



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.02.2009 Bulletin 2009/08

(51) Int Cl.:
E04C 2/24 (2006.01) **E04C 2/36** (2006.01)
A47B 96/20 (2006.01) **E04C 2/34** (2006.01)

(21) Application number: **08161086.7**

(22) Date of filing: **24.07.2008**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA MK RS

(71) Applicant: **SCM Group S.p.A.**
47900 Rimini (IT)

(72) Inventor: **Neri, Alessandro**
47900 Rimini (RN) (IT)

(74) Representative: **Crugnola, Pietro**
Luppi & Associati S.r.l.
Via Camperio, 11
20123 Milano (IT)

(30) Priority: **03.08.2007 IT MO20070260**

(54) **Panel and method for making a panel**

(57) A light structure panel is provided with a first internal layer (4) and with a second internal layer (6) which are comprised between a first external laminar layer (3) and a second external laminar layer (7) defining

faces (12, 13) of greater width of said panel (1), and with supporting means (5), for supporting and being interposed between, said first internal layer (4) and said second internal layer (6), said supporting means comprising a single laminar layer (5).

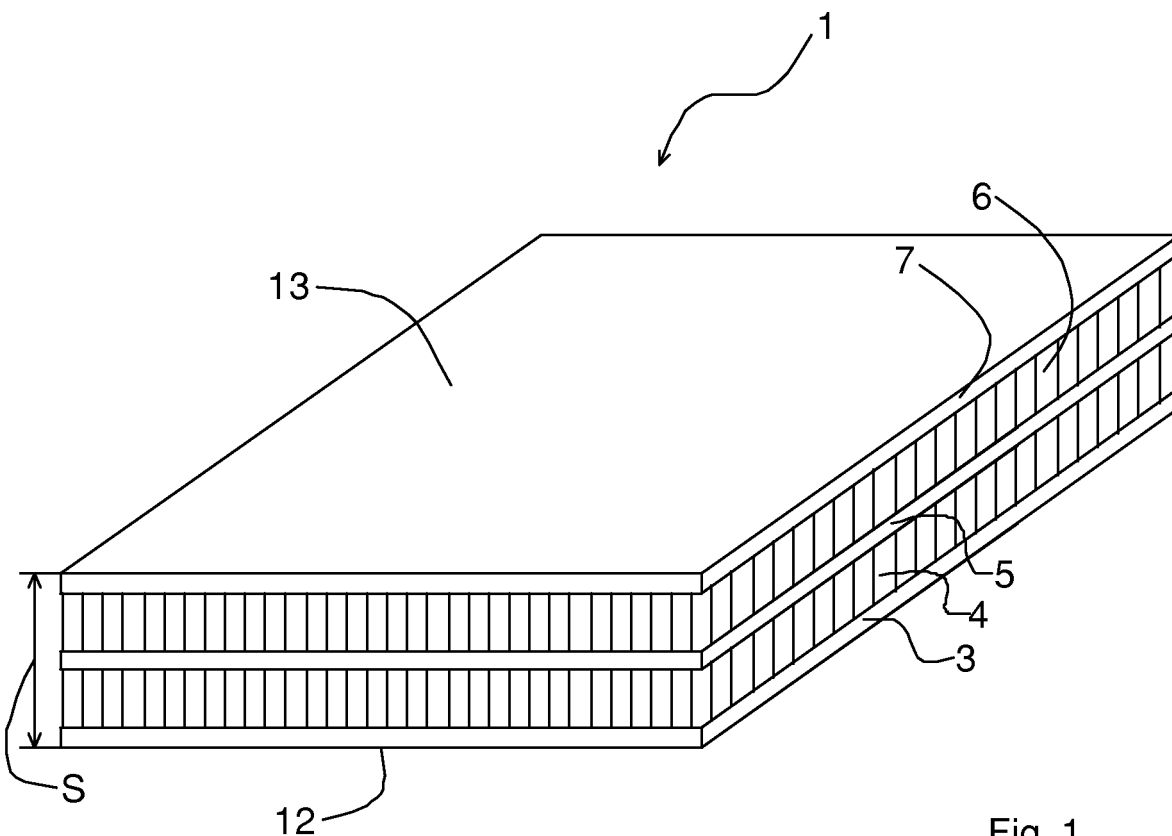


Fig. 1

Description

[0001] The invention relates to a panel, in particular a light structure panel, and a method for making a panel.

[0002] Panels are known, which are used for making furniture, shelving, shelves, door wings, doors or other furnishing elements having a layered structure.

[0003] These panels are formed by a first light structure panel that is superimposed and glued, by a fixing layer, onto a second light structure panel.

[0004] The first panel and the second panel have a "sandwich" structure.

[0005] In particular, the first panel comprises a first internal layer, which forms the prevalent part of the thickness of the first panel, interposed between a first laminar layer and a second laminar layer, that define the faces of greater width of the first panel, whilst the second panel comprises a second internal layer, which forms the prevalent part of the thickness of the second panel, interposed between a third laminar layer and a fourth laminar layer, that define the faces of greater width of the second panel.

[0006] This means that the layered structure, viewed in section, of known panels consists of the first laminar layer, of the first internal layer, of the second laminar layer, of the third laminar layer, glued to the second laminar layer, of the second internal layer and of the fourth laminar layer.

[0007] In this manner, between the first internal layer and the second internal layer are interposed the second laminar layer and the third laminar layer.

[0008] Further, in known composite panels, the first internal layer and the second internal layer are made of compressible filling materials made of wood or similar materials, such as in general cardboard sheets having a honeycomb structure that are lighter and less resistant than the materials used, which are typically plastics, wood or similar material, to make the first laminar layer, the second laminar layer, the third laminar layer and the fourth laminar layer.

[0009] Methods are known for making the aforesaid panels comprising initially assembling the first panel and the second panel.

[0010] This assembling comprises gluing the first internal layer to the first laminar layer and subsequently gluing the second laminar layer to the first internal layer to make the first panel.

[0011] This assembling further comprises gluing the second internal layer to the third laminar layer and subsequently gluing the fourth laminar layer to the second internal layer to make the second panel.

[0012] Subsequently, these methods comprise gluing the first panel to the second panel.

[0013] In particular, this gluing comprises fixing the second laminar layer to the third laminar layer.

[0014] A drawback of known panels is that they are particularly heavy and costly.

[0015] This is due in particular to the weight and to the cost of the first laminar layer, of the second laminar layer,

of the third laminar layer and of the fourth laminar layer.

[0016] A drawback of the methods for making the aforesaid panels is that they are particularly slow and laborious to apply.

[0017] In fact, these methods provide for preventively assembling the first panel and the second panel and subsequently gluing the first panel and the second panel together, which causes a certain difficulty in assembling and a significant waste of time.

[0018] An object of the invention is to improve the panels, in particular the light structure panels.

[0019] A further object is to make panels that are lighter and cheaper than known panels.

[0020] A still further object is to improve the methods for making panels, in particular light structure panels.

[0021] Another still further object is to provide a method for making panels that is simple and fast to apply.

[0022] In a first aspect of the invention there is provided a light structure panel provided with a first internal layer and with a second internal layer which are comprised between a first external laminar layer and a second external laminar layer which define faces of greater width of said panel, said panel being further provided with supporting means, for supporting and being interposed between said first internal layer and said second internal layer, characterised in that said supporting means comprises a single laminar layer.

[0023] Owing to this aspect of the invention, it is possible to provide a panel that is lighter and less costly than known panels.

[0024] In fact, in said panel between said first internal layer and said internal layer there is provided a single laminar layer opposite the two laminar layers provided in the known panels.

[0025] In a second aspect of the invention there is provided a method for making a light structure panel provided with a first internal layer and with a second internal layer, comprising fixing said first internal layer between a first laminar layer and a second laminar layer, characterised in that there is provided still fixing said second internal layer between said second laminar layer and a third laminar layer.

[0026] Owing to the second aspect of the invention it is possible to provide a method for assembling said panel that is simpler and more rapid to apply than are known methods.

[0027] In fact, in order to form said panel, it is no longer necessary to preassemble and subsequently glue a pair of panels but it is sufficient to fix said first laminar layer, said first internal layer, said second laminar layer, said second internal layer and said third laminar layer above one another.

[0028] The invention can be better understood and implemented with reference to the attached drawings that illustrate an embodiment thereof by way of non-limiting example, in which:

Figure 1 is an axonometric schematic view of a light

structure panel;

Figure 2 is a schematic, enlarged and fragmentary section of the panel in Figure 1;

Figure 3 is an exploded view of Figure 2.

[0029] With reference to Figures 1 and 2 there is shown a light structure panel 1 that is usable for making furniture, shelving, shelves, door wings, doors or other furnishing elements.

[0030] The panel 1 comprises a layered structure 2.

[0031] The structure 2 comprises a first laminar layer 3 having a first thickness S1, a second laminar layer 5 having a second thickness S2, which is substantially the same as the first thickness S1, and a third laminar layer 7 having a third thickness S3 which is substantially the same as the second thickness S2, the second laminar layer 5 being interposed between the first laminar layer 3 and the third laminar layer 7.

[0032] In an embodiment of the invention, which is not shown, the first thickness S1 is different from the second thickness S2 and from the third thickness S3.

[0033] In particular, the first laminar layer 3, the second laminar layer 5 and the third laminar layer 7 are formed respectively of only a first laminar element 22, of only a second laminar element 23 and of only a third laminar element 24.

[0034] In an embodiment of the invention that is not shown the first laminar layer 3 consists of a plurality of first laminar elements 22 that are mutually alongside and substantially coplanar, the second laminar layer 5 consists of a plurality of second laminar elements 23 that are mutually alongside and substantially coplanar and the third laminar layer 7 consists of a plurality of third laminar elements 24 that are mutually alongside and substantially coplanar.

[0035] The first laminar layer 3 and the third laminar layer 7 define respectively a first face 12 and a second face 13 of greater width of the panel 1.

[0036] The first laminar layer 3, the second laminar layer 5 and the third laminar layer 7 can be made of plastics, wood or the like.

[0037] The structure 2 further comprises a first internal layer 4, having a fourth thickness S4, interposed between the first laminar layer 3 and the second laminar layer 5, and a second internal layer 6, having a fifth thickness S5, interposed between the second laminar layer 5 and the third laminar layer 7, the second laminar layer 5 acting as a support for the first internal layer 4 and the second internal layer 6.

[0038] In particular, the fourth thickness S4 is substantially the same as the fifth thickness S5 and is greater than the first thickness S1, the second thickness S2 and the third thickness S3.

[0039] In an embodiment of the invention, which is not shown, the fourth thickness S4 is different from the fifth thickness S5.

[0040] The first internal layer 4 and the second internal layer 6 form a prevalent part of a thickness S of the panel

1 and can be made of compressible filling materials made of wood or similar materials such as in general sheets of cardboard having a honeycomb structure, which is lighter and less resistant than the materials used to make the first laminar layer 3, the second laminar layer 5 and the third laminar layer 7.

[0041] In an embodiment of the invention, which is not shown, the aforesaid filling materials comprise foams or similar materials.

[0042] The structure 2 further comprises a first fixing layer 8, a second fixing layer 9, a third fixing layer 10 and a fourth fixing layer 11, respectively for fixing together and interposed between, the first laminar layer 3 and the first internal layer 4, the first internal layer 4 and the second laminar layer 5, the second laminar layer 5 and the second internal layer 6 and the second internal layer 6 and the third laminar layer 7.

[0043] In particular, the first fixing layer 8, the second fixing layer 9, the third fixing layer 10 and the fourth fixing layer 11 may comprise an adhesive substance.

[0044] To make the panel 1, the first fixing layer 8 is initially spread on a third face 14, opposite the first face 12 of the first laminar layer 3 and/or on a fourth face 15 of greater width than the first internal layer 4 to glue the first internal layer 4 to the first laminar layer 3.

[0045] Subsequently, the second fixing layer 8 is spread on a fifth face 16, opposite the fourth face 15, of the first internal layer 4 and/or on a sixth face 17 of greater width than the second laminar layer 5 to glue the second laminar layer 5 to the first internal layer 4.

[0046] Still subsequently, the third fixing layer 10 is spread on a seventh face 18, opposite the sixth face 17, of the second laminar layer 5 and/or on an eighth face 19 of greater width than the second internal layer 6 to glue the second internal layer 6 to the second laminar layer 5.

[0047] Lastly, the fourth fixing layer 11 is spread on a ninth face 20, opposite the eighth face 19, of the second internal layer 6 and/or on a tenth face 17, opposite the second face 13, of the third laminar layer 7 to glue the third laminar layer 7 to the second internal layer 6.

[0048] It should be noted how the panel 1 disclosed above is lighter and less expensive than known panels.

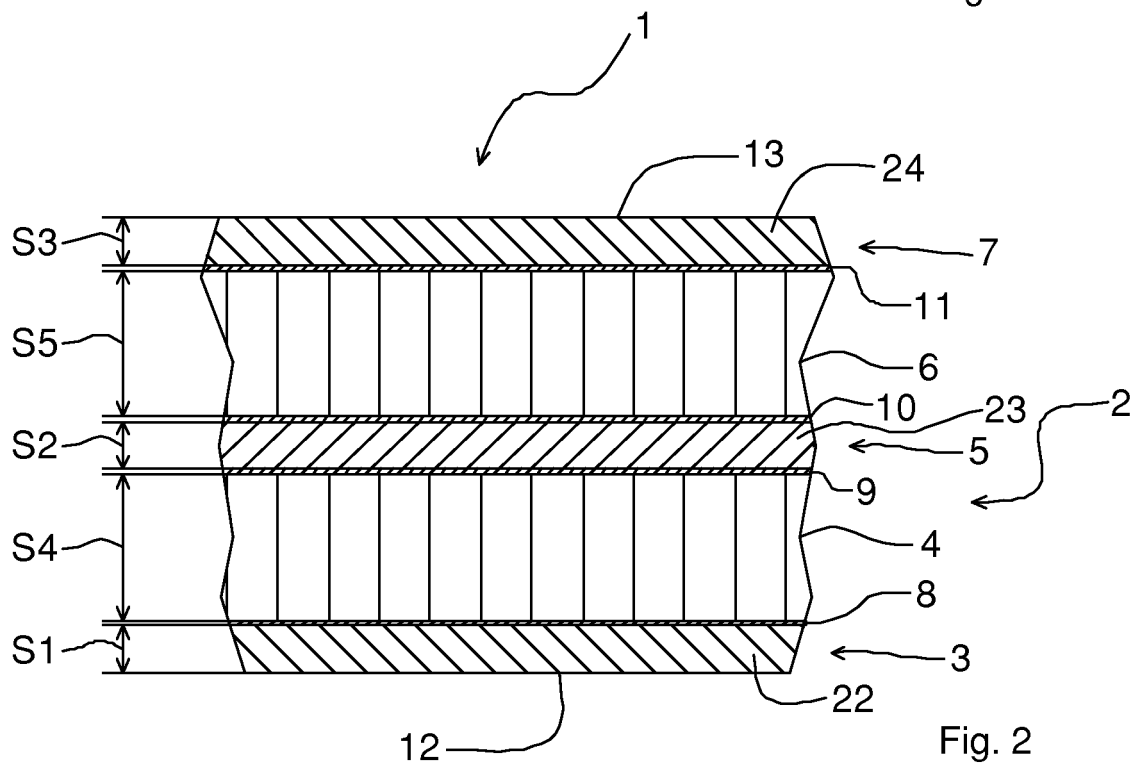
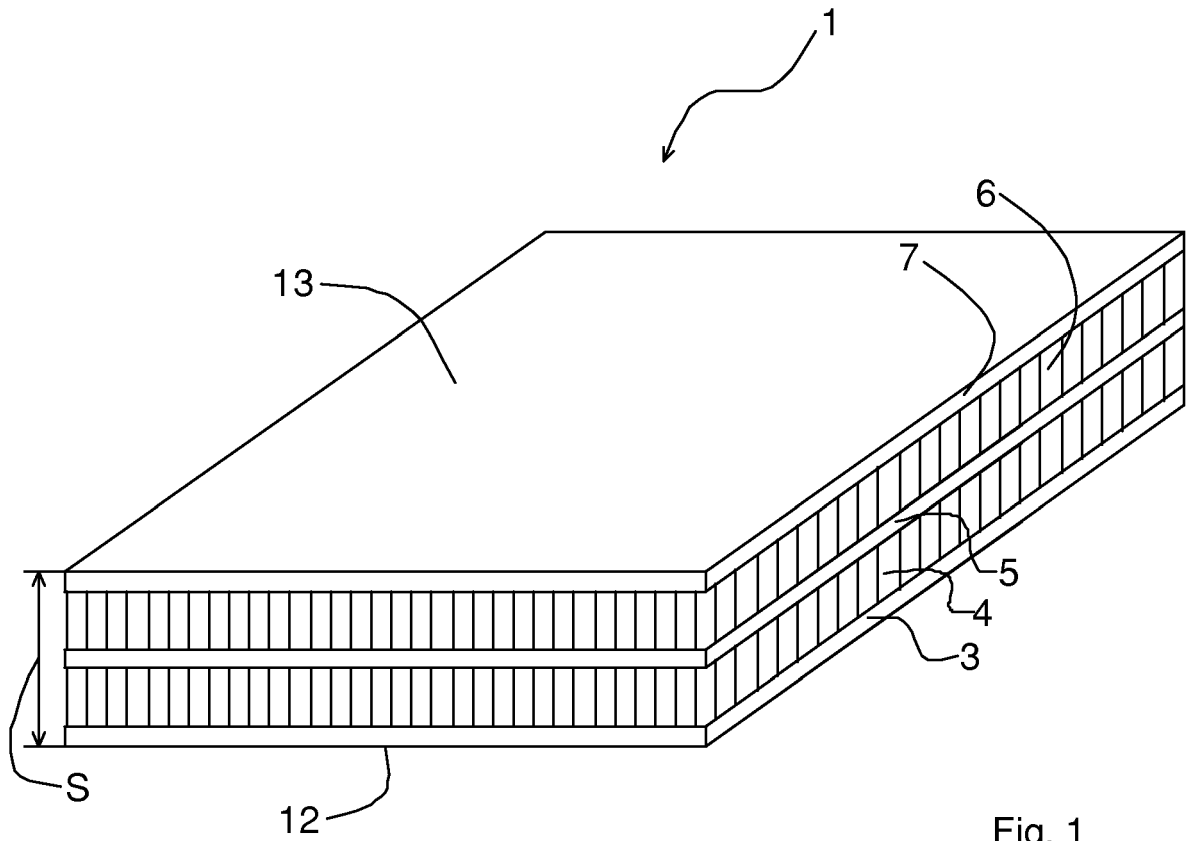
[0049] In fact, in the panel 1 between the first internal layer 4 and the second internal layer 6 there is provided only the second laminar layer 5, opposite the pair of laminar layers provided in the known panels.

[0050] It should further be noted how the method disclosed above is simpler and faster to apply than known methods.

[0051] In fact, to make the panel 1, it is sufficient to fix the first laminar layer 3, the first internal layer 4, the second laminar layer 5, the second internal layer 6 and the third laminar layer 7 above one another.

Claims

1. Light structure panel provided with a first internal layer (4) and with a second internal layer (6) which are comprised between a first external laminar layer (3) and a second external laminar layer (7) which define faces (12, 13) of greater width of said panel (1), said panel (1) being further provided with supporting means (5), for supporting and being interposed between said first internal layer (4) and said second internal layer (6), **characterised in that** said supporting means comprises a single laminar layer (5). 5
2. Panel according to claim 1, wherein said laminar layer (5) consists of a single laminar element (23). 15
3. Panel according to claim 1, wherein said laminar layer (5) consists of a plurality of mutually alongside laminar elements (23). 20
4. Panel according to any preceding claim, wherein said first external laminar layer (3), said laminar layer (5) and said second external laminar layer (7) respectively have a first thickness (S1), a second thickness (S2) and a third thickness (S3) that are substantially the same. 25
5. Panel according to any preceding claim, wherein said first internal layer (4) and said second internal layer (6) respectively have a fourth thickness (S4) and a fifth thickness (S5) that are substantially the same. 30
6. Panel according to claim 5, as claim 5 is appended to claim 4, wherein said fourth thickness (S4) and said fifth thickness (S5) are greater than said first thickness (S1), than said second thickness (S2) and than said third thickness (S3). 35
7. Panel according to any preceding claim, wherein said first internal layer (4) comprises a honeycomb structure, or a foam or similar materials. 40
8. Panel according to any preceding claim, wherein said second internal layer (6) comprises a further honeycomb structure, or a further foam or similar materials. 45
9. Panel according to any preceding claim, and comprising a first fixing layer (8) for fixing together and being interposed between, said first external laminar layer (3) and said first internal layer (4), a second fixing layer (9) for fixing together and being interposed between, said first internal layer (4) and said laminar layer (5), a third fixing layer (10) for fixing together and being interposed between, said laminar layer (5) and said second internal layer (6) and a fourth fixing layer (11) for fixing together and being 50
- interposed between, said second internal layer (6) and said second external laminar layer (7). 55
10. Panel according to claim 9, wherein said first fixing layer (8), said second fixing layer (9), said third fixing layer (10) and said fourth fixing layer (11) comprise an adhesive substance.
11. Method for making a light structure panel (1) provided with a first internal layer (4) and with a second internal layer (6), comprising fixing said first internal layer (4) between a first laminar layer (3) and a second laminar layer (5), **characterised in that** there is provided still fixing said second internal layer (6) between said second laminar layer (5) and a third laminar layer (7).
12. Method according to claim 11, wherein said fixing comprises gluing said first internal layer (4) to said first laminar layer (3) and to said second laminar layer (5).
13. Method according to claim 11, or 12, wherein said still fixing comprises still gluing said second internal layer (6) to said second laminar layer (5) and to said third laminar layer (7).
14. Method according to any one of claims 11 to 13, wherein said second laminar layer (5) consists of a single laminar element (23).
15. Method according to any one of claims 11 to 13, wherein said second laminar layer (5) consists of a plurality of mutually alongside laminar elements (23).
16. Method according to any one of claims 11 to 15, wherein said first internal layer (4) comprises a honeycomb structure, or a foam or similar materials.
17. Method according to any one of claims 11 to 16, wherein said second internal layer (6) comprises a further honeycomb structure, or a further foam or similar materials.



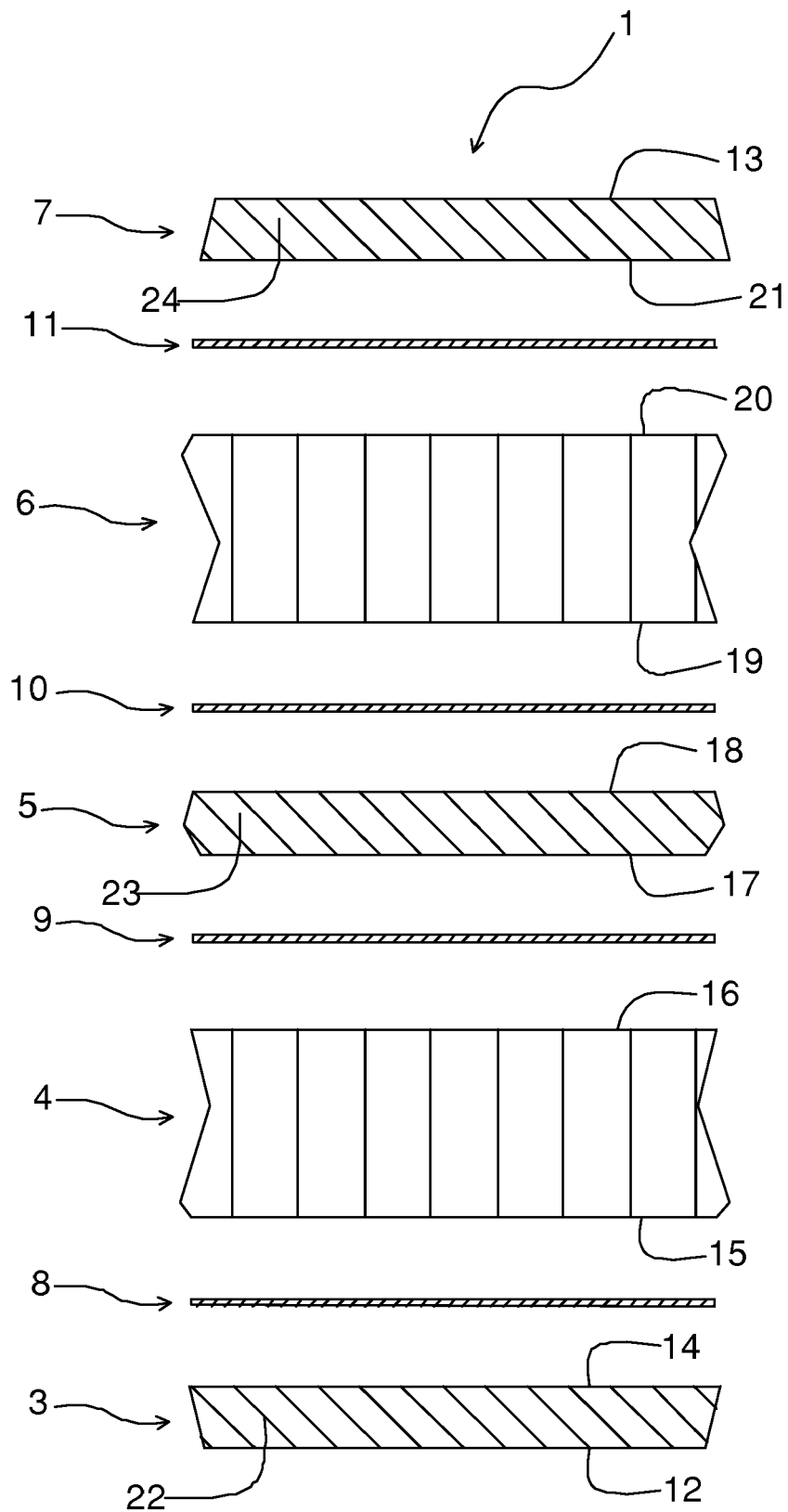


Fig. 3



EUROPEAN SEARCH REPORT

Application Number
EP 08 16 1086

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	GB 2 408 015 A (INTELLIGENT ENGINEERING [BS]) 18 May 2005 (2005-05-18) * page 1, line 7 - line 9 * * page 2, line 22 - line 23 * * page 3, line 15 - page 4, line 16 * * page 5, line 6 - line 11 * * page 6, line 20 - page 7, line 26 * * page 9, line 6 - line 22 * * page 10, line 25 - page 11, line 15 * * page 14, line 19 - page 15, line 2 * * page 15, line 20 - line 29 * * page 18, line 2 - line 25; claims 1,9,10; figures 1-14 * -----	1-17	INV. E04C2/24 E04C2/36 A47B96/20 ADD. E04C2/34
X	WO 00/30845 A (GOR APPLIC SPECIALI SRL [IT]; STEINBACH PAOLO [IT]; CAPUSSOTTI FULVIO) 2 June 2000 (2000-06-02) * page 1, line 4 - line 6 * * page 4, line 24 - line 32 * * page 6, line 25 - line 31 * * page 7, line 14 - line 24; claims 1-4; figure 6 * -----	1,2,4-8, 14,16,17	TECHNICAL FIELDS SEARCHED (IPC) E04C A47B
X	DE 44 47 239 A1 (DIPIEMME DIES AND PLASTIC MACH [IT]) 6 July 1995 (1995-07-06) * column 1, line 3 - line 6 * * column 3, line 18 - line 33 * * column 4, line 1 - line 20; claims 1-4; figure 5 * -----	1,2,4-8, 14,16,17	
X	AT 298 011 B (MALINSKY ADOLF HEINZ ING) 25 April 1972 (1972-04-25) * page 1, line 1 - line 3 * * page 1, line 26 - line 31 * * page 2, line 7 - line 10; claim 1; figure 2 * ----- -/--	1,2,4-6, 14	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 29 October 2008	Examiner Giannakou, Evangelia
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			

 3
EPO FORM 1503 03.82 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
EP 08 16 1086

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	DE 100 16 211 A1 (ERHARDT EGGE [DE]; ERHARDT ROLF [DE]) 4 October 2001 (2001-10-04) * claim 1; figures 4,5 *	1,2,4-6, 14	
X	DE 93 00 109 U1 (G.O.R. APPLICAZIONI SPECIALI S.P.A., BURIASCO, TORINO, IT; ILPA INDUST) 29 April 1993 (1993-04-29) * page 3, paragraph 3 - page 4, paragraph 2 *	11	
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 29 October 2008	Examiner Giannakou, Evangelia
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	

 3
EPO FORM 1503 03.82 (P04C01)

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

EP 08 16 1086

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

29-10-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2408015 A	18-05-2005	CN 1882434 A	20-12-2006
		EP 1682341 A1	26-07-2006
		WO 2005051645 A1	09-06-2005
		JP 2007512976 T	24-05-2007
		KR 20060130036 A	18-12-2006
		US 2007048502 A1	01-03-2007
-----	-----	-----	-----
WO 0030845 A	02-06-2000	IT SV980065 A1	19-05-2000
-----	-----	-----	-----
DE 4447239 A1	06-07-1995	IT 1265477 B1	22-11-1996
-----	-----	-----	-----
AT 298011 B	25-04-1972	NONE	
-----	-----	-----	-----
DE 10016211 A1	04-10-2001	NONE	
-----	-----	-----	-----
DE 9300109 U1	29-04-1993	NONE	
-----	-----	-----	-----