A Segmented Apple

Following the distribution of my article on the basics of segmentation I have been asked by several people to explain the procedure for making the open segment apple which appeared in that document.

In response, this should tell you all you want to know.

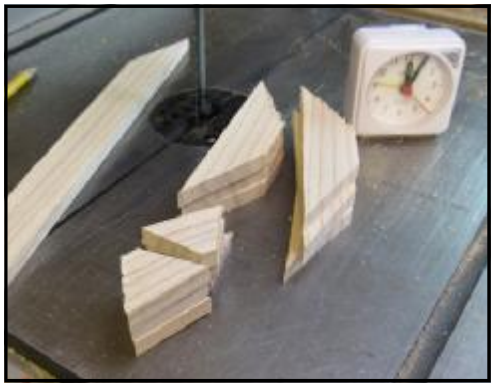
First, a bit of manufacturing. You need to make a double sided open segment wheel. Start by cutting a disc of 9mm MDF. Drill a centre hole, and using the hole as a location point for a live centre, turn the disc down to 75mm diameter. This will ensure that the centre hole actually is “on centre”. Next, cut some strips of wood about 2mm thick and 8mm wide, and glue them onto the 75mm disc. You need to apply 3 strips on one side, each 120 degrees apart and 6 strips on the other side, each 60 degrees apart. Leave the extreme centre of the disc clear so that a live centre can use the central hole during the build process of the apple. Number each open section, on both sides.

Now, on with the main part of the job Take a 3” cube of timber, and mount it in the lathe as a spindle, with the long grain running from left to right. With your favourite tool in hand, proceed to round off the cube, and add a dovetail chucking spigot at both ends. Keep one of them small, it will only be used once. Unmount the piece, and put the smaller, lightweight dovetail in the chuck. Mark the blank 30mm from the left (the headstock end), put a witness mark across the two sections for later re-alignment. Part in as far as you can with a thin parting tool, and finish the job with either in the bandsaw or with a tenon saw. With the smaller part of the blank in the chuck, use any combination of gouges that you prefer to make the open face ABSOLUTELY FLAT. My choice of tool is a small spindle gouge, and a heavy skew chisel used as a scraper. The easy way to check for flatness is to put a steel rule across the open face and illuminate from below with a small torch. Repeat this process on the larger section to get a second flat face.

Now comes the fun bit, cutting 12 segments to fit into the segmentation wheel. Cut a length of planed timber to size ready for cutting into segments, I tend to use Ash, about 800mm long, 32mm wide and 8mm thick. Set the rip fence on the bandsaw to be 32mm from the blade, and ACCURATELY, set the mitre fence on the bandsaw to 60 degrees. Trim the end of the batten with the first cut on the bandsaw, then keep flipping the timber over to cut a set of 6 60 degree segments. For the 120 degree segments I use a template to mark the 6 shapes on the batten, and then cut them freehand on the bandsaw. Sand the edges of each piece to create a complete set that fits into the "6" side of the wheel, numbering each piece as you go. The 6 120 degree segments are also sanded to fit the wheel in 2 groups of 3, with one additional step. As each piece is fitted into the wheel, the outer scrap is marked on the back using the edge of the wheel as a guide. This scrap is trimmed off on the bandsaw so that when assembled it does not extend way outside the line of the apple. Many feel this type of work is frustrating and find it difficult to achieve, but having tried it, I can genuinely say that I can cut and sand a set of 12 segments in 11 minutes. The 3 pictures below show a set of segments being cut. Each picture shows a clock displaying the time taken to complete both operations, thus dispelling the myth that segmentation takes a long time.

Blank With Square End

12 Segments Cut



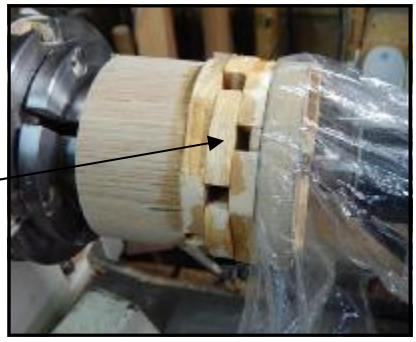
And Sanded Within 11 Minutes

Construction of the apple is done with thin superglue.

Cover the 3 segment side of the wheel with cling film, insert 3 120 degree segments, hold it against the blank in the chuck, bring up the tailstock and lock it all in place. Take care to ensure the 3 segments are pushed well into the wheel, and when you are happy, glue all the joints. This all takes no more time to do than it takes to write it.

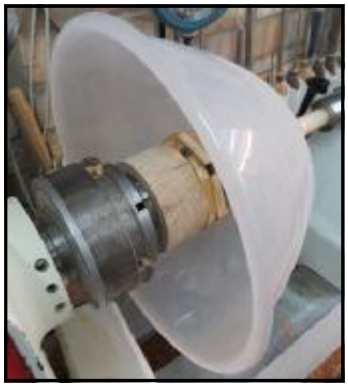
Repeat the process with 6 60 degree segments on the other side of the wheel. Make sure the gaps in the 1st ring of segments are centred on the edges of alternate segments in the 2nd ring as shown here.

For the 3rd layer repeat the process with the remaining 3 120 degree segments on the “3” side of the wheel. Again, make sure the gaps in the 3rd ring are centred on the edges of alternate segments in the 2nd ring.



Finally, the second part of the original blank is applied with a live centre holding it in place. Ensure the witness marks are aligned, and apply the glue.

When demonstrating this project I put a shield in the tailstock. It is made from a scrap of timber with a morse taper turned onto one end and has a plastic mixing bowl screwed onto it. This allows you to run the glued up blank in the chuck and shield it with the plastic bowl, thus preventing the glue from being sprayed out over you and the audience. The piece is allowed to run within the shield for a couple of minutes.



From this point on, the making of the apple is nothing remarkable. For safety, having mounted the larger section of the blank in the chuck, I normally provide tailstock support with a live centre, just until I am confident that the blank is in balance, and it is all holding together.

Shape the right side of the blank with your choice of spindle gouges, rolling the end over into where the bottom pip would be.

Having cut the apple to shape, I drill out the bottom to allow a plastic plug to be inserted. For me, a 20mm forstner bit is used to cut the hole in the base of the apple, all the way up to the top of the segment layers. As necessary, use a small gouge to open up the cavity entrance so as to accommodate the rim of the plastic plug. This now provides space inside the apple to insert potpourri, or cotton wool with scented oils etc. Part in at the head of the apple, and roll the end over to start forming the head of the apple. Go through the grits and sand as much as you

can. Apply a coat of sanding sealer, making sure you get it inside all the holes. After rubbing back, apply a coat of friction polish, followed by Carnauba wax, and finally, part it off.

When designing this project, I paid a visit to my local DIY store and bought an M12 cavity bolt. This has an overall diameter which is very close to 20mm, a very good fit in the apple base. I disregarded the central bolt and replaced it with a short length of 12mm studding. With the studding mounted in the chuck you can then use the expanding section to re-mount the apple and finish turning it. Afterwards you should repeat the sanding and polishing.

Take the piece off the lathe, and drill the head for the top stalk. Make the stalk from contrasting timber and glue it into the top of the apple, and insert the plug in the bottom. Job done.

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