

The Scraper

A sharp burr makes shavings, not dust

by Stephen Proctor

The term scraper brings to mind a tool for cleaning blistered paint from the sides of a house, or for chipping rust from the deck of a ship. It seems a poor term for such a fine tool, a tool capable of the finest of cuts and the heights of accuracy, an almost indispensable tool around a furniture shop. The term is something of a misnomer, for when sharpened to a burr edge, a scraper cuts rather than scrapes, much like a very low angle plane blade or chisel, slicing off paper-thin shavings of wood. As useful as the scraper is, it's surprising how few people understand how to sharpen and how to use it.

Scrapers come in various sizes and thicknesses and the methods I will describe for sharpening and use are the same for all. A standard scraper, good for most work, is a 2½-in. by 5-in. piece of steel, about ½ in. thick. Scraper hardness varies; I have had little luck using my methods on scrapers advertised as having hardened edges. For curved surfaces, a thin flexible steel that will conform to the curve is better. A gooseneck scraper (the whale-shaped one in the photo at right) contains a variety of curves that can be used on tight curves or moldings. I have four or five scrapers around so I don't have to stop and sharpen so frequently,

A rectangular scraper consists of four narrow edges and two broad faces. The cutting is done by a small burr formed at the juncture of a face and an edge (such a juncture is called an arris, as indicated in the drawing on the next page). The quality of the burr, and of the cut it makes, is entirely dependent on the quality of the intersecting surfaces. Two smooth, blemish-free surfaces produce a stronger burr with fewer of the microscopic serrations that produce a rough surface on the wood.

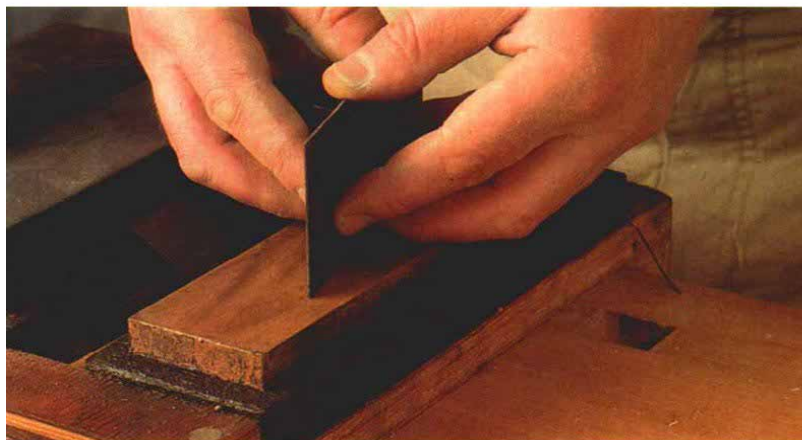
To sharpen the scraper, first dress the two long edges with a single-cut mill file. Clamp the scraper vertically in a vise and draw the file along the edge, trying to achieve a straight edge, perfectly square in cross section. All four arrises should feel sharp to the touch, if not, refile until they do.

Next, polish the faces of the scraper with a medium India stone followed by a fine, hard finishing stone—I use a hard black Arkansas stone. Be careful to keep the scraper flat on the stones, or you'll round the arris. Then, holding the scraper vertically between both hands, polish each long edge, rubbing the scraper to and fro along each stone in turn. Hold it diagonally across the stone to prevent uneven wear to the stone. Don't be tempted to polish on the edge of the stone, using the box holding the stone as a 90° guide—repeated polishings will wear a groove in the stone and round the edge of the scraper. After this operation, all four edges should again feel sharp to the touch.

A burnisher is required for the next step. It must be smooth



A scraper, most often nothing more than a piece of thin steel, can be any of a variety of shapes. Common commercial scrapers are rectangular and gooseneck, shown in the center above.



After filing, work the faces and edges of the scraper on a medium and a hard stone. Hold the scraper diagonally across the stone's width to prevent wearing the stone unevenly.



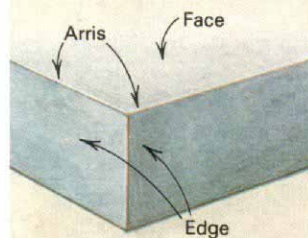
To raise the burr, hold the burnisher at a slight angle to the face and stroke it firmly back and forth along the arris. To turn the burr, make a single firm pass along the arris, the burnisher held slightly less than perpendicular to the face.

and of a harder steel than the scraper. If it isn't smooth, it will abrade the scraper and damage the burr. You can buy burnishers, but many things will work as well. My preference used to be the back of an old gouge. Currently I use a buffed-up pushrod from an automobile engine. Whatever you use, it may help to apply a little lubricant between burnisher and scraper. Oil is fine, or just rub the burnisher across your nose—it really does work.

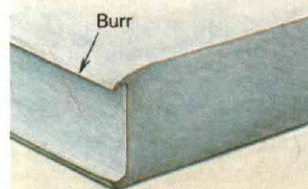
Two steps are required to make a burr: raising the burr and turning it. To raise the burr, lay the scraper flat on the edge of a firm surface, hold the burnisher almost in the same plane (a few degrees off horizontal) and stroke it firmly back and forth along each arris. You should hear a loud tick as the burnisher goes off the end of the scraper at the end of each stroke. Hence the term ticketer, as the burnisher was once known. The resulting cross section is shown in the drawing and can easily be seen on the scraper with the aid of a magnifying glass.

There are many methods of turning the burr—the following one works well for me and is quicker than others I have tried. Holding the scraper vertically in the left hand, stick one of its corners into the bench, push it firmly into the surface to create a slight curve in the steel. Then, starting the burnisher near the top corner of the scraper and holding it at a fraction less than 90° to the face of the scraper, take one firm stroke down the arris, as shown above. Finish the small unburnished section at the top with a short upward stroke. Repeat this process on the other three arrises, making sure to turn the burr on the concave arris

Scraper sharpening

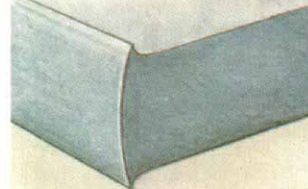


Step 1



Burnish almost parallel to the faces to begin the burr. (Size of burr exaggerated.)

Step 2



Burnish almost perpendicular to the faces to turn the burr.



To scrape a flat surface (right), hold the scraper as nearly perpendicular to the work as possible and push or pull it to take wide shavings. A gooseneck scraper is ideal for tight curves (top). A flexed rectangular scraper can scrape shallow concave and convex surfaces (bottom).

each time. It isn't necessary to curve the scraper to turn a burr, but I think that it puts a little tension in the burr once the curve is released, and this makes the burr a little stronger.

Taking several passes will turn a large burr, which will take a large shaving. However, a large burr takes longer to turn than a small one, and I've found them to be more brittle, possibly because of metal fatigue caused by the repeated passes made when turning the burr. In addition, a large burr has relatively little substance behind it to dissipate the heat generated during a cut, and this also tends to make it degrade rapidly. I prefer a small burr because it's less work in the long run. Gooseneck scrapers are sharpened by the same method, though the curves make the job a little more difficult.

Scrapers are most commonly used to remove a fair amount of wood from a flat surface. Why scrape, rather than plane or sand? A plane may tear interlocking or curly grain, but the scraper can manage nearly any awkward grain. The scraper face immediately behind the burr acts like a very finely set chip breaker, fracturing the severed wood fibers before they can tear out. A scraper also removes material quickly and leaves a finished surface, unlike coarse- or medium-grit abrasive paper, which removes the same amount of material, but leaves scratches.

To maintain the flatness of a large surface, like a tabletop, it is essential to cover as large an area as possible with one stroke of the scraper and to introduce as little curvature to the cutting



edge as possible. A curved scraper will make a concave cut—the greater the curvature, the greater the concavity. To avoid curvature, hold the scraper with your fingers behind the cutting edge and thumbs in front. Maintain a constant angle to the wood, as close to perpendicular as possible, and draw the scraper toward you, attempting to produce a shaving almost the full width of the scraper. Proceed across the surface with a series of long and slightly overlapping strokes. I prefer to pull the scraper, but you can push it, too, as shown above. It's easier to curve the tool when pushing, so be careful.

Unlike a plane, the scraper has no sole and may, therefore, ride up and down over hard and soft areas and create ridges on the surface. To avoid this, the scraper should be slightly diagonal to the direction of the wood grain. Alternate the diagonal orientation every other stroke, so that the edge will only take material from the high spots, leaving a flat surface.

For a fine, finishing cut, a small, sharp burr is needed; if the scraped surface isn't good enough, re-stone the scraper and turn another burr. Hold and move the scraper as described previously, keeping it as perpendicular to the surface as possible. Obstinate grain may require that the angles diagonal to the grain be increased to produce a skewed cut.

The third basic scraper technique is for shaping or truing concave or convex surfaces. Depending on the curves, use a flexible rectangular scraper or a gooseneck scraper, as shown on the facing page. By springing the scraper between fingers and thumb,

the cutting edge can be made to conform to a variety of curves. As the curve of the scraper tightens, the cutting angle of the scraper is inevitably lowered. As the scraper is lowered, the burnishing angle of the burr must also become more acute to maintain the proper cutting angle of the burr to the wood. You may need to experiment with various angles at first, but you'll get the feel of it with experience.

The most common fault when using a scraper is to concentrate all your energy on one small flaw—a slight tear or, most frequently, an edge joint in a veneered surface. The resulting surface looks as though it has been bombarded by billiard balls or has had a drainage ditch cut down it. To avoid this natural attraction to flaws, a good rule of thumb is to take two strokes either side of the flaw for every stroke on it. Also, try to cover as much ground as possible with each stroke.

As soon as the scraper no longer takes a shaving, it's time to resharpen. It is possible to re-turn a burr with the burnisher several times before having to go back to the file and the stones. Burnish the face first, then turn the burr at the desired angle. When the burr is ragged and leaves striations in the wood's surface, it's time to go back to the beginning of the process. Putting off sharpening because of laziness costs time and energy. The joy of using a sharp scraper is well worth the effort that it takes. □

Stephen Proctor, a woodworker for 34 years, is Dean of Instruction for the Wendell Castle School.