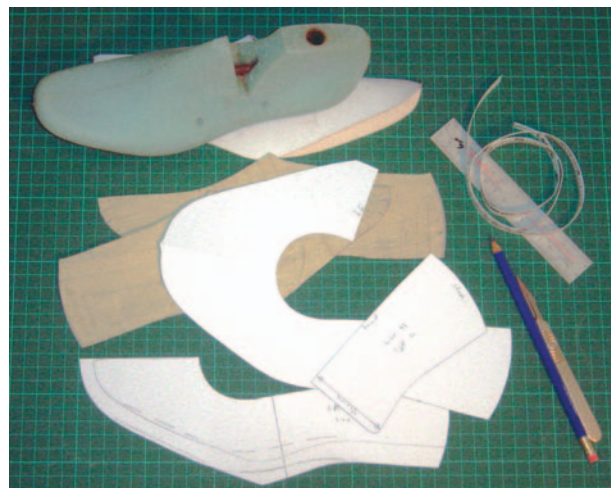




You will never achieve a perfect pattern

Pattern cutting has undergone enormous changes since the introduction of CAD, but how many operators of these systems fully understand what is going on and why? David Lyon and Tony Garley have over 65 years joint experience in the field and have some interesting views.

This is a bold statement but essentially true. There is no way, either manually, mechanically or by the most sophisticated computer systems that a totally-accurate flat pattern can be produced from a curved, three-dimensional last.

Formes

However, it is still possible to obtain a very good pattern if you know what it is you are trying to achieve. This can be demonstrated by seaming the inside and outside formes at the front and back centre lines to produce a 'drape' that can be lasted by finger pressure only. It will not be perfect but will show the inaccuracies around the toe, seat and other places.

Formes were originally made by wrapping a piece of upper leather over the last and trimming round the edges to leave an approximation of the size, shape and surface area of the last. When uppers were soaked in water and hand lasted this was sufficient. Formes can be made in many ways including slotted paper, plastic and car body masking tape but they all have to be flattened and this is where the real problems can occur.

The process of flattening a forme will also tell an experienced person a great deal about how the last and a particular upper will behave in manufacture. Areas of maximum distortion will appear as either creasing and pleating or undue stretching and straining. Both can be

corrected when the upper is lasted and, as long as the upper materials are soft and malleable, a good result can be achieved. It is essential that the 'reversibility' factor is clearly understood so that correction and compensation can be built into the patterns. The essence of reversibility in this instance is that the upper will have to stretch where the forme was creased or pleated and condense where the flattened forme was stretched or cuts opened up.

With hand lasting and—to a certain extent—machine lasting, the upper can be compressed around the edge of the last so that length and area can be allowed to stretch. In constructions such as force lasting, slip lasting, moccasin or sewn-in-sock, shortening of the bottom line is achieved through the upper seams. Upper area and length can be gained or lost by seam variations. All these require extremely accurate patterns and stitching, as there is little or no margin for error.

It has been said that shoemaking is the art of producing something possible from the impossible, converting the round of the last to the flat of the upper components and then back to the round of the shoe. And, at each stage, one needs to understand what the effects will be, how to cope with them and develop techniques to compensate for all the errors you know will be there. Shoemaking is not as straightforward as many like to think.

CAD systems

Computer aided design systems have many advantages, but to some they can also have one or two serious drawbacks. Foremost among these is the inaccuracy of the base pattern (forme) produced by 3D CAD software from the user's last. This base pattern is responsible for the accuracy and quality of all footwear to be made on that last. Sometimes it is extremely inaccurate to the extent that on a base pattern 300mm in length there may be an error of as much as 60-70mm in pitch at the back in extreme cases. Unfortunately, many patterns all over the world are accidentally 'deadened' (dragged down below their natural pitch), which results in difficult lasting and poor quality footwear.

How can you tell? There is only one foolproof way and that is to make either a drape or a simple court shoe upper and check them for fit on the last. A drape can be fitted over the last by hand, whereas a court upper needs to be at least partly lasted. If it has a tight top line and no obvious gaping or straining in key areas, it fits. However, as any CAD designer will tell you, developing software for flattening is a highly fraught subject indeed. The more successful systems have depended very heavily on a deep understanding of how to flatten

manually and this knowledge is built into the CAD process. Without this knowledge, it is extremely difficult to define what is required.

Flat or 3D?

A major challenge to CAD suppliers has been how designers use their 3D CAD systems. It is still open to question whether any experienced designers—as opposed to pattern cutters—prefer working with a virtual 3D image of the last on a screen rather than designing on the surface of the actual last or on to flat paper.

Designing on the flat forme or standard was a common method for many years and usually involved several lasting trials to get the styling lines correct three-dimensionally. Designing on the last has been the accepted method for most types of shoe for quite some time now. However, many who practise this technique are concerned that CAD systems are in danger of requiring designers to return at least partially to designing on a 2D surface, albeit on a computer screen. This is not strictly fair, as although the front of the monitor may well be flat, with many CAD systems the last seen on the screen is truly three-dimensional.

For instance, if you draw round the

back of the last, the line disappears. Rotate the last and there is the line. Despite this, it can prove difficult for a designer to position the lines exactly where they are required. It is also a very different environment from one where you are holding a last in one hand and a pencil in the other. Here, you can move the last slightly so as to see the shape of a line from a different angle. You can also see the effects of the curves of the last.

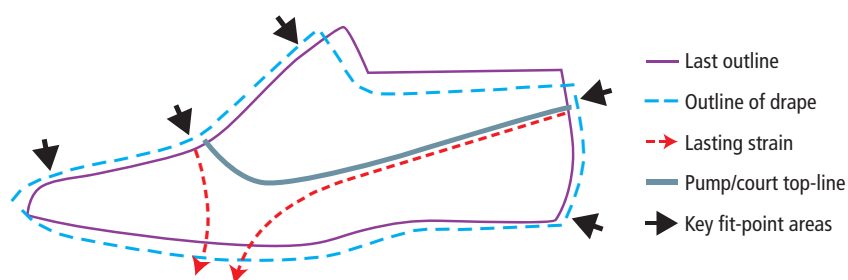
The same can of course also be done on a computer screen by changing the angle of view of the last and by editing design lines. It really is a case of becoming accustomed to a different environment and an established designer may find it difficult to adjust. Someone who starts out this way will have no such problem, although they will not experience the same 'hands on' feel that they would with a last. Indeed, some designers say that the mouse of a CAD system is an uncomfortable tool compared with a pencil. The main argument, of course, is which of them produces the best results in the shortest time.

Training

Should all designers be initially taught the manual or pencil-on-last method to begin with? The idea here is that if taught the basics and given a thorough understanding of the principles of pattern and last interaction, the young designer will find it easier and subsequently quicker to master a CAD system. It also allows a degree of flexibility in that they would have the ability to design on the last and then develop patterns on CAD or do the whole process on CAD. The problem with the latter is that CAD systems are still more successful at flattening a forme than the design lines within it.

One solution is to design on the last and then use a 3D digitiser to transfer the style lines on to the last image on the computer screen. In other words, it is not mandatory to draw directly on to the three-dimensional last image on the screen. In many ways the latter is not so much designing as the first step towards the production patterns. The functions of design and actual pattern development should ideally be separate, and then each can work in their own preferred way to achieve the best final result. 

Drape/court 'upper' for checking a forme' fit to the last



Typical deadening of a CAD forme compared to a taped forme

