Making pens from scratch – part 2

In the second part of his pen series, **Walter Hall** makes the body and cap of a fountain pen

In the previous part of this article I made the section or core of a fountain pen. In this second part I shall show how I made the body and cap. In many ways this project bears comparison with an earlier article about making closed-end pens – see *Woodturning* 281 – and many of the techniques and mandrels used could be applied and used when making pens from scratch. The greatest differences are in the absence of brass tubes or any other kit components and the need to cut both internal and external threads to fit the components to the section and to one another.

Choice of materials is important, not all acrylics are suitable as I found when making the section, and while the body and cap components are not as small and delicate as the section ones, materials that are too brittle will not stand up to the drilling and thread cutting processes. Some close grained hardwoods will take threads fine enough for pen bodies especially if strengthened with cyanoacrylate but for the purposes of this article I chose to use a True Blood Kirinite blank from GPS Agencies having found in my tests for *Woodturning* 284 that this material would hold a fine thread.

Some turners may prefer to make a drawing before beginning work on their pen, but for this project I just had a simple design in my head and built up the shape as I went along. If you choose to work in this way do be aware that you may have to make changes and re-work components. For example, when initially shaping the grip of the section I made it too large a diameter and had to go back and reduce the size in order for the cap section to fit over it. Drawings and plans would preclude this sort of problem, but for me learning by my mistakes is part of the creative process.

EQUIPMENT AND MATERIALS USED

Beading & parting tool
Parting tool
Bandsaw
Scroll chuck
Digital calipers
6.5mm drill bit
Jacobs chuck
Spindle gouge
Digital Vernier caliper
Threaded mandrel
Razor saw
'True Blood' Kirinite blank
Medium cyanoacrylate
Imitation ebony rod
Abranet and Micro-Mesh abrasives
Farecla polishing compounds

WALTER HALL

Walter Hall is a woodturner who has specialised in making pens and pencils for more than 20 years. Based on the beautiful Northumberland coast in the UK, Walter sells his bespoke pens and pencils through local craft centres and via his website.

walter@walterspens.co.uk
www.walterspens.co.uk

PHOTOGRAPHS BY WALTER HALL

1 I began by lining up the blank against the section and ink converter and marking off the approximate length of the cap and body components. I will not be fitting a clip to this pen, but if you decide to do so then you may need to leave extra length on the cap to make a finial piece to retain the clip. I will look at fitting clips in a future article or project

2 After cutting the blank to length on the bandsaw I mounted the longer piece that will form the barrel of the pen into a scroll chuck fitted with a set of engineers' jaws. Pin jaws would also work for this or any small jaws capable of gripping the blank true to the axis of the lathe

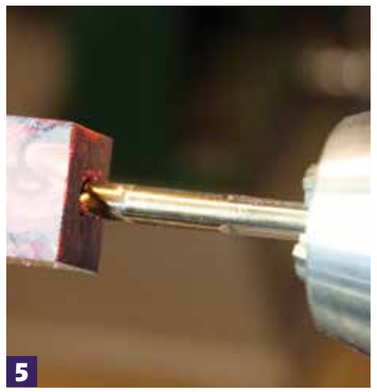
3 The blank must first be bored out to give clearance for the ink converter and then to the correct size for the 8.5mm tap. Getting the length correct is vital, too short and the components will not fit together, too long and you risk breaking through when parting off the end of the barrel


3

4 The diameter of the bore is important too. Enough clearance is required to prevent the ink converter from binding in the barrel, but the smaller the bore, the greater will be the strength of the acrylic body. Remember there is no brass tube to provide additional strength. I measured the converter at various positions with digital calipers and drilled out in stages to maximise the thickness of the body material

4

5 As always when drilling acrylic materials my advice is slow speeds, sharp drill bits and frequent withdrawal of the bit to clear swarf. When drilling deep holes where the depth of the bore exceeds the length of the drill bit flutes withdrawal is particularly important and is required for every few millimetres of drilling as the swarf will quickly build up and block the flutes. Excessive heat build-up from blocked flutes can cause the blank to melt irretrievably to the drill bit as I know from my early experiences with acrylic materials.


5

6 I set the initial 6.5mm drill bit into the chuck so that full depth would be reached when the chuck jaws just touched the end face of the blank, but for subsequent bits the appropriate depth for each was measured and marked with masking tape. You could measure the distance moved by the tailstock quill for each turn of the handwheel and calibrate the depth in this way if you choose. The final drill bit should be the correct size for the tap that you intend to use. Check with tapping drill charts or against the manufacturer's specification


6

7 Once drilled to size for the internal thread I initially mounted the tap in a keyless chuck and began to create the threads by turning the headstock handwheel whilst maintaining light pressure on the tailstock with my other hand then reversing the handwheel to clear the swarf and thus gradually cutting the thread little by little. I found this to be a little troublesome as when reversing the tap it tended to come loose so I changed over to a keyed Jacobs chuck which worked much better as would a collet chuck or similar. Remember that you are working with a much more delicate material than the aluminium used for the section so gently does it.


7

8 I blew out all the swarf with an airline and then trial fitted the section and ink converter to make sure that everything was a good fit


8

9 The exposed part of the blank can now be turned down in preparation for cutting the spigot where the threads will be formed on the end of the barrel to accept the cap. Don't worry too much at this stage about shaping just turn down until the end where the spigot will be is cylindrical


9


10

10 Now turn the spigot to the exact size required for the die that you will use to cut the thread. Once again check with the specification of the die to get the correct dimensions. I used a combination of a spindle gouge and beading and parting tool to make the cuts and a digital Vernier caliper to carefully measure the size


11

11 In order for the cap to screw up fully clearance is required behind the threads. Using a thin parting tool I cut a narrow groove to the same depth as the thread – i.e. the difference between the major and minor diameters of the thread. Care is needed not to cut too deep or you will at best weaken the structure of the component at at worst part it off altogether


12

12 The thread is cut using a die mounted in a die holder in exactly the same way as for the cutting of the threads for the section in last month's article. A chamfer on the end of the spigot will help to start the die. The die I used was an adjustable split die so I was able to cut the thread in stages to reduce the stress on the material and allow a fine final cut to give a good clean thread, but whatever sort of die you use, care is required so slow gentle progress is the way to go.


13

13 The blank was now removed from the chuck and a mandrel created to fit its internal thread. I made this one from ebonite using the same die used to create the threads on the section


14

14 The blank can now be reversed and re-mounted on the mandrel and supported by a revolving centre in the tailstock in order for the body to be shaped


15

15 All of the shaping and finishing of the barrel can be done while mounted on this mandrel except for the end which is finished by hand after parting off. Parting off is best done by cutting almost through with a parting tool and then removing from the lathe and making the final cut with a razor saw or sharp craft knife


16

16 After a final polish on the buffing wheel the barrel is complete, the section can be fitted and we can move on to making the cap

17 I decided the cap should have a centre band to delineate the joint with the barrel. This will also take the cap to barrel threads. To make it, a short length of GPS Agencies imitation ebony rod was mounted in the engineers' jaws drilled and tapped to match the barrel threads

18 A 13mm spigot was then turned on the end and a 13mm hole drilled in the end of the cap blank to the depth of the spigot

19 The prepared components were then glued together and left to set. I use medium cyanoacrylate to save time but epoxy would also be a good choice. Once set the tailstock is brought up to provide support and the whole assembly turned to a cylinder slightly larger than the diameter of the completed barrel

20 The assembly is then reversed in the chuck so that the excess can be parted off and the face where the cap meets the barrel trued up

21 The body of the barrel can now be drilled out to a diameter sufficient to accept the section and nib. Take care not to damage the threads of the centre band by using too large a drill bit or careless drilling

22 Mounted now between centres, (I used a cone centre with a small centre point to avoid making too deep a mark in the end of the blank), the barrel can be turned to shape and the sides sanded and finished

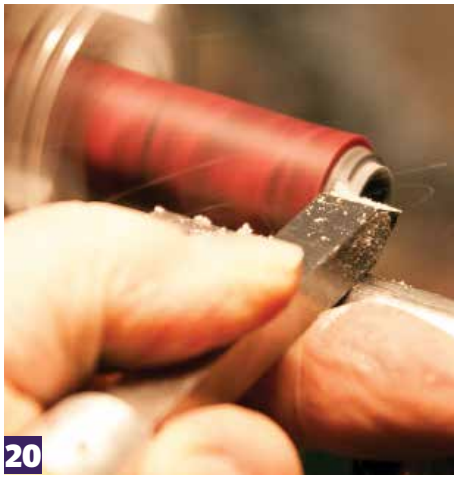
23 A threaded mandrel or jam chuck is used to re-mount the cap to shape sand and polish the end. Here the cap end is shown shaped and sanded awaiting polishing. As with the barrel the completed component was given a final polish on a buffing wheel

24 Once assembled you will have a completely unique and original pen and the satisfaction of knowing that no kit components were used in its making ●


17


18


19


20


21


22


23


24