

# MARQUETRY AND BOULLE SURFACES: AN ALTERNATIVE APPROACH

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The treatment method described herein, was developed with emphasis on minimum intrusion to the original marquetry or boulle structure, as it exists, between surface veneer and matrix. It is in nature, a reforming process, based on the properties of the original collagen adhesives used. In the process, the original glue is reactivated, and new compatible adhesive is introduced by hand manipulation, enlisting hydraulic principles. Glue viscosity is controlled with radiant heat from a controllable source.

The treatment is carried out closely in concert with the actual process of glue preparation, which takes place in two distinct stages. The first, is the swelling, or jelling, of the glue fragments in cold water, and the second, is the heat melting to liquify the gel. All of the glue reactivating, glue introduction, and directional manipulation, of glue during the treatment are kept, as closely as possible within the realm of the gelling stage. The proper hot liquid stage is only emulated in the clamping operation.

Some of the reasons why other methods of glue introduction can fail, are as follows:

1. Injection of hot glue, with a syringe, requires a 1.1 mechanically forced entry, which damages or distorts the veneers. This method also causes surrounding veneer areas to break their bond with the substrate. The injected glue, which chills on contact with the cold surface, will not flow into these areas.
2. Insertion of glue, with the aid of a pallet knife, has similar results to those produced with the needle.
3. Hot water, injected into the interface, between veneer and substrate, does not serve to swell the old glue - rather, it tends to adversely soak accessible wood areas.
4. Lifting delaminated sections of veneer completely out of their housing - just to introduce glue - can cause new distortion or deformation, of those veneers.
5. Although, heated cauls, if used for clamping, will re-melt newly introduced glue which has gelled they will not reactivate, and re-adhere, peripheral areas which where delaminated by the glue introduction.

## Hydraulic Manipulation

“Hydraulic manipulation” is the name I use for the process of introducing fluids such as water, or glue, into the voids under delaminated veneers. This involves forms of hand manipulation, or massage, guided by the practitioners awareness of the hydraulic actions and reactions, taking place during the process. The fluid movement, in terms of introduction, dispersal, and lateral movement, does not happen in response to one singular form of manipulation. It is made to progress in stages, each of which requires a particular form of manipulation - enlisting the desirable hydraulic activity. These are described in the following:

## **1. The primary glue introduction**

The fluid on the surface of veneer is pointedly wiped over accessible “entry points such as holes in the inter veneer glue lines, or the slightly lifted edges of elements. The wipe is effected in a series of short firm strokes, passing over the opening in the veneer, and followed by a firm downward push directly over the access point. The strokes begin in the area adjacent to the most shallow, or lowest, edge of the opening, and pass over the “ridge” presented by the higher edge. Wiping is best effected; beginning with the flat of the thumb on the surface, and commencing the stroke with a backward twist - thus ending the stroke with the trailing edge of the thumb in contact with the surface. The wipes serve to drive fluid into the opening, and the downward push serves to spread it radially outward. The veneer skin of the delaminated area, acts as a diaphragm, pumping fluid outward on the down push - the entry hole sealed by the thumb. As pressure is stopped, the veneer diaphragm flexes upward, sucking more fluid - supplied by the wiping - through the entry hole. By repetition, the hydraulic action escalates in efficiency, as increased presence of fluid serves to seal some of the unwanted air leaks in the, obviously imperfect, diaphragm it, in effect, “primes the pump”.

## **2. The lateral glue movement**

When it is desired to transport the glue further under the delaminated areas, not reached by the first stage. A slight excess of glue is introduced into the access area by repetition of the first method, but this modified by only applying a fraction of the downward pressure used in that method. When this is achieved, a clear plastic membrane is placed to cover the entire working area. The thumb of one hand is placed over the entry hole with just enough pressure to seal it, and offer resistance against further expansion of the diaphragm. The thumb of the second hand is placed closely adjacent to the first, and gently pressed down in a rolling motion - in the direction of the desired glue movement. When some fluid movement is felt - recognized by “give” in the pressed areas - the thumbs are replaced with the thumb-heels of the palms, and a repeat of the last described operation is performed. The extent of fluid (glue) movement can be monitored by observing the forming of glue beads on U veneer surfaces, adjacent to the immediate area of manipulation.

## **Treatment Parameters and limitations**

### **Treatable Symptoms:**

1. The veneers are generally delaminated but not deformed.
2. Individual components are in correct register, not overlapping.
3. The surface of the veneers are free of alien material deposits, such as; old glue buildup, or overfills.
4. The original and existing adhesive is a collagen, water soluble glue.
5. The form of the surface is flat. If positive or negative curvature exists, that curvature is along a single axis, allowing plexiglass cauls to be flexed, to conform exactly to that surface.
6. There are no water insoluble, or repellent, fills along the interface of veneer and matrix.

### **Symptoms Requiring Mechanical adjustment before treatment:**

1. Long tendrils of brass, sprung out of their housing, but still connected to larger well-adhered brass elements. These may be reshaped in situ, but their tendency to spring up must be neutralized.

2. Missing elements can be replaced with newly manufactured ones, but these must be of exactly conforming thickness.

## **Materials and equipment**

Heat Source:

A quartz photo lamp, fitted with a rheostat and a timer. The lamp should be light, and mounted on a flexible arm. My assembly is mounted on a rolling stand, which also carries a hot water glue pot.

Cauls:

Plexiglass and lexan in a selection of sizes and thickness. The thicker pieces are for rigid cauls, and the thinner ones offer a variety of flexibility.

Adhesive:

Granular hide glue prepared full strength, can be thinned down where the treatment requires it.

Other:

- Transparent plastic membrane, like Saran wrap.
- selection of clamps.
- various widths of rubber rollers hard and soft.

## **Treatment procedure**

1. Determine the area, up to one square foot in size. The choice is based on the following:

a) accessibility for clamping - the more undulated the surface is the more clamps will be required.

b) the ability to carry out the steps of manipulation within a time frame favorable to the treatment.

c) complexity and condition of the inlay.

2. Select an appropriate caul structure, at least one inch larger all around than the area to be treated. This is to insure a correct register with the untreated, adjacent, perimeter. The plexiglass must be flexible enough to conform to the surface undulations, yet rigid enough to disperse the pressure from the clamping points, and transmit it evenly to the surface. Pressure dispersal is also better effected by the use of the largest number of clamps possible, applying even, controlled, pressure.

The flexibility of the plastic is inversely proportional to it's thickness, but flexibility can also be adjusted by choosing an alternate plastic product such as lexan. Generally; a perfectly flat substrate would accept a rigid thick caul, whereas an undulating surface would demand a thinner caul, or even a composite, made up of two, or more, thin pieces.

The transparency of the cauls accommodates constant visual monitoring of treatment areas during clamping, and also allows radiant heat, from the heat lamp, to pass, through the plastic, directly to the surface.

3. Apply a controllable quantity of cold water to the veneer surface, and rapidly hand manipulate it to penetrate, to the, veneer and substrate, interface. If no surface access is found, carefully, with the point of a dental probe, excavate a section of inter-veneer glue line.

After sufficient penetration, and uniform dispersal of wetness, is achieved remove excess water from the veneer: surface, and cover the entire area with Saran plastic membrane. Let the surface stand for a time, ranging between ten to fifteen minutes, to allow for the gelling, or swelling, of the glue. If very porous veneers are evident, the time span should be shortened.

4. Isolate the in-work area for heat treatment by covering all adjacent areas with white paper light/heat deflector. Preheat slowly with the heat-lamp at a low setting, monitoring the process with constant hand testing. Bring the area to a uniform, hand comfortable, warmth. Having attained this; lower the lamp setting to just maintain this operating temperature.

5. Remove and discard the plastic membrane. Apply a generous amount of full strength hide glue, which has been warmed just enough to reach a liquid state. Begin the hydraulic hand manipulation (as explained under that heading), to gain as much interface dispersion as possible. Monitor this by tactile sounding and by noting the location of glue beads reappearing on the surface.

Be sure, during the treatment, that the surface glue retains moisture, replenish moisture, if necessary, with the addition of a little strong glue size, and remember to use the plastic membrane. Hard rubber rollers can be used to concentrate the glue bulk where it is required.

6. Remove the plastic membrane, and remove all glue excess remaining on the veneer surface. Apply a fresh membrane

7. Put the selected caul system in place, and position one or two clamps, tightening the clamps just sufficiently to hold the assembly in place. To allow for subsequent heating of the surface through the cauls, all clamps must be placed to afford minimum obstruction to the light from the heat lamp. This is done by applying them with the handles and screw parts away from the treatment area.

8. Ply the heat lamps' heat over the area, while applying the rest of the clamps with gentle pressure, until the caul is under evenly distributed, gentle pressure. Continue the heating, but now at the lamps highest setting, ply it evenly over the entire assembly, until a noticeable glue flow is noted. This will be seen as a whetting effect immediately under the plastic membrane. Tighten the clamps uniformly and remove the lamp. Allow the assembly to dry for at least twelve hours.

Inspect the surface after the clamps are removed, and if all is in order, allow at least twenty-four hours or more, to thoroughly dry the treated area before cleanup. The cleanup is effected with an "extremely dry" damp cloth, to avoid reintroduction of moisture to the inter-veneer glue lines.