

UNITED STATES PATENT OFFICE

JOSEPH M. VERDEROSA, OF PARLIN, NEW JERSEY, ASSIGNOR TO E. I. DU PONT DE NEMOURS & COMPANY, OF WILMINGTON, DELAWARE, A CORPORATION OF DELAWARE

PROCESS FOR FINISHING SURFACES

No Drawing.

Application filed December 26, 1929. Serial No. 416,737.

This invention relates to a process of finishing wood, metal, and the like surfaces, and more particularly to a method of producing grained effects on such surfaces.

5 This application is a continuation in part of my copending application Serial No. 291,491, filed July 9, 1928.

10 As is well known, many beautiful wood grain finishes may be produced on inferior wood, metal and other types of surfaces. It has heretofore been the practice first to apply an oleoresinous primer or ground coat of the desired shade, then a graining composition, work the graining designs in the latter, and thereafter to apply a clear lacquer top coat to protect the design and more sharply bring out the grain effect.

15 Two types of compositions have been commonly employed for this purpose, the oleoresinous vehicle type and the aqueous vehicle type. There are, however, serious drawbacks to processes involving the use of these materials. For example, in using oleoresinous compositions a relatively large proportion of drying oil must be used in order to obtain a satisfactory flow, but a prolonged drying or oxidation period is required to set the composition up sufficiently to permit application of a top coat. It is, therefore, often necessary to resort to special drying or baking operations when using this type of composition which necessitate provision of special drying apparatus. Furthermore, if the oil of the vehicle is incompletely oxidized it will be attacked by solvents when pyroxylin top coats are used and this will cause lifting of the film and unsightly wrinkles in the finished surface.

20 On the other hand, when using the aqueous vehicle type of graining composition, such, for example, as the frequently recommended dispersion of pigment in stale beer, serious difficulties are encountered because the vehicle is so volatile the composition will not remain workable sufficiently long to permit working the desired designs. This is an especial drawback when finishing surfaces of relatively large area, such as doors and paneling.

25 This invention has as an object to provide

a method of grain finishing which overcomes the hereinabove mentioned difficulties of application. A further object is to provide a method of producing grained effects on wood, metal, and the like surfaces. A still further object is to provide a method of finishing which eliminates the necessity for special drying or oxidizing operations. Another object is to provide a process of finishing which allows ample time for production of the desired effects without at the same time requiring long drying periods. Still another object is to provide a system for the successful graining of surfaces of relatively large area, such as doors, panels, and the like, which makes possible the application of pyroxylin lacquer top coats as protective films. It is also an object to provide a process in which the time required for drying the graining coat may be controlled within certain limits. Other objects will appear hereinafter.

30 These objects are accomplished by the following invention which in its essential features comprises application to the surface to be decorated of a ground coat of either oleoresinous or pyroxylin composition, application to this ground coat of a medium drying graining composition, the drying characteristics of which may be controlled so that it remains workable for a sufficient length of time to permit production of the desired graining designs, but at the same time not requiring a long drying or oxidation period before application of an oleoresinous or pyroxylin lacquer top coat.

35 I have set forth my invention in the following specification and have included several examples of my new graining composition and its method of application, but these examples are merely for purposes of illustration and are not to be regarded as limitations.

40 In carrying out my invention I prepare a composition by dispersing a pigment by a well known method in a vehicle comprising a solution of ethylene glycol and water containing also a small amount of a gum soluble in both ethylene glycol and water. The following are examples of a composition made in accordance with my invention.

Composition 1

	Parts by weight
Pigment.....	30.0
Gum arabic.....	2.5
5 Ethylene glycol.....	60.0
Water.....	7.5
	100.0

Composition 2

	Parts by weight
10 Pigment.....	40.0
Gum arabic.....	2.5
Water.....	6.0
15 Ethylene glycol.....	51.5
	100.0

Composition 3

	Parts by weight
20 Pigment.....	35.0
Gum arabic.....	2.5
Water.....	5.0
Ethylene glycol.....	57.5
	100.0

The above formulations represent graining compositions having varying drying characteristics. For most purposes I prefer to use a medium drying composition. By the term medium drying I wish to indicate a material which will become substantially dry after the expiration of $\frac{1}{4}$ to 3 hours. It is one of the distinctive features of my invention that I am enabled to keep the graining film in a workable condition for a period of time sufficient to permit working of the designs therein by control of the evaporation characteristics of the vehicle.

This control depends upon the fact that ethylene glycol is substantially non-volatile, or slowly volatile, at ordinary room temperatures, whereas water is readily volatile and evaporates with relative rapidity. By controlling the ratio of non-volatile solvent to water in the vehicle I am enabled to control the rate of evaporation within certain limits. Thus, by reducing the glycol-water ratio I may produce a vehicle which will become substantially dry within as short a time as fifteen minutes. On the other hand, by increasing this ratio I may provide a vehicle which will not evaporate sufficiently to cause the composition of which it is a part to completely set up within three or four hours, or even longer periods.

In the above examples, although I have indicated certain definite percentages of the various ingredients, I do not wish to be limited to the exact amounts stated since it will be evident, for example, that the relative proportions of glycol and water must be varied according to whether or not a relatively quick, medium, or slow drying composition is desired. It will be evident that a relatively slow drying composition will be

necessary for proper application of a graining design to a large surface, such as that of a door or wall panel, in order that the composition may remain in a workable condition sufficiently long to permit the operator to grain the whole surface before the material has become completely set up. On the other hand, a relatively quicker drying composition may be employed for the graining of surfaces of smaller area.

Although I have just alluded to quick, medium and slow drying compositions, I desire to be understood as including all these types of materials within the meaning of the term "medium drying graining composition" as used in the claims forming a part of this application.

In the preferred practice of my invention a wood, metal or other surface which it is desired to decorate is properly prepared and a ground coat of pyroxylin lacquer applied. The volatile solvents in this type of lacquer quickly evaporate, leaving the coated surface ready for application of the graining material. A composition, such as one of those exemplified by the examples given above, is applied to the surface in a well known manner. The particular composition selected will depend largely upon the surface area of the object being finished. It is sufficient to state that the composition must be such that, when applied, it will produce a film which remains workable for a sufficient length of time for production of the graining designs regardless of its area. The graining designs are then formed on the film in a well known manner. This operation is followed by application of a protective top coat of clear pyroxylin lacquer. It will also be apparent that the more volatile the graining composition selected, the more rapidly it will become set up and, consequently, the shorter will be the period of time elapsing between completion of the graining operation and the application of the top coat.

Although I have indicated the use of pyroxylin primer and top coats in the above preferred embodiment of my invention, it is one of the advantages of my new process that I am enabled to use either a pyroxylin or oleoresinous material for this purpose, since the film left on a surface after evaporation of my new graining composition contains no oil or other ingredient subject to attack by lacquer solvents.

It will be apparent to those skilled in the art that my improved method of producing grain finishes possesses marked advantages over prior art methods. As indicated above, the use of oleoresinous graining compositions necessitated long drying periods for oxidation of the vehicle before the designs were sufficiently set up to permit application of a top coat and, even when sufficiently dry for this purpose, if the oleoresinous vehicle were

not completely oxidized, it was subject to attack by the solvents of a pyroxylin lacquer. In order to provide for complete drying or oxidation, it was heretofore necessary to subject the object being finished to a special drying or baking operation. The difficulties thus involved in the use of oleoresinous materials are all effectively removed by my invention. No special oxidation period is required to allow for completely setting up the composition and pyroxylin lacquer top coats may be employed for the reasons pointed out above.

My invention also possesses distinct advantages over processes involving the use of the ordinary aqueous vehicle type materials. It has heretofore been practically impossible for the operator to work the desired designs upon large surfaces, such as doors and paneling, since, due to the extremely volatile nature of the vehicle, the composition had a tendency to set up before the operator could work the designs over the whole surface. This difficulty has been effectively eliminated by my new process due to the accurate control of the drying period.

Another advantage of my invention is the fact that intricate, irregular, and sharply defined designs, such as imitation birds-eye maple effects, may be readily produced which it was heretofore impracticable to attempt by the use of compositions of the oleoresinous vehicle type. With the last mentioned types of graining compositions, a globule placed upon a surface to be decorated has a tendency to flow and expand irregularly. However, the surface tension characteristics of a globule of the compositions employed in my process prevent such irregular flowing of the material and this feature, together with the readily controlled volatility of the vehicle, make possible the production of a sharply defined graining design on the ground coat.

As many apparent and widely different embodiments of this invention may be made without departing from the spirit and scope thereof, it is to be understood that I do not limit myself to the specific embodiments thereof except as defined in the appended claims.

I claim:

1. The process of producing a decorated wood grain finish on the surface of wood, metal, and the like, which comprises applying thereto a pyroxylin primer coat, thereafter applying a medium drying graining composition capable of receiving a graining design over a commercially workable area before it dries, said composition comprising a pigment dispersed in a vehicle composed of 30 parts by weight of pigment, 2.5 parts gum arabic, 60 parts ethylene glycol, and 7.5 parts water, producing a graining design upon said composition while it is still work-

able, and thereafter applying a clear lacquer top coat.

2. The process of finishing the surface of an article which comprises applying a primer coat, thereafter applying a medium drying graining composition comprising a pigment dispersed in a vehicle containing a glycol, producing a graining design upon said composition while it is still workable, and thereafter applying a clear protective top coat.

3. The process of finishing the surface of an article which comprises applying a primer coat, thereafter applying a medium drying graining composition comprising a pigment dispersed in a vehicle containing ethylene glycol, producing a graining design upon said composition while it is still workable, and thereafter applying a clear protective top coat.

4. The process of finishing the surface of an article which comprises applying a primer coat, thereafter applying a medium drying graining composition comprising a pigment dispersed in a vehicle containing a water- and glycol-soluble gum and a glycol, producing a graining design upon said composition while it is still workable, and thereafter applying a clear protective top coat.

5. The process of finishing the surface of an article which comprises applying a primer coat, thereafter applying a medium drying graining composition comprising a pigment dispersed in a vehicle containing water, a water- and glycol-soluble gum and ethylene glycol, producing a graining design upon said composition while it is still workable, and thereafter applying a clear protective top coat.

6. The process of finishing the surface of an article which comprises applying a primer coat, thereafter applying a medium drying graining composition comprising a pigment dispersed in a vehicle composed of water, gum arabic, and ethylene glycol producing a graining design upon said composition while it is still workable and thereafter applying a clear protective top coat.

7. The process of claim 2 in which both the primer and top coats are pyroxylin compositions.

In testimony whereof, I affix my signature.
JOSEPH M. VERDEROSA.

70

75

80

85

90

95

100

105

110

115

120

125

130