Peppermill with ergonomic handle

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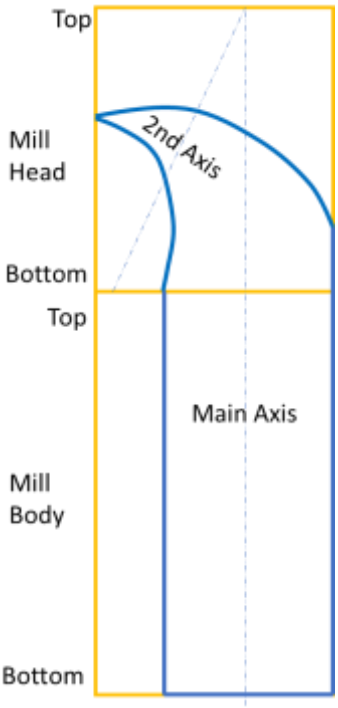
Insert: 11” Ceramic Peppermill Mechanism (Lee Valley, Craft Supply). Drill bit sizes and depth from https://www.woodturnerscatalog.com/docs/crush_grinder.pdf

Wood: dry hard wood, grain runs along the long side

Mill Head: Large hands: 3” x 3” x 5 ½”, Med hands: 2 ¾” x 2 ¾” x 5”, Small hands: 2 ½” x 2 ½” x 4”

Mill Body length: 2 ½” x 2 ½” x 7 to 8”. For mills out of one piece, part head from body before lathe work on e.g., table saw.

Figure 1 Hand size of customer



Turning the Mill Head

Mark top and bottom side on the mill head. Mark same diagonal on both ends of blank. Mark the main center 1 3/16” from the side on the diagonal, on both ends. Mark a second center on end of the bottom side 1 5/16” on the diagonal from the first center, fig 2.

Figure 2 Markings at bottom of mill head

Clamp the blank with a spur drive along the main axis. Do not round the blank. With a shoulder cut turn a tenon for standard chuck jaws. Due to the eccentricity of the wood the tool will rattle and there might be some tear out at the edge of the blank, but that does not matter.

Chuck the tenon and make sure the main center marking meets the live center on the tail stock. Drill a ¼” hole with a 1 ½” bit with a Jacobs drill chuck. Continue to drill a 1 ¼” deep hole with a 15/16” bit.

Mark roughly on the square blank a line at ¾" and at 2 ¾" (large hands), 3" (med hands), or 3 ¼" (small hands) from the tail stock side. For the next part of turning stay in between these 2 markings. Turn a smooth shape entering about 45 degrees that flattens out to about a 2 3/8" diameter; the diameter at the intersection to the mill body, fig 3. Begin shaping this cut with a bowl gauge and move to a spindle gauge for the final cuts. No sanding is required at this stage.

Figure 3 First cut on the main axis.

Fix the mill head between the second axis centers with a Steb drive at the top side. For a better friction contact with the Steb center the area around the center position can be shaped with a chisel or rotary bit.
Start shaping a V- cut with the bowl gauge aiming between the Top and the onset of the shape just made.
For advice on RPM check the side bar. Stop the lathe frequently to check the shape of the turning with respect to the cuts on the central axis before. Reduce the diameter of the V to about 1" making use of the wood at the head stock side. Now shape the half-bead on the side of the tail stock by entering the cut about 45 degrees into the wood and finishing about 90 degrees at the 1" core, fig 4. The profile can be observed with the lathe stopped. Transfer this shape such that a clear profile develops with the merge of the center axis cuts before. You may feel the onset of the cut by carefully reversing the half bead cut with the bevel of the gauge. For the final cuts with a freshly sharpened spindle gauge angle the tool rest parallel into the half bead cut and check for optimized lathe rpm. Afterwards reduce the rpm and continue the shape into the 1" core. With the core reduced to about ¼" use a hand saw for parting and release the pressure from the tail stock.

Figure 4 Cut on 2nd axis.

Build a spigot with a tenon for the chuck jaws on one side and a tenon that fits the 15/16" drilled hole on the other, fig 7. Drill a through hole for a 2 ½" wood screw. Fit the spigot into the Mill Head and fix it with a screw for a secure connection, fig 5. With the spigot in the chuck carefully reduce the waste at the bottom end of the head. The RPM can be increased thereafter. With the tool rest close, a sharp spindle gauge the high RPM the eccentric mill head can be shaped nicely. Think about the desired shape near the joint. Maybe you want a subtle waist in the mill head and/or a bead at the joint, fig 6.

Lathe RPM

With eccentric blanks in particular check the free rotation before switch on the lathe. Make sure the blank is securely clamped. There will be vibrations with increasing rpm. Whilst higher rpm will lead to better quality cuts you want to avoid rpm with lathe vibrations. Check rpm frequently as vibration pattern change with shape changes of the blank.

Before parting the eccentric wood turn the rpm down as the blank will break out if not. Final parting by saw rather parting through as with round blanks.

Sand the mill head with the lathe off with sandpaper on a soft pad on the top side, by hand. The lower part of the handle shaped head needs hand sanding in direction of the grain preferably. If you are using a 2” rotating sander, be careful at the edges, rotating from the wood towards the edge.

Figure 7 Spigot that fits the inside of the mill head.

Figure 5 Spigot with mill head attached.

Figure 6 Cut on main axis with high RPM.

Turning the Mill Body

Figure 9 Shape the top of the mill body with the bottom secured in the chuck.

The mill body can be drilled and turned conventionally. With the mill head being complex you may want to keep clear lines for overall shape e.g., fig 8. Match the design of the shape to the mill head when the body is clamped at the bottom, fig 9. Sanding of the area near the joint of the mill head and body can be on the lathe with a dummy shaped dowel inside. I do not use gauges on the mill head in this configuration. Assembly of the Peppermill mechanism and be done conventionally with epoxy raisin.

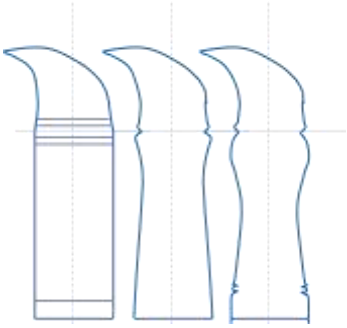


Figure 8 General mill shapes

Wood food safety:

For allergies and toxicity refer to http://www.wood-database.com/wood-articles/wood-allergies-and-toxicity/

Wood finish food safety:

According to the FDA database of approved ingredients for finishes and adhesives, all modern unpigmented finishes (ones that don’t contain lead, mercury or toxic colorants) are technically considered food safe if they are applied in reasonable amounts and allowed to cure properly.