

MODIFICATIONS TO A SHOPSMITH MACHINE TO ENHANCE WOODTURNING POSSIBILITIES

Dr. Arthur I. Duell has developed many modifications and accessories to improve the utilization



of his Shopsmith machine, particularly with respect to its use for the art of woodturning. The Shopsmith incorporates many standard accessories for use in woodworking, but Dr. Duell has added some very useful features and accessories to improve the use of this tool as a lathe in the production of various types of turnings from a wide variety of materials.

Tailstock Modifications

A major modification of the Shopsmith involved adding a standard tailstock from another brand of lathe to the bed of the Shopsmith, as shown in Figure 1. The top of the original Shopsmith support was cut off, and the new tailstock welded to the original Shopsmith base. Great care was taken to insure that the new tailstock was exactly lined up with the centerline of the headstock. The new tailstock does not slide on the lathe bed, as is common for woodturning lathes, rather, the headstock slides on the

Figure 1

cylindrical supports. The new tailstock has a common MT-2 taper to accept standard turning attachments. In addition to the many standard tailstock attachments commonly available for use with an MT-2 size tailstock, Dr. Duell has developed many specialized tailstock fixtures as shown in Figure 2.



Figure 2

Toolrest and Special Fixture Support



Figure 3

by Dr. Duell. The disc was manually laid out and drilled by Dr. Duell. The unusually large number of index holes provides for an almost limitless range of indexing possibilities. When using this indexing feature, the disc is secured to the left end of the headstock shaft, and the indexing arm, with pin, is attached to the tubular headstock supports. With the object being turned attached to the right end of the headstock shaft, the indexing disc can then be rotated manually to the desired position and the pin inserted in the appropriate hole to maintain the angular position desired. The disc is, of course, removed prior to energizing the headstock motor.

Easy Wood Chuck

Dr. Duell prefers to use his “Easy Wood” 4 jaw chuck for turning his projects. This chuck provides the ability to change the

jaws with a “snap in” feature, thereby saving quite a bit of “set up” time between turning tasks.

Figure 3 shows the standard Shopsmith toolrest and banjo arrangement. This assembly slides on the main Shopsmith tubular supports. It has the ability to be moved laterally by means of a threaded shaft with a crank style handle on the end of the shaft. The handle can be seen in Figure 1, below the tailstock. Use of this feature will be discussed in a later section of this article dealing with using a flycutter and router to turn animal horns. Just to the right of the toolrest assembly, in Figure 3, is a custom, wood, platform for mounting other custom fixtures. This platform is moveable, laterally, by simply releasing the latch and sliding it on the tubular supports.

Indexing Wheel

Figure 4 shows the indexing wheel fixture developed



Figure 4



Figure 5

This threading fixture attaches to the custom wooden platform just to the right of the tool rest assembly as shown in Figure 3. The commercial fixture is adapted to attach to the platform with a post that fits in the hole in the platform, and is secured in place with a bolt from underneath the platform into the bottom of the post. Alternate thread assemblies are available for each of the standard number of threads per inch desired. A chuck mounts on the custom assembly to hold the piece being threaded, and a cutter is secured in the headstock, to be turned at a relatively high speed. The threading attachment is shown, mounted on the Shopsmith, in Figure 6.

The jaws can also be expanded and contracted with a collar on the back of the chuck without the need for the typical large chuck wrench. The chuck wrench is still required for final tightening before use. Figure 5 shows this chuck mounted on the Shopsmith headstock.

Threading Attachment

Dr. Duell has also adapted a commercially available threading attachment for use on his Shopsmith.

High Speed Flycutter Attachment

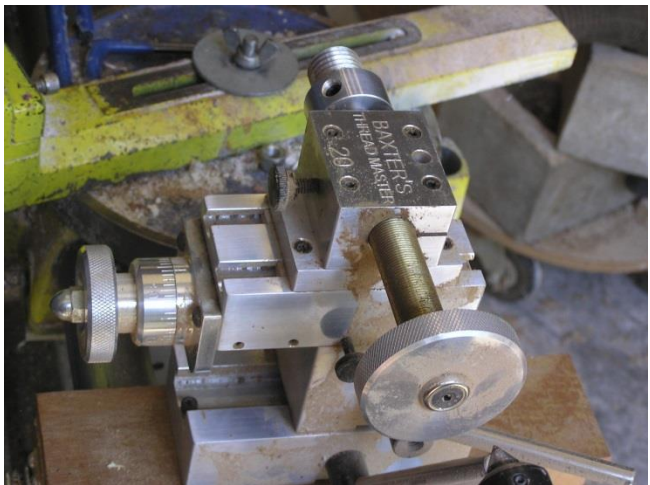


Figure 6

Dr. Duell has developed a custom attachment to allow the use of a high speed router as a shaping tool. This is used, primarily, for turning deer antlers, but can be used for a wide variety of materials. This tool provides the ability to “rough” turn animal bone relatively quickly with excellent accuracy. The fixture, shown in Figure 7, mounts on the standard Shopsmith banjo. The router motor spins the cutter at a very high speed (20,000 rpm+). The threaded rod with the crank handle on the end, mentioned earlier in this article, is used to move the toolrest



Figure 7

assembly horizontally while the headstock turns the piece at a nominal speed. It should be noted that a good respirator mask should be used to avoid inhaling any of the animal bone particles. Figure 8 shows the high speed cutter in operation turning a piece of deer antler.

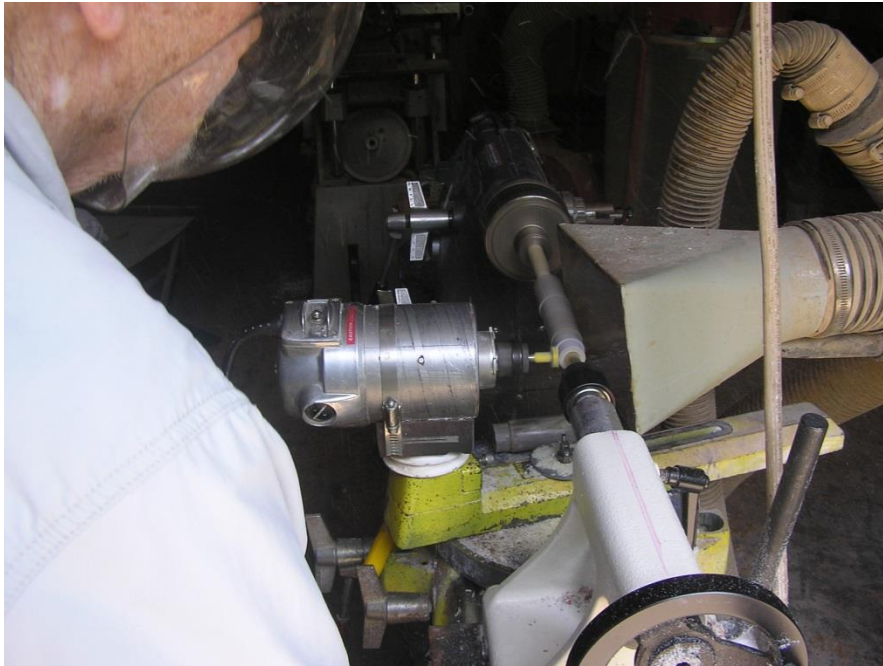


Figure 9 is a close up view of the turned deer antler showing the uniform surface left by the high speed fly cutter. The deer antler blank is now ready for shaping or embellishing, as desired.

Flexible Detailing Attachments

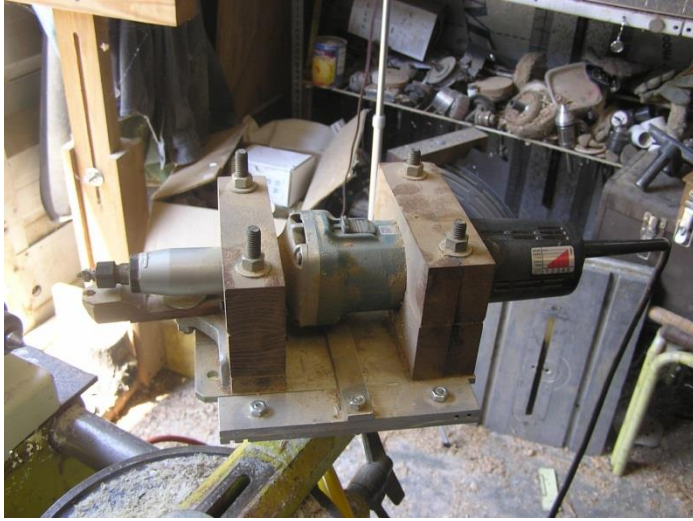
Dr. Duell has also developed a somewhat similar attachment to that shown in Figure 8, for embellishing turnings of various materials. This attachment, shown in

Figure 8

Figure 10, permits routing of any headstock mounted object with a variety of router bits. The attachment provides a steady platform and support for the high speed tool and bit, but also permits freedom of movement in the horizontal plane, and of the angle and depth of the cut. Another detailing attachment, utilizing the mechanism from a portable, hand operated drill press, provides the ability to impart very accurate embellishments in the turned object. The ability to set the exact depth of cut, using the adjustable stop on the mechanism, permits very accurate and repeatable cuts. The use of this attachment, in conjunction with the previously described index wheel, permits very accurate geometric patterns to be imparted to the turned piece. This attachment is shown in Figure 11.



Figure 9



With all of these attachments, Dr. Duell has provided his Shopsmith with the ability to execute some turnings that would normally only be possible using an ornamental lathe.

Figure 10



Figure 11



Dr. Arthur I. Duell