Aug. 30, 1932. E. C. LOETSCHER 1,875,055

PROCESS OF FINISHING WOOD SURFACES

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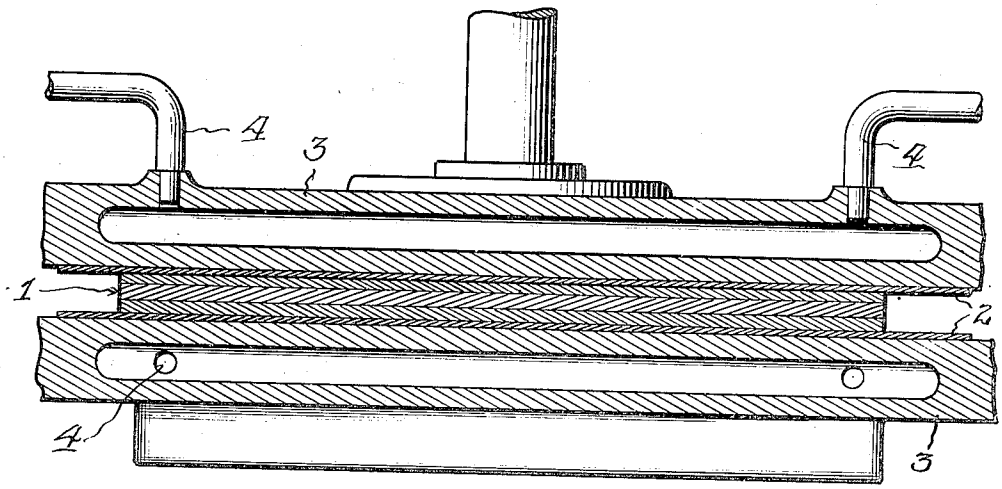


Fig. 1

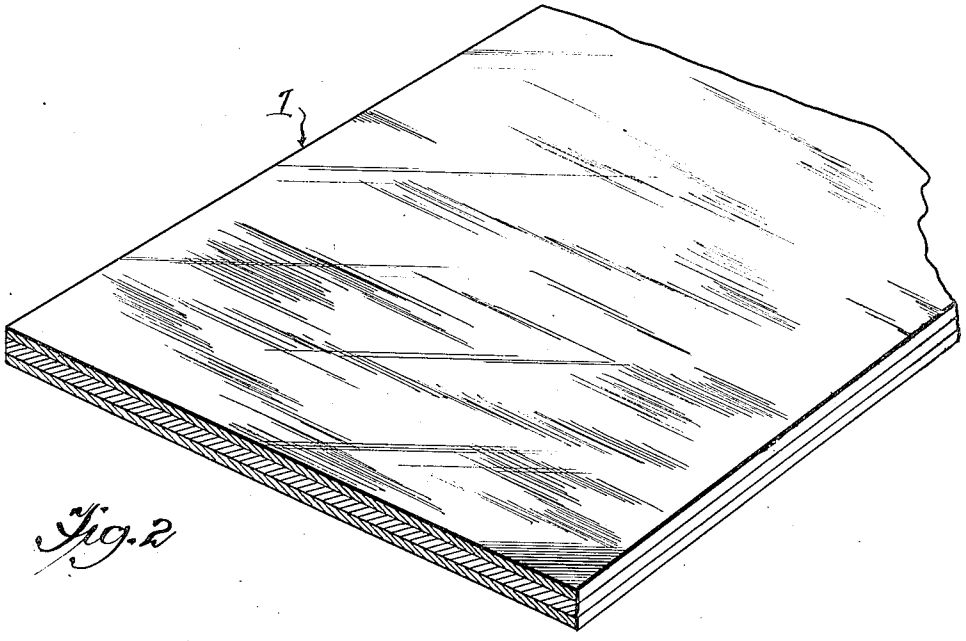


Fig. 2

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UNITED STATES PATENT OFFICE

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PROCESS OF FINISHING WOOD SURFACES

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This invention relates to improvements in process for treating certain kinds of wood to render them better suited for use in the manufacture of panels, doors and other types of wood work, requiring a smooth finished surface.

Woods used in the wood-working industries differ greatly in their texture or graining, some being relatively coarse and others quite fine. For example, fir, oak and ash are known as coarse grained woods, and when made up into a panel, either solid or in plies, it is a difficult matter to finish the surface perfectly smooth by sanding, and even after the application of several coats of varnish or enamel and rubbing down between coats, the graining is still evident to the touch and likewise visible in certain lights as elevations and depressions. This condition is not so marked in the finer grained woods such as mahogany, walnut, birch, and gum-wood, although in every case the production of a smooth fine finish involves a great deal of care and laborious hand labor. Moreover, the staining of the coarser grained woods is a difficult problem, due to the fact that the more porous areas absorb the stain freely, while the denser portions absorb relatively little, and thus produce extreme contrasts in color which are not pleasing.

The present process seeks to simplify and to minimize the cost of finishing of the surface of panels and wood work generally, by subjecting the same to pressure and heat together with the application of a waterproofing substance such as linseed oil, liquid wax or a suitable resinous solution.

In the accompanying drawing showing the manner in which the process is practiced.

Figure 1 is a general view in vertical section through a press in which a panel is being treated, and

Figure 2 is a perspective view of the finished panel.

Taking for example a ply-wood panel of ash or fir 1, neither of which lends itself readily to the ordinary processes of finishing, the method of treatment consists in placing the panel between pressure plates 2, 2 having smooth, highly polished contact surfaces, and then subjecting it to pressure in a hydraulic press equipped with hollow platens 3, 3, having hose or pipe connections 4, 4, so that steam and water can be circulated through them for heating and cooling the material being processed. The amount of pressure applied to the panel is such as to subject it to an appreciable compression, thus insuring the application of pressure to the thinner portions of the panel as well as the thicker. Depending on the density of the wood, the pressure may vary from 250 to 700 pounds per square inch. Thus upon compressing the panel at the required pressure between the highly polished plates, the surfaces of which are preferably chromium plated, for a period of from 2 to 10 minutes and at a temperature of, say, 225° F., the surfaces of the panel when removed from the press, present a smooth and glossy finish having the appearance and feel of a waxed surface. The effect of the pressure and heat is manifestly that of rearranging and altering the fibers of the wood to some extent, this being evident from the fact that the panel is slightly thinner and therefore somewhat more dense after it has been processed. Again, the surface fibers are flattened considerably in contact with the perfectly smooth surfaces of the pressure plates, so that the pores which are ordinarily open and well defined, are closed or made smaller, thus making it unnecessary to use a filler as is the common practice in the finishing of varnished surfaces. The effect of the heat is to soften the natural resins in the wood, causing them to flow and spread more uniformly through the mass and filling the voids between fibers, so that as the panel is cooled to a normal temperature while still under pressure, the fibers become set in their rearranged condition, and thus are proof against subsequent displacement and expansion.

The surface of the panel thus treated while presenting a smooth polished finish, is, however, subject to soiling and water-marking, and for this reason I prefer to apply a thin coating of linseed oil to the surfaces of the panel before the pressure treatment, this be-

ing easily accomplished by wiping the surface lightly with a saturated cloth. The application of the oil to the surface not only renders it water and moisture proof, but results in more glossy finish, resembling a carefully rubbed and varnished surface. Other waterproofing or impregnating substances can also be used for this purpose, among which may be mentioned a mixture of rosin and linseed oil, liquid wax and various resins dissolved in alcohol.

A surface thus produced, even without further treatment, produces a satisfactory permanent finish, although it would be generally desirable to stain the surface and then apply a finishing coat of varnish or wax. Staining would be resorted to where the natural graining of the wood is to be preserved, it having been found that an oil stain can be readily applied by merely brushing the surface and wiping off the excess. By so doing, the surface absorbs the stain quite uniformly, thus bringing out the graining in its natural beauty and without affecting the initial luster of the surface.

Where the panel is to be painted or enameled, it would obviously not be necessary to stain or varnish the surface, the finishing coats being applied direct to the panel as it comes from the press. It is to be noted, however, that where several coats of enamel are required to produce a smooth surface on an ordinary panel, only two are all that are generally required to produce the same result on a processed panel. Similarly in producing a varnished panel, the preparatory treatment of the wood by the present process makes it possible to apply one coat of varnish with results equivalent to the application of several coats applied to the surface of an untreated panel.

The same method of treatment may also be utilized in the manufacture of veneered panels and panelling material by treating the surface of the outer plies of veneer with the desired waterproofing and finishing preparation and then subjecting the material to the pressing operation, which at the same time serves to unite the veneer to the base through the medium of the particular adhesive used for the purpose. In the event the sheets of wood veneer are exceedingly thin they may be soaked in the finishing preparation prior to being applied to the base material.

Thus it will be seen that the cost of finishing wood surfaces for doors, panels and like kinds of wood work can be materially reduced by the process of treatment herein disclosed, since it eliminates the greater part of the hand labor ordinarily required, and effects a substantial economy in time and materials.

Another advantage of the process is the possibility of utilizing woods which heretofore have been regarded as unsuitable for the manufacture of doors and panelling because of their coarse graining, yet satisfactory in other respects. Thus fir, which is relatively cheap and plentiful, can by this relatively inexpensive treatment, be used as satisfactorily as birch, gumwood and other fine grained woods, which heretofore have been used almost entirely for stained or enamelled wood work.

Having set forth a preferred embodiment of my invention,

I claim:

1. A process of finishing the surface of a wood panel or the like, consisting of applying a thin coating of moisture-repelling fluid over the surface to be finished, compressing the panel in contact with a highly polished metal surface, and at a pressure sufficient to effect the distortion of the surface fibers, and applying heat to the panel during compression.

2. A process of finishing the surface of a natural wood panel or the like, consisting of impregnating the surface of the panel with a waterproofing agent, placing the panel between plates having polished contact faces, applying pressure and heat to said panel sufficient to partially compress the same and to distort the surface fibers, whereby a smooth lustrous surface finish is produced.

3. A process of making and finishing wood veneering materials consisting of impregnating the plies of veneer with a waterproofing liquid, applying the treated veneer to the base material with a suitable adhesive substance, and subjecting the assembled material to heat and pressure between plates having smooth contact surfaces.

Signed at Dubuque, Iowa, this 12th day of July, 1930.

EMIL C. LOETSCHER.