Set the roundnose chisel, **bevel down** on the tool rest. Slide the chisel forward until the center of the chisel touches the grinding wheel (Figure 24-21).

With the machine "OFF" prac-tice pivoting the roundnose chisel first to the left, and then to the right to complete the edge. After you get the feel of this grinding motion, be sure the roundnose chisel is not toucriing the wneel and that the speed dial is set to "**Slow**". Turn on the Mark V and set the speed dial to "R" (3400 RPM).

Gently slide the roundnose chisel on the tool rest and into the grinding wheel. Like you practiced, pivot the chisel to grind the bevel.

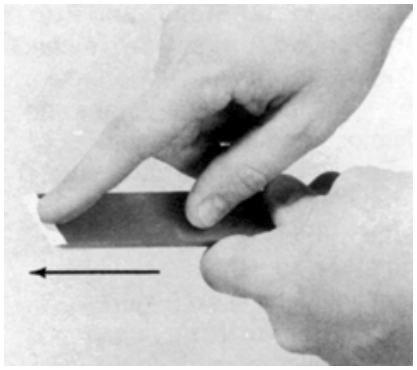

Figure 24-22. Feel the burr by carefully rubbing your finger toward the cutting edge.

Grind away only enough metal to remove any damage to the cutting edge and create a slight burr. The roundnose chisel is ground for scraping, so it is ready to use as is and should not be honed (the burr is sharp and scrapes very well).

HONING LATHE CHISELS

After the skews, gouges, and parting tools are ground for either shearing or cutting, their cutting edges **must be** honed razor sharp.

In order to hone the chisel you must be able to find and recognize the burr created by grinding. This must be done properly and with extreme care to avoid cutting yourself. As you progress from coarser to finer stones, the burr will become smaller and more difficult to find, but after you become more practiced at honing this will become second nature.

To find the burr, lightly rub your finger at right angles to the cutting edge from the **back** of the bevel **toward** the cutting edge and across it (Figure 24-22). **Warning: Be careful not to slide your finger along the cutting edge. Even though the chisel is not yet honed, the burr is sharp.**

Start honing with a coarse stone. Apply a generous amount of liquid (if required) to the surface of the stone. Set the chisel in the center of the hone, and rock the chisel on the bevel until you see the liquid squeeze out from between the ground surface and the stone. This helps to show that you're holding the chisel at the proper angle. Repeat this until you easily feel the bevel seat flat on the stone. Slide the chisel over the hone as directed for each class of hone.

By repeating this procedure on progressively finer stones you will be able to hone the cutting edge of the chisel razor sharp.

There are a couple of tests to check the "sharpness" of the cut-ting edge: (1) A razor sharp cutting edge will cut end grain of wood with little effort. (2) A razor sharp cutting edge will seem to drag rather than slip when pulled across the corner of a piece of hardwood. Do not use paper to test the sharpness be-cause the glues in the paper will dull the edge you worked so hard to obtain.

Honing the Skew

The skew is honed much like a pocket knife. Each has a bevel ground on both sides of their cutting edge. The skew must be honed on the two bevels. This will remove the grinding burr and sharpen the cutting

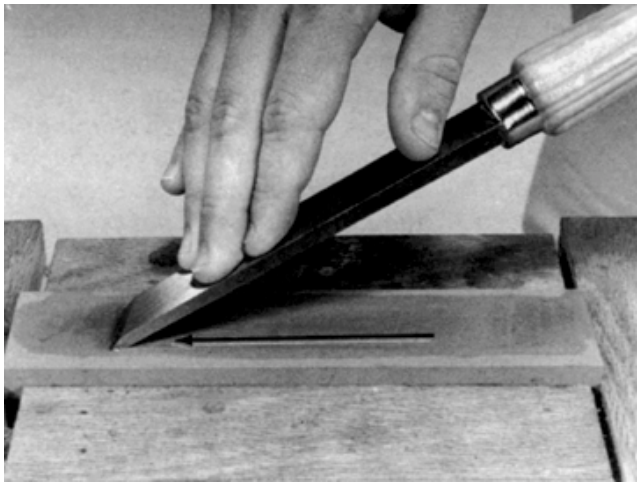

Figure 24-23. Point the cutting edge in the same direction you are sliding the skew.

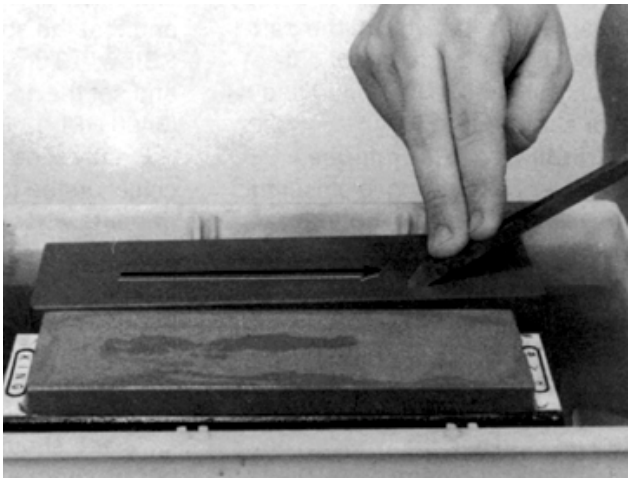

Figure 24-24. For narrow chisels, point the cutting edge away from the direction you are sliding the skew.

edge. By repeating this procedure on progressively finer stones you will be able to hone the cutting edge razor sharp.

Using Oil Stones and Diamond Hones—Hold one bevel of the skew on the hone. Slide the skew over the hone with the cutting edge pointing in the same direction you are sliding the skew (Figure 24-23). Think of it as trying to shave off a thin sliver of the hone. Turn the skew over and repeat the procedure to hone the other bevel.

Using Water Stones and Rubber Bonded Abrasives—To hone skews with a cutting edge wider than 1/2" follow the oil stones and diamond hones instructions.

For skews with narrower cutting edges, slide the skew over the hone with the cutting edge point-ing **away** from the direction you are sliding the skew (Figure 24-24). Think of it as trying to smooth over the surface of the hone. Turn the skew over and repeat the procedure to hone the other bevel.

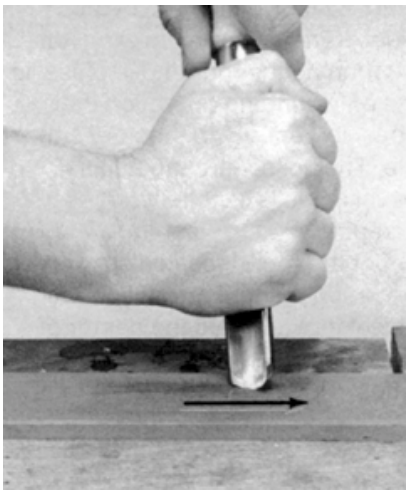

Figure 24-25. Point and roll the outside of the cutting edge in the same direction you are pushing the gouge.

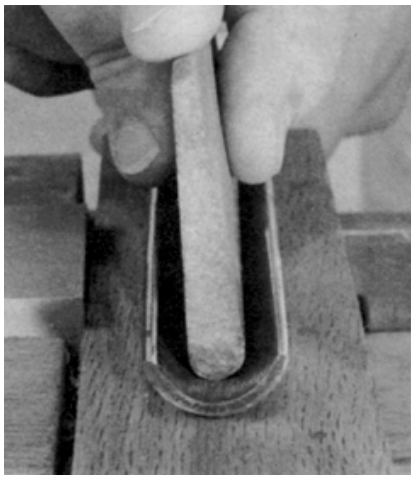

Figure 24-26. Use a rounded slip to hone the inside of the gouge.

Honing the Gouge

The gouge must be honed on both the bevel ground on the outside and the concave inside. This will remove the grinding burr and sharpen the cutting edge.

A gouge slip or other rounded (convex) slip will be needed to hone the inside (concave) of the gouge. This medium or fine slip should match the profile of the gouge as close as possible.

Using Oil Stones and Diamond Hones—Hold the bevel of the gouge on the hone. Roll the gouge as you push it over the hone. The cutting edge should be pointing in the same direction you are push-

ing the gouge (Figure 24-25). Think of it as trying to shave off a thin sliver of the hone as you roll the gouge.

Change to the slip. Apply a generous amount of oil to the inside of the gouge. Set the hone in the gouge. Slide the slip from the cutting edge to the handle while rotating the gouge so the entire cutting edge on the inside is honed (Figure 24-26). Then return to the flat bench hone.

Using Water Stones and Rubber Bonded Abrasives—Hold the bevel of the gouge on the hone. Roll the gouge as you pull it over the hone. Slide the gouge over the hone with the cutting edge pointing **away** from the direction you are sliding the gouge (Figure 24-27). Think of it as trying to smooth over the surface of the hone as you roll the gouge.

Change to the water slip hone. Apply a generous amount of water to the top surface of the hone. Set the concave side of the gouge down on the slip. Slide the gouge away from the slip while rotating the gouge so the entire cutting edge is honed on the inside. Then return to the flat bench hone.

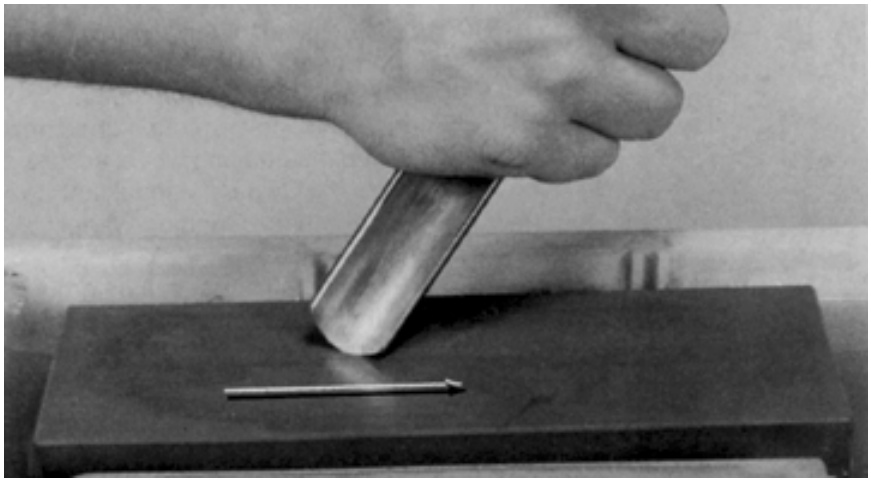

Figure 24-27. Point and roll the cutting edge away from the direction you are sliding the gouge.

Figure 24-28. Point the cutting edge in the same direction you are sliding the tool.

Honing the Parting Tool

The parting tool is honed on the bevel ground on both sides of the cutting edge. This will remove the grinding burr and sharpen the cutting edge.

Using Oil Stones and Diamond Hones—Hold the bevel of the parting tool on the hone. Slide the parting tool over the hone with the cutting edge pointing in the same direction you are sliding the tool (Figure 24-28). Think of it as trying to shave off a thin sliver of the hone. Turn the parting tool over and repeat this on the other bevel.

Using Water Stones and Rubber Bonded Abrasives—Hold one bevel of the parting tool on the hone. Slide the tool over the hone with the cutting edge pointing away from the direction you are sliding the tool (Figure 24-29). Think of it as trying to smooth over the surface of the hone. Turn the parting tool over and repeat the procedure to hone the other bevel. **Warning: Never attempt to hone the parting tool with the**

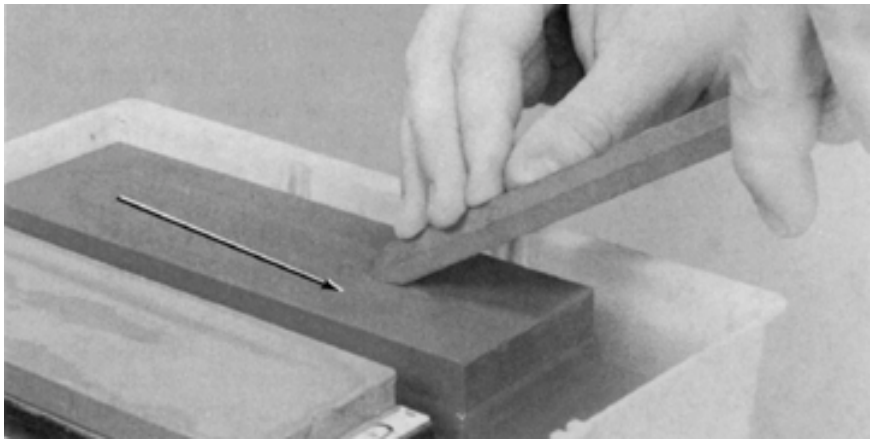

Figure 24-29. Point the cutting edge away from the direction you are sliding the tool.

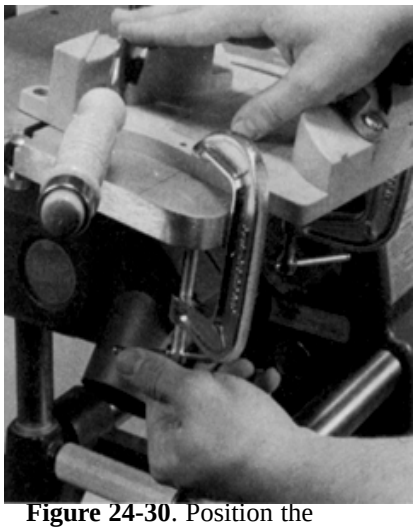

Figure 24-30. Position the sharpening guide within 1/16” of the belt and clamp it to the table.

rubber bonded abrasive wheel mounted on the grinding wheel accessory. The cutting edge of the parting tool will dig into the soft abrasive and throw the tool from your hands, possibly causing injury and certainly damaging the tool and the rub-ber bonded abrasive wheel.

SHARPENING BENCH CHISELS

A bench chisel may be one of the most used and most abused tools in the shop. Along with chiseling, it's sometimes used as a pry tool, a wedge, or even a substitute for a screwdriver. Because of this, the bench chisel could be the most sharpened tool in the shop. To sharpen bench chisels, they must be ground, then honed.

Grinding Bench Chisels using the Sharpening Guide

The Shopsmith Sharpening Guide mounts on the disc sander, belt sander and the strip sander and is used to grind bench chisels. Set up the machine you will be using and grind the chisels according to the applicable instructions below. To determine the sharpening guide angle settings, refer to Tab1e24-1.

Disc Sander Setup—Mount the sharpening guide on the Mark V worktable and adjust the worktable height. Mount the sharpening guide to the worktable only. Mounting the guide to the extension table will not allow the required 9° table tilt.

Tilt the worktable 9° toward the abrasive. To adjust the sharpening guide to the desired angle setting, lay the flat bottom of the bench chisel against the righthand wall of the second station. With the tip of the chisel against the abrasive, pivot the sharpening guide until the bevel of the chisel sets flat against the abrasive. Secure the sharpening guide in place.

Warning: Position the sanding disc to within 1/16" of the sharpening guide. Then secure the power plant lock.

Belt Sander Setup—Set up the belt sander vertically. Mount the sharpening guide to the table and secure it by tightening the two lock knobs. Tilt the table 9° toward the table. **Warning: Position and secure the sharpening guide to within 1/16" of the belt and se-cure the table locking setscrews.**

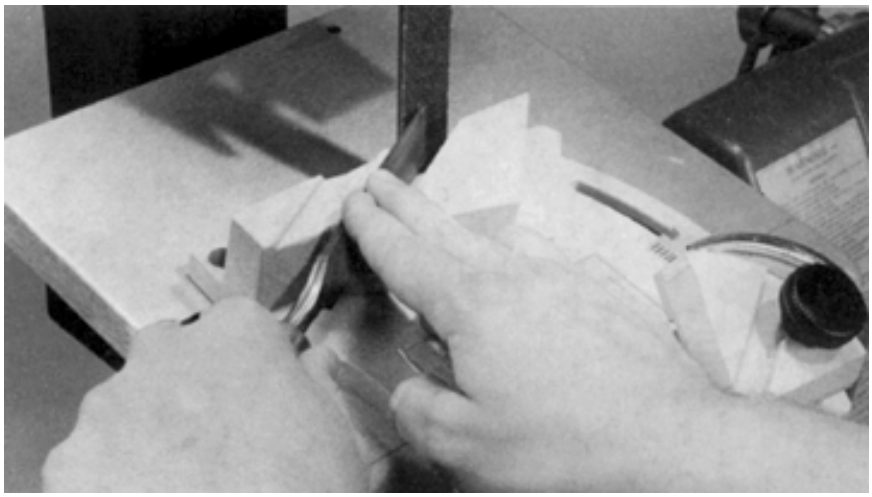

Figure 24-31. Slide the bench chisel into the abrasive. Hold the chisel there momentarily, then back it away.

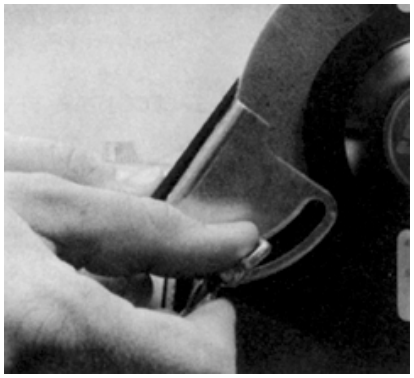

Figure 24-32. Set the angle so that the wheel is conetered on the flat bevel. Tighten the wing nut securely.

Strip Sander Setup—Because there are no table slots or mounting holes in the strip sander table, the sharpening guide must be clamped to the table. An index line is used to align the guide. Draw this line 3-5/8" from, and parallel to the platen as shown in Figure 24-8 earlier in this chapter.

When setting the table tilt and the sharpening guide angles, hold the chisel against the left wall of the second station of the guide. Position the hole in the rear of the sharpening guide and the angle setting indicator directly over the index line.

Slide the sharpening guide along the line until the chisel in the second station of the guide is in front of the belt. Warning: Position the sharpening guide to within 1/16" of the belt. Then clamp the sharpening guide securely to the table (Figure 24-30).

Grinding Bench Chisels—Turn on the machine and set the chisel in the second station of the sharpening guide. Slide the chisel into the abrasive while holding it firmly against the left wall of the station. Hold the chisel against the abrasive momentarily, then back it away (Figure 24-31).
Repeat this several times until any damage to the cutting edge is removed.

Grinding Bench Chisels using the Grinding Wheel
The Shopsmith Grinding Wheel mounts on the Mark V. Select the proper wheel for the severity of the cutting edge damage (coarse for nicks and a badly worn cutting edge and fine for routine grinding). Set up the grinding wheel according to the Owners Manual that came with the Grinding Wheel Accessory.

The bench chisel can be ground on the front or on either side of the grinding wheel. When the chisel is ground on the front of the wheel, the bevel will be hollow ground. Because this hollow ground edge is so thin, a secondary bevel will need to be honed on the cutting edge. This will be done with a coarse sharpening stone.

When the chisel is ground on the side of the wheel, the bevel that is left is flat and can be honed to a razor sharp cutting edge without the need for a secondary bevel. **Warning: Grinding on the side of the wheel is tricky because there is nothing but feel to guide the chisel to the proper angle and is not the best approach. Use extreme caution.**