DESIGNING AND MAKING CUSTOM FURNITURE – PART 5

DENNIS ZONGKER 'PAINTS IN WOOD' AS HE WORKS ON THE MARQUETRY TOP FOR HIS HALLWAY TABLE

Marquetry is a technique of applying pieces of veneer to a substrate to form decorative patterns and designs. The most common places for marquetry to be glued onto is furniture, boxes or freestanding pictorial panels to be displayed as a painting in wood. Throughout history there have always been several different methods for cutting marquetry, including: knife cutting, Boulle style, piece by piece, double bevel, painting in wood, window method, laser cutting and CNC cutting. All of these techniques can produce some beautiful pieces of marquetry.

The techniques involved in these cutting styles can be quite different from each other. For example, for the double bevel method, you can only cut two pieces of veneer at a time by cutting the pieces at an angle on a scrollsaw or with a fretsaw and a bird's-mouth jig. The angle of the cut depends on both the blade thickness and veneer thickness. This method produces tight fitting seams requiring no wood filler or dried glue to fill any gaps.

The piece-by-piece method is perhaps the most difficult of the saw cut styles to develop into a master level. In France

during the 18th century marquetry was produced at a very high degree of quality. The tool they used is called the 'Chevalet de Marqueterie', also known as the marquetry donkey, which can still be purchased today. At the Canadian school of French Marquetry, the parts that make up the Chevalet are cut precisely on a CNC machine along with the hardware that you can then assemble with a blueprint.

The cutting method that I used for this hallway tabletop has had a few different names; if you refer to any older books or scholars in the marquetry trade for example, the pad method, packet method or painting in wood are all done the same way but just named differently. I prefer the name 'painting in wood', which would actually describe the three methods I have just mentioned for producing this style of marquetry. This style is a perfect fit for this large fruit medley design.

It all starts with the design drawing. I use a drawing program called AutoCAD to draw in all the smallest details. It can be time-consuming to figure out every single piece that needs to be cut out on the scrollsaw but it's a necessary step to ensure you will have the complete design ready before cutting. The final size of this sheet of marquetry is 14in wide x 104in long. Once I completed the drawing, I printed it to full scale. There will be a centre section and two end sections to complete the full piece of marquetry.

THE VENEER LAYOUT

1 The first step was to figure out which colours of veneers to use. I printed a medium size drawing of the marquetry design, then with coloured pencils I shaded in the entire fruit medley. Then I went to a veneer website that offers flitches of veneer that best match up to my drawing. For the background I chose walnut burl veneer and I also purchased four different shades of dyed green veneer, purpleheart, yellow heart, bloodwood and makore for the grape vines. To cut the veneers I used a scalpel from Swann-Morton with a #10a blade and cutting mats for the smaller pieces to separate the fruit and grape leaves. I cut plywood to the sizes needed throughout the design. Most of the grape leaves are the same size so this sped up my cutting by placing the plywood on top of the veneer then pressing down on the plywood using the edges of the plywood as a guide for the scalpel. Without applying too much pressure I made two or three passes to cut through the veneer.

2 The larger sheets of veneer were cut in the same way as the smaller pieces by cutting a plywood caul to set on top of the veneer flitch then cut with a scalpel around all four edges. This larger sheet of veneer will be used as a waste veneer to hold all the smaller pieces together by matching up to the drawing in the correct placement for the grapes, apples, pears, leaves and vines with my smaller plywood cauls. I first cut out the paper then placed the design drawing on top of the large veneer to mark the location of where the smaller pieces of veneer will be located.


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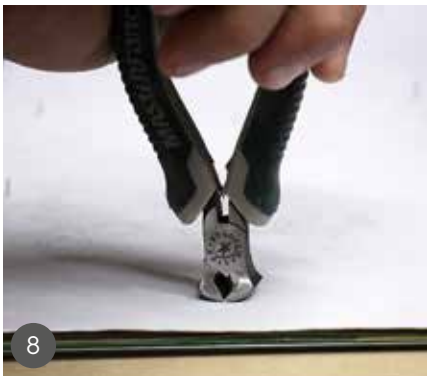
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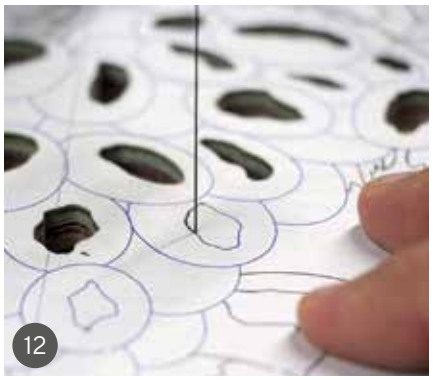
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PHOTOGRAPHS BY DENNIS ZONGKER

Then I placed the small plywood cauls on top of the large veneer flitch to cut out an opening – this is where the fruits and leaves veneer will be inserted. Next, I placed a piece of purpleheart on the cutting mat then used the same small caul on top of the veneer flitch and cut out one piece of veneer. Then I could insert it into the large waste veneer using blue painter's tape to hold the veneer insert in place. I repeated these steps to complete this full sheet of the waste veneer and inserts.

3 I flipped the veneer sheet over with the clean face up. This is just one layer of veneer, there will be eight layers of different veneers that will make up the cutting packet. For example: the walnut burl veneer is the background veneer which the whole sheet will use, except where the fruit and leaves will be cut.

GLUING ON THE PAPER

4 Once all eight layers of veneer were prepared for the packet, I glued a sheet of paper to the face side. This paper will hold together all the different pieces of veneer taped together. Plus, it will also prevent the veneer from chipping or cracking when cutting on the scrollsaw. I used hot animal hide glue for this step because it dries fast and won't penetrate deep into the pours of the veneer.

5 For such a large piece of paper I had a helper place the paper onto the veneer then press it down with a balled-up rag to the veneer.

6 I placed the veneer between two plywood cauls then put some weight on top to keep the veneer flat for a couple of hours.

NAILING AND RIVETING THE VENEER PACKET

7 The veneer was removed from the plywood cauls and I peeled off the blue painter's tape. I then placed seven of the eight sheets with the paper facing downwards and the top drawing sheet with the paper facing upwards on the plywood caul. Starting in the centre of the packet and moving outwards to the edges, I used a pair of needle nose pliers to hold the ½in-long 20-gauge nails in place and then nailed through the packet into the plywood caul until the head was flush with the veneer packet.

8 I used a thin prybar to pry the veneer packet off the plywood caul (a narrow slotted screwdriver would also work). I then placed the packet upside down on a hard flat surface and, using side cutting pliers, I snipped off the pointed tips of each nail leaving just a tiny bit of nail protruding.

9 A small flat piece of steel was placed underneath the veneer packet. I used a hammer to tap the snipped nails flush with the bottom sheet of veneer. This creates a rivet that holds the veneer packet together.

CUTTING THE VENEER PACKET

10 To cut the marquetry packet I used a 20in variable speed scrollsaw that can be slowed down to just 400 strokes per minute. I used an Olsen 5in No. 1 jeweller's metal piercing scrollsaw blade with 48-tpi. To be able to cut this larger packet on the scrollsaw I needed to cut it into five smaller packets. I had already figured out this step in the design drawing. These coloured lines are in magenta so that I could easily see where to cut out the smaller packets.

11 I began by drilling a 1/32in diameter hole through all the centre grapes, centred on the cutting lines.

12 I then fed the scrollsaw blade through the hole in the packet and through the scrollsaw table and locked the blade into the lower and upper blade clamps and set the tension. I then cut out all the grapes' centres which will produce a lighter shade of the purpleheart.

13 I cut out the grapes, cutting out the centre pieces first, then worked my way towards the outer pieces. When cutting the veins into the leaves, I just followed the template lines and then backed out the blade with the saw running. The resulting kerfs (gaps) made by the blade will be filled with glue creating dark lines that make the veins look realistic. For this type of marquetry, it is better to use a darker glue to show the contrast between the leaves and veins.

14 When I had finished cutting the centre packet, I placed all the pieces I needed on top of the printed copy of the drawing. This really helped me to keep organised with so many little pieces of veneer.

SHADING WITH HOT SAND

15 Silica sand is used to shade marquetry pieces by lightly burning the veneer and producing a three-dimensional effect. This type of sand is very fine and provides a uniform burn into the veneer. Some of the best places for shading marquetry are where two pieces meet or at the centre or outside edges of fruit or leaves. However, be careful not to overdo it: a little shading in the proper places is all that's required to give the marquetry picture a natural look. It is a good idea to practise with several different types of veneers because veneers burn at different rates. Start by filling a cast-iron skillet about two-thirds full with very fine silica sand. Once the sand is hot use tweezers to pick up the marquetry pieces and partially bury them in the sand. Leave the veneer pieces in the sand for short periods of time, 5 to 10 seconds, while periodically checking the veneer.

16 After removing the marquetry pieces from the sand, they cured up a little as they cooled. To flatten them out, I placed all the shaded pieces onto clamping cauls, then lightly misted them with water, placed one of the cauls on top and clamped them together for a couple of hours.

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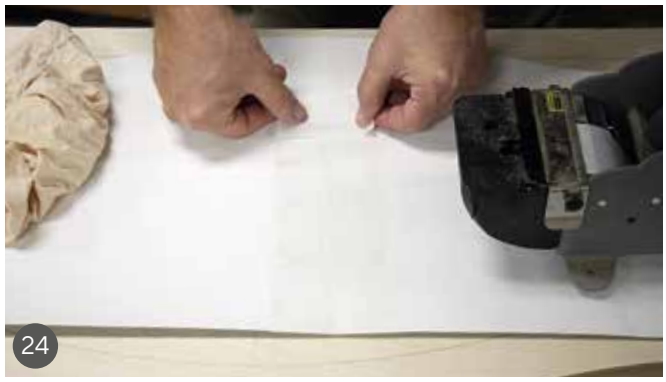
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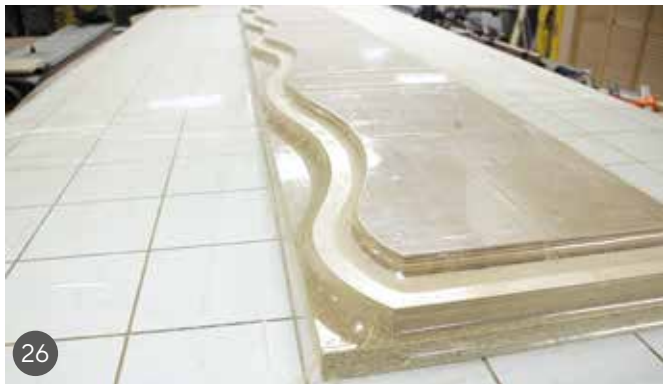
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17 Close-up view of the shaded fruits. The green leaves could not be shaded because they are dyed veneer which would only burn the green dye in strange colours.

PLACING THE MARQUETRY PIECES TOGETHER

18 I cut two pieces of double-tack mounting film (these are available at most art-supply shops) the same size as the centre section of the marquetry. I peeled off the protective backing paper from one side of the mounting film and laid it on the back face of the drawing template. I then applied another piece of mounting film to the top of the drawing template and peeled off the next layer in order to stick all the pieces of marquetry including the walnut burl veneer to the double-tack mounting film. The template gave me a guide to putting all the pieces of marquetry back together.

19 Close-up of attaching the marquetry to the double-tack mounting film on top of the drawing template.

20 This picture shows the full centre section of the top marquetry. Next, I had to repeat the same techniques to make the two side sheets of marquetry.

21 I placed the end sheet over the top of the centre sheet with a 1½in overlap and taped them together. I was able to cut an invisible seam by using the scrollsaw to cut a wavy line in between this 1½in overlap. Cutting them simultaneously leaves a perfect seam when they are fitted together. I repeated this same step for the other side of the marquetry sheet.

22 Close-up view of the wavy seam before it is taped together.

23 First, I taped the veneer face with blue painter's tape to keep it together.

24 I flipped the sheets over to their back face and taped the wavy seam with veneer tape.

GLUING THE MARQUETRY TO THE SUBSTRATE

25 The top substrate is cut out of 1⅛in-thick MDF which is a superior material for stability and for gluing down veneer. This top will have a loose joint in the centre of the top for easy access into the client's elevator. I had already cut the top in half with a loose joint spline to hold it tight together during the gluing process. To prep the top, I put down blue painter's tape so that no excess glue could roll over to where the borders and inlay will be.

26 The next step was to roll on Titebond III, a darker yellow glue which is great for filling in the veins of the leaves. I rolled glue onto both the veneer face and MDF substrate with a clamping caul on top of the marquetry and a bottom support caul to keep the loose joint together. Once the cauls were in place, I removed the blue painter's tape. Then with a helper I placed the top into the vacuum press bag and turned on the pump. I let the marquetry glue dry for 12 hours before I removed it from the bag.

REMOVING THE PAPER

27 The last step was to remove the paper that was glued to the face of the veneer sheets. The paper's main purpose is to keep the veneer sheets together and to prevent any chips or cracking while cutting on the scrollsaw. Another important thing to remember is that the design drawing is in reverse when cutting and laying out. For example, the pears when cutting are on the left side, then when the marquetry is glued down to the top they will be on the right side. This is always planned out in the design drawing stage. I used a cabinet scraper to scrape off the bulk of the paper. Then with an orbital sander I lightly sanded the top smooth with 150-grit sandpaper.

28 The full top with the marquetry glue down after the paper has been removed.

THE NEXT STAGE

In my next article I will be showing steps for bending and inlaying the solid black ebony banding, the borders and top edges. You can also follow my work on Instagram: **@denniszongker**

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