Patented Jan. 27, 1942 2,271,491

UNITED STATES PATENT OFFICE

2,271,491

METHOD OF APPLYING DECALCOMANIAS

Harry C. Rathke, Chicago, Ill., assignor to The Meyercord Company, a corporation of Illinois

No Drawing. Application February 3, 1941,

Serial No. 377,213

5 Claims. (Cl. 41—33)

It is quite common practice to apply decalcomanias to objects composed of wood and which present bare wood surfaces at the time it is necessary to apply the decalomanias, or which are intended to remain otherwise undecorated or untreated. In such cases, it has heretofore been deemed necessary to apply a sealer coat or at least a filler to the areas of the surface over which the transfer films are to be placed. This involves a painting operation as well as a subsequent drying period, in addition to the mere step of attaching a transfer film in its position of final use; thus adding considerably to the cost of transferring the decalcomania film. Unless the sealer coat or filler is carefully applied, the area covered thereby in any given instance may be either too large or too small, thereby causing some of the sealer coat or filler to be visible beyond the edges of the decalcomania film, or leave the film in direct contact with the wood in some areas.

The object of the present invention is to make it possible to bond a decalcomania ink or cellulose film directly to a bare wood surface so as to present an appearance equally as good as that of decalcomanias applied over a sealer coat covering the wood.

In carrying out my invention, the decalcomanias are manufactured from such materials that the side of the transferable film which is to be engaged with the surface to which the film is to be bonded has a face composed of lacquer or other substances which are at least largely of a non-oxidizable character. Such decalcomanias are manufactured in the usual way. When such a film is to be transferred, I soften it with a suitable solution of solvents of a character that will not raise the grain of wood and that leaves no residue upon drying. I have found that the film need then only be laid upon bare wood and be rolled or otherwise flattened and smoothed into conformity with the surface, without danger that the appearance of the work or the character of the bond suffers through a raising of the wood grain. The wetting of the transferable film may be effected either by applying the solution of solvents directly thereto or to the wood, preferably the former. The entire decalcomania may be dipped in a bath composed of the solution of solvents, or the surface at which the bonding is to occur may be sponged or brushed, to distribute the solution of solvents over the same. The solution of solvents, being of a type that evaporates without leaving a residue, does not mar the appearance of the work, if any part thereof extends beyond the edges of the transferred film, because it completely disappears in the process of drying.

Duplex paper is preferably employed as the backing or carrier for the transferable film. Both layers of paper are permitted to remain during the process of applying the film to the object to which it is to be bonded, and then the thick layer of paper may be stripped off and the thin layer of tissue paper be allowed to remain on the cellulose or ink film. The tissue paper can be removed, whenever desired, by simply wetting it, in the usual way; but, while it remains in place, it serves as a protection for the transferred film during storage, shipment and handling of the object carrying the film.

The solvent that I have found to be the best softening agent in any solution of solvents is one known as "Butyl Cellosolve," the chemical name of which is ethyleneglycolmonobutyl ether. Other of the "Cellosolves" as, for example, those of ethyl, diethyl and methyl types, may also be used. A solution of solvents may also be produced by combining the acetates with alcohols or hydrocarbons, namely the toluols, xylols or naphthas, although it is more difficult to obtain satisfactory working formulae embodying these substances.

"Cellosolve" is not used alone, but must be combined with a diluent or balancer and with a coagulant. Alcohol, either denatured or plain, is a satisfactory diluent, and ammonia hydroxide serves satisfactorily as the coagulant; the amount of water introduced into the solution by the ammonia hydroxide being too small to cause the solution to acquire the capacity of raising the grain of wood upon being applied thereto.

A typical formula based on "Butyl Cellosolve" is one containing four parts of "Butyl Cellosolve"; one part of ammonia hydroxide, twenty-six degrees Baumé; and five parts of alcohol; all parts by volume.

Instead of ammonia, other alkalies as, for example, sodium borate, may be employed, although none of the alkalies of the caustic type are suitable.

One of the more difficult problems involved when it is attempted to soften a film or a portion thereof is to give to the film the necessary softness and thickness to insure a good bond, without damage to the appearance of the film through running or flowing of colors. Using the particular formula heretofore set forth, I have found that a workman need not take more than usual care in the application of the solution of

solvents, since no harm is done to a lacquer film even though it be dipped into and left in the solution considerably longer than is necessary to bring about the necessary degree of softness. This is due to the fact that the coagulating ingredient stabilizes the film and prevents the lacquer from running.

After a film has been transferred, it hardens again in a reasonably short time, namely in from twelve to twenty-four hours, even though it was softened throughout its entire thickness during or before transferring. It is then in the proper condition to permit finishing of the object to which it is bonded, or the forming thereof if said object be, for example, a deformable panel.

It is ordinarily unnecessary to increase the thickness of the transferable film over that which has heretofore been employed when the bond is to occur between the film and a sealer coat on the object to which the transfer is to be made; so that decalcomania films of the proper types that have heretofore been bonded to other surfaces than those of bare wood may successfully be attached directly to bare wood with ease and expedition. Since the bonding of decalcomania films to bare wood is more difficult than it is to bond them to metal, pressed wood and other materials, my process is equally well adapted to making bonds with the latter materials.

I claim:

1. The method of bonding to an object having a face of bare wood or other substances the transferable film of a decalcomania in which the materials at the surface adapted to contact said face are largely of types that are non-oxidizable, which consists in wetting said face with a low moisture content solution of solvents for said non-oxidizable materials while stabilizing the film structure, and pressing the decalcomanias against said object with the said surface in contact with said face.

2. The method of bonding to an object having a face of bare wood or other substances the transferable film of a decalcomania in which the materials at the surface adapted to contact said face are largely of types that are non-oxidizable, which consists in subjecting said surface to the action of a low moisture content solution of solvents for said non-oxidizable materials combined with an alcohol and a coagulant so as to cause a softening of said non-oxidizable materials while stabilizing the film structure, and pressing the decalcomania against said object with said surface engaged with said face.

3. The method of bonding to an object having a surface of bare wood or other substances the transferable film of a decalcomania having hardened lacquer on the side adapted to contact said surface, which consists in wetting said side of the film with "Cellosolve" combined with an alcohol and a coagulant so as to cause a softening of the lacquer while stabilizing the film structure, and pressing the decalcomania against said object with said side engaged with said surface.

4. The method of bonding to an object having a face of bare wood or other substances the transferable film of a decalcomania having a hardened lacquer ground coat adapted to contact said face, which consists in subjecting said ground coat to the action of a solution of solvents composed of about two parts of "Butyl Cellosolve," one part of ammonia hydroxide, and five parts of alcohol so as to cause a softening of said coat while stabilizing the film structure, and pressing the decalcomania against said object with said coat engaged with said face.

5. A softening and coagulating agent for a hardened lacquer material forming a face of a decalcomania that is to be bonded to a surface of bare wood, consisting of a solution of solvents composed of about two parts of "Butyl Cellosolve," one part of ammonia hydroxide, and five parts of alcohol.

HARRY C. RATHKE.