Miniature Stool

Design Considerations

The seat of the stool is the most visible part of the stool therefore; using a figured wood will enhance the overall appeal of the finished stool. The legs look best if turned from a wood that contrasts with the seat. A maple seat looks good with padauk, walnut, wenge or other dark wood for the legs. When working on the design for the legs keep in mind that simple flowing lines are easier to turn and are visually less distracting from the overall look of the piece than a design loaded with beads and coves. The size of the seat and the length of the legs can be changed to fit a particular doll or teddy bear. Once you have sketched a design for the legs it is a good idea to turn a sample leg out of scrap wood. Sometimes seeing a design in 3-D will inspire changes that will enhance the overall design of the finished piece. Have fun with the miniature stool and when you have settled upon an outstanding ministool consider turning a full size stool.

Materials

Maple seat planed or sanded flat on the bottom side 1/4" x 6 ½ " x 6 1/2"
Walnut or Padauk Legs 1" x 1" x 6 1/2"
Walnut or Padauk button 1 1/4" x 1 1/4" x 1 1/4"
1/4 " x 4 1/2" spacer disk (for use on screw chuck for a shallower hole)

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Tools

5/8 fingernail ground bowl gouge
5/8 traditional ground bowl gouge
3/8 detail spindle gouge
3/8 beading & parting tool
1/16 x 2 Chris Stott parting tool
5/8 spur drill bit
3/8 spur drill bit
3/8 screw center
Oneway Talon chuck
!/2" Steb drive center
Live Center or Cone center

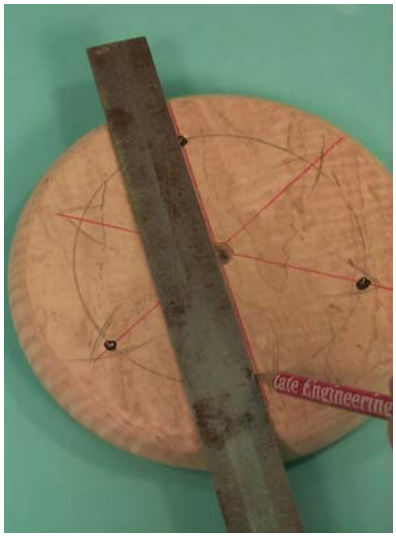
Turning the Stool:

1. I always turn the stool seat first. That way I can drill the holes for the legs and turn the tenons on the legs to match the drilled holes in the seat. Some drill presses and some drill bits tend to wander and the hole for the legs is sometimes a bit larger than the diameter of the drill bit.
2. Before mounting the square seat blank mark the center of the bottom and using a compass or template draw out a circle. I then take it to the band saw and cut it round.
3. The next step in preparing the blank is to drill a 3/8" hole in the center of the bottom, approximately ½" deep for mounting the blank in a screw chuck that has a spacer mounted on it to reduce the required depth of the mounting hole.

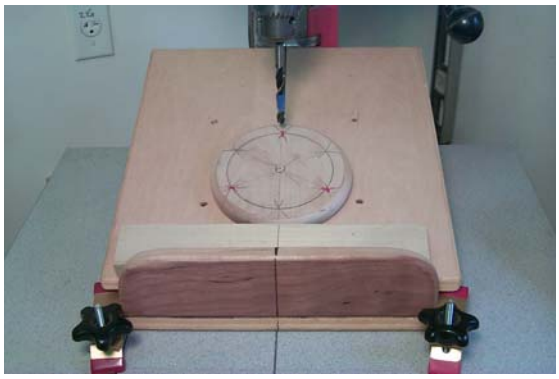
4. For the spacer I use scrap ¼" Masonite or ¼" plywood. Screw the blank onto the screw chuck and turn it true.
5. Begin to shape the top of the seat by turning the face of the blank with a slight indentation. The seat will resemble a red blood cell or life saver shape when finished.
6. Round over the outside edges to an appealing curve and finish sanding the sides and seat.
7. I do not turn or sand the back at this time, as I will need to draw out and divide a circle for locating the holes for the legs. I have found it easier to use orbital sanders on the bottom after the legs holes have been drilled.
8. To mark the seat bottom for the leg holes, I first determine how far from the edge of the seat that I want the legs to be. On the miniature stools the center of the 5/8" hole for the legs is approximately 1" in from the outside edge of the seat.

9. I then draw a circle with the center point of the compass in the 3/8” hole that was used to mount the blank to the center point of the leg holes. I insert a 3/8” piece of dowel into the center hole to make it easier to set the compass point.

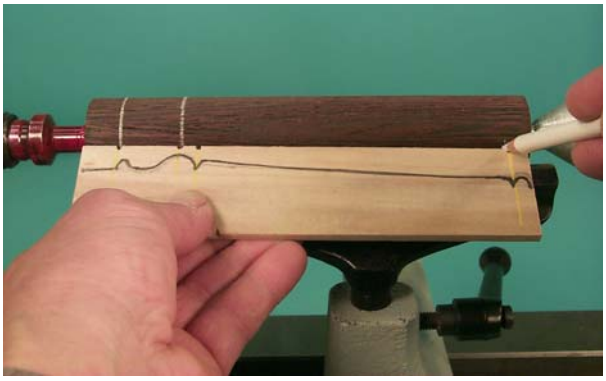
10. The next step is to decide where you want to locate the first leg. I usually locate the first leg in the middle of the flat grain pattern of the seat. I mark this spot and then using the compass with the same radius as the circle. I go around the circle and mark where the compass touches the circle. Once I have gone all the way around I then reverse direction and go back around the circle marking the arc where it meets the other arc. Do not worry if the two arcs do not line up exactly, for you can approximate the center of the two arcs.
11. Use a scratch awl to put a dimple for the drill bit to center on, at every other convergence of the two arcs. Thus producing, three equally spaced marks for the legs.
12. Use a straight edge to draw sight lines on the seat bottom connecting the center point of the leg hole to the center of the two arcs directly opposite the leg hole. (These lines are used as sight lines to help line up the drilling of the holes).



13. Next I set up my drill press to drill the holes at approximately 15 degrees. I use a portable angled table top jig that I clamp to the drill press that has the proper angle already set. For larger stools I sometimes adjust the angle to 10 degrees, to keep the legs from splaying out to far from the seat possibly creating a tripping hazard. If you intend to drill a number of items at various angles it might be worth while to buy or build a hinged table top for your drill press. To avoid drilling trough the top, I use a scrap piece of ¼" material to set the drill press to automatically stop before drilling through the top.



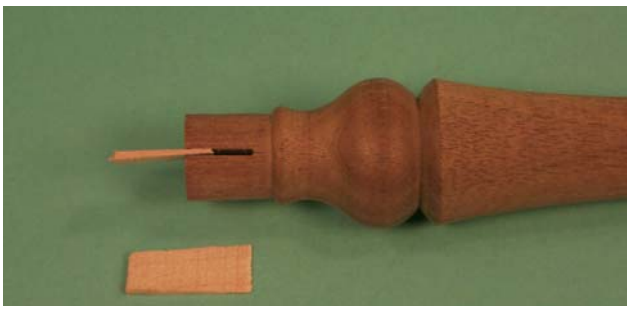
14. Now that the holes are drilled in the seat, the fun begins as I turn the legs. Three legged stools will level themselves where in a four legged stool all legs must be exactly the same length or they will rock. I work and design better in 3D, so I begin by turning a prototype for my legs. Most people will spend time drawing out and planning the design of their legs and then make a story stick. I prefer to make a story stick from an already turned leg. If I am in a real hurry I just skip the story stick and use the prototype to mark my other legs.



15. Rough turn the blank to a cylinder and then mark the high and low points. Wherever I have a bead I make the center mark a tad thicker just in case, I take too large a final cut. This helps insure that my center mark is still visible, in order to maintain my symmetry.
16. Then starting at the tail stock end which is the bottom of the leg, I shape the leg.
17. As I near the top of the leg I stop and turn the tenon to a bit larger than its' final size. Once the spindle is turned I then dry fit the tenon in the leg hole and gradually turn it to fit snuggly. I am after a firm fit. Too tight and it may not go in all the way when the glue begins to swell the wood. Too loose and the leg will fall out or require tedious wedging, or worse have to be cast aside as reject fodder. Once I am satisfied with the fit I finish sand it. If I am doing a production run of stools, I rough turn all of the legs and then fit the tenons and sand them all at the same time. The length of the tenon should be equal to or less than the depth of the hole in the seat.
18. Before applying finish to the seat I plug the holes with wads of paper towels to prevent the finish from interfering with the glue joint.
19. On the tenons I place masking tape around them to prevent the finish from interfering with the glue joint.

20. The last step is to glue the parts together and clean up any excess glue. It is best to let the glue dry and then peel it off.

21. Occasionally I need to wedge a loose tenon. To do this I use a V block to hold the leg while I use the band saw to cut a groove perpendicular to the growth rings of the leg. ¾ of the way down the unexposed part of the tenon. I then cut a wedge shorter than this groove to insure that it will not interfere with the seating of the leg in the mortise. This wedge is similar to the wedges used to hold axes to their handles.



22. If for some reason there are gaps between the hole and the leg I sometimes glue slivers of the same wood as the top in between the leg and the wall of the mortise. I later cut them flush with the seat bottom and very few people notice the gap.

23. A little buffing or elbow grease and you have a stool fit for a favorite doll or plant. The same procedures are used for turning a full scale stool. Stools over 17" high need to have cross bracing to minimize the tendency for the legs to splay apart. When using cross bracing the idea is to put the parts in tension and compression thereby locking the stool together. The same principles used in the making of Windsor chairs apply to the making of three legged stools.

24. The last step before testing your stool by sitting in it is to turn a small 1" to 2" plus or minus in diameter button with a 3/8" tenon to stick in the hole left by the screw chuck. The button should be turned from the same wood as the legs

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