

Anglo Saxon bone comb reproduction... using lasers!

I've always been interested in making things and I've always been interested in computers. So it's not surprising that technology like 3D printers and laser cutters appeal to me. A couple of years aback I bought myself a laser cutter - one of the cheap Chinese ones from EBay, 40Watt CO². Over the past year I've been indulging my creative side and having lots of fun! After making something I'll show it to Liz, expecting the usual "That's nice... Can you make ten of them for Christmas presents?"

Inspiration for an item comes from many sources, and not surprisingly in our household one potential source is archaeology. After seeing some of the experimental archaeology projects that SSARG members have been doing, I had been looking for something that I might be able to replicate using the laser cutter. As my laser cutter can only cut through relatively thin material 2 -3mm thick, no larger than an A4 sheet of paper, this does limit you a little bit! Like most things the answer came along unexpectedly when Liz suggested an Anglo Saxon bone comb. This is ideal as it's made out of flat pieces of bone, usually no more than 2 - 3mm thick. In my reproduction I used 2mm MDF.

Finding a suitable test subject:



Google!!! I Googled "Anglo Saxon bone comb" and one of the first one that came up appeared ideal as it is a good clear photo but more importantly it has a scale next to it so you can see what the dimensions are. It also has images of the front and the back of the comb. It is the Composite Single Comb from Sutton Courtenay, currently in the Ashmolean Museum.

How I did it:

In order to cut something on the laser cutter you have to prepare the image on computer first. I use a two stage process as software that came with the cutter is extremely basic. I prepare the image in another package first and then import it the software that came with the cutter. drawing package I use is *Inkscape*, a professional vector graphics editor, it's free open source (website: www.inkscape.org).

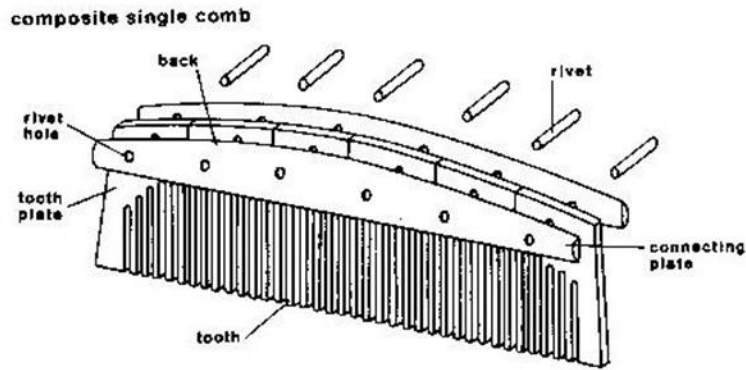


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- I took the image of the comb from the Ashmolean website and imported it into Inkscape.
- Traced over the outline.
- I then scaled the image up so it was the correct size.
Note: The Ashmoelian comb is missing a lot of its teeth! However, I decided to add a full set off teeth to show it as it would originally have looked.
- I then produced the outlines for the front and back connecting plates. This completed the cutting image file.



- Next, the engraving image. Again this was done by tracing the decorations off the original comb. This is slightly more complex as the tooth plate is not symmetrical and the decorations are different on the front and back.

Off to the cutter!

A note about the laser cutter: The laser cutter can either cut or engrave depending on the power setting for the laser. You have to decide when you're drawing in Inkscape which lines are for cutting and which are for engraving. As my laser cutter is a really cheap one, I cannot vary the power of the laser under software control. Consequently I produce an image of the comb for the cut (i.e. at full power) and a second image of the comb with the lines I want to engrave done at a lower power for the decoration. This particular comb is made of three parts - the centre section that has the teeth, and a front and back connecting plate which are held together in the real comb using rivets. However in mine I used white PVA glue!

Setting up the laser cutter:

As I don't have a workshop this has to be done in the kitchen (Liz is very understanding!) The laser tube is water cooled and this is provided by a 2 gallon plastic bucket and a small pump.



Extract fan and ducting:

When the laser cutter cuts, the material is completely vaporised so lots of smoke/fumes are created (you must use laser safe materials). These have to be extracted and expelled safely (through the kitchen window!)

Air pump:

The smoke given off will absorb energy from the laser beam so a small air pump is used to blow air onto the cut to remove smoke. This gives a better cut and also stops the wood from bursting into flames!

Laptop:

The laptop which has the software to control the cutting is connected to the laser cutter. I import the image I created in Inkscape into the laptop. Then press Go and make a cup of tea! Cutting and engraving the comb took about 40 minutes.

Finishing and assembling the comb:

After removing the cut parts they need a very light sanding, taking care not to break any of the teeth... although a few broken teeth could make it look more authentic!

A bit of PVA glue... and all done!



Peter Caldwell