METHOD FOR MANUFACTURING A PANEL FOR FURNISHING AND BUILDING AND PANEL SO MANUFACTURED

Abstract: A method for manufacturing a panel for furnishing and building by means of at least a mould (50), provided with a bottom (52), a perimetric inner edge (53) and closing means (51), provides: to position into the mould (50) a plurality of lath means (2); to pour into the mould a resinous material (3) at fluid state; to close the mould (50) by closing means (51); to wait for the consolidation of resinous material (3); to open the mould (50) and to extract the panel (1) including the resinous material (3) at solid state.
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
METHOD FOR MANUFACTURING A PANEL FOR FURNISHING AND BUILDING AND PANEL SO MANUFACTURED

TECHNICAL FIELD

The present invention relates to the technical field of prefabricated panels and particularly the invention refers to a method for manufacturing a panel for furnishing and building and to the panel so manufactured for work and support tops for kitchens or bathrooms, and for partition or curtain walls, floors and ceilings for civil residences, public and industrial environments.

BACKGROUND ART

There are known panels, for work or support top, provided with an in sight slab made of marble, granite or natural or synthetic mineral conglomerates with a thickness of around 13–15 mm and glued on a layer of wood by-products, such as the so-called MDF or chipboard, having small specific weight and a thickness such as to achieve a panel minimum overall thickness of around 30 mm.

The main drawbacks of such known panels consist in that they do not stand damp and infiltrations, in that they are very heavy and they are excessively fragile and little enduring the bending, with breaking risks during the transport and the assemblage.

There are known panels in which the in sight slabs are glued to alveolate structures made of extruded plastic and there are also known panels provided with central aluminum honey-comb structures to whose opposed faces in sight slabs and balancing slabs, made of aluminum or galvanized sheet, are respectively glued in order to confer adequate strength.

A drawback of these known panels consists in that they require many components and they require very long production times, because of the reticulation time that is the consolidation of the glues for fixing the slabs. Furthermore, the known manufacturing methods of said panels require to carry out, with high accuracy, holes, openings and/or windows for taps, sinks, hobs and for assemblage clamping.
Furthermore, it is very difficult and complicated to manufacture alveolate or honeycombed curved panels through the respective known manufacturing methods and special tools and maximum execution care are required in order to glue the in sight edges on the vertical ribs.

Other drawback of the above mentioned methods for manufacturing panels consists in that they require many and complex production phases so resulting excessively slow and expensive.

**DISCLOSURE OF THE INVENTION**

An object of the present invention is to propose a method for manufacturing panels having a fast and simple execution and allowing to carry out high qualitative panels, with high accuracy and cheaply.

Other object is to propose a light panel, with high mechanical characteristics, fire and water proof and handy for transport and installation.

Further object is to propose a panel for work and support tops, ventilated surfaces, kitchen and bathroom ceilings provided with an in sight face made of marble, granite, stone, ceramics, metal or in natural or artificial mineral and/or organic conglomerates and having an excellent aesthetical look and high functional characteristics.

Another object of the present invention is to propose a panel made of discarded or rejected organic and inorganic materials which have high disposal cost and are available in large amounts with no value or very low cost.

Further object is to propose a panel provided with inner ducts and allowing the circulation or the passage respectively of fluids for environmental conditioning or technological system such as electric installation or plumbing.

Other object is to propose a panel for draining floors.

The above-mentioned objects are achieved according with the claim content.
BRIEF DESCRIPTION OF THE DRAWINGS

The characteristics of the invention are underlined in the following with particular reference to the attached drawings, in which:

- figures 1 to 4 show schematic views, axonometric and cross section of the device of the present invention, in subsequent manufacturing phases by the method of the invention;
- figures 5 and 6 show schematic views, axonometric and cross section, of a variant of device of figure 4 in two subsequent manufacturing phases;
- figure 7 shows a partial and axonometric view of means for manufacturing a variant of device of figure 4;
- figures 8 and 9 show partial and axonometric views of respective variant of device of figure 4.

BEST MODE OF CARRYING OUT THE INVENTION

With reference to figures 1 to 4, numeral 1 indicates the furnishing and building panel object of the present invention, carried out by at least a mould 50 provided with a bottom 52, a perimetric inner edge 53 and closing means 51 according to the method of the present invention which provides:

- to position at the bottom 52 of mould 50 at least a slab 4 fit for carrying out an in sight face of panel 1;
- to position at least at a portion of inner edge 53 of mould 50 at least a section bar 5, fit for carrying out an in sight edge of panel 1;
- to position into the mould 50 a plurality of lath means 2 nearly parallely at a wider side of mould 50;
- to pour into the mould a resinous material 3 at fluid state;
- to close the mould 50 by the closing means 51 consisting of a cover or an upper surface of a press;
- to wait for the consolidation of resinous material 3;
- to open the mould 50 and to extract the panel 1 including the resinous material 3 at solid state.

The mould 50 has a plan shaped as a rectangle, as a rectangle with at least a circular convex side or has a plan curvilinear or polygonal shaped, in order to obtain a likewise shaped panel 1.
The lath means 2 have a prismatic form or a curved section, solid or tubular, made of plastic, foam material with very low density and/or water-soluble.

After the consolidation of the resinous material 3, the plastics lath means 2 can be extracted and used again for manufacturing further panels 1, while the lath means 2 soluble can be eliminated by water jets or by immersion. In alternative, the lath means 2 can be left in the resinous material 3 because their low weight does not compromise the lightness of panel.

The lath means 2 can be positioned into the mould 50 in contact with the slabs 4, before pouring the resinous material 3 or between two partial and subsequent pouring of said resinous material 3 for spacing apart the lath means from the slabs.

The lath means can be aligned to the not in sight face of the panel or entirely included in the resinous material 3 in such a way to obtain, in case of the removal or elimination thereof, grooves or cavities respectively.

Said lath means 2 can be positioned into the mould 50 also with a grid arrangement in order to obtain, after the removal thereof, a network of intercommunicating grooves or cavities.

The method provides to use slabs 4 made of marble, granite, stone, ceramic, metal or mineral and/or organic conglomerates, natural or artificial in single body, in tiles or in fragments and to use resinous material 3 comprising inclusions or fragments or granulates of at least one among cable sheaths, car bumper, plastic components also strengthen, tires fit for disposal, aluminum, fibers also vegetable, mineral granulate material synthetic and natural, organic and inorganic or hollow microspheres in a matrix of conglomerating resin also of expanding type.

Said materials, all of them with no cost or very low, influences the characteristics of heat and sound insulation and conductivity, of mechanical strength and of lightness of panel 1.

In alternative to the slab positioning, the method provide to spread at least at the bottom 52 of mould 50 a layer of inclusions in resinous matrix, fit to carry out the in sight face of panel 1, including powder or fragments of at least one among brick, mineral, glass, building material and mixture thereof, rubber or tire fragments, wood shavings, sawdust or woody fibers in a matrix of conglomerating resin also of expanding type.
Obviously the invention provides also to not use the slabs and the inclusion layer made of resinous matrix, carrying out the in sight face of the panel by means of the resinous material 3. In this last case, in order to carry out an in sight face of panel 1 of draining permeable type, the method provides to use a resinous material 3 with a quantity of resinous matrix lower than the volume of interstices among the inclusions or fragments. In such a way, the liquids can penetrate, through the empty interstices, into the grooves or into the inner ducts, in which said liquids can be held, up to respective outlets, by means of a further impermeable layer of resinous material 3 or resin.

The method also provides to reciprocally fix, by gluing, the faces not in sight of two panels 1, in order to obtain a double thickness panel.

The variant of figures 5 and 6 provides to fix to bottom 52 of mould 50, before pouring ad positioning in the mould 50, at least a windows means 54 fit to carry out a window 6 of panel 1 for a sink, a tap or a hob. Said variant also provides to fix at least a reduction means 55 in correspondence at least of a portion of the perimetric inner edge 53 of mould 50, before each pouring and positioning, for reducing the dimensions of panel 1.

In the variant of figure 7, before each pouring and positioning, a matrix means 56 is inserted into the mould 50, with smooth, rough, embossed surface or brick, tile, stone or similar shaped, removably fixed to the bottom 52 in order to obtain panels 1 with in sight faces reproducing the surface of said matrix means 56.

The panel for furnishing and building, object of present invention, has a plan shaped as a rectangle, as a rectangle with at least a circular convex side or has a plan curvilinear or polygonal shaped. The panel includes a plurality of ribs 7 carried out in the resinous material 3, by means of a plurality of interposed lath means 2, one or more slabs 4, constituting the in sight face and section bars 5 fit for carrying out realize the in sight edge of panel 1.

The ribs 7 have approximately rectangular, trapezoidal, polygonal or curved cross section, they are parallel to a longitudinal side of panel 1, they are spaced apart reciprocally by a distance ranging from 1 to 10 times their maximum thickness and they have a height ranging from 1 to 10 times their maximum thickness.

The slab 4, thanks to panel strength, may have a very small thickness, lower than about 13 mm.
The panel 1 can further include a layer of inclusions in resinous matrix instead of slabs 4 or interpose between these last ones and the resinous material 3.

The panel includes grooves 8, eventually filled by the lath means 2, parallel to a longitudinal side of panel 1, but it can also includes grooves 8 orthogonal to said side in order to carry out a network of grooves. In alternative, the panel may include a plurality of cavities 9, orthogonal and/or parallel to a longitudinal side of panel 1, fit for housing i.e. technological systems or water or air flows for heating or conditioning.

The main advantage of the present invention is to provide a method for manufacturing panels having a fast and simple execution and allowing to carry out, with high accuracy and cheaply, a high qualitative, light, strong, fire and water proof and handy for transport and installation panel, which can be used for kitchen work tops, bathroom sink support tops, ventilated surfaces and ceilings, having an in sight face made of marble, granite, stone, ceramic, metal or made of natural or artificial mineral and/or organic conglomerates and having an excellent aesthetical look and high functional characteristics.

Another advantage of the present invention is to provide a panel made of discarded or rejected organic and inorganic materials, which have high disposal cost and available in large amounts with no value or very low cost, and to provide a panel which is equipped with inner ducts for the water or air passage or for the passage of technological systems.

Other advantage is to propose a polygonal or curvilinear panel provided with a rounded vertical staff bead and to propose a panel for draining floors.
CLAIMS

1) Method for manufacturing a panel for furnishing and building by means of at least a mould (50) provided with a bottom (52), a perimetric inner edge (53) and closing means (51), characterized in that provides:
   - to position into the mould (50) a plurality of lath means (2);
   - to pour into the mould a resinous material (3) at fluid state;
   - to close the mould (50) by closing means (51);
   - to wait for the consolidation of resinous material (3);
   - to open the mould (50) and to extract the panel (1) including the resinous material (3) at solid state.

2) Method according to claim 1 characterized in that provides to position into the mould (50) at least a slab (4) fit for carrying out an in sight face of panel (1).

3) Method according to claim 2 characterized in that provides to position the slab (4) at the bottom (52) of mould (50) before pouring the resinous material (3) therein.

4) Method according to claim 1 characterized in that provides to position, before pouring the resinous material (3), at least at a portion of inner edge (53) of mould (50) at least a section bar (5), fit for carrying out an in sight edge of panel (1).

5) Method according to claim 1 characterized in that provides to position into the mould (50) the lath means (2) before the pouring of resinous material (3) or between two partial and subsequent pouring of said material resinous (3).

6) Method according to claim 1 characterized in that provides to spread at least in correspondence of bottom (52) of mould (50) a layer of inclusions in resinous matrix fit to carry out at least the in sight face of panel (1), before positioning and pouring.

7) Method according to claim 1 characterized in that provides to insert, ant before positioning and pouring, matrix means (56) mating the bottom (52) of mould (50) in order to obtain an in sight smooth, rough, embossed or brick, tile, stone or similar shaped face of panel (1).

8) Method according to claim 1 characterized in that provides to use the mould (50) having a
plan shaped as a rectangle, as a rectangle with at least a circular convex side or curvilinear or polygonal shaped, to obtain a likewise shaped panel (1).

9) Method according to claim 1 characterized in that provides to use the closing means (51) consisting of a cover or of an upper surface of a press.

10) Method according to claim 1 characterized in that provides to fix to the bottom (52) of mould (50), before each pouring and positioning in the mould (50), at least a window mean (54) fit for carrying out a window (6) for a sink, a tap or a hob.

11) Method according to claim 1 characterized in that provides to fix at least at a portion of perimetric inner edge (53) of mould (50), before each pouring and positioning, at least a reduction means (55) fit for reducing the dimensions of panel (1).

12) Method according to claim 1 characterized in that provides to position into the mould (50) the plurality of lath means (2) positioned almost parallel to a wider side of mould (50).

13) Method according to claim 1 characterized in that provides to position into the mould (50) the plurality of lath means (2) arranged for forming a network.

14) Method according to any of preceding claims characterized in that provides to reciprocally fix by gluing the faces not in sight of two panels (1) in order to obtain a double thickness panel.

15) Method according to claim 1 characterized in that provides to use lath means (2) having prismatic shape or curved section, solid or tubular, made of plastic, foam material at low density and/or water soluble.

16) Method according to claim 1 characterized in that provides to use material resinous (3) comprising inclusions or fragments or granulates of at least one among cable sheaths, car bumpers, plastic components also strengthen, tires fit for disposal, aluminum, fibers also vegetable, mineral granulate, synthetic and natural, organic and inorganic materials or hollow microspheres in a matrix of conglomerating resin also of expanding type.

17) Method according to claim 16 characterized in that provide to use a resinous material (3)
with a quantity of resinous matrix lower than the volume of interstices among the inclusions or fragments in order to carry out an in sight face of panel (1) of permeable draining type.

18) Method according to claim 2 characterized in that provides to use slabs (4) made of marble, granite, stone, ceramic, metal or made of mineral and/or organic, natural or artificial conglomerates, arranged in single body, in tiles or in fragments.

19) Method according to claim 6 characterized in that provides to use a layer of inclusions in resinous matrix, including powder or fragments of at least one among brick, mineral, glass, building material and mixture thereof, rubber or tire fragments, wood shavings, sawdust or woody fibers in a matrix of conglomerating resin also of expanding type.

20) Method according to claim 1 characterized in that provides to extract the lath means (2) after the consolidation of resinous material (3) and to use them again for carrying out further panels (1).

21) Method according to claim 1 characterized in that provides to eliminate the lath means (2) after the consolidation of resinous material (3).

22) Panel for furnishing and building manufactured according to method of one of claims 1 to 21 characterized in that includes at least a plurality of ribs (7) carried out in the resinous material (3) through a plurality of interposed lath means (2).

23) Panel according to claim 22 characterized in that the ribs (7) have an approximately rectangular, trapezoidal, polygonal or curved cross section.

24) Panel according to claim 22 characterized in that the ribs (7) are parallel to a longitudinal side of panel (1), they are mutually spaced apart of a distance ranging from 1 to 10 times their maximum thickness and they have a height ranging from 1 to 10 times their maximum thickness.

25) Panel according to claim 22 characterized in that includes at least one between slab (4) and section bar (5) fit for carrying out respectively an in sight face and an in sight edge of panel (1).
26) Panel according to claim 25 characterized in that the slab (4) has a thickness lower than about 13 mm.

27) Panel according to claim 22 characterized in that further includes at least a layer of inclusions in resinous matrix.

28) Panel according to claim 22 characterized in that includes a plurality of grooves (8) orthogonal and/or parallel to a longitudinal side of panel (1).

29) Panel according to claim 22 characterized in that includes a plurality of cavities (9) orthogonal and/or parallel to a longitudinal side of panel (1).

30) Panel according to claim 22 characterized in that has a rectangular plan shaped as a rectangle, a rectangle with at least a circular convex side or has a plan curvilinear or polygonal shaped.
### INTERNATIONAL SEARCH REPORT

**International Application No:** PC/17/IB 03/06041

**A. CLASSIFICATION OF SUBJECT MATTER**

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According to International Patent Classification (IPC) or to both national classification and IPC.

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched.

Electronic data base consulted during the international search (name of data base and, where practical, search terms used):

**EPO-Internal**

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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Further documents are listed in the continuation of box C. Patient family members are listed in annex.

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* Special categories of cited documents:
   - "A" document defining the general state of the art which is not considered to be of particular relevance.
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**Date of the actual completion of the International search:**

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**Name and mailing address of the ISA:**

European Patent Office, P.B. 5818 Patentlaan 2 NL–2280 HV Rijswijk

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**Authorized officer:**

Cordier, J
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