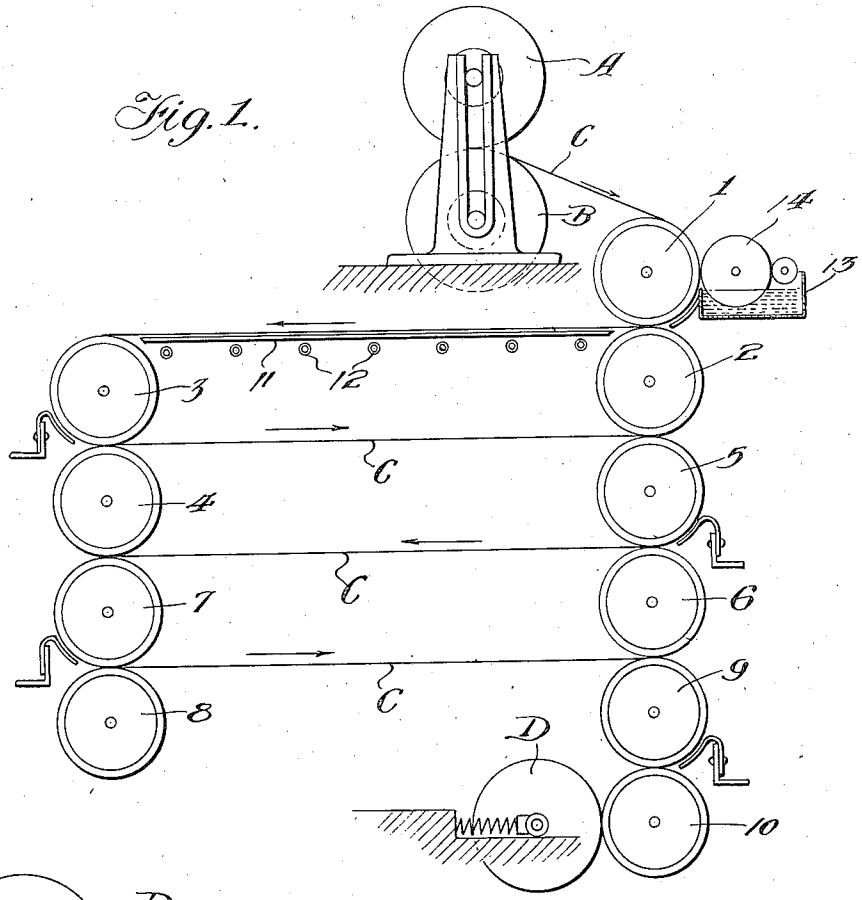
May 28, 1929. A. ELMENDORF 1,714,859

PROCESS OF VENEERING

Filed July 11, 1927

Fig. 1.



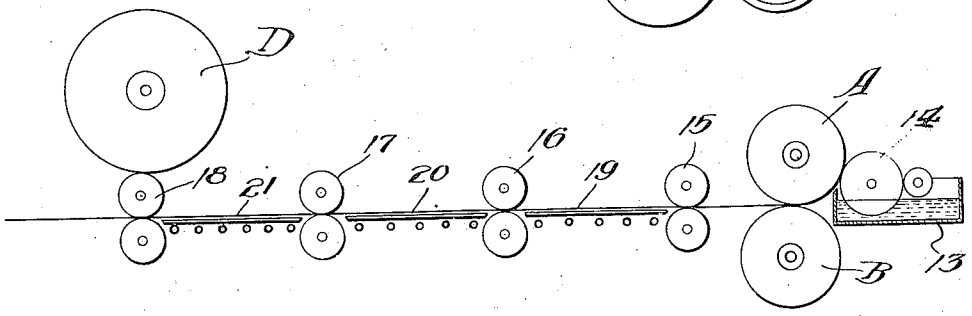


Fig. 2.

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UNITED STATES PATENT OFFICE.

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PROCESS OF VENEERING.

Application filed July 11, 1927. Serial No. 204,937.

The present invention relates primarily to a product comprising paper or other flexible material faced with thin wood veneer; and it has for its object the successful manufacture, at low cost, of the product in such a form that no more care is required in handling or applying the same than is the case with wall paper, for example.

In carrying out my invention I employ very thin wood veneer which in many cases would be damaged in gluing it to its backing, by reason of the fact that ordinary wet adhesives would pass entirely through the same and discolor the exposed face. A further object of the present invention is to make it possible to glue such thin veneer to a backing without marring or discoloring its exposed face. In this aspect of my invention, therefore, it is applicable to the gluing of thin veneers generally and not only to a flexible backing.

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:

Figures 1 and 2 are diagrammatic views illustrating two different ways of carrying out my improved process.

In so far as the main features of my invention are concerned, the veneer employed will be similar to that specified in my Patent No. 1,435,594, namely a veneer so thin that it will not crack or check when held so that it cannot contract normally in drying from a condition in which it contains sufficient moisture to make it flexible. Depending upon the kind of wood, as explained in my aforesaid patent, the veneer may be as thin as it is practicable to cut it or be a thirty second of an inch thick or thicker. The backing to which the veneer is to be applied will usually, but not necessarily, be paper.

The veneer will usually be rolled up as it is cut from the log, so that the grain of the wood extends lengthwise of the roll or transverse to the length of the sheet. Therefore, if the ends of the paper and the veneer are laid upon each other and the paper and veneer are unwound from their rolls, the veneer will lie with its grain extending crosswise of the paper. The veneer must be moist or it will be brittle and break when an attempt is made to unroll it. Therefore, since the finished product must be dry, the veneer must also be dried after unrolling. In drying, the veneer, if unrestrained, will shrink across the grain, namely in the direction of the length of the sheet. If the veneer, in its moist state, is glued to the paper and then allowed to dry it will cause the composite product to curl up, unless restrained; the veneer cracking when an attempt is made to straighten it. In accordance with the present invention, I force the veneer to dry without shrinking. This end is attained by gripping the compound sheet, after the paper or the like and the veneer have been laid together with adhesive between them, and holding it taut while the drying takes place. The result is therefore the same as explained in my aforesaid patent, the veneer adjusting itself by some internal process, or otherwise, so as to dry without shrinking and without visibly cracking.

The steps of pressing the paper and the veneer together, holding the composite sheet taut, and producing the drying action may be carried out in various ways. In commercial practice the process as a whole should be a continuous one both for the sake of economy and to secure uniformity of product. Furthermore, there are many variables, such as the kind of glue, the kind of backing, the kind of veneer; and the degree of moisture in the backing, the glue, and the veneer, that may determine the kind and extent of pressure and the degree and character of heat and the length and time of application of heat in drying, as well as the means for and time or times of application of the holding forces to maintain the sheet taut. When using ordinary bone or hide glues, for example, the pressure devices may be either hot or cold whereas, if casein glue is employed, they are preferably hot in order more quickly to soften the dry glue.

In Fig. 1 I have illustrated diagrammatically a continuous process in which the veneer is in the form of a roll A, and the paper is in a roll B. The rolls are placed with their long axes parallel to each other so that when the veneer and the paper are unrolled they register with each other and form a composite sheet as indicated at C. This composite sheet, containing a suitable adhesive to unite the veneer with the paper, is led between series of pairs of pressure rollers spaced apart from each other and rotating

at the same peripheral speed. In the arrangement shown, the composite sheet first passes between rollers 1 and 2, thence over a remote roller 3 and between the latter and a cooperating roller 4, pasing back and forth in contact with other rollers indicated at 5–10, inclusive, and being finally wound up on a roll D. The rollers perform double functions, acting as pressure members to insure intimate engagement between the veneer and the paper and as grippers at opposite ends of long sections of the composite sheet to hold them taut.

The holding or gripping function of the rollers is an important one as it prevents the occurrence of the natural contraction or shrinking of the veneer while the latter is drying. It is characteristic of the wood to shrink progressively as the moisture content recedes from a critical point, the so-called point of fibre saturation. The finished composite sheet must be dry, that is the moisture in the veneer must be far below the point of fibre saturation, whereas the amount of moisture in the veneer at the beginning of the process may be above the point of fibre saturation.

As the composite sheet passes through the rollers, assuming that means are provided for effecting a drying thereof, the veneer tends to shrink as soon as its moisture content drops below the critical point, if it was originally greater, or begins to shrink immediately if the original moisture content was below the critical point. However, the sheet is firmly gripped along many parallel transverse lines and therefore no shrinking can occur. If the veneer were thick it would crack or check under this restraint but, being very thin, internal readjustment takes place and no visible cracks appear. This readjustment may take place gradually as the drying will be progressive from the time the composite sheet enters the first pair of rollers until it is rolled up as a finished product.

The drying of the composite sheet may be brought about in any desired way best adapted to the particular condition of each case. Thus the rollers may be heated by steam or otherwise, causing heat to be applied to the work only while in contact with the work. Also, the rollers may be padded, as are the rollers in ironing machines. Dry air, heated or at room temperature, may be blown across the free stretches of the composite sheet. If desired, the free stretches, or one or more of them, may pass over tables of which one is shown at 11, heated by steam pipes 12 or otherwise. The temperature will, of course, vary with the moisture content of the work, the degree of dryness desired, the speed of travel of the composite sheet, the kind of adhesive, and other factors. The important thing, of course, is to secure a good union between the paper and the veneer and the drying of the sheet as a whole in such a way that it will lie flat and not tend to warp or curl.

When very thin veneers and ordinary wet adhesives are used, the adhesive will soak through the veneer and spoil the appearance of the exposed face of the latter. Therefore in many instances it will be desirable to have the adhesive or glue in a dry state when brought in contact with the veneer. The glue may be applied to the paper and dried until it is no longer tacky or, if the paper is to be supplied in the form of a roll, until a degree of dryness is reached that will permit the paper to be rolled up without sticking together.

Then, when the veneer and the coated paper are pressed together, the moisture in the veneer will act on the glue to make it adhere to the veneer without passing far enough into the same to mar the appearance of the exposed face of the veneer. Where a dry glue coating on the paper is used the rollers are preferably heated so that the heating of the veneer will assist in driving the moisture into the glue.

In this case it is also desirable that the moisture of the veneer be controlled to provide the necessary amount of water to make the glue adhesive. Water may be applied to the exposed face of the veneer before the composite sheet enters between the rollers, if the veneer does not contain the necessary amount of moisture. This may conveniently be accomplished by placing beside the roller 1 a water reservoir 13 containing a roller 14 partly immersed in the water and adapted to engage with the veneer as it passes around the roller.

Instead of using two sets of rollers spaced apart as shown, there may be only a single set as, for example the rollers on the right hand side of Fig. 1. The composite sheet, in that case will be passed successively over the rollers 2, 5, 6, 9 and 10.

If desired, the composite sheet may move in a straight line between supply rollers and over heated tables. Such a process is illustrated in Fig. 2 in which there are four pairs of pressure rollers 15, 16, 17 and 18, heated or cold, as conditions may require, together with hot tables 19, 20 and 21 arranged in the spaces between the pairs of rollers. The rollers grip the sheet as well as press it, permitting the drying to take place without shrinkage of the veneer.

It will thus be seen that I have produced a simple and novel process of making a composite sheet comprising a tough backing and a continuous facing of wood that will be free from blemish of any kind, the sheet being capable of lying flat and being flexible so that it may be rolled up. It will furthermore be seen that the backing is so effectively united with the thin veneer that no visible injury to

the latter will result from a flexing or rolling up of the sheet; and therefore when the composite sheet is applied to a wall or other surface the latter will be given a perfect facing of wood that may carry a beautiful harmonious design by reason of the fact that there are no joints in the veneer throughout one dimension of the wall.

While I have explained my invention with considerable particularity, and have illustrated and described only a single type of apparatus by which my invention may be carried out, I do not wish to be limited to the specific details illustrated and described; but intend to cover all forms of my invention coming within the definitions thereof constituting the appended claims.

I claim:

1. The process of facing a member with veneer, which consists in coating said member with a liquid adhesive which will become tacky when moistened after having been dried, drying the adhesive, laying on the dry adhesive wood veneer so thin that said adhesive in a liquid state will pass through the same and containing a large amount of moisture, and subjecting the veneer to a temperature and a pressure such that sufficient moisture will be transferred from the veneer to the adhesive to render the latter tacky but not enough to render it liquid.

2. The process of facing a flexible sheet with thin veneer, which consists in coating the sheet with a liquid adhesive that will become tacky when moistened after having been dried, drying the adhesive, laying on the dry adhesive thin wood veneer containing a large amount of moisture, and pressing the veneer and the flexible sheet together under such conditions that sufficient moisture will be transferred from the veneer to the adhesive to render the latter tacky but not enough to render it liquid.

3. The process of facing a flexible sheet with thin veneer, which consists in coating the sheet with a liquid adhesive that will become tacky when moistened after having been dried, drying the adhesive, laying on the dry adhesive thin wood veneer containing a large amount of moisture, and pressing the veneer and the flexible sheet together under such conditions that sufficient moisture will be transferred from the veneer to the adhesive to render the latter tacky but not enough to render it liquid, the sheet being held taut until the adhesive has become set and the veneer dried and thereby preventing the veneer from shrinking while drying.

In testimony whereof, I sign this specification.

ARMIN ELMENDORF.