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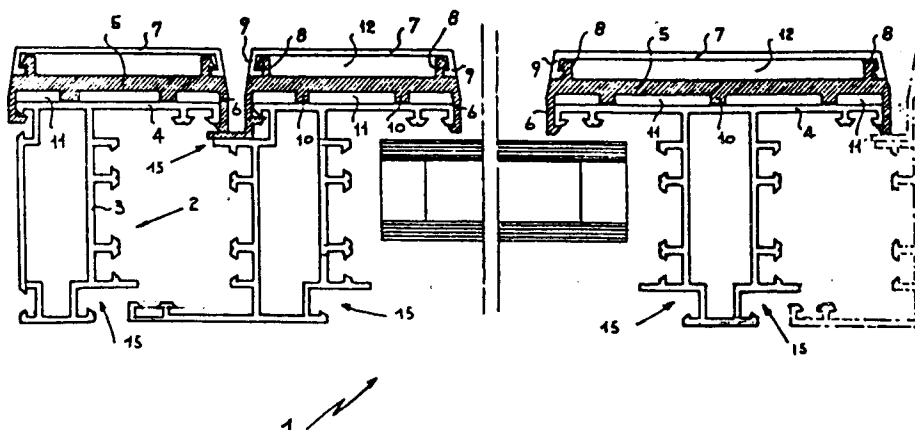
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(54) A structure of a window frame for all types of building casings, in particular hung casings.

(57) The invention relates to a structure of a window frame (1) with a rigid joint covering strip (7) and means (6,8) of associating the insulating material element (5) and the joint covering strip (7) with the standard sectional members (2) for frame making without the thermal cut-off feature having an insulating material element (5) associated.



A STRUCTURE OF A WINDOW FRAME FOR ALL TYPES OF BUILDING CASINGS,
IN PARTICULAR HUNG CASINGS

This invention relates to a structure of a window frame for all types of aluminium casings of the type of hung casings, sliding casings, bascule casings, overhanging casings, wasistass casings, swing/hung casings, sash casings, and casings for building curtain walls, and particularly hung casings.

Aluminium, despite its higher first cost, has long been used to make window frames on account of its characteristic indeformability, freedom from periodic painting requirements, and above all its high resistance to corrosion due to the oxide that forms over the surface of aluminium exposed to air being unattackable by atmospheric agents.

The performance of window frames, and especially of glazed surfaces formed from aluminium sectional members, is mainly affected by five main factors: mechanical strength, perviousness to air and water, and sound and heat insulation.

Today's aluminium sectional members tend to be made, owing to energy problems, more and more so as to afford good acoustic insulation to obviate the noise of daily and especially urban life, and a good thermal insulation tending more and more to afford considerable savings in the energy field, such as for home heating.

To obviate these drawbacks at least in part, it has been arranged for the provision of so-called thermal cut-off sectional members, that is sectional members wherein the outward portion is insulated thermally from the inward portion by various techniques such as insertion between the two portions of polyamide resin ribs secured, for example, either by the injection of high

density polyurethane or by means of closed cell foams.

These technical solutions have afforded energy savings over a standard frame without the thermal cut-off feature, especially as regards losses by conduction through the frame.

A comparison of the heat losses, for example, of an aluminium window as the standard or thermal cut-off frame type changes, may be summarised essentially as losses by perviousness to air, losses by conduction through the frame, losses past the glass peripheral area, and lastly, losses through the glass central area.

From scientific work and actual tests it appears that for a given perviousness and quality of glass, the energy saving between standard frames and thermal cut-off frames due to minor conductive losses through the frame is of only about 20 kCal/h with variable wind speed, whereas the values of all the other losses remains practically constant.

It is the aim of this invention to eliminate the above prior drawbacks by providing a frame structure for all types of building casings, in particular for hung casings, which affords a further reduction, over thermal cut-off frames, in the losses by conduction through the frame and a considerable reduction of the losses past the glass peripheral area.

Within the above aim, it is an important object of the invention to provide a structure of a window frame which can make use in its construction of standard commercially available sectional members of any shapes and size.

Another object of the invention is to provide a structure of a building window frame from commercially readily available materials so as to have a checked cost which facilitates its acceptance by the public.

A not least object of the invention is to provide a structure of a building window frame which has superior characteristics of resistance to atmospheric agents with respect to prior type sectional members.

The above aim, and these and other objects are achieved by a structure of a window frame for all types of building casings, in particular for hung casings, comprising standard sectional members for making frames without the thermal cut-off feature, characterised in that it comprises: at least one insulating material element associated with at least one rigid joint covering strip, and means of associating said insulating material element and said rigid joint covering strip with said standard sectional members.

Further features and advantages will become apparent from a detailed description of a device according to the invention, shown by way of illustration in the accompanying drawing, where:

the one figure 1 is a sectional plan view of the window frame structure comprising open joint standard sectional members according to the invention.

Making reference to the cited single figure, the structure of a window frame according to the invention is generally indicated by the reference numeral 1 and comprises standard sectional members for window frames, and more precisely in the example selected open joint sectional members each indicated at 2 and having an outer aluminium portion and an inner aluminium portion indicated at 3 and 4, respectively.

Each sectional member 2 also comprises at least one element of an insulating material 5 which has expediently a substantially plate-like conformation adapted to provide a so-called "thermal

wall" and comprises locking means 6 adapted for associating the insulating material element 5 by snap action with each of the standard sectional members.

Advantageously, the insulating material element 5 has means of engagement for snap-action connection to at least one joint covering strip of a rigid material, for example, in the specific case of aluminium 7.

More detailedly, the engagement means include teeth, each indicated at 8, extending orthogonally from the remote side from that whence the locking means 6 extend to engage with the raised edges 9 of the cited joint covering strip 7.

The insulating element also has on the side facing the sectional member at least one expansion and precisely expansions 10 to define between the outer portion 4 of the sectional member 2 and the insulating element 5 a number of interspaces serving the function of providing air pockets between the insulating element and the whole surface of the sectional member outer portion so as to provide in combination with the insulating effect, typical of the insulating element 5 itself, a considerable increase of the insulating degree which may reflect in decreased losses by conduction through the frame and decreased losses past the glass peripheral area.

Application of the aluminium joint covering strip over the insulating material element 5, as obtained by mutual engagement of the engagement means 8 and the edges of the joint covering strip 9 itself, affords formation of an air chamber 12 whose function is the same as that of the previously mentioned interspaces 11. Advantageously, the insulating material element 5 has interiorly channels 20 adapted to enhance the insulating effect.

Application of the aluminium joint covering strip affords a twofold advantage: a first advantage from that the insulating material can be protected against atmospheric agents, thus ensuring a longer life therefor, and a second advantage from that the outer sectional member portion is made aesthetically appealing which is covered by the insulating material element, almost invariably black.

It should be further pointed out that both the element 5 and the joint covering strip 7 may have such dimensions and conformations as to ensure their application in a very simple way to any sectional member types having any conformations and size. This great advantage allows utilisation of standard sectional members suitable for making standard frames such as thermal cut-off sectional members by merely applying with extreme ease by snap action both the insulating element and the aluminium joint covering strip while ensuring a considerable reduction over known type thermal cut-off sectional members in the losses by conduction through the frame and the losses past the glass peripheral area. Merely as an example, it should be also added that the structure of a window frame so constructed would also be provided with a plugged opening at the air chamber 12 so as to put the cited air chamber in communication with the outside or isolate it therefrom.

This affords depending on the areas and climate where the window frame is installed optional formation of air recirculation inside the chamber 12 effective to provide an enhanced degree of insulation especially in the event of exposure to sunlight.

Merely for added precision it should be also said that the so-called "European chamber" that is the measurement of the inner distance defined by the coupling of two adjoining sectional members in abutment relationship with each other is a standard measurement.

To prevent said measurement from varying substantially in the window frame structure of this invention the abutting sectional members 2 have advantageously a recess indicated at & adapted therefore to permit use of standard type accessories.

It has been found in practice that the window frame structure of this invention is particularly advantageous in allowing so-called thermal cut-off sectional members to be formed from standard sectional members and enabling therefore elimination of machine setting up each time that production is shifted from standard type sectional members to thermal cut-off sectional members.

Furthermore, with this solution the number of parts to be inventoried to meet the demands from purchasers of standard or thermal cut-off sectional members are considerably reduced.

In practicing the invention, the materials used and the dimensions may vary according to requirements and the state of the art.

CLAIMS

1. A structure of a window frame for all types of building casings, in particular hung casings, comprising standard sectional members for making frames without the thermal cut-off feature, characterised in that it comprises: at least one insulating material element (5) associated with at least one rigid joint covering strip (7), and means (8) of associating said insulating material element (5) and said rigid joint covering strip (7) with said standard sectional members.

2. A structure of a window frame according to Claim 1, characterised in that said at least one insulating material (5) element has locking means (6) for association with each of said standard sectional members and means of engagement (8) for connection to said at least one rigid joint covering strip (7).

3. A structure of a window frame according to Claims 1 and 2 characterised in that said insulating element (5) has on the side facing said sectional member at least one expansion (10) to define between said sectional member and said insulating element (5) at least one air interspace.

4. A structure of a window frame according to one or more of the preceding claims, characterised in that it has between said insulating element and said joint covering strip of aluminium at least one air chamber (12).

5. A structure of a window frame according to one or more of the preceding claims, characterised in that said insulating element (5) has internally channels (20) for enhancing its insulating effect.

6. A structure of a window frame according to one or more of the preceding claims, characterised in that said means of

engagement (8) comprise teeth extending orthogonally from the remote side from said at least one expansion (10) adapted to snap-action engage with the raised edges (9) of said joint covering strip (7).

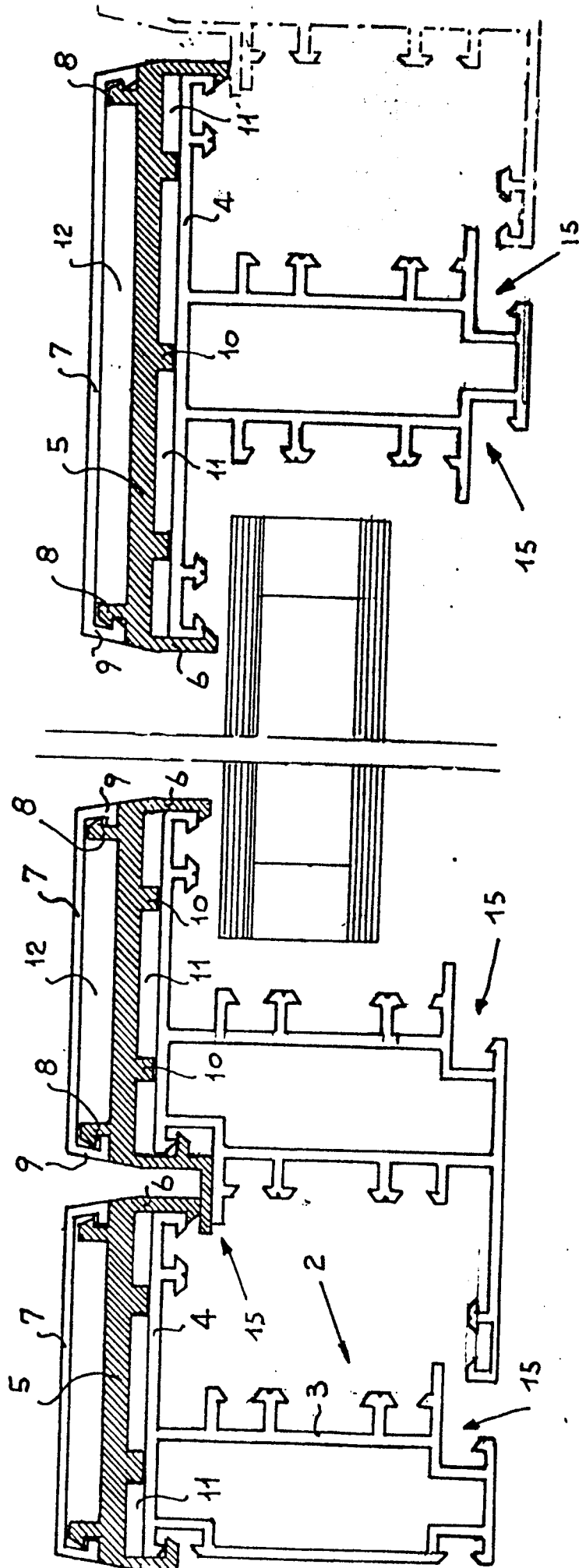
7. A structure of a window frame according to one or more of the preceding claims, characterised in that it comprises at least one opening having a closure plug at said air chamber for putting into into communication and out of communication with the outside.

8. A structure of a window frame according to one or more of the preceding claims, characterised in that said standard sectional members have in a peripheral area thereof a recess (15) adapted to enable the standardised measurement of the inner distance defined by the coupling of two adjoining sectional members in abutment relationship to be kept substantially unchanged.

9. A structure of a window frame for all types of building casings, in particular hung casings, characterised in that it comprises one or more of the features described and/or illustrated.

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European Patent
Office

EUROPEAN SEARCH REPORT

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Application number

EP 86 83 0234

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
X	FR-A-2 288 845 (NATHAN) * Page 1, lines 1-14; page 1, line 36 - page 2, line 6; figures 1,3,4 *	1-4,6,9	E 06 B 3/26
Y		7	
A		8	
X	--- US-A-4 409 769 (REDMAN) * Column 4, lines 33-57; column 5, lines 13-58; column 6, lines 14-55; column 7, lines 38-47; figures 1-3 *	1-4,9	TECHNICAL FIELDS SEARCHED (Int. Cl. 4) E 06 B
A		6	
X	--- GB-A-2 036 843 (ELEMETA) * Page 1, lines 73-120; page 2, lines 8-15,24-32; figures 1-8 *	1-4,6,9	
X	--- DE-A-2 013 245 (BIERLICH) * Page 13, line 18 - page 15, line 21; page 16, line 13 - page 17, line 7; figures 3,4 *	1,2,4-6,9	
	--- -/-		
The present search report has been drawn up for all claims			

Place of search
THE HAGUE

Date of completion of the search
27-10-1986

Examiner
DEPOORTER F.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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L : document cited for other reasons

& : member of the same patent family, corresponding document



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
X	US-A-3 555 735 (WEIKERT) * Column 3, lines 5-36, 62-70; figures 1, 4, 5 *	1, 2, 8, 9	
A	---	6	
Y	FR-A-2 112 969 (ALCO) * Page 10, lines 18-29; figure 2 *	7	
A	---	1, 2, 8, 9	
A	DE-A-2 830 570 (FACHVERBAND METALLFENSTER) * Page 4, lines 27-33; page 5, line 17 - page 6, line 11; page 7, paragraphs 2, 3; figure 1 *	1, 2, 8, 9	
A	---	1-4, 6, 9	TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
A	DE-A-3 213 891 (GERNOT) * Page 8, line 16 - page 10, line 11; figures 1-3, 6 *	1-4, 6	
A	---	1-4, 6	
A	BE-A- 817 041 (SADACEM) * Page 3, paragraphs 1-4; figure 1 *	1-4, 6	

The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 27-10-1986	Examiner DEPOORTER F.
CATEGORY OF CITED DOCUMENTS			
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