

DIY Microtome Knife Sharpener

Michael Reese Much FRMS EMS

Bethlehem, Pennsylvania, USA

One day about 12 years ago I was thinking about getting a microtome. That very morning I checked out the classified advertisements in the morning newspaper and under "For Sale – Miscellaneous" I saw

MICROTOME \$65

and a phone number. (What are the odds of ever finding a microtome for sale?) I called the seller, got directions and drove over. He was a retired doctor who had run his practice out of his home and was selling his equipment. The microtome was an American Optical 820 rotary model that came with two knives. For the \$65 he threw in a few boxes of slides, cover slips and eight combining jars for staining. He asked if I was interested in a set of scales, but I already had a Harvard Trip Balance I used to formulate my darkroom chemicals, so I took a pass on the scales. I went back to him to buy more slides and cover slips and some non-balsam mountant. Again, he asked if I was interested in a set of scales, and again I took a pass.

On my third visit, he again asked about the scales and I figured why not take a look. It was a beautiful Ohaus double-beam Dial-O-Gram with a fine measure dial. With a lump in my throat, I asked "How much?" "Twenty dollars."

Needless to say, my Harvard Trip Balance is in storage now.

It took awhile to get all of the paraffin off the microtome and wire brush the rust off with a motor tool, but I got the microtome cleaned up. However, the two knives were in very bad shape: some corrosion and nicks along the edges.

I took my lead on hand-sharpening from an article by John Moran in the October 2002 edition of Micscape and read a number of other articles on hand-sharpening. I had accumulated two grades of diamond paste and a 4000 grit waterstone, but hand-sharpening on glass is both tedious and physically tiring.

My technique was to start with 600 and then 1000 grit whetstones and oil from an old LS Lansky sharpening kit I bought in a chest of tools at a yard sale. Then I would buff the edge with crocus cloth in a pad sander and then sharpen on the waterstone, starting with water and then using diamond paste on the stone. Microscopic inspection showed the edges of the knives were getting better.

I felt there must be an easier way short of purchasing a microtome knife sharpener on eBay when I remembered I had a pad sander that couldn't hold the newer heavy-duty types of sandpaper available. The new papers use aluminum oxide and have a stronger backing than the older papers, so when I clamped a sheet of paper in the sander and started it up the paper would come out of one of the end jaws.

Since the sander used an orbital motion, why not use it as the basis of a knife sharpener using the waterstone?



The first step was to glue fabric to the pad of the sander to act as a wick to catch and water than might run off the stone. Here in the States we have a series of adhesives called "GOOP" which will stick to virtually anything.



Once the glue on the fabric set, I glued the waterstone to the cloth using GOOP.



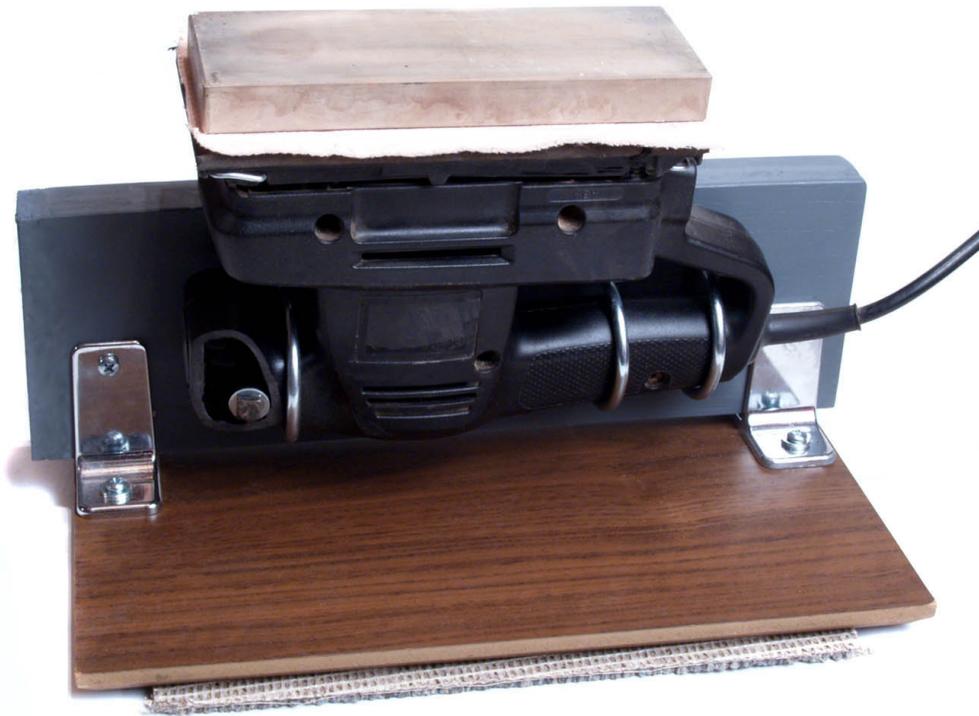
The next step was to make a base to mount the contraption on. My wife had given me a plaque she no longer wanted and I glued a piece of carpet to the bottom to act as a shock absorber and to give the base some tooth on my workbench, once again using the miracle GOOP.



The chrome fixtures were from a box of hardware used to assemble restroom stalls that I purchased at a yard sale for two dollars. The next step was an upright plate drilled to accept U-bolts to mount the sander to the base plate.



The last step was to mount the sander to the upright plate. The position on the upright plate is high enough to provide clearance to the on/off switch on the top (or, in this case, the bottom) of the sander



The sharpener needs to be clamped to the workbench using C-clamps to keep it from creeping around. I hold the knife to be sharpened with a vise-grip and let it rest on the stone under its own weight. After sharpening with water I can then go to the fine and then the finest grade of diamond paste.

One note about the diamond paste that comes in syringes – it is very thick and it takes a lot of pressure to even get it out of the syringes. I squeeze all of the diamond paste into small jelly jars and then dissolve it in a small amount of water. Then I can brush the paste onto the stone with a basting brush.

Comments to Michael Reese Much can be sent to Amoeba1@rcn.com

Published in the March 2014 issue of Micscape.
www.micscape.org