(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 141 399 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
15.03.2017 Bulletin 2017/11

(51) Int Cl.:
B44B 5/02 *(2006.01)* ***B44C 1/22*** *(2006.01)*
B44F 1/02 *(2006.01)*

(21) Application number: **16180441.4**

(22) Date of filing: **20.07.2016**

(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
Designated Validation States:
MA MD

(30) Priority: **11.09.2015 IT UB20153556**

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(54) IMPROVED PROCESS FOR PRODUCING METAL MOULDS, SUCH AS SHEETS, CYLINDERS AND THE LIKE PROVIDED WITH AT LEAST ONE STRUCTURED SURFACE AND METAL STAMPS OBTAINED WITH THIS PROCESS

(57) A process for producing a metal mould (1) provided with at least one structured surface (2) bearing a pattern (3) obtained by applying, to the surface (10) of an initial mould (4), a first protective layer (5) that reproduces said pattern (3) and subsequently treating the surface thus prepared with a corrosive substance suitable to create corroded portions (6), distinct from the uncorroded portions (7) coinciding with said protective layer (5). The invention also provides for applying, to the aforesaid surface (10) of the mould (4) a second protective layer (8) and subsequently treating the surface (10) thus obtained with a matting substance, suitable to form a structured surface (2) having corroded portions (6) with a degree of gloss different from that of the uncorroded portions (7).

In relation to the prior art, the process of the invention can be used to obtain a metal mould provided with at least one structured surface in which, as no additional materials are used with respect to those forming the actual mould, the production costs are lower and the method as a whole is also simpler, faster and more effective. In this way, the mould with structured surface of the invention is reliable and durable, also because the absence of coatings on the structured surface of the invention prevents adhesion of the panel to the surface of the mould.

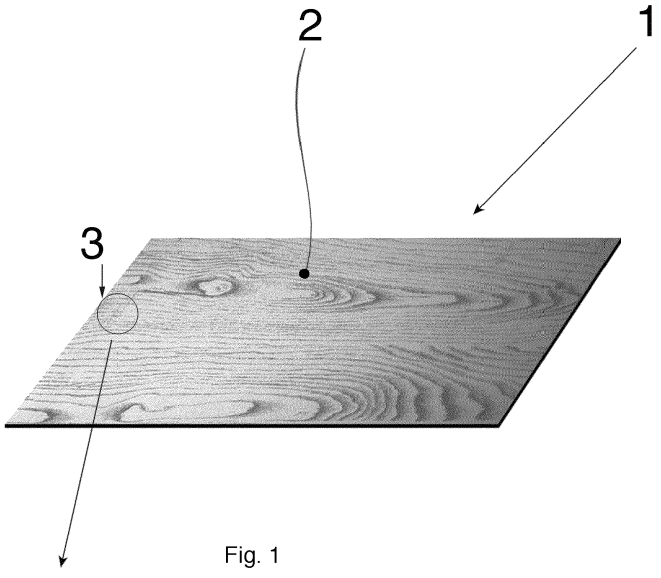

Fig. 1

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Description

[0001] The present invention relates to a process for producing metal moulds having at least one structured surface. The invention also concerns the sheets obtained with this process.

[0002] The field of application of the present invention is that of metal moulds, such as sheets, cylinders and the like, used to impress, on melamine faced chipboard panels, decorative plastic laminates and the like, motifs or patterns, for example imitating the grains of wood, of wood pore, of stones, or other geometrical patterns and the like. For this purpose, there are produced metal moulds provided with a structured surface, i.e. bearing the shape of the decorative pattern to be reproduced, which is transferred onto the respective panel by pressing.

[0003] Currently, metal moulds provided with structured surfaces are obtained by depositing layers or coatings of metal material (usually chrome) onto the structured surface, thereby obtaining a raised pattern that, after it has been stamped on the panel to be decorated, also has different degrees of matt (EP 2 060 658 B1).

[0004] However, the prior art described above has the drawback that, to obtain the different degrees of gloss on the structured surface of the mould, requires the use of auxiliary metal materials, which entails both specific raw material and processing costs, and drawbacks linked to adhesion of these metallic coatings on the structured surface of the mould.

[0005] The aforesaid prior art also has the disadvantage of allowing only a very limited range of degrees of gloss to be obtained, which in turn depend on the nature of the specific material used to reach the desired gloss effect.

[0006] The main object of the present invention is to provide an improved process for producing metal moulds provided with at least one structured surface which, unlike the prior art methods of this type, is simpler, more reliable and less costly.

[0007] In particular, an object of the invention is to provide a process of the aforesaid type, with which it is possible to obtain a structured surface from the same material of which the base mould is made and therefore without requiring to deposit coatings of auxiliary materials.

[0008] A further object of the invention is to provide a process of the aforesaid type which, unlike analogous prior art solutions, allows a wider range of degrees of gloss to be obtained.

[0009] These and other objects are achieved with the process and the metal mould of claims 1 and 4 respectively. Preferred methods of carrying out the invention are described in the remaining claims.

[0010] In relation to the prior art described above, the process of the invention makes it possible to obtain a metal mould provided with at least one structured surface in which, as no additional materials are used with respect to the material of which the actual mould is made, the production costs are lower and the method as a whole is also simpler, faster and more effective. In this way, the mould with structured surface of the invention is made reliable and durable, also because the absence of coatings on the structured surface prevents adhesion of the panel thereto.

[0011] Moreover, the use of a matting solution makes it possible to obtain structured surfaces capable of giving the pattern different degrees of matt and glossy-matt nuances that are more numerous, marked and evident with respect to those that can be obtained with conventional surfaces, structured by means of additional metallic coatings.

[0012] These and other objects, advantages and features are apparent from the description below of a preferred method of carrying out the process and producing the metal mould of the invention illustrated, by way of non-limiting example, in the accompanying drawings, wherein:

- Fig.1 illustrates the structured surface of an example of metal mould of the invention;
- Fig. 2 illustrates an enlargement of the detail of the pattern 3 of Fig. 1, and
- Figs. 3a to 3f schematically illustrate the different steps of carrying out the process of the invention.

[0013] The metal mould of the invention, which in the example illustrated in the figures and described herein consists of a sheet, is indicated as a whole with 1 in Fig. 1. This comprises in particular a structured surface 2, bearing patterns or ornamental motifs 3 obtained by photo etching or using another technique for engraving said patterns on the metal surface 2 of the sheet 1. The enlargement of an example of pattern 3 of the sheet of the invention is represented in Fig. 2.

[0014] For this purpose, the structured surface obtained with the process of the invention is prepared from an initial sheet 4 in raw state (Fig. 3a), the surface 10 of which has previously been ground. This surface 10 is therefore partially coated with a first layer 5 of resin, which reproduces the shape to be produced on the structured surface 2 of the sheet 1 of Fig. 1, for example by screen printing or with other suitable digital systems (Fig. 3b).

[0015] The sheet thus prepared is then placed in contact with a corrosive solution, that etches corroded portions 6 on the surface 10 of the sheet 4 not covered by the protective layer 5 (Fig. 3c). In this way, by removing the layer of protective resin 5 from the aforesaid surface 10, on the sheet of Fig. 3d there remains the pattern formed by the corroded portions 6 together with the uncorroded portions 7, these latter corresponding to the portion of surface of the initial sheet 4 that was protected with the layer 5. A second protective layer 8 is then applied to the uncorroded portions 7 of the sheet 4, and the surface of the sheet thus obtained is subsequently treated with a matting solution suitable to create, on the unprotected corroded portions 6, a degree of matt gloss

(Fig. 3e). At this point, after having removed the second protective layer 8, the structured surface 2 of Fig. 1 is obtained on the final sheet 1 of Fig. 3f, the pattern 3 of which is obtained by the combination of the glossy uncorroded portions 7 and of the corroded portions 9 having a degree of matt gloss (Fig. 2).

[0016] Modifications can be made to the invention to produce variants that nonetheless fall within the scope of the claims below. Therefore, for example, the second protective layer 8 could be applied to the corroded portions 6 of the sheet of Fig. 3e, in this case obtaining a reverse distribution of the degrees of gloss with respect to that of Fig. 3f. Moreover, the sheet 1 of Fig. 1 could also have a structured surface on the opposite side to the one in view in the figure, thereby making it suitable for the simultaneous moulding of a panel on each face of the same sheet 1.

[0017] Moreover, the distribution of the areas with different degree of gloss can be any, as a function of the pattern and of the aesthetic effect to be obtained.

[0018] Finally, the mould of the invention, which can also have different forms to that of the sheet of Fig. 1, such as a cylinder and the like, is suitable for moulding decorative plastic laminates and faced chipboard panels.

Claims

1. Process for producing a metal mould (1) provided with at least one structured surface (2) bearing a pattern or ornamental motif (3) obtained by applying, to the surface (10) of an initial mould (4), a first protective layer (5) that reproduces said pattern or ornamental motif (3) and subsequently treating the surface thus prepared with a corrosive substance suitable to create corroded portions (6), distinct from the uncorroded portions (7) coinciding with said protective layer (5), **characterised in that** it also provides applying, to the aforesaid surface (10) of the mould (4), a second protective layer (8) and subsequent treating the said surface (10) thus obtained with a matting substance, suitable to form a structured surface (2) having corroded portions (6) with a different degree of gloss to that of the aforesaid uncorroded portions (7).

2. Process according to claim 1, **characterised in that** the aforesaid second protective layer (8) is applied to said uncorroded portions (7), so as to obtain corroded portions (9) with a degree of matt gloss.

3. Process according to claim 1, **characterised in that** said second protective layer (8) is applied to the aforesaid corroded portions (6), thereby obtaining uncorroded portions (7) having a degree of matt gloss.

4. Metal mould, **characterised in that** it has at least one structured surface (2) bearing a pattern or an ornamental motif (3) obtained with the process according to one or more of the preceding claims.

5. Metal mould according to claim 4, **characterised in that** it is a sheet, a cylinder and the like.

6. Decorative plastic laminate, **characterised in that** it is obtained by moulding with the mould according to claim 4.

7. Faced chipboard panel, **characterised in that** it is obtained by moulding with the mould according to claim 4.

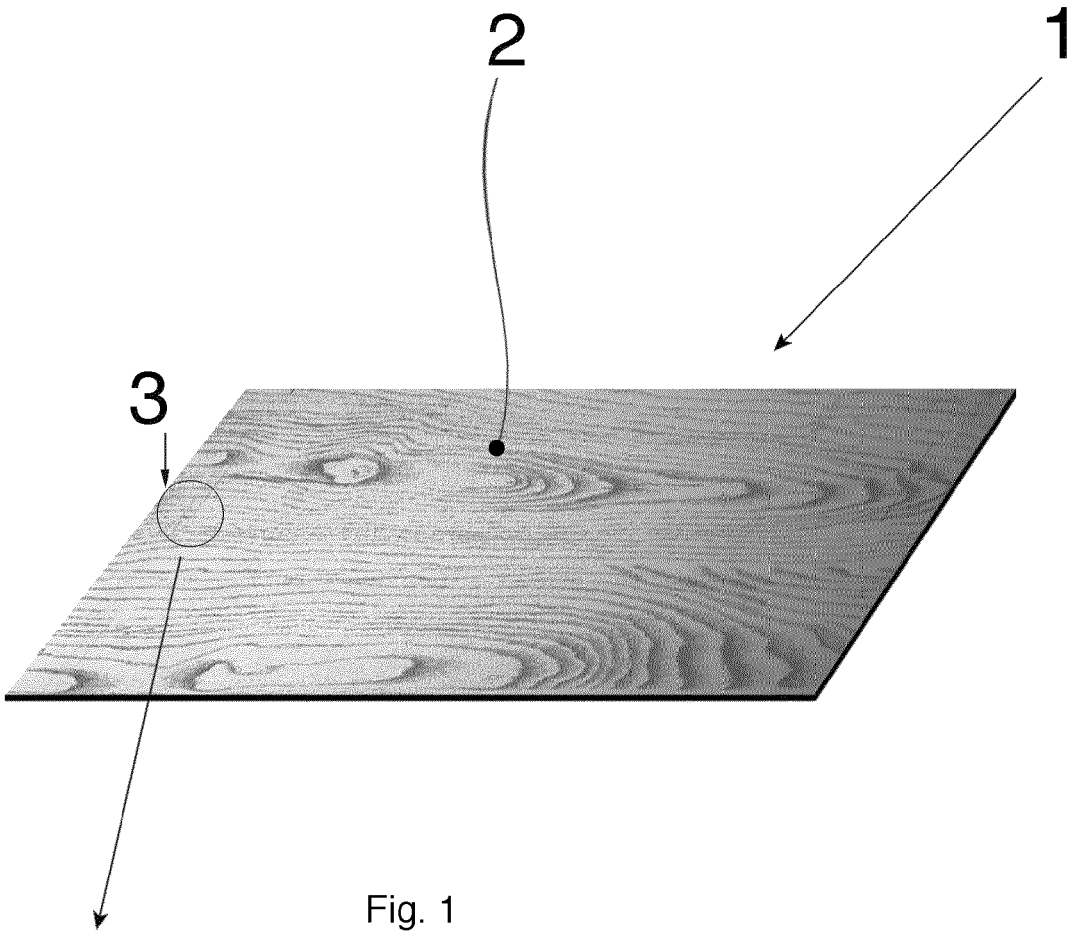

Fig. 1

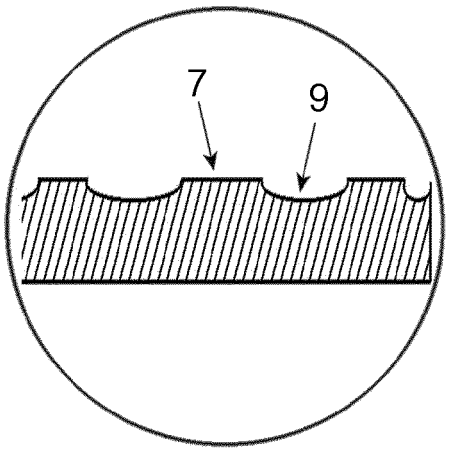

Fig. 2

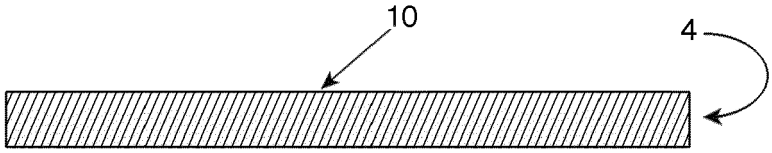

Fig. 3a

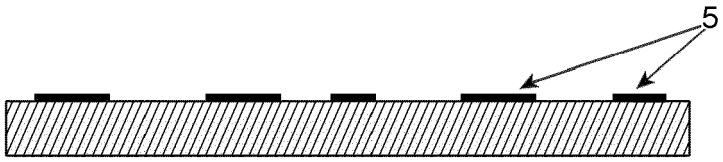

Fig. 3b

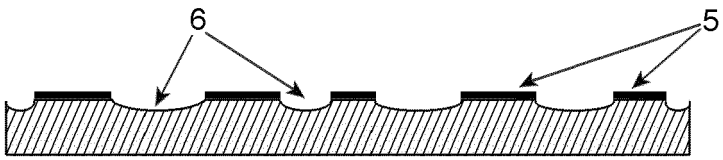

Fig. 3c

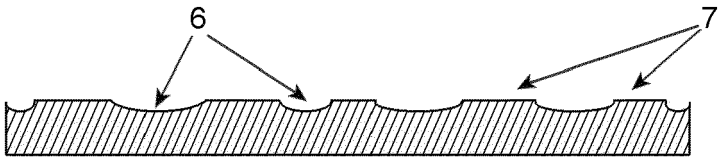

Fig. 3d

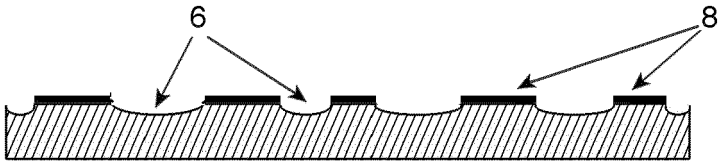

Fig. 3e

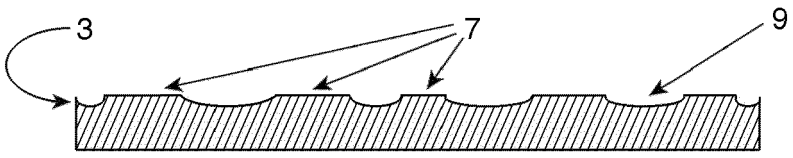

Fig. 3f

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EUROPEAN SEARCH REPORT

Application Number
EP 16 18 0441

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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B44B
B44C
B44F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 January 2017	Kelliher, Cormac

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