Jan. 10, 1933. A. ELMENDORF 1,893,886

VENEERED BOARD AND METHOD OF MAKING SAME

Filed Oct. 22, 1931

Fig. 1.

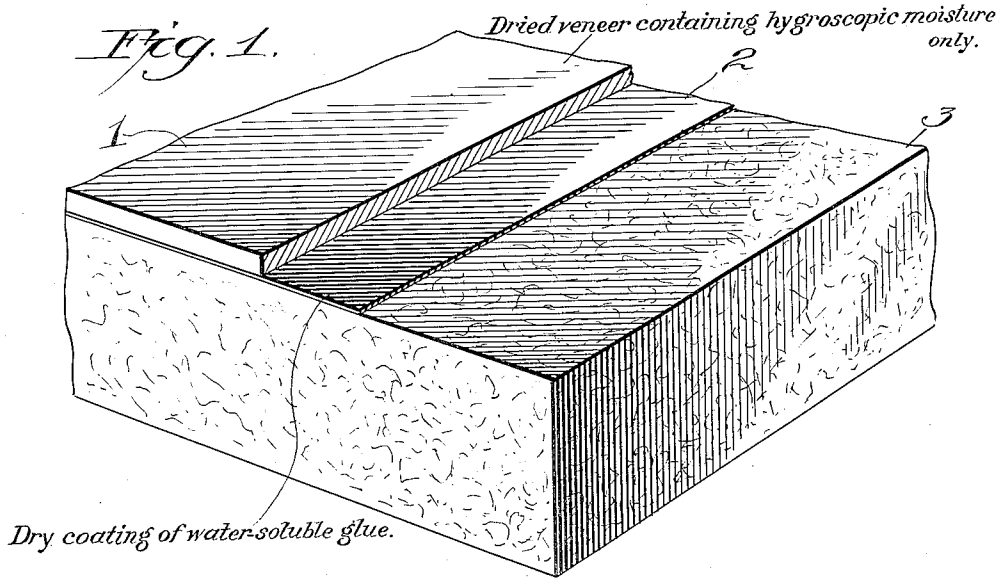
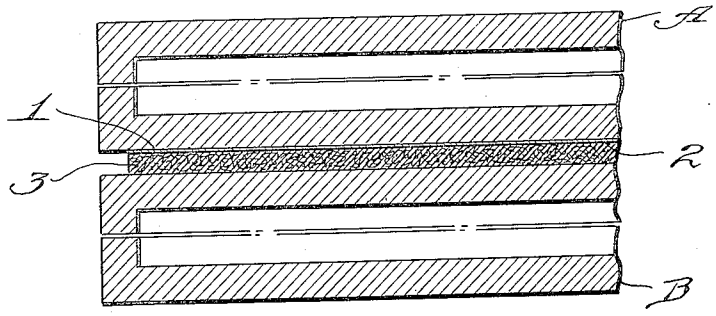


Fig. 2.



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VENEERED BOARD AND METHOD OF MAKING SAME

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There has long been sought a means for or method of successively facing one side of a wall board, asbestos board, plaster board and other board-like materials composed of fibrous material or having on the side to be faced a layer of fibrous material. When the ordinary gluing processes are employed, the boards warp; if they are composed of fibrous material throughout, they split inwardly from opposed edges more or less parallel with the broad faces; and, in the case of boards or panels sheathed with fibrous material, the sheathing tears loose in the veneering process. In the case of plaster board, for example, in which a strong core of gypsum or the like is sheathed with heavy paper, the gluing of even very thin veneer to a face thereof has heretofore caused the board to warp and the sheathing underlying the veneer to loosen.

The cause of this is that the veneer expands as it becomes wet and, upon drying, during or at the end of the gluing operation, powerful internal shrinkage stresses are set up in the veneer. If both faces of a panel are veneered, the stresses on opposite sides of the panel balance each other; but, when the veneer is applied to one face, only, the shrinkage stresses have free play to do damage to the panel.

The difficulties encountered in producing board-like materials veneered on one face have been so great that, so far as I am aware, no one has heretofore successfully manufactured them commercially.

The object of the present invention is to manufacture in a simple manner and at a low cost veneered wall board, asbestos board or other board-like material composed of a fibrous substance, or having a facing of such substance next to the wood veneer, without destroying the flat character of the board or injuring its physical structure.

The glues which are suitable for the purpose are all of the water-soluble type, meaning thereby glues that are dissolved in water for use, although they may become insoluble, or substantially so, upon setting. The difficulties to which I have referred have arisen from the drying of the glues and the veneers from a wet condition and the consequent shrinking thereof; this shrinking of the glue and the veneer subjecting the fibrous material of the board to powerful rupturing stresses.

If the gluing can be done without the presence of moisture that is the cause of the trouble, there will not be set up in the veneer any shrinkage stresses that tend to warp the boards and therefore, there will be no difficulty in facing boards of the type in question with wood veneer.

Viewed in one of its aspects the present invention may be said to have for its object to secure wood veneer to a board of fibrous material or to a layer of fibrous material on a board of any kind with a water-soluble glue, in such a manner that the veneer shall be substantially free from shrinkage stresses.

The various features of novelty whereby my invention is characterized will herein after 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 a perspective view of a fragment of a board or panel made in accordance with my invention, the thicknesses of some of the layers being exaggerated, and portions of each layer above the under layer being broken away better to illustrate the succession of layers; and Fig. 2 is a vertical section through a press in which the gluing of the assembled elements of the panel or board is performed.

I have discovered that there is sufficient hygroscopic moisture in a coating of dry water-soluble glue, or in thin, dry veneer, or in the composite body produced by laying a sheet of dry wood veneer on a dry board coat-

ed with dry glue, to soften the glue sufficiently to unite the veneer and a dry board, if this moisture can be made available for that purpose. Therefore, if this moisture be made available, the veneers may be dried until they contain no free moisture, so that the moisture content, in a hygroscopic state, will be uniform throughout, as will also the moisture content of the dry glue coating. This moisture content may be and ordinarily is varied according to the humidity of the atmosphere in which the work is done. I have found that the hygroscopic moisture in the work may be utilized to soften the glue by applying heat. Therefore, the dry veneer need only be laid on the dry glue coating on the board and be placed under sufficient pressure to bring all parts of the veneer into intimate contact with the glue, while sufficient heat is applied quickly to vaporize the hygroscopic moisture content in the work to cause the glue to soften and produce a perfect joint. By vaporizing the moisture quickly, I mean that this is accomplished in a short period of from half a minute to perhaps five minutes, as distinguished from longer periods of hours or more. The higher the temperature, the shorter will be the time required to perform the gluing operation. The lower temperature limit may, therefore, be said to be that which will produce sufficiently rapid vaporization to accomplish the intended purpose, whereas the upper limit is set by the character of the glue and cannot go to a temperature beyond which the glue might be injured. In actual practice, I have been able to secure satisfactory results with temperatures as low as 160° F. to 170° F. and with higher temperatures ranging from 250° F. to 280° F.

Glue joints made in this way are much more uniform than when made in the old way. Therefore, viewed in one of its aspects, the present invention may be said to have for its object to produce more uniform and more nearly perfect glue joints between thin wood veneer and boards or stiff panels than has heretofore been possible.

The degree of pressure employed may be varied, but I have found that it is better to use relatively high pressures. Thus, I have found that a better product is obtained by employing pressures of from 50 pounds to 100 pounds to the square inch than pressures, say of 10 to 15 pounds.

Ordinarily the veneers employed in my process will have therein hygroscopic moisture content; but it is possible, in some instances, to produce a glued joint by utilizing simply the hygroscopic moisture in the glue, the veneer being dried to such a degree as to contain no substantial amount of moisture, even in hygroscopic form. There would usually be no good purpose served in drying the veneer to a point where it has lost substantially all of its hygroscopic moisture, and I refer to that condition merely as a possibility and to demonstrate that, in carrying out my process, the hygroscopic moisture in both the veneer and the glue is or may be utilized to soften the glue.

The result of my improved process is a new product, namely a flat board-like member of the type that ordinarily warps and splits when veneered on one side only, having thereon a facing of veneer containing no shrinkage stresses and therefore exerting no tendency to warp or shear the board. Therefore my invention may be said to have for its object to produce a new construction material.

Not only am I able to produce flat, sound veneered boards by my new process but, while gluing, there is no danger that the glue will be softened to an extent that will make it strike through very thin veneer. There is still another advantage, however, so far as mere gluing is concerned, and that is that I am able to employ glues which it has heretofore been necessary to avoid. Some glues, after having been spread in the form of a coating and dried, require considerable moisture to dissolve and soften them. Where this moisture is supplied from wet veneer as may be done, there is always danger that there will be too much moisture and that the glue will strike through or stain the veneer. This is true of casein glue, for example. However, in accordance with my improved process, these glues may be successfully employed if the veneers contain only hygroscopic moisture, but in large amounts. Thus, the hygroscopic moisture content of veneers will ordinarily run from 8% to 25%. By controlling the hygroscopic moisture content of the veneer, it is possible to insure the presence of sufficient moisture to soften those glues to which I have last referred, without making them so liquid that they will strike through. For example, if the veneers are simply air-dried to a point where all of the hygroscopic moisture remains, there will not be sufficient moisture in the work to cause the glue to strike through or stain the veneer.

In the practice of my invention, reference being had to the drawing, the dry veneer 1 is laid upon a dry coating 2 of water-soluble glue on the board 3 to be veneered and the composite body is placed in a hot press, shown as consisting of upper and lower steam chests, A and B. Upon keeping the press closed for a period of one-half minute to five minutes, enough of the hygroscopic moisture present is transformed into steam to render the water-soluble glue tacky and bring about adhesion of the veneer to the board. The board, being flat, at the time of applying the veneer, and being kept under a pressure of from 50 pounds per inch to 200 pounds per inch, while the gluing is being done, and no additional moisture being supplied, there will

be no stresses set up tending to warp the board and more or less break down its physical structure. Even so, the board when removed from the hot press sometimes takes a slight curved or bowed form; but, if left to itself, the board will again flatten out of its own accord, due to re-absorption of moisture lost in heating.

The glue may initially be applied to the board in any suitable way. Curiously enough, the spreading of the wet glue on the board and the subsequent drying thereof does not harm the board. If the board should at this time take a slight curvature, it will again become flat in the press, during the gluing of the veneer, and will thereafter remain flat.

Heretofore it has been necessary to apply veneer to both faces of such boards to achieve commercial features. By my improved process this is not necessary, veneer can be applied to one face only without warping the board. Since ordinarily only one face is exposed to view great econonmy of materials is thereby achieved.

I claim:

1. The method of making a veneered board, which consists in producing a dry coating of water-soluble glue on the face of a board faced with fibrous material, laying on the glue coating thin wood veneer containing only hygroscopic moisture, and applying pressure and heat to bring the veneer into intimate contact with the glue and cause hygroscopic moisture in the work to vaporize, soften the glue and unite the veneer to the board.

2. The method of making a veneered board, which consists in providing the face of a fibrous part of a board with a dry coating of water-soluble glue, laying on the glue coating thin wood veneer containing only hygroscopic moisture, placing the composite member in a press, closing the press with a force sufficient to flatten the veneer and bring it into intimate contact with the glue, and applying through the press sufficient heat quickly to vaporize the amount of hygroscopic moisture in the work, soften the glue and unite the veneer to the board.

3. The method of making a veneered board, which consists in coating with wet water-soluble glue the face of a fibrous part of a board, drying the glue and the board until no free moisture remains, laying on the dry glue-coating a sheet of thin wood veneer containing only hygroscopic moisture, and applying heat and pressure to bring the veneer into intimate contact with the glue and cause hygroscopic moisture in the work to vaporize, soften the glue and unite the veneer to the board.

4. The method of making a veneered board which consists in producing a dry coating of water-soluble glue on the face of a board faced with fibrous material laying on the glue coating thin wood veneer containing only hygroscopic moisture, and applying pressure and sufficient heat to bring the veneer into intimate contact with the glue and quickly to cause hygroscopic moisture in the work to vaporize, soften the glue and unite the veneer to the board.

In testimony whereof, I sign this specification.

ARMIN ELMENDORF.