Custom Moldings with Paired Planes

Make your own moldings, from simple to complex, with hollow and round planes

BY MATTHEW BICKFORD

It's a common quandary: You get 95% of the way through building a piece of furniture, having safely navigated wood selection, milling, joinery, and assembly, only to get stuck at the end on the molding. Despite having a seemingly limitless collection of router bits and shaper knives, you don't have the means to produce the exact molding you have in mind. So you compromise and make a molding that's roughly similar to what you really want. But compromising on molding profiles is unnecessary if you

Matching moldings. *When Matthew Bickford mentioned that he could produce any molding with hollow and round planes, we presented him with a range of profiles and asked him to show us how he does it.*

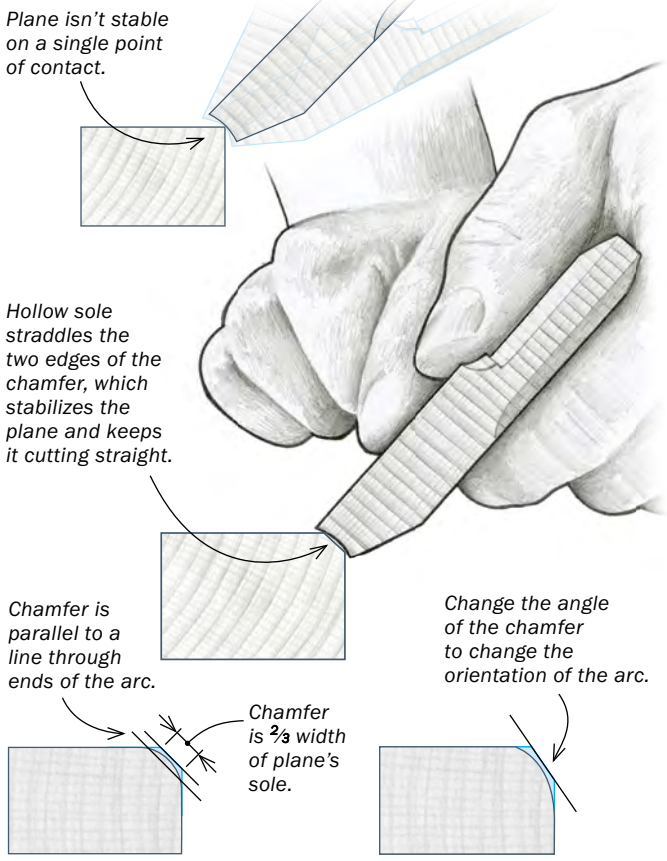
Photos, except where noted: Matt Kenney

Molding planes in mating sets

Hollow and round planes, which come in an array of widths, are named for the shape of their soles. A hollow has a concave sole and cuts a convex profile. A round has a convex sole and cuts a concave profile. You can make a lot of profiles with just two planes. Start with a mid-range pair—between ¼ in. and ⅝ in. wide, say—and add more as needed.

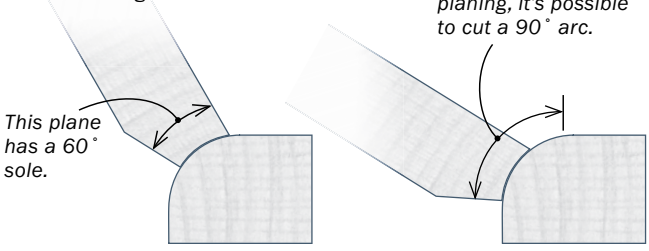
CHAMFERS AND RABBETS GUIDE THE PLANES

CHAMFER FOR THE HOLLOW

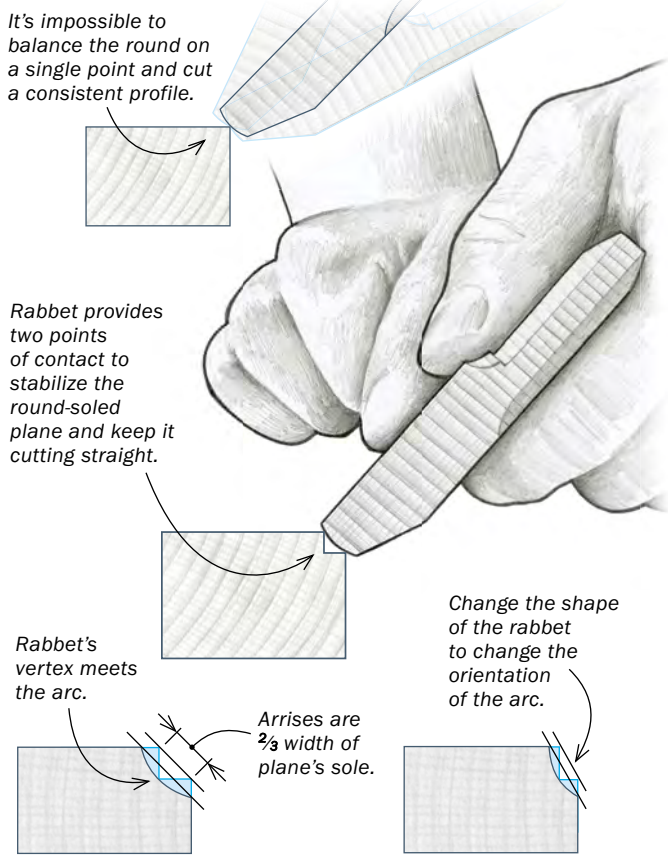


ANGLE PLANE FOR GREATER ARC

Rotating the plane allows you to cut a convex arc greater than the sole.

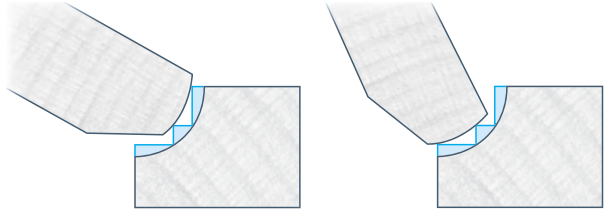


RABBET FOR THE ROUND



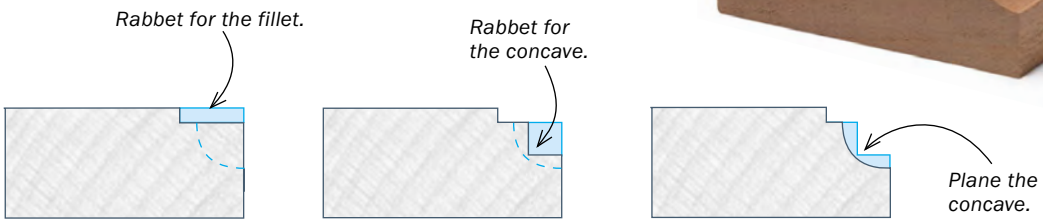
EXTRA RABBET FOR GREATER ARC

A second rabbet removes more waste and provides further guidance when cutting an arc wider than the sole.



Making a concave cut

The concave arc is one of two profiles used to make all moldings. When cutting a concave arc, first cut a rabbet to remove waste and guide the plane.



STEP 1 STEP 2 STEP 3

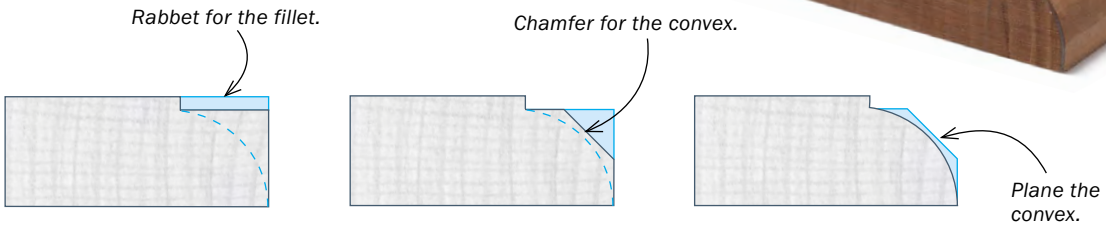
Ride the rabbet. *There is no fence to guide the cut, but the arrises of a rabbet are just as effective, serving as two points of registration so the plane rides straight through the cut.*

A pair of shavings. *When you start to cut the concave, the blade contacts just the arrises, so you get two thin shavings. These become wider with each pass of the plane.*

Use the shaving as a depth gauge. *The concave is finished, or ideally so, when the plane takes a full-width shaving and the rabbet is gone. A shopmade plywood sticking board keeps the molding stock from flexing or shifting during the cut, and the benchdog acts as a stop.*

Making a convex cut

The convex arc is the second element common to all molding profiles. Cut with a hollow-soled plane, it begins life as a chamfer. The hollow rides the chamfer's two corners, or arrises.



Straddle the chamfer. *There's no fence to guide the plane, but a hollow's sole fits nicely over a chamfer, picking up two registration points and following them for a straight cut.*

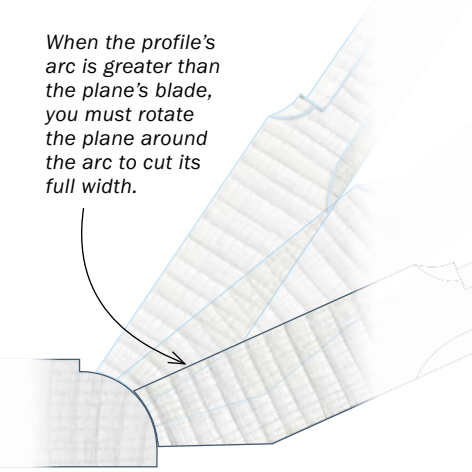
Keep the shavings consistent in width. *This tells you that the plane is cutting the molding to a uniform depth as you progress. Workpieces that won't flex under lateral pressure can be clamped between benchdogs.*

have the ideal tools: hollow and round planes.

All molding, even the most complex, is only a series of convex, concave, and flat sections. A single pair of hollow and round planes affords the opportunity to make dozens of these shapes. Add a second pair of planes and the number of possible molding profiles rises into the hundreds. With a larger collection of hollows and rounds, you can make any profile you want.

Once you've learned how to cut simple concave and convex sections, you'll have what you need to move on to more complex moldings.

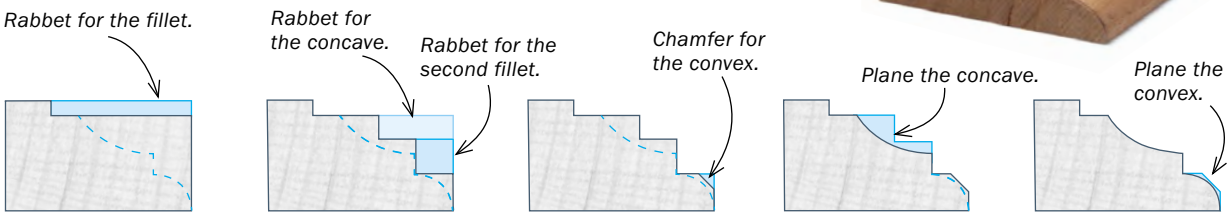
Full-width shaving often means you're done. *Because you're working a chamfer, the plane won't take a full shaving until you've neared final depth, having removed the chamfer and cut with the blade's full arc.*



Drawings, and photos of individual moldings: John Tetreault

Combining concave and convex profiles

This molding pairs a concave section with a convex one. A fillet separates the two. Bickford cut the shapes with a mixed pair of planes—a wide round and a narrower hollow.



Work the wide concave. *For this profile it's the easiest place to start, and after it's formed the convex section below is easier to get at.*

Cut a consistent profile. *When you're nearly finished, look for spots where the shaving splits into two. Work these areas, because they haven't been cut as deeply as where the plane is taking a full-width shaving.*

Shape the convex. *To finish the profile, cut the convex section with a hollow.*

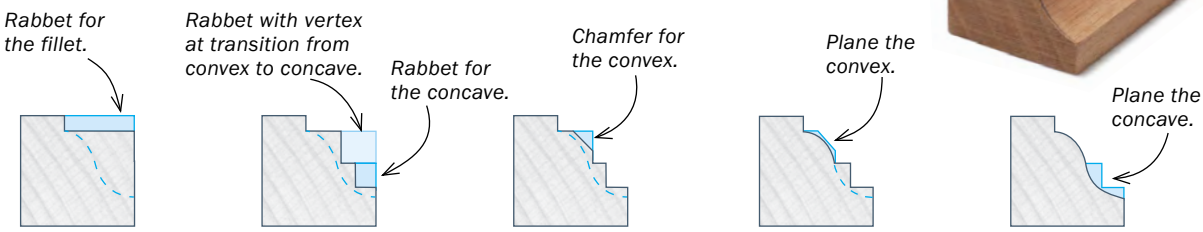
Guiding hollows and rounds

Hollow and round planes have no fence and no depth stop. This would seem to make them difficult to steer. And it's true the likelihood of balancing a hollow or round on the corner of a board and producing an acceptable molding profile is, conservatively, 0%. To cope with this, you create guides that serve as both fence and depth gauge.

To guide a round, cut a rabbet into the edge of the workpiece. The plane will sit in the rabbet, resting on its two corners, or arrises. As long as the plane is fully engaged with both points of contact throughout the cut, the profile it cuts

Creating the classic ogee

To make an ogee, cut adjacent concave and convex sections with a smooth transition. Ogees can be cut with matching or mixed hollow and round planes.



This time, start with the hollow. *Ride the chamfer and look for the full-width shaving to know when you're nearly done.*

will be predictable. The rabbet also acts as a depth gauge. When the rabbet disappears, the profile is complete (assuming the rabbet was sized properly). To change the orientation of the arc, change the dimensions of the rabbet.

The hollow is guided in a similar fashion, except that instead of riding in a rabbet, it straddles a chamfer. The two edges of the chamfer guide the hollow through the cut. And just as the rabbet serves as a depth gauge for the round, so does the chamfer for the hollow. When the chamfer has been planed away, the full profile is finished (provided the chamfer was correctly placed).

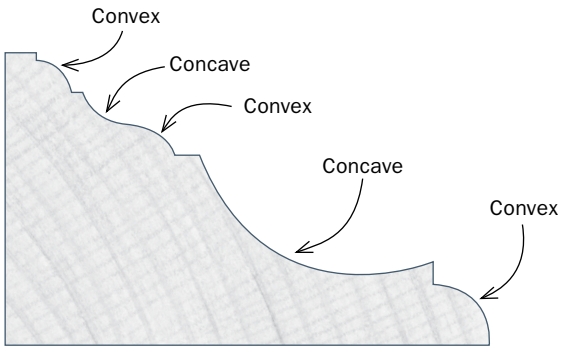
For both rabbets and chamfers the two points that the plane rides on should be about two-thirds the width of the plane's sole. Making them too close together defeats their purpose, and making them too far apart prevents the plane from registering properly. I cut the rabbets and chamfers at the tablesaw whenever it's reasonable; otherwise I cut them with a rabbet plane.

The lack of a fence and depth stop is actually advantageous. Each hollow or round only creates a specific arc. But rotating the plane with subsequent passes—which is possible because there's no fence or depth stop—allows you to cut a

Round follows hollow. *Progress as with a simple concave section, cutting until the guiding rabbet is gone.*

Complex moldings from simple profiles

By combining hollow and round planes of different widths you increase the possible molding variations exponentially.



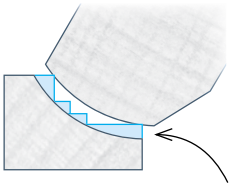
greater proportion of the same arc, and so create many more profiles. All sizes of hollows and rounds are guided and used with the same methods, simply scaled larger or smaller.

Cut complicated moldings curve by curve

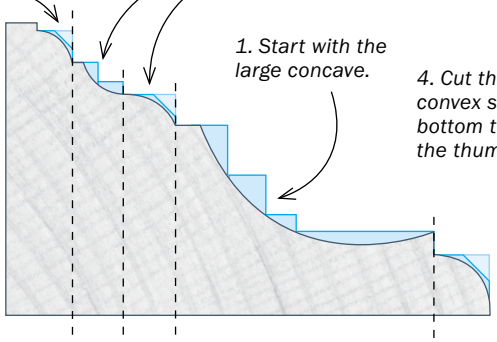
The highest hurdle to overcome with complex profiles is viewing them simply. Lay out a complex profile in its simplest form: a series of individual concavities and convexities. Break each portion of a profile apart by placing the vertex of a rabbet at every transition

TACKLE THE SHAPE ONE CURVE AT A TIME

A complex molding starts with an involved layout of rabbets and chamfers.



Additional rabbets may be added to remove more waste before planing.



Waste better. *After beveling the molding stock to remove most of the waste, cut the rabbets on the tablesaw with the blade tilted.*

Start with the hardest plane to push. *It's the one that cuts the largest profile, but it works just like its smaller brothers. Because this concave is a greater arc than the plane can cut in a single pass, you'll need to lay the plane over to complete the work (right).*

point. Then add the rabbets and chamfers to guide your rounds and hollows, same as before.

Complex profiles often demand more than a single pair of hollows and rounds. Most profiles do. Introduce additional pairs of hollows and rounds into your shop and exponentially increase your options. Not only will you be able to mix and match the hollow of one size with the round of another, but you will also be able to combine multiple hollows or multiple rounds to make elliptical shapes. But that's a subject for another article. □

Matt Bickford is author of Mouldings in Practice, *(2012, Lost Art Press). See more at msbickford.com.*

On to the ogee. *Cut the convex section of the ogee next. A sticking board with a high fence resists lateral pressure on the molding stock, which is gripped by benchdogs at both ends.*

Cut the small concave. *Then switch to a round and cut the small concave that finishes the ogee.*

Back to the hollow. *There's a small convex section framed by fillets at the top of the molding. Cut it next with the hollow (above). Then drop down to the bottom edge and cut the convex there to complete the molding (right).*