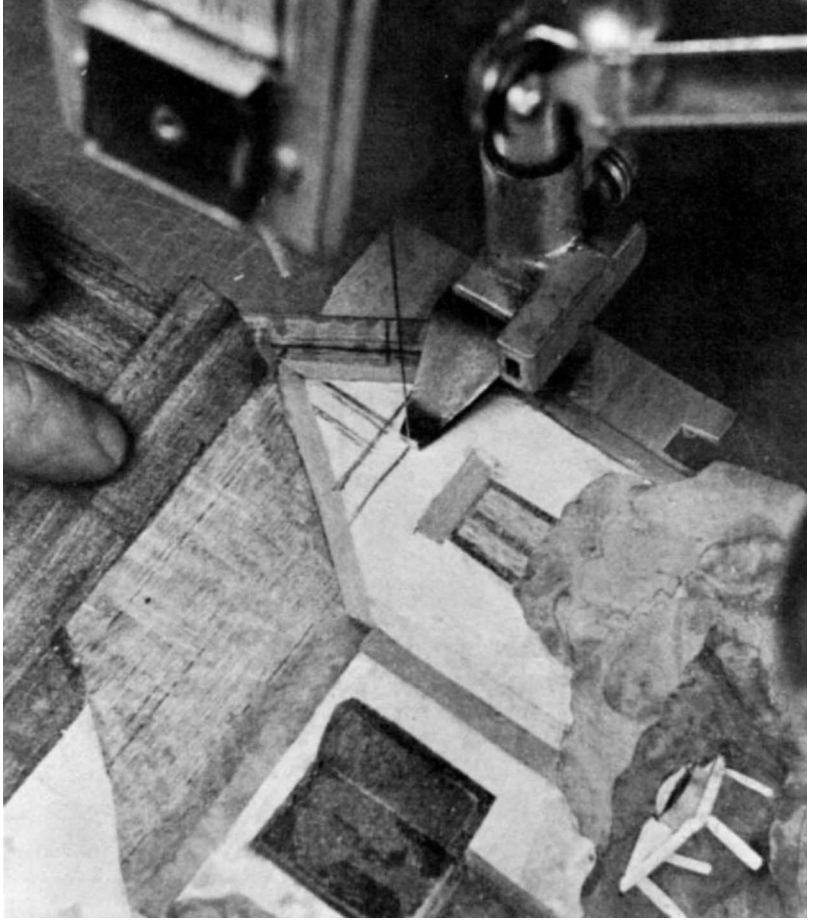
Marquetry Cutting

by Peter L Rose



The author uses the double-bevel-cut method on a jig saw to cut a horizontal beam. Veneer for the beam is taped underneath and is being cut simultaneously.

Woodworkers who have never tackled marquetry before have a variety of cutting tools and methods to choose from. Depending on one's patience and skill, some will work better than others. The aim, of course, is to have tight-fitting joints requiring no wood filler except for intentional esthetic reasons.

Basically, there are two ways of cutting veneers for marquetry—with a knife, and with a saw. The knife is good for pictures with many straight cuts and geometric designs and for cutting borders and miters. But it's difficult to cut sharp turns on the harder veneers, although there are some superior marquetarians who use a knife exclusively. Also it's difficult, if not impossible, to cut neatly through two thicknesses of veneer at a time with a knife.

The saw overcomes the disadvantages of the knife by allowing tight turns and the cutting of more than one thickness at a time. But it, too, can be difficult to handle, has limitations of size, and can run into much more expense if power equipment is chosen.

Knives to choose from

The knife most used in marquetry is the X-acto knife with a #11 blade, a blade that has an extremely sharp point. It is a comfortable knife to hold and the blade is sturdy, but frequent sharpening is required. The X-acto knife's main disadvantage is that because of the thickness of the blade, it makes a V-shaped cut, spreading the veneer apart at the top. Many marquetarians overcome this by cutting their pictures from the back using a reverse pattern. When seen from the front, the cuts will have a much tighter fit.

Another good choice is the scalpel or surgical knife, again with a #11 blade. This is a flat, slim knife that uses blades about the same thickness and sharpness as razor blades. Because the blades are thinner and sharper, the scalpel cuts the veneer more easily than the X-acto knife. However, the blades are fragile and break easily. They are usually replaced rather than sharpened.

Finally, there is the single-edge razor blade which is good only for straight cuts, as sharp turns require a much more pointed blade.

Saws to choose from

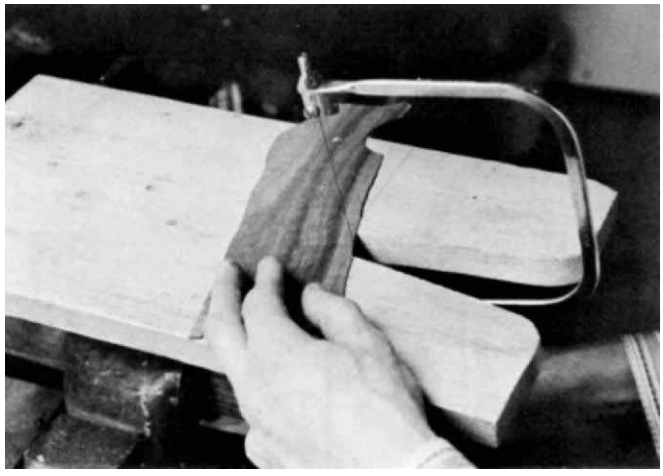
The main point to remember about saws for marquetry is that the thicker the blade, the cruder the cut and the wider the gap between pieces.

Thus the popular coping saw is definitely ruled out. Coping saw blades, which have pins at both ends, are too thick, but the coping saw frame cannot take the thinner but pin-less, jeweler's saw blades that do work. As a result, the most-used hand saw in marquetry is the fret saw. It has miniature clamp-like attachments for holding the pinless jeweler's blades.

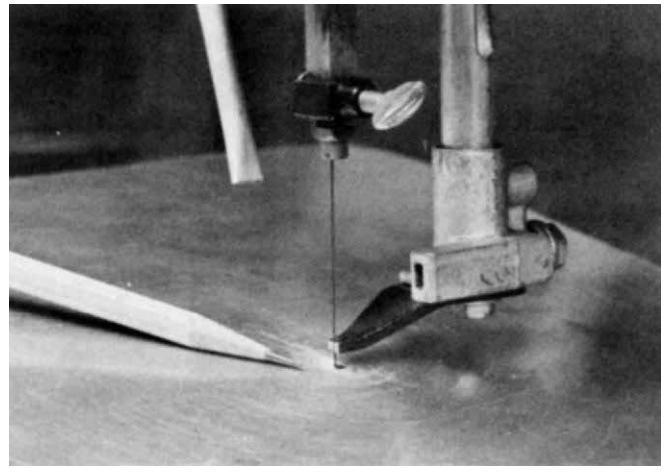
The blades are five inches long and come in various sizes—No. 6/0 being the thinnest at 0.008 inches and No. 1/0 being the thickest at 0.011 inches (although there is a thicker "J" series). The No. 4/0 blade, with a thickness of 0.009 inches and a width of 0.018 inches, is a good compromise between being thin enough to produce a fine cut, but not so thin that it is always breaking. But sometimes the thinnest blade is required for extremely fine detail, and the thicker blades must be used for unusually hard woods. In any event, all the blades are quite small: they fit through the hole made by a sewing machine needle, so breakage is always a problem, and much practice is required to minimize it.

Jewelers partially overcome this by using a saw that can be adjusted to hold the shorter broken blades. These jeweler's saws can also be used for marquetry, but their limitation is in their throat size. The average fret saw has a throat of about 12 inches, meaning that a pattern 24 inches in diameter could be worked on. Jeweler's saws usually have a much smaller throat (2-1/2 inches is a popular size), but this may not be a limitation for those working on small pictures.

Whichever saw is used, a jig called a "bird's mouth" must be made or bought. It is a board with a narrow "V" (about eight inches long and three inches wide) cut in one end. When attached to the workbench, it serves as a sawing



Fret saw cuts veneer held on a "bird's mouth." Cutting is done near the apex where there is good support. Jig would be tilted for a bevel cut.



Jig saw modified for bevel marquetry cutting. Original work hold-downs are gone. Thin metal sheet with small hole for jeweler's blades to go through is glued to original top.

surface. The blade of the saw (with the teeth pointed down) is placed close to the vertex of the "V". The saw is moved up and down in a stationary position as the veneer is fed into the blade.

The main disadvantage with the hand-saw technique is that it takes much practice to hold the saw with one hand and move the veneer with the other so that an accurate cut can be made on the pattern line.

This disadvantage is overcome (at considerable cost, however,) by the use of a power jig saw. For marquetarian, the main requirements in such a saw are special chucks for holding the jeweler's blades, a tilting table, and a foot switch that frees both hands. To my knowledge, only Rockwell makes a jig saw that can be adapted to take jeweler's blades. The popular Dremel saw does not adapt; neither does the Sears. Another desirable feature is tension adjustment, but if this is not available, a weaker spring can be substituted above the top clamp to help keep the blades from breaking too easily. Average throat size is usually between 16 and 24 inches.

The various cutting methods

The choice of the cutting method is partially determined by the tools available. If a power jig saw is available, then any of the four basic methods can be used; but if only a knife is available, the so-called double-cut methods are ruled out.

The single-piece method

The simplest of the methods (but the most difficult to get a perfect fit) is the single-piece method. Basically, one Xerox or carbon copy of the pattern must be made for each piece used in the pattern. The pattern (or portions of the pattern) are taped or glued to each of the selected veneers. (If glued, cut the picture from the back or in reverse; otherwise the glue will impregnate the veneer and show as blemishes in the final picture.) As each piece is cut, it is laid on a master pattern, and the pieces are held together temporarily with masking tape. The fret saw or power jig saw is recommended for this method, but a knife can also be used. The obvious disadvantage of the method is the difficulty in cutting exactly on the lines to insure perfect fitting joints. Since each piece is cut independently of the others, a poor fit can easily occur.

The window method

A partial way around this disadvantage is through the so-called window method. Instead of cutting all the pieces independently of each other using many copies of one pattern, and then putting them together on a master pattern, the pieces are cut consecutively from a single pattern. The pattern is traced onto the background veneer using carbon paper. The background could be one or more pieces put together. (If the pattern is taped or hinged along the top of the background veneer, it will always be in register, should additional tracings be made onto the veneer.)

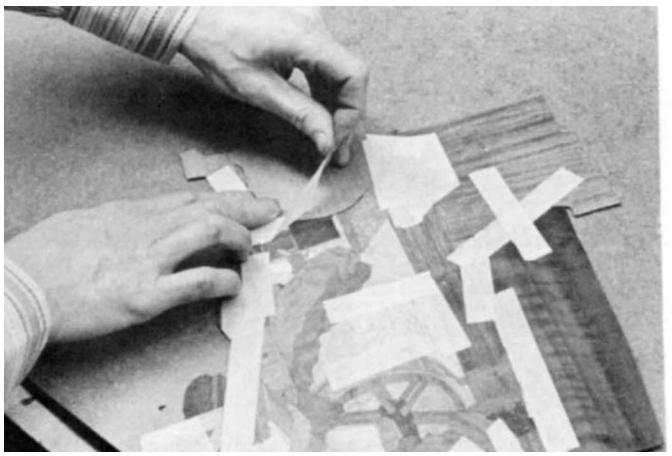
Larger pieces in the pattern are cut out of the background first. As each piece is cut and removed, a veneer selected for that part is placed under the opening and moved until the grain direction and figure are in their most pleasing and natural position. The piece is then taped temporarily on the back, turned over, and marked along the edge of the opening with a sharp pencil or knife. The veneer is then removed from the back and cut on the markings. It is then permanently placed in the opening and taped in place on the back side. Each part is done in this manner until the entire picture is completely cut.

The advantage of this popular method is that each veneer can be seen in position before it is cut, and both a knife or saw can be used. But the disadvantage, as with the previous method, is that accurate fitting is difficult because the pieces still are not cut simultaneously.

The pad method

A third method, the pad method, tries to get around this disadvantage by making a single cut; that is, by cutting all the pieces at once as in a jig saw puzzle.

Several pieces of soft waste veneer at least the size of the finished picture are stacked together into a "pad," and the good veneers are interleaved among them for the cutting. To



Veneer for house beam is taped in position to back of picture being cut by double-bevel method. Other tape is holding previously cut pieces that have been white glued.

Sewing needle is used to make hole along line of cut. Jeweler's saw blade will then be fed through and mounted on the jig saw for cutting out.

make up the pad, the good veneers are positioned on the waste veneer according to their place in the final picture and fastened with masking tape. Adjacent veneers are placed on different waste veneer layers so that there is no direct overlapping. In this way the pad is built up of alternate layers of waste and good veneers, and the assembled pad can be tightly compressed during the cutting. The top layer consists of a piece of waste veneer on which the cutting pattern is glued. The average picture may require a pad having six or so such layers.

During cutting, the pad is held together with the edges taped, stapled, or nailed. Power jig saws are recommended for this method and the blade used must be one of the thicker jeweler's blades, 1/0 or 2/0. Thinner blades would break too easily in cutting such a thick stack of veneers at one time.

This is the main disadvantage of this method: the thickness of the blade, slight as it is, prevents a tight fit. Another disadvantage is the wastage of veneers. But the main advantage is that once the pad is made up, the cutting goes quickly and the pieces all follow the same curve or contour because they are cut all at once. Ideally, if the saw blade had no thickness, the pad method would produce perfectly fitting joints.

After the cut is made, the beam is glued in place. Because the cut was made on a bevel, the pieces are not interchangeable. Notice difference in sizes of scrap pieces.

The double-bevel-cut method

This ideal can be reached by a fourth method, the double-bevel cut, but to do this, only two pieces of veneer can be cut at a time. By cutting the pieces at an angle, the gap caused by the blade thickness can be compensated for and eliminated in the final picture. The angle of the cut depends on both the blade thickness and veneer thickness, but usually an angle of 12 to 13 degrees does the job. If the angle is too great, the veneer tends to feather; if not great enough, the pieces won't fit tightly. The best way to find the proper angle is through experimentation.

Both the power jig saw or fret saw can be used with this method, assuming the jig saw table tilts. If a fret saw is used, the bird's mouth must be tilted and possibly modified to produce the same angle cut.

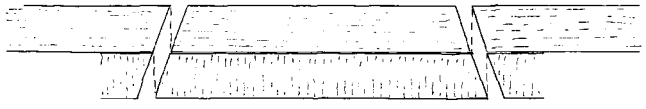
To start this method, proceed in the same manner as with

the window method. But before cutting out any piece of the background, tape the veneer that is to replace it to the back, in position. A sewing needle the same thickness as the blade and attached to a pin vise or handle is then pushed through both veneers on the cutting line. The jeweler's blade is passed through this hole (with teeth pointed downward) and then attached to the saw. The veneer is then consistently cut either in a clockwise or counter-clockwise manner, depending on which way the saw is tilted. The direction of the cut is very important because the cut pieces are not interchangeable. Again, it's best to experiment and then follow the results consistently. When the cut is completed, the new veneer will fit exactly in the place of the discarded veneer, even if the saw blade does not stay on the pattern line. The process is then repeated for the next piece in the picture.

After years of trying the various methods, I find the double-bevel cut by far the best method to use. It's also good with either hand or powered saws, so that expense is not a factor.

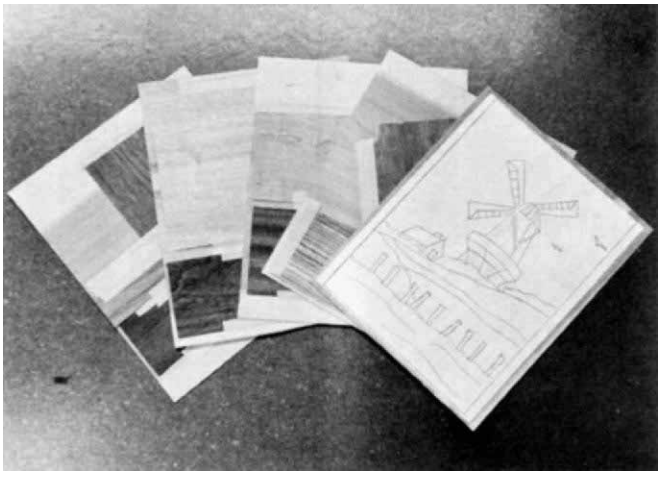
Most importantly, it consistently produces tight fitting joints requiring no wood filler. That frees my efforts for the more important aspect of marquetry: creating pictures that use the grain, figure and color of the woods to produce the most artistic and pleasing effect.

[Note: The fret saw and jeweler's blades can be obtained from Albert Constantine and Son, Inc., 2050 Eastchester Road, Bronx, N.Y. 10461. The scalpel can be obtained from the Brookstone Co., Peterborough, N.H., 03458.]



During cutting

Assembled



Photograph shows "pad" of veneers ready for assembly and cutting with pad method. Cross-sectional drawing shows how beveled saw kerf eliminates gap between pieces in double-bevel-cut method.