PATENT SPECIFICATION

DRAWINGS ATTACHED

835,075

Date of Application and filing Complete Specification: *August* 7, 1957.

No. 24886/57.

Complete Specification Published May 18, 1960.

Index at Acceptance: Class 145, B1.
International Classification: B27l.

Method of producing veneers and resulting products.

COMPLETE SPECIFICATION

We, JOHN WRIGHT AND SONS (VENEERS) LIMITED, a British Company, of Avon Wharf, Longfellow Road, Mile End Road, London, E.3, do hereby declare the invention (Communicated by John S. Williamson, a citizen of the United States of America, residing in the City of Cockeysville, County of Baltimore and State of Maryland, United States of America) for which we pray that a patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:

This invention relates to a method of producing wood veneers and the products resulting therefrom.

It is the object of the present invention to provide an economical method of producing sheets of wood veneer which simulate natural woods such as straight grain oak veneer (otherwise known as comb grain or rift grain white oak veneer), zebra wood and the like, and which have such appearance and structural characteristics that they are difficultly distinguishable from the natural products.

It is a further object of the invention to produce straight grain oak veneers which simulate the natural product and which may be produced at a fractional cost of the latter. The products in accordance with the invention may also be manufactured in the form of long sheets which are devoid of any faults which occur normally in the production of the natural product and which contribute to the relatively higher cost of the latter in view of the high proportion of waste necessitated by the incidence of natural defects.

It is also the object of the invention to provide sheets of wood veneer of long lengths and special patterns which may be controlled in the course of the manufacturing procedures by varying the species of woods and the thicknesses of the laminations thereof.

The invention proceeds upon the principle of fabricating special veneers from specially constructed blocks of wood. In particular, the invention aims to obtain at low cost and with no natural defects, straight grain oak veneer, which is in great demand at the present time, by slicing such sheets of veneer from a built-up block of wood formed from a stack of superposed laminations of oak veneer cut from a log, with the grain of the wood extending in a common direction. The sheets of veneer are preferably obtained by stripping a continuous sheet of veneer from a log by rotary cutting and subsequently clipping this continuous sheet to predetermined widths while eliminating therefrom any faults and imperfections in the sheet of veneer. By the elimination of such faults or imperfections at this time, the block of wood which is formed from these laminations is perfect so that the sheets of veneer which are subsequently sliced therefrom are free of any imperfections. The individual sheets of veneer are then passed through a glue spreader applying thermosetting glue to the opposite faces of alternate sheets, or to the opposite faces of each sheet. The sheets are then stacked in a pile and the same is formed into a block by applying pressure to the pile of sheets. Thereafter, these sheets are placed in a steam tank and are subjected to heat, pressure being maintained throughout the steaming by turnbuckle clamps, to season the several laminated sheets of veneer into an integral mass or solid block of wood and to improve the cutting qualities thereof. Following the steaming of the composite block of laminations, a pair of opposite diagonal corners are sawed therefrom to form bevelled faces thereat. The block is clamped at one of these faces to place the opposite bevelled face in position for the operation thereon of a slicer of any type known in the art, to successively slice sheets of veneer from the block along a plane inclined relative to the plane normal or perpendicular to the laminations and in parallel to the grain of the wood. The bias cuts from the block of wood result

(Price 3s. 6d.)

Price 4s 0d

Price 4s 0d

in strips of veneer having a preponderance of needle point and pencil stripes therein and a minimum amount of flakes, which are undesirable, and which in no case is of any length exceeding the thickness of the original sheets of veneer from which the block is built up. The biased cut of the stock of laminations results in a smooth mergence of the rift-cut grain between adjacent laminations so that it is difficult to perceive any lines of demarcation therebetween.

For a better understanding of the invention and to show how the same may be carried into effect, reference will now be made to the accompanying drawings, in which:

Figure 1 is a perspective view of the continuous sheet of veneer stripped from a log and clipped into uniform widths,

Figure 2 is a perspective view of the block of wood formed from a plurality of laminations which are joined together by means of adhesive and the application of pressure thereto,

Figure 3 is a sectional view of the steam chamber with the block of wood undergoing seasoning, with the simultaneous application of pressure,

Figure 4 is a front elevation of the block of wood showing the lines of the saw cuts adapted to be made thereon in preparation for the slicing of the veneer sheets therefrom,

Figure 5 is a corresponding view showing the laminated block clamped to the bed plate of a conventional veneer slicer at one bevelled face of the flitch while the opposite diagonal face is adapted to have a veneer slicer operate thereon,

Figure 6 is a plan view of a sheet of straight-grain oak veneer produced in accordance with the invention, and

Figure 7 is a plan view of a natural sheet of straight grain oak veneer.

The instant invention aims to produce wood veneers which simulate those found in nature and which, in fact, improve upon those found in nature by the elimination of natural defects and also by extending the range of the natural products by exercising a proper selection of the woods, their thicknesses, and the manipulative operations performed thereon.

The invention is primarily concerned with the obtention of straight grain oak veneers which simulate the natural product. Such veneers are characterised by a series of fine needle point lines, as might be grained with a fine comb, resembling pencil stripes and which have a minimum amount of diagonal flaking.

The instant invention enables the production of a veneer sheet which is virtually indistinguishable from the natural product and which presents many advantages thereof. In the first place, because of the small waste encountered in the production of sheets of veneer in accordance with the invention, the cost per square foot in sheets of eight foot lengths may be reduced from two and one-half to three times the cost of the natural product. Furthermore, since the sheets are cut from a synthesized or built-up log, they may be produced without faults or imperfections which occur in the natural product arising from knots, dote or rot. By the judicious selection of the veneer sheets which are used in the manufacturing process in accordance with the present invention, the grain and appearance of the final product may be controlled to a much higher degree than by the controls exercised on the natural product. A comparison of Figures 6 and 7 in the instant application shows the general appearance of the grain for a sheet A in Figure 6, produced in accordance with the invention, to be similar to the natural sheet N in Figure 7, even though the former shows a darker colour in parts thereof.

In Figure 1 is shown a preferred embodiment of the invention in which a continuous strip of veneer 3 is stripped by the knife 2 from an oak log 1 mounted in a suitable lathe to perform a veneer stripping operation. The technique of obtaining veneers from logs is an old one and need not be described in detail.

The veneer strip 3 is fed onto a table 4 whereat the same is cut into uniform widths 7 of any desired dimension by means of the reciprocating clipper 5. This clipper 5 may be operated automatically or manually and the clipper may be operated to clip or eliminate from the strip 7 any natural defects such as knots, which would evidence themselves by dark stripes or spots in the final product.

The sheets of veneer 7 may range from 1/8" to 1/16" in thickness, and of any predetermined length and widths ranging from 10" to 16". The lengths of the sheets may be longer or shorter than 8 feet, and the thickness of the veneer may range as high as 3/16". When such lengths of veneer are obtained from a veneer lathe as disclosed in Figure 1, the grains in adjacent sheets are similar in shade and physical characteristics by virtue of the fact that they stem from the log in the same period of growth of the tree. The stacking of the sheets 7 with the grain of the wood extending in a common direction in a pile 8, as shown in Figure 2, results in a pile of sheets of uniform shading or of gradual colour gradations, if any. Novel and sometimes desirable grain effects, which are still straight grained, may be obtained by reversing adjacent sheets either end on end or face to face, or both. In fact, the successive sheets 7 in the pile 8 may also be obtained by the slicing of the veneer sheets from blocks of oak, by reciprocating slicers which may be used alternatively to rotary slicers.

The thin sheets of veneer 7 are composited in pile 8 following the application of adhesives of any suitable type, such as transparent thermosetting adhesives in general commercial use in the manufacture of plywoods. Preferably, the adhesive may be applied to the opposite faces of alternating sheets, although the gluing of all of the sheets is permissible as long as there is a layer of adhesive between juxtaposed sides of adjacent sheets. Following the application of adhesive to at least alternate layers, the pile of sheets 8 is compressed into a unitary block by the application of pressure thereto, ranging from 80 to 140 pounds per square inch, which pressure is maintained throughout the following heating step.

In order to condition the fabricated compressed block in readiness for the final veneer cutting operation, the same is placed in a steam chamber 11, between turnbuckle clamps, or a clamping ram assembly 9 which is the equivalent thereof. Steam at 180°F to 212°F is admitted into the chamber through inlet conduit 10 and condensate may pass off from the chamber through conduit 12. The steaming or seasoning of the block at high temperature for approximately ten to twelve hours sets the glue and conditions the block for the veneer slicing operations to be performed thereon. The block is then prepared by sawing off the opposite diagonal corners at 15 and 16, as shown in Figure 4. The block is then secured to a slicer bedplate by means of clamp 17 at bevel face 15 in order to dispose the opposite bevelled face 16 in the field of operation of a reciprocating veneer slicer, in order to slice from the composite block veneer sheets A of any desired thickness, for example, 1/28", for mounting on plywood, fabric backings, or the like. These veneer sheets A, as shown in Figure 6, resemble very closely the sheets N of natural comb grain veneer as shown in Figure 7.

A principal contributing factor to the success of the instant invention is the slicing of the veneer layers from the bevelled face 16 along a plane which is inclined relative to the plane normal or perpendicular to the laminations and in parallel to the grain of the wood. This angle may vary up to 30° to the normal line 20, and preferably ranges from 60° to 85° relative to the planes of the laminations. The bias cut which is practiced in the production of the final product results in a wider section of the individual laminations which are indistinguishable in the final product as the result of the perfect coalescence of the several laminations at the planes therebetween. In view of the fact that the final slicing is performed in line with the grain of the wood and partially in the plane of the several laminations, smooth cuts with substantially uniform grain effects are obtained, which facilitates the splicing of the juxtaposed sheets of veneer when the same are applied upon a backing layer.

Lastly, the flakes which may occur in the pattern occasionally are never any longer than the thickness of the individual laminations and therefore do not affect the over-all appearance of the straight grain in the wood.

While the primary concern of the instant invention is the obtention of straight grain oak veneers, the advantages of the instant invention may be realised in the handling of veneers other than that produced from the oak tree, for example, walnut, maple, poplar, ash, mahogany and others. In fact, a highly desirable and useful product may be obtained by the production of a wood veneer resembling zebra wood, by building up the block 8 in Figure 2 of alternating layers of brown and white sheets of veneer, for example, those derived from blocks of walnut and maple, respectively. The thermosetting adhesives which are used in the process may be coloured to enhance the contrasting effects sought to be attained in veneers of the character under consideration. In the fabrication of veneers from the above-mentioned woods other than oak, the slicing of the veneers may as well be executed along the plane normal to the laminations, thereby obtaining veneers of uniform widths. These veneers may duplicate or simulate limba wood derived from ash veneers, walnut, mahogany and combinations of these as well as other woods to simulate rare species and exotic woods of all types.

WHAT WE CLAIM IS:

1. A method of producing a sheet of wood veneer which includes the step of cutting a plurality of veneer laminations, applying a thermosetting adhesive between the laminations and stacking together a plurality of said laminations, compacting the stack of laminations under pressure and steaming the compacted stack of laminations to set the adhesive and to condition the compact block of laminations for a subsequent veneer slicing operation.

2. A method as in Claim 1 wherein when stacking the laminations they are so arranged that the grain of the wood in the successive laminations will extend in the same direction.

3. A method as in claim 1 or 2 wherein the compacted stack of laminations is subjected to pressure during the steaming operation.

4. A method as in any of the preceding claims in which sheets of veneer are sliced from the conditioned compact block of laminations along a plane substantially transverse to the face of the laminations and in parallel to the grain of the wood.

5. A method as in any of claims 1—4, wherein sheets of veneer are sliced from the conditioned block on a bias, said bias slicing

The thin sheets of veneer 7 are composited in pile 8 following the application of adhesives of any suitable type, such as transparent thermosetting adhesives in general commercial use in the manufacture of plywoods. Preferably, the adhesive may be applied to the opposite faces of alternating sheets, although the gluing of all of the sheets is permissible as long as there is a layer of adhesive between juxtaposed sides of adjacent sheets. Following the application of adhesive to at least alternate layers, the pile of sheets 8 is compressed into a unitary block by the application of pressure thereto, ranging from 80 to 140 pounds per square inch, which pressure is maintained throughout the following heating step.

In order to condition the fabricated compressed block in readiness for the final veneer cutting operation, the same is placed in a steam chamber 11, between turnbuckle clamps, or a clamping ram assembly 9 which is the equivalent thereof. Steam at 180°F to 212°F is admitted into the chamber through inlet conduit 10 and condensate may pass off from the chamber through conduit 12. The steaming or seasoning of the block at high temperature for approximately ten to twelve hours sets the glue and conditions the block for the veneer slicing operations to be performed thereon. The block is then prepared by sawing off the opposite diagonal corners at 15 and 16, as shown in Figure 4. The block is then secured to a slicer bedplate by means of clamp 17 at bevel face 15 in order to dispose the opposite bevelled face 16 in the field of operation of a reciprocating veneer slicer, in order to slice from the composite block veneer sheets A of any desired thickness, for example, 1/28", for mounting on plywood, fabric backings, or the like. These veneer sheets A, as shown in Figure 6, resemble very closely the sheets N of natural comb grain veneer as shown in Figure 7.

A principal contributing factor to the success of the instant invention is the slicing of the veneer layers from the bevelled face 16 along a plane which is inclined relative to the plane normal or perpendicular to the laminations and in parallel to the grain of the wood. This angle may vary up to 30° to the normal line 20, and preferably ranges from 60° to 85° relative to the planes of the laminations. The bias cut which is practiced in the production of the final product results in a wider section of the individual laminations which are indistinguishable in the final product as the result of the perfect coalescence of the several laminations at the planes therebetween. In view of the fact that the final slicing is performed in line with the grain of the wood and partially in the plane of the several laminations, smooth cuts with substantially uniform grain effects are obtained, which facilitates the splicing of the juxtaposed sheets of veneer when the same are applied upon a backing layer.

Lastly, the flakes which may occur in the pattern occasionally are never any longer than the thickness of the individual laminations and therefore do not affect the over-all appearance of the straight grain in the wood.

While the primary concern of the instant invention is the obtention of straight grain oak veneers, the advantages of the instant invention may be realised in the handling of veneers other than that produced from the oak tree, for example, walnut, maple, poplar, ash, mahogany and others. In fact, a highly desirable and useful product may be obtained by the production of a wood veneer resembling zebra wood, by building up the block 8 in Figure 2 of alternating layers of brown and white sheets of veneer, for example, those derived from blocks of walnut and maple, respectively. The thermosetting adhesives which are used in the process may be coloured to enhance the contrasting effects sought to be attained in veneers of the character under consideration. In the fabrication of veneers from the above-mentioned woods other than oak, the slicing of the veneers may as well be executed along the plane normal to the laminations, thereby obtaining veneers of uniform widths. These veneers may duplicate or simulate limba wood derived from ash veneers, walnut, mahogany and combinations of these as well as other woods to simulate rare species and exotic woods of all types.

WHAT WE CLAIM IS:

1. A method of producing a sheet of wood veneer which includes the step of cutting a plurality of veneer laminations, applying a thermosetting adhesive between the laminations and stacking together a plurality of said laminations, compacting the stack of laminations under pressure and steaming the compacted stack of laminations to set the adhesive and to condition the compact block of laminations for a subsequent veneer slicing operation.

2. A method as in Claim 1 wherein when stacking the laminations they are so arranged that the grain of the wood in the successive laminations will extend in the same direction.

3. A method as in claim 1 or 2 wherein the compacted stack of laminations is subjected to pressure during the steaming operation.

4. A method as in any of the preceding claims in which sheets of veneer are sliced from the conditioned compact block of laminations along a plane substantially transverse to the face of the laminations and in parallel to the grain of the wood.

5. A method as in any of claims 1—4, wherein sheets of veneer are sliced from the conditioned block on a bias, said bias slicing

extending in a plane inclined relative to the plane normal to the face of the laminated sheets and in parallel to the grain of the wood.

6. A method as in any of the preceding claims wherein the stack of laminations is compacted under pressures ranging from 80 to 140 pounds per square inch and is steamed at temperatures ranging from 180°F to 212°F.

7. A method as in Claim 6 wherein the steaming is carried out for a period of from ten to twelve hours.

8. A fabricated sheet of wood veneer simulating natural veneer and composed of a slice of veneer cut from a rectangular block formed of a plurality of flat substantially faultless natural wood laminations which have been adhesively bonded together with the grain of the wood in all laminations extending in the same direction, said slice being cut in a plane which is normal to or is inclined relatively to the plane normal to the face of said laminations and in parallel to the grain of the wood.

9. A fabricated sheet as in Claim 8 in which the wood laminations are compressed and integrated together by intermediate films of steam activated thermosetting adhesive.

10. A fabricated sheet as in claim 8 or 9 wherein the veneer laminations comprise oak, ash, walnut or mahogany.

11. A fabricated sheet as in claim 8 or 9 wherein the veneer laminations in the block are alternately of differing colours thereby to provide a fabricated sheet simulating zebra wood.

12. A fabricated sheet as in Claim 11 wherein the colours of the alternating laminations of wood veneer are substantially brown and white.

13. A fabricated sheet as in claim 11 or 12 wherein the veneer laminations of alternating colour are of walnut and maple.

14. A method of producing wood veneer sheets substantially as hereinbefore described with reference to the accompanying drawings.

15. A fabricated sheet of wood veneer substantially as hereinbefore described.

HASELTINE, LAKE & CO.,
28 Southampton Buildings,
Chancery Lane. W.C.2.

Agents for the Applicants.

Sheerness: Printed for Her Majesty's Stationery Office, by Smiths, Printers and Duplicators.- 1960.
Published at the Patent Office, 25 Southampton Buildings, London, W.C.2, from which copies may be obtained.

