June 28, 1932. A. ELMENDORF 1,864,812

METHOD OF GLUING WET VENEERS TO BACKINGS AND DRYING THEM

Filed May 16, 1931

Fig. 1.

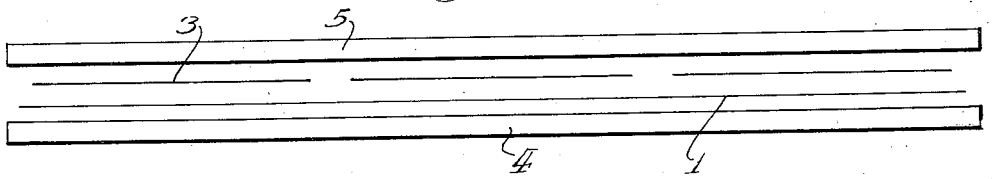


Fig. 2.

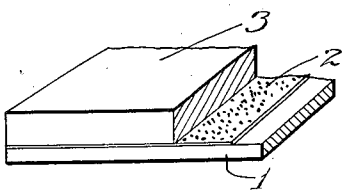


Fig. 3.

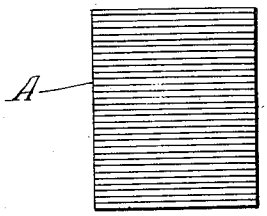
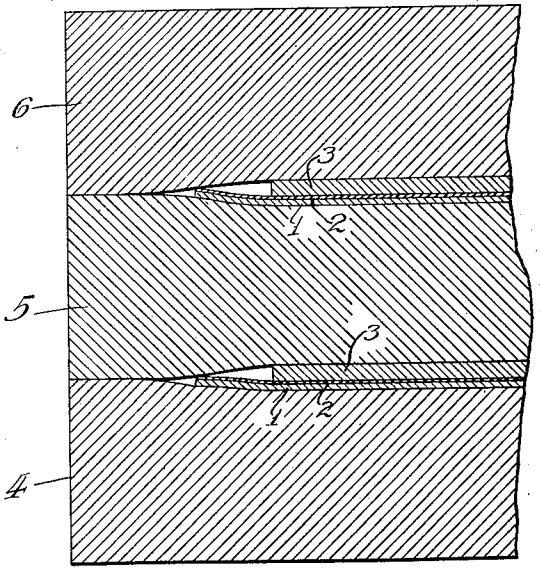


Fig. 4.



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UNITED STATES PATENT OFFICE

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METHOD OF GLUING WET VENEERS TO BACKINGS AND DRYING THEM

Application filed May 16, 1931. Serial No. 537,804.

In my prior Patent, No. 1,714,859, I have disclosed a process for gluing very thin wood veneer to a flexible backing and drying the composite sheet thus formed. In the specific example described in the patent to explain my invention, the backing and the veneer are in the form of rolls, the backing and the veneer being progressively brought into contact with each other by being fed between pressure rollers. However, much of the veneer employed in the commercial manufacture of composite sheets in accordance with the invention of said patent is in flat sheet form, and the present invention has for its object to provide a simple and novel process for producing and drying this composite material from flat sheet veneer, by gluing the entire area of each piece of veneer to the backing at one operation.

Wood veneer, in drying from its original wet or green state, shrinks to a considerable degree across the grain. Therefore, when a sheet of wet or green veneer is glued to a paper or other flexible backing, it will shrink in drying, unless restrained from doing so, and will cause the backing to shorten by curling; so that the composite sheet will not lie flat. If the composite sheet is held taut while the veneer is drying, the veneer cannot decrease in its dimension transversely of the grain but, if thin enough, it will stretch sufficiently to compensate for the natural shrinkage and thus permit the flexible backing to remain flat. Since the specific adaptation of my process illustrated in my aforesaid patent is a continuous one, the drying must be done quickly and, therefore, external heat is applied for this purpose. Viewed in one of its aspects, my invention may be said to have for its object to produce the flat flexible, dry, composite sheets in a simple manner without the application of external heat.

In its broadest aspect, my invention may, however, be regarded as having for its object to provide an extremely simple, economical, and efficient process of gluing thin wood veneers to flexible backings so as to produce composite sheets that are dry and flat.

In carrying out the present invention, I simply assemble wet veneer and a backing faced with dry water-soluble glue and press the two together and then hold them tightly between dry water absorbent pads or boards sufficiently massive to enable them to take up the excess moisture from the veneer. In order to save one operation, the initial pressing together of the veneers and backings is preferably done while they lie between the pads or boards which subsequently dry them.

These pads may be ordinary sheets of fiber board or pulp board of the type that will readily soak up water, and these will be sufficiently massive if they are about half an inch thick, as are ordinary wall boards and the like. A stack may thus be built up by alternating the absorbent pads with backings and veneers laid together. The stack thus produced is placed in a press and subjected to sufficient pressure to flatten the veneers and press them into intimate contact with the flexible backings. As long as the pressure is sufficient to accomplish this, it does not matter how great it is; pressures of from ten pounds to the square inch to one hundred pounds to the square inch having been successively employed. The pressure on the stack need be maintained only for a minute or two, in which time sufficient moisture will pass from the wet veneer to the dry glue to render the latter tacky and cause the veneers to adhere to the backings. The stack is then removed from the press and is allowed to stand for a considerable period of time, say from four to twenty hours, depending upon the thickness of the veneers and their original moisture content. Ordinarily a caul will be placed underneath and another on top of the stack, in which case even the uppermost composite sheets will be held under sufficient pressure during the long drying period.

The moisture content of the veneers will ordinarily not be reduced, while they remain in the press, to a point at which shrinkage begins. However, because the veneers have already been flattened against and caused to adhere to the backings, the clamping action of the absorbent boards or pads on the composite sheets constrains the veneers against shrinking or developing cusps during the subsequent drying.

When the stack is taken down, the veneers and the backings are separated from the pads or boards as flexible flat, dry, composite sheets which will thereafter lose no further moisture on exposure to the air. The veneer may contain 100% of moisture initially and yet, at the end of the process, it need not contain more than 6% or 8% of moisture, if that low a moisture content be desired.

The absorbent pads must, of course, be dried from time to time. They may be placed in a drying chamber in such positions that air may reach all parts of the broad surfaces thereof, and be dried in about half an hour by blowing dry, warm air across the same. The drying of the pads or boards, therefore, requires only a small fraction of the time consumed in my new process of gluing and drying the composite panels.

The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of my invention and of its objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawing, wherein:

Figure 1 is an edge view of two absorbent pads or boards separated from each other and having interposed between the same a backing sheet and a plurality of pieces of wood veneer, the view being diagrammatic and representing each element above the lower board as being in the act of descending toward the next lowermost element with which it is to engage; Fig. 2 is a perspective view, on a greatly exaggerated scale, showing a fragment of the glue faced backing and an overlying fragment of wood veneer to be glued to the backing; Fig. 3 is a side view of a completed stack in which numerous composite sheets are undergoing the gluing and drying process; and Fig. 4 is a vertical section through a fragment of the stack at one side thereof, the thicknesses of the backings, glue layers and veneers being greatly exaggerated.

Referring to Fig. 2 of the drawing, 1 represents a flexible sheet of paper fabric having one broad face covered with a thin layer 2 of dry water-soluble glue. Overlying the glue is a layer of thin wood veneer which ordinarily will be from 1/40 of an inch to 1/100 of an inch in thickness, although my process may be employed to advantage even with somewhat thicker veneers. If the veneer contains sufficient moisture, as it will if still in a green state or if it is dampened after it has become dry, sufficient moisture will pass from the veneer to the glue to render the latter tacky where the veneer and the backing are pressed together, and the veneer will be firmly united to the flexible backing sheet. It then only remains necessary to remove from the composite sheet the moisture in excess of that which it should have as a commercial product. The veneer comes in various widths, as well as in various lengths. It is not necessary to employ a backing sheet of the exact size of each sheet of veneer, but a plurality of pieces of veneer may be laid upon the same large backing sheet. Thus, in Fig. 1, I have shown a large flexible backing sheet 1 which is laid upon a massive pad or board 4 of water-absorbent material. This sheet, as heretofore explained, is faced with glue, the glue being on the upper side. On the flexible sheet are laid one or more pieces of wood veneer, three such pieces being shown in Fig. 1. Then, on top of the veneer, I lay a second water-absorbent pad or board 5. Another backing sheet and one or more pieces of veneer are then laid upon the pad or board 5, as shown in Fig. 4, and a third absorbent pad or board is laid on top of this second composite sheet. In this way, an entire stack, indicated as a whole by the letter A in Fig. 3, is built up. Each backing sheet, with its overlying veneer, is very thin so that the completed stack will have the appearance of a solid laminated block. It is not necessary that the veneer cover the entire surface of the corresponding backing sheet, notwithstanding the fact that the overlying absorbent pad or board will come in contact with those portions of the glue covered face of the backing that are left exposed by the veneer, because the glue is dry, as are also the absorbent panels and, therefore, the panels will not adhere to the glue.

After the stack has been completed, it is put under pressure in a suitable power press so as to flatten the veneers and bring them into intimate contact with their respective backings. In a very short time enough of the moisture in the wet veneer passes into the glue and softens it sufficiently to unite the veneers to their backings; some of the moisture also being taken up by the pads or boards. Upon removal of the stack from the press moisture will continue to be absorbed by the pads or boards at such a rate that, in from four to twenty hours, the composite sheets will have become dry. The stack is then taken down, a layer at a time, and the absorbent pads are placed in a drying chamber so as to remove therefrom the moisture that was taken up thereby during the process of gluing and drying the composite sheets, and place the pads in condition for further use. So far as the composite sheets are concerned, the gluing and drying thereof is complete at the time of their removal from the stacks.

It will thus be seen that I have produced a simple, novel and efficient method of gluing thin wet veneers to flexible backings and drying them, the method requiring no skilled labor and no heating of the product during the process of its manufacture. It will also

be seen that the cost of such labor as is required after the glued backings have been prepared is an almost negligible quantity per square foot or yard of finished product. Consequently, my invention is not only simple and novel, but it is very inexpensive. It should be noted that, while my invention is particularly adapted to the gluing and drying of wood veneers so thin that wet glue would or might strike through the same, it is also useful in gluing thicker veneers.

While I have illustrated and described with particularity only a single preferred manner of my invention, I do not desire to be limited to the exact structural details or the exact steps thus illustrated and described; but intend to cover all forms, arrangements and methods, including any in which a composite sheet including veneer still wet and glue in a viscous state is held tightly between absorbent pads, which come within the definitions of my invention constituting the appended claims.

I claim:

1. The method of gluing wet thin wood veneer to a flexible backing and at the same time drying the veneer, which consists in pressing a composite sheet, composed of a sheet of such veneer and a backing sheet with viscous glue interposed between them, between massive pads of water-absorbent material under sufficient pressure to hold the veneer against shrinking, and allowing the composite sheet to remain between the pads until the greater part of the moisture therein has been absorbed by the pads.

2. The method of gluing wet thin wood veneer to a flexible backing and at the same time drying the veneer, which consists in assembling a sheet of veneer and a backing sheet with glue interposed between them, pressing the veneer and the backing together so as to unite them into a composite sheet and holding the composite sheet firmly between massive pads of water-absorbent material, and allowing the composite sheet to remain between the pads until the greater part of the moisture therein has been absorbed by the pads.

3. The method of gluing wet thin wood veneer to a flexible backing and at the same time drying the veneer, which consists in providing a backing with a thin coating of water-soluble dry glue, laying on the coating a wet sheet of thin wood veneer, forcing the veneer and the backing together under sufficient pressure to bring them into intimate contact with each other and for a sufficient time to cause the glue to become tacky and unite the veneer and the backing, holding the composite sheet thus produced between massive pads of water-absorbent material, and allowing the composite sheet to remain between the pads until the free moisture and a part of the hygroscopic moisture in the wood has been absorbed by the pads.

4. The method of gluing wet thin wood veneer to a flexible backing and at the same time drying the veneer, which consists in assembling a sheet of veneer and a backing sheet with glue interposed between them, placing the composite sheet between massive pads of water-absorbent material under sufficient pressure to bring all parts of the veneer into intimate contact with the backing, and allowing the composite sheet to remain between the pads until all of the free moisture and a part of the hygroscopic moisture therein has been absorbed by the pads.

5. The method of gluing wet thin wood veneer to a flexible backing and at the same time drying the veneer, which consists in providing a backing with a thin coating of water-soluble dry glue, laying on the coating a wet sheet of thin wood veneer, pressing the composite sheet between massive pads of water-absorbent material, and allowing the composite sheet to remain between the pads until the wood and the backing have become united and the greater part of the moisture in the wood has been absorbed by the pads.

6. The method of gluing wet wood veneers to flexible backings and at the same time drying the veneers, which consists in forming a stack of thick boards of water-absorbent material alternating with composite sheets composed of wet thin wood veneers laid upon flexible backings with glue interposed between the veneers and the backings, compressing the stack to unite the veneers to the backings, and allowing the stack to stand until all the free moisture and some of the hygroscopic moisture in the veneers has been absorbed by the absorbent panels.

7. The method of gluing wet wood veneers to flexible backings and at the same time drying the veneers, which consists in forming a stack of thick boards of water-absorbent material alternating with composite sheets composed of wet thin wood veneers laid upon flexible backings with dry water-soluble glue interposed between the veneers and the backings, compressing the stack to unite the veneers to the backings, and then relieving the pressure on the stack and allowing the stack to stand until the veneers have become commercially dry.

8. The method of gluing wet wood veneers to flexible backings and at the same time drying the veneers, which consists in forming a stack of thick boards of water-absorbent material alternating with composite sheets composed of wet thin wood veneers laid upon flexible backings with dry water-soluble glue interposed between the veneers and the backings, compressing the stack to unite the veneers to the backings, relieving the pressure on the stack and allowing the stack to stand until all of the free moisture and a part of

the hygroscopic moisture in the veneers has been absorbed by the absorbent boards, taking down the stack, and then drying the absorbent boards to place them in condition to be used in another gluing and drying operation.

In testimony whereof, I sign this specification.

ARMIN ELMENDORF.