

Making Marquetry

Dave Kyle outlines some of the mysteries of an ancient craft



1. An 18th century clock in a new Arabesque marquetry case.

LIKE MANY OTHERS, I have long coveted a marquetry-cased grandfather clock, from the turn of the 17th century, but the price has always been beyond my meagre means. In 2004, I was offered a movement by George Tyler, ca 1705, at a price I could just afford, so I bought it. This left me with the task of making a suitable case, 1.

The following article is not intended as the definitive way to do the job, but rather one man's approach to a subject on which there is very little written material. The only book I know of on the subject is by Taylor and Bubb. There is a copy in the BHI library.

The first decision was whether to go for an antique look or leave it as it might have

looked three hundred years ago. As all the original cases that I know of, have long since faded I decided to leave it as new, with all its colour.

Next I had to decide on the type of marquetry. There were broadly three types used, namely floral, seaweed and arabesque. I rejected floral marquetry on the grounds that the original of the period relied too much on the saw cut and hot sand shading for its effect, whereas modern floral work makes much more use of the wood grain and looks more realistic. It also relies more on the window method rather than the interchange method, which I wanted to use as I needed several copies. Original seaweed marquetry, which can be extremely skilfully cut, is usually only bi-coloured and seems to consist of slightly meaningless scroll work. I chose arabesque for this job as more colours could be used and the design could be more interesting.

Methods

As not everyone is familiar with cutting marquetry, I should perhaps describe what is meant by the 'window' and the 'interchange' method. The window method usually starts with a single sheet of veneer with the design glued to it. The individual elements of the design are cut out one at a time, leaving a 'window' in the veneer. A piece of veneer of the desired colour is placed under this 'window' and moved around until the desired effect of grain direction and colour is achieved, the veneer is then marked through the 'window' with the point of a sharp knife, then removed, cut out and then replaced in the 'window' where it should fit perfectly. This continues until the entire design is complete.

With the 'interchange' method, the desired number of veneer sheets of different woods the size of the desired design, are selected and glued together with the design glued to the top of this sandwich. This is then taken to the saw where the individual elements of the design are cut out. They are then separated and assembled as single sheets of veneer with the various colours interchanged. In this way you end up with as many copies of the design as there were layers in the sandwich. In my case there were four: ebony, sycamore, boxwood and pear wood. The disadvantage of this method is that, even with a fine blade, there will be a very thin saw kerf round each piece.



2. A prayer mat with an Arabesque design.

I propose to give only a general outline of the work involved. Should anyone be interested I would be happy to discuss the subject in more detail with them.

My understanding of the meaning of an arabesque design may or may not be true, but I find it fascinating. Again, original arabesque has a vaguely meaningless look to it, so I prefer my version. I once bought a silk prayer mat, 2, from a dealer in the Grand Bazaar in Istanbul. It was quite expensive and it took me a week of negotiation, over endless small glasses of sweet apple tea, to purchase it. During our discussions the dealer told me that a true arabesque should tell the story of life, beginning at the bottom with chaos, rising through the creation, to the seed, and eventual growth and flowering of life. Finally it should depict the gradual dying of this life till the remaining soul is carried through the small opening in the vault of the sky to its ultimate resting place in heaven. Of course this might have all been brilliant salesmanship, but I liked the story and decided to use it. I am sure there will be at least one *HJ* reader able to advise on the truth or otherwise of the story.

Creating an Arabesque Design

Taking the trunk door as the main element, the strap work is meant, I think, to denote the boundary between the



3. Left: detail of a drawing for a panel. Right: design elements for the trunk door after scanning and mirroring.

spiritual and the temporal. The elements inside and outside are supposed to reflect this. The drawing is entirely a matter of imagination within the criteria suggested. The only thing that must not be shown is any depiction of the human form. I tried using my CAD program for drawing but found it too slow and stilted. I think it must be done free hand. As one half is a mirror of the other I only drew one half. This can then be scanned into a suitable computer program for mirroring and editing, 3.

One thing is very important however, the design must reach the edge occasionally as there must be an entry for

the saw so that the cut will not be noticed. The full design will have to be built up from sections around 200mm square (or the depth of the throat of your saw) before you can cut the individual pieces.

Cutting the Wood

Cutting marquetry for a clock case I found to be totally different from pictorial marquetry. For a clock case I think it is essential to use the thicker, 1.5mm veneer, rather than the standard 0.7mm. This is because there will be considerable colour cross contamination before the job is finished. Due to the large area to be covered, the time taken for the cutting, and the finishing scraping, there will be several months' work.

Unfortunately when using four or more colours, plus glue and backing if necessary, the extra thickness greatly slows the cutting speed. It took me twelve weeks to complete and lay all the marquetry. This, of course, was enough for four cases. I hope to make one for each member of the family.

As the sandwich has to be firmly held together for many weeks while cutting is in progress, I could find no better way than by the old fashioned method of gluing it together. Even though it has disadvantages, I think the only satisfactory glue for this is the time-tested hide, pearl, or scotch glue; call it what you will.

Obviously, with the interchange method the saw kerf must be as thin as possible. I use jeweller's piercing-saw blades. After trying various sizes, I concluded anything coarser than 2/0 left too wide a kerf, and anything finer was not up to the thickness of the sandwich; though I did use some 3/0 for some of the very small, intricate pieces. I used only good quality Swiss or German blades.

One useful discovery was that blade life will be greatly extended by softening them by soaking in just-molten lead for a minute or two, then plunging into water. This brings them to a straw colour. Needless to say, the blade must be set to run absolutely vertically to the table or the pieces cut will be less than a good fit.

Before commencing cutting it is



4. A set of identical pieces of the 4 different veneers being dried on a domestic iron.

necessary to make a number of frames on MDF board the exact size of the pattern being cut. These are lined with 'sticky-backed' plastic (sticky side up) to stop the pieces moving around too much.

Having cut out as many pieces as can be handled at one time they have to be unglued before assembling in their individual frames. Soaking the pieces in hot water for a minute or so does this, but unfortunately it also swells the wood, which then has to be dried and shrunk back to its original size so that the pieces fit accurately together. I did this on the upturned sole of a domestic iron set to low heat, 4. As different woods swell and shrink at different rates it can be tricky.

Assembling and Laying

Having dried the pieces they can be gradually assembled in their individual frames until the pattern is complete, 5. As small sections are complete they must be covered with a waxy paper and small sections of MDF, and weighted.

When fully assembled the patterns will be slightly smaller than their frames due to the amount wood removed during sawing. It is quite surprising how much is removed. In order to make the fit as tight as possible the pieces have to be squeezed together by inserting thin strips of veneer round the edge of frames, while still



5. The tiny components, left, are required to make panels to decorate just the plinth of 4 different coloured cases using the interchange method.

keeping the weighted boards in place or there will be little bits of veneer flying everywhere. This is best done over a period of days to allow the wood to adjust to the pressures.

Finally a strip of thin backing veneer is coated with hot hide glue, covered with plastic and squeezed in the press to form a thin glue line. When the glue has just lost its tack, but not yet set (about half an hour) it is removed from the press and the plastic peeled off. It is then slid gradually under the weighted boards, glue side down, over the veneers till they are all covered. The whole frame can then be returned to the press under firm pressure for a further half-hour.

Again remove the frame from the press and remove the weighted boards, as the backing veneer should be sufficiently stuck to the main veneer pattern to hold it together. Immediately place a hot sheet of aluminium on top of the backing veneer and return to the press for several hours by which time the glue will have set.

At last it is possible to remove the glued pattern from its frame and turn it over. With luck there should be a reasonable piece of marquetry ready for laying on the ground of your choice, and finishing, as you will.

Thoughts on Case Design

I will conclude with some thoughts on the design and construction of this case. It is often thought that a long case designs itself; the dial being 300mm square, the pendulum being around 1000mm long and needing about 200mm for the bob to swing, with about 1500mm needed for the weight drop.

Within these parameters however there has been a huge variation in design from the slender, elegant cases of the late 17th, early 18th centuries, to the heavy, thickset cases of Victorian Yorkshire. Fashion probably had a lot to do with it, but I feel there is more to it.

I have measured and reproduced several pieces of 18th century furniture in London's VICTORIA AND ALBERT MUSEUM and they seem to be capable of being broken down into simple geometric forms: square, circle, triangle, golden rectangle, or parts thereof. I think a lot of these early joiners made much more use of the compass and straight edge than being dominated by the ruler as we are today. They were probably much more familiar with the rules of classical proportion than us, and used simple relationships of whole numbers to each other. These had been refined over the centuries by the early Greeks to give the most pleasing proportions possible. The *Ten Books on Architecture* by Vitruvius gives an insight into this and is anyway an exceptionally

good read. Also any of the early English books on joinery lay great stress on geometric theory and laying out with compass and straight edge rather than by measurement.

With this in mind I started with a simple line drawing, composing a 300mm square for the hood, two golden rectangles for the trunk, (short side 200mm) and the hood mirroring for the base. Of course this has to be scaled up to give the outside dimensions of the case but if this is done with the same factor for the three elements the proportions should remain the same. Complications arise when adding mouldings, architraves, etc, but should be done within the rules available in order to maintain pleasing proportions.

Having said all this I still managed to make several mistakes. Probably the worst was making the base marquetry a quarter match and thus square, which forced me to add the plinth to the bottom of the square and make the shape look wrong for a square dial clock. The fretwork frieze also ended up too big forcing a change to the shape of the hood, which distracts slightly.

Construction of old grandfather cases seems to have been very variable. The first lesson in joinery is *never* fix long grain wood to cross grain wood or something will give. When making up a wood panel the 'rail and panel' system should be used. This has been known since Egyptian times, more or less until the 18th century when it was often ignored, presumably for fashion reasons. Consequently a lot of the furniture of the period suffers from splits and cracks. The classic example in clock cases is the D moulding round the trunk door which invariably shrinks and comes loose from the door. This is not the fault of the glue, just bad workmanship. It is also evident in the split often found in the thin panel nailed to the front of the base, and occasionally in the sides. In fairness to the tradesmen who made these cases, they were probably under the same financial pressures as any modern tradesman, but a lot of the faults could have been eliminated, and should be born in mind by anyone building a case today. Of course the very best work avoided most of these pitfalls, presumably because it was for people who could afford to pay for it. These are just a few points to keep in mind when building or buying a case, as this is not the place for a detailed discussion on case joinery.

During this article I have used the term 'grandfather clock' rather than 'long case clock', as I agree with Edwardes (in his book *The Grandfather Clock*) that 'grandfather' more accurately describes such a clock rather than its more modern, somewhat sterile and politically-correct

alternative. I sometimes think the older and more descriptive 'coffin clock' suits it even better!

So, if you happen to be at an auction and a 300-year-old marquetry cased clock is selling for £15000 (or whatever they make nowadays) buy it! It will be cheap considering the amount of work that went into its making. □