

# REPLICATION OF SPINDLES

The goal in replication is to try and make multiple spindles alike. If they are to be placed far apart like table legs, a small error may not be noticed. If like balusters they are close together like 5 or 6" apart an error in turning is quite noticeable. If you have a customer that expects you to make them for \$3.95 each, send him to Home Depot.

## **Preparation**

Make sure that your lathe can handle the length that is needed. If you can get a copy of the piece that has to be replicated, that is the ideal situation. If not you may have to measure all the linear and diametrical dimensions accurately and make a sketch at the site. Insure that you can determine the diameter of a hidden tenon.

From the sketch I like to make a full size drawing showing all the diameters, beads and coves and linear dimensions. I have had to reproduce more of the same at a later date from this drawing. A dial or digital caliper is most useful to measure all diameters to enter on your sketch.

If you have to reproduce many spindles, it is advisable to make a story stick from the drawing. The stick is marked at all the linear dimensions plus at about every 6 inches on long tapers. Then the stick is notched on the band saw at the pencil marks at say 1/8" depth.

## **Tools needed**

The hand tools needed are: a dial caliper, saw, roughing gouge, spindle gouge, parting tool, file, sandpaper, tenon template, multiple outside calipers, an awl, a mallet and a steady rest.

## **Wood preparation**

When preparing the wood, or square stock, insure that it's dry and at about 8% moisture content or less with little or no knots. Cut the length with an extra inch for waste. Find the centers and indent them with an awl and a mallet. Remove the spur drive from the lathe and take it to the square stock and tap it in with a mallet to insure the spurs are deep enough in the end grain to drive the spindle. Install the stock in the lathe.

## **The tenon**

If a tenon is needed, it is advisable to drill a hole in a small piece of 3/4" thick wood of the same material with the drillbit that will be used to drill the mortise. This can be used as a template for a good fit (sometimes called a go - no - go gauge) when turning the tenon. Otherwise, measure with a dial caliper for a line in line fit within .005" if you can. This can be tedious because different woods machine differently. In softwoods, leave the tenon slightly oversize and sand to the correct dimension.

## **Orientation**

It is advisable to place the large diameter of the spindle at the drive (headstock) end of the lathe. A long straight tool rest is used for spindle turning. Place the tool rest at about centerline height and 1/4" away from the points of the square spindle.

## **Roughing out the spindle**

Turn the spindle by hand to make sure all is clear from the tool rest and that the spindle lock is disengaged. A good speed for roughing using the roughing gouge is around 900 rpm. Concentrate on keeping the handle down and rubbing the bevel then raising the handle to start the cut. Tool travel should not be too fast and the tip pointed at about 10 degrees in the direction of travel. Turn the spindle to its maximum diameter checking it with an outside caliper. If you notice vibration or spirals in the cut, you may have to rough sand an area in the middle and utilize a steady rest.

## **Final turning**

Using your story stick, mark all the linear dimensions on the spindle. Set as many outside calipers as needed to the major dimensions on the drawing and mark their settings. Hang the drawing in front of you at the lathe. Set the diameters on the spindle with the parting tool and the calipers. Once this is done, make the beads and cove shapes with the spindle and roughing gouge. Proceed from the headstock towards the tailstock. Remember to cut downhill from the large diameters to the small ones. Again rub the bevel before engaging the cutting edge. You may have to move your steady rest several times to minimize vibration and get a clean cut.

## **Sanding**

Some edges should stay sharp. Sometimes a fine file is used on small flat surfaces. A dowel wrapped with sandpaper is used on small coves. Start with 80 grit and work to 400 at 800 to 1000 rpm.

## **Experience**

Once the first spindle is turned from your drawing, (which could have taken you an hour), place it in Vee Blocks just below your drawing. After making a dozen or so spindles, your time will drop by about 60% and boredom will increase. Remember if this is a contract job, errors will be at your expense.

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