

WHO NEEDS LASTING MACHINES?



Most boots and shoes have traditionally been made by first pulling an upper over a last, securing it to an insole and then attaching an outer sole by means of either stitching, rivets or, from the middle of the last century, adhesive. Up until the late 19th century when the 'Consolidated' lasting machine was introduced, lasting was done by hand. Together with all the other shoemaking machines developed in the same period, it helped to revolutionise the footwear industry by raising production levels and reducing costs through mass production.

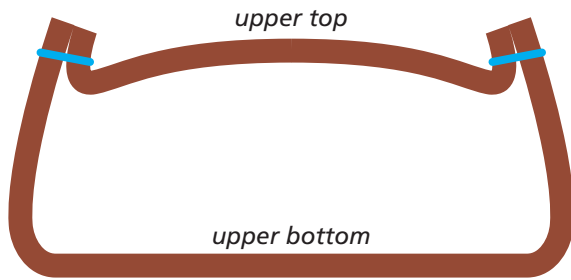
Machines gradually developed further so that, today, we have highly sophisticated, computer-controlled lasting machines that can last a pair of shoes on any last shape in only two operations. Having said this, these machines are extremely complex and require highly skilled operators, excellent factory conditions and careful maintenance. They are also extremely expensive.

They are however essential to the production of most types of dress and fashion shoes, regardless of whether they feature stitched or cemented soles. Anyone contemplating setting up a modern shoe factory to produce such footwear therefore has to consider carefully the commitment and likely return on capital, plus the time needed to obtain the machinery and train up a labour force. Add to this the highly competitive nature of the global footwear market and it becomes a tough decision unless you have guaranteed substantial long-term orders—and there are not too many of those around.

Today, formal dress or fashion shoes have been forced to take a backseat with the phenomenal growth of sports shoes, brown shoes and other forms of more casual footwear. All can be produced without using expensive lasting machines which makes them ideal for emerging footwear manufacturing countries that may lack the skills and infrastructure to justify highly sophisticated equipment.

The basic feature most of them share is that the 'lasting' operation is carried out

Figure 1 - Moccasin



by forcing a last into a completely closed upper, unlike conventional lasting where the upper is open at the bottom. Alternatively, if a direct bottoming system is involved, the upper is forced over the foot form of the moulding machine before lowering into the sole mould. In both instances this is referred to as 'force lasting'. In the other two, the construction is even simpler.

MOCCASINS

A moccasin is essentially just a piece of leather wrapped under the foot with a centre panel or 'plug' sewn into the top of the forepart to create a 'bag' to which a sole is attached. Only basic sewing machines are needed to produce the seams that create the main upper panel, plug and saddle which can then be sewn together by either by hand or machine in one operation. A last is then forced into the resulting bag and the rear of the upper lasted by hand on to a half insole. Moisture and heat are then applied to set it to the last's shape and a sole attached before the last is removed (Figure 1).

Simple and functional, the construction can be used to produce light, smart and very flexible shoes. While examples from top Italian producers such as Gucci command extremely high prices, very good shoes can be made down to quite low prices without the need for expensive machinery and highly skilled labour. It can also be used to produce pure leisure shoes like the immortal 'Boat Shoe' as well as heavier outdoor walking boots and shoes.

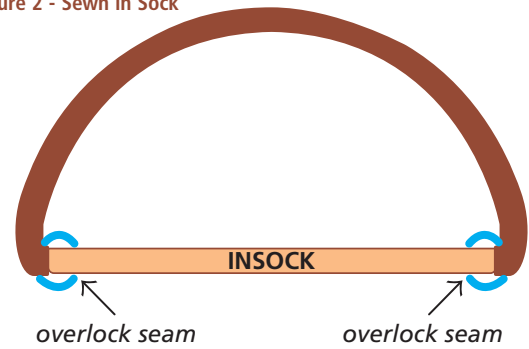
As mentioned, the moccasin front seam can be made using a special type of sewing machine. Italian firm Ciucani Machine Srl specialises in this type of machine and has models that can make decorative variations on the basic seam.

While they are more complex and expensive than conventional sewing machines, they cost a fraction of a lasting machine.

SEWN-IN SOCK

In this construction the edge of the upper is sewn to a non-stretch fabric or non-woven sock using an over-lock machine. It is the non-stretch quality of the sock that provides the lasting pull. A frequently used over-lock machine is the Strobel from Germany that has been well-proven over the years and, as a result, the construction is often referred to as 'Strobel-stitched'. In many cases the

Figure 2 - Sewn in Sock



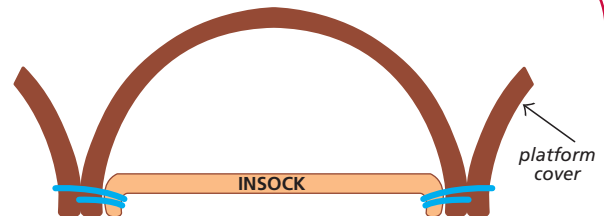
back part is moulded before sewing and the patterns cut to add some shape around the toe. The resulting bag is then steamed to soften and warm it before being pulled on to either a last or moulding-machine foot form (Figure 2).

This construction is ideal for many types of sports shoe as it can be used in conjunction with either stuck-on sole units or direct bottoming systems. Uppers, however, need to be very accurate and to have as much shape as possible sprung into them by the use of well placed seams. While this is not usually a problem with multi-panel sports shoe uppers, plainer designs often call for very carefully cut patterns.

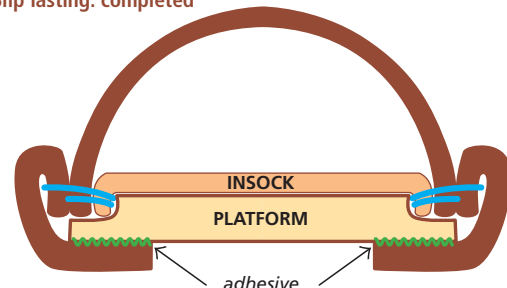
SLIP LASTING

A variation known as Slip lasting has an additional strip of material sewn round the edge of the upper. After force lasting, a platform is added and the strip lasted over by hand to cover its edges before attaching a sole. Once widely used for California type sandals, it is now rarely seen (Figure 3).

Figure 3 - Slip lasting: first stage



Slip lasting: completed



STRING LASTED

A simplified version uses the same over-lock seam to sew in a length of string all around the bottom edge of the upper. This is then used to 'last' the upper over a foot form for direct bottoming, after which a false insole is inserted. Called string lasting, it is a simple technology but lacks the

“...technically speaking...”

In all these constructions—with the exception of moccasins—the insole or sock must be flexible, have low stretch-properties and above all, stitch-tear strength. Non-wovens have proved an ideal solution.

Introduced by Texon in 1970, needle-punched non-wovens are now widely available. Most are made from polyester fibres that are blended, carded and needle-punched, before being reinforced with synthetic resins to make a very tough material indeed. They are particularly suited to the Strobel and Veldtschoen constructions as they have high bonding strength for sole attaching.

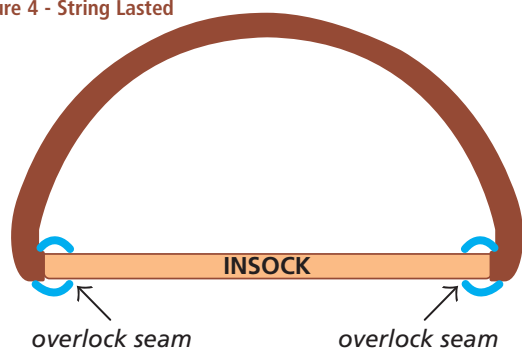
Texon has now taken the non-woven a stage further with a ‘hook-bonded’ method of manufacture which provides extra stitch tear-strength for the Strobel construction. Instead of adding thread to make the base fabric, it takes fibres directly from the non-woven itself to form a stitch, which then becomes an integral part of the three-dimensional structure of the material. This not only produces a stronger material but also reduces both

weight and cost. Being very abrasion-resistant and permeable to both air and moisture, it is particularly suitable for use in casual and sports footwear.



Texon Sprint non-woven material
COURTESY TEXON INTERNATIONAL LTD.

Figure 4 - String Lasted



flexibility of the full sewn-in sock method (Figure 4).

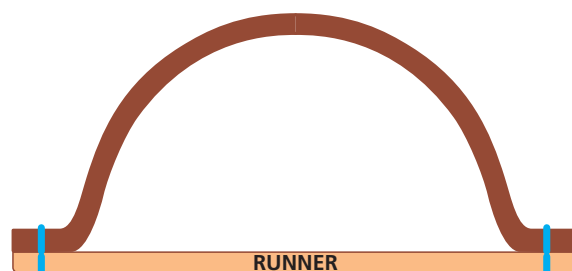
FORCE LASTED VELDTSCHOEN

This is a modern version of the old Veldtschoen or ‘Stitch down’ construction once widely used for the production of children’s shoes and sandals because of its highly flexible nature. In the modern version, the upper which has a minimal lasting margin, is partially pre-moulded before being edge stitched to a non-woven runner. It is then force lasted and a sole attached. It is very effective for simple types of casual shoes such as the traditional ‘Clark’s’ desert boot but again lacks the wider potential of the moccasin and sewn-in sock constructions (Figure 5).

SIDE-STITCHED

Then there is the side-stitched construction, which is simplicity itself. In this instance, a moulded sole unit is used which has a raised side-wall with a top lip to which the upper can be sewn. Specialist machines are again available which can either perform a simple side-seam or imitate a real moccasin seam to match specially designed sole-units. The

Force Lasted Veldtschoen



upper is again force-lasting but this time with the sole taking the place of a sock or insole. A false insole is then inserted.

This is a very flexible a cheap way to make shoes. The upper can be given shape by the use of seams as before or, alternatively, a soft upper material can be used that will readily stretch under force lasting. Suede splits are particularly suitable and will also help to keep overall costs to a minimum. This construction is ideal for any country seeking a simple construction that requires a minimum amount of material and components, a few simple machines and relatively unskilled labour.

A WEALTH OF OPPORTUNITY

All the constructions we have briefly looked at are proven. However, in today’s world the demands of much of the world’s population is for cheap practical footwear that, if possible, can also have a degree of style and fashion similar to that of developed consumer economies. While some clearly have more potential than others, none of them requires the substantial capital and training costs associated with the more traditional lasted forms of shoemaking. 🍷