Improved Sandmaster

by Guy Marsden

I have never embraced the idea of power sanding on the lathe. Somehow it feels inappropriate to apply a power tool to the turning wood. That is why I really liked the idea of Robert Sorby's Sandmaster tool. It's a hand tool that requires skill and practice to use well, so consequently it feels more like an "honest" hand tool to me. I have acquired a full selection of 2" hook-and-loop-backed sanding pads from 60 to 400 grit.

Unfortunately, after using my Sorby sander for some time, I started to get a lot of vibration from the bearing even after adding the suggested drop of oil. I also learned the hard way that anything more than just a tiny drop of oil yields flying drops of dark colored goo that are impossible to remove from finished work.

Since I am an inventor, I immediately took the tool apart to see if I could somehow improve it. I found that the steel shaft was badly worn and that it was loose in its bearing. The solution seemed obvious to me: Install ball bearings! The replacement head that I designed supports two sealed ball bearings which are available in hardware stores. It is important to use sealed bearings to prevent wood dust from entering the ball race and ruining the bearing. If you have some old bearings lying around, check to be sure you don't use the ones where the balls are visible. You'll also need a couple of shaft collets and a short scrap of 1/4" rod or an old drill bit. Overall the parts for this project are quite inexpensive.

SUPPLIES

Wood: *hardwood* – one piece about 3/4" x 1" x 2" for the bearing block, one piece 3/4" x 2" x 2" for the head
Tools: table saw or bandsaw, drill with assorted bits, compass, mallet, fingernail gouge, vise or wood clamp, 5/8" and 5/16" Forstner bits, long-bladed box cutter, assorted sanding disks
Two 1/4" ID sealed ball bearings
Two 1/4" shaft collets
2" length of 1/4" steel rod
5/16 thumbscrew and washer
Small piece of 1/2"-thick black foam rubber (or a few layers of 1/8" or 1/4" glued together)
Cyanoacrylate glue (CA or superglue)
GOOP adhesive
Assorted grits of abrasive paper
Hook-and-loop material
Finish of choice

BUILDING THE HEAD

I began preparing a scrap of hardwood for turning by marking a generous 2" circle on a 3/4" piece of hardwood (see **Fig. 1**). (Note that sanding disks are available in 1", 2", and 3" sizes. You may want to make more than one head in various sizes.)

Using the compass center as a reference, I drilled a 1/4" hole in the center of the circle about 1/2" or so deep (see **Fig. 2**). Start with a 15/64" pilot hole, then change to the 1/4" drill without moving the wood. This will ensure a very snug fit for the 1/4" steel shaft. Cut out the circle on a bandsaw (see **Fig. 3**).

Cut a 2" length of 1/4" steel shaft (stock steel rod or an old drill bit will do). Clean up and slightly bevel both ends on the grinder; this will make one end easier to insert into

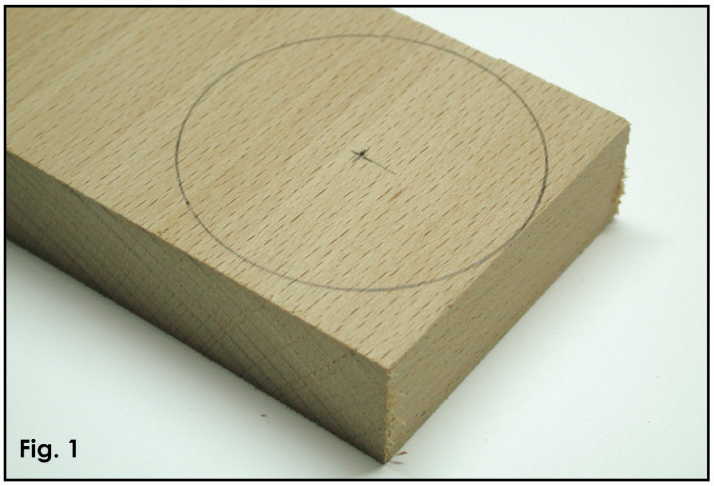
Fig. 1

Draw a generous 2"-diameter circle on a piece of hardwood.


Fig. 2

Drill a 1/4"-diameter hole partway through the block.

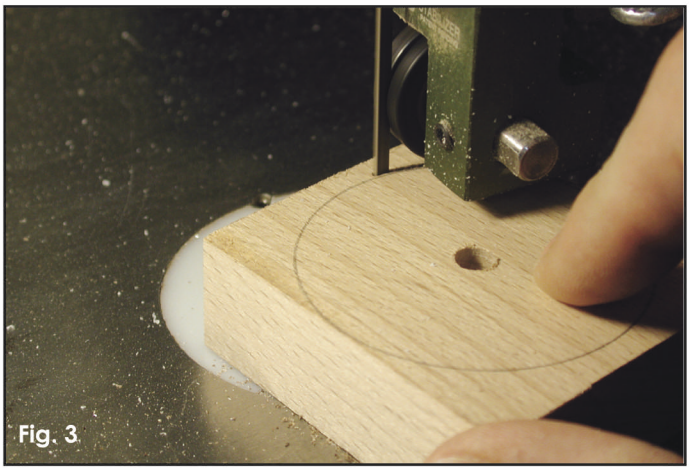
Fig. 3

Cut out the circle on a bandsaw.


Fig. 4

Glue the metal shaft in the hole with cyanoacrylate glue.

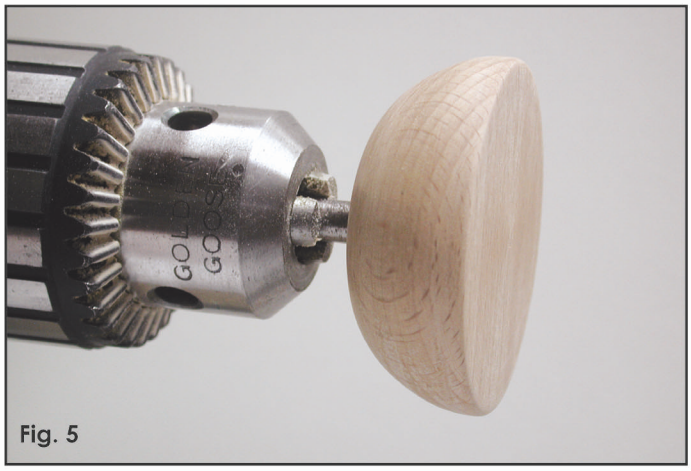
Fig. 5

Your hardwood disc should resemble this after turning and sanding.

Fig. 6

I used GOOP to glue on the foam.

the head. The other end will be exposed, so it should be chamfered as neatly as possible. You don't want to catch it on some part of your body or clothing while it is spinning.

Squirt some cyanoacrylate glue (CA or superglue) in the hole (see **Fig. 4**), then immediately tap the shaft into the wood block with a mallet. It should be a very tight fit.

Lock the assembly into a drill chuck in the headstock and turn the block down to 2" diameter, round the back over, and sand it (see **Fig. 5**). Be careful and take small cuts lest the wood spins loose on the steel rod. I used a fingernail gouge and shallow shearing cuts. Be sure to true the face as well.

At this point, you can apply some finish, just don't put any on the face as it might interfere with the glue. I used a long-bladed box cutter to cut the black foam off the Sorby head. However, if you are working from scratch, you will need to locate some 1/2"-thick black foam rubber and cut a 2" circle from the pad. Alternatively, you could glue up layers of thinner foam to achieve 1/2" thickness. This foam gets quite warm during sanding, so consider the material carefully. You will also need to glue on a piece of the mating hook-and-loop-type material to the face. I used GOOP adhesive (see **Fig. 6**) which is available in most fabric and craft stores.

(**Author's Note:** Klingspor sells the Sorby Sandmaster tool and also sells a complete set of disk pads for power sanding in sizes from 1" to 3". These will work fine if you would rather just buy this assembly complete with the shaft, foam, and hook-and-loop material on it. They also

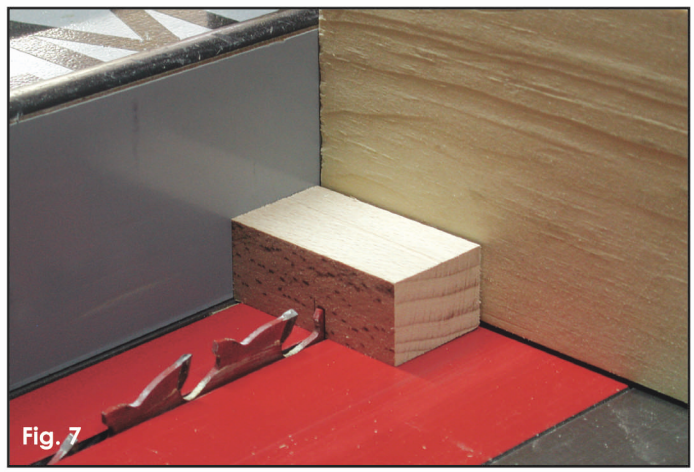
Fig. 7

Cut out a section of the bearing support block on the table saw.

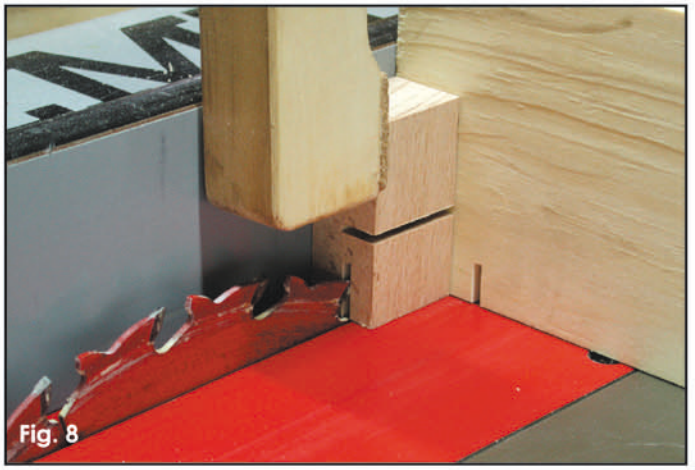
Fig. 8

Be sure the waste is to the left of the blade.

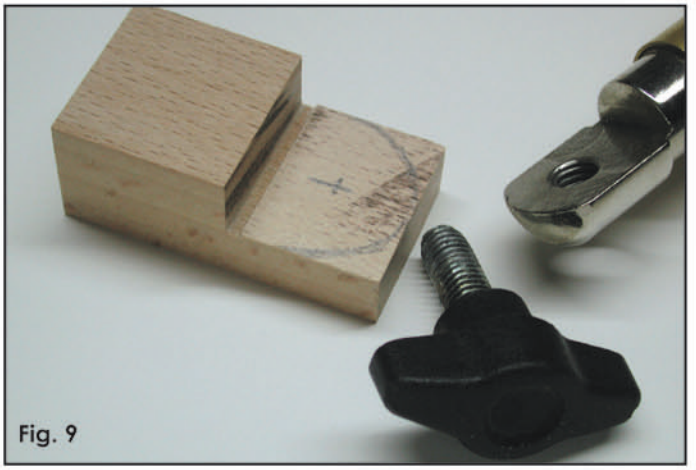
Fig. 9

Lay out the front shape with a compass.

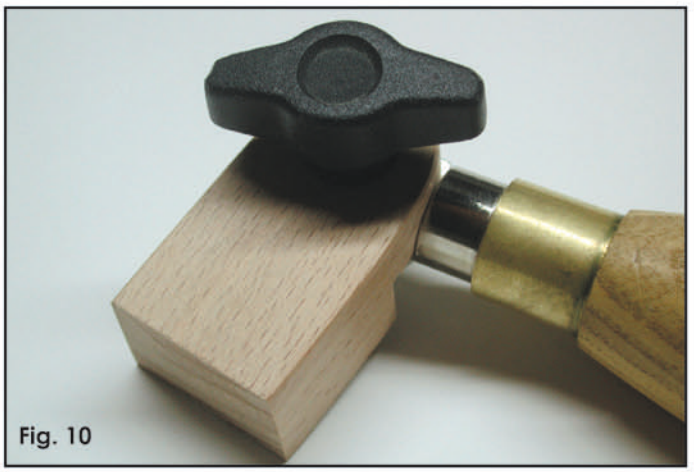
Fig. 10

Be sure that the block can swivel at least 180°.

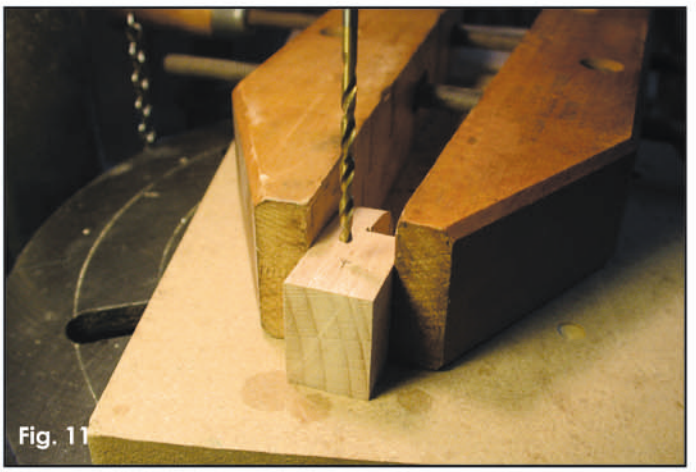
Fig. 11

Drill the first hole with a 1/8" drill bit.

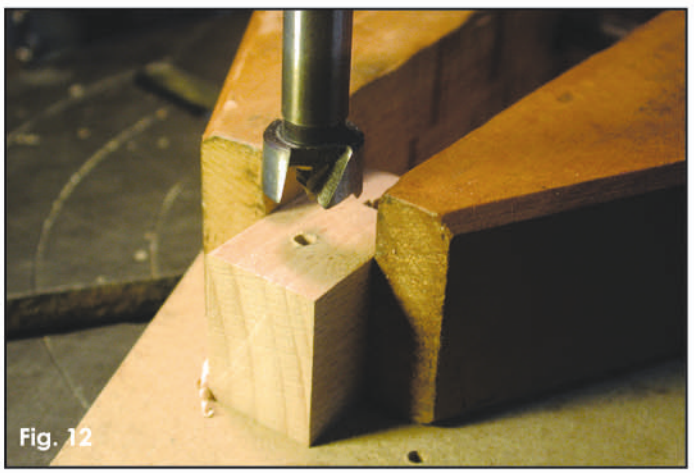
Fig. 12

I used a 5/8" Forstner bit to drill the holes for the two bearings.

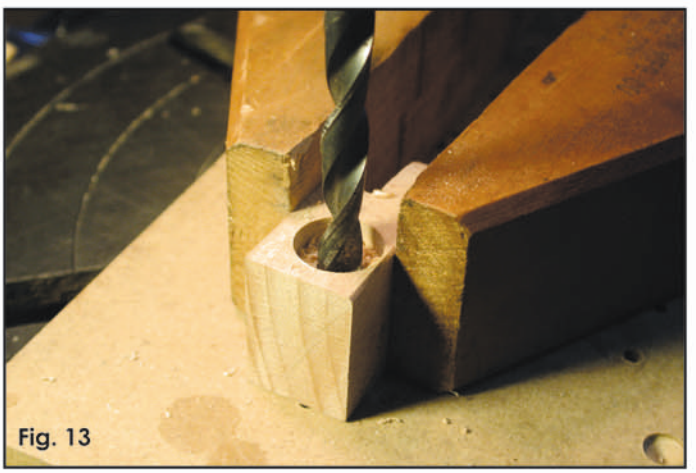
Fig. 13

Finish drilling with a 5/16" bit.

sell the hook-and-loop-backed sanding disks in a variety of sizes and grits.)

BEARING SUPPORT BLOCK

To make the bearing support block, begin with a piece of hardwood about 3/4" x 1" x 2" and cut out a section about 3/8" x 1" using either a table saw or bandsaw (see **Fig. 7**). If you elect to use a table saw, be sure to secure the blank to a waste block attached to your miter gauge. Also be careful you don't trap the waste piece next to the fence. It should be on the left side of the blade (away from the fence) so the waste can leave the cut safely (see **Fig. 8**). A

zero-clearance blade insert is essential for small cuts like this. If you cut this section out with a bandsaw, you will need to sand or file the large flat surface of the cutout so it is relatively smooth and flat.

Mark a centered hole for the tightening screw just under 1/2" from the end of the cutout section. Use a compass to draw a semicircle (see **Fig. 9**) and trim off the rounded end on a bandsaw. Sand the edges smooth. Drill a snug clearance hole for the thumbscrew. I used 5/16" for mine but yours might be different, so check.

Mount the block to the handle (see **Fig. 10**) and check that it can swivel 180°. Sand the contour down as needed. (If you are building from scratch, I am assuming that you have already turned your own tool handle and cut out the end similar to the Sorby tool.)

The holes for the bearings must be drilled in three steps, and I recommend securing the block in a vise or wood clamp throughout the drilling process. First, drill a 1/8" pilot hole all the way through, being sure that the hole is true to the block (see **Fig. 11**). Then drill holes for the bearings from both sides. Typically a 1/4" ID (inside diameter) bearing will be 5/8" OD (outside diameter), so you can use a 5/8" Forstner bit (see **Fig. 12**). The bearings should be flush with the surface of the block, so these holes should be just as deep as the thickness of the bearing. Finally drill the inside hole all the way through with a 5/16" bit (see **Fig. 13**); this leaves plenty of room for the shaft.


Fig. 14

Round over all the sharp corners to make the head more comfortable.

At this point, I recommend rounding over all the hard corners with a sander to make it comfortable to hold (see **Fig. 14**).

FINAL ASSEMBLY

All the parts are shown in **Fig. 15**. Insert both the bearings into the block. There is no need to glue them because they will be captured by the shaft collets on both ends. Slide a 1/4" collet all the way up to the head and secure it. Then slide the shaft through both bearings and secure the second collet on the back end of the shaft. The collets now capture the bearing block between them. Finally attach the head and the handle with the thumbscrew and a washer. The final assembly is shown in **Fig. 16**.

PRACTICE MAKES PERFECT

This tool runs very smooth with the two new bearings installed. It will take some practice to find the best ways to use it if you've never used one before. In general, you will be using one edge of the sandpaper while holding the tool at an angle to the turning; this encourages the head to spin freely. Adjusting the angle of the head and the pressure you use will vary the speed of the spinning abrasive. Keeping the sander spinning while working toward the center (like the center of a platter) requires a firm grip and some experimentation. There is just as much skill involved in using this tool as there is in using a gouge and it takes practice to learn all its capabilities. Dust collection is highly recommended!

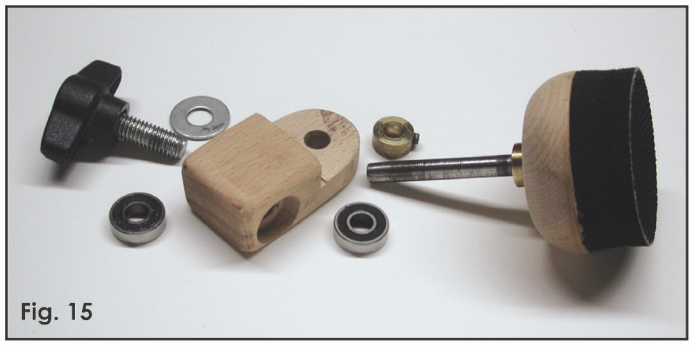
Fig. 15

These are all the parts needed to reassemble the head.

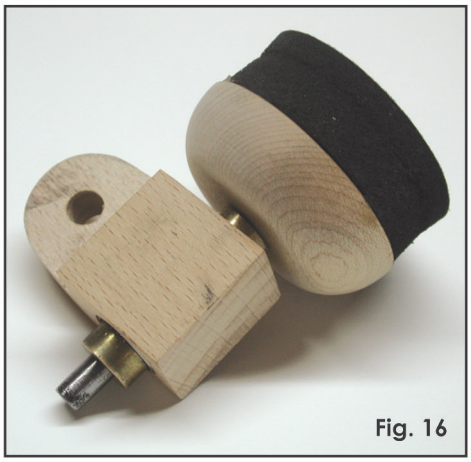
Fig. 16

Final assembly.

Guy Marsden

Guy Marsden is an inventor, artist, engineer, and photographer (to name a few of his talents) and pursues his various endeavors in his solar-heated workshop in rural Maine. A woodworker since the mid-1970s, he resisted purchasing a lathe for over 20 years knowing full well how addictive turning would become. His lathe is a highly modified vintage Rockwell with a shortened bed and a variable speed 1HP motor.

His first experiments on the lathe resulted in a body of small sculptural pieces with carved legs. More recently, however, he has been collaborating with his wife Rebekah Younger to create a series of art vessels. Guy turns simple bowl shapes from plain light hardwoods that Rebekah decorates with dye, paint, and colored pencils. To see this work and much more visit his extensive website at www.arttec.net. If you have any questions or comments about this article, you may e-mail Guy at guy@arttec.net.