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THE SHARPER EDGE

BY: BOB YORBURG

Photography by Roger Schroeder



Bob Yorburg, woodcarver and sharpening expert

Editor's Note: Besides being an avid woodcarver and instructor, Bob Yorburg sharpens carving tools for Frank Mittermeier, Inc. (P.O. Box 2, Bronx, NY 10467/ 718-828-3843). In his first article for *Wood Carving Illustrated*, Bob describes his grinding and honing systems for getting the sharper edge. In future features, Bob will discuss sharpening V tools and other oddly shaped carving tools; how to custom make a cutting profile; and horizontal grinding fixtures. Bob lives with his wife Laura in Yorktown Heights, New York.

Before I started sharpening carving tools for Frank Mittermeier, I was checking out different companies that made these tools. On a trip abroad ten years ago, I met with Ashley Isles, the English tool manufacturer. He told me that the most important aspect of carving is sharpening. Since then I have been experimenting with different systems that will allow me not only to achieve a razor sharp edge, but will also give me more time to carve with less time spent on sharpening.

The tools I receive from Mittermeier, who has them forged in Germany, are rough ground. Historically, woodcarvers put their own bevels or shapes on the tools depending on the type of wood they are carving and their style of carving. Today carvers want to take a tool out of a box or package and start removing wood immediately.

I use Mittermeier tools for my own carving projects. They do hold an edge, which indicates quality steel. Also, when pushed through wood, the tools have a nice tone. A good tool tends to "sing" when it is really sharp.

THE SHARPENING SYSTEM

I use large grinding and polishing wheels—mine are 10 in. in diameter—because they are quick and produce a flatter bevel. While grinding or polishing, I keep my finger toward the tip of the tool. If the steel gets even slightly warm, I take the tool away from the wheel and immerse it in water, which absorbs the heat.

Despite the presence of a jar of water, I have a compressed air system that sprays a coolant on the grinding wheel and tool. I use a coolant oil that is dissolved in water. The water keeps the stone from loading up with ground-away metal. This means I can sharpen more quickly, and, as a bonus, the oil puts a film on the tool to keep it from rusting. However, once I finish grinding, I let the wheel run for a while before I turn it off to help the residual moisture evaporate. If I don't, the

moisture wicks to the bottom of the wheel and stays there. When that happens, the next time I turn on the machine, the wheel wobbles.

KEEP IT MOVING

As I grind a tool, I never keep it in one place. Moving it right to left is essential if I don't want to burn the steel. Once that happens, which is indicated by a black spot, I have to grind very slowly and carefully past it to get at fresh metal. Not keeping the tool moving is a mistake that most beginners make. If it is kept in one place on the wheel, it will not only tend to burn, but small grooves will be ground into the underside of the tool. I pay particular attention to the corners of the tools; they are the easiest places to burn. This happens because there is not a lot of mass there to absorb heat. When grinding corners, I have a light and delicate touch, and I'm careful not to keep a corner resting on the wheel.

Even after grinding for so many years, I still take the tool off the grinder frequently and check the edge. It helps to have a magnifier lamp with a good source of light. It also helps me to keep a finger, which reflects light like a mirror, behind the ground edge. The reflecting finger enables me to see if I missed any spots.

THE WIRE EDGE

The key to a really sharp edge is to develop a wire edge while grinding. After grinding for a while, a burr starts forming on the top edge of the tool. Sparks coming over the top are an indication that the burr or wire edge is forming. It is also something you can feel and see, especially under a magnifier lamp. The trick is not to develop a big burr, which tends to break off and leaves a dull edge.

It is important to feel a burr along the entire top edge of the tool, not just in one spot or on one side.

THE POLISHING WHEEL

The process of putting a sharp edge on the tool is not complete until I have polished it to remove the wire burr. My polishing wheel is the same size as the grinding wheel and is made of hard sole leather. I purchased the leather from a shoe repair shop. I then glued and laminated the leather until it was about 1 inch thick. I used the same glue the shoemaker uses. Once the glue had set, I rough-cut it round and put it on the motor arbor. After the wheel was mounted, I dressed it lightly with lathe tools.

The leather wheel can polish only with the application of rouge. I use green or white rouge; the latter is more aggressive. However, once the wheel is charged with rouge it cannot be trued again. Also, I keep that wheel in place on its own arbor. It is critical to have a wheel running true, and exchanging wheels will deter this. When polishing, I let the rouge do the work, not the leather, which can overheat the

tool. I use a light touch with the tool and move it across the wheel quickly. If I were to keep the tool in one place, it would leave a depression in the leather or in the tool would burn the tool.

The bevel does not need a mirror finish, but it does need a bright one. I have found that the more a carver polishes, the more he tends to round the tool's edge. This will produce a tool that will not cut because it is too blunt. When carving, I can polish the bevel several times to keep it very sharp. Once again, this is performed with a light touch. After a while, it is important to go back to the grinding wheel and redress the edge.

THE LONG AND THE SHORT OF IT

For my own carving needs, I use either a short bevel for hardwoods or a longer bevel for softwoods. To achieve two consistent bevel angles when grinding shapes, I came up with a system that uses a clamp and stop gauges. Although I sometimes use a small C clamp, I designed a bronze clamp. With the clamp positioned on the shank of the tool, I slide the clamp across the grinder's tool rest.

How do I determine where to secure the clamp? I start off with a tool that has the bevel I'm looking for. Holding a light source to one side, I put the tool to the wheel, keeping the bevel against it so that no light is visible under the bevel. The tool must also have its shank resting on the tool rest. I then take my clamp and put it on the shank just below the rest. Now that I have a fixed length, I transfer that to a homemade setup that has a wooden stop block secured to my bench. I put the stop block at a distance from the edge of my bench that equals the distance of the tool tip to the position of the clamp.

CLEANING UP

Once the tool is polished, I wipe off the excess rouge. I then take a cut across the grain of a piece of wood. There are two reasons for this. The first is to check that the tool is cutting smoothly. The second is to make sure that it will hold the edge. If by chance I accidentally overheated the tip or it was not hardened properly, the edge will quickly crumble after my experimental cuts. I then need to slowly regrind to get to harder metal.

RUNNING SMOOTH

I prefer to run my wheels with Baldor® motors. Smooth, cool running and very powerful, they can go for hours without overheating. But an added advantage is that the motor is small enough that I have room to swing even a large tool from left to right as I grind or polish it. Other grinders tend to be fat with small wheels, making it difficult to swing the tool across the wheel. With my approach to sharpening, I need room to keep the tool moving.

SAFETY

I am always safety conscious when grinding. I cover my eyes with goggles, my nose and mouth with a respirator, and my ears with hearing protectors. I wear the respirator for both dust and fumes. My fear is that when I grind metal, the fumes may be toxic if the hardening process for the steel involves cyanide.

My advice to people is that if you can carve and shape wood, you can also sharpen a chisel. Putting a chisel to a grindstone is very much like carving. In both cases, I am creating a unique shape that is both attractive and functional. ■

BALDOR bench grinders, grinding wheels, grinding fluid coolants, and coolant misting systems are available from MSC Industrial Supply Co., 151 Sunnyside Boulevard, Plainview, NY 11803/ 1-800-645-7270.

Polishing compounds can be purchased from Frank Mittermeier, Inc., P.O. Box 2, Bronx, NY 10467 / 718-828-3843.

There is no absolute angle for short bevels. But approximately 15 degrees for a long bevel works well for softwoods. Less than that and the edge tends to be brittle. For short bevels when carving hardwoods, an angle of 27 degrees works well. More than that and the wood is more difficult to carve.



I use a compressed air coolant system that sprays an oil-water coolant water onto a 10-in. diameter grinding wheel. With my finger close to the edge, I keep the tool moving to prevent burning it. The magnifier lamp helps me keep a close eye on the edge.



I charge my polishing wheel, made of laminated hard sole leather, with either green or white rouge.



Keeping the tool moving on the polishing wheel, I let the rouge, not the leather, do the work of removing the wire edge produced by the grinding wheel.



The bevel needs a bright finish, not a mirror one. Too much buffing tends to round the tool's edge.



I have devised a system for achieving a particular bevel—short for hardwoods, longer for softwoods—using a clamp and a stop block. Where I position the clamp is determined by where the stop block is.



My homemade clamp—made of bronze—rests on the tool rest and keeps the tool's edge at just the right position on the wheel.



I always check that the tool is cutting smoothly and is holding its edge before I go to a carving project with it or send it out.



When I grind, I cover my eyes with goggles, my nose and mouth with a respirator, and put hearing protectors on my ears.



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