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(71) Applicant: **Sud Legno di Marco Congiu & C. SNC
09040 Senorbi' (CA) (IT)**

(72) Inventor: **Congiu, Marco
09040 Senorbi' (CA) (IT)**

(74) Representative: **Sarpi, Maurizio
Studio Ferrario
Via Collina, 36
00136 Roma (IT)**

(54) **Multilayer material particularly adapted to the manufacturing of window frame sections, and method of producing same**

(57) A multilayer material particularly adapted to the construction of window frames, consisting of two outside wooden layers (L) and at least one inside layer (A) made of an agglomerate of thermoacoustic insulation material. The inside layers of agglomerate (A) are sandwiched between wooden layers (L).

A method of producing said multilayer material includes the following steps:

- laying a wooden layer on the lower plate of a press;
- smearing a glue onto the upper surface of said wooden layer to form an adhesive film;
- laying a cork agglomerate layer on said adhesive film of the wooden layer;
- smearing a glue onto the upper surface of said cork agglomerate layer to form an adhesive film;
- laying a second wooden layer on said adhesive film of the cork agglomerate layer;
- lowering the upper plate of the press to the surface of the second wooden layer;
- heating the plates of the press to about 150-170°C;
- applying and keeping a pressure to the arranged multilayer material for about five minutes so as to cause the glue to set;
- removing the multilayer material from the press.

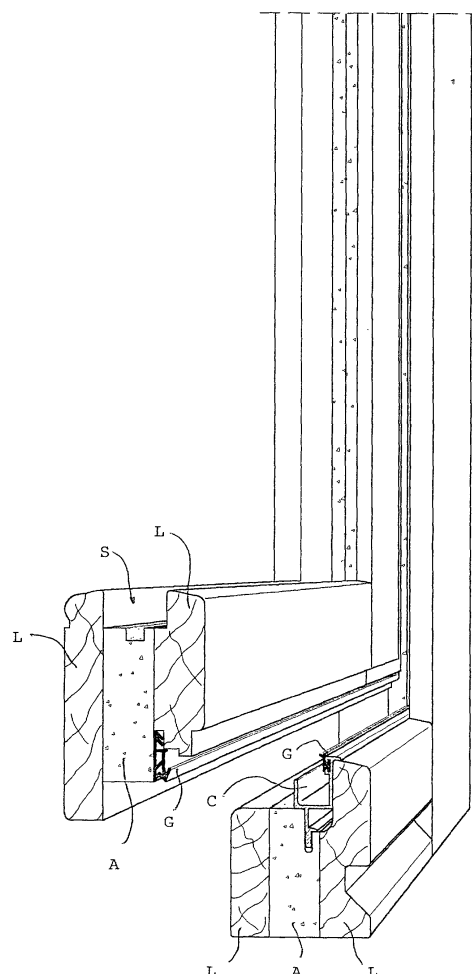


FIG. 3

Description

[0001] The present invention relates to constructions made of wooden materials particularly adapted to the manufacturing of window frames.

[0002] Many types of window frames are presently known in the art and differ from one another by their construction and above all the materials they are made of.

[0003] In fact, in recent years, beside the traditional wooden frames also metal window frames have been produced both in metal sheet and aluminium alloy, open-joint and thermal conduction blocking types, with single and double window panes.

[0004] Window frames of aluminium sections have been advertised for some years because of their high capabilities of thermoacoustic insulation and tightness.

[0005] Such metal materials, however, have a quite unnatural appearance when compared with the wooden window frames that, in contrast, give a pleasant sensation of warmth and insulation just by touching them, even if they have a lower thermal as well as acoustic insulation efficiency.

[0006] Moreover, in recent times, the so-called bio-building industry has developed a great deal with the result of a return to the natural construction materials also for indoor and outdoor window frames.

[0007] The main object of the invention is then to overcome the above-mentioned problems and to provide a novel wooden material which is capable of ensuring a particularly improved thermal and acoustic insulation.

[0008] This has been achieved according to the invention by providing a multilayer material consisting of two outside wooden layers and at least one inside layer made of high-density cork agglomerate.

[0009] A better understanding of the invention will result from the following detailed description with reference to the accompanying drawings which show some preferred embodiments by way of a not limiting example.

[0010] In the drawings:

Figures 1 and 2 show two types of multilayer sections according to the invention, i.e. one cork agglomerate layer between two wooden layers, and two cork agglomerate layers sandwiched among three wooden layers, respectively;

Figure 3 is a partial perspective view of a window frame made of the material according to the invention;

Figure 4 is a cross section of the upright of the window frame of Fig. 3; and

Figure 5 is a cross section of the horizontal base of the window frame of Fig. 3.

[0011] Figures 1 and 2 show, by way of example, two

sections of multilayer material according to the present invention, the section of Figure 1 being used for the window frames from Figure 3 on, Figure 2 showing a section with two cork agglomerate layers A sandwiched among three wooden layers L.

[0012] It is evident that the greater the number of the alternated layers, the better the thermoacoustic insulation.

[0013] In particular, the multilayer section according to the invention is made by sticking at least one high-density cork agglomerate layer A between at least two wooden layers L. Advantageously, such cork agglomerate A has density and mechanical characteristics similar to wood, however, it is generally isotropic because of its homogeneity and has then neither preferential strain directions nor different resistance according to the direction to which the load is applied.

[0014] According to the invention, the sticking is carried out by using a press and glues of the known type with high mechanical resistance.

[0015] It should be noted that the arrangement of a multilayer material as described above allows a number of advantages to be attained, thus making its application particularly useful. In fact, because of its high mechanical characteristics, cork agglomerate A allows a section with mechanical resistance similar to the presently used wooden sections to be provided, with the advantage that such cork agglomerate section is not subjected to the typical deformations of the solid wood which is, as known, a "live" material that is suffering from changes in temperature and humidity causing bending and in some case also cracking.

[0016] Moreover, as far as the thermoacoustic insulation and thermal conduction blocking is concerned, the arrangement of at least three different layers strongly increases the insulation characteristics over those of the same materials arranged separately.

[0017] The method of producing such multilayer material provides, in case of a three-layer material, the following steps:

- a) laying a first wooden layer on the lower plate of a press;
- b) smearing a glue onto the upper surface of said first wooden layer to form an adhesive film;
- c) laying a cork agglomerate layer on said adhesive film of the first wooden layer;
- d) smearing a glue onto the upper surface of said cork agglomerate layer to form an adhesive film;
- e) laying a second wooden layer on said adhesive film of the cork agglomerate layer;
- f) lowering the upper plate of the press to the surface of the second wooden layer;
- g) heating the plates of the press to about 150-170°C;
- h) applying and keeping a pressure to the arranged multilayer material for about five minutes so as to cause the glue to set;

i) removing the obtained multilayer material from the press.

[0018] It is understood that, in case of a multilayer material with more than three layers as in Figure 2, the method will be the same as that described above taking only care that the outermost layers are always made of wood and the innermost layers of cork agglomerate are separated by the wooden layers.

[0019] According to the invention, steps a) to e) can also be executed outside the press by laying the multilayer material already arranged to be stuck between the plates of the press and going on to step g).

[0020] A further alternative can relate to the fact that the plates are kept to the same operating temperature as step g) so as to prevent them from being heated and cooled every cycle.

[0021] In the specific case illustrated in Figures 3 to 5, the window frame has a slot S for a single or double pane, a water drain channel C, preferably of aluminium, plastic or other commonly used material, and rubber seals that increase the sealing action and eliminate the draughts.

[0022] With reference to Figures 3 to 5, the basic aspect of the invention is to provide a novel multilayer material to be used for window frames according to the known building techniques.

[0023] In the case where the multilayer material according to the invention is used for window frames, one or two inside layers of cork agglomerate separated by a wooden layer are usually sufficient.

[0024] The layer or layers of cork agglomerate contribute not only to a better thermoacoustic insulation but can also take up any little "movement" or deformation of wood due to climatic conditions (temperature, humidity degree, etc.).

[0025] The particular glue used to join tightly the wooden layers and the cork agglomerate layers to one another has preferably the main feature to set in about five minutes at the temperature of about 150-170°C. A glue which lends itself to such purpose is the two-component glue known under the abbreviation D4 certified by UNI standards.

[0026] The press by which the wooden layers and the cork agglomerate layers of the multilayer material are compacted is preferably of the high-frequency type.

[0027] The present invention has been described and illustrated according to two preferred embodiments thereof, however, it should be understood that different changes and modifications can be made without departing from the scope of the appended claims.

Claims

1. A multilayer material particularly adapted to the construction of window frames, **characterized in that** it consists of two outside wooden layers (L) and

at least one inside layer (A) made of an agglomerate of thermoacoustic insulation material, the inside layers of agglomerate (A) being sandwiched between wooden layers (L).

2. The multilayer material according to claim 1, **characterized in that** the wooden layers (L) and the agglomerate layers (A) are stuck to one another by a glue and compacted in a high-frequency press for about five minutes at a temperature between about 150 and 170°C.

3. The multilayer material according to claim 1 or 2, **characterized in that** agglomerate (A) is a high-density cork agglomerate with high mechanical strength similar to the wood used for wooden layers (L).

4. A window frame **characterized in that** it consists of a multilayer material according to one or more of the preceding claims.

5. A method of producing a multilayer material according to one or more of claims 1 to 3, **characterized in that** it includes the following steps:

- a) laying a first wooden layer on the lower plate of a press;
- b) smearing a glue onto the upper surface of said first wooden layer to form an adhesive film;
- c) laying a cork agglomerate layer on said adhesive film of the first wooden layer;
- d) smearing a glue onto the upper surface of said cork agglomerate layer to form an adhesive film;
- e) laying a second wooden layer on said adhesive film of the cork agglomerate layer;
- f) lowering the upper plate of the press to the surface of the second wooden layer;
- g) heating the plates of the press to about 150-170°C;
- h) applying and keeping a pressure to the arranged multilayer material for about five minutes so as to cause the glue to set;
- i) removing the obtained multilayer material from the press.

6. The method according to claim 5, **characterized in that** it is applied for the production of a multilayer material consisting of two outside wooden layers (L) and several inside layers of agglomerate (A) sandwiched between further inside wooden layers.

7. The method according to claim 5 or 6, **characterized in that** steps a) to e) are executed outside the press and the obtained multilayer material is laid between the plates of the press having already the same operating temperature as step g), thus pre-

venting such plates from being heated and cooled every cycle.

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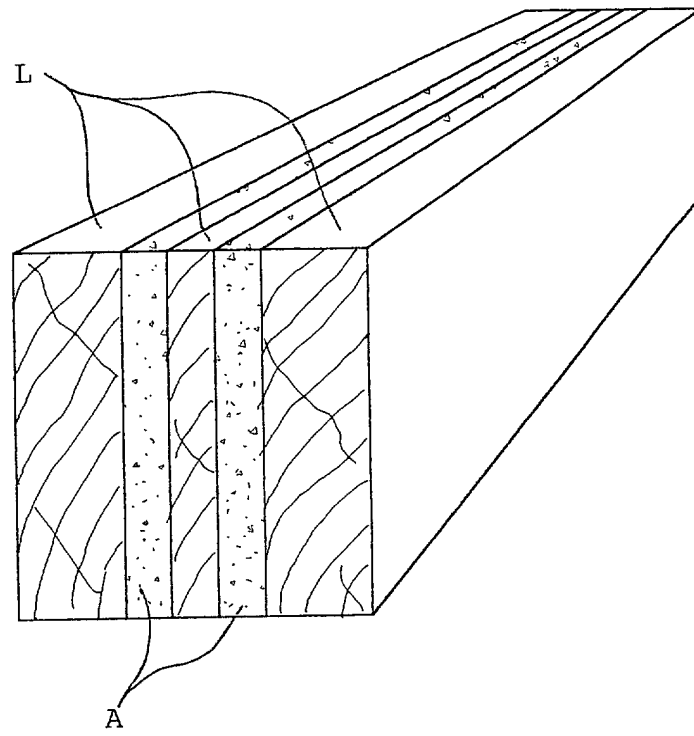


FIG. 2

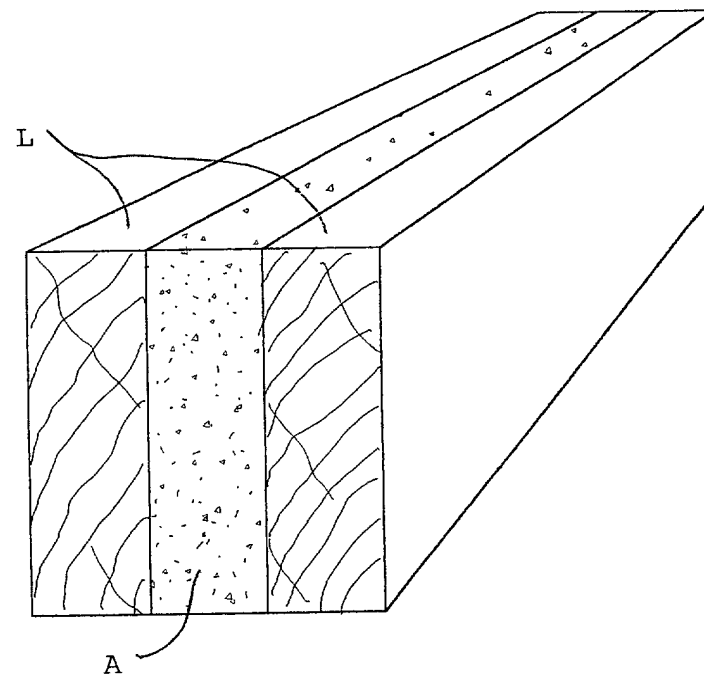


FIG. 1

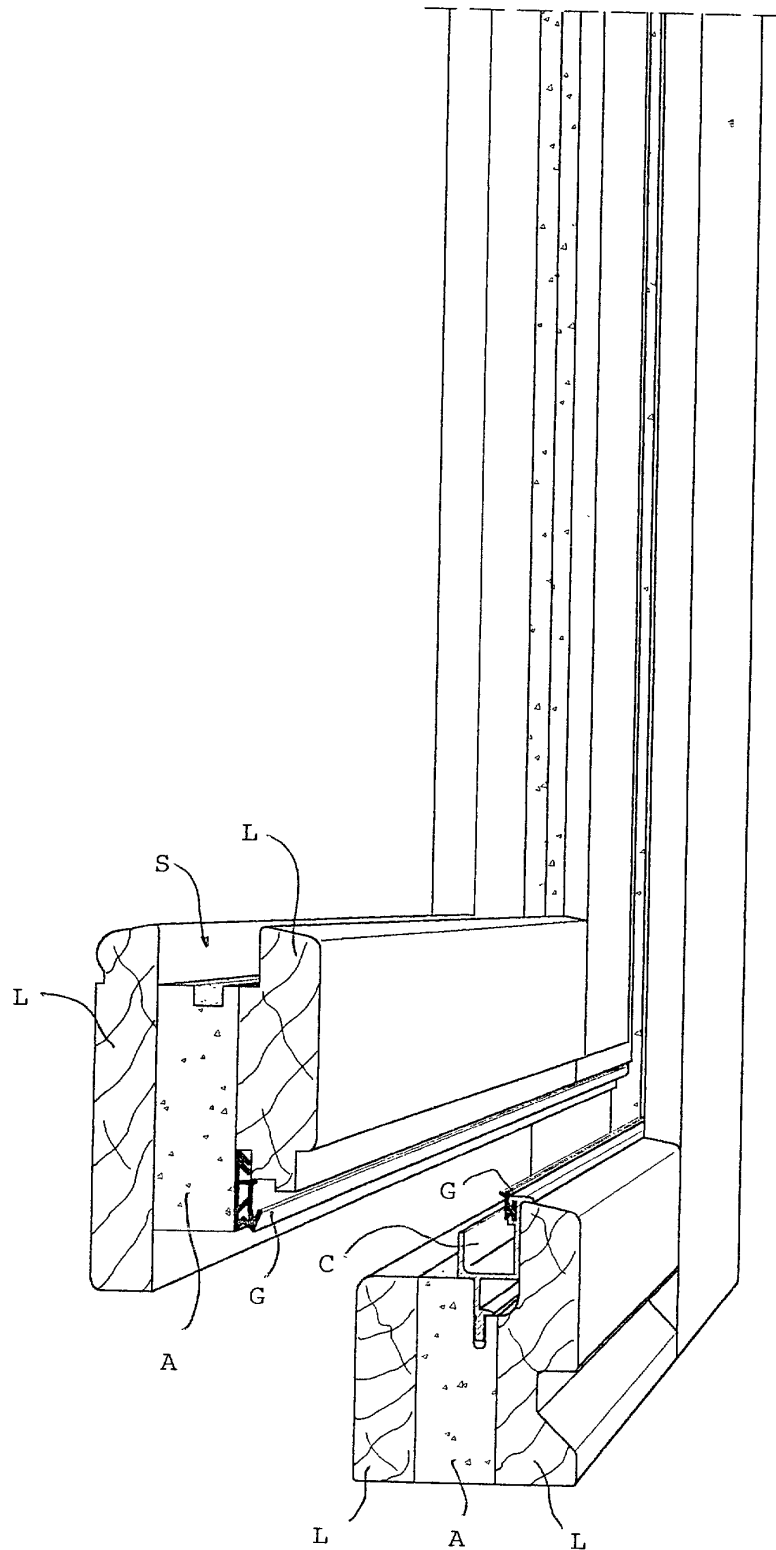


FIG. 3

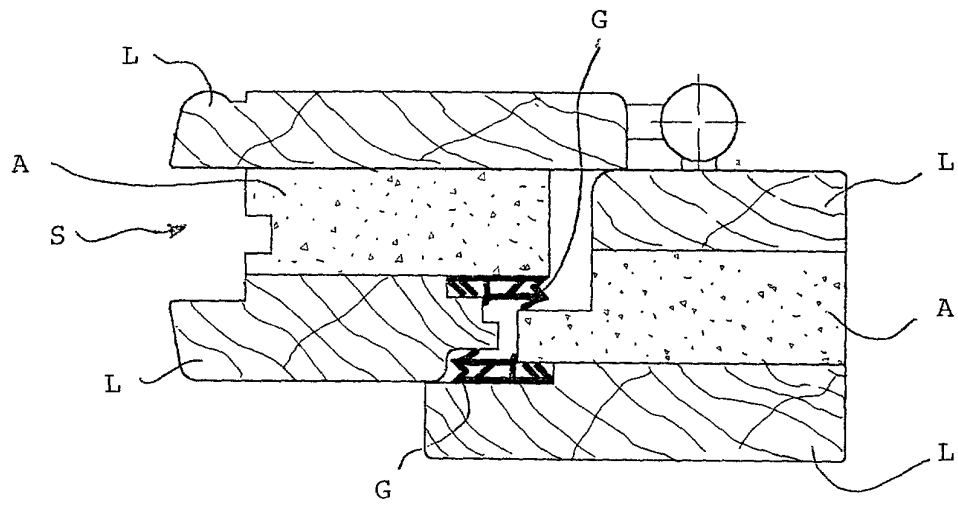


FIG. 4

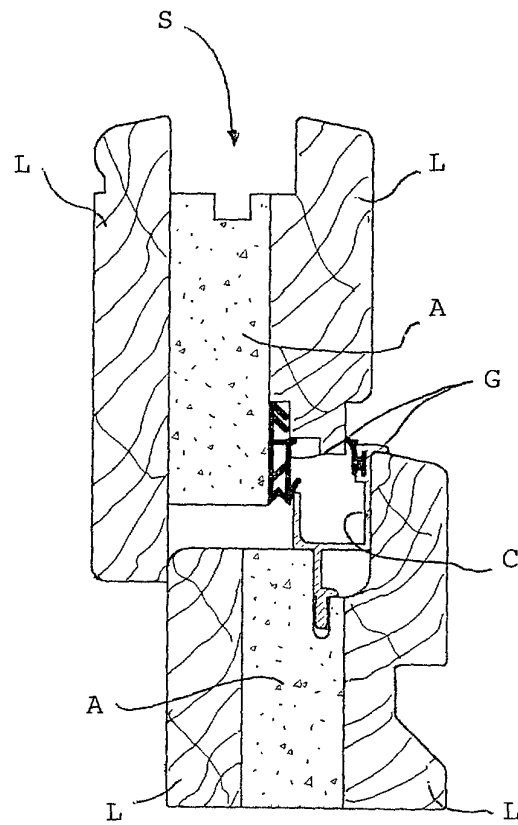


FIG. 5



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 01 83 0150

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.7)
X	DE 200 20 057 U (KARL MOLL GMBH) 1 March 2001 (2001-03-01)	1,3,4	E06B3/263
Y	* page 6, paragraph 1; figure 1 *	2,5,6	
Y	DE 296 03 671 U (PAZEN GUENTER) 2 May 1996 (1996-05-02) * page 3, line 29 - page 5, line 5 *	2,5	
Y	DE 198 02 148 A (STOELZEL CHRISTOF) 29 July 1999 (1999-07-29) * figure 5 *	6	
A	DE 200 19 578 U (NOKA HOLZVERARBEITUNGS GMBH) 18 January 2001 (2001-01-18) * page 2, paragraph 3 *	2,5	
A	FR 2 113 767 A (FOULON ROGER) 30 June 1972 (1972-06-30) * page 1, line 4 *	3	TECHNICAL FIELDS SEARCHED (Int.CI.7) E06B
A	US 2 643 744 A (PICKERING ET AL) 30 June 1953 (1953-06-30) * column 6, line 73 *	3	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 12 July 2001	Examiner Depoorter, F
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 D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/02 (P4/C01)

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

EP 01 83 0150

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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12-07-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 20020057 U	01-03-2001	NONE	
DE 29603671 U	02-05-1996	DE 19546678 A AU 1372497 A WO 9722779 A EP 0865559 A	19-06-1997 14-07-1997 26-06-1997 23-09-1998
DE 19802148 A	29-07-1999	NONE	
DE 20019578 U	18-01-2001	NONE	
FR 2113767 A	30-06-1972	NONE	
US 2643744 A	30-06-1953	NONE	