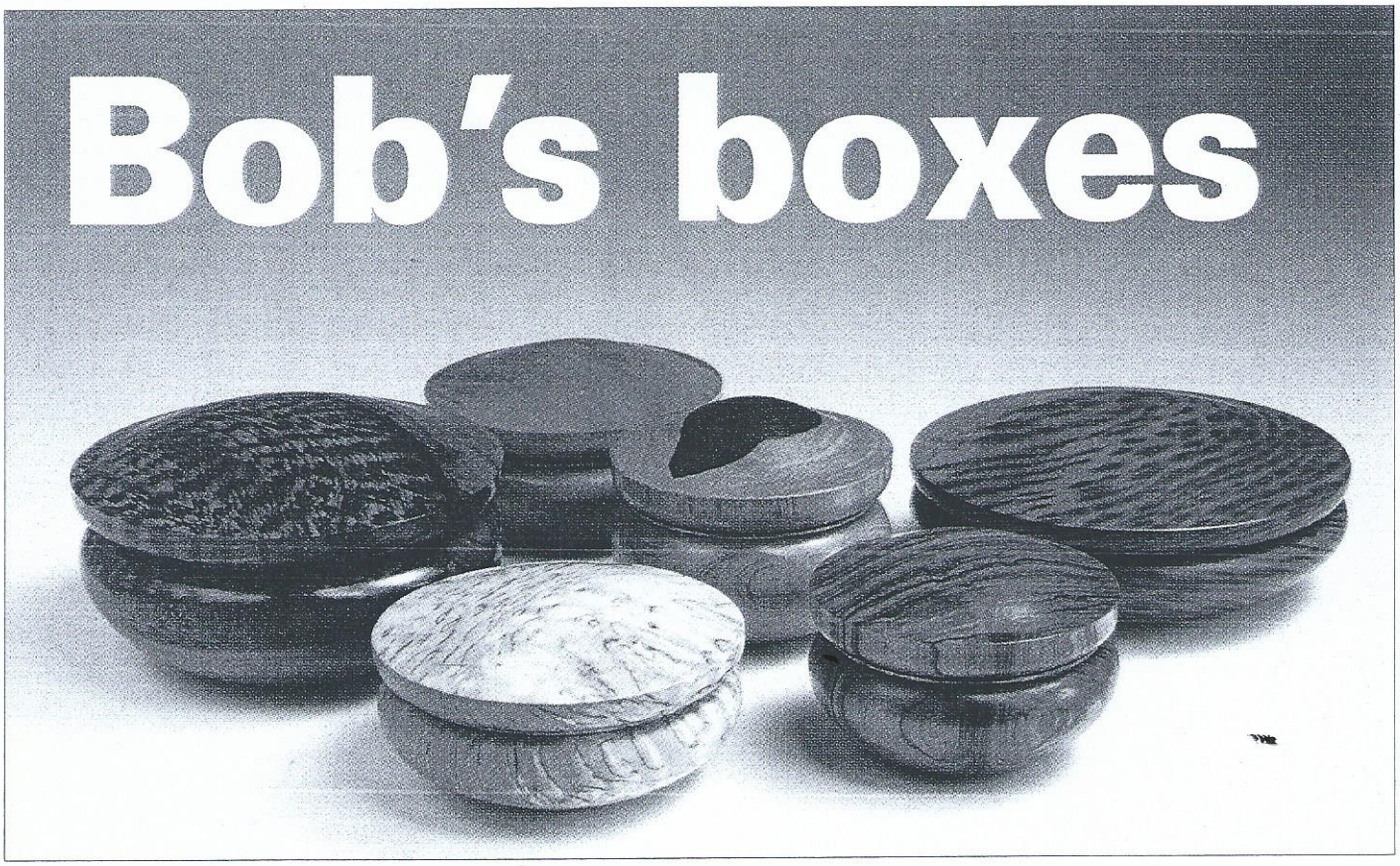
Bob's boxes



Domed boxes in (clockwise from left) snakewood *(Piratinera guianensis)*, pink ivory *(Berchemia zeyheri)*, lignum vitae *(Guaiacum officinale)*, striped Australian myrtle *(Nothofagus cunninghamii)*, Brazilian tulipwood *(Dalbergia frutescens)*, and masur birch *(Betula alba)*.

In the second of his box-making articles, ***Bob Chapman*** tells how to make one with a dome

Last month I told you how to make square-lidded pots. This month, provided you still have skin on your knuckles, you might like to try a more traditional domed box, without corners.

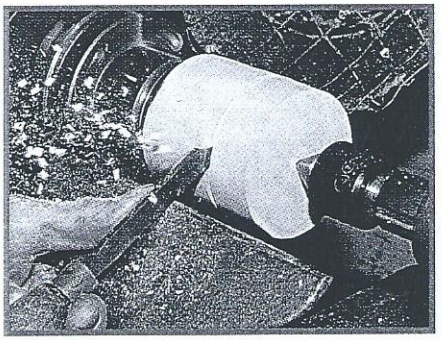
Again, I am using only a basic selection of tools. Start by cutting a piece of wood 64 to 75mm long (2 ½-3in) from 75mm square section with the grain running lengthways.

You can use a blank with the grain running across, as in bowl turning, but you will have to adjust the direction of cut at some stages to go with the grain.

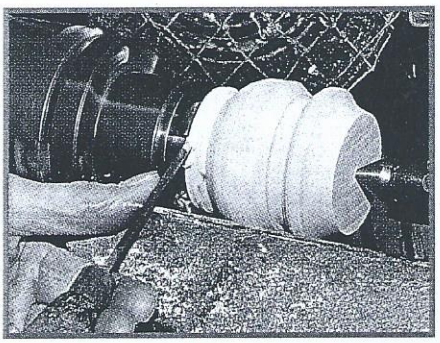
Mount your blank – I'm using European ash *(Fraxinus excelsior)* – between centres. I use the BCWA (Bob Chapman Woodturning Accessories) 64mm (2 ½in) Multi jaws, fitted with the large two-prong drive, as I take fairly aggressive cuts. But you could use an ordinary four-prong drive and take it easy.

Round the blank with a 19mm (¾in) spindle roughing gouge. Then, two-thirds up from its base, where the box's two parts will be separated, turn a groove about 10mm, ⅜in deep, using a 3mm (⅛in) parting tool. Open out the groove to 8mm (5/16in) wide – this will later become the lip for fitting the lid.

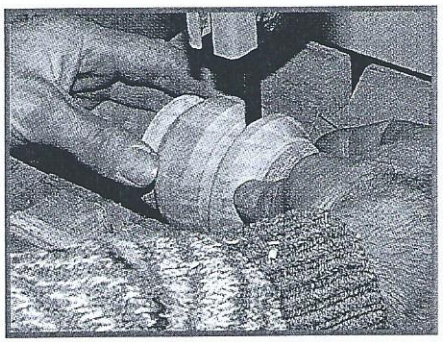
Moving on to what will become the lid of the box, rough turn a slightly concave surface from a point about 13mm (½in) to the right of the recess. For this, I use a 10mm (⅜in) spindle



Mounted between centres, the blank is trued and the position on the lip established with a parting tool.

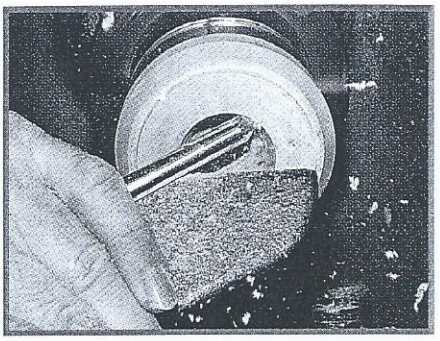


After the outside of the box has been roughed to shape, spigots for the chuck jaws are cut at both ends. The size of the spigot is easily gauged when the chuck is holding the drive points.



Parting the lid from the base is completed on the bandsaw, a v-block stopping the box from rolling under the blade.

Hollowing the base with this advanced cut starts with the spindle gouge cutting at the top of the hole...



...as the hollow widens the gouge is rotated until it is almost upside-down. The cut scoops up towards the rim.

gouge, working from the largest diameter down to the smallest to work with the grain.

Continue until the smaller diameter is down to about 57mm (2 ¼in) at the furthest edge. A dovetail fitting will be turned on the end later.

Still using the ⅜in spindle gouge, rough turn a convex surface on the base of the box. From a point about 13mm (½in) to the left of the lip recess, turn a smooth curve down to a diameter of approximately 57mm (2 ¼in) and leave a shoulder about 3mm (⅛in) wide for a dovetail to fit your chuck.

The edges of the lip recess are chamfered 45° to about 3mm (⅛in) wide before moving on to turn the dovetail mountings. Using a ⅛in parting tool turn a small 15° shoulder on the base of the box, to be held in the chuck jaws later.

Advantage

One advantage of holding the driving centre in the chuck jaws is you can see the size the dovetail needs to be without measuring, as you are working adjacent to the jaws.

If you are using a collet style chucks, measure the size of the shoulder to suit. Turn another shoulder of the same size on the lid.

Lid and body can now be parted. I use the BCWA 2.4mm (3/32in) fluted parting tool so that I don't remove too much wood and seriously misalign the match of figure between lid and base. Enter the tool to the right-hand side of the recess, away from the lid's base. This leaves a 'witness' step of the lip diameter attached to the lid to act as an aid later.

Stop the parting cut at about 13mm (½in) diameter and remove the work from the lathe. Saw the remaining wood to separate the pieces.

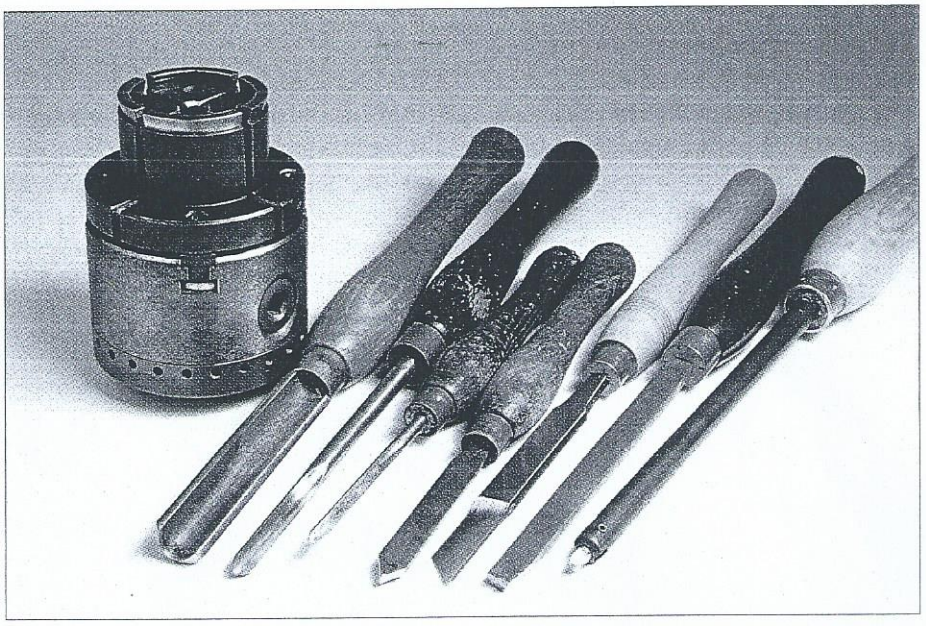
If you are doing this on the bandsaw, make sure you use a V-block to prevent the work rolling into the blade, as with any round section work. The base of the box is now remounted on the lathe, this time in the chuck. Position the toolrest across the work face and, using a 10mm (⅜in) spindle gouge, drill a hole to depth for the hollow.

Remember you are only roughing the box, so leave about 10mm (⅜in) thickness in the base at this stage.

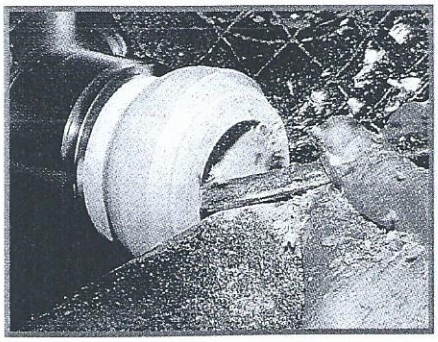
After drilling the hole, open out the box, still using the spindle gouge. I prefer to push the gouge a short way into the hole with the flute angled away from me at 45° and the handle held horizontal also at 45° from the work face.

Begin hollowing by lowering the handle and rotating the flute further away from you as you drop the handle and bring it towards you. At the end of the cut the tip of the tool should be at about 2 o'clock, with the flute pointing down.

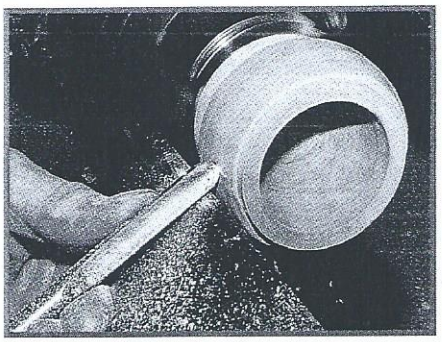
Hollowing end grain wood in this way is very efficient, as you are producing a true cutting action instead ➤



Tools used for this project: Axminster four-jaw chuck with BCWA Multi jaws, 19mm (¾in) spindle roughing gouge, 10mm (⅜in) spindle gouge, 6mm (¼in) spindle gouge, 3mm (⅛in) parting tool, 2.4mm (3/32in) fluted parting tool, 13mm (½in) square-ended scraper, 6mm (¼in) shear scraper.



For more controlled hollowing the spindle gouge is used in a scraping fashion.



The outside is shaped with the spindle gouge on its side to give a fine cut.

➤ of scraping. If you are using cross-grained timber, remember to reverse the direction of cut to start at the edge of the box and work into the middle, as if turning a bowl.

This type of cut needs practice, so beginners should use the spindle gouge like a scraper to hollow the box. Hold the gouge with the flute facing you at 45°, enter the hole with the handle just below horizontal and push it away from you, removing wood in small scraping cuts.

Continue to hollow until you are within 6mm (¼in) of the lip, then remove the base from the lathe.

Hollow lid

Remount the top of the box, again in the chuck jaws, and turn a hollow in the lid using the same method as for the base. Leave about 10mm (⅜in) thickness in the top of the lid.

When opening out the hollow's diameter, stop about 6mm (¼in) short of the small witness step on the face of the work – the tiny witness of the shoulder left when parting the halves.

Once roughed out, leave your box in a dry atmosphere to stabilise and complete seasoning. Even dry wood needs time to adjust and to allow stresses in the wood to be released. Without it, the lid may not fit correctly later. When the box has dried and stabilised, remount the base in the chuck. Position the toolrest parallel with the lathe bed. Using a 10mm (⅜in) spindle gouge, true up the box's diameter with the flute of the gouge angled at 90° to produce a finer peeling cut. Turn a 8mm (⅝in) radius from the outer diameter down towards the lip, leaving a step of about 1.5mm (1⁄16in) wide and 3mm (⅛in) just below the lip.

Now turn a gentle curve towards the base, stopping clear of the jaws by around 6mm (¼in) for safety. The lip is now re-turned, with a 3mm (⅛in) parting tool. Ensure the lip edges are true and parallel, or the lid won't fit snugly.

Using the 2.4mm (3⁄32in) fluted parting tool, turn a bead on the small 1.5mm (1⁄16in) wide step left earlier, just below the lip. The bead is an important feature, making a definite break between the top and base.

As the bead is to be smaller than the parting tool used to form it, roll the top of the blade slightly from left to right as you finish the cut and this will reduce it to the correct size.

With the toolrest moved across the work face, true the top surface of the shoulder using a spindle gouge, before re-turning the inside.

Provided you roughed out enough earlier, you will now need to remove little wood, so use a spindle gouge in the scraping action described earlier.

Lightly clean the inside to bring it back into round. To give the box a balanced feel, aim for a base thickness of just over 5mm (⅜in), as the underside of the box still needs to be finished. Slightly undercut the side to remove excess weight. The box's lip should now be only 3mm (⅛in) wide.

Refine the surface finish with a BCWA 6mm (¼in) carbide shear scraper, for a very fine finish. If you don't have one of these tools, use a 13mm (½in) round nose scraper, held with the cutting edge facing towards you at about 30° from the vertical. Start the tool at the centre and slowly draw the cut around to the edge of the hollow, taking the finest of cuts.

Sand base

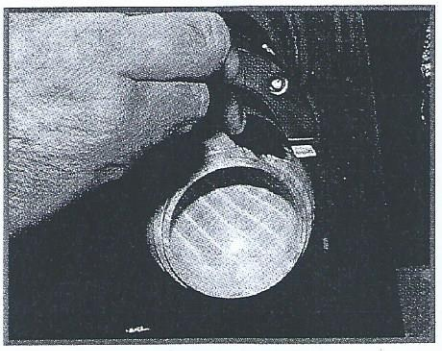
You can now sand the upper areas of the box's base. Take care not to damage the finely turned bead detail. Apply your preferred finish and polish before removing from the lathe.

Remount the lid in the jaws and position the toolrest parallel to the bed of the lathe. Using a 10mm (⅜in) spindle gouge, re-turn the diameter of the lid, then cut a 6mm (¼in) radius on the edge down towards the recess.

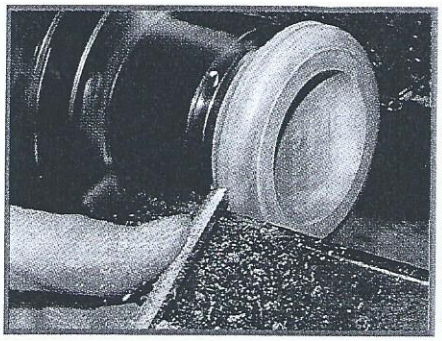
On the outer diameter next to this radius, use a 6mm (¼in) spindle gouge to turn a small concave groove about 5mm (⅜in) wide by 0.8mm (1⁄32in) deep. This will cast a shadow on the box, accentuating the lid.

Move the toolrest across the face of the work and, using a 13mm (½in) scraper ground with a 90° form set at 10° to the tool, turn the recess that will locate on the lip on the box's base.

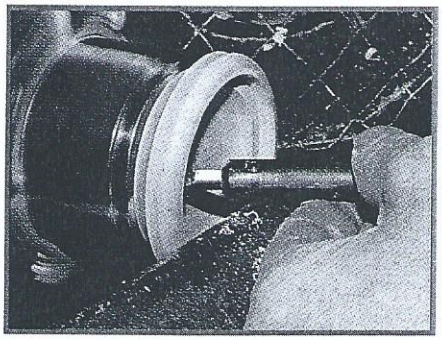
Rolling the fluted parting tool to cut a small bead just below the lip.



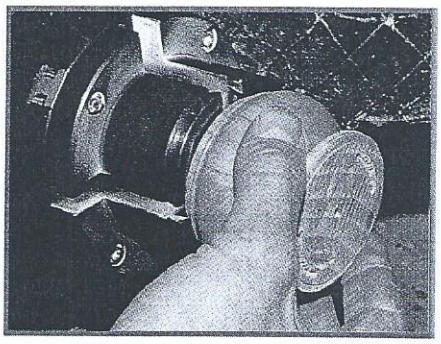
As finish is applied, the proportions of the completed hollow and the lip can be seen.



The roughed lid returned to the lathe. The 'witness' step can be seen round the hollow. The outside of the lid is shaped with a bead flowing into a shallow cove.



After the recess for the lip has been cut, the hollow is finished by shear scraping. Note the hard transition between lip recess and hollow.



Remounting the base to turn off the foot. The scroll chuck jaws are gently expanded into the hollow, or a jam chuck could be made if you don't have a scroll chuck.

When turning part of a box or pot that has to fit closely to another part, always start with a shallow cut, about 0.8mm (1/32in) deep. Open this out to the correct diameter, checking it against its mating part until the correct fit is achieved.

Mistakes

By keeping this first cut shallow, a mistake can be easily rectified. If you work to the full depth of the recess in one go, there are no second chances.

Once the diameter of the lid recess is just big enough to fit over the lip on the base of the box, go deeper, to a depth slightly more than the shoulder, so that the halves fit perfectly when seen from the side.

Then have one last scraping from the diameter of the recess to ease the fit slightly without making it sloppy.

Re-turn the lid's hollow with a spindle gouge, as for the base of the box. Keep the top of the lid about 5mm (3/16in) thick, so the recess is left with a step about 3mm (1/8in) wide.

Refine the surface with the shear scraper, as before, to leave a hard join between the hollow and the recess, creating a crisp look. Sand and polish before removing from the lathe.

Remount the base in the chuck jaws, but this time with the box lid held lightly. If you are using a collet chuck, you may not be able to mount the base in this way – it will depend on the shoulder's diameter.

If it can't be mounted, when sizing the lid recess to fit the base, turn it to give a good push fit and use the lid as a jam chuck to hold the base. If the fit is loose, tighten by sandwiching paper cloth between the halves.

Position the toolrest across the base at 30° and using the spindle gouge turn away the dovetail fitting. If you are using the jam chuck method, take only small cuts so the base doesn't slip, or the friction will burn both halves of the wood's surface. Round off the base to blend with the radius part-turned earlier.

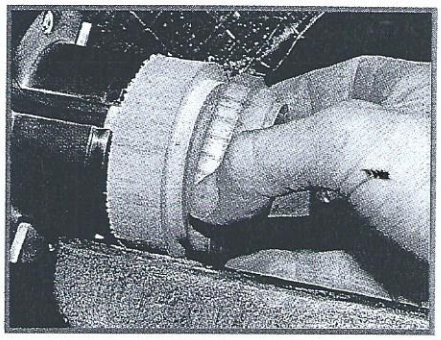
Make sure you turn the centre of the box either flat or slightly concave, so it will stand well when finished. Use the 6mm (1/4in) spindle gouge for these final cuts. Sand and polish before removing from the lathe.

Jam chuck

After finishing the base, hold the lid in the chuck, expanding the jaws into the lip recess. If you are working with a collet chuck, mount scrapwood on the lathe and turn a 3mm (1/8in) wide shoulder to fit the recess. Use this as a jam chuck to drive the work.

With the toolrest positioned at 30° across the top of the lid, turn the dovetail fitting away with the spindle gouge. Finish turn the top with this gouge, starting from the edge in a slightly concave direction and blending into a gentle convex surface towards the centre. Continue until the edge has a hard corner meeting the small concave groove in the outer diameter turned earlier.

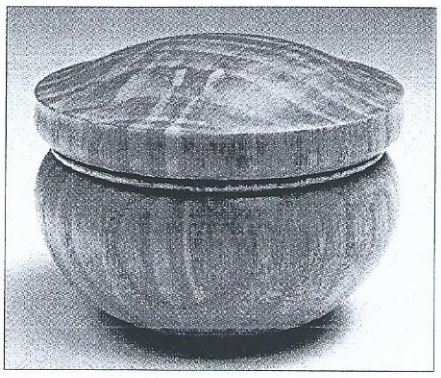
Finally, sand the lid, taking care not to remove detail on the corners. Be aware of heat building up on the surface, as you will be sanding end grained timber and heat shakes are likely. Polish and wax before removing the lid from the lathe.



The lid can be held on a jam chuck to shape the top surface.

There are an infinite number of similar designs you can try, using the basic techniques described. Texture could be added, for example, by carving the surface, or you could inlay the lid. See what develops. ■

Workshop photos: John Chapman



Shallow coves on the finished dome box accentuate the corner on the lid. The bead highlights the joint between lid and base.