Rebuilding a set of Northumbrian Smallpipe bellows originally made by Jim Bryan

Jim Bryan was a maker and player of Northumbrian Smallpipes best known for his major contribution to the NPS. publication ‘the Northumbrian Bagpipes’ that, for the first time, set out their construction. Later in life he, and his wife Marion, came to live in Salisbury and became founder members of the local N.S. Piping group which is where I came to know them both. When Jim died Marion dispersed many of his materials to members of the NPS and, eventually, a set of bellows came to me. The leather was holed in a couple of places and the bellows were unusable so I set them aside until a colleague was in need of a replacement.

General condition.
These must have been special to Jim as he inscribed the outer board with a hunting scene and both boards were embossed with his initials. The bellows outlet tube had cracked at its junction with the lower board and he had invested much time and energy into its rescue, first with woodscrews and then liberal applications of what felt like ‘UHU’ glue to seal it in. The leather delivery tube, as often happens, had collapsed in on itself and tended to close in use, preventing the bellows from inflating the pipe bag. I decided to strip, clean up and rebuild the set while retaining as much of the original materials as I could – hence ‘rebuild’ rather than ‘restore’.

Disassembly.
Firstly, I unscrewed the belt and its fittings and untied arm and hinge thongs. With a scalpel, I cut through the stitching between the boards and leather to discover that the edge of the leather had been reinforced with a fold of very thin ‘skiver’ leather partly to assist with the seal to the wood. The inside of the boards was heavily incrusted with fatty deposits which looked like old dubbin or possibly solidified neatsfoot oil. Some makers advise sluicing the inside with a sealing mixture to ensure airtightness and I presume Jim did this. Next, I removed the remains of the stitching using a 1.2mm drill in a pin vice to punch it through followed by picking clean with needle and fine tweezers. I cleaned the belt fixings with a soak in household ammonia plus one drip of Fairy Liquid. (I am a chemist and relatively unfazed by solvents).
Figure 1. Disassembled bellows.

Figure 2. Outlet tube and bottom board.
**Copying the leather shape and dimensions.**
I cleaned the leather, roughly, with white spirit, let it dry and drew around it on to A2 tracing paper. Next, I used French curves to establish the original outline, transferred it to card as a pattern and cut round it.

**Choice and treatment of leather.**
From previous experience where I had replaced three unsuitable choices of leather on my colleague’s bellows – that’s a lot of stitching to do and undo – I sourced a piece from Lyon Leathers of Northampton during a visit to a re-enactors market at Ryton on Dunsmore. It’s slightly under 1mm thick, chrome tanned with a smooth, sealed outer surface. At the expense of my own embarrassment, my mistakes were in allowing others to suggest leathers that were too thin, too soft and not airtight. What I chose, in the end, was the closest I could get to Jim’s original and fairly ‘beefy’ to ensure that it was airtight. Another stallholder enquired what I was about to do with the leather and advised me to seal it from the inside (rough side) with beeswax dissolved in turpentine. This I made up by melting beeswax and adding distilled turpentine to the hot melt, away from any source of ignition, until, when cold, it had a texture like Vaseline. I brushed this into the leather and ensured even distribution by a further application of turpentine. Once dry, I brought it indoors and the house smelled glorious.

**Treatment of the woodwork.**
The original varnish on the boards looked traditional, natural resin based but had to be removed with a hot air gun to permit degreasing. The sealing mixture referred to above had seeped into the wood which required cleaning. I attempted this, unsuccessfully, with a thorough soaking in white spirit but, later, I found that sequential wiping with kitchen roll soaked in Swan Vestas’ lighter fuel (light petroleum distillate) was effective. Following varnish and oil removal I re-treated both faces with a matt polyurethane varnish. The grooves to accept stitching and leather were rather shallow so, using a Dremel drill with appropriate bitts and taking due care not to deepen the grooves, I routed the outer channels to be squarer and the inner ones to be slightly wider and rounder.
Bellows outlet tube. (See figure 2)

Jim, and others, overcame the fragility of this joint in a number of ways but his favoured solution, as I’ve seen on other sets of his, was to increase the flare on the cone, thereby increasing the area of contact. I don’t know if this was an early set but it does look like the corresponding illustration (plate 3) in the 1975 edition of ‘Cocks and Bryan’, possibly before he had modified his approach. I rescued the tube end by nifty use of my lathe, cut and drilled a block to accept it and marry it more securely to the bottom board. This had to be screwed from the inside after the bottom set of stitching but before the upper board had been attached. Note the pre-drilled mounting holes and that a thin leather gasket is required between this and the board.

Figure 4. Bellows outlet tube and connecting block.
Stitching the leather into the boards.
I used braided, waxed polyester saddle thread for this task taking both ends of the same thread in a crossover stitch. I find that needles, in forcing two thicknesses of thread through each hole, have a tendency to break their eyes as well as compelling me to a protracted fight to get the stitch through the leather and the boards. To simplify matters I modified the ‘hog’s bristle’ approach as follows. Cut the end of the braid cleanly and insert the roughened end of a ~6cm piece of 0.6mm brass wire about 1cm into the centre of the braid. Hold the wire horizontally close to the un-braided end and heat the wire about 1cm from the braid with a lighter flame. Once the polyester has started to melt, twiddle it in your fingers while still semi-molten. Trial and error will make you pick a cooling interval that won’t burn your fingers. Check that the join is secure and repeat for the other end.

Figure 5. Wired thread ends.

Using the pattern, I cut a new leather and sealed it as noted above. Next, I joined its ends with a double, parallel row of stitches – see ‘Cocks and Bryan’ plate 3 and my figure 6 for the details, and put temporary stitches in to secure the front and back in their respective positions in the lower board. As in ‘Cocks and Bryan’ plate 2 1975 edition, I folded the leather edge upwards and over to form a doubled seam and a more secure bedding of the stitching, adding some more of my beeswax and turpentine ‘gunk’ into the groove as I proceeded. I used a sharpened awl to create stitching holes. Starting level with the outlet tube, I commenced stitching forwards to the front and round, back to the starting point, removing the anchoring stitches as I met them. I finished with the two braid ends coming up to the inside, leather surface, tied a reef knot, cut the thread at ~1cm from each end and set fire to the ends. These ends burn, melt back to the knot and go out, at which point you blow on the melt to cool and harden it. Don’t let them burn for too long or you will have to start stitching all
over again. I attached just the lower board to allow me to screw in the connecting block – an impossible task if you’ve stitched both boards.

Mounting the connecting block.
Next, I placed the block on to a piece of very thin glove leather and drew round it to make a gasket. I remembered to mark and cut a hole in the gasket for the air outlet at this stage or, eventually, no air would pump out and there would be no way to rectify this error without removing the top board and re-stitching it. I screwed the block and gasket from the inside of the bellows at this point.

Figure 6. Mounting the outlet block.

Next, I repeated the stitching for the top board. Finally, I sealed the outer groove with well softened beeswax, a material that, unlike the wooden beading strip used by some makers, can be removed easily for maintenance.

Finishing the job.
Next, I re-attached the belt with its anchorages, tied in a hinge thong at the front and attached a double thong at the back for the arm grip, as noted in ‘Cocks and Bryan’ p19. Then I reinserted the inlet valve the correct way up. My replacement delivery tube was a suitable length of Copely Extra Flex Reinforced Water Hose tubing with a tight push fit to the end of the outlet tube and its corresponding outlet bush. This material bends sufficiently to fit round the paunch without closing up. Some years ago, I was able to purchase this by the metre from a local agricultural merchant but now they stock it with a minimum pack size of
25metres. Thus, I have enough for about 1,000 sets of bellows; please feel free to approach me if you need some. Finally, to disguise the unsightly plastic tube, and having seen Ruth Goodman prepare an historical condom in a similar way on 'Victorian Pharmacy', I stitched a moderately tight thin leather sheath to fit over the offending article. The bellows now works well without missing a stroke.

Figures 7, 8, 9. Reconstructed bellows.
References

   An earlier version is available on:
dating from 1967 but varies in minor details including outlet pipe construction (in brass) and the use of skiver leather edge binding. It’s clear from the dates and minor variations in these two publications that Jim used a variety of constructional methods more or less concurrently making the dating of these bellows problematical.

2) http://www.northumbrianpipers.org.uk/leaflets/bellows.pdf

3) http://www.lyonleathers.co.uk/index.html