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(11) **EP 1 199 434 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
24.04.2002 Bulletin 2002/17

(51) Int Cl.7: **E06B 3/30, E06B 3/273**

(21) Application number: **00650164.7**

(22) Date of filing: **20.10.2000**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

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(54) **A method of forming a building component from different materials**

(57) A building component comprises an inner structural member (10) and an outer structural member (12), each structural member (10, 12) having one part of a two part fastening (14, 16). The part (14) on the inner member (10) is a tenon, and the part (16) on the outer member (12) is a formation (18) providing a mortise for location of the corresponding tenon. The forma-

tion (18) is of channel shape having splayed apart limbs (20) which are movable from a splayed attitude to a substantially parallel attitude against the side of the tenon, and means (22, 28) to prevent subsequent movement between the members (10, 12).

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Description

[0001] This invention relates to a method of forming a building component, particularly but not exclusively a structural member for a window frame, from different materials, such as a metallic material, for example aluminium, and a wooden or plastic material. In window construction, (1) frames all of wood have been provided, (2) frames all of plastics have been provided, (3) and frames all of aluminium have been provided. Each of these frames has disadvantages. The all-wood frames have a problem in that at least the external parts required regular maintenance and upkeep to prevent the wood rotting. The plastic frames can discolour through weathering and cannot be painted without the paint peeling off due to the characteristics of the plastic material and weathering. The aluminium frames have durability however suffer from cold-bridging with air condensing on the inside of the window frames and a higher cost than the others.

[0002] An object of the present invention is to provide a building component from a composite of materials which obviates or mitigates the aforesaid disadvantages.

[0003] Accordingly, one aspect of the present invention is a method of forming a building component comprising providing an inner structural member of non-temperature conducting material and an outer structural member of metallic material, providing each structural member with one part of a two part fastening, the part of the inner member being a tenon, and the part on the outer member being a formation providing a mortise for location of the corresponding tenon, the formation being of channel shape having splayed apart limbs, bringing the two members together with the tenon located in the mortise, causing the limbs to be moved from a splayed attitude to a substantially parallel attitude against the tenon, and providing means to prevent subsequent movement between the members

[0004] Preferably, the movement prevention means includes providing on the inner surface of each limb a or a plurality of sharp protuberances which project therefrom, and which protuberances of each limb engage and bite into the opposing surfaces of the corresponding tenon when the limbs are moved.

[0005] Preferably also, as the movement of each limb of a formation being pressed against a corresponding tenon side is or is being completed, a tongue is punched out of the limb into the tenon side.

[0006] Further according to a second aspect, the present invention is a building component comprising an inner structural member and an outer structural member, each structural member having one part of a two part fastening, the part on the inner member being a tenon, and the part on the outer member being a formation providing a mortise for location of the corresponding tenon, the formation being of channel shape having splayed apart limbs which are movable from a

splayed attitude to a substantially parallel attitude against the side of the tenon, and means to prevent subsequent movement between the members.

[0007] Preferably, the movement preventing means includes a or a plurality of sharp protuberances projecting from the inner surface of each limb and the protuberances of each limb engaging and biting into the opposing surfaces of the tenon when the limbs are moved.

[0008] An embodiment of the present invention will now be described, by way of example, with reference to the accompanying schematic drawings, in which:-

Fig. 1 is a cross-sectional view of a building component according to the present invention with fastening means in an open position;

Fig. 2 is a cross-sectional view of an enlarged detail of the building component shown in Fig. 1;

Fig. 3 is a cross-sectional view of the building component with the fastening; means in a closed position;

Fig. 4 is a cross-sectional view of an enlarged detail of the building component shown in Fig. 3;

Figs. 5A and 5B are cross-sectional views of a building component showing respectively two types of thermal breaks provided in one structural member of the building component;

Fig. 6 is a cross-sectional view of a modified building component;

Fig. 7 is a cross-sectional view of an enlarged detail of the building component shown in Fig. 6; and

Fig. 8 is a plan view of a length of a building component as shown in Fig. 5.

[0009] Referring to the drawings, a building component comprises an inner structural member 10 of non-temperature conducting material and an outer structural member 12 of metallic material. Each structural member 10, 12 is provided with one part of a two part fastening 14, 16. The part 14 of the inner structural member is a tenon, and the part 16 on the outer structural member 12 is a formation 18 providing a mortise for location of the corresponding tenon. The formation 18 is of channel shape having splayed apart limbs 20 on the inner surface of each of which means for preventing subsequent relative movement between the members is provided, the means being a plurality of sharp protuberances 22 which project from the limbs. With the tenon located in the mortise the two limbs 20 are brought together from a splayed attitude to a substantially parallel attitude against the tenon and in which the protuberances 22 of each limb 20 engage and bite into the opposing surfaces of the corresponding tenon. At the translation between the limbs 20 and a web 24 of the mortise, a groove 26 is provided to assist in the movement of the limbs 20. In Figs. 5A and 5B, the outer member 12 is shown provided with a thermal break 30. In Fig. 5A, the break is formed of two ties and in Fig. 5B the break is formed as a block. The ties and block are formed from synthetic plastics

material.

[0010] In a first modification, as the movement of each limb 20 of a formation pressed against a corresponding tenon side is or is being completed, a tongue 28 is punched out of the limb 20 into the tenon side as a means of securing against longitudinal movement of one member relative to the other. This tongue 28 is additional to the protuberances 22 in the movement prevention means or indeed can be an alternative to the protuberances.

[0011] In a second modification, only one protuberance can be provided on the limbs, the shape of which differs as required.

[0012] In a third modification, the movement prevention means may simply be an adhesive bond between the members. This may be additional to one or other of the means described above.

[0013] In use, a building component as described is used to form a window frame to be installed with the metal outer structural members outermost. The advantages of the present invention are the combination of the good weathering characteristics of aluminium and the non-temperature conductivity of wood or plastic material on the interior of the frame.

[0014] Variations and other modifications can be made without departing from the scope of the invention described above and as claimed hereinafter.

Claims

1. A method of forming a building component comprising providing an inner structural member of non-temperature conducting material and an outer structural member of metallic material, providing each structural member with one part of a two part fastening, the part of the inner member being a tenon, and the part on the outer member being a formation providing a mortise for location of the corresponding tenon, the formation being of channel shape having splayed apart limbs, bringing the two members together with the tenon located in the mortise, causing the limbs to be moved from a splayed attitude to a substantially parallel attitude against the tenon, and providing means to prevent subsequent movement between the members.

2. A method as claimed in Claim 1, wherein the movement prevention means includes providing on the inner surface of each limb one or more sharp protuberances which project therefrom, and which protuberances of each limb engage and bite into the opposing surfaces of the corresponding tenon when the limbs are moved.

3. A method as claimed in Claim 1 or 2, wherein as the movement of each limb of a formation being pressed against a corresponding tenon side is or is

being completed, a tongue is punched out of the limb into the tenon side.

4. A method as claimed in Claim 1, wherein the movement prevention means is a tongue punched out of each limb of a formation into the respective tenon side as it is or is being pressed against the tenon side.

5. A method as claimed in Claim 1, wherein the movement prevention means is an adhesive bond between the members.

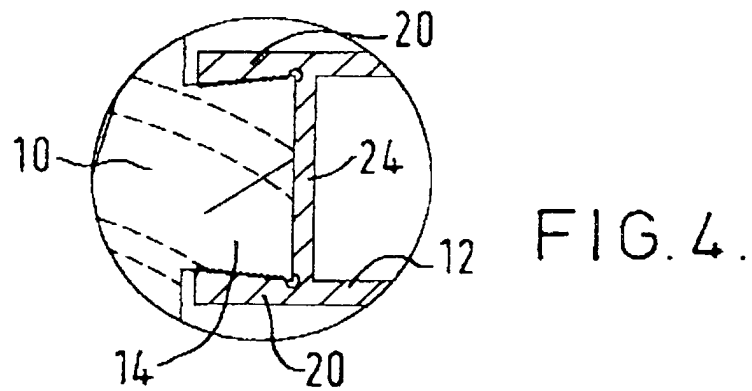
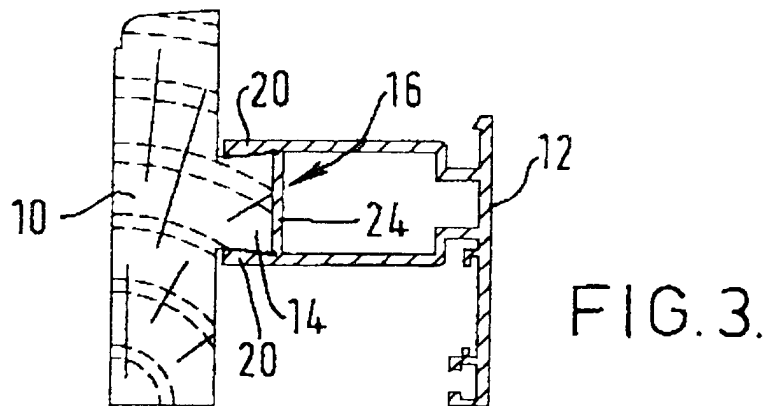
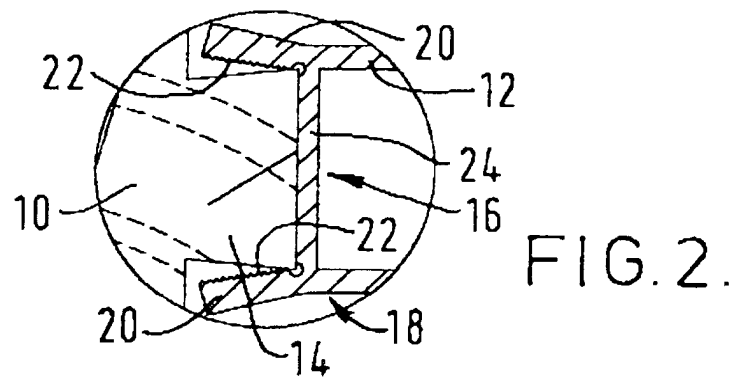
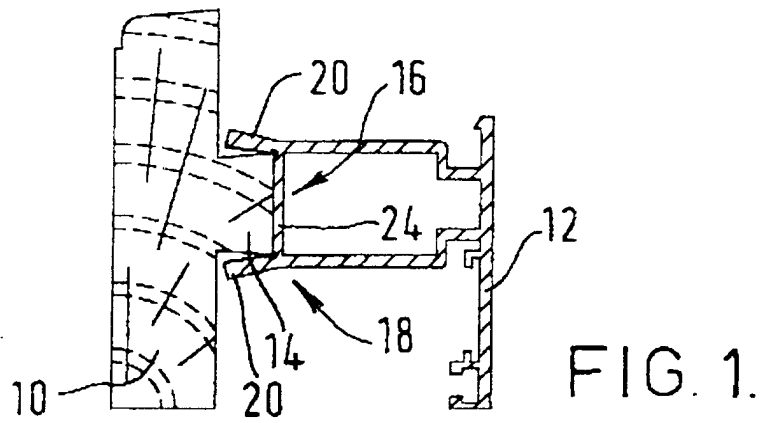
6. A building component comprising an inner structural member and an outer structural member, each structural member having one part of a two part fastening, the part on the inner member being a tenon, and the part on the outer member being a formation providing a mortise for location of the corresponding tenon, the formation being of channel shape having splayed apart limbs which are movable from a splayed attitude to a substantially parallel attitude against the side of the tenon, and means to prevent subsequent movement between the members.

7. A building component as claimed in Claim 6, wherein the movement preventing means includes one or more sharp protuberances projecting from the inner surface of each limb and the protuberances of each limb engaging and biting into the opposing surfaces of the tenon when the limbs are moved.

8. A building component as claimed in Claim 6 or 7, wherein a tongue is punched out of the or each limb into a respective tenon side as the movement of the limbs is or is being completed.

9. A building component as claimed in Claim 6, wherein the movement preventing means comprises a tongue punched out of the or each limb into a respective tenon side as the movement of the limbs is or is being completed.

10. A building component as claimed in Claim 6, wherein the movement preventing means comprises an adhesive bond between the members.



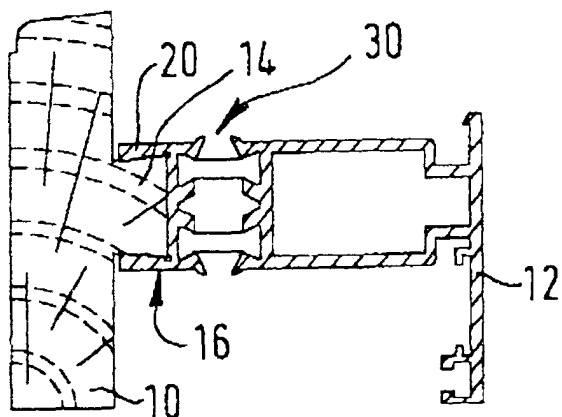


FIG. 5A.

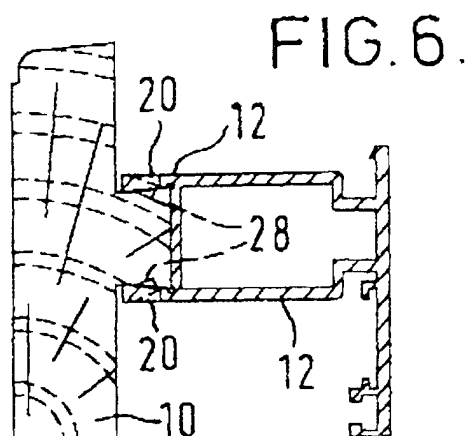


FIG. 6.

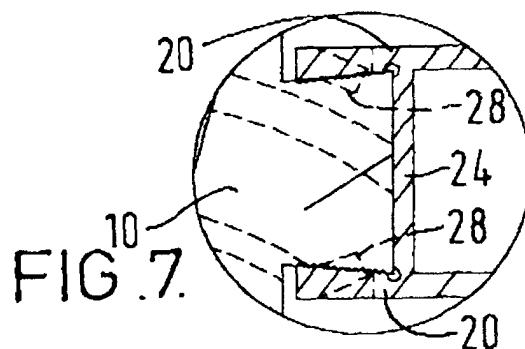


FIG. 7.

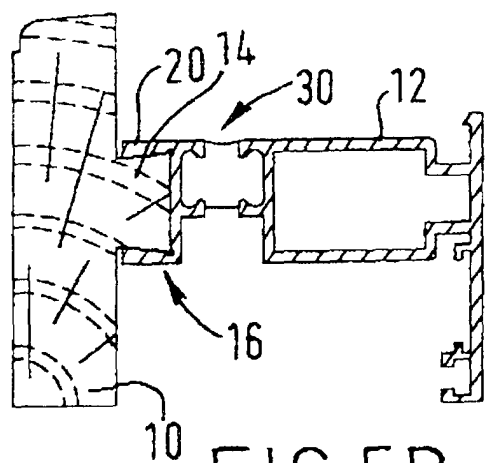


FIG. 5B.

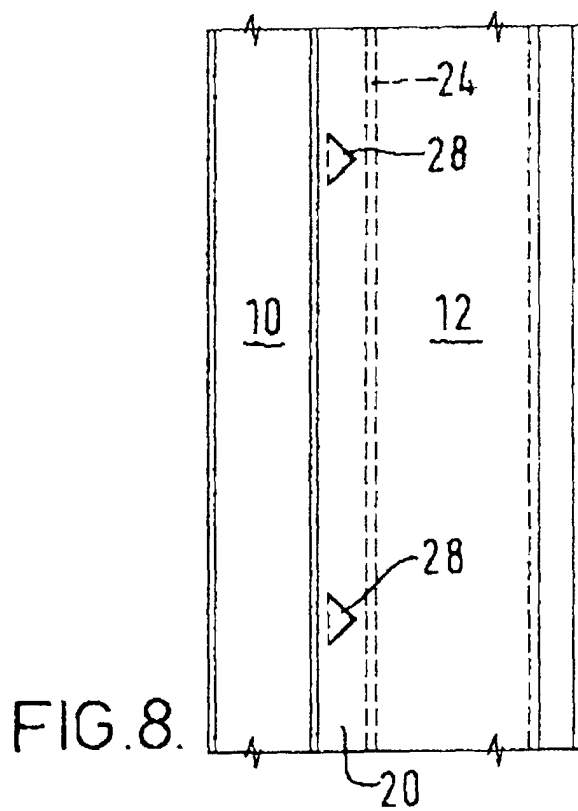


FIG. 8.



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EUROPEAN SEARCH REPORT

Application Number
EP 00 65 0164

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.7)
X	US 3 517 472 A (TOTH LOUIS) 30 June 1970 (1970-06-30) * column 4, line 37 - column 5, line 40 * * figures 6,7 *	1-4,6-9	E06B3/30 E06B3/273
X	US 5 469 683 A (MCKENNA GREGORY B ET AL) 28 November 1995 (1995-11-28) * column 5, line 16 - line 66 * * figure 1 *	1-10	
X	US 4 982 530 A (PALMER DOUGLAS J) 8 January 1991 (1991-01-08) * column 4, line 49 - line 51 * * figures 5,8 * * column 5, line 8 - line 10 *	1-10	
E	GB 2 350 642 A (WATSON MICHAEL JOHN) 6 December 2000 (2000-12-06) * the whole document *	1-10	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			E06B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 8 March 2001	Examiner Verdonck, B
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03 82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 65 0164

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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