Disclosed therein is a flooring, which can secure environment-friendliness by forming a surface layer laminated on an upper face of a base layer using PLA (Poly Lactic Acid) resin instead of wood, easily provide a handcraft surface texture by applying a curved pattern onto the surface of the surface layer using embossing rollers at the time that the surface layer is manufactured, and prevent compression, scratches, discoloration, and so on in comparison with woods. The flooring constructed on a floor of a building includes: a base layer made from one of an MDF, an HDF, and a plywood; and a surface layer having a reinforced layer, a printed layer, and a transparent layer which are laminated on an upper face of the base layer in order, at least one of the layers being made of PLA (Poly Lactic Acid) resin. A curved pattern is formed on an upper face of the surface layer.
FLOORING HAVING PLA LAYER

TECHNICAL FIELD

[0001] The present invention relates to a flooring, and more particularly, to a flooring which can easily provide a handcraft effect to enhance a natural surface texture of the flooring and can prevent compression, scratch, discoloration, and so on.

BACKGROUND ART

[0002] In general, flooring is constructed in order to cover and decorate a concrete surface constructed on an interior floor of a building to thereby show a high-grade interior atmosphere and provide a natural wood texture effect.

[0003] With a development of plywood manufacturing technology, a hardwood utilization has been increased, and various kinds of plywood with good properties have been provided. Plywood is manufactured through the steps of: rounding off hardwood thinly without directly cutting the hardwood into a lumber or a board; cutting the thin wood board; laminating the thin boards in such a fashion that wood grains are arranged at right angles to each other; bonding the thin boards with adhesives so as to form a plate body of a predetermined thickness.

[0004] The plywood manufactured through the above steps has little distortion because it does not have a uniform grain direction in comparison with wooden boards having grains, and provides an enhanced tolerance in all directions. However, such plywood has a problem in that it is deteriorated in decorative feature because it has no pattern, such as wood grains, due to the nature of the manufacturing process.

[0005] Accordingly, in order to use the plywood for flooring or other construction materials, the surface of the plywood is decorated to have a pattern like a sliced veneer and coated with resin varnish to thereby have water resistance and tolerance against scratches.

[0006] As an example of methods of manufacturing such a flooring, there is a method of manufacturing a floor board by bonding a decorative veneer onto the upper surface of plywood with urea resins, but the flooring manufacturing method has a disadvantage in that manufacturing costs are increased and water resistance and thermal resistance are very weak.

[0007] Moreover, the flooring using wood provides a handcraft effect to secure reality, but it is difficult to secure productivity because the handcraft effect is obtained by manual labor. Particularly, the flooring has several problems in that it is difficult to show the handcraft effect using sliced veneers of 0.5 mm which are generally used, and in that manufacturing costs are increased because hardwood of at least 2 mm is used.

DISCLOSURE OF INVENTION

Technical Problem

[0008] Accordingly, the present invention has been made in an effort to solve the above-mentioned problems occurring in the prior arts, and it is an object of the present invention to provide a flooring, which can secure environment-friendliness by forming a surface layer laminated on an upper face of a base layer using PLA (Poly Lactic Acid) resin instead of wood, easily provide a handcraft surface texture by applying a curved pattern onto the surface of the surface layer using embossing rollers at the time that the surface layer is manufactured, and prevent compression, scratches, discoloration, and so on in comparison with woods.

Solution to Problem

[0009] To achieve the above objects, the present invention provides a flooring, which is constructed on a floor of a building, including: a base layer made from one of an MDF, an HDF, and a plywood; and a surface layer having a reinforced layer, a printed layer, and a transparent layer which are laminated on an upper face of the base layer in order, at least one of the layers being made of PLA (Poly Lactic Acid) resin, wherein a curved pattern is formed on an upper face of the surface layer.

[0010] The flooring provides a handcraft surface texture by forming a curved pattern on the upper face of the surface layer.

[0011] In this instance, the curved pattern is formed through a compression process of passing the surface layer between a pair of embossing rollers which are rotated by receiving a driving force from a motor.

[0012] Moreover, at least one of the embossing rollers includes a protrusion part of a predetermined shape disposed on an outer circumferential surface thereof to form the curved pattern by pressing one side of the surface layer.

[0013] Furthermore, the surface layer is laminated on an upper face of the base layer by a medium of a bonding layer of thermostetting melamine resin.

[0014] Additionally, the surface layer includes a UV coated layer laminated on the upper surface thereof.

[0015] In addition, the flooring further includes a balance layer disposed below the base layer for balancing against curling of upper and lower parts of the flooring.

Advantageous Effects of Invention

[0016] The flooring according to the present invention can secure environment-friendliness and reduce manufacturing costs by forming the surface layer laminated on the upper face of the base layer using PLA (Poly Lactic Acid) resin instead of wood, easily provide a handcraft surface texture by applying a curved pattern onto the surface of the surface layer using embossing rollers at the time that the surface layer is manufactured, and prevent compression, scratches, discoloration, and so on in comparison with woods to thereby secure good surface properties.

BRIEF DESCRIPTION OF DRAWINGS

[0017] FIG. 1 is a sectional view of a flooring according to the present invention.

[0018] FIG. 2 is a photograph showing a curved pattern of the flooring according to the present invention.

[0019] FIG. 3 is a photograph showing a pressurizing device for forming the curved pattern.

[0020] FIG. 4 is a photograph showing a pair of embossing rollers disposed on the pressurizing device.

MODE FOR THE INVENTION

[0021] Reference will be now made in detail to the preferred embodiment of the present invention with reference to the attached drawings.

[0022] In the drawings, the same components have the same reference numerals even though they are illustrated in different figures.
[0023] FIG. 1 is a sectional view of a flooring according to the present invention, and FIG. 2 is a photograph showing a curved pattern of the flooring according to the present invention.

[0024] Referring to FIGS. 1 and 2, the flooring 100 according to a preferred embodiment of the present invention is constructed on the floor of a building, and includes: a base layer 110; and a surface layer 130 having a reinforced layer 131, a printed layer 133, and a transparent layer 135 laminated on an upper face of the base layer 110 in order, at least one of the layers being made of PLA (Poly Lactic Acid) resin. A curved pattern 137 is formed on an upper face of the surface layer 130.

[0025] Here, it is preferable that the curved pattern 137 is formed through a process of compressing the surface layer 130 after passing the surface layer 130 between a pair of rotating embossing rollers (R). (See FIG. 3)

[0026] In this instance, a pair of the embossing rollers (R) keep a predetermined interval therebetween so as to form the curved pattern 137 with a predetermined pressure without mangling the upper face of the surface layer 130 which is impressed in one direction. Moreover, at least one of the embossing rollers (R) has a protrusion (R1) of a predetermined shape disposed on an outer circumferential surface thereof so as to form the curved pattern 137 by compressing one side of the surface layer 130. Here, it is preferable that the protrusion (R1) is formed on the upper roller. (See FIG. 4)

[0027] The embossing rollers (R) repeatedly form the curved pattern 137 along a longitudinal direction of the upper face of the surface layer 130 put into one side while rotating at a predetermined speed by receiving a driving force from a motor (not shown in the drawings) disposed at one side of the embossing roller (R).

[0028] In the meantime, the base layer 110 is to provide a volume of a predetermined thickness to the flooring. Such a base layer 110 may be made from one of MDF (Medium Density Fiberboard), HDF (High Density Fiberboard), and plywood. As well known, the MDF and the HDF are manufactured through the steps of: grinding hardwood into powder; mixing glue to the powder and massing the mixture into a lump; and compressing the mixture into a board-like plywood.

[0029] In more detail, because the MDF has uniform fiber distribution on the whole thickness and compact texture, it is suitable for complicated machine working carried out without breaks of faces or sides. Furthermore, the MDF is very suitable for overlaying or painting decorative films or veneers because it has a strong and smooth surface. Additionally, the MDF is used as a material for sides of a drawer, cabinet rails, mirror frames, moldings, and floorings.

[0030] The HDF is widely used as a plywood substitute, a furniture material, and a laminate floor because it is 900 kg/m in density and is higher in intensity than the MDF.

[0031] Moreover, the PLA (Poly Lactic Acid) resin of the surface layer 130 is lactide or lactic acid thermoplastic polyester, and may be manufactured by polymerizing lactic acid which is manufactured by fermenting starch extracted from corns, potatoes, or others.

[0032] Such a PLA resin has merits in that it can solve problems due to depletion of oil resources because it is renewable, and in that it is still lower in environment-harmful materials release amount and is more rapid in decomposition rate than other resins, for instance, vinyl chloride.

[0033] The PLA resin may be divided into a crystalline PLA (c-PLA) resin and an amorphous PLA (a-PLA) resin. Because the crystalline PLA resin may cause bleeding that plasticizer flows out of the surface of sheets, the present invention uses the amorphous PLA resin.

[0034] It is preferable to use 100% amorphous PLA resin, but as occasion demands, a PLA resin which has crystalline and amorphous structures may be used.

[0035] Furthermore, the PLA resin may contain nonphthalate-based plasticizer for forming or acrylic copolymer, calcium carbonate, silica gel, and titanium oxide as a filler for re-inforcing melt strength. In this instance, the plasticizer is an additive used for providing physical properties, such as processability, flexibility, and others, according to use purposes, and in the present invention, the nonphthalate-based plasticizer which is not harmful to the human body is used.

[0036] The surface layer 130 having the above materials and structure is laminated on the upper face of the base layer 110 by a medium of a bonding layer 110 of thermosetting melamine resin.

[0037] Additionally, a UV coated layer 139 is laminated on the upper face of the surface layer 130 for protecting the surface layer 130 so as to secure good surface properties by preventing compression, scratch, discoloration, and so on in comparison with wood.

[0038] In addition, the flooring may further include a balance layer (not shown in the drawings) disposed below the base layer 110 for balancing against curling of upper and lower parts of the flooring 100.

[0039] As described above, the flooring 100 according to the present invention can provide the surface texture, which is looked as if a worker rounds off the surface of the surface layer 130 of the flooring using a tool such as a plane, by the curved pattern 137 formed through the process of compressing the surface layer 130 after passing the surface layer 130 between the rotating embossing rollers (R) and, hence, can provide a handcraft aesthetic sense to consumers who use the flooring 100.

[0040] While the present invention has been particularly shown and described with reference to the preferable embodiment thereof, it will be understood by those of ordinary skill in the art that the present invention is not limited to the above embodiment and various changes may be made therein without departing from the technical idea of the present invention.

\begin{center}
\textit{Explanation of essential reference numerals in drawings}\\

100: flooring \hspace{1cm} 110: base layer \\
120: bonding layer \hspace{1cm} 130: surface layer \\
131: reinforced layer \hspace{1cm} 133: printed layer \\
135: transparent layer \hspace{1cm} 137: curved pattern \\
139: UV coated layer
\end{center}

1. A flooring constructed on a floor of a building, the flooring comprising: a base layer made from one of an MDF, an HDF, and a plywood; and a surface layer having a reinforced layer, a printed layer, and a transparent layer which are laminated on an upper face of the base layer in order, at least one of the layers being made of PLA (Poly Lactic Acid) resin, wherein a curved pattern is formed on an upper face of the surface layer.
2. The flooring according to claim 1, wherein the curved pattern is formed through a process of compressing the surface layer after passing the surface layer between a pair of rotating embossing rollers.

3. The flooring according to claim 2, wherein at least one of the embossing rollers has a protrusion of a predetermined shape disposed on an outer circumferential surface thereof so as to form the curved pattern by compressing one side of the surface layer.

4. The flooring according to claim 1, wherein the surface layer is laminated on an upper face of the base layer by a medium of a bonding layer of thermosetting melamine resin.

5. The flooring according to claim 4, wherein the surface layer comprises a UV coated layer laminated on the upper surface thereof.

6. The flooring according to claim 1, further comprising a balance layer disposed below the base layer for balancing against curling of upper and lower parts of the flooring.

7. The flooring according to claim 2, wherein the surface layer is laminated on an upper face of the base layer by a medium of a bonding layer of thermosetting melamine resin.

8. The flooring according to claim 3, wherein the surface layer is laminated on an upper face of the base layer by a medium of a bonding layer of thermosetting melamine resin.

9. The flooring according to claim 7, wherein the surface layer comprises a UV coated layer laminated on the upper surface thereof.

10. The flooring according to claim 8, wherein the surface layer comprises a UV coated layer laminated on the upper surface thereof.

11. The flooring according to claim 5, further comprising a balance layer disposed below the base layer for balancing against curling of upper and lower parts of the flooring.

12. The flooring according to claim 9, further comprising a balance layer disposed below the base layer for balancing against curling of upper and lower parts of the flooring.

13. The flooring according to claim 10, further comprising a balance layer disposed below the base layer for balancing against curling of upper and lower parts of the flooring.

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