
Making a Windsor Stool

The Windsor style

The Windsor style is the name of a particular type of traditional English chair. Within this style there are a variety of forms which can be seen in the many publications which illustrate these chairs. One of these, which is particularly worth mentioning, is the excellent and inexpensive booklet by Ivan Sparkes in the Shire Books range.

The defining characteristic of a Windsor chair is that it does not have a continuous 'backstand'; that is to say, the back support and the back legs are separate pieces mortised into the upper and lower faces of the seat. Strictly speaking, therefore, there can be no such thing as a Windsor style stool. Despite this Sparkes describes the Windsor stool which he says was common in the nineteenth century. He says that: '... the normal Windsor stool had a round top, sometimes with the handgrip cut in the centre of the seat. The top was often not dished and the typical example had the leg turning of the 1870's with three rings above the vase turning'. This is the type of leg which is used in this project.



The Windsor stool leg

The number of legs

This type of stool can be made with either three or four legs. A stool with three legs will stand firmly on any surface no matter how rough it is, and it does not matter if the legs are not quite equal in length. There is also a small saving in time and material. To offset these points a three legged stool has two major disadvantages: it is relatively unstable and easy to tip over; and when viewed in such a way that two of the legs are aligned it appears to be unsymmetrical with the seat overhanging one side more than the other. The disadvantages of three legs tend to outweigh the benefits; as a consequence four legs are recommended.

Making matching legs

Turning a set of legs is an exercise in copy turning. This is not too difficult as long as the right procedure is adopted. This entails sizing the workpiece at key points and is best explained by working through an example step-by-step. The first leg is the easy one. When it is completed it will form the pattern for the rest. The secret of making good copies is to follow exactly the same procedure for every leg.

However good the turner no two legs will be a perfect match; but, in practice, all that is required is a reasonable match. When the stool is assembled the casual observer will find it quite difficult to see differences in the legs which are obvious to the person who made them.

The dimensions

Suitable sizes for a child's stool would be 9 ins in diameter for the seat, with legs 11 ins long (including the spigot at the top) and those for an adult 11 ins and 13 ins respectively. For full dimensions see diagram on page 8. If other heights are required

make the seat 80% of the length of the legs (including the spigot). Other dimensions for the legs can be made proportionate to the those in the diagram.

The material

I normally use are either ash or whatever softwood I have to hand. A problem encountered when using using softwood is that it is difficult to obtain boards which are wide enough to make the seat in one piece. I have never been comfortable with the idea of using a seat with a plain butt joint as I have no confidence that it would be strong enough. If facilities are available to make a biscuit joint that is likely to be satisfactory. Perhaps a dowelled joint could be tried. In any case ash is better, it looks nice, it turns well, it can be obtained in wide boards, and it is not necessarily much more expensive than softwoods.

The blanks for the legs

If this is the maker's first attempt at copy turning perhaps it will be a good idea to have some spare blanks for the legs. In fact, if the time and the materials are available, it may be advisable to plan to make enough legs for several stools. These can then be sorted out at the end of the exercise to get the sets which match the best. In any event if you end up with a leg which is a bad match with the others, but is otherwise satisfactory, do not discard it. Save it for another time when you can make another set to match it.

To make copying easier, cut all the blanks to exactly the same size. The length needs to be about 1/2 in. longer than the finished size. All the waste will be at the bottom of the leg. At the top end the marks left by the spur drive centre will either be hidden in the socket in the seat. So that that the tenon may be turned right up to the end the diameter of the spur drive must be less than that of the tenon.



Making the first leg.

Step 1

The work piece is roughed down to a cylinder of the required diameter and planed smooth with a chisel over the widest part of the leg (including the area where the three beads will be). After this the principal divisions are marked with a pencil. In the case of the leg shown these are the three beads near the top, the bead near the bottom and the waste at the bottom.

At this point it is necessary to make a template so that the rest of the legs can be marked accurately in the same way. The method I use is to take a piece of hardboard about 1 1/2 in. wide and the same length as the leg. The principal divisions are marked on this template to match those on the first leg.

Step 2

The top and the bottom of the leg are now sized to the required diameter. At the top of the leg (the tenon) the sizing must be done particularly carefully so that the spigot will be a good fit in the socket to be drilled in the top of the seat. There are various aids which can be employed here. The use of callipers is the most obvious way but I have found it difficult to achieve the desired degree of accuracy with these.

One effective method is the use of a sizing tool (see Glossary). This tool can be set to size by making some tests on scrap wood before the work on the legs is

started. Another method is to make a gauge out of sheet metal. In fact several of these can be made to match saw tooth bits of various sizes.

At the bottom of the leg, only the 1/2 in. which will be parted off as waste should be sized. The reason for this will become apparent later. It is convenient to make this the same size as the tenon at the top.



The appearance of the workpiece after step 2

Step 3

The part of the leg below the bottom bead is sized with the aid of callipers.



The appearance of the workpiece after step 3

Step 4

The three beads near the top of the leg can be formed in the conventional manner. If a beading tool of the right size happens to be available this can be tried out; but it must be used with great care, because it is easy to chip out pieces of the bead, particularly with soft woods.

Step 5

Having formed the beads the section of the leg above them is shaped. The curve has to be carefully blended into the parallel section which will form the tenon. The length of the parallel section should be made a little longer than the depth of the socket in the seat. This will enable the length of the leg to be adjusted, if necessary, on assembly.

When this has been done it is not a bad idea to remove the work piece from the lathe to check the fit of the tenon in a hole drilled in a piece of scrap wood.

If the tenon is too small there is not much that can be done but scrap the work and make another start. However, should the tenon be too large the piece can be put back on the lathe and the necessary adjustments made.



The appearance of the workpiece after step 5

Step 6

Having made the tenon a good fit work can begin on shaping the middle section between the beads. The diameter of the bottom part of this section is steadily reduced, whilst forming a nice curve, until it is the same as that of the lower part of

the leg which was sized previously. The profile of the top part of this section is curved down to the base of the adjacent bead.



The appearance of the workpiece after step 6

Step 7

At this juncture the lower bead is formed and the curve on the middle section is completed.



The appearance of the workpiece after step 7

Step 8

All that remains now is to shape the bottom section. The curve of the foot at the bottom is run down to the waste piece which is already sized.



The appearance of the workpiece after step 8

Step 9

Now the piece can be sanded and the finish applied.

Step 10

Finally, the 1/2 in. of waste is parted off leaving the bottom of the leg slightly domed. The sharp break line which is left should be radiuses so that it will not cut into the fibres of a carpet when the stool is in use.



The finished leg

Matching the legs

As pointed out earlier, if the procedure described above is repeated exactly, no great problems should be encountered in making matching legs. The key is the sizing operations. There should be no difficulty in repeating the sizing operations and forming the upper three beads. Having done this the shaping of the curves on

the upper, middle and lower sections can be performed carefully with repeated comparisons with the first leg. It will be found that with a little practice this becomes much easier than might have been feared and can be done with much less reference to the first leg.

The seat

Turning the seat is straight forward. The method described here results in a seat which reveals no signs of how it has been held on the lathe. The procedure is as follows.

A piece of scrap wood is glued to the side of the blank which will be the top of the seat. The scrap wood needs to be large enough for the work piece to be attached to a face plate or to a large screw chuck. This assembly is then mounted on the lathe and the face (which will be the bottom of the seat) is turned flat, the corner radiused, sanding done, and the finish applied.

A neat trick

The next step is to take a plywood (or MDF) disc a little smaller in diameter than the work piece and about 1/2 in. thick, and to screw this to the work piece whilst the latter is still on the lathe.

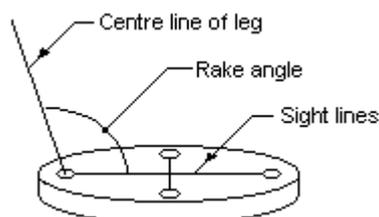
The trick is to insert the screws into the area in the top where the holes for the legs will eventually be drilled. To get the screw holes in the correct positions in both the plywood and the seat a simple paper template can be made. Cut a piece of paper into a circle of the appropriate size, mark the position of the holes, and prick through with a bradawl onto both the seat and the plywood disk.

When the plywood disk has been attached a recess for expanding jaws can be turned or the position for a faceplate marked. In the latter case a very shallow recess could be formed to accept the faceplate as a snug fit. This will ensure that concentricity is maintained for the following operation.

The work piece is removed from the lathe, reversed, and re-attached by whatever chucking method has been selected. The top can now be turned. After it is sanded and the finish applied it is removed from the lathe and the plywood detached.

Drilling the seat

The final step is to drill the holes to form the sockets for the legs. First, we need to consider the rake angle of the legs. I find that an angle of 110° is about right; this is measured between two lines, one that runs through the centre of the leg and another which runs from the centre of the hole forming the socket to the centre of the seat. The latter line can actually be drawn on the underside of the seat to be used as a 'sight line' when drilling the sockets (see diagram).



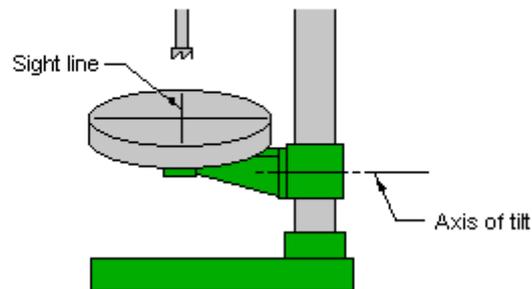
The rake angle

The holes can be drilled with an electric hand drill, or a brace and bit, but this is not easy. If one of these methods had to be used some kind of jig would have to be made to maintain the drill at the correct angle and in alignment with the site line. It is worth noting

that the important thing is to drill all the holes at the same angle - what that angle is does not matter quite so much. It is recommended that the holes are bored either on a drill press or on the lathe using a machine (or sawtooth) bit. This type of bit is desirable because the wood will be entered at an angle. The holes are drilled as deep as possible without breaking through the top.

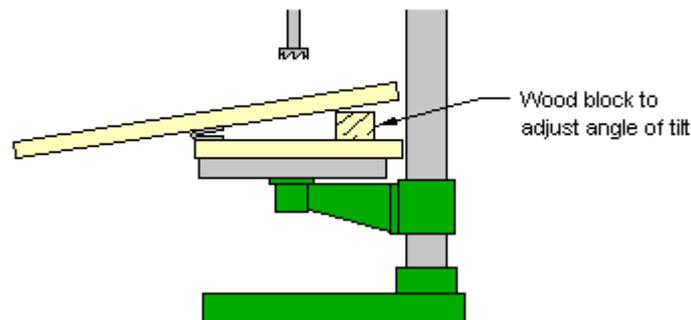
Using the drill press

If a drill press is used it will be necessary to incline the seat at the required angle. If the table of the drill press is adjustable, and the seat is small enough to fit onto it, the table can simply be set to the required angle. When drilling the site line is aligned by eye so that it is pointing straight up the slope of the table (another way of putting this is that the sight line should be perpendicular to the axis of tilt of the drill table, as shown in the diagram.)



Aligning the sight line when using a tilting table on the drill press

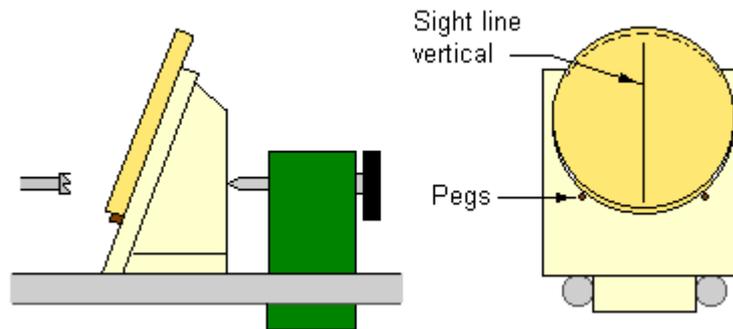
If the seat is too large to fit on the drill table it will be necessary to make a jig from two boards hinged together. The lower of these boards is bolted to the drill table with the hinge to the front. Another sight line is drawn on the top board. This line is drawn at a right angle to the hinge line. The point of the drill should be immediately above the sight line. The angle of the upper board is set by supporting it with a block of wood of an appropriate size (see diagram below). When a hole is drilled the sight line on the seat is lined up with the sight line on the board. The angle of the top board can be set with the aid of a proprietary device or with a custom made widget. I use the latter.



A jig for boring holes on the drill press

Drilling on the lathe

When the holes are to be drilled on the lathe a jig will be required to hold the seat in the required position. This jig will have to slide along the bed of the lathe and be pushed on to the drill by the tailstock (see diagram). When drilling the sight lines should be vertical (if the jig is properly centred and the hole positions accurately marked this will happen automatically).



A jig for boring holes on the lathe

Assembly

A dry run of the assembly should be made before the legs are glued in. The assembly is placed on a surface which is known to be flat, such as a piece of veneered chipboard. If it is found that the lengths of the legs need adjusting this should be done by taking the necessary amount off of the top of the spigot of the relevant legs.

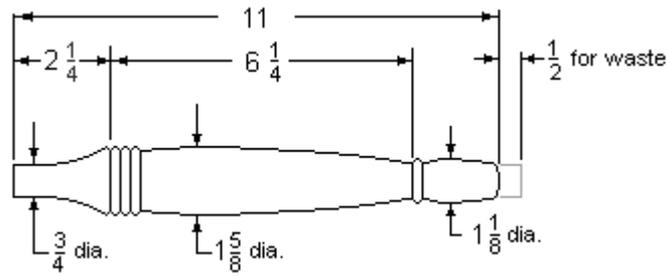
Some sources of further information

Ivan Sparkes, *The English Country Chair*, Spur Books

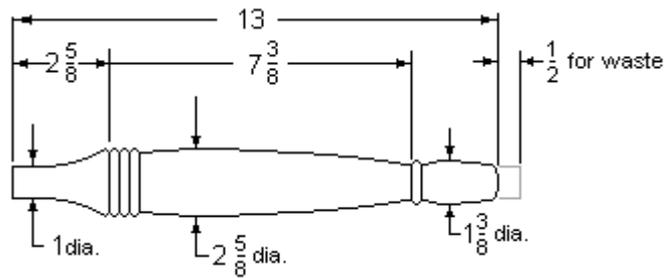
Ivan Sparkes, *English Windsor Chairs*, Shire Books

Vic Taylor, *Making Chairs*, Argus Books

Jack Hill, *Country Chair Making*, David and Charles

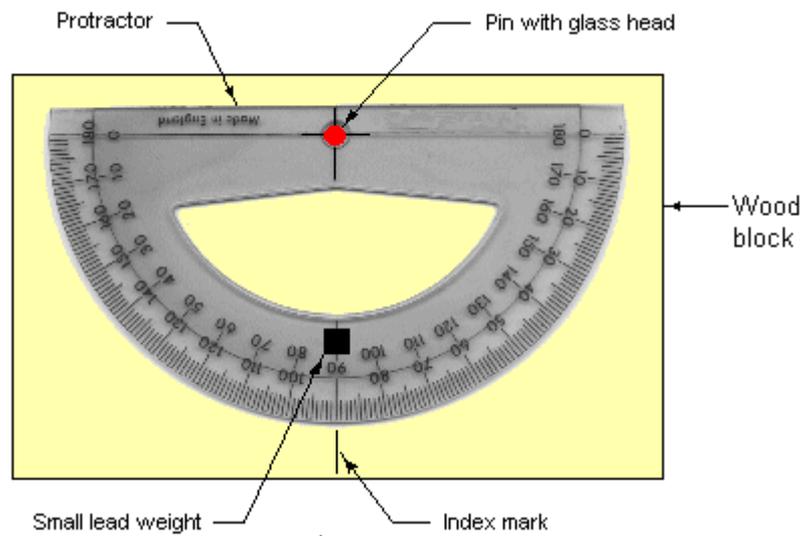


Leg for child's stool - dimensions in inches



Leg for adult's stool - dimensions in inches

Conversion factor: 1 inch = 25.4 mm.



Widgeon for setting rake angle