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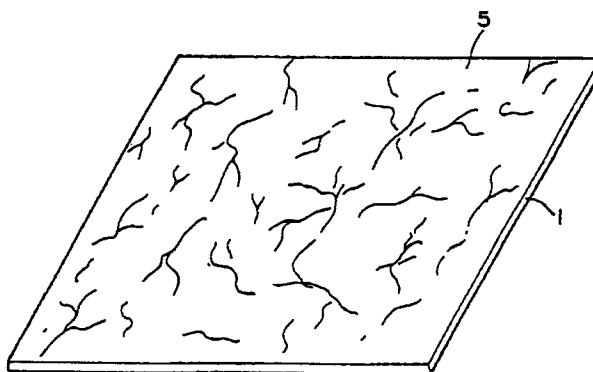
Decorative board and method for producing the same.

A decorative board having the marble-like pattern on its surface and a method for producing the board are disclosed.

In the decorative board, a coating layer of a non-transparent paint containing resin component and 10 to 20 wt% of pigment is formed on the surface of a cork board. The viscosity of the non-transparent paint is not higher than 100 cps, and the coating amount of the non-transparent paint directly after its application is not higher than 15 g/m².

The marble-like gradation pattern is formed in the coating layer as a result of the difference in absorptivity of the cork board.

FIG. 4



Decorative Board and Method For Producing the Same

BACKGROUND OF THE INVENTION

Field of the Invention

This invention relates to a decorative board useful so as variety of woodwork and construction materials and a method for producing the same. More particularly, it relates to a decorative board presenting a marble-like pattern on its surface, and a method for producing the same.

Description of the Prior Art

Recently, marble-like decorative surface patterns are frequently used in the designing of the interior construction materials or pieces of furniture. Since the marble itself is expensive, a decorative board having a marble-like pattern printed on its surface, that is, so-called printed plywood, has come to be used extensively.

The decorative board having the marble-like pattern printed on its surface is a plywood board on whose surface a coating layer resembling the surface of natural marble is applied by printing. Although such decorative board is producible in larger quantities and inexpensive, it is destitute of the feeling of natural marble and the sense of high quality goods, while the produced pattern tends to be free of variations proper to natural marble.

As a means to obviate the above inconveniences, it may be contemplated to realize the unique pattern on the plywood surface by hand drawing after the surface patterns of natural marble.

However with hand drawing, the operators' labor is intolerably increased so that mass production becomes almost impossible.

SUMMARY OF THE INVENTION

In view of the above inconveniences of the prior art, it is an object of the present invention to provide a decorative board having a massive feeling or sense similar to that of natural marble and presenting delicate difference in feeling from one board to another.

It is another object of the present invention to provide a method for producing the decorative board in larger quantities without resorting to com-

plicated printing or laborious hand drawing.

The present inventors have found that the difference in absorptivity to the paint of a cork board obtained upon molding the chipped cork may be utilized for generating the marble-like gradation pattern on the cork plate surface. Such finding has led to fulfillment of the present invention.

In the decorative board of the present invention, a coating layer of a non-transparent paint containing a resin component and a pigment component is formed on the surface of a cork board obtained upon molding chipped cork with a suitable resin binder or adhesive. The marble-like gradation pattern is formed in the coating layer as a result of the difference in absorptivity of the cork board.

According to the method for producing the decorative board of the present invention, a non-transparent paint containing a resin component and a pigment component and having a viscosity of not higher than 100 cps is coated on the surface of the cork board obtained upon molding chipped cork in the presence of the resin binder, and the marble-like gradation pattern is formed as a result of the difference in absorptivity of the various surface areas of the cork board.

The decorative board of the present invention is useful in the field of interior decoration, as a result of the complicated and peculiar marble-like pattern formed on its surface, despite the fact that the pattern is formed simply upon forming the coating layer on the cork board.

Also, according to the method of the present invention, the decorative board superior in massive feeling and the sense of high quality goods can be produced in larger quantities.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a diagrammatic perspective view of a cork board.

Fig. 2 is a partial enlarged plan view of the cork board.

Fig. 3 is a partial enlarged sectional view for illustrating the state of formation of the marble-like gradation pattern.

Fig. 4 is a diagrammatic perspective view of the decorative board to which the present invention is applied.

Fig. 5 is a perspective view showing a typical flow coater employed for producing the decorative board of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

The decorative board of the present invention has a marble-like gradation pattern formed on its surface under utilization of the textural pattern of a cork base plate or board.

When a conventional white paint or the like paint is applied on the cork board, the textural pattern of the cork board is covered by the pigment component so that the resulting coated board cannot present an appearance different from that of other conventional coated boards. On the other hand, when the highly transparent paint or coating composition such as stain or varnish is employed, the result is simply that the textural pattern of the cork may be seen through the transparent coating film.

According to the present invention, the amount of the pigment contained in the coating film formed on the surface of the cork board is defined so as to generate the marble-like gradation pattern on the cork board surface.

When producing a cork board, shown in Fig. 1, the crude cork, that is, the bark of the cork oak, is chipped by a granulator and the resulting chips are admixed with a resin binder as an adhesive and formed into a board under application of elevated pressure and temperature. Thus the cork board 1 is in the form of a molded mass of an extremely large number of cork granules 2.

It is desirable that the cork granules 2 constituting the cork board 1 vary in size and absorptivity to the paint. For this reason, it is preferred that the inner and outer bark portions of the cork oak be used as a mixture as the starting material.

The surface 1A of the cork board 1 obtained upon molding presents a large number of minute recesses 2 and crevice-like gaps or interstices 4 as a result of pressure molding of a large number of the cork granules of irregular shapes, as shown in Fig. 2.

The cork board 1 may be in the form of a panel, board or block, as desired.

As shown in Fig. 3, the surface 1A of the cork board 1 is coated with a non-transparent paint containing the resin component and the pigment, so that, as shown in Fig. 4, a coating layer 5 presenting a marble-like pattern is formed on the surface 1A.

In more detail, the coating film layer 5 applied to the surface 1A of the cork board 1 is absorbed into the recesses 3 or gaps 4 on the board 1 or into the cork granules 2a having higher absorptivity to the paint, such that the coating layer 5 remains as a thin film on the surface 1A and the textural color may be seen through the film at some portion of

the board. On the contrary, the coating layer 5 applied on the cork granules 2b having a lower absorptivity to the paint is absorbed into these granules only in minor amounts so that it remains as a thick film and strongly presents the pigment hue. In this manner, the coating layer 5 having locally different gradations in color tone and hence a marble-like pattern is formed on the surface 1A of the board 1.

The above pattern can be variegated as a result of a suitable selection of the molding conditions of the cork board 1, such as, for instance, the size of the cork granules.

It is noted that the percentage of the pigment contained in the coating layer 5 is critical in producing the above pattern. Thus, with excess pigment contents, the coated surface in its entirety becomes monotonous in color tint. According to the present invention, the contents of the resin component and the pigment component in the coating layer 5 are selected to be 80 to 90 percent by weight and 10 to 20 percent by weight, respectively. With the pigment contents in excess of the above range, the textural pattern of the cork board 1 is covered and is not seen visually. On the contrary, with the pigment contents lower than the above range, the textural pattern may be seen excessively through the layer. In either cases, the marble-like pattern is not obtained.

As the resin component employed for formation of the coating layer 5, any of the well-known resin materials may be employed. However, in view of pliability, urethane and acrylic resins are most preferred. As the pigment, any of the well-known pigments presenting a white or gray color or a color similar to the textural color of the marble may be employed. Titanium white is most preferred. Other color pigments may be employed simultaneously depending on the desired color tone of the decorative board.

For generating the above described marble-like gradation pattern on the surface 1A of the cork board 1, the above described non-transparent paint may be applied to the board 1 by some means or other. In view of mass producibility, a so-called flow coater is most preferred. It is difficult to produce a satisfactory marble-like pattern with the spray or roll coating.

The flow coater is shown for example in a perspective view of Fig. 5 and composed of a head 11 for causing the paint to flow down as a thin curtain of a predetermined width, a pump 12 for supplying the paint to the head 11 and a conveyor 13 for conveying an article to be painted through the paint curtain. Thus the viscosity of the paint is utilized effectively for applying the paint itself on the article in an undistorted form.

The head 11 includes a pair of head blocks 14,

14 at a predetermined gap therebetween and above the conveyor 13. The gap size may be positively set by a constant pressure device and a stop device such that the coating volume of the paint may be adjusted by adjusting the gap size.

The paint is stored in a paint reservoir 15 and supplied by a pump 16 into the head 11 via supply pipe 17.

The conveyor 13 is formed by a belt 19 of synthetic resin placed between a pair of wide rolls 18, 18. The cork board 1 is placed on the belt 19 and passed through the curtain of the paint 20 at the head 11 so that the paint is applied to the surface 11A.

Although the coating by the flow coater may be effected only once and for all, it is preferred that the coating be effected two or more times. At any rate, the number of times of the coating operations may be suitably set in dependence upon the absorptivity of the paint to the cork board 1.

In coating, the composition, viscosity and the coating volume represent critical factors.

In view of the aforementioned percentage of the pigment in the coating layer 5, it is preferred that the composition of the non-transparent paint be 35 to 40 percent by weight of the resin component, 5 to 10 percent by weight of the pigment and 50 to 60 percent by weight of the solvent. However, such composition may be changed slightly depending on the kinds of the resin component. It is preferred above all that the solvent contents be suitably adjusted so that the viscosity of the non-transparent paint is not higher than 100 cps. The reason is that, with the viscosity of the non-transparent paint in excess of 100 cps, the paint is lowered in fluidity and absorptivity to the cork board 1.

The coating amount of the non-transparent paint directly after its application should be not higher than 15 g/m², in view that an excess coating amount of the non-transparent paint results in covering or concealing the textural pattern of the cork board 1. However, with too small a coating amount, the textural pattern of the cork board 1 may be seen through excessively so that the feeling of the marble cannot be exhibited on the decorative board. Therefore, the non-transparent paint may be used in an amount not lower than 3 g/m² and preferably not lower than 5 g/m².

For preparing the non-transparent paint, the various components may be mixed simultaneously. However, in view of the different handling properties of these components, the paint portion including the resin and the pigment, the hardener portion including the hardener and the solvent portion including a mixture of various solvents may be prepared separately and mixed at a predetermined ratio at the time of the coating operation. The

relative compositions of the paint, hardener and the solvent portions may be suitably selected so that the aforementioned composition may be realized ultimately. Thus the mixture ratio of the paint portion to the hardener portion may be selected to be 1 to 1, 2 to 1, 3 to 1, 4 to 1, 10 to 1 or 15 to 1, for example, according to the respective compositions. The coated non-transparent paint usually undergoes a drying step so as to be formed into a coating layer. For drying, spontaneous drying or hot-air drying may be used. Above all, drying by infrared or far-infrared rays is most preferred. With the use of infrared or far-infrared rays for drying, the paint may be dried promptly resulting in a shortened drying time and improved mass-productibility.

Example

The cork oak was barked and dried to a crude cork material which was then chipped in a granulator, admixed with a resin binder, mixed under agitation and solidified under application of elevated pressure and temperature. As the resin binder, the phenolic resin admixed with a minor amount of glycol was employed.

The solidified product was cut into a plate and the plate surface was ground to produce a cork board consisting essentially of a molded mass of an extremely large number of crushed chip granules.

On the other hand, the paint A or coating material and the hardener B having the following compositions were mixed at a ratio of 4 to 1 and the resulting mixture was admixed and diluted with a solvent C to a viscosity cup of 20 seconds or about 60 cps to produce the non-transparent paint.

Paint A

acrylic urethane resin	50 wt. %
colored pigment (TiO ₂)	10 wt. %
additive	1.1 wt. %
aromatic hydrocarbons	24.3 wt. %
ester of acetic acid	8.3 wt. %
methylethylketone	8.3 wt. %

Hardener B

polyisocyanate	75.0 wt. %
aromatic hydrocarbons	12.5 wt. %
ester of acetic acid	12.5 wt. %

Solvent C

aromatic hydrocarbons 55.0 wt. %
 ester of acetic acid 35.0 wt. %
 methylethylketone 10.0 wt. %

The prepared paint was uniformly applied twice on the overall surface of the cork board using a flow coater manufactured by Iwata Tosokiko K.K., Japan. The coated paint was then dried by a far-infrared ray drier.

The produced decorative board presented a marble-like gradation pattern on its surface and resembled natural marble in appearance. Thus the paint was absorbed into the cork board at the crevice-like gaps and left on the surface as a thin film portion so that the textural color of the cork was exhibited slightly, while the paint was not absorbed on the flattened portions of the cork board surface and thus left on the surface as a thick film portion.

Moreover, changes in the gradation in the color tone were caused gradually between these thick and thin film portions such that unique pattern similar to the surface pattern on the natural marble was realized on the surface of the decorative board.

Claims

1. A decorative board comprising a cork board formed of chipped cork bonded with a resin binder, and a coating layer formed on said cork board, said layer being formed by applying a non-transparent coating material containing a resin component and pigment on said cork board for generating a marble-like gradation pattern according to the difference in absorptivity of various portions of said board.

2. A decorative board according to claim 1, wherein said coating layer contains 80 to 90 wt% of a resin component and 10 to 20 wt% of pigment.

3. A decorative board according to claim 1 or 2, wherein said resin component is urethane-base resin and said pigment is titanium white.

4. A method for producing the decorative board comprising applying a non-transparent coating material containing resin component, pigment and a solvent and having a viscosity not higher than 100 cps onto the surface of a cork board formed of chipped cork bonded with a resin binder for generating a marble-like gradation pattern of said board according to the absorptivity thereof.

5. A method for producing the decorative board according to claim 4, wherein said non-transparent coating material contains 35 to 40 wt% of resin component, 5 to 10 wt% of pigment and 50 to 60 wt% of solvent.

6. A method for producing the decorative board according to claim 4 or 5, wherein said non-transparent coating material is applied so that the applied quantity is not larger than 15 g/m².

7. A method for producing the decorative board according to claim 4 to 6, wherein said non-transparent coating material is applied with a flow coater onto the surface of said cork board.

8. A method for producing the decorative board according to claim 4 wherein the coated non-transparent coating material is dried with infrared or far infrared rays.

FIG.1

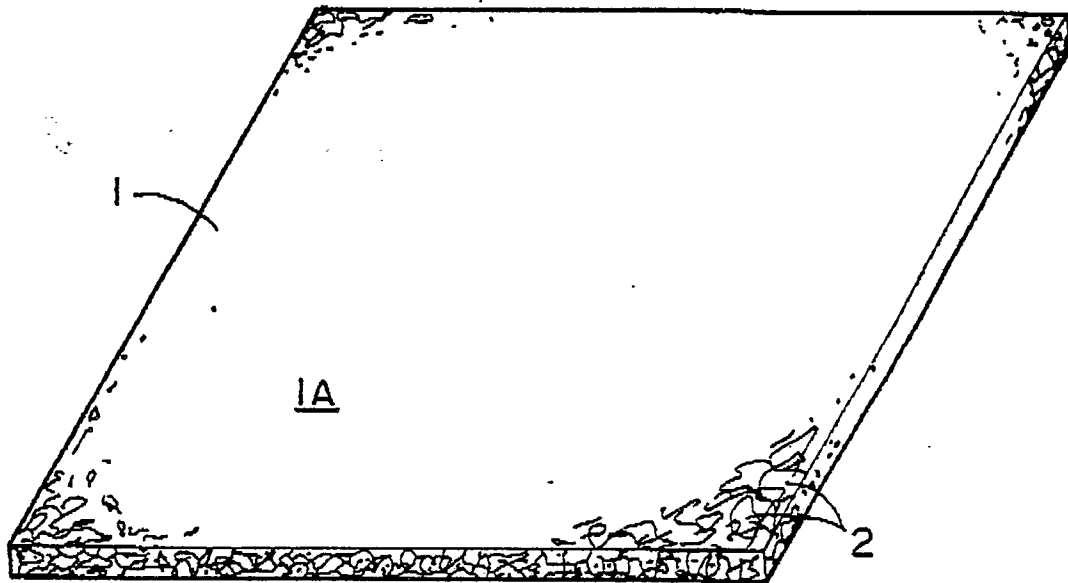


FIG.2

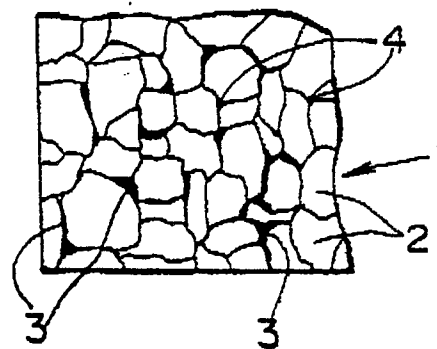


FIG. 3

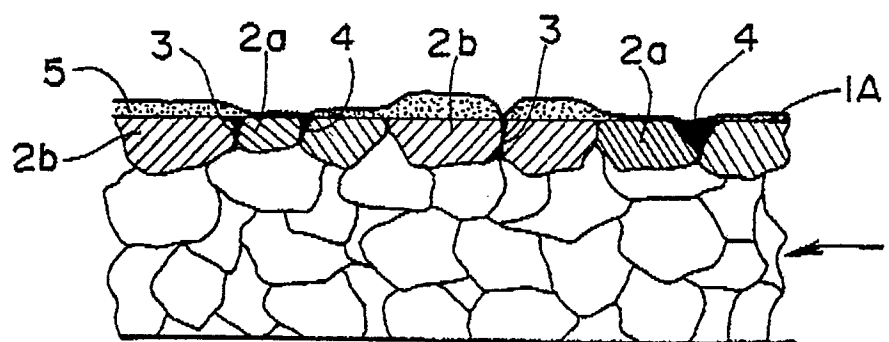
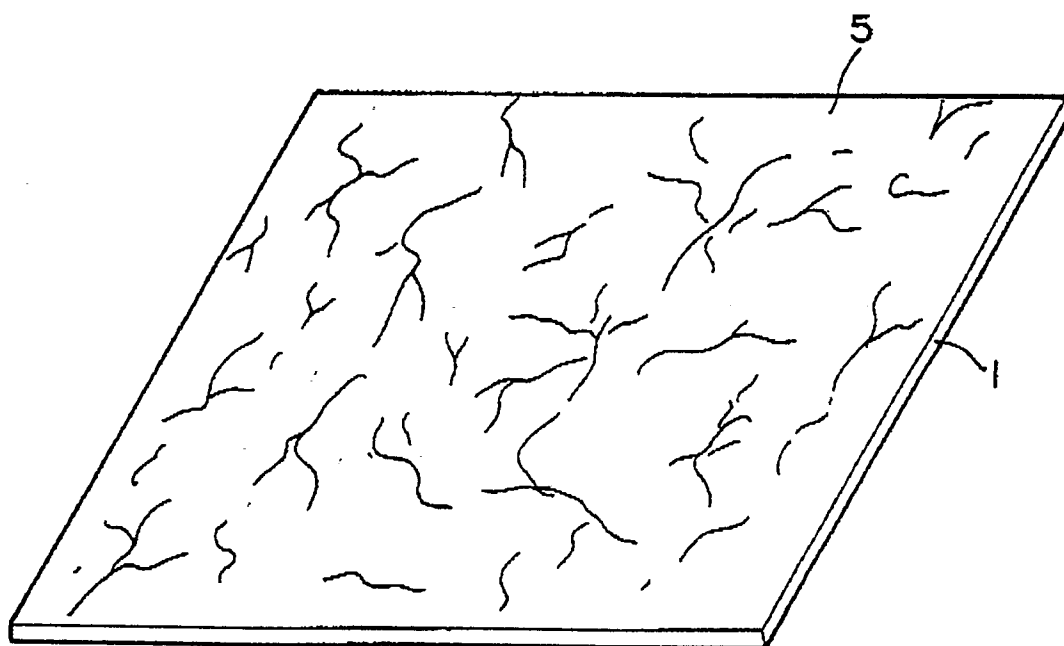


FIG. 4



GOLE

