Aug. 24, 1948. J. T. BREECE 2,447,609

PROCESS OF MAKING MARQUETRY INLAY

Filed April 16, 1945

FIG. 1

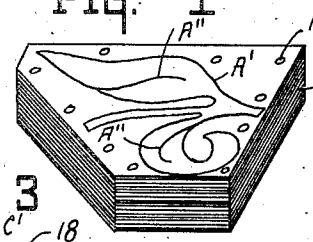


FIG. 2

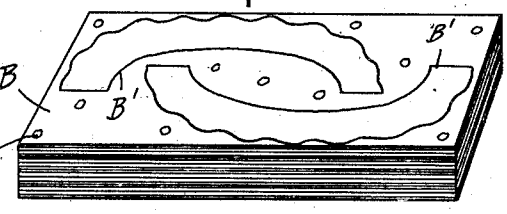


FIG. 3

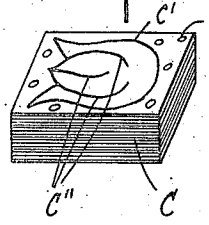


FIG. 4

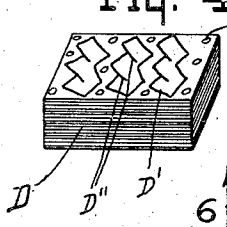


FIG. 5

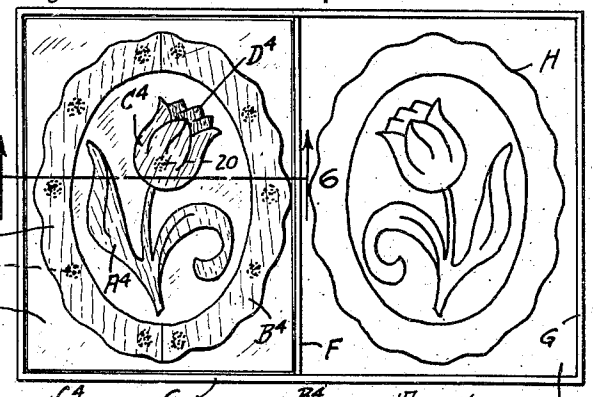


FIG. 6

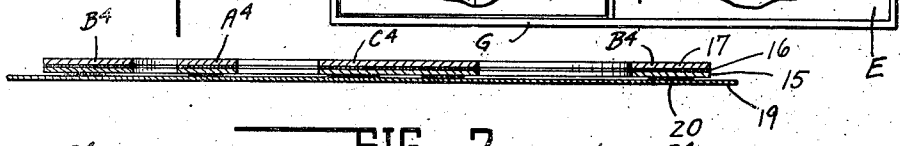


FIG. 7

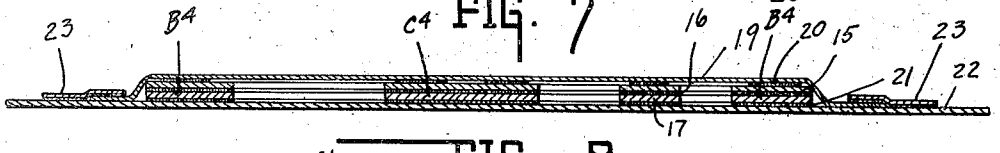


FIG. 8

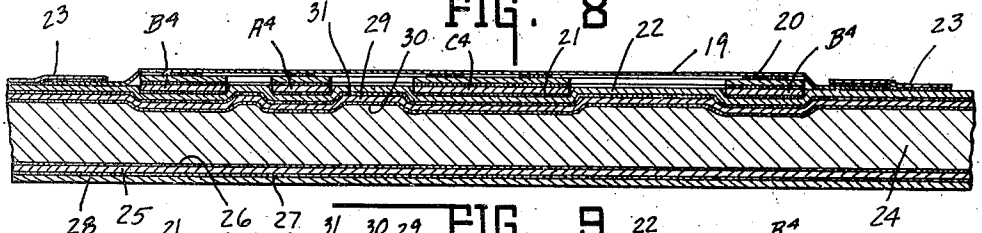
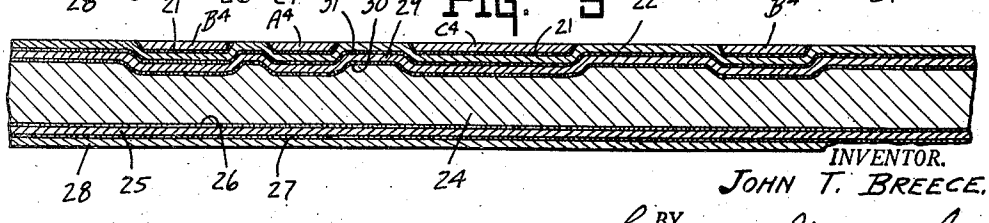


FIG. 9



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PROCESS OF MAKING MARQUETRY INLAY

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2 Claims. (Cl. 41—35)

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This invention relates to marquetry inlay and the method of preparing same.

The chief object of this invention is to produce inlaid veneer and without routing cut or cutting cut a seat for the inlaid portion or portions thereby eliminating discrepancies between inlaid portion and such seat common to all but the most expensive craftsmanship.

Another object of this invention is to produce commercially and economically inlaid veneer units by common labor.

A further object of this invention is to produce inlaid veneer units of like design or pattern and in large quantities.

A still further object of this invention is to produce inlaid veneer of a wide variety of patterns, variable at will and without the use of other than standard machinery.

The chief feature of the present invention resides in sinking into the surface to be veneered, the inlaying veneer and in the desired pattern effect, the inlay simultaneously forming by compression its own seat and the latter conforming to the inlay pattern.

Another feature of the present invention resides in initially pressure sinking the inlay below the surface in which same is to be inlaid and securing same in such sunk position to the body to be inlaid, the inlay upon pressure release rebounding so that the inlaid surface and the inlay have a substantially common plane surface.

A further feature of the invention resides in the inlay pattern production and its use.

Other objects and features of the invention will be set forth more fully hereinafter.

The full nature of the invention will be understood from the accompanying drawing and the following description and claims:

In the drawings,

Figs. 1 to 4, inclusive, are perspective views of blocks of inlay veneer arranged for inlay pattern portion production.

Fig. 5 is a plan view of a pattern board, the left hand portion having the pattern sheet thereon, the right hand portion having the master pattern design exposed.

Fig. 6 is an enlarged sectional view of the pattern sheet with inlay portions shown in Fig. 5 and is taken in line 6—6 thereof and in the direction of the arrows.

Fig. 7 is a sectional view of the surface veneer sheet with the pattern sheet applied thereto.

Fig. 8 is a sectional view of a five ply board with the pattern sheet applied thereto and following

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pressure inlaying and the release of pressure therefrom.

Fig. 9 is a similar view of the same board and veneer from which the veneer cushion layer and paper sheet have been removed.

In Figs. 1 to 4 of the drawings, there is illustrated composite sheets of cushion material and veneer temporarily secured in block form. As shown more clearly in Fig. 6, each composite sheet is composed of a cardboard sheet 15 united by an animal glue 16 to a veneer sheet 17.

Veneers are worked up in sheets by splicing on a tapeless splicer to the desired size. Two sheets are run through the glue spreader at the same time and then cardboard backing sheets are applied dry and the sheets baled and pressed as in regular plywood production. Such sheets so pressure consolidated, and from which the composite sheets are cut, are then arranged so that the cardboard sides face each other and the veneer sides face each other and the number is that desired.

When so alternated the composite sheets are suitably secured in block form, see A in Fig. 1, B in Fig. 2, C in Fig. 3 and D in Fig. 4, by nails, etc., 18. Upon an outer face of each block (preferably the cardboard) is traced a pattern, see A', B', C' and D' in Figs. 1 to 4, inclusive. This pattern is then cut out by a band saw or scroll saw, same also cutting kerfs A'' in Fig. 1, C'' in Fig. 3 and D'' in Fig. 4 if desired. The backed veneer patterns are thus alternately rights and lefts and are collected in appropriate containers. The cardboard holds the veneer cut out together, even if it were to crack as frequently happens.

Reference will now be had to Fig. 5. Therein is illustrated a pattern board E having one or more partitions F. Same includes rims G. Herein left and right patterns are assembled for upper corners of head and/or foot boards, or half table tops. If four patterns were to be inlaid, the board would have four cells instead of two as illustrated.

On the upper face of the pattern board E is a permanent representation of the desired pattern and herein same is designated by letter H. In operation a sheet of transparent or translucent paper 19 of suitable weight and size is placed over the permanent representation and animal glue 20 is dotted or otherwise applied to the upper face of the paper sheet. Then the veneer pieces A^4, B^4, C^4 and D^4 are applied to the sheet over the glue and in registration with the permanent representation that shows through. The result is illustrated in Fig. 6.

The sheet of paper now holds the marquetry in relative position. This unit sheet is then face glued with a resin glue 21 on its entire veneer face and subsequently applied to the face veneer sheet 22. The result is illustrated in Fig. 7. It is temporarily held thereto by gummed paper tape 23, see Fig. 8, for the resin glue is of pressure and heat setting character. In other words, the entire exposed face of the inlay layer is glue covered and same may dry before tape connection of the sheet 19 to the face veneer 22.

It will be apparent that each operation aforesaid is of simple character and can be performed usually by so-called common labor and no special machinery is required other than that now available in a conventional plywood plant.

If a five ply, marquetry, board is to be made, the core or body 24 may be of poplar, oak, maple or other solid lumber base. A cross ply 25 has a resin glue 26 and 27 applied to opposite sides. If desired, the backing face of veneer 28 may have its inside face glued as well as the bottom face of body 24. All are assembled in superimposed relation with the body down.

The resulting structure is inverted and a cross ply 29 has a resin glue 30 and 31 applied to opposite faces. If desired, the upper face of the body 24 may have such glue applied thereto as well. The cross ply 29 is registered with the structure and then the facing layer 22 with inlay thereon and uppermost is applied to the cross ply. If desired, the free surface of this face veneer may have resin glue applied thereto.

When all plies, etc., are assembled, a flat, aluminum caul is placed on opposite sides of same and the resulting assembly is placed in a multiple platen press. Two units may be placed in each compartment of the press, and the inlay faces face each other, but offset relative to the inlaying veneer. This is to maintain uniform elevation of platens. Even if but one assembly is placed between platens, if such assembly has the inlay localized at one corner, or a pair of corners, other assemblies are reversed for level pressing purposes.

When such a multiple press is loaded, pressure is applied as required and heat is supplied to the platens as required and such heat and pressure is maintained until all plies in each assembly are smoothly banded together.

In this operation, the inlay and cardboard backing lie initially above the surface of the face veneer. As pressure is applied, the inlay sinks into and depresses the face veneer adjacent the inlay and into the cross ply, and the depressed portion thereof sinks partially into the body portion. Pressure application is such that the cardboard even sinks into the face veneer.

Such pressure retains the assembly in that relation until the stock has deformed. The heat used dries the assembly, evaporates the resin glue solvent or liquid and cures the resin. Upon the release of the pressure, and this is an important factor in mass production, the compressed portions behind the inlay tend to resume former positions. However, the inlay penetration is of such an amount that this rebound is only sufficient to just return the cardboard so that the glue joint (vegetable) between the inlay and this board is in the plane of the outer face of the face veneer. In other words, this cardboard now lies just above the face veneer outer surface plane. This is illustrated in Fig. 8. The cauls and assemblies are then removed from the press and separated. Due to the heat employed and to

prevent subsequent warping, checking, etc., each assembly is passed through a water spray and the assemblies stacked to permit the bone dry assembly to absorb moisture to restore moisture and reestablish internal pressure. A four or five hour delay is usually sufficient for such purpose. In this step the assemblies are stacked inlaid face to inlaid face and back face to back face to retain straightness.

Each assembly, now normally dry, is passed through the roller sander, the back veneer being sanded first so as to even up any inequalities in thickness. The back, being thicker than the face, allows sanding off any inequalities in thickness without cutting through the veneer.

The assembly then is inverted and passed through the sander to make the face veneer smooth and parallel and to produce an assembly having substantially the thickness required.

Following the roll sanding, substantially to size, the assembly is polished by a belt sander which removes any remaining paper, tape or cardboard that has been left by the roll sander and also polishes the face ready for finishing. This operation is performed by a very fine sand so as to produce a perfectly smooth surface.

The assembly is then ready for use, that is, fabricated into table tops, panels, bedstead foot and head board panels, etc. It may be peripherally trimmed to size, or outline, as required for the ultimate use. Such marquetry inlaid veneer then can be surface finished as desired or required.

One such assembly was exposed to the weather for four weeks of inclement weather and at varying temperatures without any rejection or expulsion of the inlaid portions.

Having thus described the process and product, reference will now be had to certain factual data whereby one skilled in the veneer art may practice this invention without experimentation.

Preferably, the inlay stock veneer should be natural colored woods. However, dyed or stained woods are not objectionable, if necessary or more economical. Such stock is 1/28 of an inch thick. The hard cardboard cushion layer is about .015 inch thick. The inlay stock should be of hard texture. Woods such as maple, white holly, bubinga, purple heart, rosewood, vermillion, osage orange, satinwood and ebony are some which are satisfactory. Colors needed, which are not available in natural woods, can be produced by treating maple with a dye of the desired color to give the desired color and shade. The cross plies may be of poplar, gum, maple, face maple or comparable wood.

To prevent undue core compression, yet secure sufficient consolidating and indenting pressure, the multiple platen hotplate press exerts a pressure of 130 tons upon assemblies 35 by 25 inches in size. Greater pressure will unduly compress the core. The temperature utilized is about 250° Fahrenheit. The time of pressing and heating found suitable is from five to ten minutes, the average being between six and seven minutes.

A resin glue, satisfactory for the purpose described, is sold by the Resinous Products and Chemical Co., of Philadelphia, Pennsylvania, and is a urea formaldehyde resin (a plywood glue) composed of "Uformate Catalyst Q–87 and Catalyst Q–107," which sets or cures at from 212° to 240° F. and under 150 to 200 pounds per square inch pressure. The proportions found satisfactory are one pound of Uformate, one-twelfth ounce of catalyst Q–87 and three and one-quarter

ounces of catalyst Q–107. As better waterproof glues become available, temperatures, pressures and durations of curing may be varied as desired or required by such new glue and to accomplish the inlaying effect without subsequent separation of the inlay.

Obviously, various patterns may be utilized and of the same color or different colors. As herein illustrated, inlay portion A^4 is green, inlay portion C^4 of the tulip flower color desired, such as red, yellow, orange, or purple, while inlay portion D^4 may be of a darker shade and for contrast the oval B^4 portion may be lighter or darker than the face veneer color.

Patterns may be initials, designs, etc., as desired, and continuous or discontinuous in character, even though as in the oval outline same is formed by a plurality of portions. The kerfs A'', C'' and D'' in the inlay become line not slot effects in the finished product.

It is also obvious that the invention of multiply marquetry or like inlaid board need not be confined to heavy or thick stock but can be of two or three ply comparatively thin plies suitable for book or album covers, tray bodies and similar wooden articles.

Likewise plural ply marquetry inlaid sheets, a commercial item, suitable for subsequent incorporation into so-called cedar chests, and other furniture have been made embodying this invention as set forth in the appended claims.

While the invention has been illustrated and described in great detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character.

The several modifications described herein as well as others which will readily suggest themselves to persons skilled in this art, all are considered to be within the broad scope of the invention, reference being had to the appended claims.

The invention claimed is:

1. In the process of inlaying a veneered multiply assembly, the step of assembling the plies together with a pressure and heat curable adhesive therebetween, applying to the outer surface of the outer veneer sheet the inlay with similar adhesive therebetween, pressure seating the inlay into the outer veneer and pressing the pressed veneer into the next ply of the assembly while compressing and consolidating the plies accompanied by heating, the inlay having an identical shaped relatively compressible backing, the seating pressure being sufficient to initially compress the backing and sink the inlay material and a portion of the backing into the outer veneer, release of pressure permitting expansion of the backing and rebound of the backing and inlay portion so that the inlay-backing junction substantially coincides with the outer surface of the outer veneer.

2. In the process of making marquetry inlay the steps of applying several inlay portions to a retaining sheet in the desired position in which they are to appear as marquetry, applying the sheet over the outer face of a veneer surface to be inlaid and with the inlay portions closest to that surface and with adhesive therebetween and with the retaining sheet outermost, then pressure seating such portions into such surface with sufficient force to secure the inlay portions in the inlay indented surface, and then removing the retaining sheet, each inlay portion having an identical shaped relatively compressible backing, the seating pressure being sufficient to initially compress the backing and sink the inlay portions and a portion of each backing into the outer veneer, release of pressure permitting expansion of the backing and rebound of the backing and inlay portions so that the inlay-backing junctions substantially coincide with the outer surface of the outer veneer.

JOHN T. BREECE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
738,704	Semmer	Sept. 8, 1903
739,861	Harass	Sept. 29, 1903
1,133,604	Alcan	Mar. 30, 1915
1,902,087	Loetscher	Mar. 21, 1933
1,954,754	Hartzell	Apr. 10, 1934
2,105,265	Reilly	Jan. 11, 1938

FOREIGN PATENTS

Number	Country	Date
723,956	France	Jan. 23, 1932

OTHER REFERENCES

"Useful Arts," by Leland, published 1901 by Dawbarn & Ward, London, vol. 1, pages 273–277.