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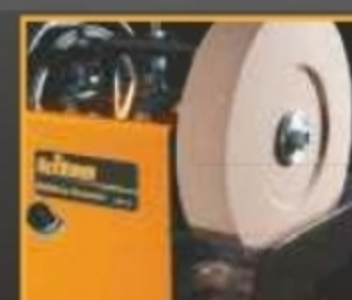
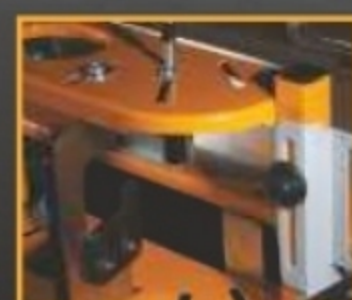
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WELCOME

The last time Practical Woodworking covered woodturning, we set about enthusing you with the UK's most popular woodworking discipline, advising you about equipment and how to use it effectively before getting you started with a few simple projects. This time we know we're preaching to the converted, and if you are anything like the turners we know and love, you will be champing at the bit to explore this fascinating hobby. So the collection of techniques and projects here has been chosen to advance your skills and, if you like, set you on a journey that you will enjoy travelling for the rest of your woodworking life.

To that end we're harking back to the way that the craftsmen's guilds trained youngsters, rising from humble apprentice to Master Craftsman... or Turner, in this case. To help you to attain the giddy height of Master Turner we present projects and techniques by some of the best turners in the country, designed to introduce important techniques. For example, Colin Simpson's fruit bowl introduces texturing methods at apprentice level, while Alan Holtham focuses on specialised texturing tools for the journeyman.

We also explore long-hole boring, multi-centred techniques, the importance of grain matching, hollowing branch wood, copy turning, thread chasing, cutting and pasting, wet wood turning, turning bowls square, indexing, avoiding distortion, and tackling segmented work.

Enjoy!

Andrea Hargreaves



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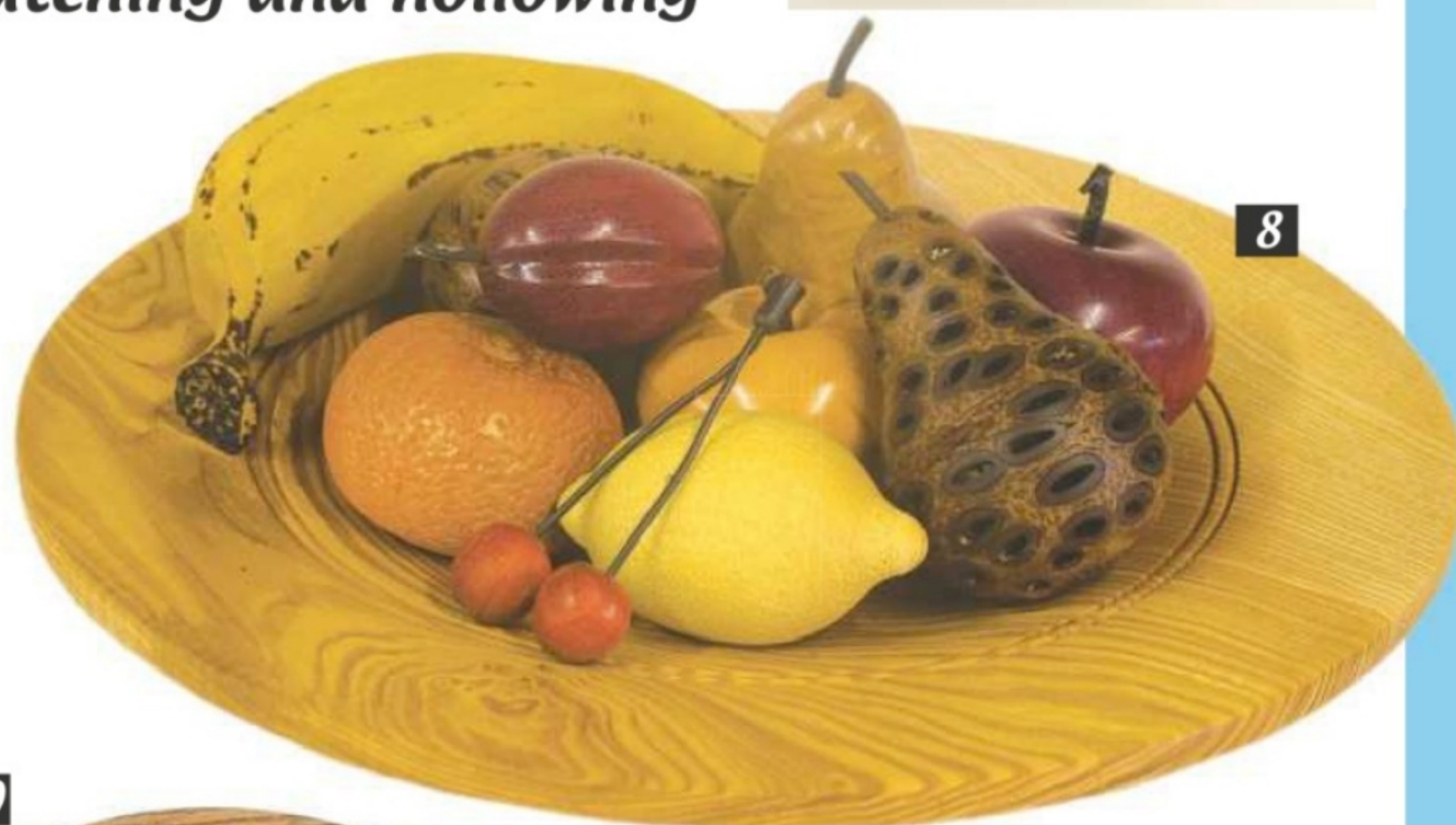


Apprentice

In this opening section we aim to give you a series of projects designed to furnish you with the basic principles of woodturning. Colin Smith's fruit is ripe with techniques and we also look at long-hole boring, multi-centred turning, grain matching and hollowing branch wood.



8



30



25



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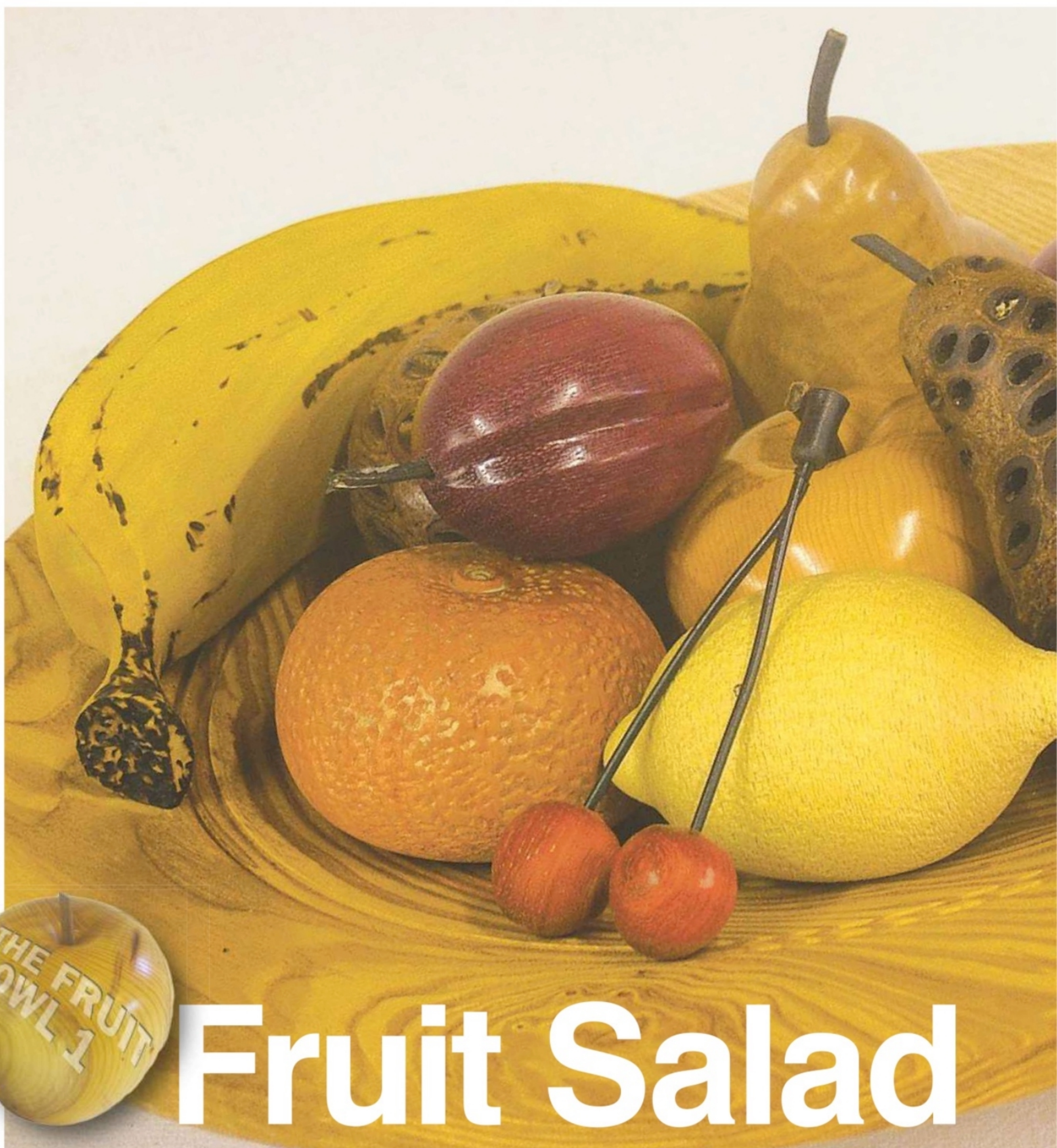


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Fruit Salad



BY COLIN
SIMPSON

In this exercise Colin Simpson shows you how to make a simple screw chuck, turn and texture fruit and make a bowl to display it all in

To make the screwchuck you'll need a hardwood offcut 70mm square and 25mm thick. Mount the stock between centres and turn it to a cylinder using the spindle roughing gouge, **photo 1**. I try to make my screwchucks for fruit apple-sized, roughly 68mm in diameter.

Square all round

Next, square off the side of the blank nearest the tailstock, using a parting



tool or skew chisel on its side, and turn a spigot to fit your chuck's jaws. In my case the spigot is 38mm and I'm using a skew. This peeling cut with the skew will automatically produce a dovetailed spigot, **photo 2**.

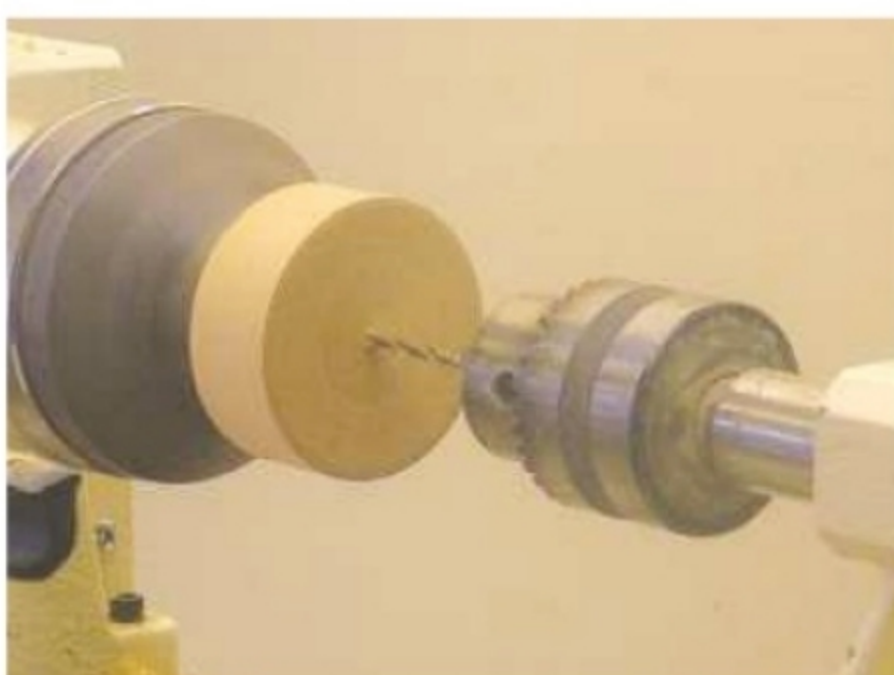
Remove the blank from the lathe, replace the four-prong drive with your chuck and remount the blank in it using the spigot you have just cut. Square off the exposed face of the blank and accurately mark a small indentation



1. Turn the square to a cylinder using a spindle roughing gouge



2. Cut a spigot using a skew chisel on its side to make a peeling cut



3. Use the Jacobs chuck in the tailstock to bore a 4mm hole through the blank



4. Start shaping the top of the apple using a 3/8in spindle gouge



5. Finish shaping the top of the apple with the same spindle gouge



6. Use the bottom wing of the gouge to blend in the curve

exactly in the blank's centre using the long point of a skew chisel. It is vital that this face is exactly square and flat – or, preferably, slightly concave. If it's convex, anything held on the screwchuck is likely to wobble.

Bore and screw

Load a 4mm drill bit into a Jacobs chuck in the tailstock and carefully bore a hole right the way through the blank. The small indentation helps to align the drill bit initially, but slow progress is necessary to ensure that the drill bit doesn't wander off centre, **photo 3**.

The screw chuck is now complete with the addition of a No.8 x 60mm screw. I use Robertson round-head square-drive screws for this; I find they have a longer life than Phillips-head screws because they're less likely to cam out.

You can visit www.squarescrews.co.uk for more details.

An apple a day

You'll need a piece of wood about 68mm square and 62mm thick. Almost any wood will do, but I find yew to be one of the most popular sellers, particularly if you can include some sapwood.

It's important that at least one end is square to the sides, as it's going to be mounted on the screwchuck. If you don't have a square end, mount the blank between centres in order to square it up.

Find the centre of the square end by using the corner-to-corner method and bore a 3.5mm pilot hole in the centre; then screw it onto the screw chuck. Mount the piece on the lathe and bring up the tailstock for additional support. Turn it down to a cylinder using a spindle roughing gouge.

Taking shape

Photo 4 shows the initial shaping of the top of the apple using a $\frac{3}{8}$ in spindle gouge. Don't do too much shaping to the bottom part of the apple – the end nearest the screwchuck – as we still need the wood here to give a firm hold on the chuck.

When you've shaped as much of the top as you can, stop the lathe and remove the tailstock. This allows access to the very top of the apple, which is again shaped using the $\frac{3}{8}$ in spindle gouge, **photo 5**.

I'm using the tip of the tool to make the cut. Now turn the tool over to use the bottom wing to blend in the shape, using a pulling action, **photo 6**. Note that this photo also shows that there is enough wood at the bottom of the apple left to

still have a reassuringly good hold on the chuck.

The other half

When the shaping of the top is complete, bore a 3.5mm-diameter hole in the top of the apple where the stalk will eventually go, using a Jacobs chuck mounted in the tailstock. Sand the top of the apple to 600 grit and, if you intend using sanding sealer and wax to finish the piece, apply this now to the top half.

Remove the apple from the screw chuck and mount a soft foam pad onto the screw before remounting the apple using the stalk's hole that you have just bored, **photo 7**. This will help to protect the work surface. Bring the tailstock up again for support and shape the bottom of the apple, again using the $\frac{3}{8}$ in spindle

gouge as you did for the top. I like to keep the tailstock in place for as long as possible during this operation, removing it only to complete shaping the very bottom, **photo 8**.

I think apples look better if the widest part is not at the halfway point. Try to make the widest part about one third of the way down from the top, and aim to get a smooth, gentle flowing curve all the way round the body of the fruit.

When you're happy with the shape, sand the bottom half – making sure to blend it into the already sanded area – and apply sanding sealer and wax as before, if this is your choice of finish.

A good shine

I like to spray my fruit with an acrylic lacquer. I do this off the lathe by holding



8. Use the $\frac{3}{8}$ in spindle gouge to shape the bottom of the apple



10. Use a buffing wheel held on a pig's tail to polish the apple



11. To make the pear, mount the banksia nut on the screwchuck ready for shaping

7. Reverse the blank, using a foam pad to protect the surface



9. Hold the finished apple on a wire and spray on acrylic lacquer



12. Start shaping the pear using a spindle gouge as before

the piece on a strong wire, **photo 9**. Apply a couple of coats, leaving the piece to dry in between; then buff up using a buffing wheel on the lathe, **photo 10**. I know this finish is more time-consuming to apply, but it's far more durable than a wax finish, particularly if the fruit is going to be handled a lot.

Making a pear

Again, almost any wood is suitable for pears, but if you want a reasonably realistic pear, robinia (the pseudo or false acacia) is a good choice of wood. You'll need a blank that's approximately 65mm square by 85mm long.

For something slightly different, I'm going to use a banksia nut instead. These aren't really nuts at all, but the seed pods of the Banksia Grandis tree

from Western Australia. They're fun to turn, but initially the outside of the nut comes off the tool in small chippings rather than shavings. Once you get below the outside 'crust' you should achieve proper shavings.

Full of holes

Photo 11 shows the banksia nut topped and tailed and mounted on the screw chuck. The tailstock is again used for additional security. Take the gentle cuts initially – I'm using a ½in spindle gouge – and bring the piece to a cylinder before starting to shape the bottom half of the pear, **photo 12**. Remember to keep enough wood in touch with the chuck to make a secure holding.

As with the apple, remove the tailstock to complete the shaping of the bottom

of the pear, using the same cuts as used on the apple, then sand to a fine finish, **photo 13**. Before removing the pear from the screw chuck, bore a 3.5mm hole in the very bottom. I'm holding the Jacobs chuck freehand, but if you prefer you can put the Jacobs chuck in the tailstock, **photo 14**.

Now reverse the piece on the chuck, using the soft foam pad as before to protect the sanded area, and turn the top of the pear in the same way as the apple.

When you're happy with the shape, **photo 15**, sand it and apply the finish of your choice. I like to use lemon oil on banksia nuts, **photo 16**.

Natural stalks

I used to turn stalks for fruit, but found that they were often a little fragile and broke off all too easily. You could raid the garden shrubbery and cut off suitable small twigs to use as stalks. For my part, I find small lengths of willow – as used in wicker work – ideal.

Cut a piece about 25mm long at an angle and glue it in place using superglue. A clove from your spice rack glued into the bottom of the fruit makes a very realistic calyx, **photo 17**. The main picture shows the two pieces and the rest of the collection, complete with stalks.



13. Sand with your fingers flat on the underside of the work; remove the toolrest first



14. Bore a hole in the bottom of the pear with a hand-held drill bit



15. Use the ¾in spindle gouge to shape the top of the pear



16. Mount the pear on a wire and apply lemon oil with a brush

17. A clove in the base of the pear creates a realistic calyx



Citrus texture

Let's start with the lemon. *Pau amarillo* is a good choice of wood to use for lemons, as it's naturally yellow. You'll need a piece 50mm (2in) square and about 100mm (4in) long. Mount the piece between centres and turn it down to a cylinder using a spindle roughing gouge, **photo 1**. Next, turn a spigot to fit your chuck at the tailstock end using a peeling cut with a skew chisel. Remove the piece from the lathe and replace the drive centre with your chuck.

The lemon takes shape

Mount the lemon blank in the chuck using the spigot you've just turned. Now start shaping the lemon with a $\frac{3}{8}$ in spindle gouge, **photo 2**. Strictly speaking you don't need to use the tailstock support here, because the chuck will hold it securely. However, the revolving

centre does give an extra bit of security.

Do a little shaping of the bottom part of the lemon at this stage, but that remember you need to leave some wood near the chuck so you can complete the top end. If you remove too much at this stage, you'll get vibrations when you tool the top again.

Remove the tailstock to finish shaping the top end of the lemon, **photo 3**. Sand as much of the lemon as possible at this stage, but because you're going to texture it, you need to sand no finer than 180 grit.

A cunning tool

I'm going to use the Robert Sorby texturing tool to texture the lemon, **photo 4**. This consists of a handle and shaft with a bearing-mounted toothed wheel at the end. The texture is achieved by pushing the wheel into the revolving wood. It also



has an adjustable shoe that sits on the toolrest and enables the cog to be fixed at a specific angle. Different angles will give different textures.

To achieve an orange-peel effect you need to use the tool with the wheel upright, **photo 5**. It's important to keep the tool's shaft at 90° to the surface of the timber being textured. If you don't, the tool may skate downhill. The lathe speed here is 1500rpm; note also that the toolrest is positioned away from the wood to support the shoe and allow the wheel to revolve freely.

Perfect texture

The photograph of the finished lemon overleaf shows a close-up of the texture



1. Mount the lemon between centres and turn it to a cylinder with a spindle roughing gouge



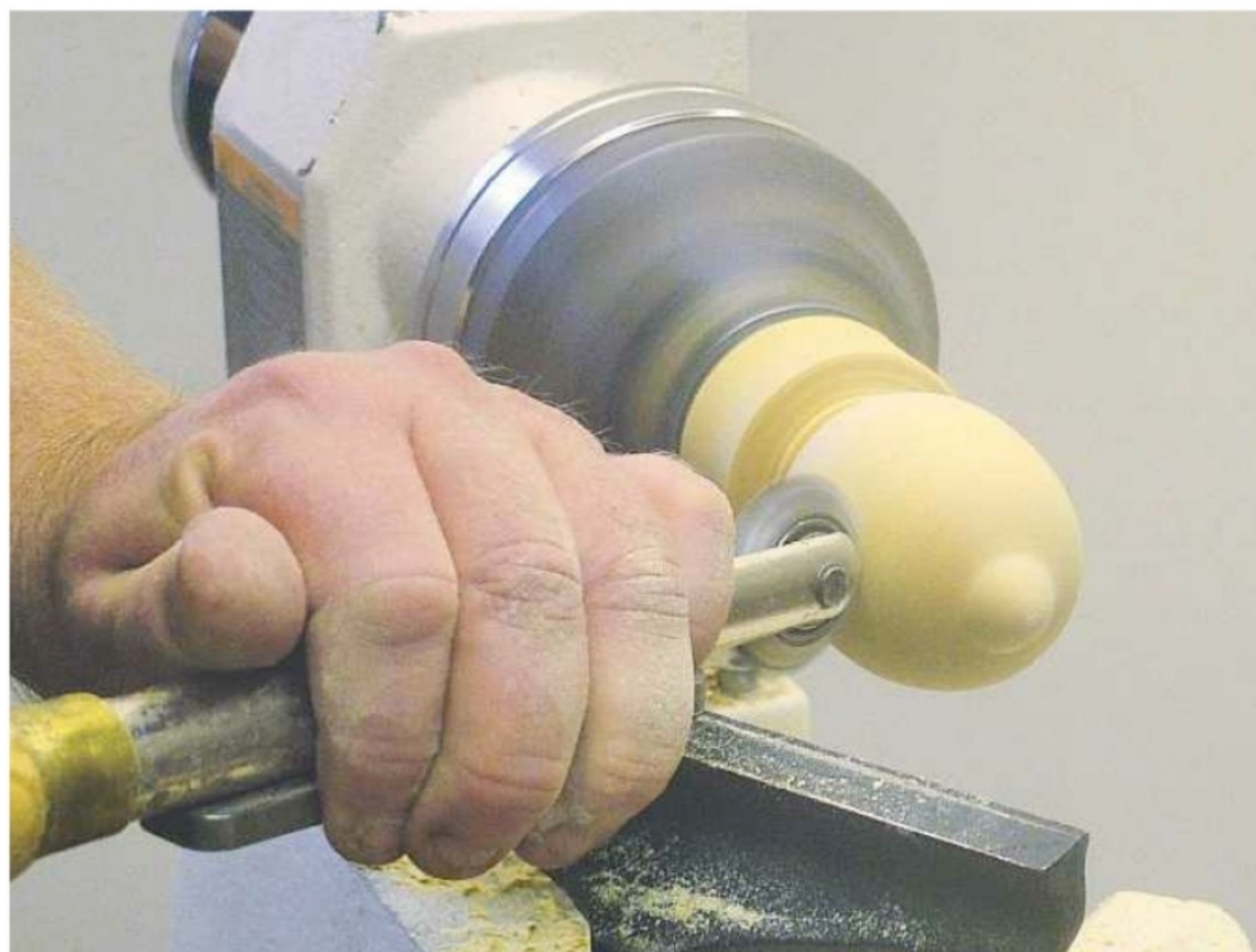
2. Then mount the blank in the chuck and start the initial shaping with a $\frac{3}{8}$ in spindle gouge



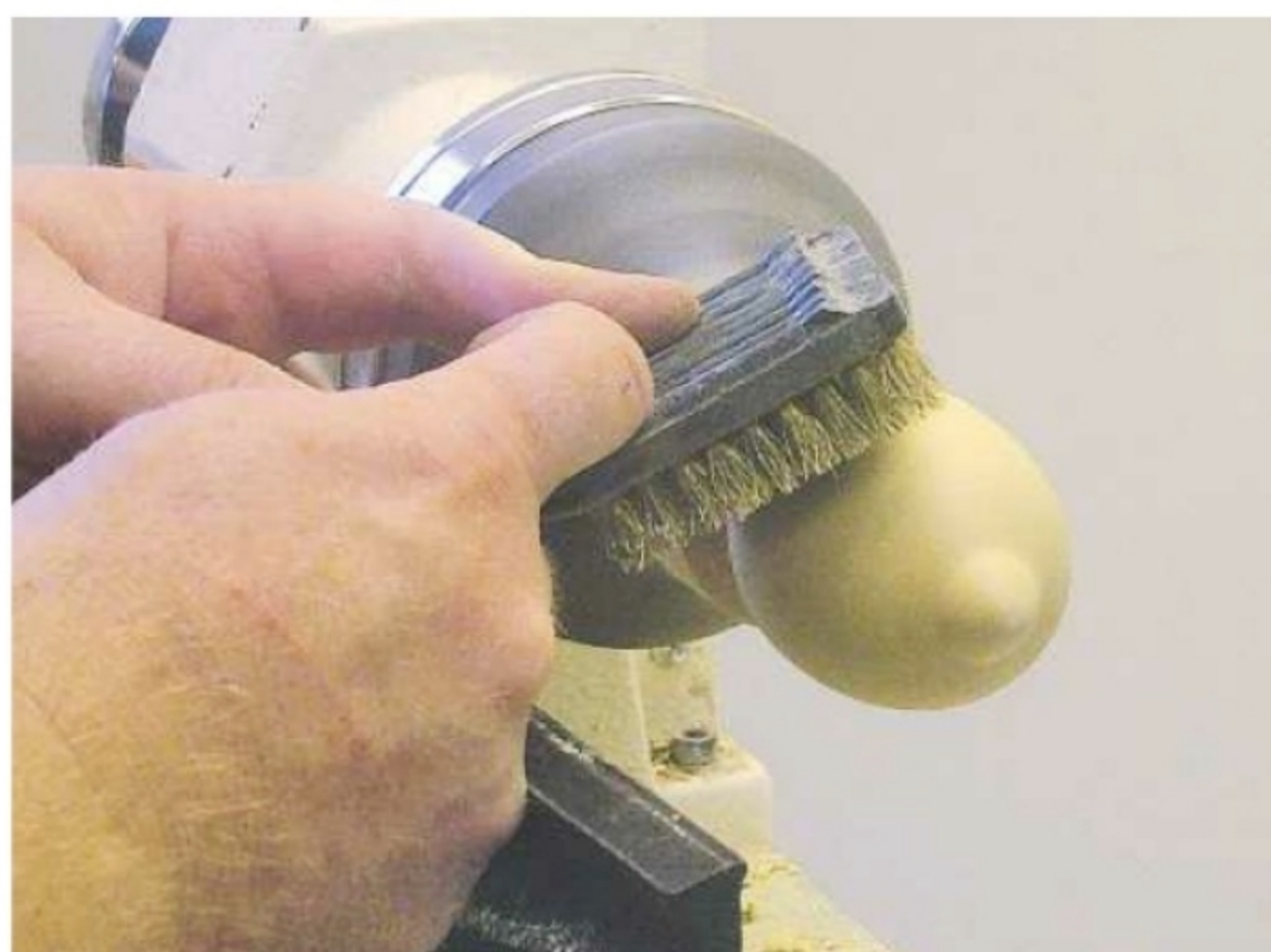
3. Remove the tailstock so you can finish shaping the end of the lemon



4. The Robert Sorby texturing tool has a toothed wheel mounted in the shaft



5. Keep the shaft at 90° to the work to prevent it from skating across the surface



6. Use a soft bronze or brass brush to remove any whiskers left by the tool

that's created with this technique. To achieve this you need to keep the tool moving along the toolrest. A soft bronze brush does a good job of removing the fine wisps of wood left in the textured surface, **photo 6**. When that's done, lightly sand the surface with 400 grit abrasive.

Now you can shape the bottom part of the lemon, taking it down to about 10mm diameter near the waste wood, **photo 7**.

Then texture this part in the same way.

Note in **photo 8** that I'm supporting the lemon with one hand whilst using the texturing tool with the other. This is to reduce the vibrations that are inevitable because of the relatively small amount of solid wood left holding the lemon.

The photo shows my forearm close to the revolving chuck, but there is in fact some distance between them. I'm fully aware of this distance, and if you use this technique, you should be too. Swapping hands and supporting the piece with your right hand while using the tool in your left will keep both hands away from the chuck.

The last slice

Finally shape the last part of the lemon – the part where the lemon blossom was – with a slicing cut using the long point of the skew, **photo 9**. A little hand sanding will be needed to smooth the curve on the end of this part; then you can apply the finish.

I like to finish lemons with Chestnut's Lemon Oil. It gives a matt finish and makes the piece smell of lemons, although it is actually made from lemongrass. **Photo 10** shows the finished piece.

Satsuma time

Oranges, satsumas, tangerines and the like are made in a very similar way to lemons. A good wood for these fruits is padauk, although any hardwood is suitable. Padauk has quite an orange colour when it's first cut, but over time it mellows to an orangey-brown. However, if you don't wish to use exotic woods, cherry makes a good alternative and this is what I'm using here. You'll need a piece about 75mm (3in) square and 80mm (3¼in) long to make a satsuma, and a piece slightly larger and longer to make an orange.

Just like a lemon

The initial turning process is the same as for the lemon. Mount the piece between centres, turn it to a cylinder, turn a spigot to fit your chuck and then load the piece in the chuck. Shape the top part of the fruit and do some initial shaping of the bottom, but leave sufficient wood as before to support the piece without vibrations, **photo 11**.

Punching dimples

You could texture the piece in the same way as the lemon, but a more realistic technique is to use a punch to apply dimples to the surface. If you intend to make lots of citrus fruits, you could grind a centre punch to a small rounded tip because this will be more comfortable to hold. Alternatively you could use a

masonry nail with its head ground to a dome shape. One turner I know uses the rounded end of a pop rivet.

Gently stipple the surface of the fruit with light hammer blows on your punch. You're aiming to make small, random, almost overlapping indentations in the surface of the wood, **photo 12**. **Photo 13** shows a close up of the effect this technique gives; however, there is still more stippling to do here.

When you're happy with the overall texturing, drill a 3.5mm diameter hole in the centre of the satsuma's free end, either with a hand-held Jacobs chuck as shown in **photo 14**, or with the Jacobs chuck mounted in the tailstock.

Turn and turn again

Remove the work from the chuck and load the screwchuck I made in last month's issue of *The Woodworker*. Then screw the satsuma to the screwchuck. This allows access to the bottom of the piece, which you can now shape, sand and stipple in the same way as the top,



7. Shape the bottom part of the lemon, taking it down to about 10mm in diameter



9. Shape the last part of the lemon using just the tip of the skew to avoid a dig-in

10. The finished lemon shows off its realistic orange-peel texture

photo 15.

Lastly, turn a button about 5mm in diameter to look like the orange blossom scar and glue it in place to cover the screw hole, **photo 16**. The finished satsuma is shown in **photo 17**, complete with the button.

Plum target

Plums are made on the screwchuck in much the same way the apples and pears I turned last month. Purpleheart is an ideal wood for Victoria plums. To make one you'll need a piece about 40mm (1½in) square by 75mm (3in) long.

The turning is very simple. Find the centres of both ends, bore a 3.5mm hole in one end, mount it on the screwchuck and bring up the tailstock support. Then shape the plum roughly using a spindle roughing gouge and a ⅜in spindle gouge, just as you did with the apple.

Skew perfect

Work from the tailstock end to the chuck end, and sand the piece to a finish



8. Support the lemon by cupping it in one hand while texturing it with the other





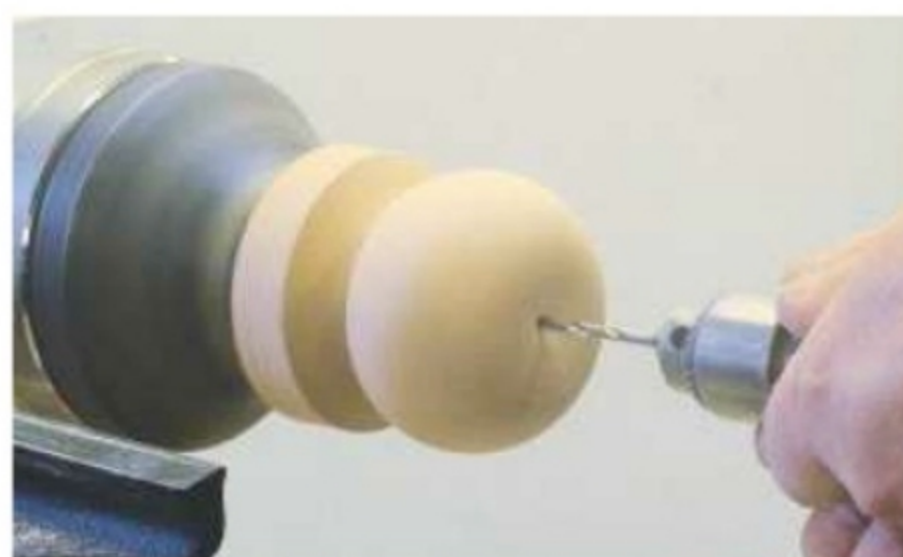
11. The turning techniques for the satsuma are the same as the lemon



12. Stipple the surface all over using a hammer and rounded punch



13. This is the result after 15 minutes of stippling. More work is still needed



14. Bore a 3.5mm pilot hole in the centre of the free end to take the screw chuck



15. Reverse-mount the satsuma on the screw chuck and start shaping the bottom



16. Turn a small button about 5mm in diameter to cover the screw hole in the satsuma



17. Finish the satsuma by super-gluing the turned button into the screw hole

I finish plums with acrylic spray varnish, then buff them up on a wheel. Then I insert a small piece of willow (as used in wickerwork) for the stalk, just as I did with the apples and pears.

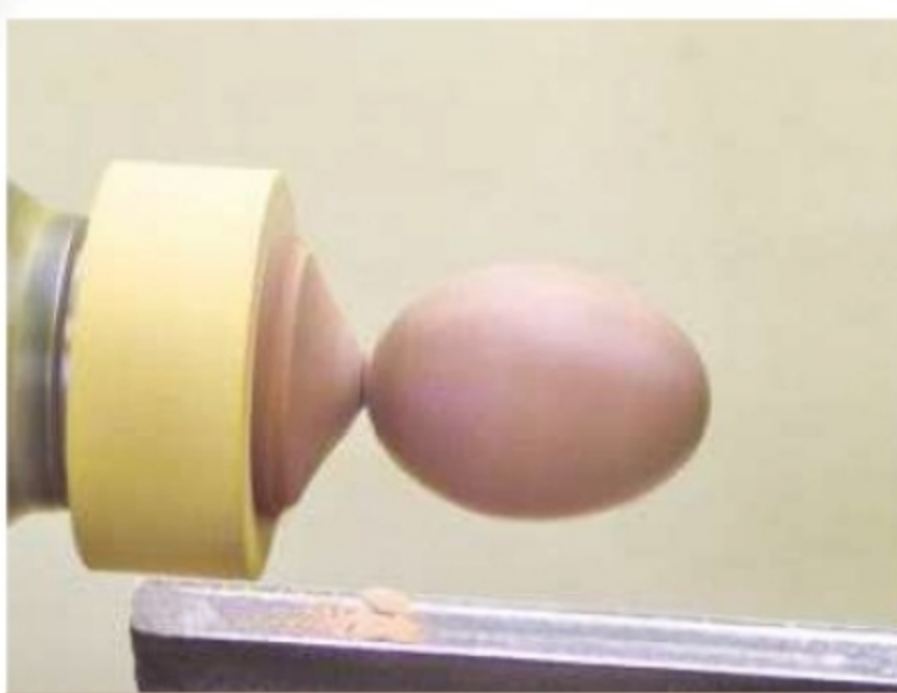
A pair of cherries

I turn cherries in exactly the same way as plums: individually on a screw chuck.

You can use thin garden wire to pair up the cherries, and hold them together using a small, turned dowel with a hole bored into it to take the wire.

Cut off a piece of wire about 100mm long and fold it in half.

Glue the fold into the dowel with superglue and glue a cherry onto each end, **photo 20**.



18. The plum has been turned and sanded and is ready to be parted off



19. Create the groove common in plums with a sanding drum on a flexible shaft

before using the skew to complete the shape using a slicing cut at the stalk end. When doing these slicing cuts, I hold the skew with the long point down and use only the very point to make the cut. If you allow the cut to come up the cutting edge, you'll get a dig-in and create an unwelcome spiral texture on your workpiece. Be careful not to cut into the screw when making this cut. You should be aiming for a shape like **photo 18**.

In the groove

You could finish the plum like this, but it looks more realistic if you carve a curved groove into it. I use a Dremel multi tool with a flexible shaft attached to do this. Load the tool with a small sanding drum, **photo 19**, then hand sand.



20. A small piece of dowel holds the folded end of the wire that forms the cherry stalks



Banana and bowl

Unlike the other fruit we've made, bananas aren't turned on the lathe... but they do make an attractive addition to a bowl of wooden fruit. *Pau amarillo*, the wood we used for the lemon, is a good wood to choose for a banana too because of its natural yellow colour.

However, if you don't like using exotic woods, sycamore is an ideal substitute. This is what I used, and I deliberately picked a piece that had a yellowish colour on the outside. When I cut into it I revealed the wood's characteristic creamy white colour, so decided to stain the banana using a spirit-based yellow dye for a more realistic colour.

Turning the bowl

Wooden fruit is best displayed in a shallow bowl so as not to detract from

the fruit. I've chosen a piece of ash 350mm in diameter and 75mm thick for this bowl. I wanted to lift the fruit off the surface of the table, but also to hide a lot of the bowl's base, so I chose this simple trumpet shape.

First stages

Start by deciding which surface of the blank is going to be the top of the bowl, find the centre of this surface and screw a faceplate to it, **photo 1**.

Mount the faceplate and blank on the lathe, check the speed – I'm starting to turn this at 800rpm – and face off the bottom of the bowl blank using the fingernail profile bowl gouge, **photo 2**.

The right technique

Start the cut in the centre of the wood and slowly draw the tool across the

surface of the wood towards the edge of the blank, **photo 3**. Note how the handle is tucked into my right hip and my back is almost upright. This stance takes a lot of stress off your back and is far more comfortable than bending if you intend doing a long stint at the lathe. Keeping the handle locked to your body in this way makes for a more stable cut. My left hand is over the top of the tool, with the heel of my hand resting on the tool rest. The flute of the tool is facing into the bowl blank and I'm using the bottom wing to make the cut. You can shape the whole of the back of the bowl using this technique. I cut the chucking spigot for my chuck, again using the bowl gouge.

Shaving time

When you are happy with the shape of the bottom, the edge needs to be trued



1. Cut the blank for the bowl to round and attach a faceplate



2. Face off the bottom using a pull cut with the 1/2in bowl gouge



3. Start the cut in the centre and work slowly towards the edge

Making a banana

You'll need a piece of wood measuring about 200 x 110mm and 45mm thick. Either draw the side view of a banana on the blank freehand, or use a real banana as a template and draw round that. I make lots of bananas, so I've made myself a wooden template, **photo A**. Note the direction of the grain on this blank. The stalk will end up quite thin and if the grain were running across the blank, rather than along it, you would end up with short grain on the stalk and this could easily break off.

The first cut

Now carefully cut around the shape using a bandsaw, **photo B**, keeping your fingers well away from the blade. A $\frac{3}{8}$ in blade with four or six teeth per inch is fine. Always use a sharp blade, as it will minimise the force needed to

push the wood through it. When cutting out the banana, try to take off the waste on the inside of the curve in one piece because this is used to support the blank when cutting the other edges. Tape the banana to the waste and draw the side shape freehand, again using a real banana as reference, **photo C**. Carefully cut this out on the bandsaw, **photo D**.

Extra dimensions

You should now have a four-sided rough-out of a banana, **photo E**. However, bananas are normally five-sided. **Photo F** shows the shaded areas on both sides that need to be cut away, and the back of the banana will also be shaped to provide two sides.

If your bandsaw has a tilting table, this waste could be cut away using it, but I find my fingers start to get too close to the blade and I'm much happier using a drum sander, **photo G**.

An oscillating bobbin sander would be ideal, especially if it had a tilting table, but here I am making use of a drum sander in my pillar drill, using a home-

made platform secured to the drill's table. Alternatively, a belt sander could be used, or you could shape it all by hand using rasps and files. You should be aiming for a five-sided shape with reasonably well-defined straight edges.

Burnt and stained

When you're happy with the shape, use a pyrograph or a soldering iron to burn the end and add a few ripening marks along the sides, **photo H**. Again use a real banana as your reference.

As I mentioned earlier, I wasn't too happy with the pale colour of my sycamore. So when the pyrography was complete I stained it using Mylands powdered dye. Their yellow dye can be used with water or spirit, and I diluted a little powder in methylated spirits, **photo I**. The disposable latex gloves are a sensible precaution if you don't want bright yellow fingers.

When this had dried, I gave the banana a couple of coats of melamine lacquer, rubbing down lightly with wire wool between the coats.



A. Draw round a real banana or a template. Note the grain direction



B. Cut out the shape on the bandsaw. Save the larger offcut



C. Tape the banana to the offcut and add the shape of the sides



D. Make these shaping cuts using the taped-on offcut as a support



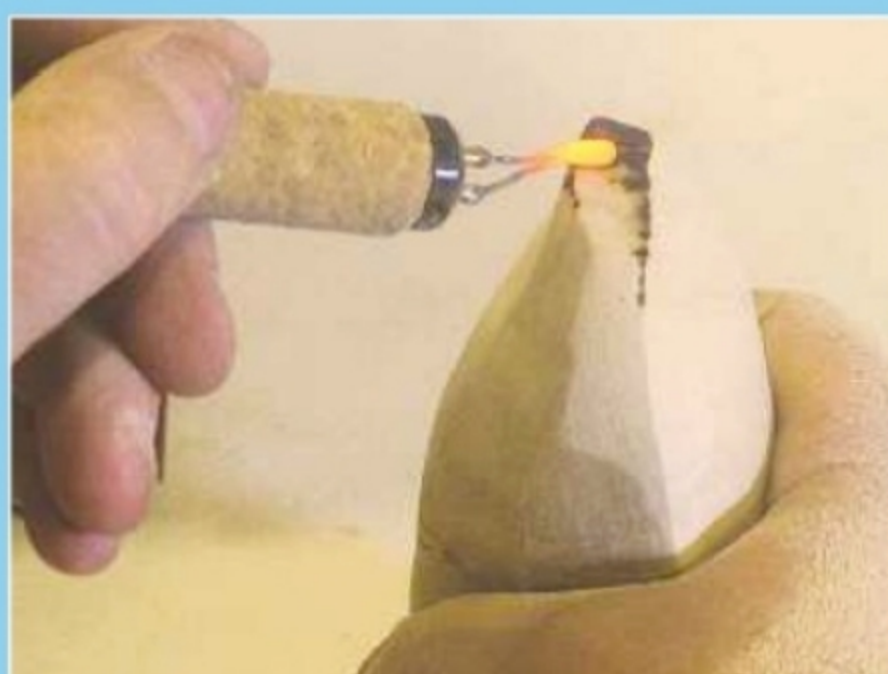
E. You now have a three-dimensional banana shape with four sides



F. The shaded areas need removing next to improve the shape



G. It's easier to do this on a drum sander rather than the bandsaw



H. Use a pyrograph to burn the stalk end and add ripening marks



I. Apply some yellow stain to give a more realistic banana colour

up, **photo 4**. I'm still using the ½in bowl gouge, but the cut is now coming off the very tip of the tool.

Finishing cuts can also be made with the same tool, still using the bottom wing, but this time it is rolled over further and the handle is held further down. In this position the cutting edge is at approximately 45° to the surface of the wood being cut, **photo 5**, and should create very fine spiral shavings as the wood is being sheared off.

I thought it might be useful to show you the different types of shaving that can be achieved with this tool.

Photo 6 shows some thick, heavy shavings on the left, made while shaping the outside.

On the right are the very fine spiral shavings from the finishing cut.

Power sanding

Next, sand the outside of the bowl, **photo 7**. I'm power sanding here, starting with 120 grit and finishing at 600. If you want to try power sanding, use only the edge of the sanding disc. If you put the whole face of the disc on the revolving wood, it's likely to skate away across the surface.

Before removing the bowl from the lathe, tidy up the chucking spigot with a skew chisel, **photo 8**, and make a small indentation in the very centre of the spigot with the point of the skew, **photo 9**.

A hollow centre

Take the piece off the lathe, then remove the faceplate, mount the chuck on the lathe and fix the bowl to the chuck using the spigot.

Face off the front using the same pull cut as before.

Now hollow the bowl out, still using the ½in bowl gouge. If the bowl's face was a clock, start the cut with the tool's flute pointing towards 3 o'clock.

On this initial entry cut it is important that the tool handle is on the right-hand side of the centre of the bowl – over the bed bars. This helps to prevent the tool skating across the surface of the timber.

Start the cuts left of the centre point using the very tip of the tool, **photo 10**. Once the cut is started, swing the tool towards you and rotate it up so the flute points toward half past one on your imaginary clock face, **photo 11**.

Continue to hollow out the bowl using this cut until you have reached its final shape.



4. True up the edge of the bowl using the very tip of the tool



5. Try to achieve very fine spiral shavings using this finishing cut



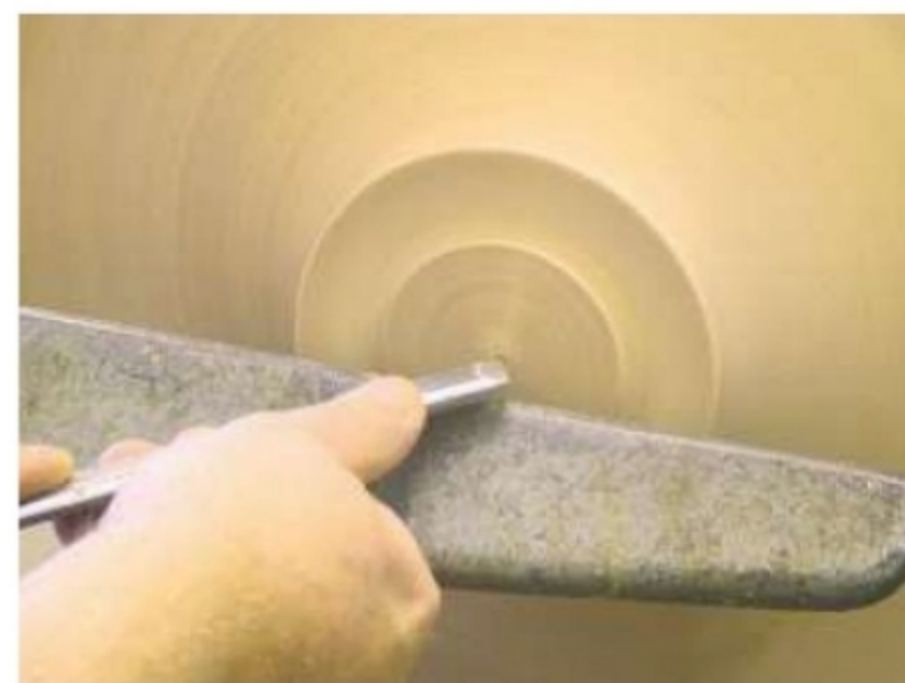
6. Rough-cut shavings are thick, while finishing-cut ones are fine wisps



7. Power-sand the base using the bottom edge of the abrasive disc



8. Clean up the chucking spigot with a skew chisel on its side



9. Pop-mark the very centre of the spigot. You'll use this later... Then reverse the blank on the chuck



10. Start the hollowing-out cut to the left of centre, using the point of the tool



11. Then swing the tool handle towards you and rotate the flute up



12. Keep the tool on its side to make this cut on the bowl edge

Edge with care

Work with caution when cutting at the very edge of the bowl.

Photo 12 shows this entry cut, with the tool's flute right over on its side and my thumb behind the tool to help prevent it skating. Note that the cut is coming off the very tip of the tool.

Use a round-nosed scraper for the finishing cuts on the inside of the bowl. Hold the scraper with the handle higher than the cutting edge, and take very light cuts. You must get shavings from a scraper, **photo 13**. If you're getting only dust, you need to sharpen the scraper.

Adding a bead

I started sanding the inside of the bowl, **photo 14**, and then decided that it would

look better with a decorative bead.

Photo 15 shows this being cut with a home-made beading tool, made from an old spindle gouge. You could also cut this bead using the point of a skew chisel on its side.

Finishing off

With the sanding complete, I gave the bowl a coat of finishing oil, left it on the surface for about 10 minutes and then burnished it with a paper towel with the lathe running.

The last thing to do is to turn off the chucking spigot. Mount a scrap wooden dolly in your chuck. This has a small dome shape cut on it.

Use a thin scrap of leather as a sandwich between this wooden dolly and the surface of the bowl, **photo 16**.

Bring the tailstock up and locate the revolving centre in the small indentation you made back in **photo 9**.

Lock the revolving centre in place – it should be tight enough to hold the bowl against the dolly, but please don't overtighten it.

With the tool rest in place as shown in **photo 17**, use a $\frac{3}{8}$ in spindle gouge to turn away most of the spigot, leaving just a small stub in the centre.

Remove this stub off the lathe with a sharp chisel, **photo 18**; then hand-sand the base before giving the whole piece another coat of oil.

That's it. Job done and some useful techniques learnt along the way. All that remains is to arrange your fruit tastefully in the bowl, stand back and admire your creation.



13. Finish the inside of the bowl with a round-nosed scraper



14. Power-sand the interior with the dust extract hose nearby



15. I cut this small decorative bead with a home-made beading tool



16. This shows the set-up I used to turn off the chucking spigot



17. Use a spindle gouge with care to turn away most of the spigot



18. Take the bowl off the lathe and cut off the stub with a chisel





1. The long-hole boring kit includes the auger, centring bar, hollow centre and counterbore tool



2. Mount the lamp stem blank between centres as normal



3. Knock the drive centre into the blank with an old mallet



4. Rough the blank down to a parallel-sided cylinder



BY ALAN HOLTHAM

Core bore

Alan Holtham demonstrates that long-hole boring is nothing to be feared if you have the right kit

The standard long-hole boring kit consists of a hollow centre, a counterbore tool and the long auger itself, normally 5/16in diameter, **photo 1**. You often have to supply your own handle for the auger.

Securely mounted

It is usually better to start by turning the stem, so mount this between centres as normal, **photo 2**. Make sure the drive centre is really well engaged into the end of the timber, by knocking it in with a soft-faced hammer or an old mallet, **photo 3**. This is important as the drilling action of the auger can otherwise cause the wood to spin on the centre, as you can't apply too much pressure with the fixed ring centre.

Turned round

Rough the blank down to produce a parallel cylinder, **photo 4**, working off either end of the blank. A good tip here when you

are roughing out is to run your index finger along the edge of the rest as a guide to help you keep the cut parallel, **photo 5**.

I then set up to do the boring at this stage, rather than later on after the profile has been turned. With any piece of woodturning it's important to bore first and then turn off the hole to ensure that the shape is truly concentric.

Locked in

Fit the hollow centre and feed the centring bar through the tailstock barrel and the centre to provide a locating point for the blank, **photo 6**. Keep the pressure on as you wind in the tailstock barrel and the centre ring starts to engage in the end of the blank, **photo 7**. Spin it by hand a few times to help the ring bite in securely, **photo 8**. Once the ring has a firm hold, back the tailstock pressure off a fraction, lock up the barrel and pull out the centring bar, **photo 9**.



5. Run your index finger against the tool rest as a guide



6. Fit the hollow centre and feed in the centring bar to provide a locating point for the blank



7. Keep the pressure on as you wind in the tailstock barrel...



8. ...and the centre ring starts to bite into the end of the blank



9. As it grips, lock up the barrel and pull out the centring bar



12. The best type of auger to use is the fluted shell type



13. Apply firm pressure on the end of the auger to begin with



14. Bore about 20mm, then withdraw the auger to clear the swarf



17. Feed the pilot into the hole and tap it to engage the wings



18. Fit the counterbore tool in the headstock and mount the blank



19. Line up the tailstock end as before and complete the boring

Well driven

Set the lathe speed to about 500rpm and you're ready to start boring, **photo 10**. Keep checking the tailstock pressure as the wood spins, as it does tend to slacken off – hence the need for a secure drive at the headstock end. However, using too much pressure will cause the centre to burn, so be careful you don't overdo it. If the ring centre starts to get hot and burn, apply a tiny amount of wax as a lubricant, **photo 11**, but don't overdo it or the end of the blank will become very messy.

Handle with care

For the actual drilling, the best type of auger to use is the shell type, **photo 12**. Although this is very effective, it's quite delicate and offers little scope for regrinding, so treat it with care. There are some spiral augers on the market, but I've never found them as successful, particularly on hard timbers, as they tend to wander off line.

Clear the swarf

You will initially need to apply really firm pressure to get the auger to start cutting, but after this initial stage it will start to move forward quite easily, **photo 13**.

It is very important to feed the auger in by no more than about 20mm at a time and then to withdraw it to clear the swarf, **photo 14**. If you don't, the swarf generated will block up the short fluted section and the auger will be pushed off centre.

Changing ends

Continue to bore until you reach approximately half way down the length of the spindle. Withdraw the auger and line it up with the tailstock to check your progress, **photo 15**.

Then remove the blank and locate the

counterbore tool, which is fitted with a central $\frac{5}{16}$ in pilot, **photo 16**. Feed this into the hole you have just drilled and give it a few sharp taps to get the driving wings to engage, **photo 17**. Fit the counterbore tool back into the headstock, **photo 18**, and thread on the blank.

The second half

Line up the tailstock end as before using the centring bar and complete the rest of the boring, **photo 19**. Make sure there's enough pressure from the tailstock to prevent the blank from spinning on the counterbore tool. The two holes should meet perfectly in the middle, **photo 20**. If they don't, either the auger is blunt or you've been applying too much pressure and not allowing the swarf to clear.



10. Set the lathe speed to about 500rpm and you're ready to start



11. If the ring centre gets hot, apply a tiny amount of wax to it



15. At the halfway point, withdraw the auger to check progress



16. The counterbore tool is fitted with a central $\frac{5}{16}$ in pilot



20. Take the blank off and check that the holes meet perfectly



21. Fit a conventional revolving centre and complete the turning

The final turn

Once the hole is bored, replace the ring centre with a conventional revolving centre, increase the speed back to about 2000rpm and complete the rest of the

turning, **photo 21**. Boring the hole first and then turning off it ensures that the design will be concentric, which is not always true if you try to bore the hole after the turning has been completed.

FITTING A LAMPHOLDER

If you're using a fixing plate to hold the lampholder, here's a good tip to help you locate it more neatly. Slide the top end of the lamp onto the counterbore tool, but don't push it so far that the drive wings engage. With the tailstock centre in place for support, start up the lathe while holding the blank firmly in your hand, photo A. If you now gently wind in the tailstock to push the blank onto the spinning counterbore tool, it should cut a neat locating recess for the plate, photo B. About 3mm deep is enough. Then drill pilot holes for the three fixing screws and fix the plate in place.

To complete the job, feed the flex up through the hole in the lamp base, connect its cores to the lampholder terminals and screw the lampholder onto the fixing plate, photo C. Remember that you must use three-core flex if you're fitting a metal lampholder instead of a plastic one.

Feed in the flex, connect up its cores and attach the lampholder



A. Use the counterbore tool to bore a recess for the fixing plate



B. Mark and drill pilot holes, then screw the plate into place



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Turning triangles

Turning a multi-centred project is simpler than it sounds the way Colin Simpson does it



BY COLIN SIMPSON

The actual making of the box part is done in the conventional way, but it's the preparation of the blank to make it triangular that lifts this project to another dimension. The marking out of the blank prior to the off-centre turning is important and the more accurately this is done, the better the finished result. So take your time.

I used a lovely piece of olive ash for this project. Any wood will do but, because of the shape of the box, I think a strongly figured piece works well. My blank was 120mm long and 70mm square.

First circles

Start by mounting the blank between centres, and turn it down to a cylinder using a spindle roughing gouge. Square off both ends using a peeling cut with either a parting tool or a skew chisel. Now measure and mark two circles on each end, one of 50mm diameter and another at 25mm diameter, **photo 1**. Because the four-prong drive gets in the way of this marking out at the headstock end, it's easier to turn the blank end to end and do all the marking out at the tailstock end.

Dividing by three

If you have an indexing system on your lathe or chuck, use it to draw three lines along the side of the blank 120° apart. I used the toolrest as a guide, **photo 2**. Continue these lines down both ends of the blank and through the centre points.



1. After turning the blank to a cylinder, mark two circles on each end at 25 and 50mm diameters



2. Use an indexing system if you have one to draw lines 120° apart on the sides of the blank



3. Alternatively, use dividers set 25mm apart to mark off six steps round the circumference



4. Centre-punch holes where the three radial lines cross the inner circle, then number them

Don't worry if you haven't got a means of indexing; you can use simple geometry instead. Set a pair of dividers to the radius of the larger circle – in this case 25mm. Place one leg of the dividers on the circumference of this circle and step along the line six times, **photo 3**. You should end up back where you started.

Now mark every other step and draw a line from these steps to the exact centre of the circle. Centre-punch the three locations where these three radial lines cross the smaller circle, and number each point. You must do this on both ends of the blank. You should end up with your marking out looking like this, **photo 4**.

Three curves

Next mount the blank between centres using the no.1 points. You will now be turning off-centre and the blank will not be balanced, so reduce the speed of the lathe. Switch it on and watch the blank 'ghosting'. Using a spindle roughing gouge with the handle held well down, gently move the cutting edge into the ghosting, **photo 5**. Stop the lathe frequently to check progress and continue to shape this side of the blank until the curve just touches the 50mm circle on each end of the piece, **photo 6**.

Now sand this curve on the lathe. I use the abrasive wrapped round a block of wood, **photo 7**. I also like to stop the

lathe and sand with the grain, **photo 8**. This way the edges of the side stay crisp.

Repeat this process with the blank centred on centre point numbered two, and then repeat again with the piece mounted on centre point three. If all has gone to plan, you should end up with a blank looking something like **photo 9**.

Parting of the ways

You can now finish making the box in the conventional manner. Mount the piece between centres, using its true centre, and turn a spigot on each end to fit your chuck, **photo 10**. Mount the lid end in your chuck and, using a narrow parting tool, part off the base from the lid. If you're not happy parting all the way through the blank, stop the lathe before you reach the cut-off point and use a saw to complete the cut.

Turning the lid

I like to work on the lid first and then make the base fit it. Use a $\frac{3}{8}$ in spindle gouge to hollow the lid and then switch to a skew chisel on its side to cut the recess, **photo 11**. It is important that this cut is exactly parallel. Use Vernier callipers to check this and measure its diameter. Then sand and polish the inside of the lid and remove it from the lathe.

Tapering the base

Mount the base in the chuck and use the Vernier callipers to mark the lid's diameter on the top of the base,



5. Mount the blank and use a spindle roughing gouge to start shaping the first face



6. Continue cutting this face until the curve just touches the 50mm circle on the end of the blank



7. Fold abrasive paper round a wood block and hold this gently against the revolving blank



8. Then stop the lathe so you can hand-sand the blank in the direction of the wood grain

photo 12. Use a skew chisel on its side to cut a tapered spigot down to the line made by the callipers. The narrow part of the taper should be towards the top.

Now offer up the lid to this tapered spigot. The parallel-sided recess in the lid should burnish the tapered spigot somewhere along its length. I've pushed the lid on firmly to scorch the taper, so it shows up in the photograph, but you don't need to apply this amount of pressure, **photo 13.** The idea is that if you make the tapered spigot parallel down to the diameter of the burnish mark, the lid will fit onto it perfectly.

Hollowing the box

However, don't do this just yet. I prefer to hollow the box out first, and there's a good reason for this. If you make the lid fit perfectly now, you will release stress in the wood when you hollow the box and it may move slightly, resulting in a less than perfectly fitting lid.

Hollow the box using the $\frac{3}{8}$ in spindle gouge, **photo 14.** Sand and polish the inside of the base and then use a skew chisel to cut the tapered spigot parallel. The lid should be a tight fit on this spigot, as it's going to be used as a jam chuck to turn the top of the lid. Use masking tape over the joint if you're unsure whether the lid will stay on while you do this.

Finishing off

Use the $\frac{3}{8}$ in spindle gouge again to shape the top of the lid. I simply rounded mine over slightly, **photo 15,** before sanding it. Take care not to catch your fingers on the three sides as they revolve. Then remove the lid and set it aside. Sand the parallel spigot to ease the tight-fitting lid slightly.

Remove the base from the chuck and mount a scrap piece of wood in it so you can turn a jam chuck to fit inside the base of the box. Mount the base on the jam chuck and use the $\frac{3}{8}$ in spindle gouge to remove the spigot on the bottom surface, **photo 16.**

Now you can hand-finish the outside of the box. I used sanding sealer and then paste wax, buffed up with a soft cloth.



9. Repeat the process to curve the other two sides, and a blank like this will be the end result



10. Mount the blank between its true centres and turn a spigot on each end to fit your chuck



11. Use a skew chisel to cut a parallel-sided recess in the underside of the lid



12. Mount the base in the chuck and use Vernier callipers to mark the lid's diameter on its top



13. Taper the spigot and push the lid onto it so its inner surface burnishes the spigot



14. Hollow out the box, sand and polish the interior, then cut the tapered spigot parallel



15. Fit the lid on the spigot, over masking tape for a secure fit, and round over the top surface



16. Reverse the base onto a jam chuck so you can remove the spigot on its underside using a spindle gouge

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Keep taking the



BY IAN WILKIE

Learn how to match figure while turning Ian Wilkie's pill box on a scrollchuck

The lid of a box should fit well. A simple test is to pick the box up by the lid; the body should come too! However, wood isn't stable and it does move. Sometimes when you return to a box after a while you can be disappointed to find that the lid is now too tight or too loose.

You'll get the best results from well-seasoned blanks free from cracks, faults or knots. I turned this little box from a beautifully figured block of zebrano about 150mm long and 75mm square that I obtained from Ockenden Timber.

Preparing the blank

Mount your chosen blank between centres. I use two matching Steb centres (available from Ockenden Timber and other Sorby stockists), which give an excellent grip. Turn the blank down to a cylinder using a roughing spindle gouge. Measure it with callipers in at least three places to make sure it's the



Marbled beech box

tablets

same diameter all the way along. Then hold a straightedge against the cylinder to reveal any irregularities. When you're satisfied, form a spigot at each end – see **fig 1** overleaf – with a diameter to suit the jaws of the scrollchuck you plan to use.

Off with the lid

Next, mark a line where the lid is to be parted off, **photo 1**. A body-to-lid ratio of 3:2 looks well balanced, but the proportions are really a matter of personal preference. Partially part off

the lid at the line, **photo 2**, using a thin parting tool so only the minimum amount of wood is removed. Widen the cut slightly so the thin blade doesn't overheat and burn the wood.

Stop the lathe and cut through the last few millimetres of wood with a saw, **photo 3**. Don't be tempted to twist the end; you could well tear a hole in the wood!

Turning the lid

Mount the scrollchuck on the headstock and tighten the jaws onto the spigot

of the lid blank, **photo 4**. Set the lathe speed to 1200rpm. If you turn at too fast a speed, there's a risk that the wood will overheat and crack.

Face off the surface and start to hollow the lid out, **photo 5**, leaving a side wall thickness of 3mm. Measure the height of the lid inside and out as you work. You need to finish up with the top of the lid about 4mm thick, as in **fig 2**. Then part it off using the same technique as before, **photo 6**.

Working in reverse

Discard the waste wood left in the scrollchuck and mount the body blank in its place. Turn a spigot on the end to match the inside diameter of the lid, **photo 7**; this will form a jam chuck.

Care and patience is needed to get this right. Make light cuts and check



1. Form spigots and mark the cutting line



2. Part off the lid with a thin parting tool



3. Complete the parting off with a saw cut



4. Fit the lid blank in the scroll-chuck jaws



5. Hollow it out with a gouge and ring tool

Vernier callipers

Callipers are a very useful piece of kit for a woodturner. They're manufactured in steel or reinforced nylon, and can read outside and inside diameters. A rod pulls out at the end of the body to measure depth. There are three main types:

- with a conventional scale (centre);
 - with a dial gauge (right; easier to read);
 - with a digital read-out (left; even easier to read, and switchable between imperial and metric).
- Digital callipers – the most expensive – are very sensitive, which can be a disadvantage for some work.

Don't forget that you should use callipers only when the lathe is stationary!





6. Check the lid depth and part it off



7. Mount the body and form a jam chuck



8. Reverse the lid and fit it on the chuck



9. True off the top of the lid and sand it



10. Start to hollow out the body of the box



11. I used a spindle gouge and a ring tool



12. Sand the inside well; I used Micromesh



13. Form a secondary shoulder on the rim



14. Mark the depth of the body with your callipers



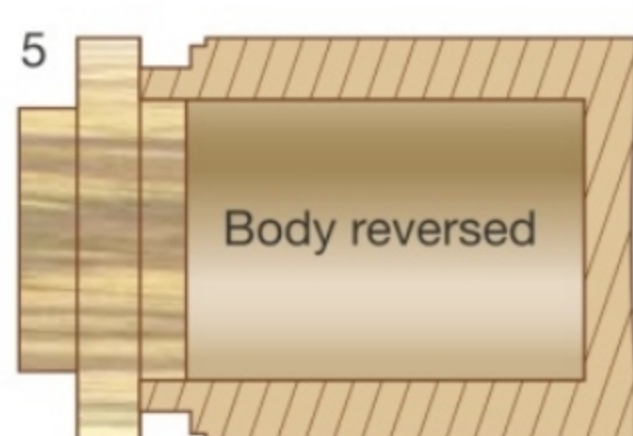
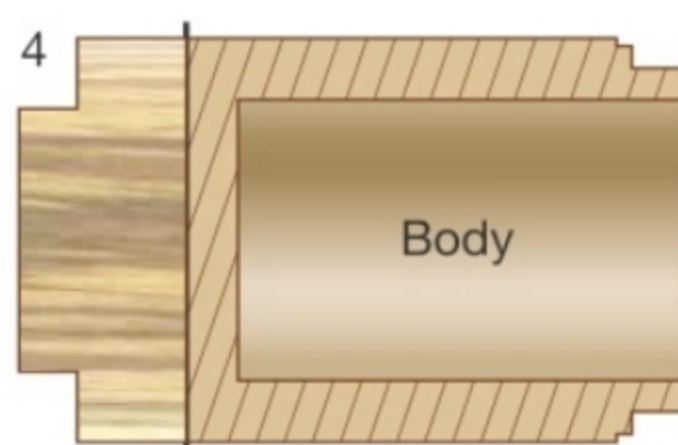
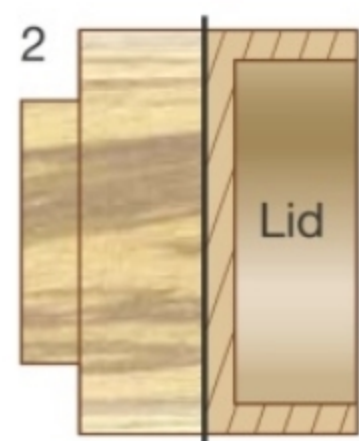
15. Partially part off the body at the mark



16. Apply finish, then part it off completely



17. Reverse the body and tidy up the base



frequently until the lid fits on it securely and squarely. Reverse the lid and push it on to the jam chuck, **photo 8** and **fig 3**.

True off the top of lid and turn it flat or domed as desired, **photo 9**. Make sure that pressure from the tool is always directed towards the body to stop the lid from spinning off. Then sand it with fine abrasive to remove any tool marks, remove it and set it aside.

Back to the body

Now it's time to start hollowing out the body, **photo 10**. I used two tools for this task – a spindle gouge and the Len Grantham ring tool from Ashley Iles, both shown in **photo 11**. Try to get the bottom of the hollow as flat and as smooth as possible, then sand the inside well. I'm using Micromesh abrasive here, **photo 12**.

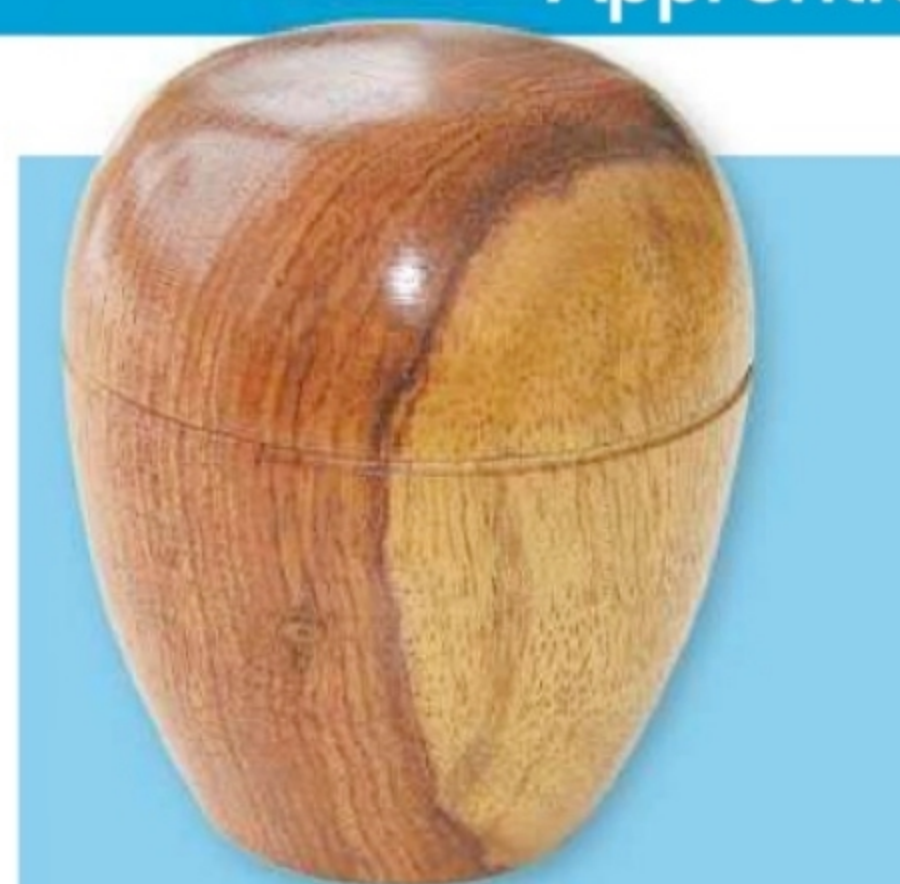
Form a shallow (about 1mm deep) secondary shoulder on the rim, **photo 13** and **fig 4**. This will help to camouflage the slight misalignment of the grain resulting from parting off the lid, where a small amount of wood was lost.

Finishing touches

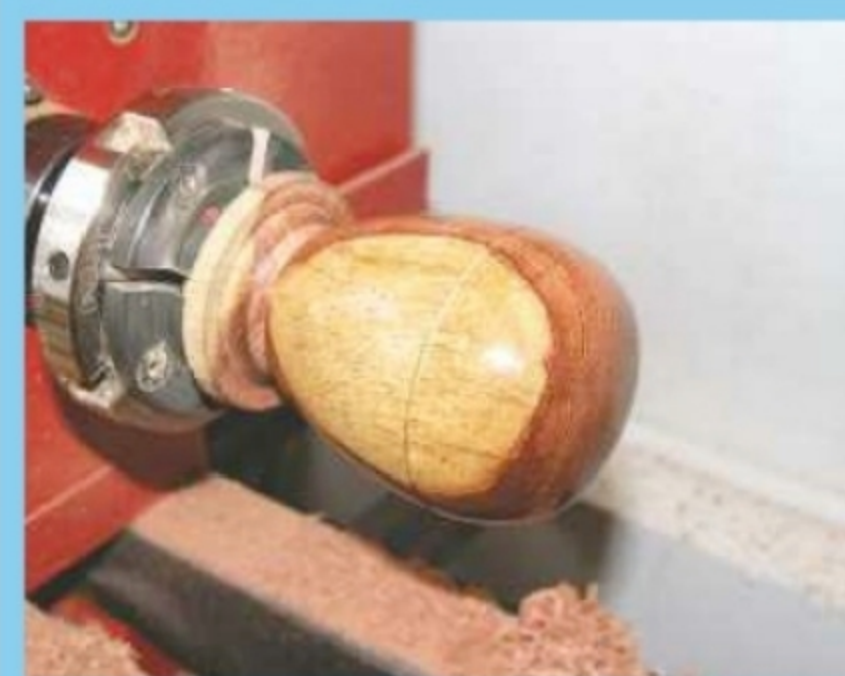
Measure the inside depth of the body. To give a base thickness of 4mm, add 4mm to the inside depth and mark this measurement on the outside, **photo 14**. Vernier callipers are ideal for this – see panel below. Then put the lid back on to see that the proportions are correct, and part off partially as you did earlier, **photo 15**.

Before completing the parting off with a saw cut, sand the box well and apply a finish. I used Record Power's Speed an eez friction polish, **photo 16**. Then complete the parting off.

Form a jam chuck as before with the remaining wood left in the chuck jaws and reverse the body onto it, **fig 5**. Tidy up the underside, giving it a slightly concave profile, **photo 17**. Then finish and polish it to match the rest of the box.



The body and lid are about to be separated



The box is polished before the final parting



Variations on a theme

This box was created from a blank of bubinga. I turned it to a cylinder first and formed a spigot at each end, as described for the zebrano box. I then remounted it in the scrollchuck and used a Steb centre to give support at the tailstock end. I turned the box to shape before separating the body and lid, leaving some waste wood at each end to be removed later. I then held the lid in the chuck jaws so I could hollow out the underside. The rest of the turning proceeded as already described.

Further information

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Relieving the tension



BY COLIN SIMPSON

Colin Simpson hollows branch wood using basic tools to create a vase

If you have specialist hollowing tools, by all means use them to complete this project. However, for those of us that cannot justify their cost, this vase can be made using only basic turning tools – spindle gouges, a bowl gouge, a parting tool and a skew chisel.

Almost any wood can be used, but I think this piece is more attractive if there is a contrast between the bark, the sapwood and the heartwood. I'm using

yew here but laburnum, cherry or any of the fruitwoods are ideal. My piece is about 150mm (6in) in diameter and approximately 200mm (8in) long.

A choice of ends

Mark the centre of both ends. Mount the log between centres and square off both ends. Cut a spigot to fit your chuck on each end, **photo 1**.

Replace the four-prong drive with your

four-jaw chuck, decide which end of the log will be the top of the vase and mount this end in the chuck. **Photo 2** shows this mounting, and how I've brought the tailstock up for additional support.

Creating the shape

Use a $\frac{3}{8}$ in spindle gouge to start shaping the bottom of the vase, **photo 2** again; then use the same gouge to shape the neck. With the gouge right over on its side, use the tip of the tool to make this V cut. Make alternate cuts for each side of the V, gradually deepening and widening the neck of the vase, **photo 3**. Next, blend the neck into the base of the vase, trying to achieve a continuous curve.



1. Mount the log between centres, true it up and cut a spigot on each end



2. Mount the top of the vase in a chuck and start shaping the body using a spindle gouge



3. Define the neck of the vase by making V cuts with a spindle gouge



4. Make a reference mark on the vase and base so you can realign the grain later



5. Part off the plug section next to the spigot using a narrow parting tool



6. If you don't want to part it right off, use a coping saw to complete the cut



7. Clean up the base and mark the centre using the point of a skew chisel



8. Use a $\frac{3}{8}$ in spindle gouge to start boring a hole into the base of the vase



9. Hollow out the vase, starting in the hole and swinging the handle away from you



10. This upright stance helps avoid backache. My forearm is resting on top of the tool's handle



11. Double-ended callipers will give an accurate indication of the wall thickness



12. Use a skew chisel to cut a parallel-sided step in the base for the plug



13. Measure the size of the hole with Vernier callipers; then remove the vase from the chuck

Removing the base

This is where the turning gets cunning, because my plan is to hollow out the vase from the base, rather than by the more obvious route via the neck. So the next step is to separate the base from the vase.

Before parting off the base, make two register marks, one on the base's spigot and another one the vase itself, **photo 4**. These will be used later to realign the grain when the vase is reassembled. Use a narrow parting tool to part off the base at least $\frac{3}{8}$ in away from the spigot. This plug section needs to be reasonably substantial as the spigot next to it will be used to turn the vase when completing the top, **photo 5**. Before parting through completely, release the tailstock pressure. If

you don't want to cut right through with the parting tool, leave a small stub and cut it off with a hand saw, **photo 6**.

Making the breakthrough

Clean up the bottom of the vase and make a small indentation in the very centre with the point of a skew, **photo 7**. Now bore a hole into the vase. This can be done using a twist drill in a Jacobs chuck in the tailstock, or with a spindle gouge as I'm doing here, **photo 8**.

With the tool resting on its back on the toolrest and the handle down, gently place the tip of the tool in the indentation made by the skew chisel. Hold the tool firmly and raise the handle until the tool is horizontal and the handle is in line with the axis of

rotation. Now push the tip of the tool into the vase to start boring the hole.

Remove the tool often to release the shavings, but always re-insert it in the way described. You don't need to bore all the way through to the top of the vase, but the hole should reach into the neck area.

Hollowing out

To hollow the vase out, I started by using the $\frac{3}{8}$ in spindle gouge with the wings swept back. Imagine the base of the vase having a clock face on it. Start with the flute of the tool pointing towards 11 o'clock and the cutting edge on the left wing of the tool just inside the hole. Push the handle away from you, pivoting the tool on the toolrest. This



14. Mount the plug, transfer the size of the hole to it and cut a taper on it using a skew chisel



15. Offer up the vase to make a mark on the taper. Cut the plug sides parallel down to this mark



16. Glue the plug in place and use the tailstock to apply pressure until the glue dries



17. Use a $\frac{3}{8}$ in spindle gouge to tidy up the vase rim and reduce the spigot



18. Bore a hole in the top to meet the cavity inside; then blend the hole into the rim



19. Reverse-chuck the vase onto a padded dolly and bring the tailstock up to apply pressure



20. Use a spindle gouge to reduce the spigot and leave just a small stub to be chiselled off

action should make a semi-circular cut, starting in the hole and finishing at the base of the vase, **photo 9**.

As the hole gets deeper, the tool cannot just be pivoted on the tool rest. Instead, push it through your front hand, at the same time swinging the handle away from you.

Avoiding chatter

Depending on the size of your vase, at some point the $\frac{3}{8}$ in gouge will start to chatter due to the amount of tool overhanging the tool rest. When this happens, move to a larger tool. In my case I used a $\frac{1}{2}$ in fingernail profile bowl gouge, but a larger spindle gouge will do just as well. **Photo 10** shows my stance. Note that my back is almost upright – important if you don't want to end up with backache at the end of the session. Also my forearm is resting on top of the tool's handle. This means that my whole arm and shoulder help to

counteract the downward force on the cutting edge as it overhangs the toolrest. This results in far less fatigue than trying to counter this force with just your hand and wrist.

Getting thinner

Keep checking the wall thickness; double-ended callipers are useful for this, **photo 11**. When you're happy that it's even, cut a step in the base of the vase for the plug.

Photo 12 shows me making this cut with a skew chisel on its side. It is important that the interior walls of this step are parallel. Measure the size of this hole with Vernier calipers or outside calipers, **photo 13**.

Now remove the vase from the chuck and replace it with the plug. Transfer the size of the hole to the plug using the Vernier calipers and cut a slightly tapered spigot to this size, **photo 14**. Offer up the hole in the vase with the lathe running slowly and push it gently onto the tapered spigot on the plug, **photo 15**. This should leave a light burnishing mark somewhere on the taper.

Plugging the base

Use this burnish mark as a reference to cut the spigot sides parallel. Just leave a trace of the mark and the hole in the vase should fit perfectly. Superglue the vase in place, aligning the two reference marks, and use the tailstock to apply a little pressure until the glue dries, **photo 16**. When it has, keep the tailstock in place and use a $\frac{3}{8}$ in spindle gouge to tidy up the rim and reduce the spigot. Leave a small stub for the revolving centre, **photo 17**.

You can now sand and polish the outside of the vase. With care you can achieve a beautifully silky finish on yew; I sand it all the way down to 1500 grit. As far as the finish is concerned, I find that oil darkens yew, so I used a couple of coats of cellulose-based melamine lacquer, de-nibbed between coats, followed by a coat of paste wax.

The final cuts

Now remove the tailstock support and gently cut away the stub. Mark the very centre of the top and cut a hole into it to meet the hollow part inside, **photo 18**. I used the spindle gouge again, but use a twist drill in a Jacobs chuck if you prefer. Gradually widen the hole and blend it into the rim of the vase. Then sand and polish this part as before.

All that remains is to remove the chucking spigot at the bottom of the vase. **Photo 19** shows my set-up for this operation. I mounted a mushroom shaped dolly in the chuck and used a piece of non-slip router mat to protect the polished surface of the rim of the vase. Then I brought up the revolving centre in the tailstock to apply enough pressure to hold the vase against the dolly.

I used a $\frac{3}{8}$ in spindle gouge to remove the spigot, leaving a small stub. **Photo 20** shows a close-up of this cut. It also shows the joint between the plug and the vase. Undercut the base slightly so the vase doesn't wobble when it is upright.

Remove the small stub that remains by hand with a sharp chisel. Sand and seal the base; then stand back and admire your creation!

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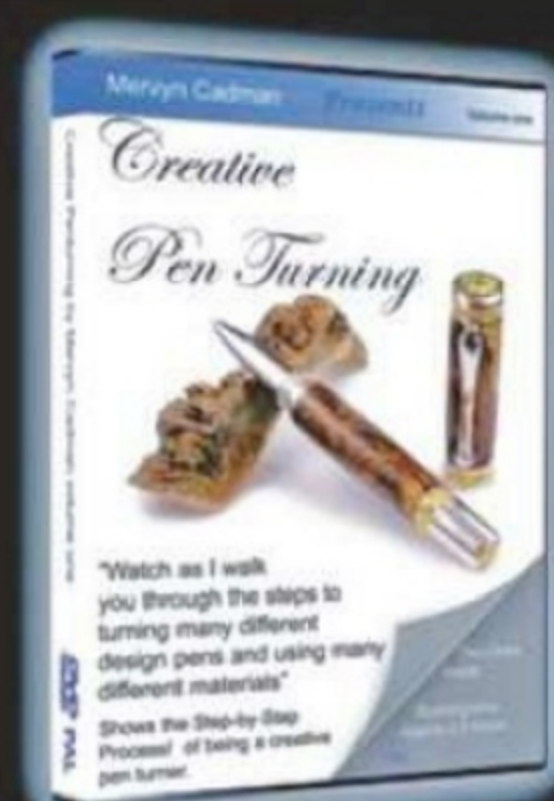
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DELIVERED WORLD WIDE

PARCEL FORCE
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Journeyman

So, you are familiar with general turning principles but realise there is still much to learn. This section is chosen to boost your confidence by leaps and bounds. We look at texturing tools, copy turning, thread chasing, cutting and pasting, wet wood turning, square turning and off-centre work.



Putting on the style

Colin Simpson shows you how embellish your projects with interesting textures by the use of special tools



BY COLIN SIMPSON



I know some turners don't like to embellish their work, preferring to keep a smooth, polished surface. However, I believe that some subtly applied texturing can improve the look – and feel – of your turning. Here's a word of caution, though. Texturing doesn't hide bad workmanship or blemishes in the wood surface, so make sure you achieve a good sanded finish before applying a texture. Any surface enhancement shouldn't be applied as an afterthought, but should be designed in at the beginning of the project.

Essential variables

With many of the tools I'm going to look at, there are several variables that will change the nature of the pattern or texture being applied. These include:

- the type of wood;
- the lathe speed;
- the speed at which you move the tool

across the wood surface;

- whether you texture on, above or below the centre line.

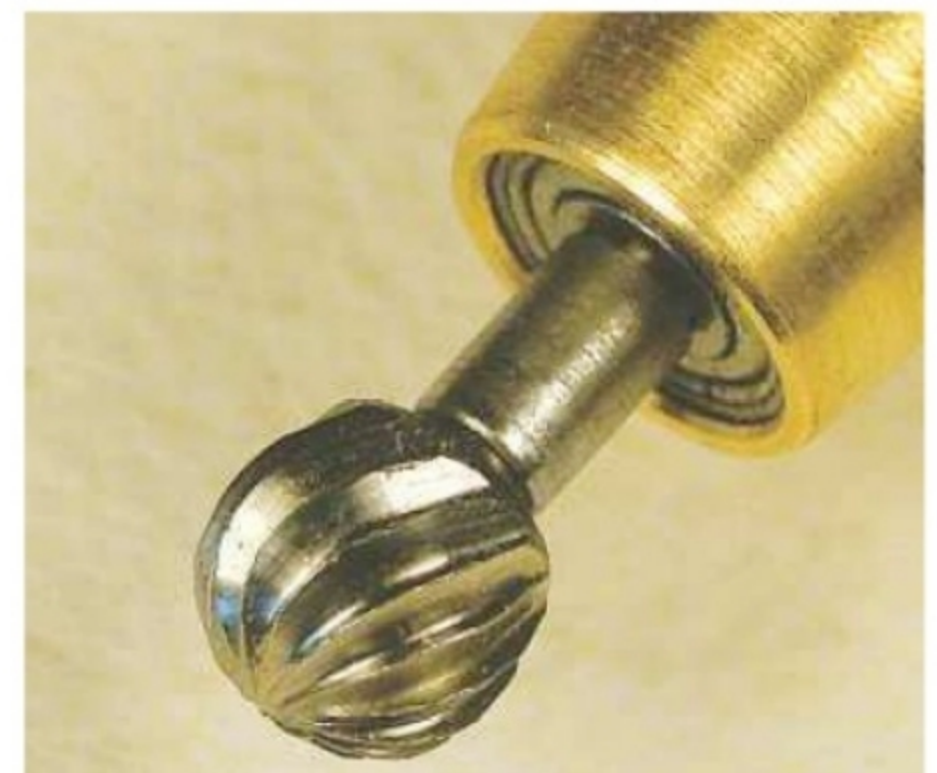
Whenever you find a texture you like, make a note of these variables so you can repeat it. There's so much you can do with these tools; you'll be limited only by your imagination. So be prepared to experiment!

The Decorating Elf

This is a recent addition to Henry Taylor's armoury, and like all their tools is very well made and finished. The tool consists of a stained beech handle, a brass body or ferrule that houses two sealed bearings, and a rare-earth magnet. The bearings and magnet hold the cutter in place. The ball cutter comes as standard and there are two other cutters available – the $\frac{5}{16}$ in cylinder cutter and the $\frac{5}{16}$ in bud cutter, as shown with the Decorating Elf in **photo 1**.



1. The Decorating Elf can be fitted with ball, cylinder and bud cutters, and comes with optional point and coving tools (top)



2. This close-up of the ball cutter clearly shows the angled texturing surfaces



3. With the toolrest lowered I'm cutting just above centre, so the handle needs to be held well down. The lathe speed is about 700rpm. Starting in the centre of the piece, slowly drag the tool along the toolrest towards the edge



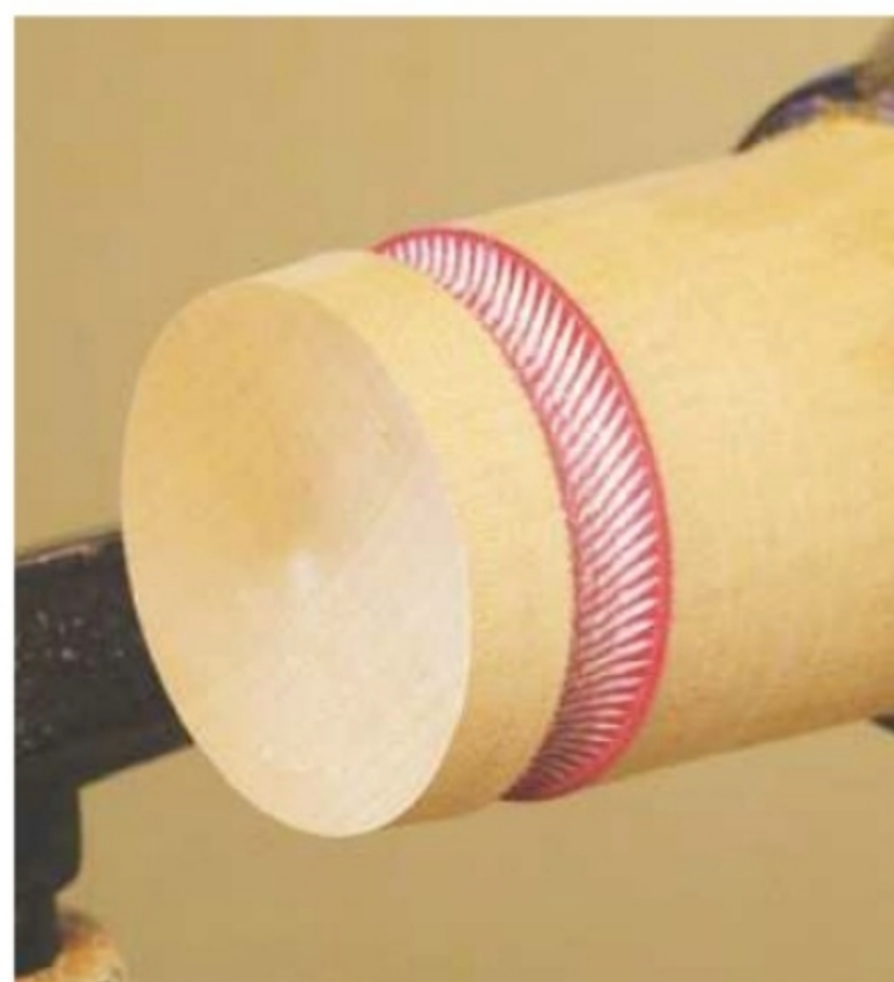
4. This produces a spiral effect. Cutting end grain like this leaves a few torn fibres, and these are easily cleaned off with the natural hog's hair brush supplied with the tool. Simply push the brush into the textured area with the lathe running at around about 1200rpm



5. This effect can be enhanced by applying some colour to the wood and by incising a few V grooves with the optional point tool



6. You can make the texture stand out even further by rubbing in some liming wax and then cleaning off the excess with oil



7. This shows the effect of texturing on a cove, as detailed in the instructions that come with the tool. You can also texture a cove on end grain



8. I textured the rim of this platter with the ball cutter at 700rpm. This time keep the tool still; don't drag it across the toolrest. Press hard and allow time for the cutter to create the decoration

Two other tools are also shown – a point tool (top) and a small coving tool (middle). You may prefer to use a small spindle gouge to cut coves, but this small coving tool has a polished bevel and produces an extremely fine finish. Use the point tool to define a textured area and give it a boundary.

A simple technique

This tool can be used to decorate both side and end grain on wood, and can also tackle acrylics, ivory substitute, bone and antler. It can also be used on flat, concave and convex surfaces. Let's

see what it can do.

Photo 2 shows the ball cutter in close-up, while **photos 3 to 6** show the method for texturing end grain such as a lidded box, a spinning top, a coaster and the like.

The clear instructions that come with the tool explain how to texture a cove, so I won't repeat them here. Instead I'll simply show you an example, **photo 7**. In **photo 8** I have textured the rim of a small platter using the ball cutter. Again I've defined the textured area by making a couple of incisions with the point tool. I used the ball cutter again, but this time

I didn't drag the tool across the toolrest. It's important to keep it still and to allow time for the cutter to do its work. You can see the crisp detail that can be achieved here and in the main picture.

Summing up

There's so much you can do with this tool, but I do recommend that you practise for a while on some scrap wood before letting it loose on your latest masterpiece.

It's fun and very easy to use, and at around £36 represents very good value for money.

Using a chatter tool

Unlike the Decorating Elf, which can be used on both end and side grain, the aptly-named chatter tool (**photo 1**) is best used on the end grain of relatively dense, close-grained wood. It works by holding a thin strip of spring steel, sharpened at one end, against the rotating work, **photo 2**. The spring steel vibrates or 'chatters' as you do this, and it is this action that cuts a pattern on the work, **photo 3**.

The vibration causes a high-pitched

screech, and this noise tells you that the tool is working correctly. The amount of spring steel projecting from the tool body, the shape of the cutting edge and the speed of the lathe (and of course the type of wood being used) are all variables that will affect the type of pattern that is achieved, so once again you'll need to experiment. As with the Decorating Elf, judicious use of colour can significantly enhance the finished effect, **photo 4**.

1. This is Hamlet's version of a chatter tool, although other manufacturers also make them. The spring steel strip is reversible and has a different grind on each end. You can, of course grind your own, including a concave edge to texture beads

3. This is the result of a few seconds' chattering in three distinct areas of the end grain, but...



2. With the toolrest set back from the work, rest the shaft of the tool on it with the handle held slightly higher than the cutter – just like a scraper. Hold the cutter firmly against the rotating wood for a few seconds and listen for the tell-tale screeching sound



4. ...I think the effect looks better if it's defined by a shallow groove. Here I've also coloured the texture by holding a felt-tipped pen against the work while it's rotating

The ukibori technique

This is a traditional technique used by Japanese wood and netsuke carvers. If you've ever removed a hammer dent or a bruise in wood by using a wet cloth and a steam iron, you'll understand the principle.

The idea is to punch a series of tiny indentations in the surface, **photos 1** and **2**, then to sand or cut away the surrounding wood down level with the bottom of the dents, **photo 3**. Next, wet

the wood thoroughly before steaming it with heat from a hot air gun, **photo 4**. This raises the grain in the dents so you end up with pimples that project above the finished surface.

A pop rivet makes an ideal punch, but if you're doing a lot of this work you may want to make one from an old centre punch, giving it a rounded and polished tip so it deforms but doesn't break the wood fibres. Be very careful not to punch

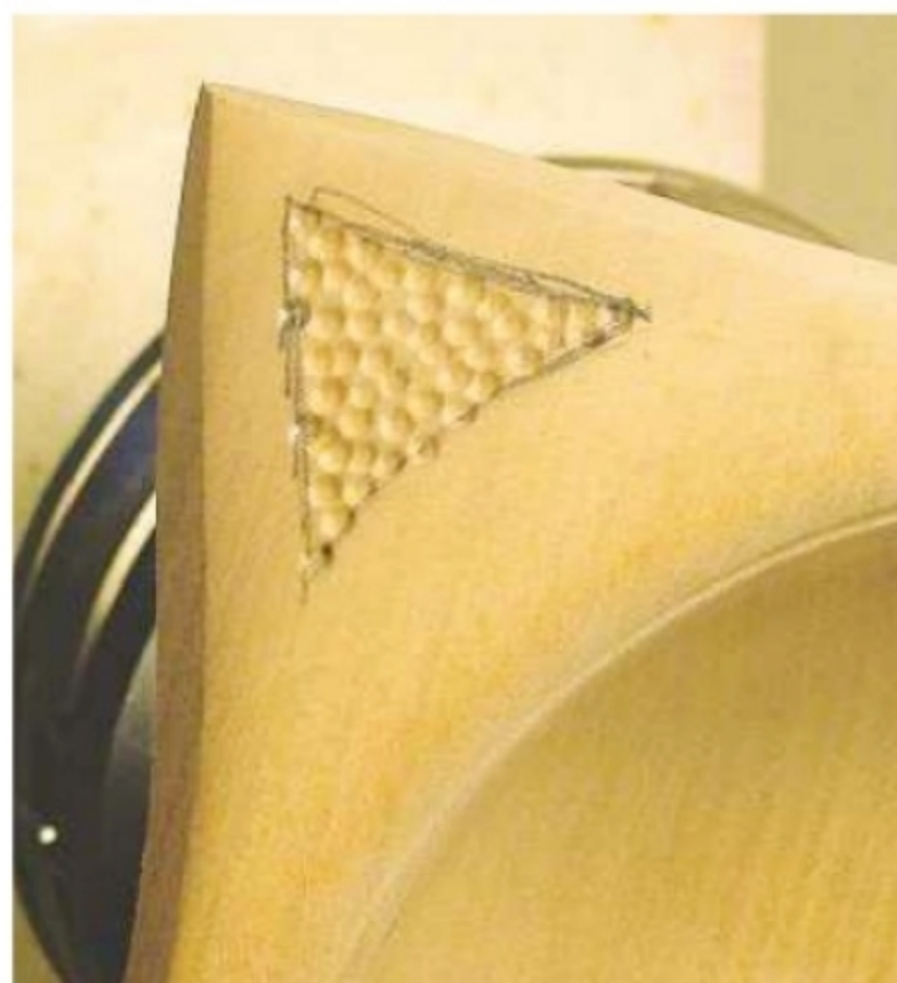
the wood too hard; you just want to bruise it.

Once you've steamed the wood, you can use wire wool to remove any raised grain caused by the water. The finished result can be further highlighted by applying a contrasting coat of coloured wax if you wish, **photo 5**.

This technique is time-consuming, so you won't get the instant gratification that some of the other texturing techniques will give you. Try using this method to create writing on your piece, or maybe even a design in Braille lettering.



1. Tap your punch with a hammer to make each indentation. You can create a random pattern, or draw a design on the wood and follow that. Try to make all your indentations the same depth



2. This is the (somewhat amateurish) pattern I produced on the 'leg' of a square bowl



3. Either sand the work or take a very light finishing cut with a chisel to remove wood down to the bottom of the indentations



4. Wet the wood, cover it with a wet cloth or paper towel and use a hot air gun to heat the wood. The steam created will swell the fibres and raise each dent into a projecting pimple

5. My finishing cut was a little too heavy and removed some of the indentations completely, so they couldn't be raised by the steam. However, you get the idea. Me? I need more practice!



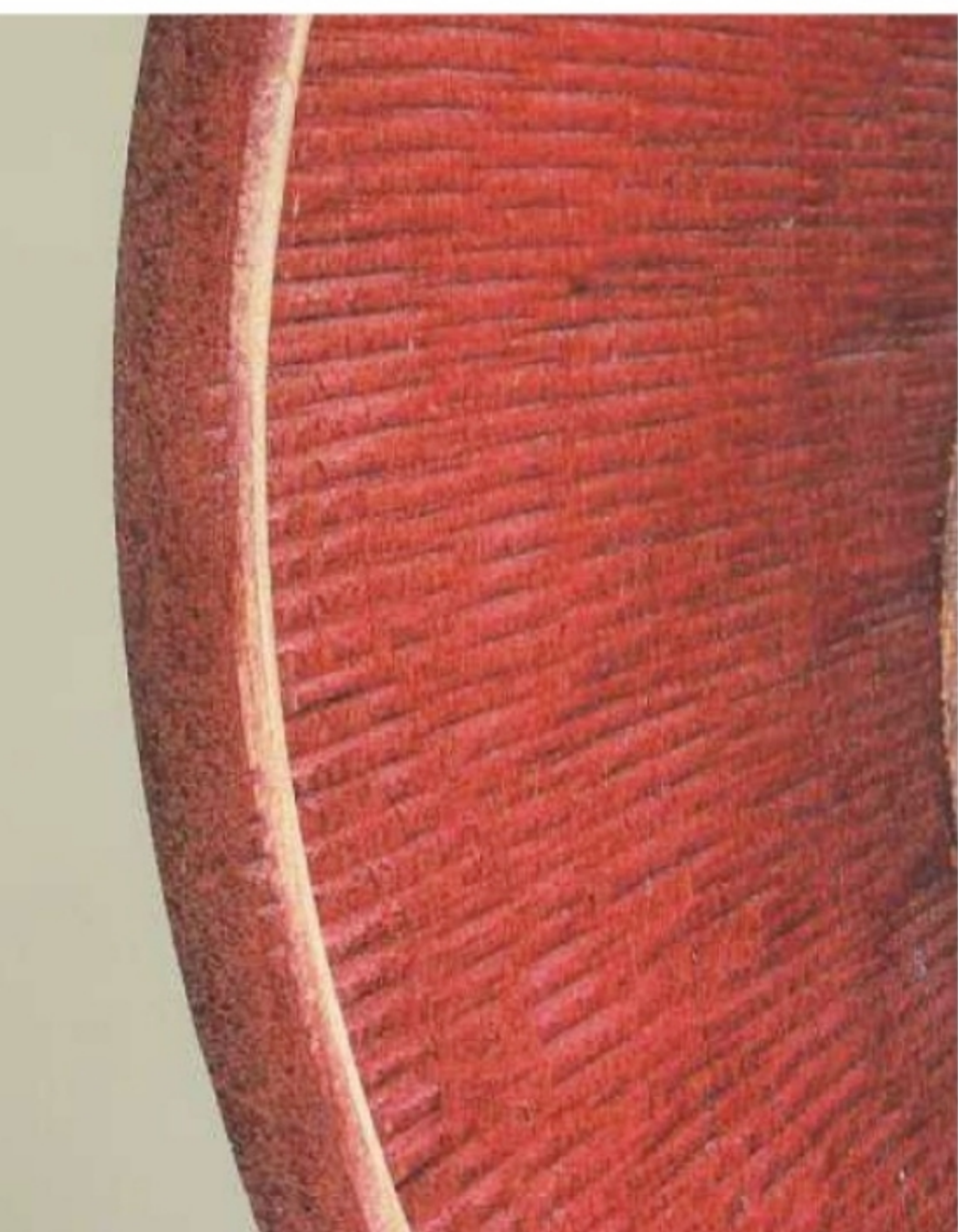


Do keep in mind the word of warning on the previous pages. For the most part, texturing won't cover up bad tool work or blemishes in the wood, so do ensure you have a good surface finish before you start. I also believe that any enhancement should be designed in from the start and not applied as an after-thought.

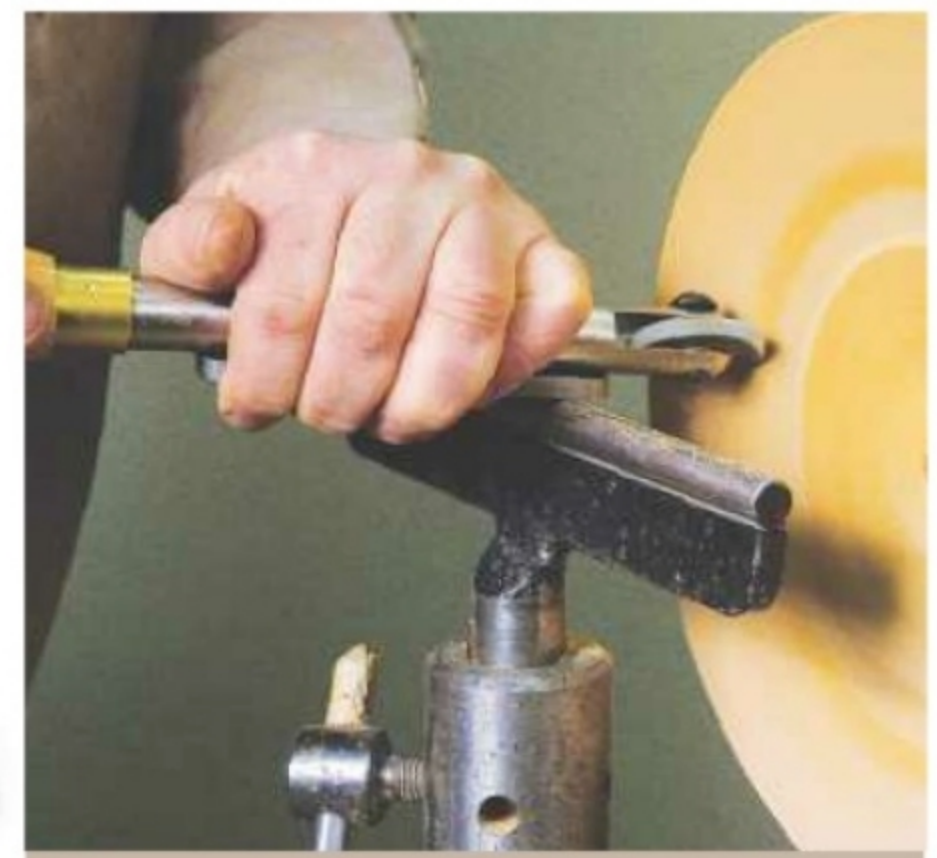
I hope this very brief canter through some surface enhancement techniques will inspire at least some of you to give it a go. There is so much that can be done; I've only scratched the surface here (excuse the pun). What can be done with these tools is limited only by your own imagination.

Spiralling and texturing

Robert Sorby's Spiralling and Texturing Tool is a fantastic piece of equipment that is capable of achieving an almost unlimited number of different patterns. It consists of a tool handle and shaft onto which any one of a number of differently shaped toothed cogs can be fitted. The cog is held against the revolving work, which makes it spin and cut the pattern. It can be used on both side and end grain. Here I have space to show you just a couple of the things it can do. The instructions supplied with the tool cover many more, which you can try once you've mastered the basic technique.



1. The Spiralling and Texturing Tool is supplied with a number of different cogs. The platform or shoe can be bolted to the shaft to maintain a constant angle for the revolving cog



2. This is the set-up for cutting a whirl-type texture on the rim of a platter, using the medium spiralling cog. Lathe speed is about 800rpm, and I've set the shoe so the cog is at an angle of about 35°. The tool is in trailing mode – like a scraper – and I'm moving slowly along the toolrest towards the rim



3. Once the required texture has been applied, I use a rotary nylon abrasive brush in a power drill to clean off any torn grain



4. This is the end result after finishing hollowing out the platter and cutting a couple of beads to define the textured area



5. The spiralling tool can also be used to cut spirals on spindle work. Place the tool horizontally on the toolrest and advance it gently into the wood, just above centre height, until the cog starts to rotate. Now lift the tool handle so the cog is lowered to centre height and starts to cut. Allow the cog to cut a reference point before slowly moving the tool along the toolrest and cutting the spiral



6. It's possible to stop the cut to see your progress and then to continue cutting the spiral. The teeth on the cog will slip into the spiral on the wood, providing the tool is horizontal



7. Here's a simple example of the type of item you can produce – a small needle case – but the technique looks equally good on corkscrew handles or the stem of a candlestick, for example

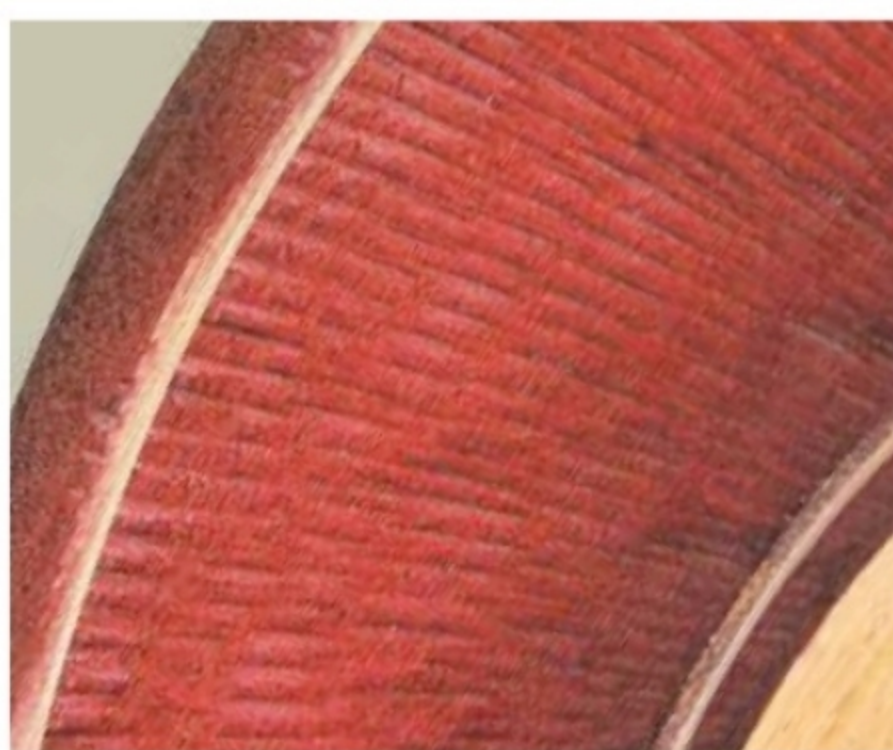
Using rotary carving tools

Similar effects to the spiralling on the rim of a platter can be achieved with special cutters held in an angle grinder.

1. I use a number of different rotary carving tools, each giving a slightly different effect. Shown here, clockwise from the top, are The Lancelot, a chainsaw in an angle grinder; the Arbortech Industrial mini cutter in a Proxxon angle grinder; the standard Arbortech cutter; the rotary chisel blade with three TCT teeth



2. Here I'm using the Lancelot to texture the rim of a platter, holding the tool firmly with my elbows at my sides. The lathe is running at about 800rpm, and the cutter is lightly brushed across the surface of the wood. I use the other cutters in the same way



3. This is a close-up of the finished rim after spraying it with acrylic paint and hollowing the rest of the platter

4. I also use these tools with the wood off the lathe to cut grooves like these on the rim of a double-bowl jarrah burr



5. This close-up of the rim shows the carved grooves. After doing the carving, I used a blowtorch to lightly scorch the tops of the grooves before oiling the piece



Using rotary burrs

Small rotary burrs can be used to incise patterns or pictures into the wood. I use a flexible shaft driven by a dedicated motor to hold my burrs, but a Dremel or similar small power tool will do just as well. This type of enhancement can be done on or off the lathe. If you do it on the lathe, as I am here, it's a very good safety precaution to turn the lathe off at the plug. This will prevent you switching the lathe on inadvertently.



1. This is a close up of the tiny rotary burr I'm using for this project



2. Here I'm free-handing some very loose circles around a raised band on the back of a beech bowl. Before starting work, I divided the band into eight equal sections using the indexing system so I could ensure that the carved circles would fit around the circumference of the band more accurately



3. To make the band stand out more, I painted it black and then rubbed gilt cream into the carved areas. It makes a strong contrast, and the black and gold go well together. I think the looseness of the carving also contrasts well with the smooth surface of the rest of the bowl

Using a pyrograph

Many of you will know pyrography as the process of burning a picture or letters into wood, but I'm using it to add random texture to my work. This can make even a very bland piece of wood look stunning. It can be quite time-consuming, so make yourself comfortable before you start and work in a well-ventilated room.

It's a good idea to buy a pyrograph that allows you to control the heat at the nib, because some woods burn better than others and generally endgrain burns slower than side grain. I strongly recommend that you practise on scrap wood before trying this on your latest turned masterpiece!

1. My pyrograph is an Eagle Burnmaster. It's rated at 130 watts and has dual ports for two pens. You can buy several different-shaped nibs for the pen, or shape your own from special nickel-chromium wire that comes in various thicknesses

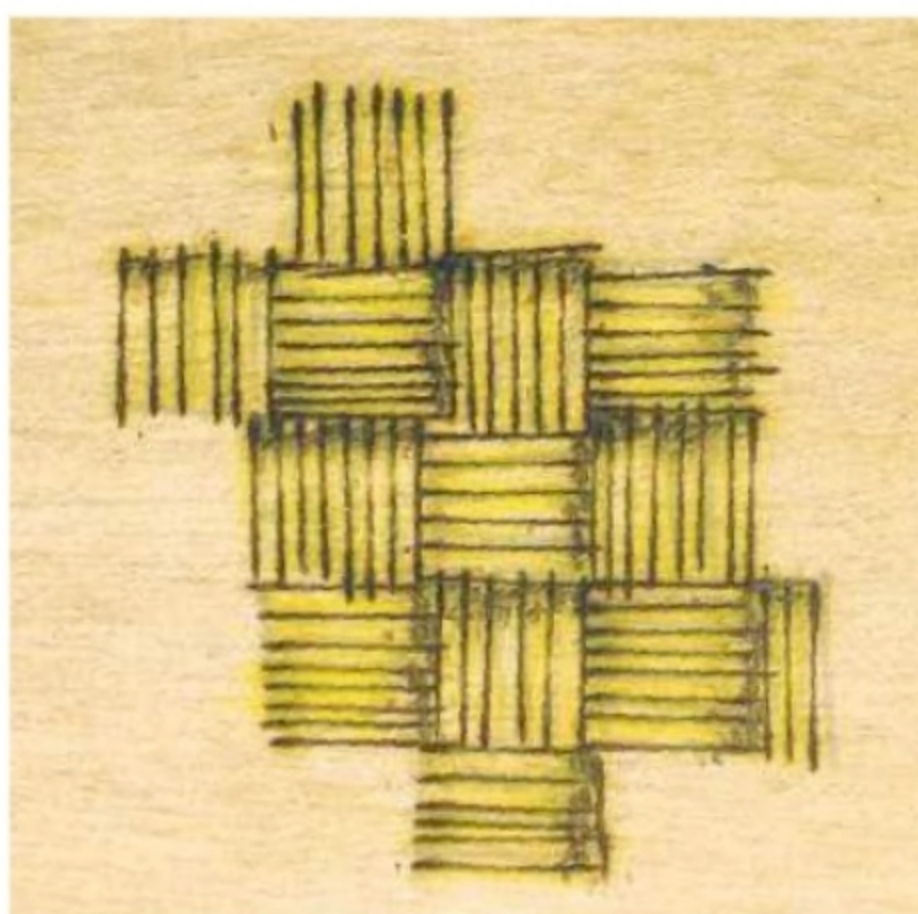


2. Here I'm using a spoon nib to apply random texture to a lidded box in a plain piece of ailanto (Tree of Heaven). Alter the angle of the nib so the burns don't become too regimented, and leave some natural wood between the burn marks. As I work, I use an old wire brush to clean the carbon off the nib

3. I think the effect of the pyrography on the finished piece not only adds texture but also enhances the visual appearance of what might have been a very plain box



4. Here I've used the side of the spoon nib to burn a random pattern of straight lines on the rim of a bowl, but...



5. ...if you prefer greater regularity, you could try burning regimented patterns. Here are a few simple doodles, some with colour added, to give you ideas



Three-legged stool



BY ALAN HOLTHAM



This project demands spindle, faceplate and copy turning skills, but Alan Holtham is here to guide you through

If you're not too confident about the copy-turning bit, keep the leg design very plain for your first attempt.

Traditional milking stools had legs that were just a simple straight taper, but you can make them more ornate as your skills improve. This design is reminiscent of a Windsor chair leg, but in some ways this makes it easier to copy as the



1. The raw materials for the stool – one disc and three blanks

distinct detailing produces more definite reference points to measure from.

Selecting materials

You'll need a disc for the top 265mm in diameter and 45mm thick, and three pieces for the legs each 310mm long and 50mm square. Any timber will do, but beech and ash are the traditional choice; this is ash, **photo 1**. Make sure the leg pieces are all exactly the same size to help with the copying process. Take all the material from one board if possible to maintain grain and colour continuity.

If you have a choice, select timber for the top that's as near quarter-sawn as possible to minimise any distortion. Anything with distinctly cupped rings will bend away from the heart, **photo 2**. However, this is less critical with a three-legged stool than a four-legged one.

Turning the top

Screw a faceplate onto what will be the upper surface of the top, **photo 3**. Use very short screws, and use a bradawl

rather than a drill to make the pilot holes so you don't go too deep. Two screws penetrating 10mm into the wood will be adequate if the face is flat and the wood is properly centred on the faceplate.

With the lathe spinning at about 500rpm, true up the edge of the disc using a bowl gouge held well on its side to make a clean slicing cut, **photo 4**. Then clean up the face, dishing it slightly to reduce the thickness in the centre and therefore the weight of the finished stool.

Back to front

Form a recess in the centre of the disc to take the expanding jaws of your chuck, **photo 5**. Make sure the recess is flat (or even slightly concave) so the chuck will seat accurately. If you want to make the recess slightly more decorative, put in some detail here, but don't overdo it.

Now round over the entire edge of the disc, **photo 6**. A smooth rounded profile always looks more finished than a square one with just the corners radiused.



2. Try to avoid choosing wood for the top with cupped rings, which will distort over time



3. Screw on the faceplate using the shortest possible screws. Use a bradawl for the pilot holes



4. True up the edge first, then clean up the face and dish it slightly in the centre



5. Form a recess in the centre of the disc to take the expanding jaws of your chuck



6. Radius over the whole edge to create a smooth profile, which looks better than a square edge



7. Mark a pencil line round the disc 40mm in from the edge to indicate where the legs will fit



8. Use your dividers to mark six equal steps round the perimeter of the circle



9. Use a sliding bevel to experiment with the splay angle



10. If you have a drill press, tilt the table to the desired angle; 10° is about right



14. Put the disc back on the lathe so you can sand and polish it. Mind the holes with your fingers



15. Reverse the top onto the expanding chuck and make sure it's well seated in the recess



16. Dish the top to remove any trace of the faceplate fixing screws



20. Use a mini drive centre so you can reduce the foot to a small diameter



21. At the other end, reduce the leg to fit into the holes in the top



22. To check the spigot size, make up a test gauge from a piece of scrap wood

Dividing by three

Use a pencil to mark a line around the disc, **photo 7**, about 40mm in from the edge. The measurement isn't critical; just make sure it's tucked well under the radiused top.

Set your dividers to the radius of this circle and step around it as shown in **photo 8**, marking every point in pencil. You'll find that it takes six swings of the dividers to get back to your starting point, so use alternate marks to give you the positions of the three legs.

Setting the angle

The next step is to drill the holes for the three angled legs. Use a protractor or sliding bevel to experiment with the splay angle, **photo 9**. I found that 10° was about right. You really need a drill press

to make these holes accurately and all at the same angle; Then you can just tilt the table to the desired angle, **photo 10**.

Draw a pencil line across the blank at each hole position, radiating out from the centre to help orientate it correctly on the table, **photo 11**. Then stand back and line up this marked line with the shank of the drill bit, **photo 12**. This may all seem rather imprecise, but it works fine in a non-critical application like this.

Drilling the holes

Clamp the blank firmly to the table top before you start drilling. Then set the depth gauge on the drill press so you don't drill too deep into the top. Remember that the top will be quite dished when it's finished, so allow plenty of clearance for this.

Use a 20mm saw-tooth or Forstner bit running at about 1000rpm to drill the three holes. Neither of these bit types should have any problem entering the wood at this slight angle, **photo 13**.

Once you've drilled the holes, put the top back on the lathe and skim the surface with abrasive paper to clean up any tears around them. If you sand by hand, hold the abrasive in a trailing manner so your fingers can't get caught in the holes, **photo 14**.

Then sand and polish this face. For larger surfaces like this, I recommend a hard pastewax applied over two coats of cellulose sanding sealer.

Finishing the top

Now reverse the top onto the expanding chuck, making sure that it seats properly



11. Draw pencil lines at the three hole positions to aid the orientation of the drill bit



12. Align each marked line in turn by eye with the shank of the drill bit



13. Clamp the blank securely to the table and drill the three leg holes in turn



17. Power-sand the top with a Velcro pad, working down to 400 grit



18. Polish the top with pastewax, applied over cellulose sanding sealer



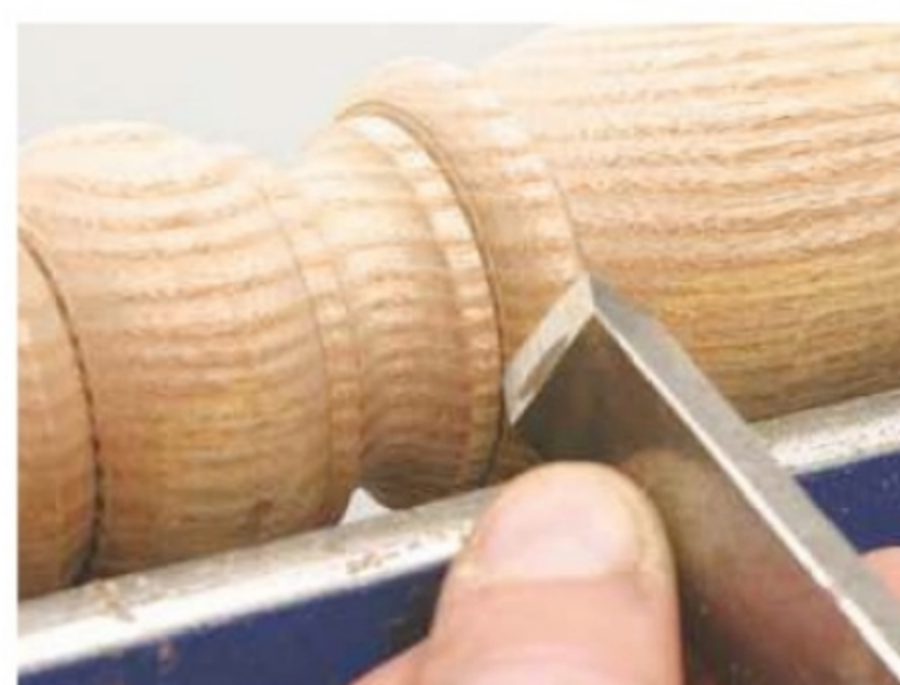
19. Mount the first leg blank between centres and turn it to a cylinder



23. Form the details on the leg using a variety of gouges and a parting tool



24. Smooth the long tapering centre section of the leg with a skew chisel



25. Use the long point of the skew to incise lines at all the details

in the recess, **photo 15**. It should run perfectly true if the recess was made properly.

Dish the top surface to remove any trace of the screw holes, and radius the top edge to match the underside, **photo 16**. Then power-sand the top with a Velcro pad, working through the range of abrasives from 180 down to 400 grit, **photo 17**. Then polish it to match the other side, **photo 18**.

Turning the first leg

The legs are a simple between-centres turning job, so mount the first piece and set the lathe to about 2000rpm. Reduce the blank to a cylinder using a $\frac{3}{4}$ in roughing gouge, **photo 19**, working off each end of the blank in turn. Even on such a short piece as this, expect

some vibration as the turning proceeds. Ash in particular is quite springy, so take light cuts if you start to experience any problems.

If you use a mini drive centre, **photo 20**, it's easy to reduce the foot to a small diameter. A larger centre means you'll have to leave some waste on this end and part it off later.

At the other end, reduce the leg to be a tight fit in the holes you drilled in the top, **photo 21**. Set the callipers off the actual drill bit you used; then the taper should be a perfect fit. Make up a test gauge for it by drilling the same size hole in a piece of scrap wood, **photo 22**.

Finishing the first leg

Use a combination of gouges and a parting tool to form the details on the leg,

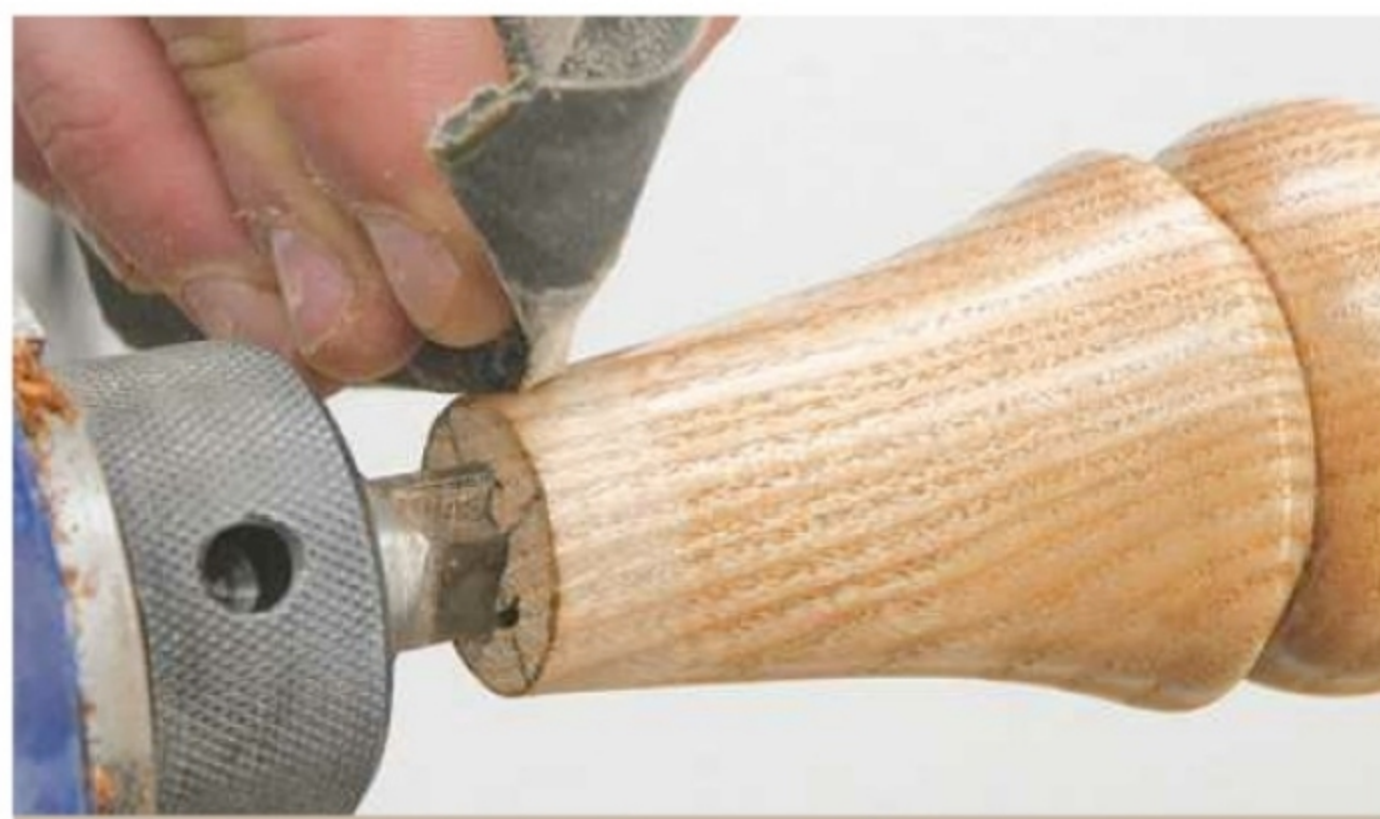
photo 23, keeping the shoulders crisp and square. The long, tapering section of the detail can be smoothed with a skew chisel, **photo 24**. Use the long point of the skew chisel to incise a fine line at all the points of detail, **photo 25**. This makes the whole job look much sharper and crisper, particularly after it's been sanded.

Use the same sealer and pastewax mixture to polish the legs, **photo 26**, buffing it initially with fine steel wool and then burnishing it with a soft cloth. This leaves a lovely soft glow to the wood, rather than a tacky high gloss.

Sand the area at the top of the leg that is to be glued into the top, **photo 27**, to make sure there is no wax residue remaining that could affect the glue's bond strength.



26. Use the same sealer and pastewax mixture you applied to the seat to polish the leg



27. Sand the top of the leg to remove the wax so the glue can bond it into the seat



28. Reduce the second leg to a cylinder and mark the detail positions



29. Reduce all the detail points to the correct diameters and check them carefully with callipers



30. As you work, check your progress with the first leg held alongside the piece you're turning



31. The three finished legs should look identical if your copying has been accurate

Making the copies

To copy the next leg, reduce it to the same overall diameter initially, and then use a pair of dividers to set out the main detail positions from the first leg, **photo 28**.

Reduce all these detail points to the necessary diameters, **photo 29**, checking them with callipers as you work. Provided these are right, the rest of the turning can be quite different and yet the job will still look good. As you turn, keep checking the work against the first leg, **photo 30**, filling in the profile by eye.

The three legs should be as close as possible to being identical, **photo 31**, though fortunately they look all right even if there are minor differences. This is part of the character of a hand-turned piece.

To assemble it all, smear a small amount of glue in the holes in the top, **photo 32**, and then knock the legs into place with a mallet. This way no glue gets forced out to spoil the waxed finish. And that's your stool finished: take a seat!



32. Glue the legs into their holes and tap them home with a mallet



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Turning the thread

Chris Child's classic egg timer involves thread work and precise turning technique

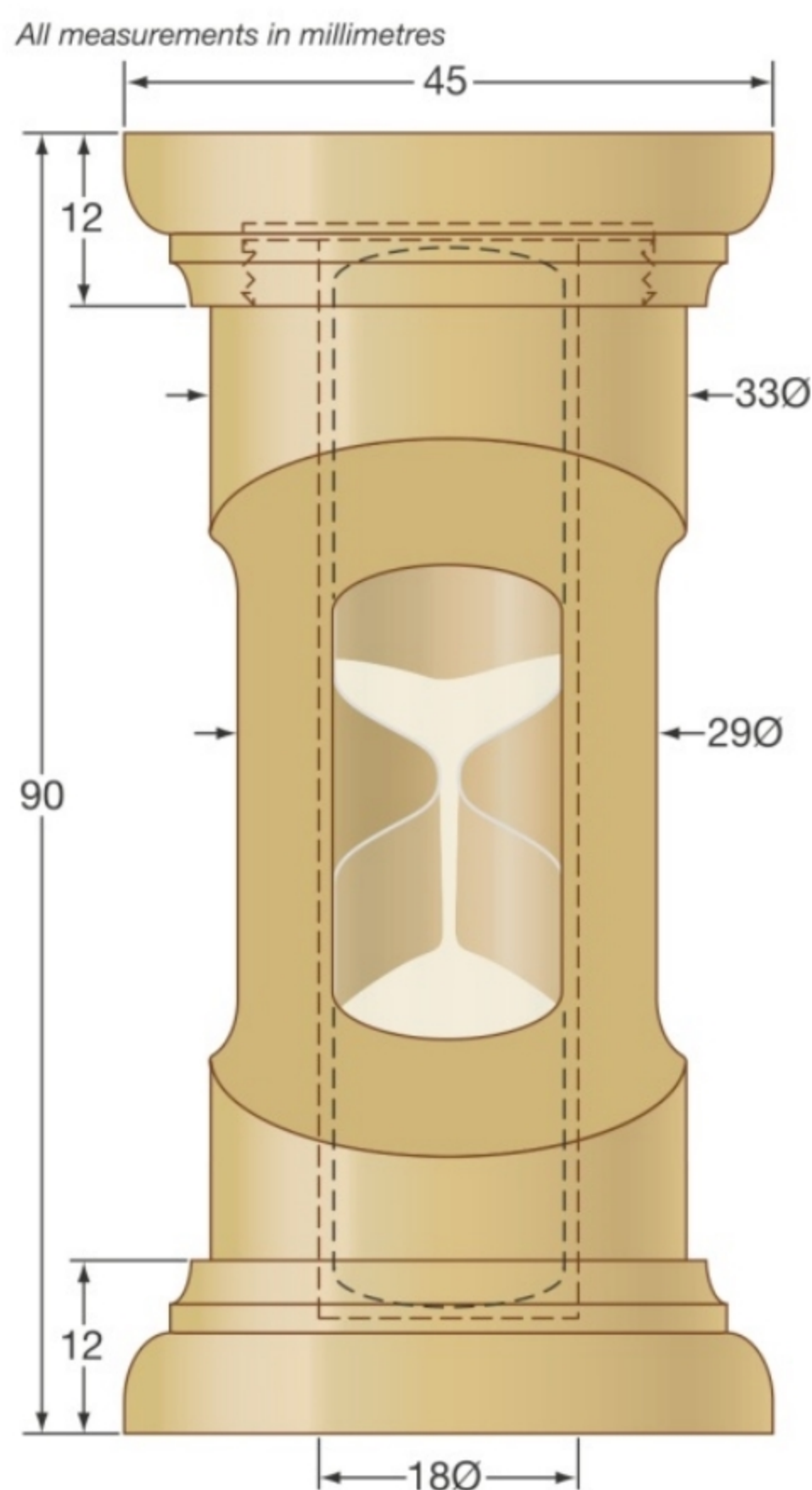
Anyone who has worked with seasoned boxwood will know what a joy it is to turn. It scrapes as cleanly as it cuts and when it comes to forming screw threads, it's in a class of its own.

The one drawback is that it's prone to splitting during seasoning. A crack will open up in the side of the log and travel along its entire length, halving the diameter of usable timber. It's rare to find whole pieces more than a couple of inches in diameter, which makes this little egg timer, with its threaded lid and fine mouldings, an ideal project as it can be made from a small branch less than 50mm in diameter and 100mm long.

A close fit

Creating a threaded joint for the lid of the egg timer case involves a quite specialised turning technique. If you don't fancy this, you can use a simple interference fit instead to hold the lid on, so long as the joint is a tight 'friction' fit.

This would free you from having to use boxwood or a similar tight-grained timber such as lignum vitae, but of



BY CHRIS CHILD



1. Glue the blank cylinder of boxwood to the centre of a softwood disc



2. Use a small scraper to form a shallow recess in the end of the work



3. Clean up the corners of the recess with a small square-end scraper



4. Form space in the base of the recess for the chasing tool to run into



5. Start the thread by holding the chaser lightly against the side wall



6. As the thread gets deeper, press harder so the teeth dig into the wood



Thread chasing tools

The special tools used to cut threads in wood are called thread chasing tools. They're supplied in sets of two – one for making the internal thread and the other for the matching external one. They're sized according to the number of teeth per inch, and for this egg timer case I used chasers with 20 threads to the inch.

They should be sharpened beforehand on an oilstone by laying them flat and honing them until the surface is bright all the way to the tips of the teeth.

Sometimes, with a new set of tools, the bottom back corner of the internal chaser will have to be ground away so it doesn't bind on the inside wall of a tight opening. If you have never done thread chasing



before, you might like to practise creating some threads on an area of the workpiece where they will be removed. You should then be a little better prepared when it comes to tackling the real thing.

course a threaded lid is a much more reliable and refined solution. The screw thread holds the separate components securely together, yet allows them to be dismantled easily if the sandglass ever needs replacing.

Essential preparation

Mount your piece of wood between centres and turn it to a cylinder. Then square off the ends so the blank can be glued directly to a small softwood disc. I used a stick of hot-melt glue which I melted with a blow torch and dripped onto the face of the disc, before pushing the end of the cylinder into the glue puddle. I then pinned the assembly between centres on the lathe, **photo 1**, and left it to set.

You should really do this preparation the day before, using a slow-setting epoxy adhesive, since it will need to be left overnight to set hard.

Making the lid

Attach the disc to a faceplate with four screws and then mount this on the lathe. Slice the end of the cylinder smooth and square with a small bowl gouge, then form a shallow recess using a small round scraper, **photo 2**. When you've removed the majority of the waste, use a square scraper to cut out the corners, **photo 3**. Now you're ready to cut the internal thread inside the lid.

Starting the thread

In the base of the lid recess, form a $\frac{1}{16}$ in space using a side-cutting parting tool, **photo 4**. This gap is for the thread chaser to work into at the completion of its thread-cutting run. Without it, the nose of the cutter would strike the roof of the lid and mince up the threads.

Select a lathe speed of around 100rpm and set the height of the tool rest so that when the thread chaser is held horizontally, the teeth lie $\frac{1}{16}$ in above the centre. Make sure that your tool rest is clean, and apply a little oil or candle wax to lubricate it.

Start the thread by holding the chaser with two or three teeth lightly pressed against the corner of the recess, and let the teeth brush against the side wall, **photo 5**. At first you'll need to use some gentle force to push the tool forward, but as soon as a thread begins to form, the tool will be drawn in by the pull of the spiralling thread.

Checking progress

As soon as the thread begins to form, stop the lathe and check that there is a single thread (one with a single start) and not a double or triple one, which occurs when you feed the tool in too quickly.

As the thread gets deeper you can



7. At the end of the thread run, push the chaser clear of the threads



8. Smooth the threads with abrasive nylon matting and rub in some wax



9. Form the small concave moulding on the edge of the lid with a scraper



13. As the thread develops, press the chaser quite hard into the threads



14. Withdraw the chaser at the end of the run so it misses the shoulder



15. After every three or four passes, test the thread by winding on the lid



19. Unscrew the faceplate and position it off-centre on the softwood



20. Use a small bowl gouge to cut through the side of the timer case



21. Cut in from each side of the hollow so you don't dislodge the work

press sideways, so that the teeth of the chaser dig into the wood. I hold the tool right at the end nearest the teeth, to maximize my sense of touch, and generate a rhythmic elliptical movement with my fingers, **photo 6**.

At the end of the thread run, push the chaser out of the threads so it doesn't crash into the roof of the lid, **photo 7**. Then use some abrasive nylon matting to rub wax into the threads, **photo 8**. This will take off any sharp corners and lubricate the threads.

Adding detail

One of the advantages of boxwood is that it doesn't require the use of sophisticated slice cutting techniques; you can form wonderfully crisp detail with scrapers as long as they are sharp. I didn't need to use the hard-to-control spindle gouge to form the concave

moulding on the lower corner of the lid; I simply nibbled it out with a small radius scraper, **photo 9**. Check the depth of the recess and mark this on the side of the workpiece. Add about $\frac{3}{16}$ in for the top thickness and part the lid off, **photo 10**.

Threading the case

To make the thread on the end of the egg timer case, cut a rebate on the corner so that the projected section is $\frac{1}{16}$ in wider than the diameter across the threaded recess in the lid. Cut an end space for the chaser to work into, **photo 11**, using a narrow parting tool.

Start the cut with the chaser, using very gentle sideways pressure on the side of the tool, **photo 12**. Once you feel the first signs of a thread forming, let the tool run along by itself. As the thread develops you can press the chaser quite hard into the threads, while allowing it to be pulled

freely along by the deepening thread, **photo 13**.

Just as when making the internal thread, you will need to withdraw the chaser at the end of the thread run before it hits the shoulder on the other side of the end space, **photo 14**. After every three or four passes with the thread chaser, test the thread by winding on the lid, **photo 15**.

Leave the lid firmly screwed on while you form the decorative mouldings on it. Use a parting tool to cut the square fillets, and a skew chisel set on its side to round off the beads, **photo 16**.

Hollowing out

Bore the hole for the sandglass using a saw-toothed bit held in the tailstock of the lathe, **photo 17**. Test that the hole is deep enough by screwing the lid on with the glass inside. It's ideal if the glass is



10. Allow for the thickness of the top of the lid as you part it off the lathe



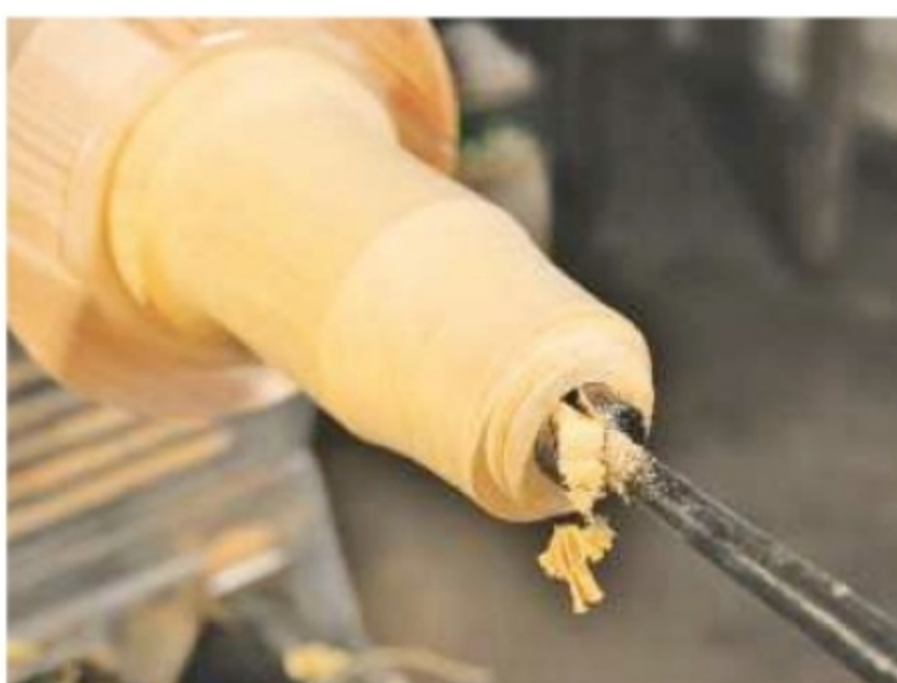
11. As before, cut an end space on the case for the chaser to run into



12. Start the cut with gentle sideways pressure on the side of the tool



16. Leave the lid screwed on while you form its decorative mouldings



17. Bore the hole for the sandglass using a saw-toothed bit in the tailstock



18. Turn the outside shape of the case and add its mouldings and details



22. Check the fit of the hourglass, then trim and sand the window by hand



23. Then part off the work. Leave the waste on the softwood disc and...



24. ...turn it down to form a slim mandrel chuck. Then jam the case onto it

held snugly in place, but don't worry if there is a bit of slack, because you can always pack out the hole with a little ball of Blu-Tack or cotton wool. Remove the glass and turn the outside shape of the case with its various mouldings and details, **photo 18**.

Creating the window

You will need to perform some off-centre turning to cut the window in the body of the case through which the sandglass is viewed. This isn't as difficult as it sounds. Remove three of the four screws that hold the wooden disc to the faceplate. Then move the faceplate to one side as shown in **photo 19**. Screw it back in the off-centre position and return the work to the lathe.

Use a small bowl gouge to cut through the side of the timer case so that the hollow chamber is exposed, **photo 20**.

Cut in from each side of the hollow, feeding the tool in slowly, **photo 21**, so you don't dislodge the work from the off-centre plate.

Stop the lathe and check that the opening displays the centre section of the glass. Remove a little more wood if it doesn't. Then trim and sand the window surround by hand, **photo 22**.

Finishing touches

Remove the work from the lathe and re-centre it on the faceplate. Return it to the lathe for a final sanding and the application of a coat of oil or wax polish. Then part off the work in the usual way, **photo 23**.

Leave the waste on the softwood disc and turn it down to form a slim mandrel chuck. Jam the open end of the case onto the chuck, **photo 24**. Then trim, sand and polish the end, **photo 25**.



25. Trim, sand and polish the end, fit the sandglass in its window and screw on the lid

To complete the job, simply pop in the sandglass, screw on the lid and get ready to treat yourself to a boiled egg!



In a nutshell

Alan Holtham cuts up turned work and reassembles it in the form of a nutshell

I tried this technique some years ago, but never got round to more than the one piece. So I thought it was about time to have another go with a simple bowl. The design isn't original and I take no credit for it, but this particular piece will give you a very gentle introduction to another dimension in your turning repertoire. Once you've understood the basic principles on a simple piece like this, the possibilities for more complex shapes seem boundless for those with an artistic vision. I can't wait to experiment further.

The first mistake

You may want to draw it out on paper first before you finally commit tool to wood, but I was fairly relaxed about the whole thing and decided to make it up as I went along. There is nothing particularly difficult about it, but it is important to consider the final wall profile as you make

the initial turning, as this is what is immediately apparent in your finished composition. I only realised this when it was too late, so learn from my first mistake!

Starting point

The blank I used was a piece of ash which although hard actually turns quite easily, **photo 1**. Its figuring is relatively bland, and something more ornamental would probably have been a bit more striking, but cheaper species are better for these experimental pieces! It doesn't matter what size of blank you use; just bear in mind how the overall proportions will work out when it's sawn in half. I started with a piece about 180mm diameter and 90mm thick, though I reduced the thickness somewhat as I was working to get the shape I wanted.



Making a start

Begin by finding the centre of the blank, **photo 2**. Then decide how you're going to hold it for the initial turning. I settled on the screwchuck in my combination chuck, **photo 3**, but a standard faceplate would do just as well.

With the lathe set at about 750rpm, start by roughing down the edge to get it balanced. Put plenty of pressure on the rest and not too much on the wood to stop the tool bouncing on hard timber like this, **photo 4**.



BY ALAN HOLTHAM

Then true up the face of the disc in the same way and start turning away the outer edge to form the bowl profile, **photo 5**.

The shape evolves

The shape you develop on this outer edge will determine the profile of the bowl when it is cut and glued back together. I wanted quite rounded ends to the bowl, so I worked slowly to produce an evenly rounded curve, **photo 6**. This is not always as easy as you might think, so take your time and keep checking the profile against a plain background to make sure that there are no kinks in it. Smooth, even curves are always much more difficult to achieve than highly ornate detail.

Form a temporary spigot for holding the bowl later. Keep this shallow to minimise wasting too much thickness, but make sure it is properly parallel so you get a good grip with the chuck. Reverse the blank onto the chuck, **photo 7**, making sure it is seated squarely. It's not a very big spigot, so keep any subsequent cuts quite gentle.



1. My cut-and-paste bowl started life as a plain and rather bland ash blank



2. I used a proprietary centre finder to mark the blank's exact centre...



3. ...and mounted it using a screwchuck in my combination chuck



4. The first turning stage was to rough down the edge to get it balanced



5. True up the face in the same way and start turning away the bowl profile



6. The curve you create here will dictate the shape of the reassembled bowl



7. Form a temporary spigot on the base and reverse the bowl on the chuck



8. Turn away the top lip into a smooth curve, using a coin as a template

The bowl develops

Turn away the top lip into a smooth curve, **photo 8**. Take particular care here because, when the two halves are rejoined later, this curve will be doubled so any errors will be magnified. I wanted another perfectly rounded shape, so I used a coin as a template.

With the outside dimension established, you can then start hollowing out the main core of the bowl, **photo 9**. A $\frac{3}{8}$ in bowl gouge with a short bevel will be adequate for the bulk of the work.

The undercut lip is a little more tricky to cut, but the short bevel on the gouge allows you to work nearly all the way



9. With the outer dimension established, start hollowing out the core of the bowl



10. The short bevel on the gouge allows you to undercut the lip of the bowl



11. The key to success is in creating an even wall thickness; check this with callipers



15. Flat down between coats, apply pastewax and buff up to a high sheen



16. Use fine abrasive to remove any trace of wax from the rim of the bowl



17. Remount the bowl using a combination chuck with large bowl jaws



21. Set the fence to half this distance from the blade and cut the bowl in half



22. True up the two bandsawn faces on a disc sander to get a perfect join



23. The simplest option is to rejoin the two halves as they are, rim to rim

round the lip, **photo 10**. You'll have to start with the handle of the gouge right round across the face of the bowl.

Checking progress

I now realize that the key to success with this technique is to get the wall thickness even, or at least gently tapered, so use callipers regularly to check your progress, **photo 11**. I didn't really pay enough attention to this stage.

Finish off using a power sander to get the inside surface ready for polishing, working down the grades to 400 grit, **photo 12**.

After sanding, check that the rim is dead flat, **photo 13**, as this will form the gluing edge later. Use a flat scraper if necessary to get it spot on.

Finishing time

My usual finish for this sort of project is several coats of cellulose sanding sealer,

photo 14, rubbed in well with a cloth while the lathe is stationary. Flat these down well between coats using fine abrasives or wire wool. Then apply a coat of pastewax and buff it to a sheen at high speed with a soft cloth, **photo 15**. Finally use very fine abrasive to clean off any polish from the rim, **photo 16**, as any wax here will stop the glue holding properly later.

Turn and turn about

To clean off the mounting spigot, remount the bowl on a scrapwood chuck, or on a combination chuck with the large bowl jaws, **photo 17**. This gives a really secure grip and allows you to take some quite heavy cuts on this hard timber.

Try to maintain the same curve round the base as you remove the spigot, **photo 18**. I didn't do a particularly good job, so the profile then showed up as a bit flat when it was cut through.

Sand and finish the outside in the same

way as the inside, and the actual turning process is then complete, **photo 19**.

Half in half

Now all you have to do is cut it all up! Start by finding the exact diameter of the bowl using a square and a rule, working against the bandsaw fence as a reference point, **photo 20**. This is an important step, so take time to get it dead right. Then set the bandsaw fence at exactly half this diameter from the blade, and cut the bowl in half. I chose to cut down the length of the grain, **photo 21**.

Only now will the accuracy of your bowl walls be revealed; this attempt was just about acceptable, but wouldn't have won any prizes! A bit more patience and care with the shaping would have got them more even.

The bandsawn faces can then be trued up on a disc sander, **photo 22**, to get a perfect join between the two halves.



12. Sand the interior of the bowl, working down through the grades to 400 grit



13. Check that the rim of the bowl is dead flat, and trim it if necessary



14. Apply several coats of cellulose sanding sealer with the lathe stationary



18. Maintain the same curve round the base as you remove the spigot



19. Sand, seal and finish the outside surface as you did for the inside



20. Use a square and a rule to find the precise diameter of the bowl



24. I decided to alter their profile by sanding away one end of each half...



25. ...which changed the assembled profile of the bowl quite dramatically



26. Assemble the two bowl halves, then sand and polish the rim and create a flat base

Changing shapes

The simplest choice now is just to join the two halves of the bowl back together, rim to rim, to produce a symmetrical but oval shape, **photo 23**. However, I was feeling a bit more adventurous so I set about sanding a lot more off one end of each half than the other, **photo 24**. This changed the profile quite dramatically and removed the symmetry to make the finished result even more puzzling, **photo 25**.

Coming together

To glue the two halves of the bowl back together I recommend using medium-consistency superglue, **photo 26**, as this gives you a bit of time to line up the join. Then give it a whiff of accelerator to finalize the bond.

Use some fine abrasive to clean up the top surface of the reassembled bowl, softening the sharp edges a little. Then polish the cut edges by hand with the

same sealer/wax combination.

Finally, decide how you want the bowl to sit – either level or at an angle – and sand a suitable flat on the underside to

achieve this. Don't take off more than is necessary; just make it stable. Then give the entire bowl a final buffing with more wax, and the job is finished, **photo 27**.



27. Give the bowl one final application of pastewax and the job is done



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BY IAN WILKIE

Goblet from the green

Ian Wilkie explores greenwood turning to create a goblet from a branch of wet sycamore

During the winter, my farmer neighbour cleared the hedgerow at the end of my garden so it could be layered. As a result some quite large holly, sycamore, hawthorn, hazel and blackthorn branches were chain-sawed and piled up to be burnt.

This was a great opportunity to replenish our log pile free of charge. As I started to sort out some suitable specimens, I noticed that some of the wood was so fault-free that I put aside a few pieces, sealed them up in plastic bags to keep the moisture in, and decided to try my hand at wet-wood turning.

Also known as greenwood turning, this is great fun to do, as the long ribbons of damp shavings peeling off the wood are very satisfying. However, the unseasoned wood will tend to move in next to no time, and as a result you should aim to turn the object in one session and not take a lunch hour... or even a coffee break!

Making a start

Select a length of suitable branchwood and mark the centre pith (the red dot you can see over page in **photo 1**). Then make another mark 6mm to one side (the black cross in the photo) and use this mark as your centre pop.

Mount the blank between centres, **photo 2**. If you have a set of matching Steb centres, they will hold the blank very firmly.

Rotate the lathe by hand to make sure the work revolves freely and clears the toolrest without obstruction. This is particularly important with uneven blanks of branch wood. Set the lathe speed to 1500rpm.



The first turning

Begin by facing off the tailstock end of the blank with a bowl gouge, **photo 3**. Then turn a spigot to suit the chuck jaws you intend to use, **photo 4**. Note how the damp shavings peel off the wood with no dry dust to worry about.

Stop the lathe and use callipers to check the dimensions of the spigot, **photo 5**. Throughout this project I used the Robert Sorby Patriot chuck fitted with

STAYING SHARP

It's important with wet-wood turning to keep the tool very sharp and to touch-up the edge from time to time as you work. The Sorby ProEdge Sharpening System, shown here with a gouge from the Sovereign system, is very quick and easy to set up and use.



the spigot jaws. These jaws are serrated and give a very firm grip; they require a spigot 45mm in diameter and 30mm long.

While the blank is still in position, remove some surplus wood from what will eventually be the stem and the base of the goblet using a roughing spindle gouge, **photo 6**. This helps to reduce the imbalance and makes for smoother turning later on.

Shaping the bowl

Remove the work from the lathe and screw on the chuck. Mount the spigot in the jaws and then bring up the tailstock with the revolving centre for alignment before tightening the chuck with the hex key, **photo 7**.

You can now withdraw the tailstock and start to hollow out the bowl of the goblet using a 9mm bowl gouge, **photo 8**. Take

your time, and try to avoid cutting into and damaging the bark as this will be a feature of the finished goblet.

The outside cut

Using the same gouge, start to turn the outside surface of the bowl, **photo 9**, always cutting in a 'downhill' direction. If the wings of the gouge are ground slightly back, it will reduce the chance of catching them on the other side. A very good finish can be achieved straight off the tool, and little sanding will be required. Go as thin as you dare!

Some turners will spray the work with water as they turn it, to keep the wood from drying out. The need for this depends on your lathe and the position of the motor. I must confess I'm very reluctant to do it!

A small bendy worklight, **photo 10**, or an LED torch will be a useful aid when it



1. Select a suitable length of branchwood and mark the turning centre on the cut end



2. Mount the blank between centres and spin it to check that it clears the toolrest



3. Set the lathe speed to 1500rpm and use a bowl gouge to face off the end of the blank



4. Start turning a spigot to suit your chuck jaws. Note how the wet shavings peel off the wood



5. Stop the lathe and use callipers to check that the length and diameter of the spigot are correct



6. Remove some surplus wood from the stem and base area to reduce the imbalance



7. Screw on the chuck, mount the spigot in the jaws and bring up the tailstock before tightening up



8. Withdraw the tailstock and hollow out the goblet carefully using a 9mm bowl gouge

comes to judging the uniform thickness of the bowl wall. However, if you don't have one you can always use an external/internal calliper to measure the wall thickness instead, **photo 11**.

Tackling the stem

Before you work on the stem, you'll need to give some support to the bowl of the goblet by bringing up a revolving centre. As **photo 12** shows, all you need is a pad of scrunched-up kitchen paper to protect the surface from the point of the revolving centre.

Start to turn the stem in stages about 12mm wide at a time and gradually develop it from bowl to base, **photo 13**. Aim to get the diameter as thin as you dare; I lost my nerve at 6mm!

Finish off by forming the underside of the base with a concave shape to mirror the upper surface, **photo 14**. If you leave too much wood, the base could crack as it dries out and then the goblet won't stand up. As the wood dries out I also expect the bowl to distort and the stem to bend before it stabilises, but this all adds to the goblet's charm!

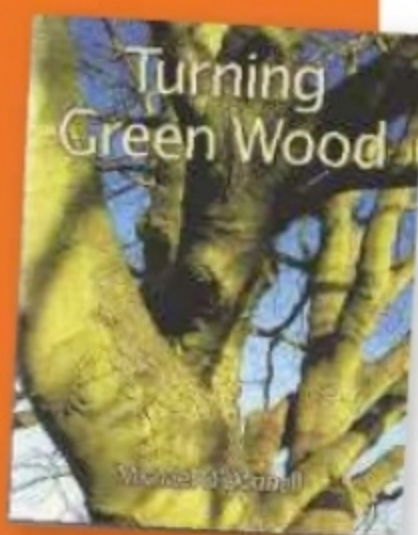
Health and safety

Although very little, if any, wood dust was formed during the turning, I did use a disposable Alpha Solway Professional cup mask respirator, **photo 15**. These masks are excellent and cool to wear; they come from Axminster at £7.65 for a pack of 5 and are highly recommended. Incidentally, the photo also illustrates the importance of working with the lathe at a comfortable height.

When you've finished, remove any damp shavings from the lathe and clean accessories paying particular attention to the chuck and its jaws. Wipe the lathe bars and apply a thin coat of light machine oil.

FURTHER READING

If you're interested in learning more about wet-wood turning, Michael O'Donnell's book *Turning Green Wood* is excellent. It covers all aspects of the subject, from selecting the wood to producing the finished object. I particularly like the combination of clear photographs and drawings which guide the turner through each stage in a clear and concise manner. You can't fail to be enthused and to want to have a go! It's available on www.amazon.co.uk for £12.99



9. Use the same gouge to turn the outside of the bowl, working down towards the stem



10. Check that the wall thickness is uniform using a small worklight or an LED torch



11. Alternatively you can measure the wall thickness using external/internal callipers



12. Support the bowl with a revolving centre and a protective pad of kitchen paper



13. Turn the stem in 12mm wide stages from top to base, aiming to get it as thin as you dare!



14. Form the base with a concave underside to minimise the risk of cracking as it dries



15. I used a disposable cup mask respirator, although the turning produced very little dust



BY COLIN SIMPSON

Set square

Turning a square bowl calls for some different techniques to your standard round, says Colin Simpson

Firstly, as the bowl rotates the tools will sometimes be cutting wood and then air. It's therefore essential not to rub the bevel hard against the wood. A gentle caressing of the bevel is all that's needed.

Secondly, I often see turners loop their fingers over the toolrest to help control the tool, **photo 1**. I consider this bad practice and, on a project like this one, downright

dangerous. Sooner or later the corners of the square stock will give your fingers a nasty rap. So keep them safely behind the toolrest at all times.

I'm using a 275 x 275 x 50mm block of mahogany that I cut perfectly square on a table saw.

There's a little bit of short grain at the corners, so any close-grained timber would be a good choice.



1. This type of grip on the blade and toolrest is definitely not recommended, particularly when turning pieces that aren't round. Keep your fingers behind the toolrest at all times



2. Find the centre of the blank, attach your faceplate or screw chuck and mount the blank on the lathe. Position the toolrest across the bottom face. It's difficult to see the corners as they revolve, so stick masking tape on the toolrest to show where the corners are



3. Face off the bottom of the blank with a bowl gouge. Then measure and cut a shallow recess to fit your chuck. I use a skew chisel held on its side to cut the dovetail



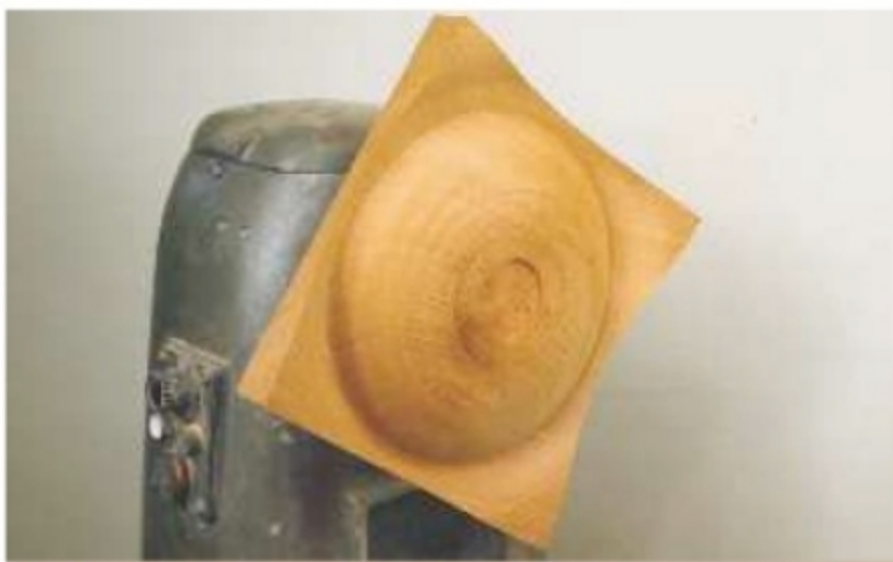
4. Use the bowl gouge again to start shaping the underneath of the bowl, cutting from the chucking recess in the centre towards the outer edge. Keep the cuts within the solid part of the blank at this stage



5. Now cut in the opposite direction to start making the feet. Begin the cut with the gouge on its side and gently advance the bevel into the rotating wood. As soon as you hear the clicking of the four corners hitting the bevel, move the handle away from you slightly to engage the cutting edge. Move the tool along the tool rest at the same time as swinging the handle



6. This is a photo of the same cut as step 5 after several more cuts have been taken. Note that the tool is still over on its side and the bevel is just caressing the wood



7. Keep alternating the cuts described in steps 4 and 5 until you have a shape something like this. Then take a couple of light finishing cuts or use a round-nosed scraper to remove any ridges left by the gouge



8. Power sanding is a safer option than hand sanding on this type of bowl. Keep your fingers well away from the rotating corners as you work



9. Here I've made up a sanding stick using a thin piece of foam rubber bent over a stick. The abrasive is taped to the foam. I'm using the toolrest to support the stick, and my fingers remain behind the rest

CUTTING CORNERS

If you want to make a square bowl but really don't like the idea of the corners whirling round, there is another way. This photo shows the blank with a sacrificial block glued along each edge using a paper joint. Once the glue has set up, simply turn your bowl in the conventional way; then remove the sacrificial blocks and clean up the edges.

There are a couple of disadvantages to this method. Firstly, it takes longer because you need to machine the sacrificial blocks accurately, cramp them in place and wait for the glue to dry. Secondly, you can't see the four edges of the bowl so it's more difficult to judge whether they are parallel. You need to rely more on callipers to check the width of the edges. Alternatively you can simply turn a round bowl and cut it square afterwards, but I think this method is wasteful of good wood.





10. Sand down the underside of the bowl to at least 400 grit, then apply the finish of your choice. I used paste wax over sanding sealer, both applied with the lathe stationary



11. Remove the bowl from the lathe and load your chuck. Mount the bowl on the chuck using the recess you made in step 3. Then use a bowl gouge to start shaping the top surface of the feet. Note the masking tape on the toolrest to show the extremities of the bowl



12. Keep stopping the lathe to check the edge of the bowl. I'm looking to achieve a parallel edge, so a little more work is required here



13. With the edge complete, I hollowed the bowl in the conventional manner, starting near the centre and working out towards the rim with each cut



14. Still using the bowl gouge, I rolled the rim over to leave a high ridge between the bowl section and the edge



15. Next, I rolled a bead on this ridge using a skew chisel held on its side. This bead creates a neat shadow line and helps define the rim and bowl



16. I'm power sanding again, holding the sander stationary while the bowl spins. Take care not to roll over the leading edges of the four corners



17. Here I'm hand sanding the bead, but this is within the solid part of the bowl, so I'm unlikely to rap my fingers on the four corners. Note that my right hand is supporting my left wrist. Next, I applied sanding sealer and wax to the surface with the lathe stationary



18. It's safest to polish the piece with a buffing mop. Use the bottom quarter of the mop as shown, and take care not to let a leading edge of the workpiece touch the mop or it will be snatched violently from your hands. I'm applying carnauba wax here, which gives the bowl a lovely sheen

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Quality from start to finish



BY COLIN SIMPSON

Hot stuff

Accurate marking out is the key to successful off-centre turning, demonstrated by Colin Simpson's trivet

In this article I'm going to show you how to make a small trivet that involves a little off-centre turning. The actual turning is simple, but precise marking out is the key to success. My trivet is 150mm in diameter, but you can make yours whatever size you like... within reason. You might even like to consider making a set of smaller ones to

use as drinks coasters, or larger ones for place settings. They would certainly make a conversation piece at any dinner party!

Raw materials

You will need two pieces of 18mm MDF or good quality plywood (one 250mm in diameter and the other 180mm) to make the jig, and, of course, your trivet stock. This



1. Accurate marking out is the key to successful off-centre turning, demonstrated by Colin Simpson's trivet



2. True up the larger circle of MDF and mark its precise centre with a skew chisel



3. Screw the smaller MDF circle to the larger one and true it up with the skew



4. Cut a 6mm deep recess with a square-ended scraper to act as a jam chuck for the trivet blank



needs to be a close-grained timber such as beech, sycamore or any of the common fruit woods. Yew would also be suitable, and box wood is ideal if you can get it in a suitable size.

I'm using a piece of quarter-sawn London plane, which features beautiful medullary rays and gives a very attractive surface to the wood. You'll need a piece about 150mm in diameter, 12mm thick.

The right mount

Because the trivet stock is so thin, I don't want to screw a faceplate to it, nor to drill a hole in it for a screw chuck. There are several ways to mount this stock on the lathe, but probably the safest is to use a glue chuck.

If you choose this method, you'll also need a scrap block about 50mm in diameter. Mount it between centres, true it up and turn a spigot on it to fit your chuck jaws. Load this block in your chuck and use a hot-melt glue gun to glue this to the centre of your trivet blank, **photo 1**. Use the tailstock as a clamp until the glue

cools. Then true up the exposed face and edge of your blank, making sure the edge is parallel. Remove the blank from the glue chuck and set it aside.

Assembling the jig

Next, screw a faceplate to the larger piece of MDF, mount it on the lathe and true up the edge. Mark the exact centre of the piece using a skew chisel on its side, **photo 2**.

Take the smaller piece of MDF and drill three clearance holes in it, one in the exact centre and two on a circle 165mm in diameter. Countersink these two holes. Using the centre hole, screw the smaller MDF piece to the very centre of the larger one. This will ensure concentricity of the two pieces. Screw the two pieces together using the two outside holes, then remove the centre screw. True up this piece as before with a skew chisel on its side, **photo 3**.

Preparing the chuck

Cut a 150mm diameter recess (or match the diameter of your trivet blank) in the

smaller piece of MDF to a depth of about 6mm. This will become a jam chuck for your stock, so cut it carefully and keep offering up the trivet blank to ensure a good fit. Don't make it too tight, because later on the trivet will become relatively fragile and you'll risk breaking it when you remove it from the jam chuck. Ensure that the bottom of this recess is flat, by using a square-ended scraper, **photo 4**.

The first circles

Mount the trivet blank in the jam chuck. Two or three beads of hot-melt glue will hold the piece in place if the recess is slightly too big, **photo 5**. True up the face of the blank using a fingernail profile bowl gouge, **photo 6**. Then cut a series of concentric grooves 6mm deep with a parting tool (mine is $\frac{3}{16}$ in wide), starting at the centre and working towards the rim, **photo 7**.

Photo 8 shows a close-up of my witness mark – a piece of masking tape wrapped around the bevel of the tool 6mm from the cutting edge. This makes



5. Fit the trivet blank into the recess, securing it with hot-melt glue



6. True up the face of the blank with a fingernail profile bowl gouge



7. Cut a series of concentric grooves in the blank using a parting tool



8. Use tape on the blade as a witness mark to gauge the groove depth accurately



9. Remove the tool rest and sand each groove with folded abrasive paper



10. Mark two concentric circles on the blank and divide them into six segments



11. Move the jam chuck round the backing MDF until point 1 is centred on the lathe



12. Rotate the MDF and use a pencil to mark the widest diameter circle round this centre

it easier to see when you have cut the groove deep enough. Try to make the grooves and spaces as even as you can; draw light pencil circles on the blank first if this helps.

Turn and turn about

Remove the tool rest and sand each groove with abrasive paper folded in half and shaped to the curves, **photo 9**. After sanding, break the glue beads holding the blank in the jam chuck. If you have any difficulty, then a minute in the microwave oven will soften the glue, but remember to remove the screws and faceplate first; metal and microwaves don't go well together.

Remove the trivet from the jam chuck, reverse it and replace it in the chuck. If necessary, glue it in place once more with hot-melt glue.

Geometry time

The next step, marking out, needs to be done very accurately. Measure and mark two concentric circles on your blank, one 75mm in diameter and the other 140mm in diameter. Mark the very centre of the blank and then divide the blank into six segments, using the indexing system on your lathe.

Don't worry if you haven't got a means of indexing; you can use another method. Set a pair of dividers to a fraction below the radius of the larger circle – in this case just shy of 70mm. Place one leg of the dividers on the circumference of the large circle and step round the circumference six times. You should end up back where you started. Mark each step. Next, draw a radial line from the centre of the blank through each of the six steps. Number each alternate radial line where it crosses the small circle as 1, 2 and 3. Number the other alternate radial lines where they cross the larger circle 4, 5 and 6.

This marking out sounds complicated, but it really isn't. **Photo 10** shows you what it should look like when you've finished.

Going off-centre

Undo the two screws holding the jam chuck to the backing MDF and move the jam chuck around the backing MDF until the point numbered 1 is centred on the lathe. Use the revolving centre in the tailstock to hold the jam chuck in place and re-attach the chuck to the backing MDF with the two screws, **photo 11**; then remove the tailstock. Rotate the MDF and use a pencil to mark the widest diameter circle around this new centre, **photo 12**.

Keeping your balance

You are now turning off-centre and the blank will be out of balance. Reduce

the speed of the lathe accordingly. The lighter the lathe, the slower you will need to turn. You can, of course re-balance the blank by attaching a weight to the back of the larger piece of MDF so it opposes the weight of the off-centred blank.

Once you're happy with the speed and balance of the lathe, cut a series of grooves 6mm deep around this centre until you reach the pencil line. Take it gently and keep sharpening your parting tool. You should aim to just break through to the grooves you cut on the other side. Sand the grooves as before, and it should look something like **photo 13**.

Two more circles

Now relocate the jam chuck on the MDF so that point 2 is on centre, and repeat steps 11, 12 and 13. When that's done, reposition the chuck for the third time so point 3 is on centre and cut the final set of grooves. Remember to sand the grooves as you go.

It's likely that you'll need to remove a few fibres from the intersections of the grooves, and you can use either abrasive paper or a file to do this. I used a small needle file, **photo 14**, working off the lathe.

Turning feet

Putting feet on the trivet is optional, but I think it lifts the project in more ways than one. The downside is that the trivet can then be used only one way up. A contrasting wood looks attractive; I used plain sycamore and sprayed it with ebonising lacquer.

Rough down a piece of wood about 50mm long to a cylinder and mount it in your chuck. Starting at the end farthest from the headstock, use a parting tool and a spindle gouge or skew chisel to turn three feet, each with a 5mm diameter spigot.

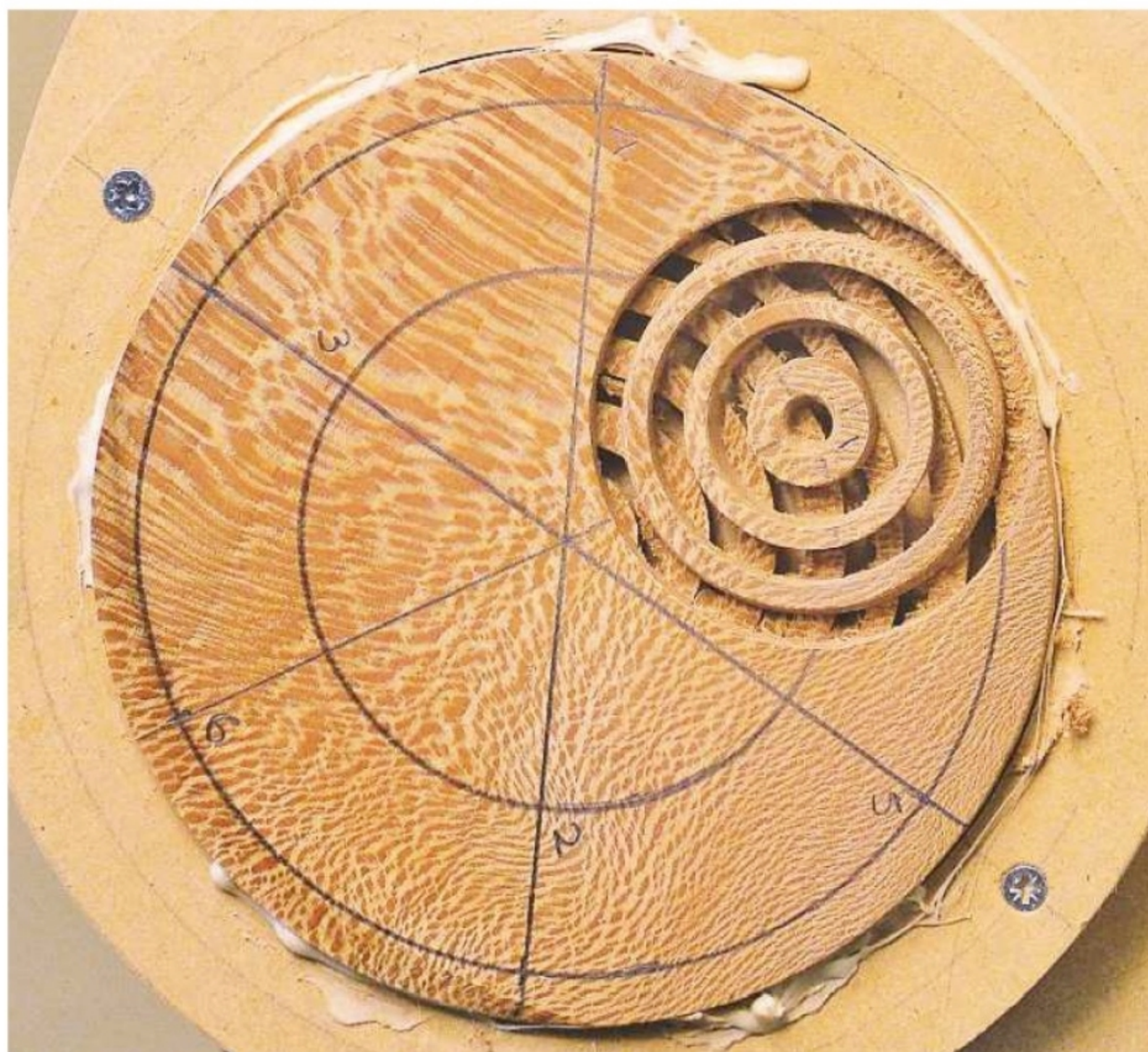
I like to complete as much of the work as I can on all three feet before finishing the first one and cutting it off. This way I can ensure that all three feet are as similar as possible. Sand the furthest one from the chuck before cutting it off with a fine-toothed saw, **photo 15**, and repeat for the other two feet.

Lastly, I drilled three 6mm holes in a piece of scrap wood to hold the spigots while I sprayed them using a Chestnut ebonising lacquer in an aerosol, **photo 16**.

Finishing touches

Drill 5mm diameter holes 5mm deep on points 4, 5 and 6 on the underside of the trivet, and glue the feet into these holes, **photo 17**. Oil and wax are not very durable finishes for a project like this, so I usually finish them with polyurethane varnish.

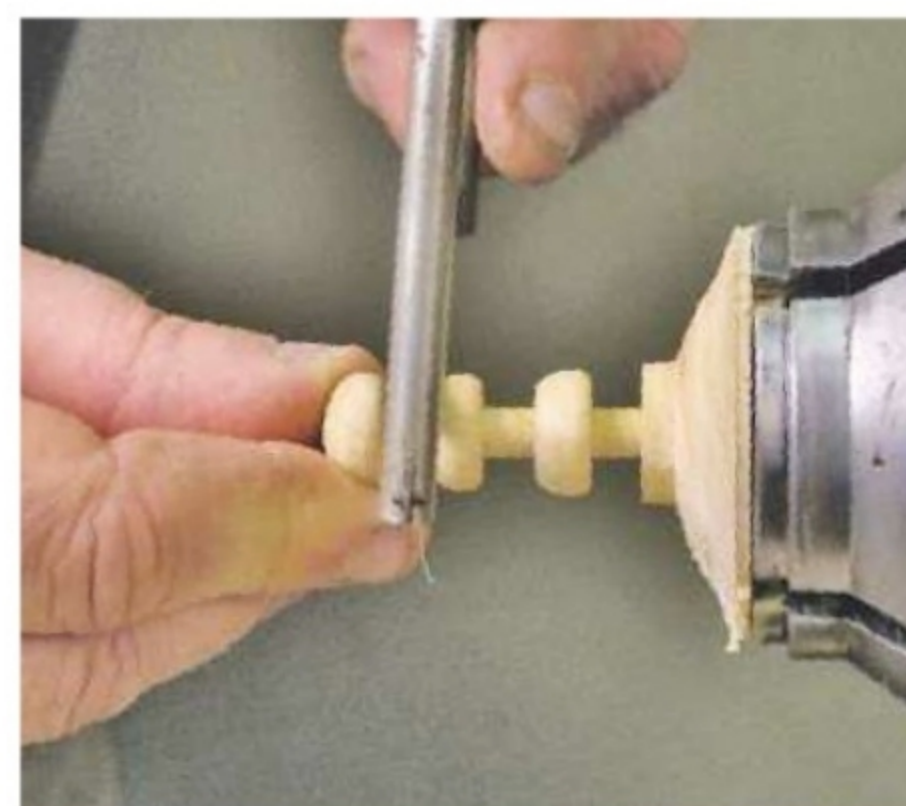
A couple of coats will complete the project.



13. Cut a series of grooves around this centre to a depth of about 6mm. Your cuts should just break through to the grooves on the other side



14. Remove wood fibres from the intersections with abrasive paper or a needle file



15. Turn the three feet on one piece; then sand each one and cut it off



16. Mount the feet in holes drilled in some scrap wood and spray them black



17. Drill a 5mm hole at points 4, 5 and 6 on the trivet and glue on the three feet



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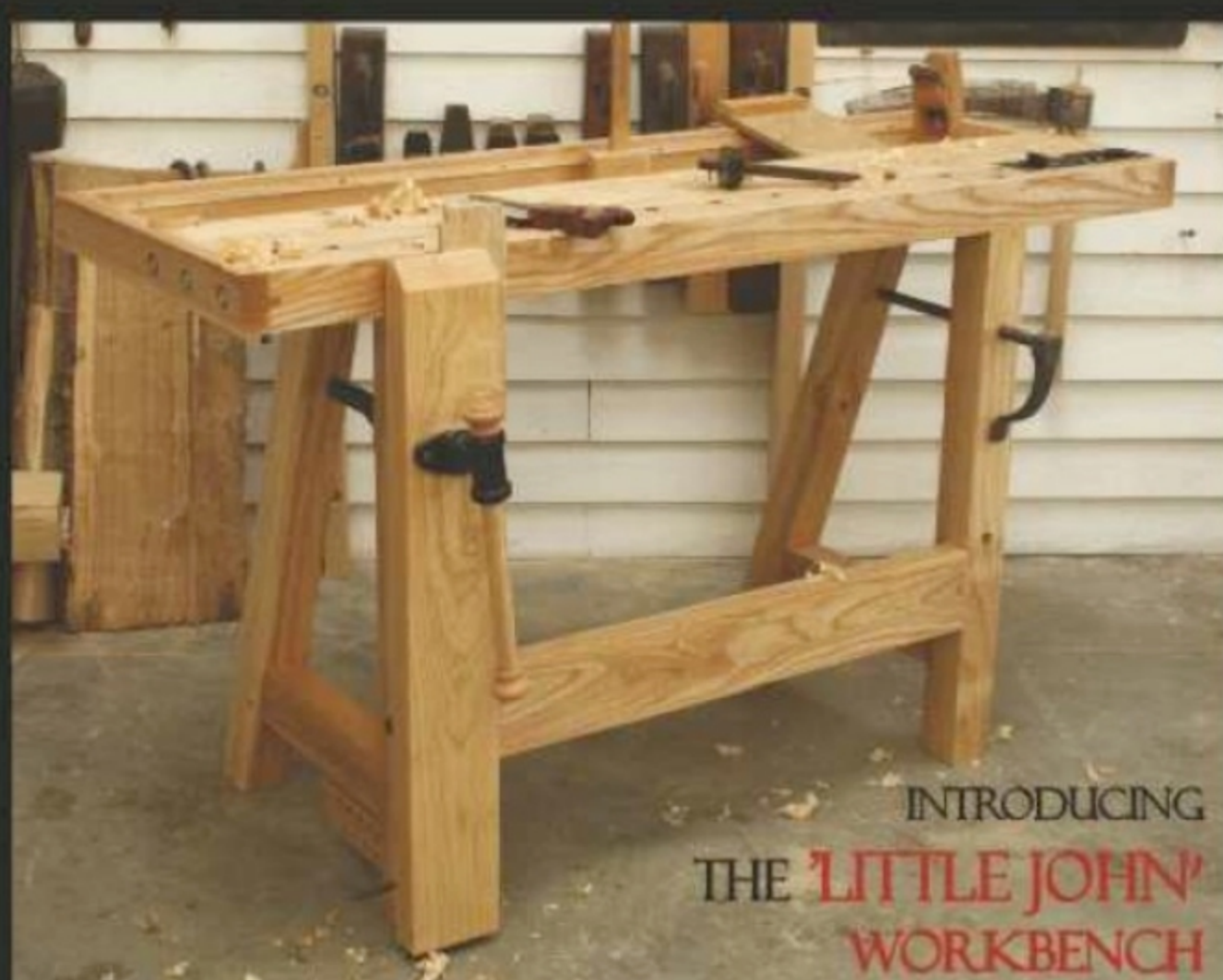
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Master Turner

Like most things in life, the more you know the more you realise there is so much out there still to be assimilated. In this section we offer our take on complex issues that will probably fox turners for decades to come, like indexing, how to avoid distortion, and how to tackle segmented work.



88

76



92

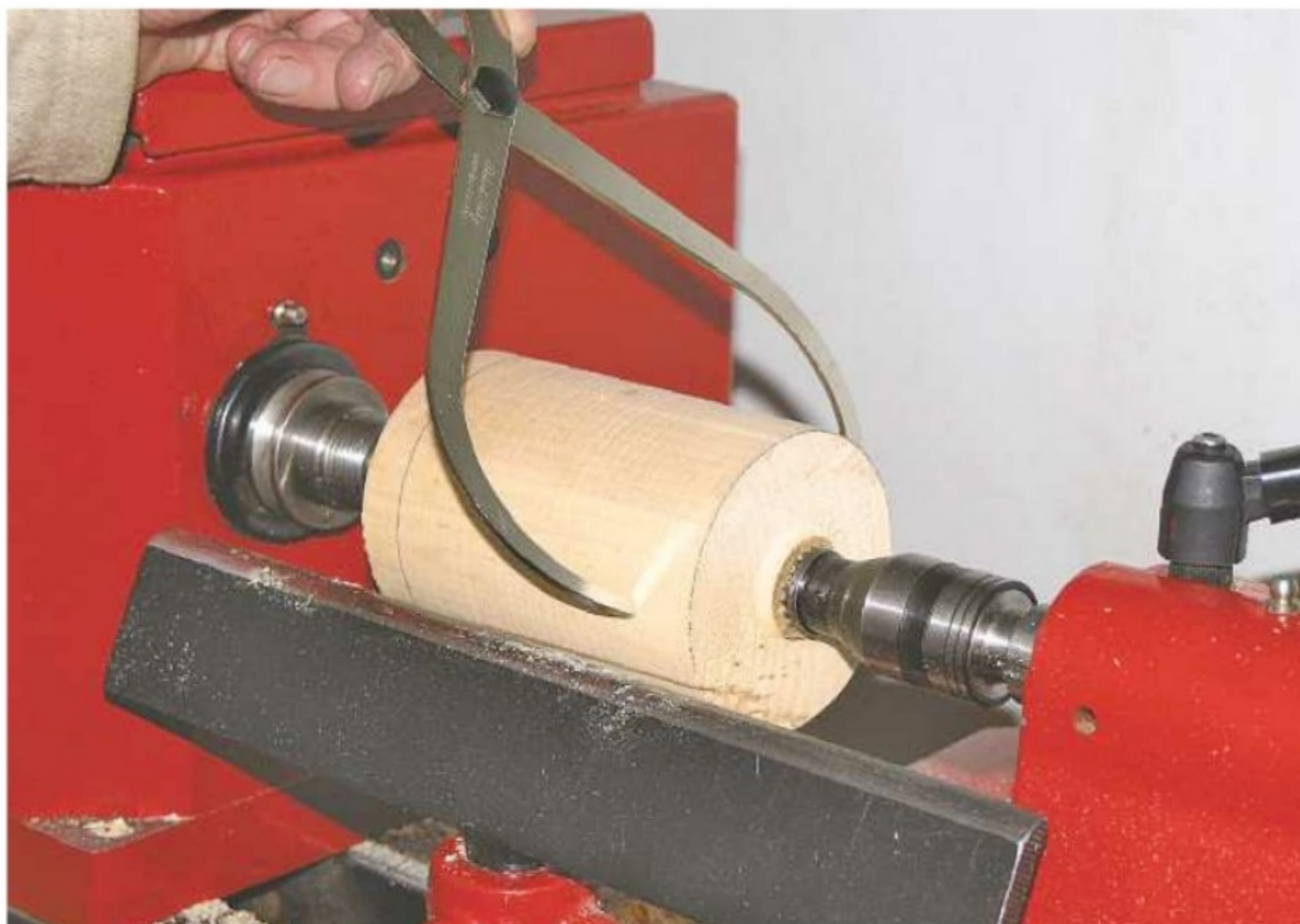


Index linked

Ian Wilkie turns a lidded pot, pierces a pomander and creates matching gallery parts to demonstrate a range of indexing techniques



BY IAN WILKIE



1. Turn the sycamore blank to round and check its diameter in several places

The pot shown here is turned with a sycamore body and a lid and base in walnut. The body of the pot is decorated with 6mm diameter walnut dowels. Both the sycamore and the walnut blank measured 100 x 100 x 120mm. Sycamore is a good clean wood to turn – it cuts, sands and finishes well. It's fairly bland in appearance, without a very marked grain, so it makes a good foil for the walnut. Sycamore sometimes exhibits vertical streaks which you don't really want to see in a project like this, so choose your wood with care.

Forming the pot

Start by turning the sycamore blank to round, with an external diameter of 80mm. Use callipers in several places to check that it's the same diameter all the way along, **photo 1**.

Measure and form a spigot at one end to match the chuck jaws you plan to use, **photo 2**. I used the Oneway chuck fitted with standard jaws which are designed to grip onto a parallel spigot 45mm in diameter and 10mm long. These jaws have tremendous gripping power with their patented internal grooves. Oneway chucks and jaws are available from Toolpost.

Hollowing out

Face off the outboard end. Then fit a drill chuck in the tailstock with a

SORBY PRECISION BORING SYSTEM

This system from Robert Sorby enables accurate holes to be drilled on the side or face of turned work, either at right angles or at another angle. The set consists of a stem, which is available in different sizes to cater for various lathes, a head which screws into the stem, and three drill bushes with diameters of 6, 9 and 12mm that fit into the head. Other sizes are available on request. Three HSS drill bits are also included to match the bush diameters.

The toolpost fixes into the banjo assembly toolrest hole and can be set at any height. The photo shows a steel collar which I purchased in an agricultural outlet; this is secured to the stem by means of a grub screw. This ensures that the jig will always be accurately in line with the centre line of the lathe.

With the jig in position and the drill bit held in a small electric drill or in a flexible shaft chuck, it's possible to

carry out accurate repetitive drilling.

I've had this system for a long time now; it's well made and very good value. It's sold in a strong plastic box which keeps the various parts from getting lost.





2. Form a spigot at one end to match the chuck jaws you're using



3. Fit a drill chuck in the tailstock with a 60mm sawtooth Forstner bit



4. This set of sawtooth Forstner bits includes eight sizes from 55 to 76mm



5. Withdraw the bit from time to time to clear out the shavings

Making dowels

It is relatively easy to make dowels in short lengths which can be inserted into drilled, indexed holes in turned work for decorative purposes. The secret of success is to select and prepare the wood carefully.

1: Use a proprietary dowel plate

The one shown below is made by Lie-Nielsen in the USA and is marketed by Axminster at £41.30, with an optional leather wallet at £12.40. The plate is pre-drilled in A2 hardened steel to produce 3, 4, 6, 8, 10, 12 and 16mm diameter dowels (an Imperial version is also available). The product is of very high quality and I doubt that it will ever need to be re-sharpened.

To use the plate, cut the wood slightly larger than the size required and plane off the squared edges. Then tap the wood through the appropriate hole in the dowel plate with a soft hammer. I usually just hold the plate vertically in soft jaws in the vice, but you can make a small block for it as recommended in the instructions.

2: Turn the dowels

I do this with the wood held in my Sorby Zero jaws, which are made for the Sorby Patriot chuck or the SuperNova2. These chucks are hollow throughout and allow 50mm of the dowel blank at a time to be extended beyond the chuck jaws and turned down to the size required. A small skew chisel is ideal for this operation.

Turning a parallel cylinder is not quite as easy as it appears, and it's necessary to check along the length with callipers for consistency as you work. I have a small DIY gauge for this purpose, which I made from an old spanner many years ago! Alternatively you could hold the wood in a lace bobbin drive in the headstock, with support from a revolving centre in the tailstock.

3: Buy prepared dowels

You can buy lengths of hardwood dowel in various diameters from outlets such as model shops or the Hobby's catalogue. Take your callipers with you to check the diameter carefully. This saves work, but you will be more restricted with your choice of woods and it is best to match the dowel exactly with any other contrasting wood on the project for the best effect.

1. Proprietary steel dowel plates have pre-drilled holes in a range of different diameters



2. Drive the rounded wood through the selected hole in the plate with a soft hammer



3. Turn the dowel down to the diameter you require and check the size in several places

60mm (2 3/8in) sawtooth Forstner bit, photo 3. If you don't have a bit of this size, use what you do have and hollow out the rest. Indeed, you can hollow it out completely without any drilling if you prefer; I've simply chosen the easiest option! Whichever method you adopt, the aim is to leave a wall thickness of no less than 10mm.

I have a set of Jumbo sawtooth bits which came from Rutlands and was given to me as a gift, photo 4. It's proved very useful because it contains the larger sizes I need from time to time. The bits are protected from damage with a plastic cap, and live tidily in their plywood box. Bits can also be purchased individually as required, at prices ranging from £5 to £50 according to the bit size.

Start drilling with the lathe set to a low speed (say 600rpm). Withdraw the bit from time to time to clear the shavings, photo 5. If you don't, there's a risk of it binding and overheating. Check the depth of the pot as you work, photo 6. You should aim for a final base thickness of about 10mm.

Tidy up the inside of the pot with a multi-tip scraper, photo 7, and sand it well. The centre point of the Forstner bit will leave a slight hole at the bottom, but this can be sanded away.

Marking out the holes

The next job is to mark where the rows of holes are to be drilled. Measure 10mm in from the top and bottom of the cylinder, then mark a position halfway between these points. Divide again between these positions so that you will end up with five evenly spaced rows. Now it's time to do some indexing.

Most modern lathes are designed with a built-in indexing system, giving 24 positions which are set with a locking pin. This allows you to mark 2, 4, 6, 8, 12 or 24 evenly-spaced holes round the circumference of your work. For this pot I went for six holes in each of my five rows.

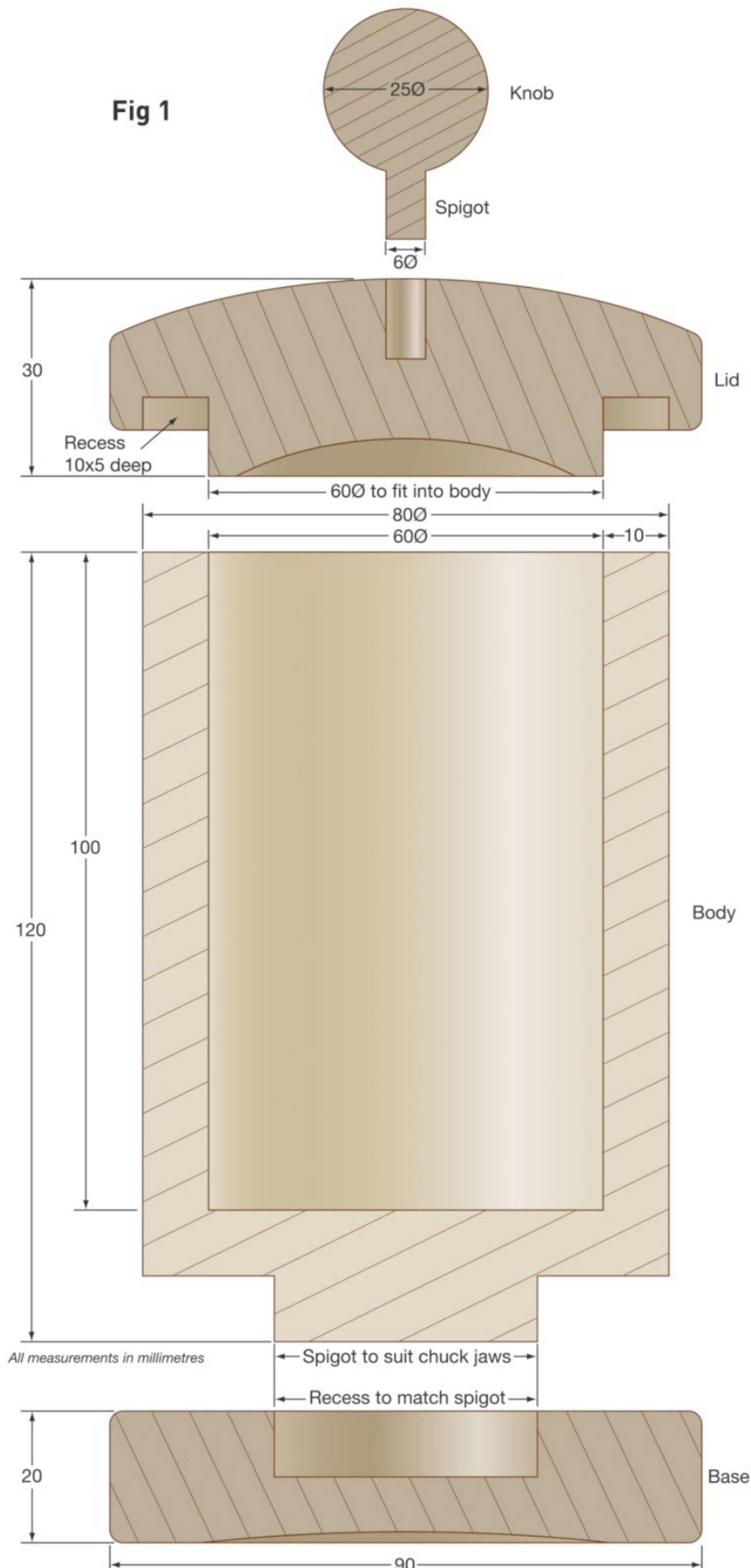
If you don't have this facility on your lathe, Sorby market an indexing plate which is held between the back of the chuck and the vertical register of the headstock spindle; this plate has a locking device, but it is expensive at almost £49. I reviewed it in the June 2010 issue of *The Woodworker*.

There are a few chucks marketed by Record and Axminster with an indexing facility drilled into the body, and to use these you need a separate arm with a pin which locates into the selected hole. Axminster also have indexed back plates for some of their chucks.

Drilling the holes

Disconnect the lathe and set up the drilling jig, making sure that the centre

Fig 1



6. Check the depth of the pot as you work; aim for a base thickness of 10mm



7. Tidy up the inside of the pot with a multi-tip scraper, then sand it smooth



8. Set up the drilling jig and depth stop, then drill the 30 holes to a depth of 6mm



9. Prepare 30 short lengths of dowel and tap one into each glued hole



10. Trim off the protruding dowels almost flush with a fine-toothed saw



11. Use a sharp gouge to turn the dowels flush; then sand the outside and apply cellulose sealer



12. Turn a recess in the base blank to take the spigot on the pot base



13. Shape the top into a slight dome and drill a hole for the knob spigot



14. Mount the knob blank on a dowel to act as a spigot, then turn it to shape and apply the finish



15. Glue the dowel into the hole in the lid to complete the assembly

tip of the bit is in line with the centre line of the lathe and that the drill is at right angles to the surface of the wood, **photo 8**. Fit a depth stop to the drill and set it to give holes 6mm deep; you don't want to drill right through to the inside of the pot.

Drill the first six holes round the circumference of the body; that means you'll be using every fourth index setting on the lathe. You need to take your time and concentrate as you do this! Then move the jig to the next line along the pot and drill the next six holes. Repeat the process for the remaining three lines and 18 holes.

Fitting the dowels

Use a small paintbrush to put a little PVA adhesive into each hole in turn. Then tap a short length of dowel into the hole, **photo 9**. Trim it off with a fine-toothed saw so it's just a little proud of the pot wall, **photo 10**. Repeat for the other 29 holes.

When the glue is dry, gently turn off the top surface with a sharp gouge, **photo 11**. Use a firm but light cut to reduce the risk of the tool bouncing when it comes into contact with the dowels. Sand the work well and apply a coat of cellulose sealer to the outside of the body. A finish of friction polish or wax can then be applied later when the sealer is dry.

Turning the walnut

Mount the walnut blank between centres, turn it to a diameter of 90mm and form a spigot at each end to suit the chuck jaws you're using. Part off to the sizes given in **fig 1** on page 79 to produce separate blanks for the lid and the base.

Hold the base blank in the chuck jaws and turn a recess to match the spigot on the bottom of the pot body, **photo 12**. Part it off and form a jam chuck with the remaining wood. Reverse the base and tidy up the bottom. Sand it, apply a finish and polish it. Then glue the pot to it.

Forming the lid

Follow exactly the same procedure for the lid, carefully matching up the spigot on the underside to fit comfortably into the top of the pot. Jam-chuck the lid and shape the top with a slight dome. Then fit a drill chuck in the tailstock and drill a 6mm hole about 10mm deep in the centre for the knob spigot, **photo 13**.

Turn a small knob for the top and finish it to match the lid. I have changed the chuck and jaws for this stage; I'm using the Sorby Patriot chuck with their brilliant Zero jaws which grip tightly on to a small spigot with ease, **photo 14**. I drilled the blank for the knob to take a 6mm Wolfcraft dowel, which then acts as a spigot.

Finish off by gluing the end of the dowel into the pre-drilled hole in the lid, **photo 15**; this will make a good, strong joint.

Variations on a theme

In the first variation (A), I've decorated an elm lid with 16mm blackwood dowels to show how the drilling jig can be used on the face of the blank. When the lid is turned to give it a curved surface (B), the dots are slightly distorted into ellipses (C).

A bowl or platter can be drilled and decorated as shown in this example of a bubinga dish with boxwood dowels (D). The pot behind it shows the effect of staggering the dowel holes.



A



B



C



D

A perforated pomander

A pomander was a ball, made of perfumes such as ambergris, musk or civet, which was originally contained in a case hung on a belt or neck-chain in the Middle Ages to give the wearer protection against disease and bad smells. The case was usually perforated and made of metal, although a wooden example was found on the Mary Rose and dated to 1545. Today, similar decorative pomanders are often hung indoors to fill a room with the fragrant scent of flower petals and the like.

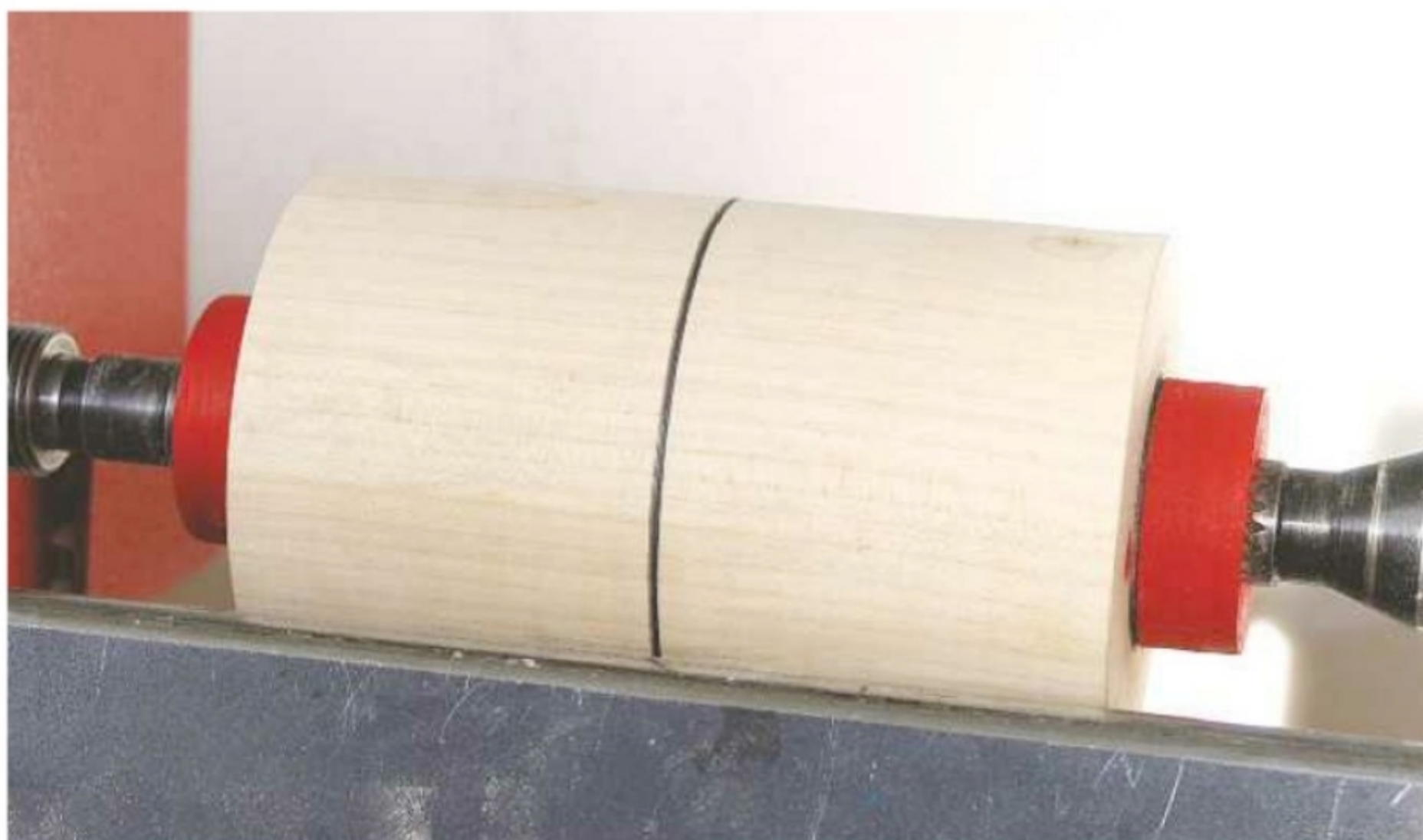
A tale of two halves

In this article I've used this theme to turn a case in two halves and filled it with pot pourri. It has a finial at the top and bottom and can be hung by a cord. The bottom finial can be removed so the pot pourri can be refreshed from time to time with scented oil. It's a good example to show how the combination of indexing and drilling opens up plenty of design ideas and possibilities.

My pomander is turned with a sycamore body and blackwood finials. It would be possible to turn the body in one piece and to hollow out the inside with a hollowing-out tool, but this needs considerable skill and it would be difficult to get a smooth, uniform internal finish. The method I've used is simpler and a lot less stressful!

Making a start

Hold the body blank between Steb centres and turn it to a diameter of 98mm. Form a spigot on each end of the blank to suit the chuck jaws you're going to use. Measure and mark the centre of the blank, **photo 1**, and part off with a thin parting tool to produce two identical cylindrical blanks, each with a spigot.



1. Turn the sycamore blank to a cylinder and mark its centre with a pencil line





2. Mount one half of the blank in the chuck jaws and start to hollow it out



3. Check the progression of the inside curve with your internal template (see the panel below) as you proceed



4. Switch to the bowl gouge and start to shape the outside of the hemisphere



5. Use the external template (see below again) to check the progress of the outside curve

Blanks & templates

For the pomander body you'll need a blank measuring about 190mm long and 100mm square. The blanks for the finials are both 25mm square; the one for the top is 30mm long and for the bottom 60mm long.

Before starting work, it's a good idea to make simple internal and external cardboard templates for the body, as an aid to getting the curves for both halves of the sphere the same. The templates quickly show if the shape you've turned is correct. Here are all the relevant dimensions.

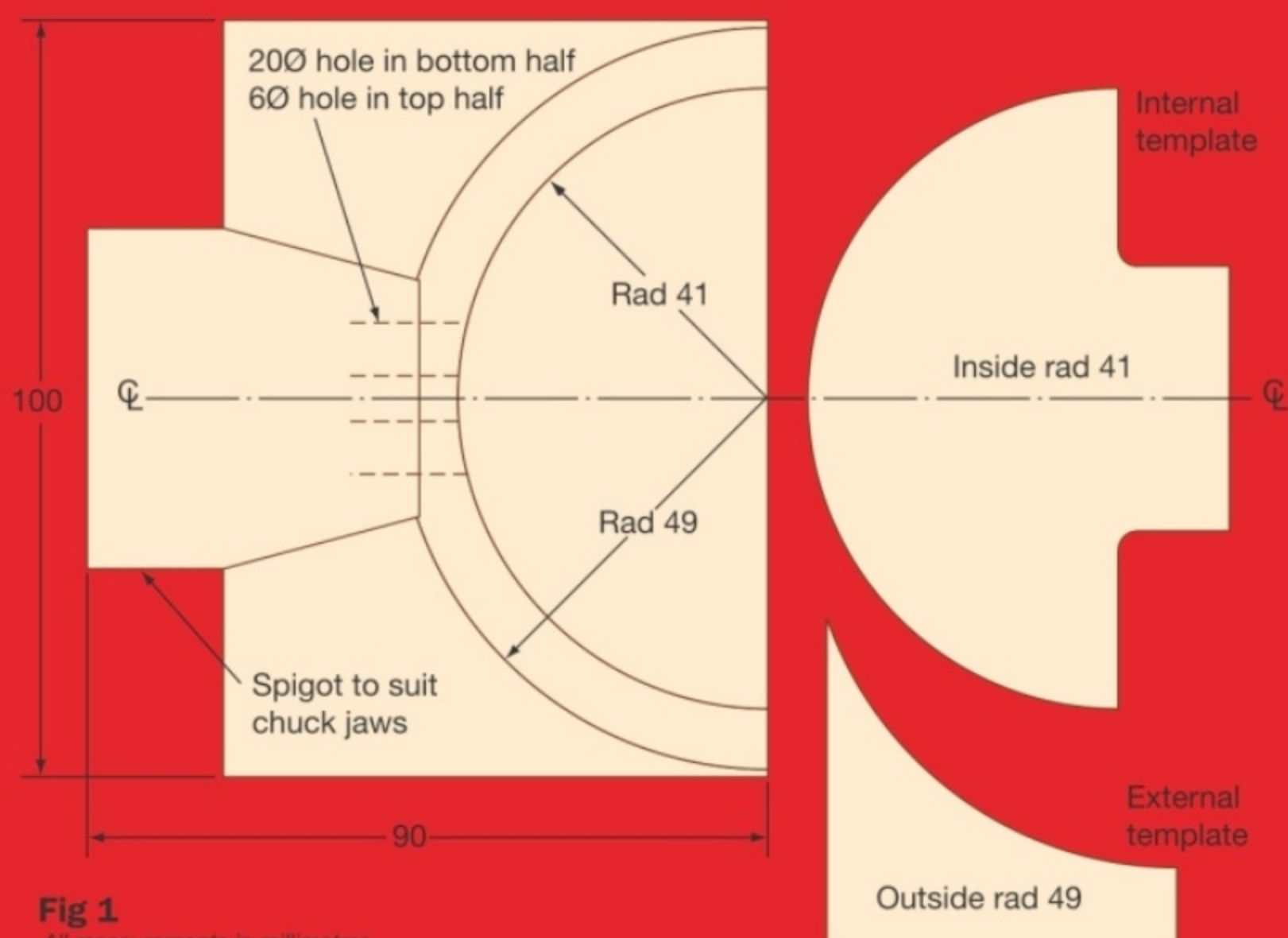


Fig 1
All measurements in millimetres

Hollowing out

Mount one blank in the chuck jaws, face it off and start to hollow it out. I began with a 6mm Henry Taylor Superflute bowl gouge, and finished off with an Ashley Iles ring tool, **photo 2**, which was designed by Len Grantham.

Use your internal template (see **fig 1**) to check the inside curve as the hollowing out proceeds, **photo 3**, and continue the process until the template fits perfectly.

Shaping the exterior

Now use the gouge again to develop the outside shape of the top hemisphere, **photo 4**, checking the curve with the external template (see **fig 1** again) at regular intervals, **photo 5**. As you work, measure the wall thickness with callipers, **photo 6**. You're looking for a finished thickness of about 8mm.

When you're happy with the shape, fit a drill chuck in the tailstock and drill a 6mm hole in the centre of the hemisphere, **photo 7**. This hole will take the spigot for the short top finial.

Now repeat the internal hollowing and external shaping process to create the matching bottom hemisphere. When it's finished, fit a 20mm sawtooth Forstner bit in the drill chuck and drill a hole in the centre, **photo 8**. This will be plugged by the long bottom finial, which will be a tight push fit.

Drilling the first half

Unplug the lathe and set up the drilling jig so you can create the grid of 6mm diameter holes in each hemisphere.

Fig 2 overleaf gives all the details and dimensions you need.

Engage the first hole in your indexing system and drill the first row of 12 holes 8mm in from the rim at every second indexing position, **photo 9**, using a small power drill with a sharp 6mm spur bit.

Reset the jig for the next row, which will be 10mm further towards the headstock, and drill a further 12 holes. Position this row so that the holes are offset midway between the holes in the first row.

Continue in this way until you have four rows of holes, all offset as shown in **photo 10**. Note that you need to re-position the jig each time so that the drill enters the wood exactly at right angles to the surface.

Repeating the process

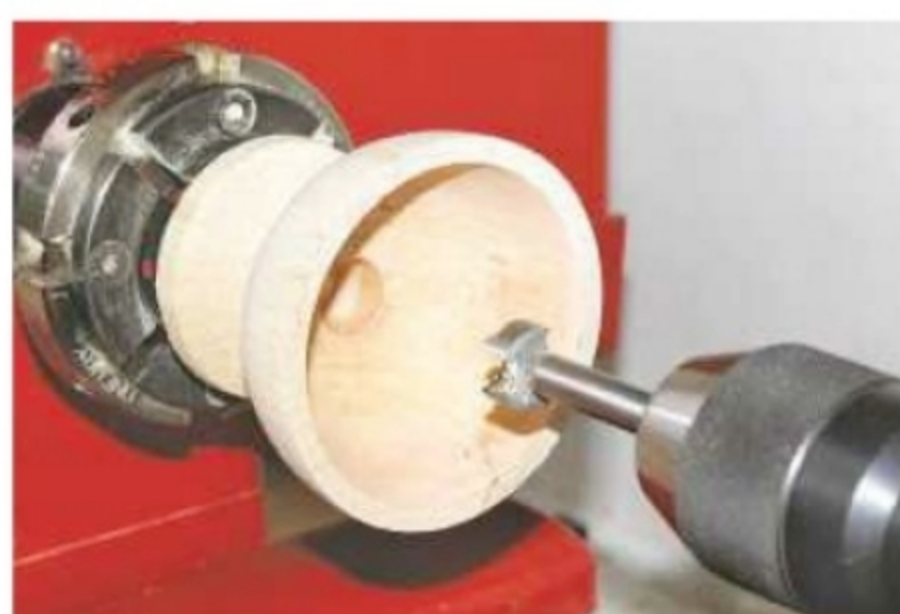
Use a thin parting tool to part off the spigot, remove the first half of the pomander from the lathe and set it aside. Then repeat the drilling process on the second hemisphere. When you're drilling the first line of holes in this second half, position the first row of holes to take the grain pattern into consideration, **photo 11**, and remember to allow for an



6. Check the wall thickness with callipers; aim for an even 8mm all round



7. Drill a 6mm diameter hole in the centre of the top half...



8. ...and a 20mm hole with a Forstner bit in the bottom half



9. Set up the drilling jig and start to drill the first row of holes



10. Move the jig for each row so the drill is always at 90° to the surface



11. Match the grain carefully and offset the holes in the second half



12. Mount each hemisphere on Cole jaws so you can remove the spigot and sand the surface smooth



13. Turn the two finials with spigots to fit the holes in the pomander



14. Drill a small hole through the top finial for the hanging cord



15. Glue the two halves together and push the finials into place

offset too. Clean up the holes with a small round file to remove any whiskers.

Finally, mount each half in turn on a set of Cole jaws or a home-made jam chuck so you can remove the remains of the spigot and sand the hemispheres smooth, **photo 12**.

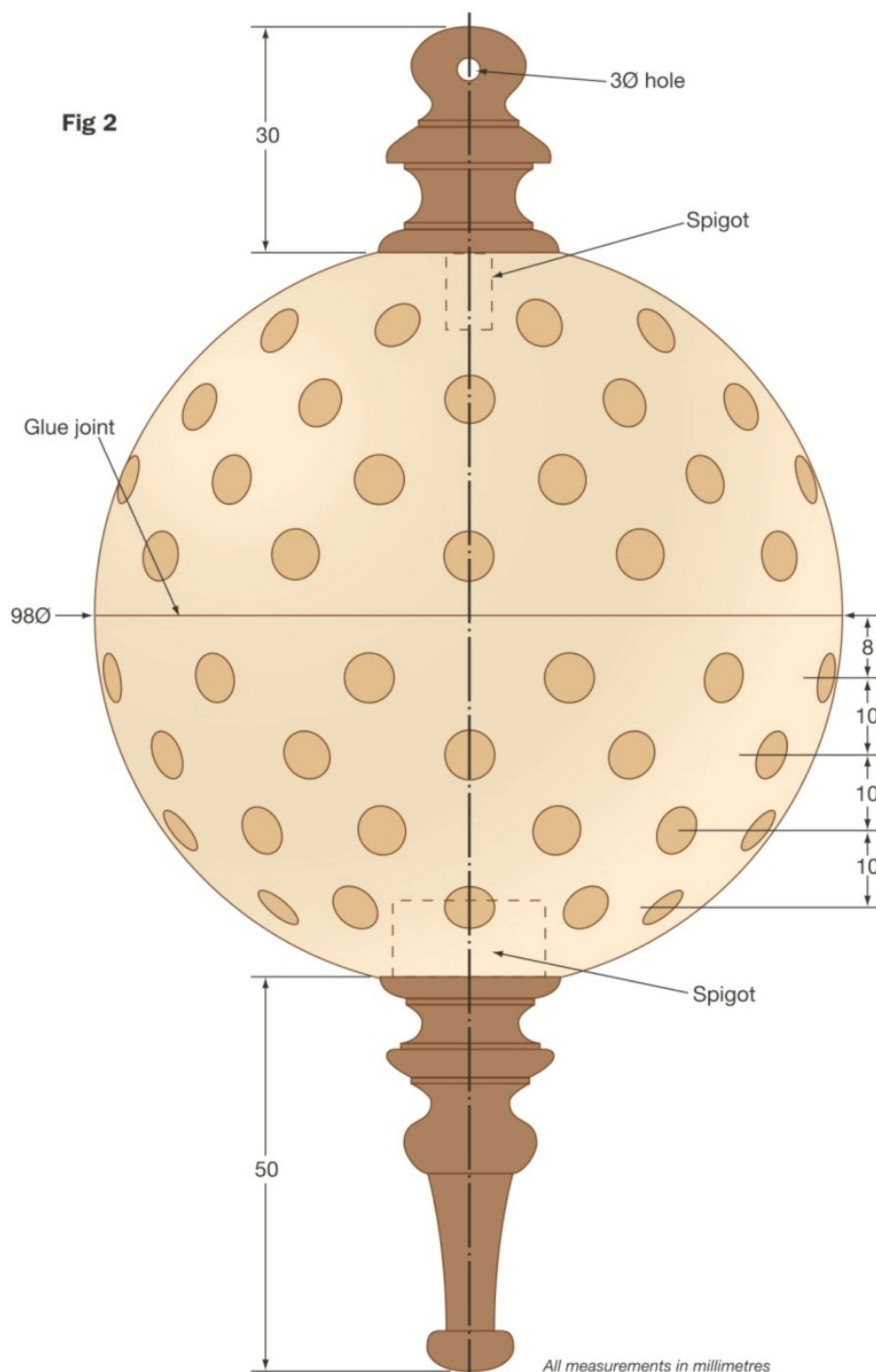
Making the finials

Turn the two blackwood blanks to make finials with spigots for the top and bottom of the pomander, **photo 13**. The top finial requires a 6mm spigot, and will be glued into its matching hole in the top hemisphere. The bottom finial has a 20mm spigot, and this needs to be accurate as it will be just a push fit into its hole. A small O-ring washer slipped over the spigot into a turned groove will act as a friction seal.

Next, use the drilling jig and a 3mm bit to drill a hole through the top finial for the hanging cord, **photo 14**.

Finishing touches

Glue the two halves together, aligning the grain and the offsets accurately, and cramp up the assembly lightly until the adhesive cures. Remove any glue squeeze-out when it's dry, then give the body of the assembled pomander a light coat of spray-on satin varnish to keep the wood clean. Glue in the top finial, **photo 15**, and add a suitable hanging cord. Finally, fill up the pomander with lavender or suitable pot pourri using a small funnel, and push the bottom finial into its hole to act as a plug. Hang it up and wait for a pleasant scent to waft around the room!



A decorative birdcage

This little project is a bit of fun to illustrate how top and bottom plates can be drilled together. The same technique can be used for sand glasses, gallery rails and similar projects where accurate alignment of the upper and lower elements is essential. The scalloping round the bottom edge of the cage also shows how versatile the drilling jig can be.

To make it you'll need a softwood blank about 190mm in diameter and 65mm thick, some 6mm plywood, 12 150mm lengths of 6mm dowel and a small blank for the knob on the top.

Preparing the plywood

Cut two 160mm diameter circles of 6mm plywood and drill a centre hole to suit your screw chuck. Mount both discs as a sandwich on a screwchuck and turn the edge to shape.

Unplug the lathe and set up the drilling jig. In this project I'm using the Sorby indexing plate on the lathe spindle behind the screw chuck (see *The Woodworker* June 2010 page 83 for more details).

Drill 12 6mm diameter holes through both discs, 10mm in from the edge, **photo 1** and **fig 1** (overleaf). Mark the edges of the discs so you can realign them exactly as drilled when they're removed from the lathe. Then measure 25mm in from the edge and cut through both discs with a thin parting tool to produce two rings, **photo 2**.

Making the base

Mount the softwood blank on the screwchuck, turn it down to 180mm in diameter and face it off. This blank will be split in two to form the base and top of the cage.

Mark a circle on the face 10mm in from the edge, and turn a recess 160mm in diameter and 6mm deep to take one of the plywood rings. Draw an inner circle 25mm in from the edge to indicate where the centre of the base will be parted off.

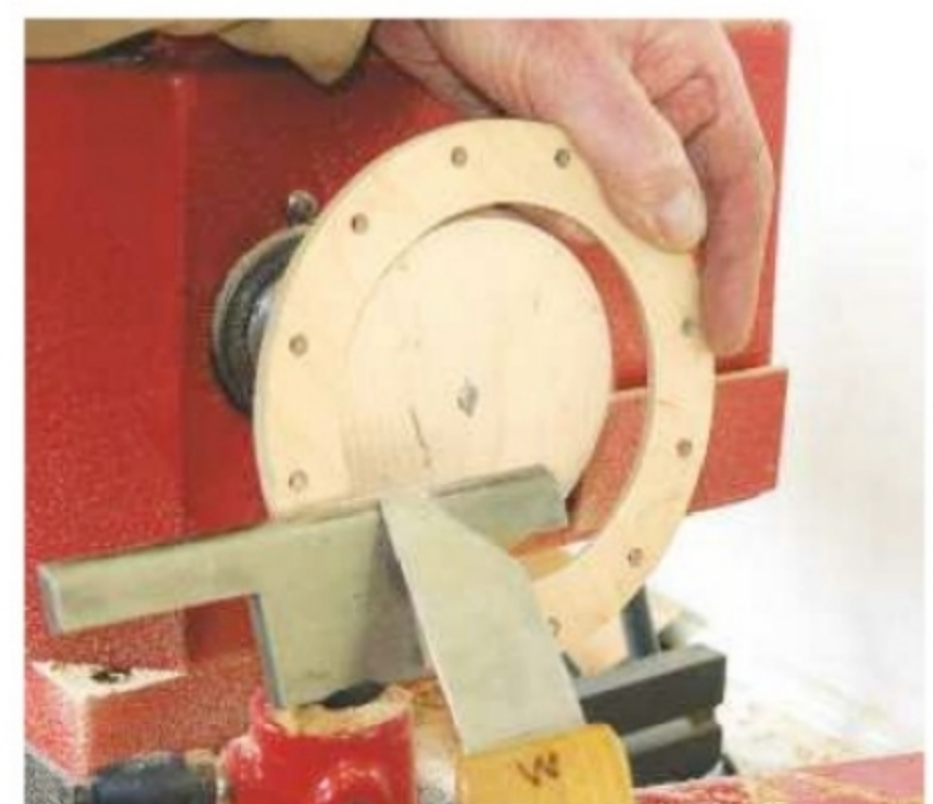
Unplug the lathe, then set up the indexing plate and drilling jig to take a 12mm drill bit. Position the first hole 15mm in from the front edge and drill a total of 24 holes to a depth of 25mm around the edge, **photo 3**.

Next, use a thin parting tool to cut into the edge of the blank to a depth of about 30mm, at a distance of 18mm from the face, **photo 4**. Cutting through the holes as shown produces the scalloping.

Finally, part off the outer ring that will form the base of the cage with a thin parting tool, **photo 5**, by cutting at the pencil line you marked earlier until a free ring is created.



1. Drill 12 holes right through both discs, 10mm in from the edge



2. Cut through both discs with a thin parting tool to make two rings



3. Drill a total of 24 holes to a depth of 25mm around the edge



4. Cut into the edge of the blank to a depth of about 30mm

Fig 1

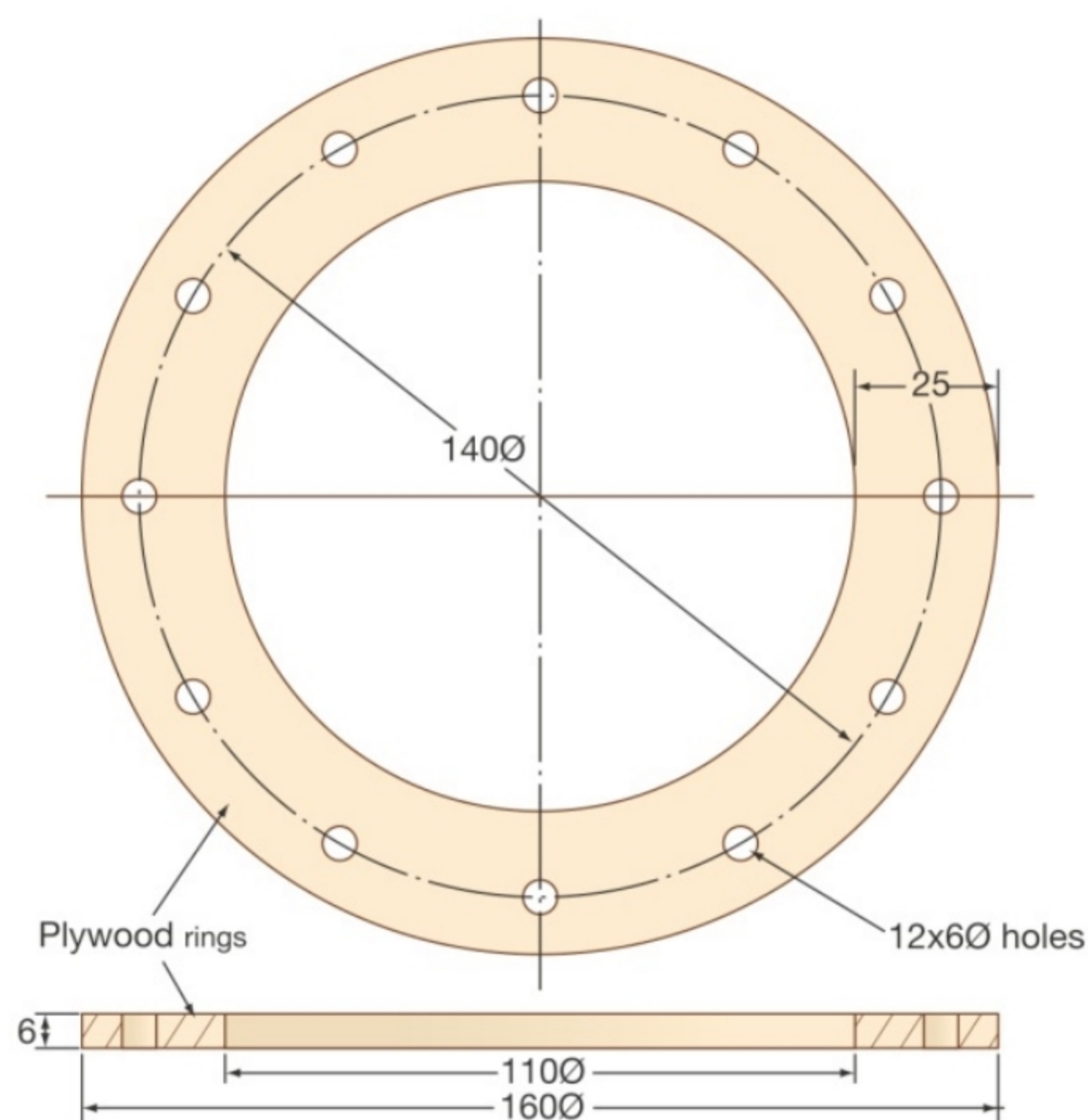
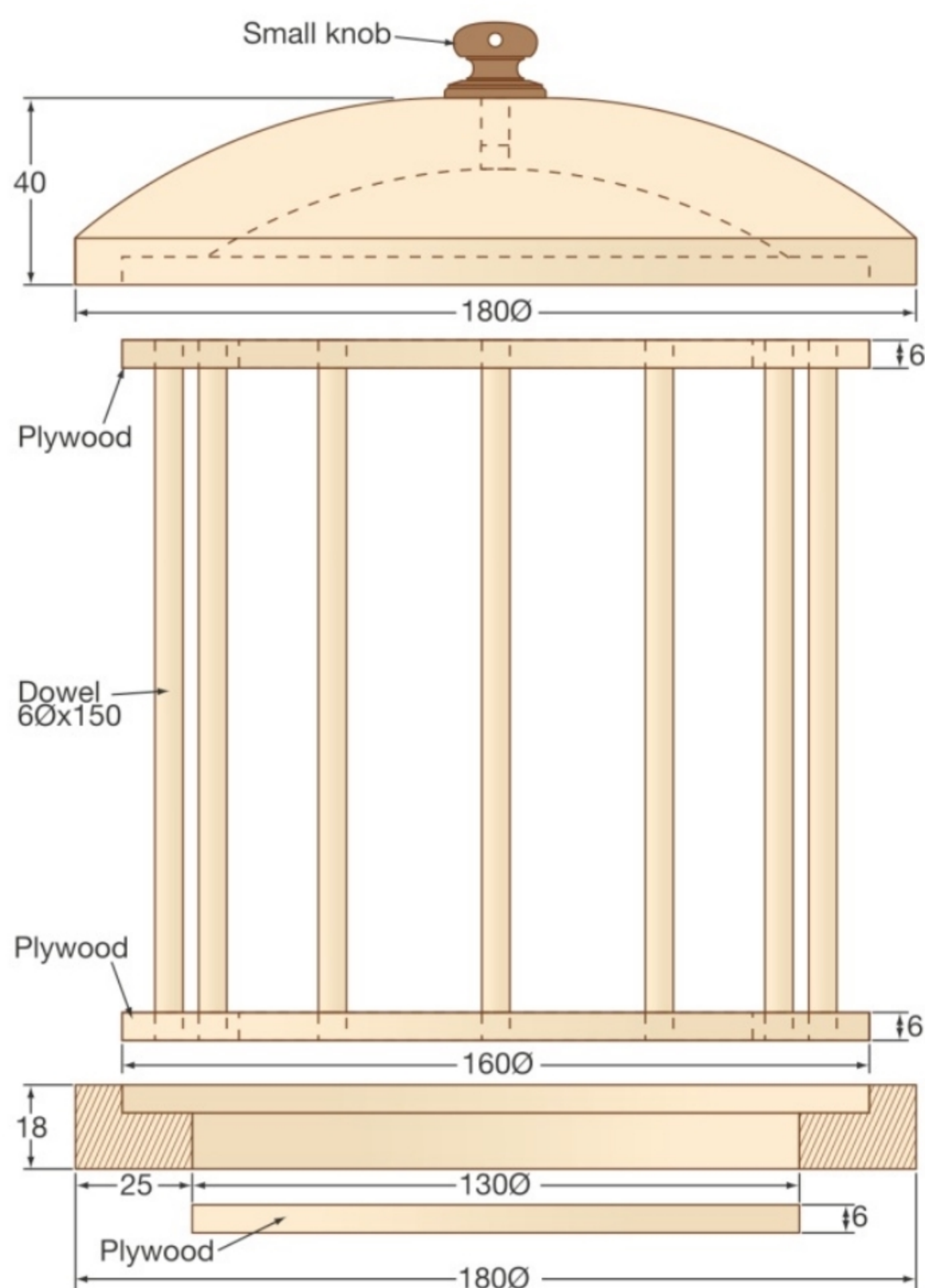


Fig 2



Making the top

Face off the wood remaining on the screwchuck; this will form the top of the cage. Turn a rebate on it measuring 160mm in diameter and 6mm deep to take the top plywood ring. Then draw a circle 120mm in diameter within the rebate and form a shallow dished recess in the underside of the lid as shown in **fig 2** above. Test the fit of the plywood ring in the rebate, **photo 6**. Then reverse the blank and turn the top surface to a domed shape, **photo 7**.

Assembling the cage

Cut 12 150mm lengths of dowelling for the cage bars and insert the ends with a little adhesive into the bottom plywood ring first. Then glue the top ring in position, **photo 8**, making sure that the two rings are lined up as drilled (remember the edge marks you made earlier).

Glue the cage into the rebates in the top and base pieces. Cut a disc of plywood to fit in the underside of the cage (see **fig 2** again); this can be glued or screwed in place once the bird has been positioned.

Turn a little knob with a spigot to be inserted in the hole left in the top by the screwchuck. With the knob still held in the lathe, position the drilling jig and drill a small hole through it for a hanging cord. Finish off the birdcage by applying a light coat of satin varnish.



5. Then part through the face of the blank until a free ring is formed



6. Form a rebate in the top and test the fit of the plywood ring in it



7. Reverse the blank and turn the top surface to a domed shape



8. Assemble the plywood discs and the dowel rods to form the cage

Next issue

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Cherry ripe

Chris Child explains how to avoid shrinkage and distortion when he makes a lidded container from a single piece of cherry



BY CHRIS CHILD



To make a project of this size out of a single piece of wood, you'll need a block about 200mm across.

Pieces of fully seasoned timber as thick as this are very difficult to come by, so many woodturners resort to green logs for making their deep vases, large boxes and hollow containers.

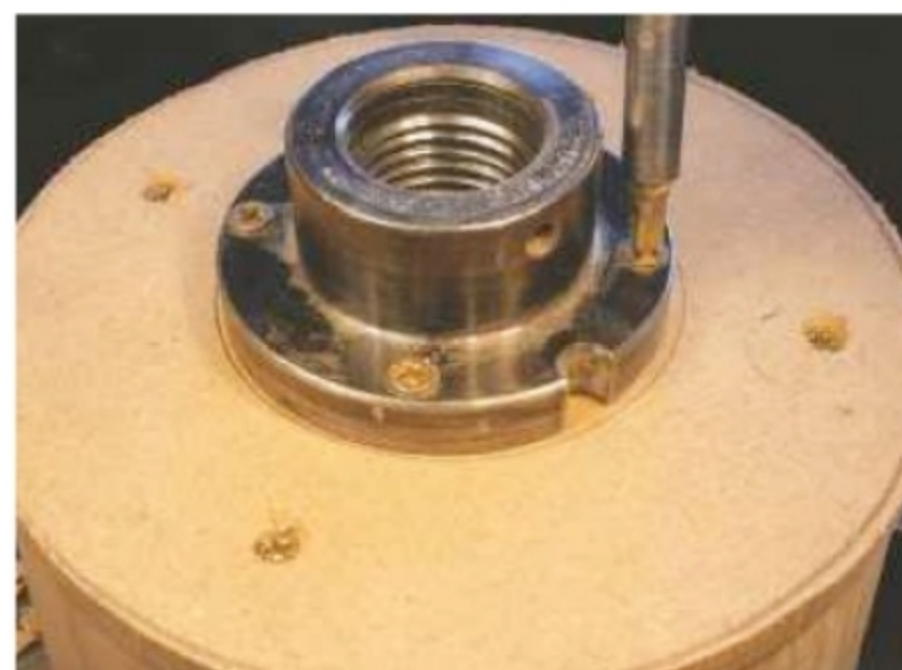
Of course, articles made out of unseasoned wood will shrink and may split when they eventually dry out. To avoid this happening, you need to construct the work with an empty core around which



1. Turn the lid section to a cylinder; note the overhand grip for extra control



2. Rotate the toolrest through 45° and slice one end square with a bowl gouge



3. Mount the blank on a faceplate, positioning the eight Spax screws with care

the walls of the vessel can contract when the project dries out.

The right log

This container was made from a section of log about 220mm long, which I cut into an 80mm lid section and a 140mm base section. Note that the finished box will have a separate circular 'floor', housed in a groove near the foot of the base. See **fig 1** for more details.

Find the centre of the lid section and mount it between centres on the lathe. To check that a large blank like this is secure, lock up the headstock and try forcing the blank round by hand. If you're able to twist the work off its drive centre, apply a few more turns of the tailstock handwheel.

Start with the lid

Set the lathe speed as low as you can – 500 rpm or less – and stand clear before switching on. If the log is free from knots, a freshly sharpened roughing gouge is fine for turning the log down to a cylinder. However, if you do encounter any difficulty, change to a ½in bowl gouge; it should get you out of trouble.

As you reduce the diameter with each pass of the gouge, stop the lathe to examine the log for crevices, insect holes, areas of decay and any other faults that need to be removed. I use an overhand grip on the gouge, **photo 1**, holding the handle against my body at all times so that my weight is over the tool.

When you've turned it to a cylinder, rotate the toolrest through 45° and use the bowl gouge to slice one end square, **photo 2**.

Getting a grip

You can use your compression chuck to fix the work to the lathe, but a faceplate

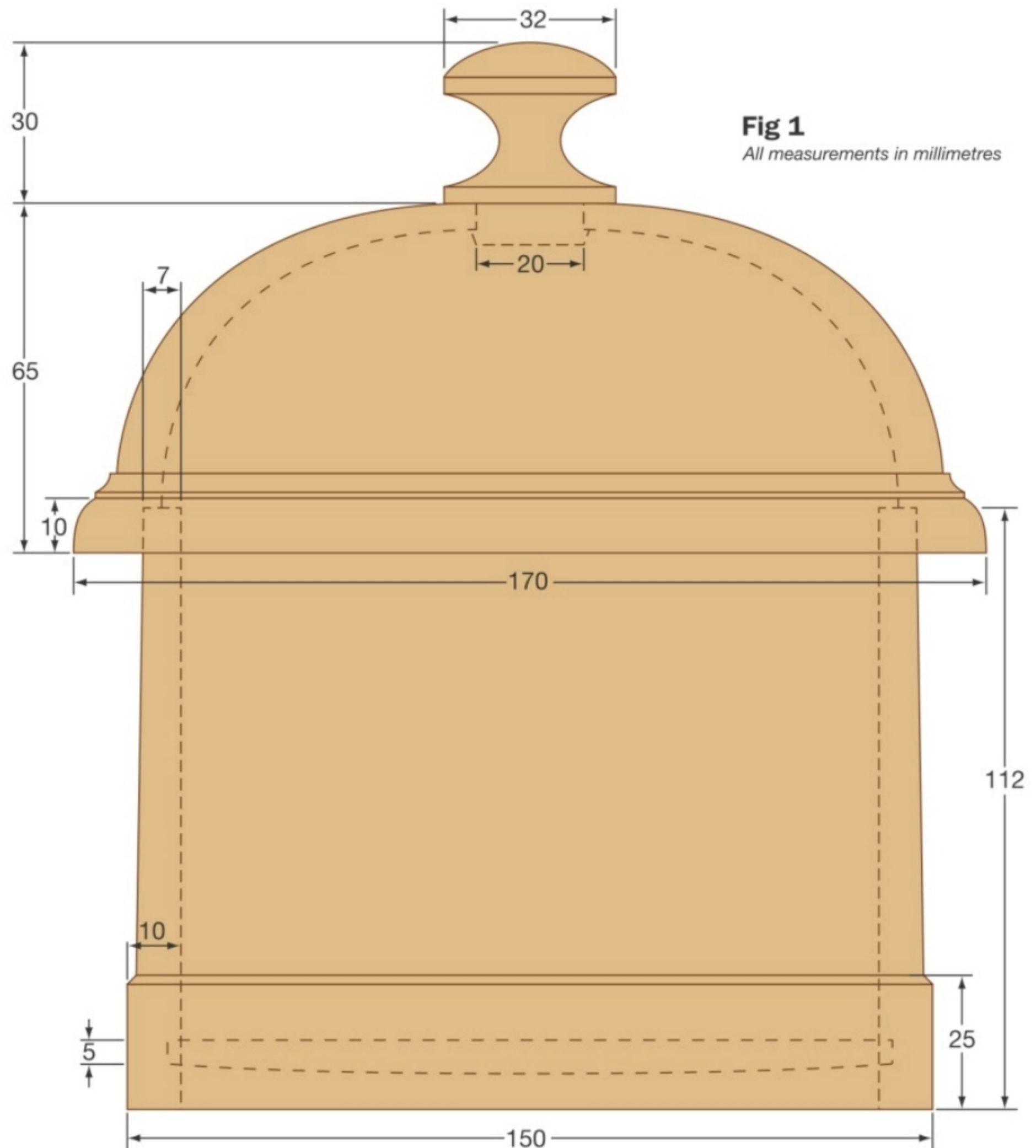


Fig 1

All measurements in millimetres

will hold the workpiece closer to the headstock, providing more rigidity. I used eight 25mm Spax screws, spaced out on a waste disc so that the holes can be positioned well clear of the finished lid, **photo 3**. These hardened steel screws are ideal for gripping endgrain, as they have very sharp serrated threads that penetrate without the need for a pilot hole.

If you're in any doubt about the hold, give the workpiece a thump with the side

of your hand to test whether it's secure before you proceed with the next stage.

Picking the right tool

Turn the inside of the lid first. The hollow dome shape is not just for decoration; it's a design feature which provides a space into which the side walls of the lid can shrink.

You can use a scraper for hollowing when the timber is tight-grained, but to obtain a clean finish with most woods you need to use a tool with a slicing action. The ring tool does this perfectly, and also minimizes the load on the screws holding the workpiece. To use this tool, adjust the height of the toolrest so that, with the handle held horizontally, the centre of the cutting edge of the tool lies diagonally across the centre of the workpiece.

Hollowing inside

Start the cut by angling the edge of the tool slightly so it scoops out a small depression. Slowly swing the tool in a horizontal arc, keeping the rear bevel of the loop flat against the concave surface of the work face at all times, **photo 4**. Watch for a spiral flow of shavings to indicate that the tool is cutting correctly, and keep it free from swarf by clearing out the ring after each pass.

To locate the lid on the body of the container, form a parallel-sided rebate on the inside edge of the lid using a square



4. Use a ring tool to hollow out the inside of the lid; clear the shavings regularly

scraper, **photo 5**. While the inside of the lid is accessible you can, if you want, sand and polish it. I prefer the insides of my containers left 'straight from the tool'.

Forming the beads

To shape the outside of the lid, part off the work and mount it onto a jam chuck, formed from some scrap wood and held on a faceplate, **photo 6**. The rebate on the jam chuck must correspond exactly with the interior rebate of the lid so an interference fit is created. If it's a bit loose, pack it out with some tissue paper.

To form the half-bead moulding on the edge of the lid, first cut in with a parting tool to form a 100mm section. Then form the convex curve of the moulding by rolling the tool over on its side, **photo 7**.

Next, create a small concave moulding by forming a step above the quarter bead and slice the shape out delicately with the point of a small spindle gouge. To make

it easier to control the tool, I cramped a vertical support made out of hardboard to the tool rest. I could then lever the gouge against it and stop it sliding backwards, **photo 8**.

Shaping the dome

I formed the dome shape of the lid with the bowl gouge, using a slicing cut and keeping the bevel of the tool in line with the curve at all times, **photo 9**. At the crown of the dome, cut a hole for the knob by pushing the point of the spindle gouge through the wood and then widening the opening with a small square scraper, **photo 10**.

Tackling the base

I mounted the section of log to form the base of the box on the lathe and processed it in the same way as the lid so I could fit it to a faceplate. I began hollowing it out by boring a pilot hole using a saw-toothed centre held in the

tailstock, **photo 11**. Then I removed the rest of the waste using a square scraper, sliding it down the sides of the pilot hole like a reamer. In this way you can gradually open the hole out to the full width of the interior, making sure that the inside walls of the box are parallel, **photo 12**.

Again, a long handle on the tool is a great aid when working deep inside the body of the container. Even with a long handle, you must avoid bringing the full width of the scraper to bear against the bottom of the cavity, as this will cause a snatch and may dislodge the workpiece. Leave the bottom of the hole in a series of rising steps, or fix a depth guide to your scraper.

Allowing for shrinkage

Before making the housing groove for the box floor, I sliced off a 2 mm thick ring from the base of the container on the bandsaw to use as a template for



5. Form a rebate round the inside edge of the lid using a square scraper



6. Part off the work and mount it onto a jam chuck held on a faceplate



7. Form the convex curve on the edge of lid with the parting tool on its side



9. Complete the dome shape of the lid with the bowl gouge, using a slicing cut



10. Form a hole in the lid for the knob and widen it with a small square scraper



11. Bore a pilot hole in the base with a saw-toothed centre bit held in the tailstock



15. Cut a plinth on the base and form the straight sides with a beading tool



16. Turn the knob blank to a cylinder and form a lipped spigot on the inner end



17. Use a small spindle gouge to form the profile on the body of the knob...

gauging the diameter of the container after shrinking. Dry the ring in the oven; once it has shrunk, you can then measure it and calculate the depth of the housing groove you need to cut for the floor panel.

You can use the same technique to calculate what size of spigot to leave on the knob. You can see both templates in **photo 20**, along with all the finished box components.

To cut the housing groove for the floor panel, slide the toolrest into the opening and simply cut into the wall of the container using the parting tool, **photo 13**.

To complete the hollowing of the base, reverse the work and mount it on a jam chuck. Then work in gradually with the scraper, taking no more than a millimetre off with each pass, **photo 14**.

I made the outside of the base very plain by forming a simple plinth with the parting tool and working a beading tool

sideways to form the straight sides, **photo 15**.

Sanding and polishing

When preparing work of this sort for its finish, I start off with 100 grit aluminium oxide abrasive and follow up with 240 grit, which removes the scratches left by the coarser abrasive. I find that the friction caused by this sanding is usually quite sufficient to dry out any surface dampness in the wood, but you can use a hair dryer if excess moisture is a problem.

Give the work a light rub with 350 or 400 grit to be sure of obtaining a fault-free finish before you apply the wax. I have a stick made up of beeswax and carnauba wax, which is rubbed directly on to the revolving work and then burnished.

Turning the knob

I used a piece of seasoned cherry for the knob of my container but any piece

of dry fruitwood will do as well. Fix the block on the lathe at one end using a compression chuck or screw chuck, and reduce the diameter using a roughing-down gouge. Turn a spigot on the end of the cylinder nearest the chuck with the parting tool.

Use a Vernier gauge to measure the thickness of the lid and mark this measurement on the side of the dowel. Then reduce this section by a further 1mm to leave a projecting lip on the end of the spigot, **photo 16**. You can use the small template ring shown in **photo 20** as a guide.

Use the $\frac{3}{8}$ in spindle gouge to shape the rest of the knob, **photos 17-18**. Then sand and polish it before parting it off, and tap it into its hole in the box lid.

Adding the floor panel

The separate floor panel needs to be made from a piece of well-seasoned wood. I made mine from an offcut from a planed elm board. Stick the disc onto a faceplate using double-sided tape, and trim the chamfer to the edges with a gouge. Slice the edge of the disc to the correct width using the gouge, cutting with the bevel in line with the cut, **photo 19**.

The disc must be sized so it's a tight fit through the hole in the base, but can then be manoeuvred into its groove. The fit will be quite loose at first, but as the container assumes its final dimensions, the disc will be trapped fast as the sides of the container shrink around it.



8. Use a toolrest support to control the gouge while cutting a concave curve



12. Remove the rest of the waste by widening the hole with a square scraper



13. Cut the housing groove in the base for the floor panel with a parting tool



14. Reverse the base onto a jam chuck and complete the hollowing-out process



18. ...and reduce the neck of the knob to about a third of its overall diameter



19. Cut the floor panel down to the diameter required and chamfer the edges



20. The components are now ready for assembly. Note the two ring templates



BY DOUG BARRATT

Block work

Doug Barratt demonstrates segmented technique by turning a brick-effect pen

A demonstration of segmented work, including making pens, at a local fair inspired me to sort out my pile of offcuts. I like the idea of utilizing every last piece of timber. Perhaps that's why I'm so loath to throw any away – even the smallest bit. Here was a chance to use up some leftovers and also to make some presents, as a gift of a hand-made pen always seems to delight. What I had in mind was some sort of built-up construction, rather like a brick wall...

Small beginnings

I started the project with a piece of sapele, which I planed to 21mm square. I then ripped it down its length on the bandsaw, **photo 1**, and re-planed the cut edges.

Next it was the turn of a piece of maple, which I chose to introduce some contrast into my design. I planed the face side and edge square, and cut off a 1.25mm thick veneer on the bandsaw, this time using a sacrificial MDF fence, **photo 2**. I then hand-sanded the veneer faces with fine-grit abrasive paper wrapped round a sanding block.

Making a sandwich

I cut a piece of the maple veneer to 21mm wide, sandwiched it between the two pieces of sapele with PVA adhesive, **photo 3**, and set it aside to cure. Once the glue was dry, I cleaned up the sides and cut the sandwich in half lengthways through the centre of the veneer strip. Then I reassembled the two pieces with another length of maple veneer in the middle, to create the effect of a miniature 'Battenberg cake' in wood.

Turn and twist

With the blank mounted between centres, **photo 4**, I turned it down to a simple cylinder with a rouging gouge and a large flat scraper, **photo 5**.

Next I mounted the blank in my pin jaws, fitted a Jacobs chuck with a 7mm drill bit in the tailstock and drilled a hole through the centre of the cylinder, **photo 6**.

I had to work from both ends due to the length of the blank. If you don't have jaws small enough to hold the blank, it could be drilled (with care) on a pillar drill.

Making bricks

After doing a little maths, I worked out that each 'brick' needed to be 7mm high, as my pen tubes were each 51mm in length. So I fitted a sacrificial fence and stop block to the mitre saw, marked a pencil line on the cylinder to aid realignment later, and cut the bricks to size, **photo 7**.

I then glued them to another sheet of maple veneer using an activated superglue, **photo 8**. While they were still on the sheet and easy to hold, I drilled out the holes through the veneer, using the centre hole in each brick as a guide and drilling through into a piece of scrap below each one to prevent breakout.

My next job was to cut the bricks from the sheet, **photo 9**, and to clean up the edges of the veneer discs by chopping off the corners and sanding to round. I then stuck veneer to the unveneered faces of four of the bricks; these would be the top and bottom bricks in each half of the pen. Again I had to drill the holes through these veneer discs, ready for the final assembly.

Building the brickwork

It was now time to build up the two pen blanks, starting with the bottom piece that had veneer on both faces. I glued each brick to its neighbour with superglue, using the pencil line I'd drawn earlier to aid the offset alignment of the vertical joints, **photo 10**. As it grew it began to resemble a miniature lighthouse!

With both blanks assembled, it was back to the lathe to turn the pen sections to their desired shapes, **photo 11**. The outcome was every bit as striking as I'd imagined at the beginning, as the main photo shows.

I was happy that a few more scraps had been used up, but that offcut pile still seems to be getting larger. Perhaps I





1. Start by ripping the piece of sapele down its length on the bandsaw



2. Prepare a strip of maple to the same width and cut off a thin veneer. Note the sacrificial fence



3. Sandwich the maple veneer between the two pieces of sapele



4. The blank resembles a Battenberg cake. Mount it between centres



5. Turn it to a regular cylinder using a roughing gouge and a large scraper



6. Mount the blank in pin jaws and drill a 7mm diameter hole through the centre



7. Mark a line on the cylinder to aid realignment later, and then cut the bricks to size



8. Stick the bricks to another sheet of maple veneer using an activated superglue



9. When it's cured, cut the bricks from the sheet and clean up the edges of the veneer discs



10. Build up the two halves of the pen body, starting with the bottom section



11. With both blanks made, mount them back on the lathe and turn the pen to its final shape

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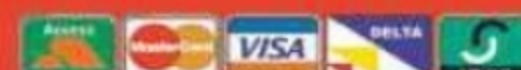
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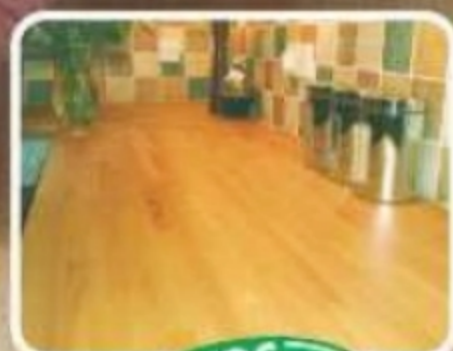
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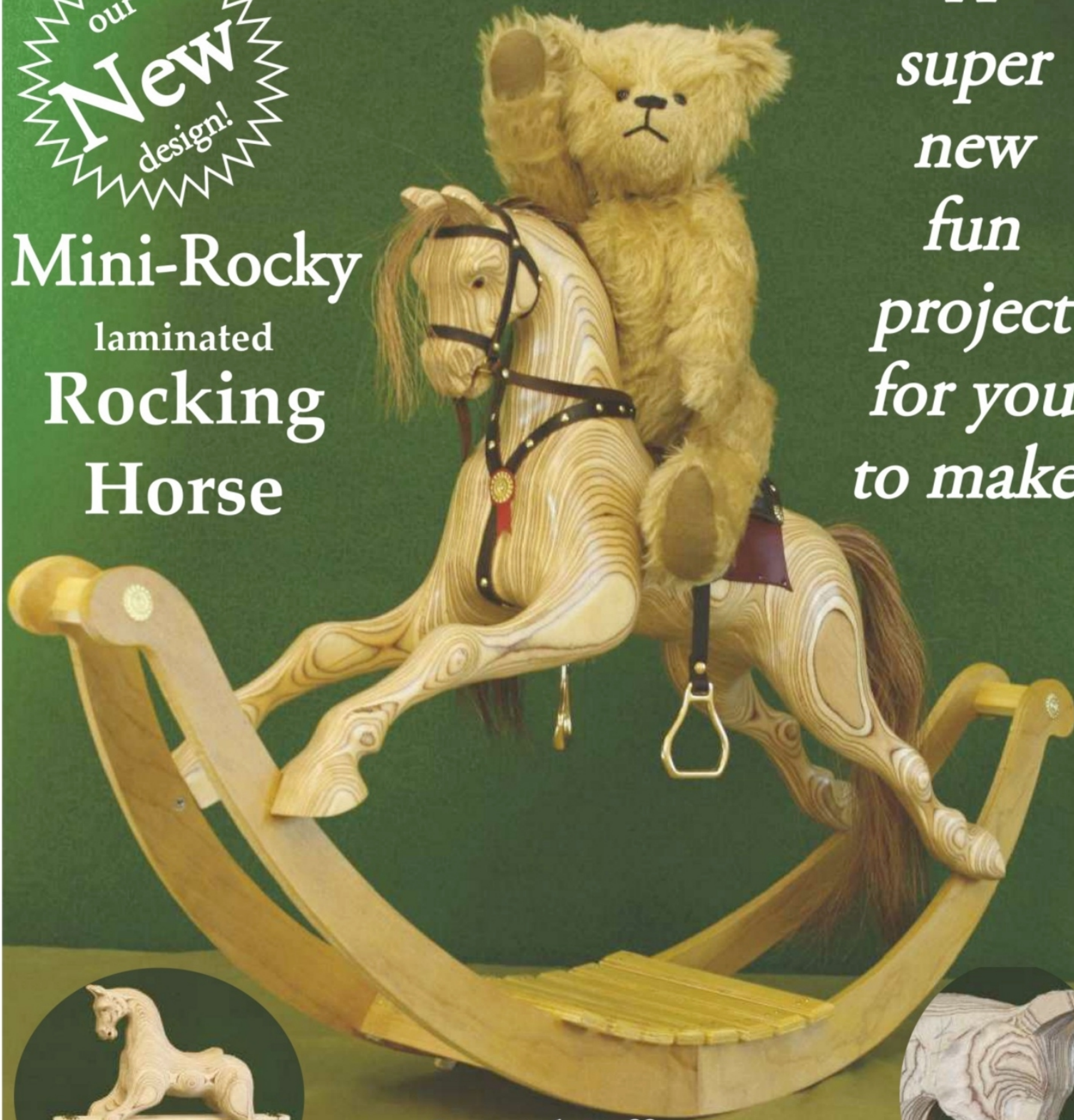
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