



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
25.06.2014 Bulletin 2014/26

(51) Int Cl.:
B27N 1/00 (2006.01)

(21) Application number: **12461565.9**

(22) Date of filing: **18.12.2012**

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

(72) Inventors:
• **Balcerak, Bogusław**
91-158 Lodz (PL)
• **Kecerski, Tomasz**
92-432 Lodz (PL)

(71) Applicant: **R&D Project Sp. z o.o.**
92-318 Lodz (PL)

(74) Representative: **Pawlowski, Adam**
Eupatent.PL
ul. Zeligowskiego 3/5
90-752 Lodz (PL)

(54) **Method for making holes in furniture boards and a furniture board with holes**

(57) A method for making holes (106) in furniture boards (100) comprising a chip inner layer (101) containing odorous and/or hazardous substances, covered by outer layers (102, 103) and edge covers (104, 105), comprising the step of drilling holes (106) which pass through

at least one outer layer (103) and at least part of the chip inner layer (101). The inner area of the holes is covered with a blocking coating (107), which blocks the release of odorous and hazardous substances from the chip inner layer to the environment by at least 99%.

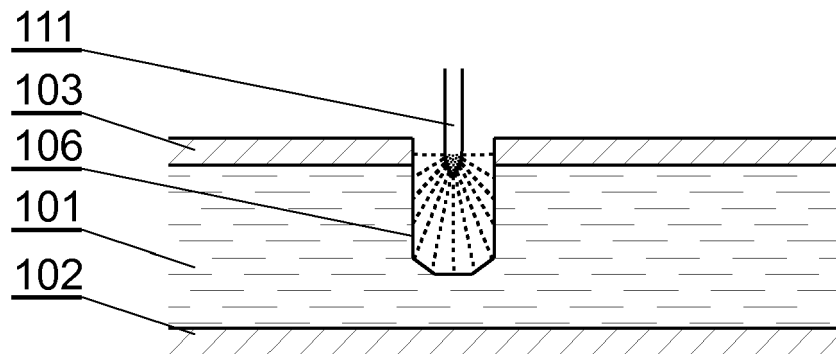


Fig. 3

Description

[0001] The present invention relates to a method for making holes in furniture boards applicable to hutch furniture.

[0002] Hutch furniture consist of a set of furniture boards which constitute walls and fronts of furniture, couplers i.e. screws or shanks and various other elements such as holders or legs as well. Hutch furniture may be sold for self-assembly in a form of a set of furniture boards. In order to facilitate precise mounting of the furniture by the user, the furniture boards have pre-drilled holes.

[0003] The furniture boards of hutch furniture are manufactured from chipboards of MDF or HDF type. The boards of this type, in particular shortly after production, emit odorous and hazardous substances contained in the glue which binds the material of the chip inner layer. The allowed limits of emission the odorous and hazardous substances are determined by corresponding norms.

[0004] For example, formaldehyde is one of the hazardous substances released from the chipboards. The PN-EN 312 "Chipboards. Technical requirements" standard specifies the maximum content of formaldehyde in raw chipboards at a level below 8 mg/100g of the raw mass of the chipboard, measured by means of a 'perforator method' according to PN-EN 120 standard.

[0005] By coating the chipboard with veneer, scale-board or foil, the emission of odorous substances can be blocked, which is positive for the manufacturing process, as it results in reduction of the content of odorous substances at the manufacturing plant environment. It is also good for the users of the furniture, because it reduces the characteristic unpleasant smell of new furniture in rooms. However, the blocking effect is diminished when holes are made in the furniture boards.

[0006] The aim of the present invention is to provide a method for manufacturing furniture boards with drilled holes, which provides furniture boards with reduced emission of odorous and hazardous substances to the environment.

[0007] The object of the invention is a method for making holes in furniture boards comprising a chip inner layer containing odorous and/or hazardous substances, covered by outer layers and edge covers, comprising the step of drilling holes which pass through at least one outer layer and at least part of the chip inner layer, wherein the inner area of the holes is covered with a blocking coating, which blocks the release of odorous and hazardous substances from the chip inner layer to the environment by at least 99%.

[0008] Preferably, the blocking coating is applied by means of a spraying head, which is inserted into each drilled hole.

[0009] The object of the invention is also a furniture board with holes comprising a chip inner layer containing odorous and/or harmful substances, which is covered by outer layers and edge covers, wherein the holes pass

through at least one outer layer and at least part of the chip inner layer, wherein the internal area of holes is covered by a blocking coating which blocks the release of odorous and harmful substances from the chip inner layer to the environment by at least of 99%.

[0010] The invention is shown by means of exemplary embodiment on a drawing, in which Fig. 1 presents schematically the furniture board with holes, Fig. 2 presents a diagram of a process line for making holes in furniture boards according to the present invention, and Fig. 3 presents schematically the method of spraying a coating substance on a side area of the holes.

[0011] The furniture board 100 according to the invention, presented in a cross-section in Fig. 1, comprises a chip inner layer 101, covered by outer layers 102, 103, e.g. natural or plastic veneer and the edge covers 104, 105. The chip inner layer comprises odorous and hazardous substances, e.g. formaldehyde. Holes 106 are made in the board, wherein the fasteners and other elements can be mounted when assembling the furniture. The holes 106 can be made as blind holes or through-holes. Due to the small thickness of the outer layer 102, 103, the holes connect the inner layer 101 with the outer environment. Not every hole has to be used while assembling the furniture. For example, there can be a row of pre-drilled holes arranged along the edge of the board, for mounting dowels to support furniture shelves, thereby enabling selection of the holes in which the dowels should be placed and allowing adjustment of the shelves at the suitable height selected by the end-user. The side area of the holes 106 of the furniture board 100 is covered with a coating 107 which blocks the release of the odorous and hazardous substances from the inner layer 101 to the environment.

[0012] The blocking coating 107 contains a substance which captures formaldehyde molecules, i.e. solution of carboxylated styrene-butadiene copolymer for example Styronal BN 4606 X made by BASF, USA. The blocking coating 107 dries spontaneously. The coating 107 is applied in a volume which enables to reduce the emission of odorous and hazardous substances from the side area of holes 106 at least by 99%.

[0013] Fig. 2 presents a diagram of a process line for making holes in furniture boards with the method according to the invention. The furniture boards, cut to match required dimensions and having an inner layer covered with the outer layers, are fed by the conveyor 201 to a numerically-controlled drilling station 202. On the drilling station 202, the boards are drilled at pre-determined locations up to a certain depth of the holes, which depends on the drilling program. The boards 100 are then fed to a brushing station 203, wherein dust and chips generated while drilling are removed from the edges of holes. The boards with cleaned but unprotected holes by which the odorous and hazardous substances can be released from the chip inner layer 101 are fed to a protecting station 204, wherein the substance blocking release of odorous and hazardous substances from the chip inner layer 101

is sprayed on the side area of holes by a spraying head. Afterwards, on the inspection table 205, the precision of drilling and accuracy of preservation is checked. Properly manufactured boards are then fed to the place of destination.

5

[0014] Fig. 3 presents schematically the method of spraying the blocking coating 107 on the outer area of holes 106 on the protection station 204. The spraying is effected by means of a spraying head 111 which is inserted into the hole 106 in order to spray the coating substance 107 in an amount depending on the diameter and depth of the particular hole.

10

Claims

15

1. A method for making holes in furniture boards comprising a chip inner layer containing odorous and/or hazardous substances, covered by outer layers and edge covers, comprising the step of drilling holes which pass through at least one outer layer and at least part of the chip inner layer, **characterized in that** the inner area of the holes is covered with a blocking coating, which blocks the release of odorous and hazardous substances from the chip inner layer to the environment by at least 99%. 20 25
2. The method according to claim 1, **characterized in that** the blocking coating is applied by means of a spraying head, which is inserted into each drilled hole. 30
3. A furniture board with holes comprising a chip inner layer containing odorous and/or harmful substances, which is covered by outer layers and edge covers, wherein the holes pass through at least one outer layer and at least part of the chip inner layer, **characterized in that** the internal area of holes (106) is covered by a blocking coating (107) which blocks the release of odorous and harmful substances from the chip inner layer (101) to the environment by at least of 99%. 35 40

45

50

55

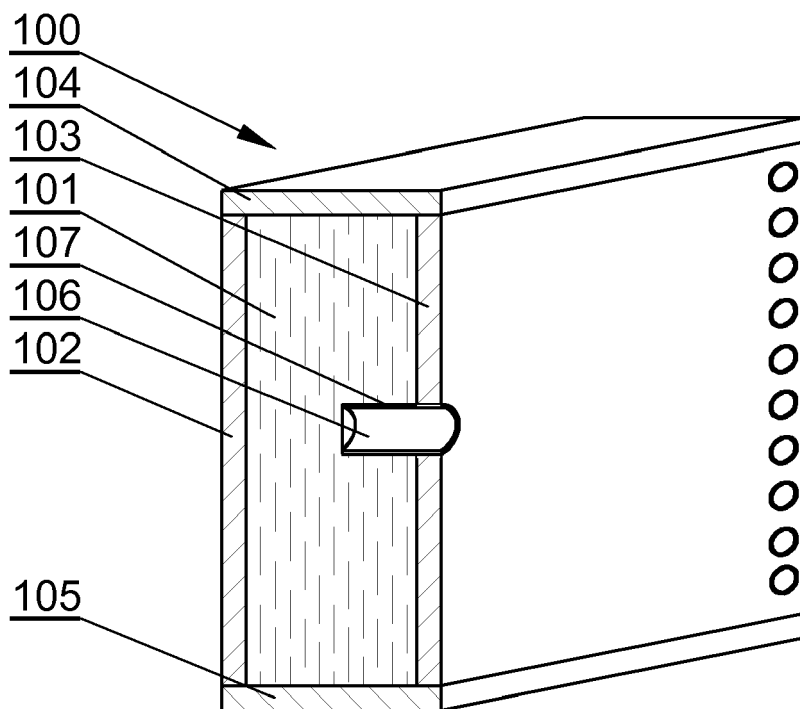


Fig. 1

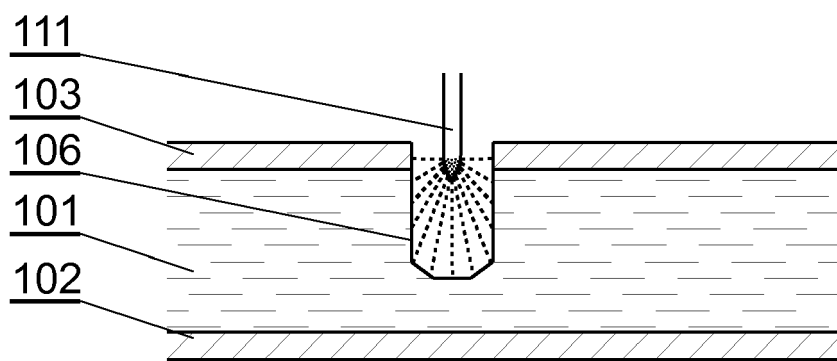


Fig. 3

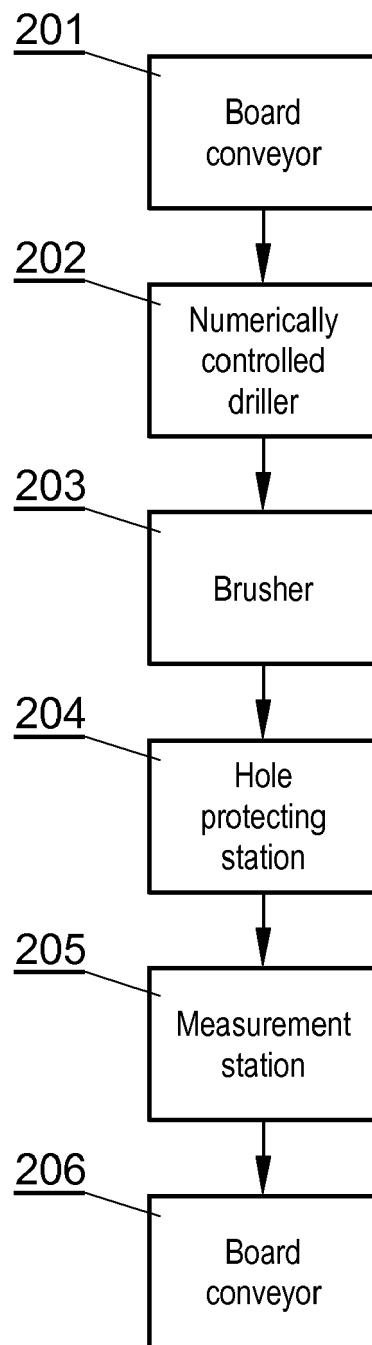


Fig. 2



EUROPEAN SEARCH REPORT

Application Number
EP 12 46 1565

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	US 2010/190021 A1 (RUEBA EVA [CH] ET AL) 29 July 2010 (2010-07-29) * paragraph [0013] * * paragraph [0014] * * paragraph [0017] * * paragraph [0025] * * paragraph [0056] * * paragraph [0078] - paragraph [0079] * -----	1-3	INV. B27N1/00
E	PL 395 280 A1 (R&D PROJECT SPOLKA Z OGRANICZONA ODPOWIEDZIALNOSCIA [PL]) 7 January 2013 (2013-01-07) * the whole document * -----	1-3	
			TECHNICAL FIELDS SEARCHED (IPC)
			B27N
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 21 June 2013	Examiner Huggins, Jonathan
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	

1
EPO FORM 1503 03.02 (P04C01)

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

EP 12 46 1565

5

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.

21-06-2013

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2010190021 A1	29-07-2010	AU 2007206994 A1	26-07-2007
		BR PI0706437 A2	29-03-2011
		CA 2631869 A1	26-07-2007
		EP 1979139 A1	15-10-2008
		JP 2009523628 A	25-06-2009
		MY 146656 A	14-09-2012
		NZ 569380 A	30-07-2010
		US 2010190021 A1	29-07-2010
		WO 2007082837 A1	26-07-2007

PL 395280 A1	07-01-2013	-----	-----

EPO FORM P0459

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