depths increasingly higher to ensure an insulation coefficient as good as possible. But this causes a low static resistance because the elements are not capable of taking loads of stress. Thus, important deformations are occurring, making them virtually unusable.

Traditional PVC door system with the covered sash has a major drawback due to differences of expansion coefficients of the materials that come in contact (aluminium and PVC) - bending the door leaf when extreme temperatures are achieved - that is very high or very low temperatures on the external side of the door leaf.

Major disadvantages:

[0004]

1. The door's curvature is more pronounced when the metal inside of the section profile is small compared to the size of the PVC so that the PVC has an important influence on the structure of the profile and the profile's static.

2. As a PVC profile gets massive - i.e. large construction depths, the more the problem grows - so the amount of metal used must be increased to ensure the stability of the door leaf. Once increased the amount of metal, the coefficient of thermal insulation will decrease making practically useless the increase of PVC profile.

3. The corners of a classic PVC door are relatively unstable where metal reinforcement is discontinuous - even using welded corners - stability of this region depends on the combination between the structure of PVC and the metal.

4. In the joining area between the sheet of aluminium and PVC profile appears an unaesthetic area, firstly caused due to the slightly curved structure of the profile in that area and secondly caused by errors of overlapping the aluminium sheet over the door sash.

[0005] Technical problem: The technical problem solved by the invention is to achieve a set of profiles, one of aluminium and one of PVC, that confer mechanical stability and resistance to thermal stress - similar to aluminium doors - and that also provide thermal insulation similar to or better than a classical PVC doors.

Invention exposure:

[0006] The achieved invention was used on system Profine MD88, but it can be used on any other system of PVC profiles currently on the market.

For carrying out the invention I have designed a PVC profile (1) and an aluminium profile (2).

[0007] The aluminium profile (2) has a generally rectangular form, achieved with a pronounced thermal break. Specific are channels (3) and (4) where the PVC profile (1) is clamped. Aluminium profile (2) is assembled at the corners by welding or other mechanical joining and forms a continuous frame, which is the basis of the door. PVC profile (1) is designed to cover the aluminium profile entirely, except the outside - where the aluminium profile (2) plated with the aluminium sheet (7) comes in contact with the outside. Such direct contact is eliminated between the PVC and the outside part of the door.

[0008] In the inside of the door, the PVC profile (1) is provided with a shoulder (5) which ensures the protection of the bonding area of the aluminium sheet (7) for better aesthetics and resistance of the bonding area.

To achieve the door leaf, several steps are to be taken:

1. creating the PVC frame from (1) by the traditional method of cutting, milling, welding.
2. creating the aluminium frame from (2) by cutting, milling, mechanical joining.
3. Combining the two frames by clipping and screwing.
4. Making the panel by combining with glass (9)(optional) with filling (8) and aluminium plates (7).

Advantages:

[0009] By applying the invention, the following advantages are obtained:

1. A door with a high stability, deformation being minimized; the outside the door is completely aluminium,

2. The aluminium frame ensure the stability of the door. The amount of PVC being lowered carries little influence on the door.

3. The door reinforcement is removed, the role being taken over by an aluminium frame.
4. The profile system has a coefficient of thermal insulation similar to the classic PVC due to the filling within the whole profile.
5. It decreases the amount of PVC used at approximately 20-30% compared to a traditional profile.
6. It eliminates the use of weld brackets - expensive items.
7. Overall results in a high-quality door - covered door leaf, high strength, improved thermal stress resistance, higher insulation factor and also at a lower cost.

Figure description:

[0010] Figure 1 is a section through the door, realized with invented profiles in the threshold area (10) and Figure 2 in the frame area (13 + 14), we distinguish:

- PVC profile (1) with clipping elements (3), (4) in the inside of the door
- the aluminium profile with thermal break (2) with the appropriate channels for clipping from the metal side
- Protection shoulder for the PVC - aluminium bonding area (5)
- Fastening screws (6)

[0011] The other elements are common with the doors that have the sash covered - sheets of aluminium or another material (7), filling (8) with different densities of materials, insulating glass (9) threshold (10), gasket system (11) or (15) dropper (12), the frame (13), aluminium cover for frame(14).

Claims

1. **The modified door sash PVC profile (1) is characterized by being provided with clipping shoulders (3) and (4), protection shoulder (5) and having a similar structure of a PVC door profile - regardless of type or series of profile base - with the inside eliminated so as to make room for an aluminium profile (2).**

2. **The aluminium profile (2) is characterized by the channels for clipping the PVC profile (2).**

3. **The profile system characterized by being compounded from profiles mentioned in claims 1 and 2, by clipping the PVC profile (1) over the aluminium profile (2).**

4. **The door is characterized by the door sash made from the profile assembly in claim 3.**

Amended claims in accordance with Rule 137(2) EPC.

1. Profile system for joinery elements **characterized by** being formed of a PVC profile (1), two aluminium(metal) profiles (2, 3), two profiles of thermal insulating material (poly-amide, PVC, etc.) (4) - disposed in the form of a sandwich structure in the following order from the inside to the outside: PVC profile (1), aluminium(metal) profile (2), poly-amide profiles, PVC, etc. (4), aluminium(metal) profile (3) interconnected with different methods of bonding.

2. The PVC profile (1) **characterized by** covering the aluminium(metal) profile assembly (2, 3, 4) both in the interior of the door and in the visible lateral side.

3. The PVC profile (1) **characterized by** having a cellular structure in the interior of the door and a lamellar structure in the transverse direction, covering the aluminium(metal)profile assembly(2,3,4)

4. The PVC profile (1) **characterized by** having at least two clip elements, at least one on the longitudinal axis and one on the cross-sectional axis of the profile/ **the difference is in the orientation between the clipping direction /orientation**

5. A door, **characterized in that** the sash is made with the profile system described in claim 1**. (when 1 is a novelty- that claim is also a novelty.)**

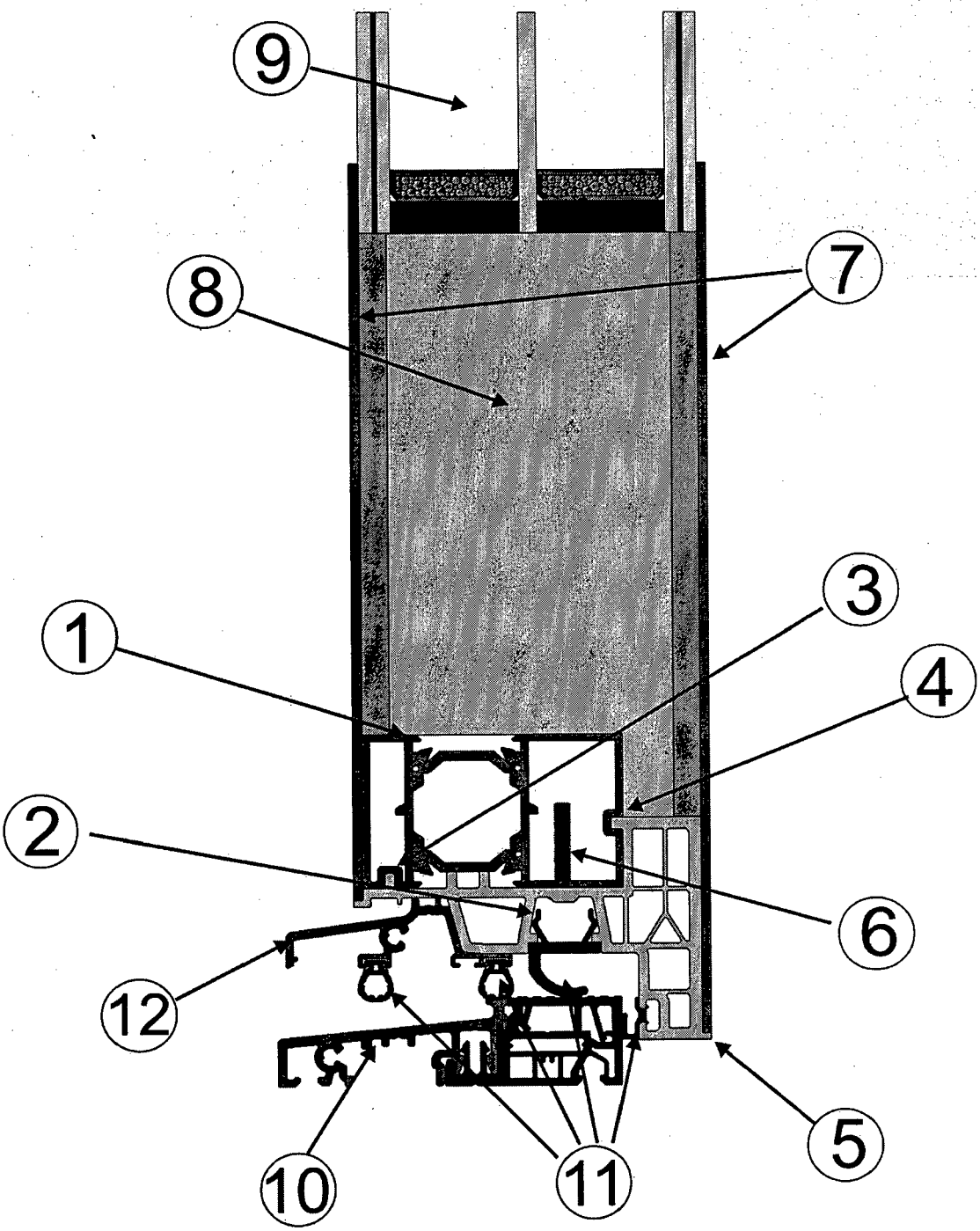

Fig.1

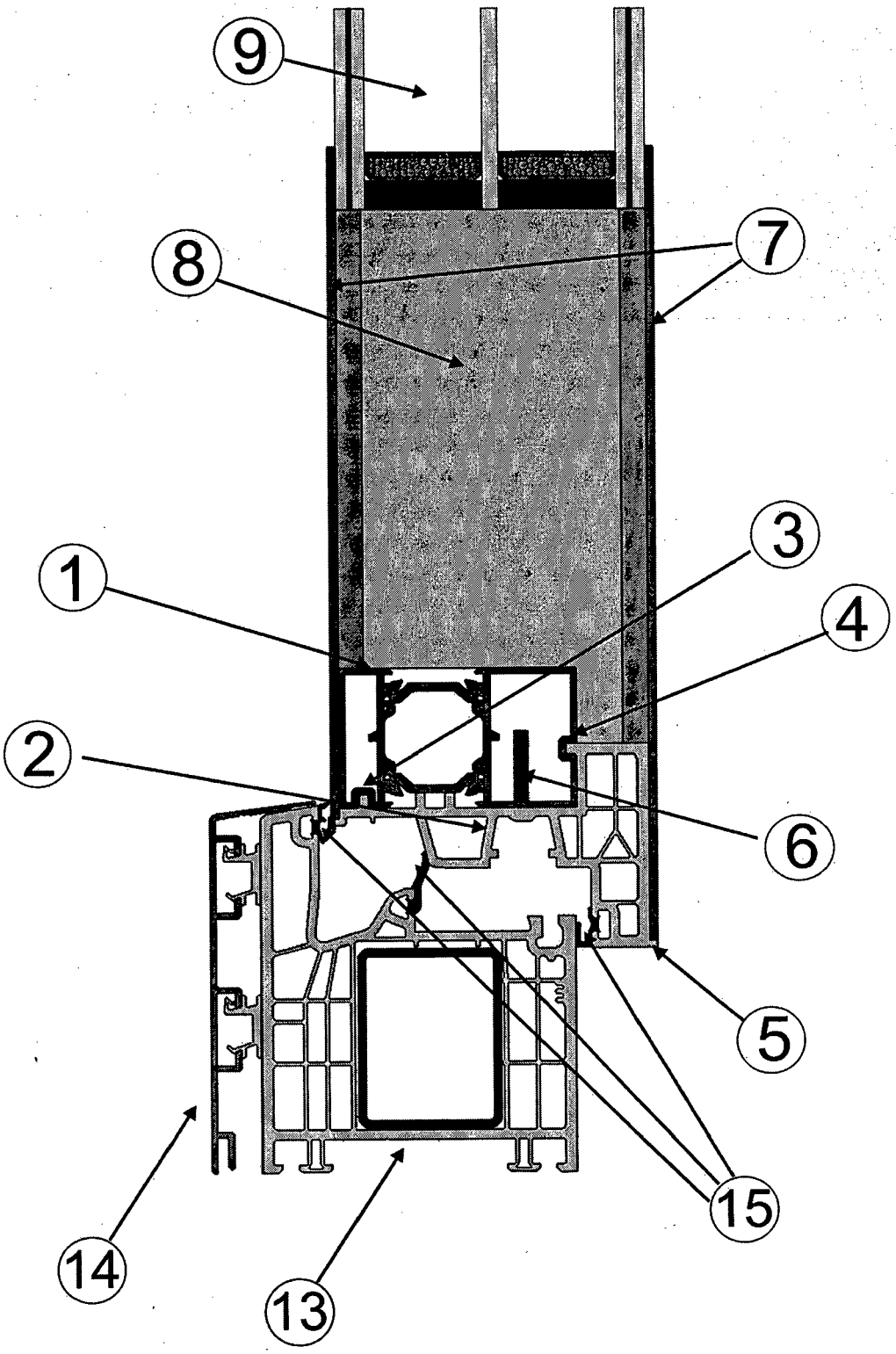

Fig. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 17 00 0206

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 2 933 422 A1 (PAX AG [DE]) 21 October 2015 (2015-10-21) * figure 1 *	1-4	INV. E06B3/70
X	DE 30 12 872 A1 (SEELZE & EICHRIEDE FULGURIT [DE]) 8 October 1981 (1981-10-08) * figure 3 *	1-4	

TECHNICAL FIELDS SEARCHED (IPC)

E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	12 July 2017	Crespo Vallejo, D

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
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L : document cited for other reasons

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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 17 00 0206

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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12-07-2017

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