Snainton Woodturners' Club Newsletter

Issue
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November 2010

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Meeting held at Snainton Woodworking Supplies, Barkers Lane, Snainton, North Yorkshire YO13 9BG

A Wooden Half-Sized Hat

by Andrew Hall RPT

Snainton Woodturners' Club

Meeting at Snainton Woodworking Supplies on Thursday

4 November 2010

Background

Andrew has had a life-long interest in woodworking and turning (www.hallwoodhats.com/introduction). He was inspired initially after reading an article in a woodturning magazine about a turner in America, JoHannes Michelsen (http://www.woodhat.com/), who made full-size hats that could be worn.

Andrew tried several times to make hats, then, four years ago, he had the opportunity to see JoHannes

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Snainton Woodturners' Club

Meets at 1930 hr on the first Thursday of each Month:

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2 December 2010. Members & Guests, buffet, quizzes & competition (***Snainton Village Hall***)

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6 January 2011. Hands-On Night with Members & Guests

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3 February 2011. Jim Wood – Pole Lathe Turning

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3 March 2011. Mick Hanbury – Decorative Work with Spalting

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7 April 2011. Keith Brevitt - ?

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5 May 2011. Bob Chapman – Singapore Ball

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2 June 2011. Ian Clarkson – From Log to Bowl

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7 July 2011. Sue Harker – Something Different

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4 August 2011. Club AGM & Bring-and-Tell

(>> more, on p 6, col. 2)

demonstrate at the Irish Woodturners' Guild. After a three-day immersion (the equivalent of three years of training, Andrew says!), his full-size hat-making took off.

Jimmy Clewes (http://jimmyclewes.com/) was Andrew's second inspiration, when he suggested that Andrew demonstrate only what he enjoys doing – hence the hat making. Andrew can turn three full-sized hats in about 12 hours.

Contact details: 01388 767740; info@hallwoodhats.com

Preparative Work

Andrew usually sources his own wood, which is freshly felled timber. Before working on the wood, take special care to check it for nails and other inclusions: Andrew once found an embedded bullet! Andrew has certificates for chain-saw use and also for training others; he emphasised the importance of safety procedures and of using suitable protective clothing.

It is possible to retain moisture in the timber for about a month by coating with Resin W or another wood glue. Otherwise, he prepares three full-size hat blanks, cuts them to rough cones, and immerses them in a butt of water (with diluted disinfectant if storage is for a long period), weighted down by dumbbells.

Tools

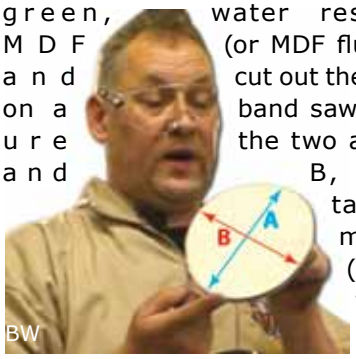
For a half-size hat, no special tools are required: bowl gouges with swept-back (fingernail) grinds of 10 or 12 mm (3/8 or ½ in), parting tools of 10 or 6 mm (3/8 in or ¼ in) and a beading tool, are all that are needed. For a full-size hat, Andrew uses a large, Robert Sorby RS2000 elbow-supported lance, part of the deep-hollowing tool system. For small hats, Andrew uses a splayed, or fishtail, parting tool in which the tip is wider than the shaft. Before starting, align the headstock and tailstock using points inserted in each Morse taper.

Head-size

Use a 1 metre (or 36 in) Flexicurve® (obtainable from most art or drawing shops; Flexicurves of 600 mm (24 in) can be slightly too short). Wind it round the head of the person where the hat is to sit.

BW

Transfer the shape to paper; repeat the operation to give three estimates and then average these to get the head shape. Glue the paper to 6 mm green, water resistant MDF and cut out the shape on a band saw. Measure the two axes, A and B, then take the mean (A+B)/2, which will be the inside diameter of the hat.



BW

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Stetson Hat Sizes

The best materials to use are Sycamore and Beech. Cherry is very attractive but difficult to dry: fruitwoods tend to crack. The fresher the wood the better it is for bending. Merely reducing the full-size by a reduction factor does not work: but the following dimensions, kindly provided by Andrew, will produce hats with balanced proportions. The table below gives hat dimensions in mm, (with inches shown in parentheses).

For the outside diameter of the hat band, add 28.5 mm (1 1/8 in) to the diameter – 12 mm (½ in) for overall shrinkage of the wood, and 12 mm is for the outside diameter if the hat is 6 mm thick; the rest is to allow for sanding and 'good luck'!

Velcro pads as comfort bands can be purchased (available from Andrew) to fit onto the inside of the hat for added comfort, for which allowance might also be made. Andrew says that, in general, a women's head diameter is 6 mm (¼ in) less than a man's.

Starting on the Blank

A Bramley apple tree blank had been cut two weeks ago and kept in a bucket of water. A hole is drilled in the blank with a saw-tooth bit to fit the chuck (eg 55 mm diameter for a Super Nova chuck). Remove loose bark, and cover workshop areas likely to be splashed by water from the rotating blank.

Start the lathe at a slow speed and increase it until the blank is turning without vibration. It is important that the centre of rotation is about elbow

>> Continued p.3 Col. 1

A Stetson Hat – Components

Hat Size	Blank Diameter mm (in)	Blank Thickness mm (in)	Brim Width mm (in)	Body Diameter mm (in)	Body Depth mm (in)	Crown Diameter mm (in)
Full (gallon)	375 (15″)	200 (8″)	87 (3 ½″)	200 (8″)	125 (5″)	150 (6″)
Half (quart)	250 (10″)	150 (6″)	75 (2 ½″)	125 (5″)	100 (4″)	90 (3 ¾″)
Quarter (pint)	175 (7″)	125 (5″)	50 (2″)	75 (3″)	75 (3″)	56 (2 ¼″)
Eighth (gill)	75 (3″)	75 (3″)	50 (2″)	50 (2″)	50 (2″)	40 (1 ¾″)

height, and the operator should stand with feet apart and maintain a straight back when turning. Set the rest parallel to the surface of the timber and at a height to ensure that the gouge blade is near the centre of rotation of the wood.

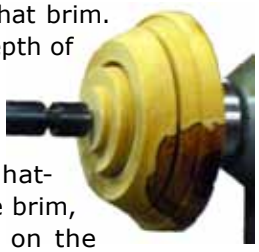
Use tailpiece support, and a large 18 mm (¾ in) fingernail-ground gouge to turn to round. With the gouge at 30° to the lathe bed, the handle pressed against the thigh and the thumb on the flute to press it down onto the rest, remove all the bark until the sapwood is reached. Then remove the corners to yield a conical shape towards the tailstock end.

Flatten the top that will become the hat's crown using bevel-rubbing push-cuts (with the flute angled towards the wood) and pull-cuts (using the gouge wing at about the same angle), moving inwards in stages. Pull back the tailstock, remove the wood knob on which it rested and flatten the entire surface, then return the tailstock support.

Shaping the body

Mark the chuck-diameter on the crown and cut a spigot (or tenon, as Andrew calls it), but leave it oversized: it will be re-sized and crisped up later. Cut another spigot, whose diameter is twice the wood thickness (y = 3 to 6 mm) plus the hat's interior diameter (ie (2 x y) + 125 mm: this is 2y wider than the diameter of a bespoke light-box over which the hat will be inserted, *see* p.5, col.1).

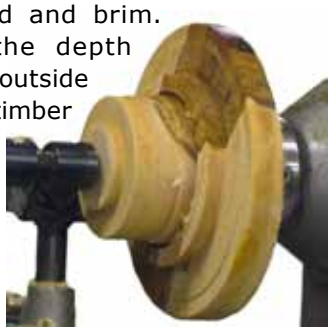
With the second (wider) spigot as a guide, use the fishtail parting tool to cut down towards, and perpendicular to, the hat brim. Measure the depth of this cut, which should stop about the height of the hatband above the brim, and mark this on the outer surface of the timber.



Cut in at this mark and remove a ring of wood.

Tip 1: This ring can be dried for about six months, re-turned on Coles jaws and used to make a frame for a mirror, for embroidery or for a picture.

Make another parting tool cut, outside the first, and to the depth of wood that will eventually form the hatband and brim. Mark the depth on the outside of the timber and part off another ring. Note that the hat brim is still about 25 mm (1 in) thick at this stage.



Tip 2: This ring can be dried, re-turned, cut in half and one end inserted into a turned base. Fit a hemisphere at the top and you have a hat stand.

Outside Shape

Face-up the headstock side of the brim to flat and reduce to about 12 mm (½ in) thick.

Because of a bark inclusion, Andrew changed the hat design from a half-size Stetson to a Mississippi gambler's hat. This has a slightly turned-up brim, a concave body, and a flat top with a sharp edge.

Finish off the (tailstock-facing) upper brim, curving it up towards the outer rim. Turn the hat body to concave, down to the final diameter of the hatband. Finish the hatband, which is about 20 mm (¾ in) wide, to the top of the brim.

Using freshly sharpened Derwent Rexel® pencils (http://www.pencils.co.uk/, colour-fast, artist quality, wax and ***not*** water-colour), draw black lines to delimit the top and bottom of the hatband, turning the hat by hand. Then draw another line inside each to give a double tram-line. With the lathe rotating slowly, fill these tram-lines with a chocolate colour. Finish off the hatband by adding an olive colour between the chocolate tram-lines.

Tip 3: The hat can be left for a short time at this stage, eg for a coffee break. Soak the hat, back and front, with a mist spray of water, fill a polythene bag with shavings then cover the hat with the bag and bring up the tool rest to hold the bag and shavings against the hat.

Scissor Callipers

Andrew demonstrated the ease of use of some scissor callipers that he had had made for him by Bill Robinson, Northumberland, (who does beautiful segmented turning). Just clip the two ends to the wood, then adjust the knurled knob to sit on the rest of the middle arm, tighten the locking nut, and the position of the two measuring fingers is thus fixed.

Create the top spigot

Re-wet the wood, then with a 10 mm (3/8 in) parting tool, skew chisel or beading tool, cut the spigot on the hat top to fit the chuck jaws with a 6° dovetail. Using a fingernail gouge with the flute at 20° to the timber, shave (don't scrape) the crown of the hat to a smooth finish. Sand wet with a container of water by the work, through the grits 80 to 240. Use a cloth-backed abrasive on the wet

>> Continued p.4 Col. 1

wood, as grey-backed wet-and-dry abrasive discolours the wood. (Also, sand dry, when the hat is dry and before applying lacquer.)

Tip 4: : Trying to create a 3 mm thick brim with your first hat might be considered ***setting yourself up to fail***! Andrew turned this hat at 3 mm thickness, but a 6 mm thickness is quite acceptable and will still allow the brim to be bent.

Underside of the brim

Reverse the hat on the chuck and ensure that it runs true (speed, about 1,100 rpm).

Use a 12 mm (½ in) fingernail gouge and true up the face of the brim: sight 'through the brim' to the far side and use a pull-cut. Turn away the wood surrounding the chucking hole until its diameter forms a step that is just wider than the desired hat interior underneath the hatband.

Start to hollow

With the step as a guide, use a parting tool to cut a 30°-angle cone into the centre of the hat. When nearly through, lever the cone out with the parting tool to break the wood at the apex. With a bowl gouge, hollow out the centre in a rough semi-circle to about half the depth of the body, widening the hole until it is near the final head diameter.

Creating the brim

Place a bright angle-poise lamp (one on a tall stand from IKEA® at about £6 is suitable) beside the headstock, shining through the brim. Start at the outer rim and use pull-cuts (with the flute of a 12 mm (½ in) gouge at about 30° to the wood surface) to thin the timber and give the brim a slight upwards curl at the edge. Cut a track about 12 mm (½ in) wide, then check the thickness: the light-colour through the wood should be a uniform orange.

Perform finishing cuts with a 10 mm (3/8 in) fingernail bowl gouge, pushing in and using pull-cuts to finish. Work inwards in 12 mm (½ in) stages, and blend the latest cuts with the earlier ones to give a uniform light-transmission through the wood.

At stages, check the thickness of the wood with callipers in four places, radially, to ensure a uniform thickness at every part of the brim.

The heat of the light dries out the wood, so use a mist-spray periodically to keep the wood wet. When at the head-hole, leave a thin 1-2 mm rim to mark the outside thickness of the hat body that will be removed when the hat is finally hollowed.

Hollow the hat

Use push-cuts with a 12 mm (½ in) fingernail bowl gouge to round and hollow the cone into a bowl-shape. Use a swept-back 10 mm (3/8 in) bowl gouge for finishing cuts.

Work down towards the crown in 12 mm (half-inch) steps, ensuring the hat sides are of uniform thickness as the hollowing progresses, as was done for the brim. Use the light intensity as a check, and callipers to measure the uniform thickness. The chocolate-coloured band outside will show as a slightly darker line.

Tip 5: The light intensity varies around the body of the hat. The end-grain region will be brighter (like viewing the light through the hole-ends of a bundle of straws), while light viewed through side-grain fibres running parallel to the wood surface will be duller.

Andrew used a right-angle shaped tool-rest with the elbow inside the hat (and not catching!) when about half-way into the hat. The light is moved to shine on the top portion to be hollowed, close, but not too close for the lamp heat to dry out the wood.

It is important to clear out the debris frequently as hollowing progresses; the shavings shield the light and give the impression that the wood is thicker than it actually is. The hatband is thicker than the sides of the hat, so ensure that this is taken account of when hollowing inside the hat. The light will be brighter past the hatband.

Alternate large and small gouges, and hollow down to the crown of the hat, periodically using the water mist-spray to keep the wood wet. Follow the concave shape of the outside of this hat. (A Stetson curves the other way; a convex outer shape.)

Check the depth when nearing the top of the crown. When near the final depth, hollow from the centre, outwards, then blend the side-wall with the top to give a curved finish inside.

Finishing the hat-top

Load the light-box (*see* next column) into the jaws, and attach the hat so that the lights illuminate the crown.

Continued on p.5

Bring up and tighten the tailstock for support; watch carefully until a few drops of water begin to be squeezed out near the hatband, then stop tightening.

Home-made light box

Andrew has made a light box by mounting seven battery-powered multi-LED clusters into the end of a cone-shaped tube, turned to have a diameter just smaller than the inside of the half-size hat and with a chucking point at the rear. (Andrew can no doubt provide construction details on request).

The lights are turned on by switches reached through holes in the rear of the light-box. A piece of router mat and rubber bands round the outside of the light-box are used to help provide a tight jam-chuck into the newly turned hat.

BW

Carefully, cut away the top of the crown with the gouge resting on a small tool rest. Working from the inside out, ensure that the crown thickness is uniformly illuminated. Remove most of the spigot and then remove the tailstock.

Very gently and carefully cut away the final knob, working from the top edge down to the hat top, then cut down the final stem, working from the middle out. To complete the spigot removal, work for the outside in and finish by ensuring that the crown of the hat is uniformly thin. Wet-sand the brim, hat sides and top, working through the grits.

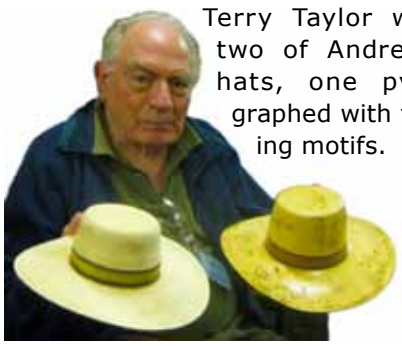
Shaping and finishing

If placed in a 'bending jig' immediately, the wood will break. So leave it to relax for a while before putting it in the bender. Most of the bending will take place in the first 24 hours.

Afterwards, the wood of the brim will relax back slightly, eg by as much as 6 mm (¼ in). Put parcel-tape on the brim to prevent it splitting, and when the tape crinkles, this indicates that the hat is dry.

Dry-sand, if necessary. Finishing is completed by applying Chestnut® melamine lacquer for outdoor hats, and Andrew uses Chestnut acrylic matt lacquer for smaller hats to be displayed indoors.

The finished Mississippi gambler's hat:



Terry Taylor with two of Andrew's hats, one pyrographed with fishing motifs.

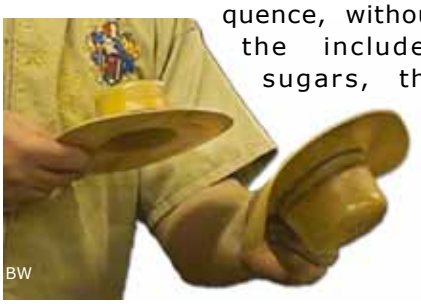
Additional Notes

Awa' 'n Beil yer Heed!

The final hat-shape depends on the wetness and thickness of the wood. Andrew cut an 18 month-old piece of wood in two and turned two identical hats.

He boiled one hat (*see* right, below) in a pan for half an hour, then applied a rubber band round the brim to bend it upwards, repeated the boiling, and repeated the process twice more with a wedge on the crown. After 2.5 hr of boiling, this gave a hat with a turned-up brim and an indented crown.

A sweet aroma of wood-sugars was given off during boiling: in consequence, without the included sugars, the



BW

hat dried out in about 12 hours, when it normally takes two or three days. The untreated hat (left, above) was probably too dry, as the brim had only a light upwards curl.

... Or Soak It!

Andrew showed two ladies hats: one had been made immediately, while the other had been made after soaking in disinfectant-treated water for 9 months. The freshly turned hat was light-coloured, while the water-soaked hat had altered colour to a light purple that enhanced the wood-grain structure.

BW

Some more or Andrew's work.

Training with Andrew Hall

The most Andrew will take is two friends or relatives on a day's training, as they need to 'come together' and not be two strangers getting to know each other.

Home Demonstration Day

Andrew does a home hat demonstration day, starting at 10 and finishing about 4.30. Prices below are per person for a group, and lunch is included in the price:
For 4 people (a car-full) £40;
For 8 people (two cars) £30;
For 12 people (three cars, or a minibus and share the cost of hire and fuel) £25;
The more people, the better the price ... but 12 is the maximum number for a home demonstration.

Club Meetings

Continued from p.1:

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1 September 2011.
Joey Richardson – Colouring, Texturing, Air Brushing, Piercing & Design

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6 October 2011.
Margaret Garrard – Off-centre Textured Bowl with Involuted Flowers

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Member's Work:

Back-to-back turned candle-holders by Ray Stein

Swinton Show Successes

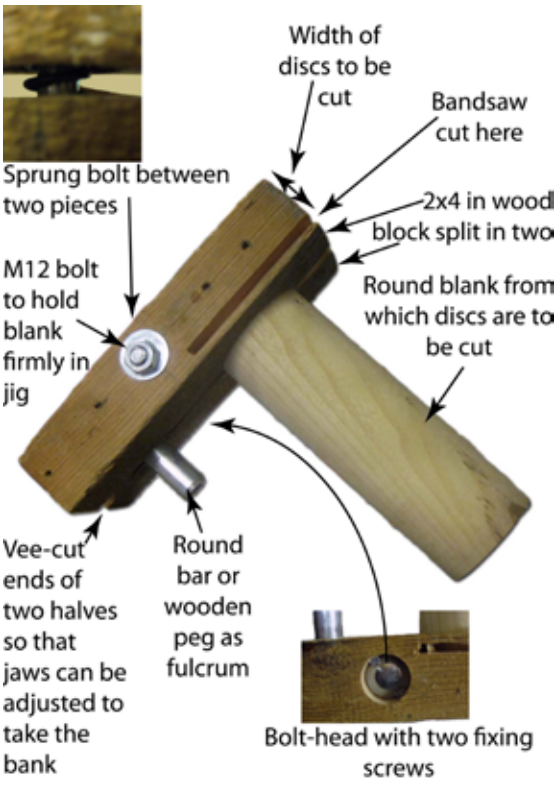
1st Brian Wrigglesworth – Tea set;
2nd Ernie Freer – American spinning wheel;
3rd Brian Wrigglesworth – Skeleton clock on pedestal.
Congratulations, Woodturners – Ed


BW

Hints 'n Tips

A Jig for Cutting Uniform Discs by Irving Waterhouse

Irving was faced with making 80-odd napkin rings, essentially all the same. Anyone faced with this task (or making other similar items), would benefit from having a jig on which to produce discs of a uniform width. Why re-invent a jig when Irving has done the hard work of thinking for you? The diagram on the left is largely self-explanatory.



To use, undo the nut, put the round blank into the hole with the end flush with the outer edge of the jig. Tighten the nut. Place on the band saw, nut uppermost, set the guide fence so that the jig's slot is aligned with the blade. Carefully push the jig forwards until the first blank is cut. Remove, release the nut, move the blank forward, tighten the nut, then repeat until all the blanks have been cut (left, below). Finished napkin ring on the right:

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Comments, copy, and suggestions or additions to the e-mail list to:
mobile: 07809605969, tel: 01944 758287; pgmalan@biotech-is.co.uk
Thanks to Stephen Fearnley (left) for kindly arranging the printing of this newsletter and to Brian Wrigglesworth (BW, right) for his video recording of the meeting and captured images


Photo: Ron Rogers