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## UNIT 2 PRACTICAL : HAND LASTING

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### 2.1 INTRODUCTION

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**Lasting** is a term related to the process involved in stretching (in some areas by compressing) the upper material over **the last** and securing it. The upper will conform to the contours of the last and when the last is removed upper retains much of the shape.

There are many variations in the way which footwear can be made from the Lasting point of view. **These are known as lasting constructions.**

The types of constructions used will often depend upon what the finished shoe is used for. So each will demand different considerations. The methods can be divided into two groups :

#### **Direct Attachment**

Where the soles are attached directly to the lasted upper.

#### **Indirect Attachment**

Where the soles are attached to the welt or runner, these already being attached to the lasted upper.

Group one includes Cemented (Stuck-on) Constructions, Direct Moulded Constructions, etc.

Group two includes Welted Constructions, Veldtschoen Constructions, etc.

The lasting department is divided into three sections :

- (i) Assembly
- (ii) Lasting
- (iii) Bottoming

A shoe nearly always has to be made on a last to achieve a shape to give the necessary comfort and fit. Lasting is the process of stretching, compression of material takes place mainly on seat area, the upper leather over the last and securing it to the insole, runner etc., so that the upper conforms to the last contours.

The areas of the last which present the greatest difficulties in lasting are mostly those in which the major shape changes occur. To facilitate shape retention it is essential to apply correct strains at certain major points.

The amount and direction of strains must be suitable to both material and the design of the upper to help to produce good shape retention throughout the life of the shoe. Shoes must be lasted to match in pairs so that the design of the uppers is correctly matched. It is important that the back height will be according to specification; otherwise if the back is too high, the shoe will rub the heel, if too low the shoe may not fit the foot as desired.

The top line of every shoe must be reasonably tight. It is essential during lasting that the top line is pulled somewhat tight to maintain correctly the balanced top lines. If the initial

stretch is not taken out of the upper, the top line becomes loose, resulting in poorly fitting shoes. The top line must also be correctly balanced, i.e. the outside quarter 3 mm below the height of the inside quarter. The reason for this being the difference in the anklebone height, or according to the specification.

### **Objectives**

After studying this unit, you should be able to

- hand last a shoe upper properly, thus converting the 2-Dimensional shape into a 3-Dimensional shoe, which would be ready to be used,
- identify the tools and the machines used in the hand lasting of the upper, and
- quality check the prepared shoe so that there shall be no faults which might lead to rejections.

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## **2.2 SEQUENCE OF OPERATIONS**

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Traditional hand lasting involves the use of twelve basic lasting strains, which make the upper conform to the shape of the last. The order in which these lasting strains are taken can vary to suit the individual situation, and the laster may modify the order, to make sure that the upper is lasted properly. For example, if the upper is tending to the swing to the outside then the laster will remedy this by pulling the upper from the inside first. In other words, the laster will ensure :

- that the upper conforms to the shape of the last,
- the upper is positioned centrally on the last, and
- upper components are falling on the proper place on the last as specified by the designer.

The following are the tools used in the hand lasting of the upper :

(i) **Lasts**



(ii) **Pincers**



(iii) **Tack Puller**



(iv) **Hammer**



(v) **Adhesives**



(vi) **Tacks and Nails**



(vii) **Table with a Lasting Jack**



The following is the sequence of operation (step by step) required for hand lasted shoes.

(In European countries, this method is used for very high-grade shoes and surgical/orthopedic footwear.)

- (i) The insole is first attached to the last.



- (ii) The toe-puff and stiffener are inserted into the upper. There are various types of these materials that can be used. Mostly the solvent activated type of the toe-puffs and stiffeners are used. Lining is attached with the upper.
- (iii) If the shoe is a laced one then a string is used to tie up the lace holes prior to lasting.

**Practical in Lasting  
and Finishing Processes**

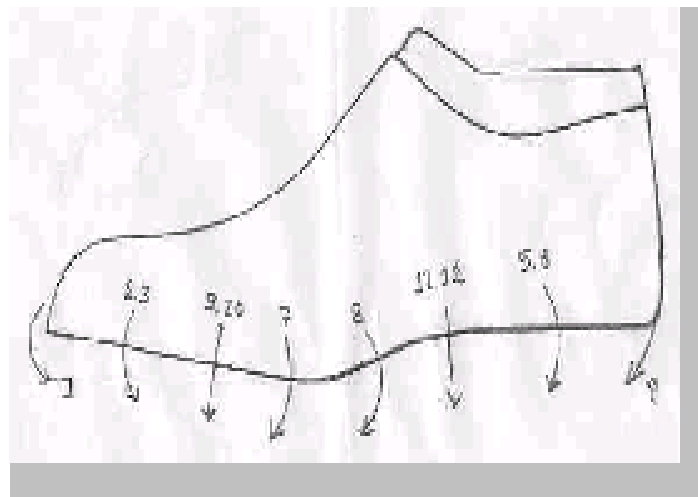
- (iv) We then place the upper on the last and proceed with the 'pulling over pulls'. By using of lasting pincers the "First Drafting Pull" is made. For each of the pulls in the first part of the operation we call it a draft. The drafts are made in numerical order and in the direction indicated in the diagrams.
- (v) The first drafting pull is along the length of the last, positions the upper and is creating some tension on the top line. The toe end is then secured to the insole by a tack.



- (vi) The second and third drafting strains position the front of the shoe. (At this point a careful check is made that the whole upper is straight.)



- (vii) The fourth draft is made to position the seat. (At this point we check that the back seam is straight and the top line is in the correct position.)



- (viii) The fifth and sixth drafting are taken at the front end of the stiffener and often referred to as "Cornering the Counter". At this stage, tension is first put on the lining to ensure that there are no pleats or creases. This is what we call

“clearing the lining”. The draft is then made with the pincers holding the upper stiffener and lining. This downward pull further increases the tension of the upper.



- (ix) The seventh and eighth drafting strains are just behind the joint position and have the function to pull somewhat forward. So that there is no surplus material in the waist.



- (x) The ninth and tenth drafting strains are taken halfway down the forepart to ensure that the vamp is properly stretched down to the last.



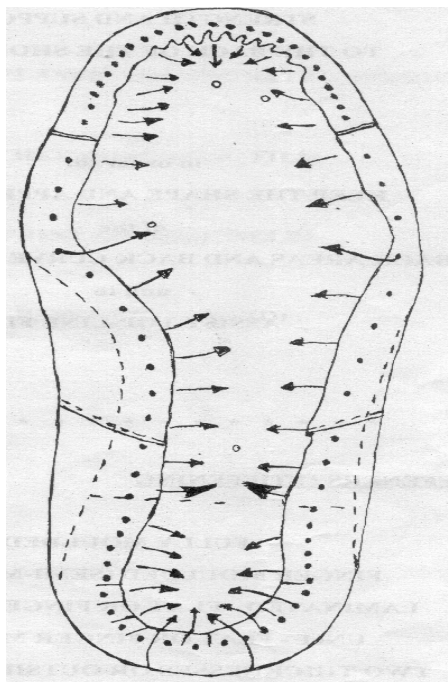
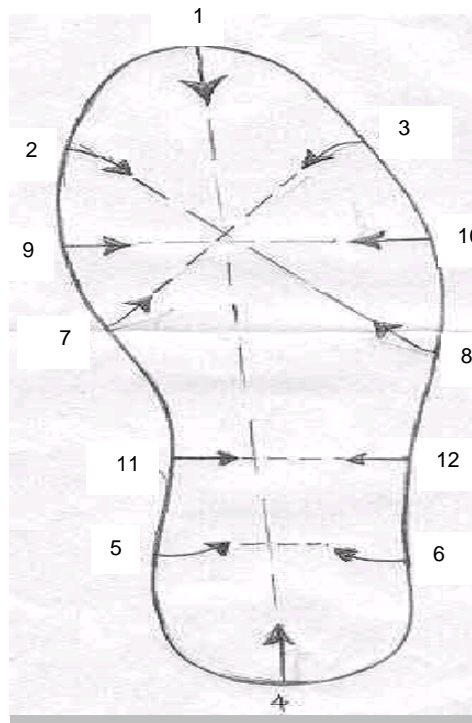
- (xi) The final drafting strains are taken in the waist and a firm pull is required to ensure that the upper is pulled down right to the last.



- (xii) The gaps between these drafting pulls are then filled with more pulls and tacks spaced about 5-10 mm apart.
- (xiii) Around the toe and seat it is necessary to twist the pincer clockwise to the right of the centre and anticlockwise to the left of the centre. The twisting action helps to compress “the leather so that it does not FORM pleats which travel over the feather edge.



- (xiv) The final operation is to top up or beat the upper by hammer all around the featheredge to give a smooth feather line.



- (xv) Once the lasting is completed then the lasted upper is passed through the heat setting machine, which helps the upper to retain its new shape. For small scale or cottage industries lasted uppers are kept as it is for at least 48 hours to ensure retention of given shape.





- (xvi) From the lasted upper, the tacks are removed wherever unnecessary and then it is now subjected to the wrinkle-chasing machine, if required to remove any creases from the upper. Ironing may also be carried out to achieve wrinkle free lasted upper.
- (xvii) After this the lasting margin, which was pulled down on the bottom profile of the last, is then roughened and scoured so as to make the bottom plain and to tease up the fibers for proper adhesion. In case of the synthetic uppers, instead of the physical roughing by the machine, the upper is wiped with the chemical, which again helps in forming a good bond during adhesion.
- (xviii) One or two coats of adhesive is applied to the prior prepared sole and the upper.
- (xix) On drying up of this adhesive films, the upper and the sole is heat reactivated.
- (xx) Spotting and sole press operation follows thereafter.
- (xxi) Then the shoe is de-lasted from the last and sent to the finishing section for cleaning and finishing before it is finally packed.



### SAQ 1

- (a) Give the sequence of operations of Hand Lasting.
- (b) What are the drafting pulls? What role do they play in the lasting of an upper?

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## 2.3 IN-PROCESS QUALITY CONTROL

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The completely lasted shoe should have the following important quality points :

- (i) It should be down to the last.
- (ii) The top line should be somewhat snappy.
- (iii) Toe cap or other parts should be in right position.
- (iv) Back should be straight and have the specified required height.
- (v) Shoe should make a pair.
- (vi) The sole should be firmly attached to the upper and should not come off with little pressure given by the hand.
- (vii) The length of the various components of the upper in a pair should be uniform.
- (viii) There should be no over roughing shown on to the upper.
- (ix) The sole should be spotted properly before sole pressing so that it looks straight and the designs on the sole is not hidden.

The following are some of the shoes, which not only depict the style but also describe the construction in which they were made.



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## 2.4 SUMMARY

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Practical shoe lasting is either done by hand or with the help of different types of machines used in the lasting section. These machines are used as per the type of shoe construction and operation. The practical includes :

- Sequence of operations for upper to be made;
- Machine layout;
- Work allocation;
- Trial production;
- Bottleneck area identification;
- Development of various guides and tools; and
- Quality control.

To ensure the quality and productivity during making can be obtained by adopting these measures before going for actual production. Upper making is a process of assembling upper cut component all together by following the particular system. The components are attached/stitched one aside another or one over another by zigzag seam, close seam, reverses close seam, lap seam or blind seam as per requirement. Finally upper shape takes place and is ready to mould on last. Correct sequence of operation has been required to follow; during upper closing and quality standards are maintained according to specification given.

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## 2.5 KEY WORDS

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<b>Draft</b>	:	The pull of the upper in order to secure to the last.
<b>Pincer</b>	:	A plier like tool used for pulling the upper below to the bottom profile of the last.
<b>Strain</b>	:	Pull given to the upper.