

Scrollsaw Use

by Jacob von Holzen



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HISTORY

Fretwork is the craft of creating very ornate and decorative items with numerous inside or cut-out openings, that involve series of quick turns using a fine bladed fretsaw. It is a form of craftwork that was very popular in the late 19th and early 20th centuries, and is now being rediscovered.

Fretwork is primarily cut from solid Woodstock and plywoods of various thicknesses with a hand held fretsaw or treadle saw and more recently with powered scrollsaws.

It is very difficult to determine exactly where and when in history fretwork had its first beginnings. Egyptian furniture removed from tombs provide prove that veneers were used as ornamental fret-like overlays at about 3000 years B.C. Delicately ornamental overlays were also found in European and Scandinavian countries in the 16th and 17th centuries.

Elaborate fretted furniture parts were clearly evident in works of famous 18th century European craftsmen including Frenchman Andre Charles Boulle (1642-1732), Englishman Thomas Chippendale (1740-1780) and others.

Early this century fretwork became a popular passtime in the homes of hundreds of thousands of adults and children indulging in the creative and absorbing activity, creating useful and decorative items for the home and play. A large number of New Zealand boys who attended school between the 1920's and the late 1940's will have had some experience with a hand held fretsaw. More recently with the introduction of the powered scrollsaws, the craft is experiencing a revival, as more people discover the possibilities of the scrollsaw.

CHOOSING A SAW

In the past I have had a number of inquiries from members as to which scrollsaw to buy. This is a difficult question to answer, as a number of considerations need to be taken into account. I will try to answer some of the questions asked, by giving pointers to assist you in making your decision.

Most of you are aware that I use a “Hobbies Gem” treadle Fretsaw dating back to the 1930’s, for cutting veneers for my Marquetry pictures, and plywood's, veneered mdf and solid timber for my fretwork boxes etc. These saws are still manufactured in England, but unfortunately there is no agency in New Zealand.

The treadle fretsaw gives me instant speed control. I can treadle faster for easy cuts and immediately slow to a crawl for sharp corners and delicate cuts such as veneers and thin materials, all by adjusting the speed of my pedalling.

Another feature is the simple and easy blade release and retightening mechanism, in the form of a wing nut, which allows me to release the blade, pierce through the next cut-out and retighten in a matter of seconds. When making a project with perhaps 60 or 70 piercing cut-outs, releasing the blade, threading through the next hole and retightening, takes up much time if the process is not simple.

CONSIDERATIONS WHEN BUYING A SCROLLSAW

Decide what sort of projects you plan to make with your scrollsaw. If you only want to make simple outline cut-outs without piercings, just about any scrollsaw will do the job. In this case there is no point spending a lot of money. If on the other hand, you wish to do more intricate work, it is essential that the blade changing, release and tensioning system is quick and easy to operate. There is nothing more frustrating than an awkward blade change. Try this operation in the shop, and be entirely happy with the ease of the procedure before buying.

Another point is to ask if they carry a full range of blades for the particular scrollsaw, which will only take a certain type of blade. Some saws will only take a blade designed for that particular brand. This is often the case with saws which are designed for pin ended blades. A scrollsaw is of little use if the blades are hard to obtain.

TYPES OF SCROLLSAWS

There are two basic designs of Scrollsaws:

- The C-arm that pivots on one point and means the blade moves through a slightly arced movement resulting in a faster cut.
- The Parallel arm where each arm is independently pivoted which gives straight up and down movement of the blade. They are ideal for jig saw puzzles and stacked work where a square and accurate cut is essential.

BLADES

Some scrollsaws have provision for both plain ended and pin ended blades. Plain ended blades are available in much thinner sizes and are able to do much finer work than their pin ended counterpart. Pin ended blades are more robust because they need to be deep enough to allow for the pinhole and as a result rule out fine work. They can also cause difficulty when turning sharp corners, necessitating attacking sharp corners from several directions before clearing. They also need a large hole to thread through piercing work to allow the pin to pass through. A plain ended blade of up to no. 3 will turn sharp corners without having to back-off. The piercing hole can be of a much smaller diameter. Some brands of plain ended blades have rounded backs, which makes turning sharp corners a breeze.

I use blades made by “Hobbies” and all are a standard length of 130mm, having a rounded back and slightly hooked teeth, which give a smooth and fast cut.

SPEED CONTROL

Variable speed control is, I think, a very important consideration if many and varied materials are to be used. A slower speed is a definite advantage if thin materials and intricate cutting are involved. At high speed it is difficult not to over-shoot a sharp corner and hard to control on intricate cuts.

A tip when cutting very thin materials, such as veneers or other brittle materials, tape the work onto a thin piece of backing material such as 3mm mdf and cut through both. This will protect the workpiece and also alleviate much of the furring on the underside of the workpiece.

TILTING TABLE

A tilting table is useful for angle cutting and auto-fretting. This again is another aspect to consider before buying.

THROAT SIZE

Throat size is the distance from the blade to the back of the saw arm, and will determine the size of the workpiece. In some cases it is possible to cut as far as you can go from one end, then remove the workpiece from the saw and approach from the other end, thus completing the cut. An alternative is to break down the workpiece into smaller segments for cutting and re-joining on completion.

POWER SWITCH

The power switch should be in a convenient, easy to reach place. Particularly in the case of a blade break, which can be a frightening and noisy experience.

NOISE AND VIBRATION

Run the Scrollsaw in the shop and check for noise level. The quieter the running the more pleasant the machine is to work with over a long period of time. My own scrollsaw makes an unpleasant

droning and surging sound which, without earmuffs, is most irritating. Remember you may have to listen to the sound of your machine for lengthy periods on a big job.

Vibration can cause problems by giving you a blurred vision of the line you are trying to cut along. So, in short, a quiet running and vibration free scrollsaw is desirable.

To sum up

- Think carefully before buying.
- What sort of projects do I plan to make?
- Type of Scrollsaw.
- Simple blade release and tensioning.
- Ease of operation.
- Type of blade
- Speed control
- Tilting table
- Throat size
- Power switch
- Noise and Vibration
- How much can I afford to spend?

SETTING UP YOUR SCROWSAW

You have just bought your new scrollsaw and brought it home in its box and put it down on the workbench. You tear open the package and want to start playing with it immediately. But hold on a moment. A good idea is to find and read the manual first. Check that every component is included in the package, familiarise yourself with the machine and how it operates. Most machines are supplied almost completely assembled, generally leaving only the feet and perhaps the dust blower and guard to be fitted.

POSITIONING

Your new machine will either be freestanding or require bolting to a bench. Either way, be sure to have your work table at a comfortable height. Being in a hunched position while working can become uncomfortable for your spine, shoulders and neck.

Set up near a power point. Avoid trailing power leads; great things to trip over. If the position you have chosen is not well lit, use a well placed lamp but natural light is best.

BLADE FITTING

Most machines come with the blade fitted. It is a good idea to practice changing the blades and tensioning, before you start a serious project, thus familiarising yourself with the particular blade holders on your saw. Some saws require the removal of the blade clamps and securing in a special jig to change the blade. The simplest is a winged nut. Whatever the method, always ensure that the teeth of the blade are facing downwards. Otherwise the blade will tend to pick up the workpiece off the worktable on the upward stroke. Always ensure that the blade is secured tightly in the clamps so it cannot slip out in operation. This could result in a bent blade which in most cases is difficult to straighten.

BLADE TENSION

There is possibly a scientific formula as to how tight a blade should be tightened. I find the simplest way is to “ping” the blade with my finger while tightening the tension nut or lever until it strikes a pleasing high pitch note. Much like tuning a stringed musical instrument. Rely on your ear and practice. A slack blade will curve backwards and trail in the work and make accurate cutting and turning difficult. My philosophy is “better a tight blade than a slack blade”

When using your Scrollsaw for the first time ensure you have plenty of blades on hand, because breakages will be inevitable.

TILT TABLE STOP

Using a good small set square, check that the blade is square to the table. Adjust if necessary. Most saws have some form of adjustable table stop. Usually a simple bolt and lock nut. Some saws will have a tilt scale. I still like to use a protractor or a bevel square for accurate angle setting.

DUST REMOVAL

Many saws have a dust blower. Usually a bellows with a tube directed onto the work immediately in front of the blade to blow away the dust to keep the saw line clear.

WORKPIECE PATTERNS

In most cases you need a design on your workpiece as a cutting guide. There are a number of methods to choose from:

- One off - Measurements can be transferred and marked directly onto the timber and cut out.
- Tracing Paper - This method involves using a sheet of typist black carbon copy paper to trace the design onto the workpiece. I use a “dry” fine tip ball point pen for this on the rare occasions I use this method. After the piece is cut out all traces of the carbon have to be removed so as not to spoil the finish.
- Templates - Made from thin mdf for shapes you will use often.

- Photocopies - This is the easiest and most fool proof of methods. I have the master copy of the design photo copied and use the copy. Thus the master copy is saved for future use. Cut out the components from the photo copy and fix to the timber.

METHOD OF FIXING

A spray adhesive can be used to fix the photo copy to the timber. The advantage of this method is that the whole of the design is fixed to the timber. The disadvantage is that all traces of glue residue need be removed from the timber after the design has been cut out, or the final finish could be affected.

The method I use is to cellotape the design to the timber. (masking tape could be used instead) This leaves the work clean and free from glue and is easy to peel from the under side of the workpiece. The only inconvenience is that the design only being taped around the edges of the workpiece, fingers need to be kept close to each side of the blade to stop the design from lifting as you cut. I still have 10 digits and have used this method for more years than I can remember. If you keep your fingers on each side of the blade there is no possible way they will be cut.

SCROLLSAW MAINTANENCE

Periodical checking your saw for loose bolts, nuts, screws, power connection, etc. and oil where necessary. Doing this could add years to the working life of your machine. Polish the worktable with wax, thus giving a nice gliding surface to turn on while cutting.

CUTTING

It is important to try to stand or sit or in a relaxed and comfortable position when sawing. You are supposed to be enjoying your work. Just hold down the workpiece onto the table enough so the blade does not lift it on the upward stroke. Do not hurry the work into the blade. (More blades are broken because of this fault than any other reason.) Let the blade cut at its own pace. Practice will soon teach you at what speed your blade will cut more comfortably. Each material is different and some will cut more easily than others.

A comment I hear often is “My saw will not cut straight, it tends to wander off to one side”. With practice you will learn to compensate for this trend. It is good practice to try each new blade on a piece of scrap wood to see how true it cuts. If the blade cuts way out of true, I take a pair of pliers and bend the blade slightly just below the top clamp and also just above the bottom clamp in the opposite direction of it’s bias. Usually this does the trick. Do not over bend. Just a little at a time, until you are satisfied with the results. If the blade only runs off true slightly don’t worry about it.

When sawing with the grain (ripping) in timber you will experience more blade resistance and slower cutting than when cutting across the grain (cross cutting). Take care when changing direction from ripping to cross cutting and hold back a little on the turn as not to overshoot the corner. A little practice will soon tell you when to stop moving the workpiece forward, and to start your turn.

Anticipate what the blade will do and compensate before you are way off the line you are sawing on. Resist backing off if you have gone off the line, and into the work side of the design. Curve out gently and get back onto the line in a gently sweep. If however, you stray into the waste side of the

line, back off to where you started to stray, press the workpiece sideways onto the blade, on the side you want to get back onto the line, move the work slowly forward until the blade teeth grip the side of the cut, and then you can relax the sideways pressure, and proceed as normal.

Whether you cut on the line, or just touching the line on the waste side is your choice. With most of my designs, I have drawn with a black fine tipped ball point pen, and I cut down the centre of the line. I'll be honest, this is not always easy to do. If the design is shaded in, I cut on the waste edge of line.

Before you attempt a serious project, I suggest you practice some basic cuts on some scraps of 6mm mdf say about 150mm square; it has no grain and will cut at the same speed in any direction. Practice on wood when you are more confident, because as mentioned earlier, wood will cut faster across the grain, than with the grain, so it requires more control.

Back to the practice pieces. Draw a few straight lines, wavy lines, zigzags, half circles, squares, rectangles, and a few piercing cut-outs etc. Practice cut until you are able to follow each line accurately and feel confident enough to start your first project.

I like to cut out all the piercing cuts (waste pieces) first and do the outline last. This will avoid any damage to any delicate protrusions around the outside edge of your project, which may catch on your hands or sleeves while the work is being turned on the saw table. When you are doing the piercing cuts, the blade will need to be released, threaded through the drill hole, retightened and the tension adjusted. Cut into the corner and cut in whichever direction you prefer. After completing each cut, remove the waste piece from the work to stop it from dropping and getting caught in the blade opening in the worktable.

It is not good practice to start a cut halfway along a line, as it can be difficult to meet up in exactly the same place and leaves a small nodule of timber, which will have to be removed. The only way to keep such a cut tidy is to cut one way to a corner, then retreat back to where you started. Turn the work around and complete the cut from the other direction.

YOUR FIRST PROJECT

You have done all your practice cutting and are now eager to start on your first project. The design has been chosen, and the timber selected. Fit a suitable blade for the thickness of the timber to be used. As a guide I will give you the blade sizes recommended by "Hobbies".

00	veneer
0	fine overlay
1	3mm wood
2	4.5mm wood
3	6mm wood
4	9mm wood
5	12mm wood

6

18mm wood

7,8,9,10,11

for multiple cutting and various thicknesses of wood etc. and hard board.

This is only a guide. If you use a blade larger than a no.3, you will not be able to turn a tight corner without nibbling from more than one direction to get around. This can result in untidy cutting. If your scrollsaw is designed to take only coarser blades, cut to the corner, then back up a few millimetres and cut a arc around in the waste wood, and finish the corner from the other direction. This takes time, and not taking care can result in a messy corner. One reason why I prefer to use finer blades.

For other than cutting veneer, I use a No. 2 blade for all wood up to 10mm thick. The No. 2 blade results in a fine smooth cut which requires no touching up. Maybe it will take me a little longer to cut thicker material, but the finished result is worth it.

Again I remind you that the blade is always fitted with the teeth facing downwards, so it cuts on the downwards stroke. Fine blades can be tested by lightly rubbing your finger along the teeth edge to determine as to which way the teeth are facing.

ARRANGING THE DESIGN

Cut the design into its separated components and arrange on the timber, remembering the grain direction of each piece Either glue or tape each piece to the timber. Any pieces which are straight sided I cut to their exact size on the circular saw, before I tape on the design. I cut duplicate pieces in pairs where ever practicable, such as box sides and ends, and any other parts of the design which require more than one of the same. Tape the two pieces together with the face sides inwards and cut out together. This saves time and both parts will be identical. Any piece which has a straight side, fix this side to a machined edge of your timber. This saves having to attend to the edge after scrollsawing is complete.

When a design has cut-outs, holes need to be drilled to allow the blade to pass through. I use a 1/16 (2mm) drill in my drill press for this. Plan where you drill the holes, keep within 2-3mm of where you will commence the cut. Near a corner or at the end of a point are ideal places to places to drill.

SANDING AND FINISHING

Having cut out all the pieces of your project, remove all traces of glue or tape from the surfaces. The underside of most pieces will have burrs and some cases threads of wood protruding from the surfaces. The underside of most pieces will have burrs and in some cases threads of wood protruding from the surface. These are due to the downward cutting stroke of the blade, and need to be sanded away. For stubborn bits, take a tiny bit of say 180 grit paper, fold in half and rub along the offending areas until all traces have gone. Sand the rest of the surfaces smooth and round off where necessary.

When cutting very thin wood or veneers, I place another piece of material underneath the workpiece and cut through the two together, 3mm mdf is great for this purpose. This will eliminate most if not

all the rough underneath, and at the same time protects a delicate piece of work. I like to dry assemble each project before gluing. This gives me the opportunity to test all joints for accuracy of fit, and I can make adjustments where necessary. It also helps me plan the gluing sequence.

Because most of my work has fretted cut-outs, and can be difficult to get at after assembling, I like to give everything a coat of sealer before assembling. I use Wattle super Blond Polish (which is shellac based) and thin it down about 10% with clear Meths. I coat all surfaces, getting into every nook and cranny with a small bush. When dry I give all flat surfaces and outside edges a final sanding with 240 grit paper.

ASSEMBLING

You have sanded all the parts, and are satisfied with the finish of each piece. You have dry assembled, to make sure each piece fits properly. It is time to glue your project together. Have all requirements for assembling on hand and within easy reach. Glue, rag, champs, lights..... Do not over glue; any glue oozing out needs to be removed immediately, or it will show up through the finish you apply. A little glue well placed does the trick. Hold glued pieces together firmly, be it with clamps, rubber bands, or weights. Each job will require a different approach of holding together while the glue is drying.

Weather conditions will determine the setting time of glue. Damp and cold conditions will take longer setting time than fine and warm weather. The final finish you use is your choice. I use lacquer sprayed on with a spray can. Having sealed the work before assembling, one spray is usually sufficient to give me a satisfactory result.

MISCELLANEOUS

CLOGGING SCROLLSAW BLADE

If you find the piece of timber you are cutting keeps clogging the blade or is burning, try a strip of cellotape over the line along which you are cutting. Cutting through the cellotape seems to lubricate the blade and also to act as a cooling agent and prevents burning.

CUTTING PLASTIC OR SIMILAR

Cut at a very slow speed. If the blade speed is too fast the plastic will melt and adhere to the blade.

DENTS IN TIMBER

If you accidentally knock a dent into a piece of timber, wet the dent with water, cover with brown paper and apply a hot iron. Repeat until the dent has disappeared. Allow to cool and sand lightly.

NAILING THIN TIMBER

When nailing thin timber, 3mm to 6mm. I always drill pilot holes to avoid splitting. I use a brad selected for the job as a drill bit. Cut off the head of the brad and use in the drill. This saves a lot of heartache.

GLUING A NARROW FACE

To apply glue to a narrow face, hold the glue container as you would a pencil, and guide the nozzle of the glue container with your middle finger rubbing the edge of the timber as a guide. Squeeze the glue container gently while doing so. A neat controlled bead of glue can be spread down the centre line quite easily.

GLUING OVERLAYS

To apply glue to the underside of fretted overlays, I use a small roller covered with foam plastic to spread the glue in a even layer.

GLUING SMALL ITEMS

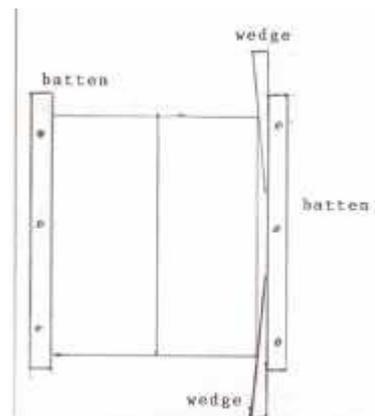
Small items can be held together with rubber bands. Spring clothes pegs make handy little clamps. Bricks make ideal weights to hold down items while the glue is drying.

GLUING SURFACE

I have a piece of 18mm particle board which fits my work bench. This I cover with a plastic sheet and use this surface for all my glue jobs. The plastic prevents the glued workpiece from sticking to the surface of my work bench.

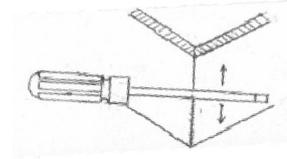
JOINING SMALL THIN BOARDS

Small thin boards are easily glued together using the method illustrated in the drawing. Place a piece of plastic sheeting under the work. Brad down two battens about 6mm further apart than the width of the pieces of timber to be joined, glue the joint, rub together. Then knock in the two wedges until tight. Place a weight (brick) over the boards to stop from bowing up. The wedges I cut from 18mm stock, 150mm long and 12mm wide.

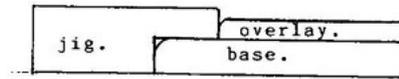


ROUNDING MITRED CORNERS

Using a round tool (screwdriver) rub up and down the outside edge of the mitre applying pressure against the edge while doing so. This will crush the sharp edge and result in a smooth rounded edge.



When I glue overlays onto the base timber, I make little jigs with a notch cut from one end to help me position the overlay correctly.

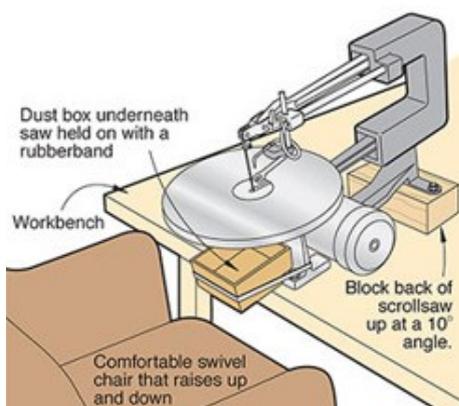


GLUING A MITRED BOX

Gluing a box with mitred corners can be a problem. My method makes this simple. I lay the pieces in sequence (end-side-end-side) along a straight edge, face side up, and tape the joining edges together with strips of tape and one end (see fig. 1). Then turn the taped pieces over and apply glue to the valleys and the untapped end (see fig. 2). Stand on edge and fold the ends together and wrap the loose ends of the remaining tape around the final corner. Check with a set square and add weight until dry.

REFERENCES AND TIPS

CUT FATIGUE WITH A SWIVEL CHAIR AND TILTED SCROLLSAW

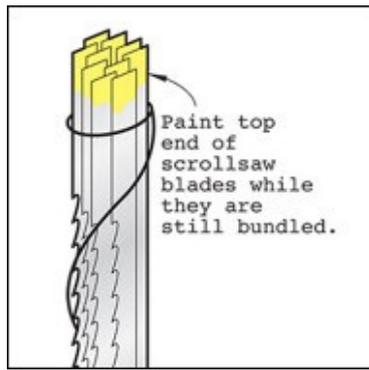


Many people love to scrollsaw for hours at a time, but hunching over a saw for that long can give you a stiff neck and shoulders. Set up your scrollsaw work station for comfort. First, get a swivel chair and raise it higher than you normally sit. Then, tip the back of your scrollsaw up with a block of wood so the saw sits at about a 10° angle. (Be sure to bolt the saw to the block and the block to your table or bench.) In this position, you won't need to lean over the saw to work, and your muscles and joints will thank you for it. You also can attach a dust-collection box below the table to make clean-up easier.

-- Allen Salfer, Atlantic Beach,

Fla.

CODE BLADES FOR EASY INSERTION



The older I get, the harder it is to see the teeth of my scroll saw blades to make sure they go into the saw right-side up. So when I buy a new bundle of blades, I figure out which end is up, and dip that end of the blades into a bottle of brightly colored model paint. The blade always goes into the scroll saw with the painted end up. For quick identification, I dip blades of different types or tooth-counts into different colours.

-- Henry Worrells, North Fort Myers, Fla.

SUPPLIERS

HOBBIES LTD.

Units 8-11 The Raveningham Centre, Beccles Road, Raveningham, Norwich, Norfolk, NR14 6NU. England. Phone: 01508 549330. Fax: 01508 549331 E-mail: enquiries@alwayshobbies.com
Web: www.alwayshobbies.com

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Knight's Hill Square London SE27 OHH. England. Phone 020 8761 4244

Fax: 020 8761 4796. E-mail: mail@hobby.uk.com Web: www.hobby.uk.com

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Fax: 608-314-3097 Web: www.wildwooddesigns.com

BOOKS

"Scroll Saw Basics" by Patrick Spielman, may be available from your library.

The Tauranga Woodcrafters Guild has a number of designs, which members can photocopy for your own use.