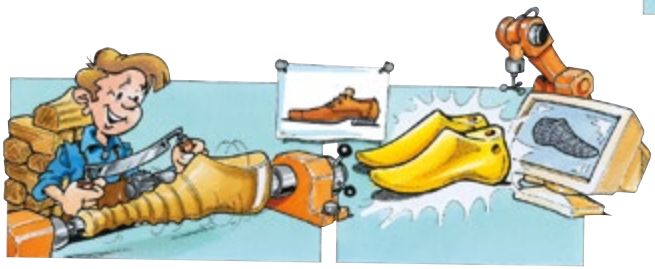
SHOE
making secrets

Shoes have always protected feet from harm and dirt, rough surfaces and bad weather. This product will long remain a clothing accessory, one that must first be attractive before it is worn. Despite mechanisation, the shoe industry is still labour-intensive. 150 operations are necessary to produce a pair of shoes. 3 types of manufacturing technology are discussed: cementing, welted construction (Goodyear), injection moulding.

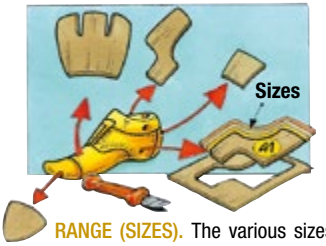
Manufacturing process

DESIGN. The entire process starts with **the style.** Many designs and sketches are made according to fashion. Two collections are prepared each year (summer-winter), taking into account the shapes, colours, materials and chosen accessories.



MODELLING. The **last** is made, in a basic size, according to the design of the shoe. The lines of each element of the design are reproduced on the last and stretched (a two dimensional representation) to obtain the **standard.** These operations are performed very quickly using **CAD (Computer Assisted Design).**

PATTERN-CUTTING. Whatever the method used, this operation consists in determining the final outlines of the different parts of the sample upper for industrial production.



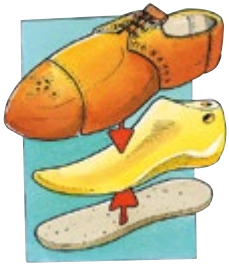
RANGE (SIZES). The various sizes of the model parts are obtained (scaled up) from the base-size (sample-size) to create a range. Size 41, for example, allows for a range of sizes between 39 and 46.

CUTTING. All the components of the uppers are cut out of selected materials, such as leather, textile, etc., irrespective of the cutting technique used, manual cutting, press-knife cutting, laser or water-jet cutting.

PREPARATION FOR STITCHING. The various components of the uppers undergo operations such as skiving, folding, perforating, etc.

STITCHING. To form the upper, the parts are joined together by stitching. Ornamental seams are sewn at this stage.

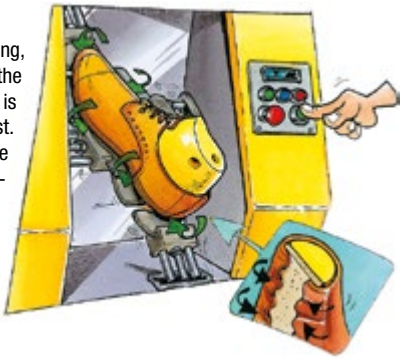
ROUGH ROUNDING - PREPARATION. Bottom parts, such as the **insole, sole, heel,** etc., are assembled using the upper section of the last as a gauge.



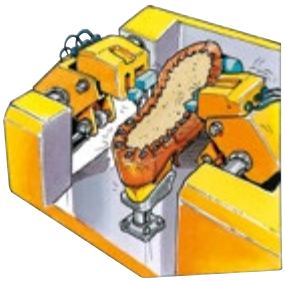
ASSEMBLY AREA OR ROOM. The last, the upper, the insole and the sole are joined together by pair and size, and the lasts are put together and matched up into sets for the lasting room as required.

Cementing

Technical construction where the sole is bonded by cementing on the tack-lasted upper.

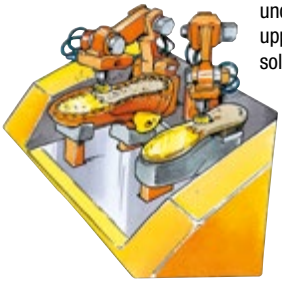


LASTING. During lasting, the **insole,** which is the keystone of the shoe, is positioned on the last. The **upper** covers the **last** exactly and the excess material is folded onto the **insole** to which it is cemented. The operation is performed by machines.

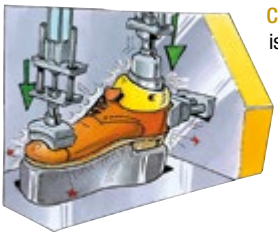


ATTACHING THE HEEL. In the heel area (back part of the upper), 22 rivets reinforce assembly of the upper to the insole. This is a mechanical operation and all the rivets are driven in and riveted at the same time.

CEMENTING - PREPARATION. To begin, cement is spread on the underside of the upper and on the sole.



ATTACHING. The sole is manually positioned on the insole.



CEMENTING. The sole is cemented to the shoe through high pressure being applied to the upper part of the shoe.

INSPECTION, CLEANING AND DRESSING ROOM. The shoe is inspected, cleaned, dressed and polished. Heel socks, laces and the brand label are added.

PACKING. The shoe is checked and then packed for sale.

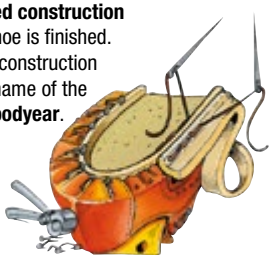
Machine Welted Construction (Goodyear)

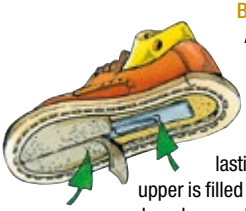
This method was originally performed by hand. It is a shoe construction method in which the welt and upper are sewn onto the insole rib by the welt sewing machine.

The upper is temporarily fastened onto the last by tacks.

THE WELT. The **welt** gives the construction a particular appearance. It is the means by which the upper, the insole and the sole are fastened to each other.

The seam of the **welted construction** is invisible once the shoe is finished. The machine-welted construction is also known by the name of the machine's inventor, **Goodyear**.





BOTTOM FILLING. After the wooden or metal **shank** has been fastened, the space between the lasting margins of the upper is filled with a mixture of cork and cement or foam.

ATTACHING THE SOLE. The sole is positioned on the bottom of the shoe and cemented. Adhesive is spread on the two parts before they are brought into contact with each other.

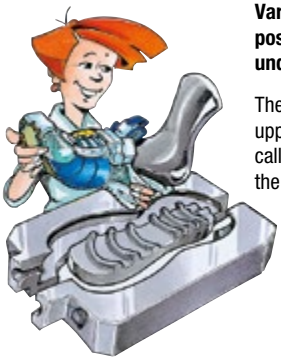
LOCKSTITCHED SEAM. The sole is attached permanently to the welt by a "lockstitched seam". This stitching is still visible when the shoe is finished.

ATTACHING OF THE HEEL. The heel is cemented and then nailed to the sole.

Mocassin

Sandal

Injection moulding

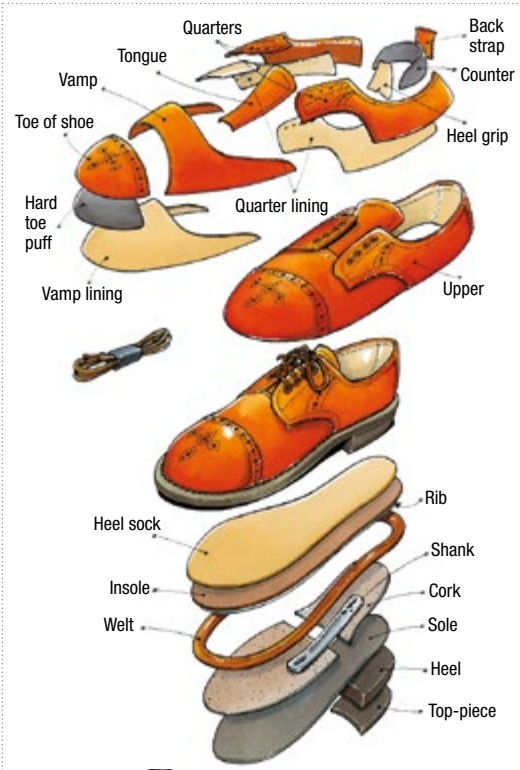


Various products are positioned in a mould under pressure.

The insole is attached to the upper by an overedge seam called a **Ströbel,** the name of the machine's inventor.

The upper is inserted into the male mould.

The polymer, which becomes liquid when heated, is injected under pressure into the mould of the sole held against the upper.



New concepts and materials used in modern shoe-making.