Hot sand was used to shade the maple plugs that Janet inlaid around the rim of this walnut platter.

INLAY TECHNIQUES FOR WOODTURNERS

Janet A. Collins

The objects we create as artisans are usually influenced by things we have seen. We see something we like—a shape, a decorative technique, or the use of a particular species of wood—and we incorporate these elements into our own work. I am no different. At North Bennet Street School in Boston, I studied traditional eighteenth- and nineteenth-century American furniture construction and decorative techniques. One of my favorite things to study and explore was inlay techniques from the various regions of the country. Variations in inlay is one way experts attribute a piece to a maker or region.

In the years since my training, I have incorporated inlay techniques in many pieces of furniture. Some of my inlays have been true to the original, but mostly I have put my own spin on the designs. I have recently been incorporating contrasting wood inlays into my woodturning. I will explain a few techniques in this article, along with their historic significance.

INVITED SYMPOSIUM DEMONSTRATOR

Janet A. Collins will be featured as one of the selected demonstrators at AAW's 2017 International Symposium in Kansas City, Missouri. For more, visit woodturner.org.

Shading plugs

The first technique is the use of hot sand to shade the wood inlay and create the illusion of depth and shape, as shown in the opening photo. Historically, this technique was used to shade a wide variety of species of wood for inlay, with the pieces assembled to create a design or image. John and Thomas Seymour were a father and son team of furniture makers working in the Boston area from 1793 to 1824. They produced some of the finest Federal-style furniture using distinct inlay in their pieces, including the lunette banding that is the inspiration for my sand-shaded disks.

I use hard maple for creating sand-shaded plugs, which are cut with tenon cutters from sidegrain (*Photos 1, 2*). Inlay should always be cut from facegrain or sidegrain. As inlay material, endgrain is unlikely to stay in place long-term,

especially when it is glued into facegrain or sidegrain. Also, endgrain will absorb more finish than surrounding side- or facegrain, which makes it darken more than surrounding areas.

A tenon cutter is chucked in the drill press and the blank is clamped to the table to keep it from moving. I usually cut several sizes of plugs from a milled maple block. I usually make only what I can use right away as the shape of the plugs can distort to oval if they are stored too long before use. The plugs are easy to remove from the blank with a chisel and mallet, or by tapping them to encourage the grain to separate from the base.

The next step is to scorch the plugs along their length. I heat sandbox sand, purchased from a home center store, in a cast iron skillet on a hot plate (*Photo 3*). I fill the skillet about three-quarters full of sand and place it over medium-high heat for ten minutes before verifying the sand is hot enough to scorch the wood. The sand will be hotter nearer the heat source, so mix the sand with a spoon to distribute the heat. The sand temperature needs to be quite hot to scorch the plugs deep enough to give the desired shading. Check the plug after a minute in the sand, returning it if it is not scorched enough. The size and number of plugs and the sand temperature determine the amount of time needed for scorching. It takes a little practice to identify a good temperature setting for the hot plate and to experiment with timing, but thereafter the process is quick and easy.

I monitor progress with a timer set to one-, two-, or three-minute intervals to assure I keep an eye on the plugs. If I start to see smoke, I know the plugs are scorching and should be checked regardless of time. It is possible to scorch the wood too much and ruin the plug, which will then simply crumble when cut and will no longer be round. Also, inattention can lead to the plugs catching fire, so best to not leave the pan unattended. I use tongs or tweezers to place and remove the plugs and avoid burning myself. Let the plugs cool before proceeding with the inlay. Once the sand has cooled, I store it in a plastic container for reuse.

Prepare the blank

My bowl or platter blank is kiln-dried wood, milled with parallel surfaces and with the diameter carefully cut on a bandsaw. This preparation minimizes the amount of wood removed during turning and after completing the inlay. I have inlayed my bowls both before and after turning and found inlaying prior to turning leads to better results. It is easier to hold the unturned blank steady on the drill press to drill for the inlay (*Photo 4*). It is important to keep track of how deep the inlay is set; I usually aim for ⅜" (10mm). The accompanying photos show 8/4 (5cm) cherry and walnut that have been milled to about 1⅞" (4.8cm) thick. The diameter of the piece is drawn on the blank with a compass prior to bandsawing, and a second circle is added to indicate the width of the rim, which is the area that will be inlayed. To provide a good "canvas," I aim for a 1¾" (4cm) rim for bowls less than 10" (25cm) in diameter, and about 2" (5cm) for larger forms. I sometimes draw the design on paper to be sure of the proportions.

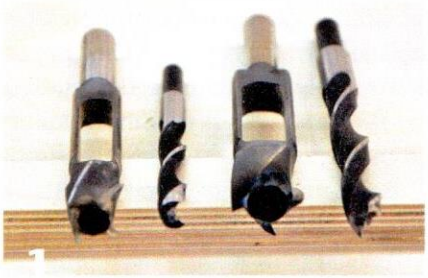
I use good quality brad-point bits to drill the holes for the shaded plugs. Test the drill bit on a scrap piece of ▸

Tips for Turning

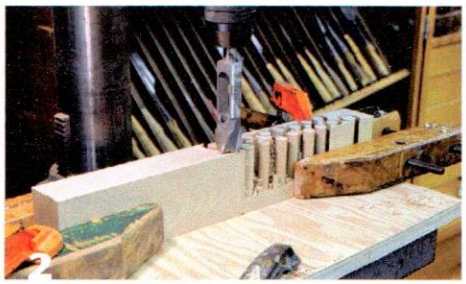
This article focuses on creating inlaid blanks, not the turning, but here are a few tips:

- The mounting method I use includes a screw chuck for turning the exterior and chuck jaws gripping a foot or tenon to turn the interior.
- I start by truing the blank, then lightly shear-scraping and sanding the top of the inlayed rim, making it gently concave while recalling the depth of the inlay.
- I then turn the exterior, then interior of the bowl.
- The depth of the inlay limits the thickness of the rim, so it is critical to know how deep the inlay has been set. It is no fun to see the bottom of the inlay appear on the underside of the rim.
- Avoid any temptation to cut the rim after the bowl has been hollowed, as the rim is not sufficiently supported once the center wood has been removed.

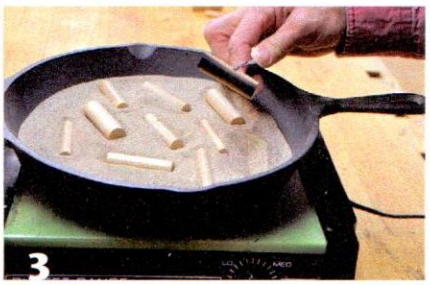
Prepare plugs for shaded inlay



Tenon cutters are capable of producing long plugs in side- or facegrain, and brad point bits of matching diameters cut clean holes to receive the plugs.

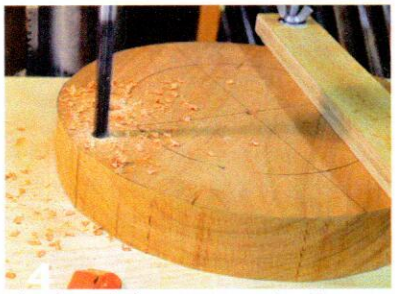


A single board can yield many plugs of varying diameters, and each plug may yield two or more pieces for inlay.

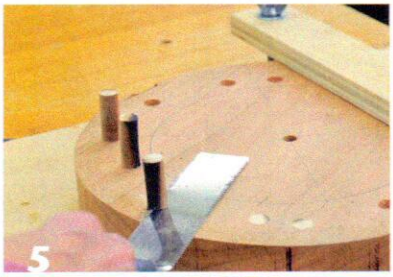


The plugs are carefully monitored as they are embedded in hot sand for shading. Watch closely to avoid over-scorching and keep the work area clear of flammable materials.

Drill holes, glue in shaded plugs



Cleanly cut holes ensure a perfect fit, so use a drill press for this step. A sharp drill bit, a shopmade holding jig, and additional clamps ensure quality holes for inlay.



Flush-cut the first round of inlayed plugs after the adhesive has set, then return to the drill press for more holes. When you are satisfied with the inlay pattern, the next step is turning.

Stringing inlay

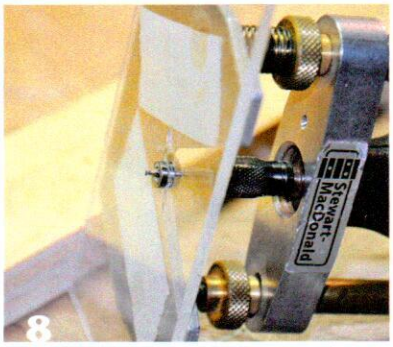
An alternative to the round plug is straight (or curved) linear inlay.

wood to make sure the fit of the plugs is exact. Once I match the drill bit to the plug cutter, the drill bits are never used for anything else. I replace the drill bit when it no longer cuts cleanly.

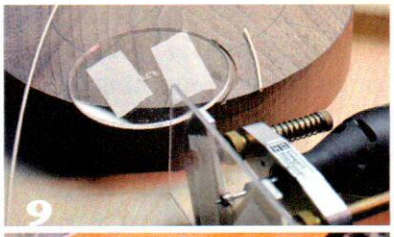
I built a simple jig to hold the bowl blank on the drill press and on the bench; glimpses of the jig can be seen in *Photos 4, 5,* and *10*. A plywood strip attaches to a wider base with long carriage bolts and wing nuts, functioning as a clamping mechanism. The jig base can be clamped to the bench or the drill press and the wood blank quickly rotated by loosening and re-tightening the wing nuts.

I drill a series of holes scattered at random around the rim to accept the inlayed plugs. I keep the holes at least a ¼" (6mm) from the outer edge and about ⅛" (3mm) from the inner edge of the rim to avoid cutting through the side of the plugs on either edge of the rim while turning. I fill the hole with wood glue and tap the plug into place with a mallet. I am conscious of where the shading occurs on each plug and like the look created by varying the orientation. I let the glue dry for about twenty minutes and then cut the protruding plugs with a flush-cutting handsaw (*Photo 5*). Then it is back to the drill press to drill more holes, either of the same or a different diameter (*Photo 6*). When the glue is completely dry, the plug can be drilled to place a smaller plug or to partially overlap plugs. Once I am happy with the pattern, the blank is ready to turn.

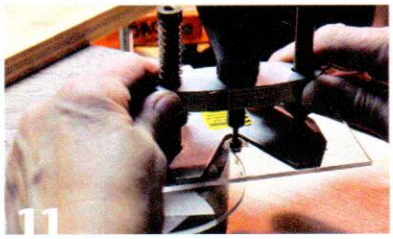
Cut the inlay grooves



A shopmade router base and guide cut the grooves for the inlay.



With small, flexible strips of veneer or solid wood as inlay material, curved or straight lines are possible, depending on the shape of template used to guide the router.



To cut safely and avoid tearout, the router needs to be running, and it needs to engage the guide before contacting the blank.

Line or stringing inlay

Another form of inlay that I use on my bowls and platters incorporates a geometric design created by a wood strip or a line of veneer inlaid into a groove cut in the wood (*Photo 7*). The inlay can be straight, curved, or a combination of both. This form of inlay is based on designs found on eighteenth-century furniture made in most regions of the United States. Line and berry is a highly decorative, geometric form of this inlay found in furniture made in the Chester County, Pennsylvania, area in the eighteenth century. Makers from this region included contrasting plugs of wood with the lines or stringing designs.

Prep the blank and inlay material

I use a Dremel with a shopmade base and a ⅛" (4mm) spiral bit to inlay veneer

of the same thickness. I buy ⅛"-thick holly (preferably) or maple veneer. I cut the veneer into strips on my table saw, using a 1/16" (2mm) thin-kerf blade and a zero-clearance insert to prevent strips slipping between the blade and the insert. I use a block of wood with adhesive-backed abrasive to hold the veneer down and against the fence, cutting the veneer into approximately 3/16"- (5mm-) wide strips. The veneer can also be cut using a veneer saw or razor cutter.

For wider inlay pieces, I use a laminate trimmer with a ⅛" spiral bit to cut grooves in the rim of the blank. I mill wood to ¼" thick, the depth to which the inlay is placed. I cut the ¼"-thick wood into strips on my table saw, again with a zero-clearance insert. I use a wood push stick to guide the material against the fence and cut it into ⅛" strips. A bandsaw with a fence can also be used to cut both the veneer and the ¼"-thick material. If I use the bandsaw, I cover the throat plate with masking tape to eliminate gaps for small pieces to fall through.

My Dremel is outfitted with a router base purchased from a lutherie supplier. I have attached a 3" × 5" (8cm × 13cm) piece of ⅛" acrylic to the base with double-sided tape (*Photo 8*). Prior to attaching the base, I drilled a ¼" hole in the center of the acrylic and glued in a section of a ¼" spring pin using cyanoacrylate. This spring pin section acts as a guide against a template, and it should not project out of the base farther than the thickness of the template. I have it projecting out less than ⅛", as I use ⅛" acrylic for my templates. I have access to a laser cutter and have made several different templates from ⅛" acrylic that I use to create the curved lines on rims. I have also made templates from ⅛" plywood, cutting the shape on the bandsaw and sanding the edges smooth. I use strong double-sided tape to hold the template in place while cutting the grooves for the inlay (*Photo 9*).

A simple jig speeds cutting

For a design utilizing a straight line, I use a straight-sided template for the Dremel to follow. When I use the laminate trimmer with the ⅛" cutter, I simply clamp a straightedge across the blank, off-setting the guide the distance of the router base to the edge of the cutter to place the line.

A simple jig to accomplish this task can be made from two identical strips of plywood, acrylic, or medium-density fiberboard (MDF). The length of the jigs should span the turning blank with a few inches extending beyond both sides. The width of the jigs should be the same as the distance from the edge of the router bit to the outside of the router base. The strips I use with my laminate trimmer and ⅛" spiral bit are 16" × 2⅝" × ¼" (41cm × 7cm × 6mm).

In use, the first strip determines the router's cutting offset; the second strip becomes the guide fence. I set one strip where I want the inlay on the rim and butt the second strip against the back of the first strip. I clamp the second strip down to become my router guide for placing the groove in the chosen location. The hold-down bar on the previously described clamping jig can also be used in a similar fashion to both hold the blank in place and guide the laminate trimmer (*Photo 10*).

My guide or pattern extends beyond the area being routed. This allows the laminate trimmer base or template guide of the Dremel to come in contact with the fence before coming into contact with the wood (*Photo 11*).

Set the inlay

I glue the inlay in as deep a groove as I can while still leaving it flush or slightly proud of the top surface by no more than a 1/32" (1mm). The deeper the inlay, the more adjacent wood can be removed or shaped. With the inlay slightly proud, I can apply clamping pressure to ensure the inlay is fully seated in the groove. The ends of this inlay will be seen at the inside and outside edges of the rim. If the inlay is not fully seated, a gap will be visible at the bottom edge. To avoid this problem, I built a clamping press (*see Build a Clamping Press sidebar*).

I will cut several grooves, glue in the material using wood glue, and clamp the blank in the press for about twenty minutes. Before cutting more grooves for inlay, I will level the inlay that is proud of the surface with a block plane. Otherwise, inlay protruding above the surface will interfere with accurately cutting the depth of the next set of grooves. I always fill a groove with inlay before cutting a second groove across it, a step that reduces the risk of tearout and avoids weakened walls. This step also produces a cleaner look than trying to neatly join pieces of inlay in a groove (*Photo 12*).

The techniques in this article are just two examples of hundreds of possibilities inspired by early furniture makers. I hope they will start you on a path of exploration and lead you to your own discoveries for unique rim decorations. ■

Curved lines evoke movement

The combination of curved inlay intersecting the curvature of the rim embodies energy and creates a dynamic form.

Janet A. Collins has been a furniture maker, woodturner, and teacher since graduating from the North Bennet Street School furniture-making program in the mid-1990s. Her shop is located in a barn at her home in Ryegate, Vermont, and she teaches woodworking full time at Dartmouth College in Hanover, New Hampshire. Janet's work can be seen at greenmountainwoodturning.com.