

# ALIEN PROPERTY CUSTODIAN

## METHOD FOR JOINTING VENEER BY MEANS OF ARTIFICIAL RESINS IN ALCOHOLIC SOLUTION AND/OR COLLOIDAL AND/OR BY MEANS ARTIFICIAL RESINS SOAP AND VENEER AND PLYWOOD OBTAINED BY SAID METHOD

Rudolf Ludwig, Lissone, Italy; vested in the Alien Property Custodian

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The object of the present invention is a method for obtaining veneer joints withstanding the influence of bacteria, moisture, temperature changes, resisting to alkalies and to acids. The invention covers also said veneer and plywood

The present art in jointing veneer sheets knows, barring the skew joints, the metal wire clamps for holding together the veneer sheets, the seams, the cutting out of swallow tails with relative assembling of the veneer sheets, the bonding head to head of the ends of the veneer sheets overlap covered by strips of tissue or paper, cut-out or plain, and finally the spreading with animal glue of the united edges of the veneer sheets.

In this last process, after the glue is dry, the edges of the veneer sheets are moistened, immediately before glueing, with a solution of formaldehyde in order to swell-up like a jelly the dried glue on one hand and on the other hand to hasten, by means of pressure and heat, the setting and the hardening of the glued connection. The heat required for melting and hardening the glue is applied by means of machines of various designs operating either continuously in the direction of the glued joint or intermittently in a direction at right-angles to the direction of said joint by means of heating plates, travelling-bands, chains or plates. The side pressure required for bonding is obtained in the continuous machines by means of friction rollers arranged in pairs, somewhat inclined one towards the other and also to the feeding direction of the veneer sheets.

In the machines operating intermittently, the pressure required for bonding is provided by the friction of the veneer sheets themselves, retained on the heating plates by means of pressure-bars and moving at right angles to the joint to be bonded; or other-wise the two sheets to be jointed are seized directly by four heated bars and transoms being pressed one against the other. Due to the thickness of the sheets of veneer to be glued, which is only a few thousandths of an inch thick and due to their fragility and brittleness, the side pressures, thus obtained do not reach by far the pressures required for bonding with artificial resin glues.

All the methods and machines used to this purpose, barring the tendency of trying to obtain the greatest efficiency at the minimum cost, are designed and achieved, according to the requirements of cabinet-makers, viz. with the idea of avoiding unsightly joints.

When on the contrary, veneer strips are to be

employed for external or covering layers by glueing them according to the method stated above, for technical wood-construction which have to undergo very high stresses, as for instance in veneer plywood sheets for airplanes or plywood for propellers or plywood for transoms, gear-wheels, dies and angle joints for wooden frames, the result is generally unsatisfactory so as to compel the user to use only whole veneer sheets without joints.

Therefore, for instance in most of the tender rules for the manufacture and inspection of plywood sheets for airplanes, it is forbidden to use veneer sheets with joints on the face and back layers.

But in order not to render impossible due to said rules the use of back veneers exclusively without joints or defects, in the manufacture of plywood sheets for airplanes, it has been found necessary to allow for knots or other defects up to a certain limit and to reduce on the other hand the minimum dimensions of the finished sheets to 1 x 1 meter.

If in some specifications for the inspection and reception, it may be allowed to accept veneer with joints, under certain restrictions, it cannot be denied that all the joints of veneer in the assembled plywood, bonded with a film of artificial resin, become joints of least resistance to mechanical stresses upon the sheets, and also to the influence of bacteria. This is one of the main arguments of the promoters of all-metal plane designs against the use of wood arguments, in which all the other advantages of the wood constructions are forgotten or neglected, namely: lower cost, simpler construction, easier repairs of the planes and finally the elasticity of the wooden frames reacting right to the limit breaking stress. When the glueing of the single layers one upon the other, is made, with fluid artificial resins or soap-solutions of the same the spreading on the veneer edges is made during the spreading on both sides of the artificial resins solutions on the veneer strips also of the inner layers themselves and the tight bonding of the veneer strips one with the other is no more necessary, as usual with any other bonding of plywood with fluid glues.

In the following phase of the bonding operation under pressure in the glue hot-pressing machine, the dried films of artificial resin acquire new plasticity and fill-up all eventual joints which do not close perfectly, binding the plywood edges and converting the resin to the irreversible state.

This process is however not applicable in the

manufacture of cover-sheets made out of strips bonded with artificial resins. For such a manufacture it is however indifferent to bond the single layers with a film of artificial resin at a later period of phase of manufacture or by spreading directly the resin solutions.

A spreading of artificial resin or of resin soapy solutions thereof on the veneer edges and the use of any of the known machines for obtaining a veneer bonding joint with an artificial resin is not a possible proposition, as, barring the higher temperature and compression pressures required for obtaining the setting of the glue, the time required for converting the artificial resin or resinous soap to an irreversible and insoluble condition, would reduce production in practice to a non allowable minimum.

According to the invention, instead, the bonding of the veneer joints with artificial resin in a single operation is given up. It is sufficient, for instance in a first phase to connect the veneer strips smeared on their edges with artificial resin, in the jointing machine, running at very high speed by means of strips of paper or similar material just to obtain full plywood boards for coverings, which can be manipulated readily, whilst the necessary heating process with the inherent necessary time delay for the conversion of the artificial resin or soap of said resin is put-off to the further phase of operation under the plywood press proper. Thus in this press simultaneously with the plywood sheet, is also automatically achieved the bonding of the single joints of the face and bark veneers without any particular loss of time.

This new achievement of a process, known in itself of temporarily jointing veneer strips in the jointing machine by means of adhesive strips, whilst putting-off the setting under high temperature and in a certain length of time of the artificial resin to the further phase of the operation wherein the bonding proper of the plywood sheet is achieved, is made possible because the

artificial resin in the joint is being isolated by means of the adhesive layer of the strip of paper or of tissue. Said strip, after the bonding is achieved and after a proper moistening, may be torn off readily.

With this division of the bonding operation of the veneer joints in two phases: namely in a first phase in which the strips of veneer already provided with artificial resin or resin soap on their edges are temporarily jointed and in a second final jointing phase whereby the artificial resin is converted, the following advantages are obtained:

By means of the veneer jointing glued with artificial resin, besides all the advantages already stated, it is possible to abandon all restrictive specifications relatively to the application and the number of veneer joints in the outer layers for high duty material, because the resistance of the joint in artificial resin is greater than the breaking stress of the timber in any direction at right angles with the fibres.

A better utilization of the raw materials is then possible with a greater uniformity in the final product, because all faulty parts may be cut away and replaced with a jointed piece of veneer. Therefore it is again possible to turn out sheets of larger sizes and it is possible in the construction of airplanes to better utilize the materials with less loss of time in erection, because it makes a real difference to be able to work on sheets of say 2,5 square meters surface, rather than with sheets of 1.50 sq. m. or less (say 1 sq. m.).

The invention covers also the products, namely the veneers and plywoods obtained with this method.

It is to be understood that in practice the details for achieving the invention may vary in any way without thereby exceeding the limits of the invention.

RUDOLF LUDWIG.