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3,467,538

METHOD OF PRODUCING SIMULATED WOOD GRAIN FINISH

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No Drawing. Filed June 10, 1965, Ser. No. 463,045

Int. Cl. B44d 1/12; B44c 1/22

U.S. Cl. 117—8

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ABSTRACT OF THE DISCLOSURE

A method of wood graining wherein the workpiece surface to which the wood graining is to be applied has depressions formed therein which correspond to the pores or ticking of the wood grain. This surface of the workpiece has a base coat applied thereto so as to penetrate into, but not fill, the depressions. Thereafter the ground coat is applied to the surface of the workpiece so as to not penetrate into the depressions. The overall wood grain design is then applied to the ground coat and finally a transparent protective finish is applied.

This invention relates to the production of a simulated wood grain finish on a workpiece formed of plastic, metal or any other material capable of having the surface thereof textured to simulate the natural ticks or pores in a wood grain surface.

It is an object of this invention to provide a simulated wood grain finish on a workpiece having the natural appearance of a wood grain surface.

A further object of the invention resides in the provision of a method for producing a simulated wood grain finish on a workpiece which is economical and capable of being performed as a continuous operation with conventional surface coating equipment.

The first step involved in producing a simulated wood grain finish in accordance with the present invention is the making of a suitable die. In the case of a metal workpiece the die would be of the type conventionally used for stamping the sheet metal part and in the case of a plastic workpiece or the like the die would be in the form of a mold. In either event the die has formed on the surface thereof tiny projections or ridges which are the reverse in appearance of the small pores or ticks in a wood grain surface. Any suitable means, such as etching, may be employed for producing this textured surface on the die. In the case of etching the process is carried out so as to leave small, unetched ridges or projections which produce depressions in the surface of a molded or stamped part which simulate the ticks or pores in a wood grain surface. For reasons which will appear later, it is not important or necessary that the etched surface of the die be polished smooth because a slight roughness of the die's surface does not interfere with processing of the part in accordance with the present invention, and such slight roughness does not actually detract from the natural wood grain appearance of the finished product. The die, of course, should be shaped such as to either stamp or mold a part of the desired configuration.

After the workpiece is stamped or molded from the die, it is ready to have a first coating applied thereto. The first coat applied to the workpiece is in the nature of a base coat which is applied over the entire surface of the workpiece which is to have the appearance of wood grain finish. This base coat may be conveniently applied by spraying or the like, so that the surface as well as the pores or ticks in the surface of the workpiece have applied thereto a coating of the base coat. In wood grain surfaces the pores or ticks in the wood are darker

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in appearance than the background of the wood grain, and for this reason the base coat applied to the workpiece in accordance with the present invention is preferably of a dark color. Naturally the type of base coat applied to the workpiece is selected so as to be compatible with the substrate, particularly if the workpiece is molded from a plastic material. In any event a base coat should be a material which when dry provides a somewhat porous surface capable of absorbing a ground coat which is subsequently applied. A lacquer type finish, that is, one which dries essentially by evaporation of a solvent, as distinguished from one which dries by a chemical change, works exceptionally well as a base coat since, when dry, it presents a surface admirably suited for absorbing the ground coat subsequently applied to the workpiece.

On plastic materials of the ABS type (acrylonitrile-butadiene-styrene copolymer), excellent results have been obtained with a base coat comprising a nitrocellulose lacquer plasticized with non-drying alkyd and di-butyl phthalate. Drying of the base coat may be hastened by subjecting it to a temperature of 170° F. for about twenty minutes.

After the base coat has dried, there is applied to the surface of the workpiece a ground coat. In accordance with the present invention, the ground coat applied to the surface of the workpiece serves as the background color for the grain pattern which is subsequently applied. The ground coat should completely cover the surface of the workpiece which is to have the wood grain appearance except for the small pores or ticks in such surface.

The ground coat normally is selected so that its color contrasts and is lighter than the color of the base coat. The ground coat is preferably of a pigment-plasticizer type having a high degree of opacity for covering the base coat except at the pores or ticks. Since it is necessary to apply the ground coat in a manner such that it does not enter into the pores or ticks of the surface, the most expedient means for applying the ground coat is by means of a roller coating apparatus. Accordingly the ground coat should be of a material which is non-drying, so that it does not become necessary to periodically clean the rolls by means of which the coating is applied. It is also important that the ground coat is selected such that it is compatible with the base coat and dries by being absorbed into the base coat. Where the base coat is a lacquer type finish, very successful results have been obtained with a ground coat of straight pigmented di-butyl phthalate.

As an alternative to coating by means of rollers, the ground coat may be applied to the surface of the workpiece by any other suitable means which prevent the ground coat from flowing into the pores or ticks in the surface of the workpiece. Such means, for example, may be in the form of printing or hot stamping with foil. The application of the ground coat by rolling it on is preferred, in view of the efficacy with which this operation may be performed. For example, the ground coat may be applied to a chrome plated steel roll, the thickness thereof adjusted to the optimum desired by means of a doctor blade. The ground coat is then transferred to a rubber-covered transfer roll by rolling the transfer roll against the chrome plated steel roll and then rolled by means of the transfer roll onto the surface of the textured part having the base coat applied thereto. The ground coat is allowed to be absorbed into the base coat. Absorption of the ground coat into the base coat can be facilitated by drying at an elevated temperature, for example, at 170° F. for one-half hour, which enables the workpieces to be processed immediately thereafter.

After the ground coat is applied to the workpiece, the surface of the workpiece is now the color of the ground coat which, as previously explained, is usually lighter than

the base coat, and the depressions in the surface of the workpiece, which represent the pores or ticks, are the color of the base coat which, as previously indicated, represents the color of the final grain. One of the important features of the present invention resides in the application of the ground coat to the workpiece so that the color of the ground coat is applied only to the surface portions and not to the depressions in the surface as would be the case if the ground coat were sprayed. Thus, any irregularities in the surface of the workpiece, such as scratches or the like, or even roughness, due to the absence of polishing, will remain the color of the base coat and in the finished article will appear as graining in the surface.

After the ground coat is dried by being absorbed into the base coat, the workpiece is ready for the application thereto of the final grain effect. This is applied by conventional roller printing of a simulated wood grain on the surface of the article. As is the case with the application of the ground coat, the color of the final grain coat is of a non-drying type that is adapted to be absorbed into the base coat. The use of a non-drying color is important, since for economy reasons it is essential that the final graining finish be applied by some sort of a continuous printing process which obviously cannot be carried out if the coloring material is of the type that dries readily on the rolls or other printing surface employed. In the case of rigid plastic materials, very successful results have been obtained when both the ground coat and the final graining coat comprise colored or pigmented di-butyl phthalate. Obviously other pigmented, non-drying materials may be employed. The final grain coat is of substantially the same color as the initial base coat so that the final grain pattern and the randomly dispersed ticks or pores are of the same color.

The final step in the method of the present invention comprises the application to the entire grained surface of a clear transparent film of desired gloss. This final film preferably comprises a clear lacquer which is adapted to dry in a relatively short period of time. As is the case with any overlaying paint operation of this type, care should be exercised not to disturb the grained finish by applying too heavy or too wet a film. If the final transparent coating does not dry rapidly, or is applied too heavy or too wet, there will be a tendency for the transparent coating material to soak into or be absorbed by the undercoatings and thereby disturb the wood graining effect applied thereto.

It will thus be seen that the present invention provides a wood grain finish having the appearance of natural wood grain in that the pores or ticks in the textured surface of the workpiece have the same color as the overall grain pattern. Furthermore, as pointed out previously, since the ground coat is applied by means of rollers or the like, so that it covers only the surface portions of the workpiece and not the depressions, any small imperfections in the surface due to roughness or the like which form depressions will appear in the final finished workpiece

the color of the wood grain and will therefore not detract from the appearance of the wood grain finish. This is to be distinguished from a process wherein the ground coat is applied by spraying, in which case imperfections in the surface of the workpiece would be light-colored rather than the dark color of the grain and would therefore detract substantially from the appearance of the final finish. In addition, it will be appreciated that the method disclosed herein and particularly the steps of applying the ground coat and the final graining coat with non-drying, pigmented materials, enables the process to be carried out as a continuous straight line operation. Obviously, this renders the process economical, as distinguished from other methods wherein the workpieces must be handled in batches for each successive operation, which requires considerable handling and delay between successive operations.

I claim:

1. The method of producing a simulated dark wood grain finish on a workpiece which comprises forming in the surface of the workpiece to which the finish is to be applied depressions which correspond in appearance to the small ticking or pores in a wood grain surface, applying to said surface of the workpiece an overall base coat having the dark color desired in the pores or ticking of the simulated wood grain finish, said base coat being applied to said surface of the workpiece so as to penetrate into said depressions without completely filling them so that they remain in the form of depressions, applying an overall ground coat over said base coat, said ground coat being of a color lighter than said base coat to form the desired background color of the wood grain pattern and being applied thereto so that it does not penetrate into the depressions forming the ticks or pores in the wood grain finish whereby the depressions remain the color of the base coat and the remainder of said surface assumes the color of said ground coat, and thereafter roller printing over said ground coat the desired wood grain pattern with substantially the same color as the base coat so that the dark colored depressions merge into the dark wood grain pattern and contrast with the lighter background color of the wood grain pattern.

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U.S. Cl. X.R.

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