This invention relates to a veneer plank for wall application and a method of making it. One purpose of the invention is to provide a veneer plank which may be effectively employed without the need of backing material such as fabric and the like.

Another purpose is to provide a veneer plank effective to mask imperfections in the surface to which the plank is applied.

Another purpose is to provide a particular method of forming a veneer plank, which method shall be relatively simple in performance and economical in operation.

Another purpose is to provide a method of making a veneer plank, which method shall maintain the desired appearance, strength and dimensions of the veneer.

Another purpose is to provide a method of making a veneer plank which shall be effective to produce a veneer plank having certain desired properties and which shall, at the same time, avoid fracturing of the veneer.

Another purpose is to provide a veneer plank which does not blister in high humidity weather.

Another purpose of the invention is to produce a veneer plank which shall be at one time thick enough to prevent telegraphing of wall defects therethrough and, at the same time, shall be flexible enough to conform to the surface to which it is applied and which can be bonded with the application of momentary pressure. It is customary in commercial practice, in making veneer wall coverings, to use veneers having a thickness of about 3/16 inch in order to obtain flexibility. These veneers are necessarily backed with a flexible fabric in order to avoid fracturing caused by handling of thin veneer. These thin veneers, when applied to a wall or other surface, reveal defects in such surface such as cracks, grit, joints, nailheads, which telegraph through the thin veneer and mar the appearance. Further, distortions in the veneer grain such as "cockles" produce blisters as it is very difficult to bond veneer to walls in such areas.

Accordingly, it is a purpose of this invention to provide a solution to the problems presently existing, as set forth above, and to provide a method of producing a veneer plank which is not subject to the defects above outlined.

Other objects will appear from time to time throughout the specification and claims.

The invention is illustrated more or less diagrammatically in the accompanying drawings, wherein:

Figure 1 is a cross sectional view of one form of veneer plank produced in accordance with and constituting this invention;

Figure 2 is a view similar to that of Figure 1 illustrating a veneer plank at one point in the manufacture thereof;

Figure 3 is a diagrammatic illustration of one method of grooving the veneer plank shown in Figures 1 and 2; and

Figure 4 is a diagrammatic section through a typical hot press structure which may be employed in its manufacture.

I describe herein a veneer wall covering and a method of making it. It will be understood that the particular shape or linear dimensions of the resulting product may be varied without departing from the nature and scope of my invention. For convenience I illustrate and describe herein individual pieces of veneer which may, for example, be separate strips having their longitudinal edges beveled to accentuate the same in the manner of conventional lumber planking. The particular form described herein may, therefore, be conveniently described as veneer planking.

I find that the product herein described, produced in accordance with the method of my invention, costs no more than the present commercial product made to date by mechanically treating veneer pieces having a thickness of 3/8 inch. I begin, for example, by providing veneers at least three times as thick as those presently in use. By so doing, the need for fabric backing is eliminated, as further described below, and the telegraphing through of wall surface defects is prevented. I find that excellent results are obtained when using veneers having a thickness approximately five to ten times that previously employed. Experience has shown that any additional cost resulting from increased thickness is overcome by the elimination of the cloth backing and the labor, materials and time required to apply the backing. The thicker veneers are more readily cut and handled than the conventional 3/8 inch veneers.

One feature of my invention is the provision of a method for treating relatively thick veneers so as to make their employment possible in the place and for the uses of present thin veneers. Several problems arise when attempts are made to apply thick veneers to foundations or surfaces such as plaster walls or wallboards. It is virtually impossible to "hang" ordinary thick veneer; that is, to bond it by means of an adhesive applied on the job by momentary pressure, such as that of a roller. Mechanical flexing of thick veneers, such as that described in my United States Patent No. 1,776,530, for example, results in fissuring and unacceptable breakage. It is therefore a feature of my invention to provide a solution to these problems and to produce a pliable, tough, very flat veneer board or plank that does not tear or break in handling, that effectively covers wall imperfections and does not develop blisters either at the time of application or afterwards during periods of high atmospheric humidity.

I achieve the results desired by using green veneers from 3 to 10 times as thick as the conventional 3/8 inch veneers, and treating these in the green condition by a process of wedging and thereby expanding one surface only without fissuring the opposite side, then drying the resultant curved veneers under constraint between smooth hot plates, driving out the moisture in large part along the wedging grooves, case-hardening both surfaces of the veneer, and then humidifying the flattened veneers to raise their moisture content to approximately equilibrium moisture. Wedging of the veneer may be achieved by pressing V-shaped metal ridges into one surface with momentary pressure or by means of discs having V-shaped edges mounted on a rotating shaft which presses the grooves into the veneer with momentary pressure.

I have found that it is very difficult to cut grooves in large metal plates of such a degree of fineness that when the plates are used as ventilating cauls the ridges developed in the veneer surface by the ventilating grooves when the veneers are dried under hot-plate pressures adequate to constrain them do not show and thereby mar the appearance of the product. I therefore prefer the use of smooth non-ventilating cauls plates on at least the.
face side of the veneer, and have found that veneers of any commercial length can be dried successfully and very rapidly through the escape of steam in the fine grooves of the veneer which extend in the direction of the veneer grain. Fine grooves can, of course, also be used in the metal plates in contact with the back side of the veneer to assist in the escape of the steam even though they are not essential. For the fastest drying, the grooves in the plates should extend across the grain of the veneer. Rapid drying is facilitated if the grooves are less than about two inches apart but the spacing of the grooves is not critical.

The use of wire screens for ventilating in contact with the face side is undesirable in view of the resulting indentations that are pressed into the veneer surface. These cannot be sanded out without materially reducing the thickness of the veneer.

I find that plate temperatures in excess of 400° F. darken most veneers to the point where they are no longer commercially acceptable and temperatures less than 200° F. prolong the drying time excessively. Pressures less than about 25 p.s.i. do not hold the veneers adequately against shrinkage in the press, and pressures in excess of about 200 p.s.i. crush most veneers. A pressure range of from 25 to 200 p.s.i. and temperatures from 200° F. to 400° F. therefore produce the desired results. Under these conditions hardwood veneers that are normally dried, as in conventional roller driers, in about ten minutes can be dried in from one to two minutes. The width of the veneer so dried is within two percent of its original green width.

The wedging can be done with either roller or plate-pressure and preferably at room temperatures. The grooving should preferably be V-shaped and close together, the depth being determined in part by the wedging. I illustrate, for example, in Figure 3, a roller 10 having a plurality of circumferential grooving blades 11. The plank 1 is shown as passing over a supporting base 2. Any suitable feeding means, not shown, may be employed for moving the plank beneath and past the grooving roller. In order to avoid undue injury to the veneer the spacing should be such as always to provide a flat zone of veneer between the grooves. The closer the spacing and the deeper the grooves the greater the expansion obtained. The groove depth must, however, not be so great as to cause the veneer to curl. As the depth of groove and the spacing depend upon veneer thickness, species, grain direction and method of cutting the veneer, these variables cannot be fixed without trial. In general the spacing of the grooves should not be more than three times the thickness of the veneer.

Case-hardening and ventilation can also be achieved by cutting V-grooves parallel to the grain without veneer expansion. Some expansion or spreading of the green veneer is, however, desirable in order to reduce the expansion still possible after the dried product has been applied to a wall. Grooving parallel to the grain, irrespective of the type of grooving employed, improves the flexibility of the veneer. The width of the veneer at the time of application should be as near as possible to the green width, and should not be more than about two percent less than the width of the original green veneer.

Figure 3 shows a typical section of the wedged veneer dried under hot plate constraint, and Figure 7 shows the curling effect introduced by wedging the green veneer. Figure 4 illustrates, diagrammatically, the subjection of the already grooved plank to hot pressure, in the course of which the grooved plank is dried under constraint. The plank 1, with its grooves 3, is shown as held between a lower press member 15 and an upper press member 16. The upper press member is shown as provided with any suitable chamber 17 through which a suitable heating agent may be circulated through inlets 18 and outlets 19, and the lower member 15 has a similar chamber 17a with inlet 17b and outlet 19a.

In the process of drying under hot plate constraint the ridges are flattened to some extent and the width of the grooves is reduced but steam can still escape through the narrower grooves. It will be observed from the drawings that the grooves or channels 3 are continuous and parallel and extend along the plank. As above mentioned, the grooving is carried out preferably along the grain. The steam produced by the subjection of the plank to heat and pressure escapes readily through the continuously extending grooves, it being understood that in the course of the pressure application there is no closure of the ends of the grooves. It will be understood, also, that at the time of the exertion of pressure the grooves have already been formed, and the pressure is carried out between flat, or generally flat, plates which do not extend into the grooves. The sole constraint given to the wood is the constraint of pressure between opposed, smooth surfaces. I apply constraint between positive plane surfaced clamping members to heat the wood during such constraint and permit the steam thereby generated to escape along and through the continuous grooves formed in the wood surface.

The veneer edges should be trimmed after drying and preferably after seasoning or humidification so that the edges are straight when the veneers are applied. Beveled edges are preferred. In veneer edges that are fragile, they may be reinforced for bevelling by applying a narrow strip of paper tape on the back side. The veneer leaving the hot press is from one to two minutes. The width of the veneer so dried is within two percent of its original green width.

I claim:

1. The method of treating veneer including the steps of providing a single ply of green veneer, forming a plurality of grooves in one surface of said ply parallel to the grain while in its green state, then reducing the moisture content of said ply to a point below its equilibrium moisture while the veneer is held under constraint, forming a plurality of grooves in one surface of said ply parallel to the grain while in its green state, then reducing the moisture content of said ply to a point below its equilibrium moisture while the veneer is held under constraint between smooth surfaces by subjecting the veneer to a temperature of 200 to 400 degrees F. and a pressure of 25 to 200 p.s.i.

2. The method of treating veneer including the steps of providing a single ply of green veneer, forming a plurality of grooves in one surface of said ply parallel to the grain while in its green state, then reducing the moisture content of said ply to a point below its equilibrium moisture while the veneer is held under constraint, forming a plurality of grooves in one surface of said ply parallel to the grain while in its green state, then reducing the moisture content of said ply to a point below its equilibrium moisture while the veneer is held under constraint between smooth surfaces, and then raising the moisture content of the veneer to at least 5 percent.

3. The method of treating veneer including the steps of providing a single ply of green veneer, forming a plurality of grooves in one surface of said ply parallel to the grain while in its green state, then reducing the moisture content of said ply to a point below its equilibrium moisture while the veneer is held under constraint between smooth surfaces, and then raising the moisture content of the veneer to at least 5 percent.

4. The method of treating veneer including the steps of providing a single ply of green veneer, forming a plurality of grooves in one surface of said ply parallel to the grain while in its green state, then reducing the moisture content of said ply to a point below its equilibrium moisture while the veneer is held under constraint between smooth surfaces, and then raising the moisture content of the veneer to at least 5 percent.

5. The method of treating a single ply of veneer including the steps of providing a single ply of green veneer having a thickness greater than 1/16 inch, forming a plurality of grooves in one surface of said ply parallel to
the grain while in its green state, and case-hardening and drying the veneer ply by reducing the moisture content of said ply to a point below its equilibrium moisture while the veneer is held under constraint between smooth surfaces.

6. The method of treating veneer including the steps of providing a single ply of green veneer, forming a plurality of grooves in one surface of said ply parallel to the grain while in its green state, then reducing the moisture content of said ply to a point below its equilibrium moisture while the veneer is held under constraint between smooth surfaces, raising the moisture content of the veneer to at least 5 percent, trimming the edges of the veneer and then bonding the veneer to a wall surface with a nonaqueous adhesive.

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